GEOTECHNICAL SUBSURFACE INVESTIGATION DATA REPORT (REVISION NO. 1)

CGG Combined Operating License Application (COLA) Project Calvert Cliffs Nuclear Power Plant (CCNPP) Calvert County, Maryland

April 13, 2007

Prepared By:

SCHNABEL ENGINEERING NORTH, LLC Gaithersburg, Maryland (Schnabel Project No. 06120048)

Submitted To:

BECHTEL POWER CORPORATION Frederick, Maryland (Bechtel Subcontract No. 25237-103-HC4-CY00-00001)



Schnabel Engineering North, LLC

April 13, 2007

Mr. Frank Lopez, Jr., P.E. Bechtel Power Corporation 5275 Westview Drive Frederick, MD 21703-8306

Subject: Geotechnical Subsurface Investigation Data Report (Revision No. 1) CGG Combined Operating License Application (COLA) Project, Calvert Cliffs Nuclear Power Plant (CCNPP), Calvert County, Maryland Subcontract No. 25237-103-HC4-CY00-00001 (Schnabel Project No. 06120001)

Dear Mr. Lopez:

Schnabel Engineering North, LLC (Schnabel) is pleased to submit this Geotechnical Subsurface Investigation Data Report (Revision No. 1) for the above referenced project. This data report contains a summary of the equipment and methods used, subsurface information Schnabel personnel collected for this project, and soil and water laboratory testing. This report supersedes the Geotechnical Subsurface Investigation Data Report dated December 19, 2006, and incorporates information contained in Addendum No. 1, dated January 8, 2007, and Addendum No. 2, dated January 31, 2007.

This report has been prepared in accordance with the Technical Services Subcontract agreement between Bechtel Power Corporation (Bechtel) and Schnabel, dated March 23, 2006, and subsequent Change Orders.

Sampling and testing activities for this project were performed under Bechtel's quality assurance program meeting NQA-1 requirements, and according to the pre-approved project technical specification, technical procedures, and work plans.

We appreciate the opportunity to be of service to you for this project. Please contact Mr. Brian Banks at (301) 417-2400 if you have any questions regarding this report.

Very truly yours,

SCHNABEL ENGINEERING NORTH, LLC

K d a

Brian K. Banks, P.G. Associate

BB/PP/AM:bb/pp/am G:\2006\06120048 Calvert Cliffs\WP\FINAL\07-04-13 Final Report\Calvert Cliffs Data Report 07_04-13.doc

Table of Contents

1.0 Introduction	1
1.1 Site Description	
1.2 Scope of Work	
-	
2.0 Field Testing and Sampling	
2.1 Surveying Services	
2.2 Underground Utility Detection	
2.3 SPT Drilling and Sampling	
2.4 Test Pit Excavation	
2.5 Well Installation	
2.6 Field Permeability Testing	
2.7 Hydraulic Conductivity Analysis	
2.8 Ground Water Sampling	
2.9 Field Electrical Resistivity Testing	
2.10 CPT Soundings	
2.11 Borehole Geophysical Logging	
2.12 SPT Hammer Energy Testing	
2.13 Subcontractors	
3.0 Laboratory Testing	

List of Tables

Table 1: Summary of Hydraulic Conductivity Results	8
Table 2: Field Resistivity Results, ER-1 and ER-2	
Table 3: Field Resistivity Results, ER-3 and ER-4	11

i

Appendices

Appendix A: Summary Tables

- A.1 Table A1: Field Equipment List
- A.2 Table A2: As-Built Subsurface Exploration Point Locations
- A.3 Subcontractors

Appendix B: Underground Utilities

B.1 Underground Utility Location Report

Appendix C: Borings and Test Pits

- C.1 Test Boring and Test Pit Log General Notes
- C.2 SPT Boring Logs
- C.3 Test Pit Logs

Appendix D: Ground Water Observation Wells

- D.1 Well Construction Logs
- D.2 Field Permeability Test Data
- D.3 Well Sampling Records
- Appendix E: Field Electrical Resistivity
 - E.1 Field Electrical Resistivity Test Data
- Appendix F: Cone Penetration Testing (CPT)
 - F.1 CPT Report
- Appendix G: Borehole Geophysics
 - G.1 Borehole Geophysics Report

Appendix H: SPT Hammer Energy Study

H.1 SPT Hammer Energy Study Report

Appendix I: Soil Laboratory Testing

- I.1 Summary of Soil Laboratory Test Results
- I.2 Summary of Chemical Laboratory Test Results Soil and Water
- I.3 Gradation Curves
- I.4 Moisture Density Relationships
- I.5 California Bearing Ratio Results
- I.6 Consolidation Results
- I.7 Unconfined Compression Results
- I.8 UU Triaxial Compression Results
- I.9 CIU-bar Triaxial Compression Results
- I.10 Direct Shear Results
- I.11 Chemical Test Results Soil
- I.12 Chemical Test Results Water
- I.13 Organic Content

1.0 Introduction

Schnabel Engineering North, LLC (Schnabel) performed a geotechnical subsurface investigation under the direction of Bechtel Power Corporation (Bechtel) to support the Combined Operation License Application (COLA) for two new nuclear reactors and associated infrastructure (e.g., heat sinks, cooling towers, switch yard, construction access road, water intake structure, etc.) and help evaluate the siting feasibility for the new reactors.

1.1 Site Description

The project site is located adjacent to the existing Calvert Cliffs Nuclear Power Plant (CCNPP). The site is bordered by the CCNPP to the north, and by Calvert Cliffs along the western shores of the Chesapeake Bay to the east.

The site includes the land currently occupied by "Camp Canoy", a lightly developed recreational facility with a few small, widely-spaced buildings and shelters; a baseball field; tennis courts; pool; a small, earth-dam pond; both paved and un-paved access roads; and utilities.

The majority of the site is wooded with small to large trees and a thin understory of brush and vines, except for some open grassy areas in Camp Canoy. The topography generally consists of gently to moderately sloped terrain, although some areas exhibit steep slopes. Streams and wetland areas occupy many of the topographic lows. Wetland areas were also found at intermediate levels on some of the slopes.

1.2 Scope of Work

The scope of our work as defined by Exhibit D, Scope of Work and Technical Specification 25237-103-3PS-CY00-00001 of the Subcontract included performing field testing and sampling, conducting laboratory testing, providing quality control surveillances during field and laboratory activities, and preparing this data report. Specifically, the following scope items were performed:

- Surveying to establish the horizontal and vertical locations of subsurface exploration points;
- Detecting underground utilities at subsurface exploration points;

Schnabel Engineering North, LLC

1

- Drilling 145 standard penetration test (SPT) borings to depths up to 403 feet, and collection of disturbed SPT and undisturbed tube soil samples;
- Installation and development of 40 ground water observation wells to depths up to 122 feet, permeability testing in each well, and ground water sampling in each well;
- Excavating 20 test pits to depths up to ten feet and collection of bulk soil samples;
- Performing 63 cone penetration test (CPT) soundings, some including shear wave and/or pore water pressure dissipation measurements, to depths up to 142.4 feet with auger pre-drilling;
- Conducting two-dimensional field electrical resistivity testing along four alignments;
- Performing borehole geophysical logging including natural gamma, long- and short-normal resistivity, spontaneous potential, three-arm caliper, and direction survey, and P-S velocity logging in 10 SPT borings;
- Conducting SPT hammer energy testing for each of the five hammer-rod combinations used.
- Soils laboratory testing for moisture content, unit weight, specific gravity, sieve and hydrometer analysis, Atterberg limits, organic content, chemical analysis (pH, sulfate, chloride, cation exchange capacity), moisture-density, unconfined compression, unconsolidated-undrained triaxial compression, consolidatedundrained triaxial compression, direct shear, resonant column torsional shear (RCTS), and consolidation properties. RCTS data is not yet available and will be submitted as an addendum to this report.
- Water laboratory testing for alkalinity, ammonia, nitrogen, bromide, chloride, dissolved solids, fluoride, nitrate, nitrite, sulfate, and sulfide.

This data report, prepared to convey information collected during the subsurface investigation, includes the following:

- Table listing the manufacturer field equipment used,
- As-built exploration point survey data,
- List of subcontractors used,
- Underground utility detection report,
- Typed SPT boring logs,
- CPT report,
- Typed observation well logs,

- Field permeability test results,
- Field electrical resistivity test results,
- Borehole geophysical logging results,
- Laboratory test results, and
- SPT hammer energy study results.

Services with respect to providing engineering analyses and recommendations, approval of testing locations, environmental assessments, and wetlands identification are not included in our scope of services.

2.0 Field Testing and Sampling

The subsurface investigation, including field testing and sampling, was performed between April 27, 2006 and August 8, 2006, except for the as-built survey which was performed between September 15, 2006 and October 19, 2006, and the ground water sampling which was performed between December 19 through 21, 2006. All field testing and sample collection was performed in accordance with technical procedures and work plans established for this project. The field equipment used during field testing and sampling activities is provided as Table A1 in Appendix A.

The subsurface exploration test locations were planned by Bechtel personnel and presented to us on the Subsurface Investigation Location Plan (Drawings 25237-0-CY-0000-00001 and 25237-0-CY-0000-00002) and on the Test Pit Location Plan, (Drawing 25237-0-CY-0000-00003). Each planned test location was staked in the field in advance of the associated testing activity. Offsets from the planned locations were sometimes necessary to avoid steep slopes, large trees, wetland buffers, overhead power lines, underground utilities, and debris piles. Offset locations were approved by Bechtel personnel in advance of testing.

2.1 Surveying Services

Surveying services included both an initial stakeout prior to testing and an as-built survey after testing. The originally planned subsurface exploration point locations (i.e., northing and easting) were staked in the field during the initial stakeout. The follow-up survey was performed after completion of field testing activities to determine the as-built locations for subsurface exploration points offset from their originally planned locations. A summary of the as-built subsurface exploration point locations is provided as Table A2 in Appendix A.

2.2 Underground Utility Detection

Underground utility detection activities were performed to investigate for the presence of underground utilities at each subsurface exploration point location. When underground utility conflicts were detected, subsurface exploration point locations were offset to avoid underground utilities. The underground utility location report prepared by AMT (provided in Appendix B) includes the methods used and the results of the underground utility detection activities.

4

2.3 SPT Drilling and Sampling

A total of 145 SPT borings were performed to depths up to 403 feet. Schnabel personnel provided full-time field inspection of SPT boring activities and logged each boring during drilling. SPT boring logs are presented in Appendix C. Five drilling rigs equipped with automatic SPT hammers were used to advance the borings, including:

- 1. Failing 1500 (truck-mounted)
- 2. CME 75 (truck-mounted)
- 3. CME 550 (ATV-mounted)
- 4. CME 750 (ATV-mounted)
- 5. Diedrich D50 (ATV-mounted)

Borings were advanced using primarily mud rotary techniques, although hollow-stem augers were used as casing in the upper portions of some borings. Details about the drilling tools used for each boring are included on the boring logs. The drilling mud, consisting of a weighted bentonite-water mixture, was used to stabilize the borehole walls and to facilitate sediment removal during drilling. Clean water was used during drilling. The water was brought in from offsite and stored in a water tank.

Standard penetration testing (ASTM D 1586) was generally conducted at a regular spacing of one test every five feet. However, tests were conducted every two-and-a-half feet in the upper 15 feet of each boring. Additionally, SPTs were conducted approximately every ten feet below a depth of about 300 feet in boring B-401. Pocket penetrometer measurements were collected on the exposed bottom portion of selected cohesive undisturbed tube samples. SPT and pocket penetrometer results are included on the boring logs in Appendix C.

Soil sampling in SPT borings included collecting disturbed SPT samples and undisturbed tube samples. SPT split-spoon samples retrieved at each SPT interval were visually described and classified by a Schnabel field inspector. A representative portion of each recovered split-spoon sample was placed in a glass sample jar sealed with a moisture-proof lid. Undisturbed tube samples were collected at selected intervals between SPT tests. The methods used to collect tube samples, including Shelby tubes, Osterberg, and Pitcher sampling, were selected on based on geologic conditions. When possible, the exposed bottom portion of each recovered tube sample

was visually described and classified by a Schnabel field inspector before the tubes were capped and sealed with wax.

SPT borings were backfilled with bentonite-cement grout using a tremie-pipe to displace drilling mud during grout placement. All borings were sealed with grout except for the boring in which wells were installed. A note indicating whether a boring was sealed with grout or finished with a well is included on each boring log.

2.4 Test Pit Excavation

A total of 20 test pits were excavated to depths up to ten feet with a backhoe. Schnabel personnel provided full-time field inspection of test pit excavation activities and logged each test pit during excavation. The Schnabel field inspector collected bulk soil samples at various depths within the test pit excavations. Test pit logs, including subsurface soil descriptions and classifications, ground water observations, and sampling depth intervals, are presented in Appendix C.

2.5 Well Installation

A total of 40 ground water observation wells were installed to depths up to 122 feet. Schnabel personnel provided full-time field inspection of well installation activities and prepared a well construction field log during well installation. Wells were either installed in SPT boreholes in lieu of grout backfill, or at an offset location, typically about ten feet from the SPT "companion" boring. For wells installed in SPT boreholes, the borehole was grouted to the planned bottom depth of the well and reamed to at least six-inch diameter using mud rotary methods and biodegradable drilling fluid. The well holes installed at offset locations were advance using either six-and-a-quarter-inch inside diameter hollow-stem augers or six-inch diameter mud rotary methods with biodegradable drilling fluid. No SPT sampling was conducted at offset well locations.

Well construction logs are presented in Appendix D. Ground water observation wells were constructed using two-inch diameter schedule 40 PVC riser casing; ten-foot long, ten-slot (0.01-inch), machine-cut PVC screen; and a two-foot long sump made of blank casing capped on the bottom. Centralizers were placed above and below the screen interval. Filter pack sand consisting of clean, well-graded sand was placed around the sump and screen intervals, and at

least two feet above the top of the screen. A bentonite seal at least three feet thick was placed above the filter pack. The annular space around the riser casing above the bentonite seal was backfilled with cement-bentonite grout. A protective steel well cover, locking cap, and concrete surface seal were installed for each well.

Each well was developed by pumping and/or flushing with clean water to remove sediment from the well and filter pack prior to field permeability testing. The duration and extent of well development was determined by Bechtel field personnel. However, in general development was carried out until the well water appeared clear.

2.6 Field Permeability Testing

Schnabel personnel performed field permeability testing at each of the 40 ground water observation wells from July 21 to 31, 2006. We followed the falling head slug test method in accordance with Section 8 of ASTM D 4044. A falling head slug test is an unsophisticated test method in which an object of known volume is lowered into a well to induce a rise in water level in the well. Water in the well is subsequently forced out into the surrounding aquifer due to an increase in water pressure at a rate proportional to the hydraulic conductivity of the aquifer. Permeability testing results are presented in Appendix D.

Of the 40 wells tested, 38 contained water immediately prior to testing and two, OW-729 and OW-770, were dry immediately prior to testing. We used a mechanical slug in the wet wells and a water slug in the two dry wells. The mechanical slug was a five-foot long, $1-\frac{1}{4}$ inch internal diameter ($1-\frac{3}{4}$ external diameter) PVC pipe filled with sand. The water slug was a measured amount of water poured quickly into the well.

We recorded a pre-test water level for each well using a water level indicator. Prior to conducting the falling head test at each well, we used an In-situ, Inc. LevelTroll pressure transducer to obtain pre-test water level trends. The LevelTroll was inserted into the well and linked by a cable to a field laptop at the surface. We recorded water level measurements with the LevelTroll every two seconds until the water level in the well recovered from the insertion of the transducer.

To conduct the falling head test, we quickly inserted the slug in the well to raise the water height almost instantaneously. The LevelTroll recorded the water level in the well every 0.250 seconds for the first five minutes, and every two seconds thereafter. The duration of the tests varied from several minutes to three hours, depending on the time it took for the water levels to return to approximate pre-test levels. We ended the test when the water level recovered to within about 0.3 feet of the pre-test water levels, or three hours duration.

2.7 Hydraulic Conductivity Analysis

Hydraulic conductivity analysis was performed for each set of permeability test data using the Bouwer and Rice method for slug/bail testing and Aquifer Test software (version 2.57) by Waterloo Hydrogeologic, Inc. Input parameters (static water level, depth to bottom of aquifer, length of screen, casing radium, and radius of influence) used in the analysis are included on each of the hydraulic conductivity data report sheets included in Appendix D. The porosity of the well filter pack was assumed to be 25%. The hydraulic conductivity results are summarized in Table 1. The hydraulic conductivity analysis results for the two dry observation wells (OW-729 and OW-770) are not reported because the permeability testing for these wells impacted the filter pack material rather than the surrounding formation soil.

		P	
Location	Screened Interval Depth (ft)	USCS	Hydraulic Conductivity (ft/s)
OW-301	65 – 75	SP	1.58X10 ⁻⁴
OW-313A	40 - 50	SM, ML	7.50X10 ⁻⁶
OW-313B	95 - 105	CL, ML, MH	2.74X10 ⁻⁷
OW-319A	20 - 30	SP-SM, SC, CH, CL	2.89X10 ⁻⁶
OW-319B	70 - 80	SM	3.42X10 ⁻⁵
OW-323	30 - 40	SP, SP-SM	6.24X10 ⁻⁵
OW-328	60 - 70	SM, OH	3.79X10 ⁻⁶
OW-336	60 - 70	SP-SM, SM	2.10X10 ⁻⁵
OW-401	63 - 73	SM	6.77X10 ⁻⁶
OW-413A	35 - 45	SP-SM	1.21X10 ⁻⁵
OW-413B	110 - 120	SP-SM, SM	2.78X10 ⁻⁶
OW-418A	25 - 35	SP-SM	4.41X10 ⁻⁶
OW-418B	75 - 85	SC, SM	2.16X10 ⁻⁷
OW-423	28 - 38	SP-SM, SM, SC	6.86X10 ⁻⁵
OW-428	35 - 45	SM, SC	1.19X10 ⁻⁵
OW-436	29 - 39	SC, SM	2.80X10 ⁻⁶
OW-703A	35 - 45	SM	1.34X10 ⁻⁵

Table 1: Summary of Hydraulic Conductivity Results

OW-703B	68 - 78	SM, ML	1.08X10 ⁻⁶
OW-705	40 - 50	SC, SM	4.99X10 ⁻⁶
OW-708	22 - 32	SM	2.56X10 ⁻⁵
OW-711	35 - 45	SM	6.04X10 ⁻⁶
OW-714	38 - 48	SP-SM, SC	2.81X10 ⁻⁶
OW-718	30 - 40	SP-SM	4.44X10 ⁻⁶
OW-725	48 - 58	SM	7.54X10 ⁻⁶
OW-735	60 - 70	SP-SM, SM	5.48X10 ⁻⁵
OW-743	40 - 50	SP-SM, SM	6.23X10 ⁻⁷
OW-744	38 - 48	CL, SC, SM	1.07X10 ⁻⁶
OW-752A	25 - 35	CH, SM	7.03X10 ⁻⁵
OW-752B	85 - 95	SP-SM	3.35X10 ⁻⁶
OW-754	32 - 42	CL, SM	5.29X10 ⁻⁶
OW-756	30 - 40	SP-SM, SP-SC	2.01X10 ⁻⁴
OW-759A	20 - 30	SM, SC, MH	4.64X10 ⁻⁷
OW-759B	75 - 85	SM, SP, SP-SM	1.17X10 ⁻⁶
OW-765A	17 - 27	SP-SM	1.00X10 ⁻⁵
OW-765B	82 - 92	SM	1.36X10 ⁻⁶
OW-766	20 - 30	SP-SM	1.10×10^{-6}
OW-768	30-40	SM	5.29X10 ⁻⁶
OW-769	32 - 42	SM, SC	1.74X10 ⁻⁶

2.8 Ground Water Sampling

Ground water sampling was performed between December 19 and 21, 2006 to obtain ground water samples for laboratory analysis. A total of 15 ground water observation wells, were sampled, including OW-301, OW-323, OW-336, OW-401, OW-423, OW-428, OW-705, OW-708A, OW-711, OW-725, OW-735, OW-744, OW-752, OW-768A, and OW-769. The wells were purged prior to obtaining the ground water samples. Water quality field parameters including pH, dissolved oxygen, electrical conductivity, oxidation-reduction potential, and turbidity, were measured during purging in accordance with ASTM D 6452. Water sampling was also performed in accordance with ASTM D 6452 using a submersible pump laced below the water level in the well and above the screen interval, if possible. The well sampling records for each well are included in Appendix D.

2.9 Field Electrical Resistivity Testing

Field electrical resistivity (ER) testing was performed on June 19 and 20, 2006 to provide apparent resistivity values and modeled one dimensional ground resistivity profiles for

grounding design. ER testing results are provided in Tables 1 and 2 below, and in graphical format (i.e., Resistivity Sounding Data Sheets) in Appendix E.

Schnabel personnel collected field resistivity data using an Advanced Geosciences, Inc., Sting resistivity meter, a Wenner four-electrode array, and "a" spacings of 1.5, 3, 5, 7.5, 10, 15, 20, 30, 40, 50, 100, 200, and 300 feet in accordance with ASTM G57 and IEEE 81. The arrays were centered on the surveyed and staked locations R-1 and 2, R-3, and R-4 as shown on the Subsurface Investigation Location Plan. The electrode locations used for the "a" spacings were located using 300 ft measuring tapes along the appropriate bearings using a Brunton compass. ER line R-1, oriented to site east-west, and line R-2, oriented to site north-south crossed at their midpoints. ER lines R-3 and R-4 were single lines in two separate locations oriented to site north-south. Ground cover at the testing locations generally consisted of forest litter underlain by sandy soil.

Perpendicular lines R-1 and R-2 may be used to observe resistivity anisotropy in the subsurface. Anisotropy is typically caused by differing soil types, soil grain orientation, or moisture content within the test area. In general, the site soils exhibited anisotropy at greater depths. However, consideration should be given to the terrain, which varied between lines R-1 and R-2. The measurements appear to be consistent with those expected from coastal plain soils. The location of the vertical resistivity profile is considered at the midpoint of the array. The depth of the measurements is about ¹/₃ of the "a" spacing (Roy, A. and Apparao, A., 1971, *Depth of Investigation in Direct Current Methods*, Geophysics, v. 36, No. 5, pp. 943-959).

The raw field data are considered "apparent" resistivity values because the measured data includes influences from the large volume of material that is sampled and influences from the geometry of the array used. Modeling the data is an attempt to remove these influences and develop vertical profiles that estimate the true subsurface resistivity values. Schnabel personnel modeled the apparent resistivity data using the modeling software Res1D by M.H. Loke, which uses an iterative approach to model true conditions, and a multi-layer approach. The multiple-layer inversion method results in models with much lower RMS error than a simple two layer method. We found that a seven-layer scenario resulted in the lowest error for ER-1 (12.4%), and a five-layer scenario resulted in the lowest RMS error for line R-2 (7.70%). The inversion results for lines R-1 and R-2 are presented in Table 2 below and on the Resistivity Sounding Data Sheet (sheet one of three) in Appendix E.

Location	Bottom Depth of Layer (ft)	Resistivity (Ohm-feet)
	0.5	1,404
	2.2	40,413
	6.3	3,169
R-1	15.0	10,216
	43.1	167
	119.4	56
	N/A	308
	0.5	2,096
R-2	7.6	11,969
	17.9	7,372
	62.9	3,885
	N/A	223

Table 2: Field Resistivity Results, ER Lines R-1 and R-2

The two perpendicular lines R-1 and R-2 show similar apparent resistivity values in the upper layers. However, the models show differences between their layer resistivities and thicknesses. This may be due to complexities in the subsurface that the inversion program cannot resolve or the fact that lines R-1 and R-2 had potentially significant differences in topography.

The model inversions for lines R-3 and R-4 resulted in best fit of a four layer model with an RMS error of 9.4%, and a best fit of a five layer model with an RMS error of 11.2%, respectively. Although these ER lines were collected with the same trend, the raw data show significant differences which are reflected in the inverted model results. The inversion results for lines R-3 and R-4 are presented in Table 3 below and on the Resistivity Sounding Data Sheets (sheets 2 and 3 of 3) in Appendix E.

Location	Bottom Depth of Layer (ft)	Resistivity (Ohm-feet)
	2.4	9,685
ER-3	10.6	39,140
	59.8	420
	N/A	98
	4.6	1,621
	13.8	16,535
ER-4	39.9	2,923
	53.2	1,230
	N/A	118

Table 3: Field Resistivity Results, ER Lines R-3 and R-4

2.10 CPT Soundings

ConeTec, Inc. completed a total of 63 cone penetration test (CPT) soundings to depths up to 142.4 feet, including seismic and pore pressure dissipation testing at selected depth intervals. Many CPT soundings encountered refusal above the target depths. Predrilling with hollow-stem augers was performed in several locations to penetrate refusal zones. Schnabel personnel provided full-time field inspection of CPT activities.

The ConeTec report, *Presentation of In Situ Testing Program Results*, is presented in Appendix F. The ConeTec report includes a summary of the equipment and methods used as well as CPT test results (i.e., CPT logs, shear wave velocity data, and pore pressure dissipation curves).

2.11 Borehole Geophysical Logging

Geovision, Inc. performed borehole geophysical logging in a total of ten SPT borings. Borehole geophysical methods included natural gamma, long- and short-normal resistivity, spontaneous potential, three-arm caliper, direction survey, and P-S velocity logging. Schnabel personnel provided full-time field inspection of borehole geophysical logging activities. The Geovision report, *Boring Geophysical Logging*, is presented in Appendix G. The Geovision report includes a summary of the equipment and methods used as well as the borehole geophysics test results.

2.12 SPT Hammer Energy Testing

GRL Engineers, Inc. performed SPT energy measurements for each of the five SPT drilling rigs used for this project to evaluate the energy transfer efficiency for each rig-hammer combination. Schnabel personnel provided full-time field inspection of SPT energy measurement activities. The GRL report, *Summary Report for SPT Energy Measurements*, is included in Appendix H. The GRL report presents a summary of the equipment and methods used as well as the results of the SPT hammer energy testing.

2.13 Subcontractors

Table A3 in Appendix A lists the subcontractors used by Schnabel on the project.

3.0 Laboratory Testing

Laboratory testing of selected soil samples was performed on disturbed SPT and bulk samples, and undisturbed tube samples recovered from the SPT test borings and test pit excavations. Laboratory testing of selected water samples was performed on ground water samples obtained from ground water observation wells. The samples selected for testing were based on laboratory assignments provided by Bechtel personnel. Soil laboratory tests included moisture content, grain size (sieve and hydrometer), Atterberg limits, organic content, chemical analysis (pH, chloride, sulfate, cation exchange capacity), unit weight, specific gravity, moisturedensity, California bearing ratio (CBR), consolidation, unconfined compression (UC), unconsolidated-undrained triaxial compression (UU), consolidated-undrained triaxial compression (CIU-bar), direct shear, resonant column torsional shear (RCTS) testing. Water laboratory testing included total dissolved solids, inorganic ions (bromide, chloride, fluoride, sulfide, sulfate, nitrite, and nitrate), alkalinity (bicarbonate/carbonate), and ammonia. Laboratory testing was conducted in accordance with the following ASTM standards:

- 1) Identification and Index Testing:
 - a) Unified Soil Classification System (USCS) ASTM D 2487 and ASTM D 2488
 - b) Sieve and Hydrometer Analysis ASTM D 422 and ASTM D 6913
 - c) Atterberg Limits ASTM D 4318
 - d) Natural Moisture Content ASTM D 2216
 - e) Specific Gravity ASTM D 854
 - f) Organic Content ASTM D 2974
- 2) Compaction and Strength Tests
 - a) Moisture-Density Relationship ASTM D 1557
 - b) California Bearing Ratio ASTM D 1883
 - c) Unconfined Compression ASTM D 2166
 - d) Unconsolidated-undrained Triaxial Compression ASTM D 2850
 - e) Consolidated-undrained Triaxial compression ASTM D 4767
 - f) Direct Shear ASTM D 3080

- 3) Compressibility Tests
 - a) Consolidation ASTM D 2435
- 4) Chemical Testing Soil
 - a) pH ASTM D 4972
 - b) Chloride EPA 300.0
 - c) Sulfate EPA 300.0
 - d) Cation Exchange Capacity ECL-SOP-313
- 5) Chemical Testing Water
 - a) Total Dissolved Solids ECL-SOP-306
 - b) Inorganic Ions ECL-SOP-301a
 - c) Alkalinity ECL-SOP-312
 - d) Ammonia ECL-SOP-320 and ECL-SOP-350

A total of five approved soil testing laboratories were used to conduct soil laboratory testing for this project, including:

• Schnabel Engineering, Baltimore, Maryland

Performed moisture content, sieve, sieve with hydrometer, Atterberg limits, unit weight, specific gravity, moisture density, and CBR tests.

• Schnabel Engineering, Blacksburg, Virginia

Performed moisture content, sieve with hydrometer, Atterberg limits, unit weight, specific gravity, consolidation, UC, UU, CIU-bar and direct shear tests.

• GeoTesting Express, Boxborough, Massachusetts

Performed moisture content, sieve, sieve with hydrometer, Atterberg limits, unit weight, specific gravity, consolidation, UC, UU, CIU-bar and direct shear tests.

• Enviro-Chem, Baltimore, Maryland

Performed chemical analysis tests on soil and ground water samples.

• Fugro Consultants, Houston, Texas

Performed RCTS tests (results pending).

Detailed laboratory test results are presented in Appendix I. The boring logs in Appendix B include moisture content, grain size, and Atterberg limits results. The Unified Soil Classification System (USCS) group names and group symbols shown on the logs are consistent with laboratory testing results. The color descriptions on the gradation curves indicate the colors observed during laboratory testing and therefore may differ from the color descriptions on the boring logs which reflect field observations.

<u>APPENDIX A</u> SUMMARY TABLES

- Table A1: Field Equipment List
- Table A2: As-Built Subsurface Exploration Point Locations
- Table A3: Subcontractors

Schnabel Project No. 06120048 Appendix A: Summary Tables

Table A1 Field Equipment List

Table A1 Field Equipment List Constellation Generation Group (CGG) COLA Project Calvert Cliffs Nuclear Power Plant (CCNPP) Calvert County, Maryland

	Equipment Used						
Field Activity	General Description	Manufacturer	Model	Serial Number	Calibration Certification Date		
Surveying	Transit	Topcon	GPT-3002W	990609	2/13/2006		
	Pipe/Cable Locator	Radiodetection	RD-4000	142021NZ	1/26/2006		
Underground Utility Detection	Pipe/Cable Locator	Radiodetection	RD-4001	2938UZ	1/26/2006		
Detection	Pipe/Cable Locator	Metrotech	Metrotech	3222	3/13/2006		
	Pipe/Cable Locator	Metrotech	Metrotech	3222	3/13/2006		
	SPT Drilling Rig	Failing	1500 (truck-mounted)	N/A	N/A		
	SPT Drilling Rig	Central Mine Equipment Co.	75 (truck-mounted)	N/A	N/A		
	SPT Drilling Rig	Central Mine Equipment Co.	550 (ATV-mounted)	N/A	N/A		
	SPT Drilling Rig	Central Mine Equipment Co.	750 (ATV-mounted)	N/A	N/A		
Standard Penetration	SPT Drilling Rig	Diedrich Drill, Inc.	D50 (ATV-mounted)	N/A	N/A		
Installation	Automatic SPT Hammer	Central Mine Equipment Co.	N/A	C-I	4/18/2006		
	Automatic SPT Hammer	Central Mine Equipment Co.	N/A	C-II	4/18/2006		
	Automatic SPT Hammer	Diedrich Drill, Inc.	N/A	C-III	5/12/2006		
	Automatic SPT Hammer	Central Mine Equipment Co.	N/A	UTD-001	4/20/2006		
	Automatic SPT Hammer	Central Mine Equipment Co.	N/A	UTD-002	4/24/2006		
	CPT Sounding Rig	ConeTec, Inc./Moroka	TC3	N/A	N/A		
Cone Penetration Testing	Load Cell	ConeTec, Inc.	N/A	LC1129	5/15/2006		
(CPT)	Electronic Seismic Piezo Cone	ConeTec, Inc.	N/A	AD195	2/13/2006 & 7/11/2006		
	Electronic Seismic Piezo Cone	ConeTec, Inc.	N/A	AD184	9/14/2005 & 7/11/2006		
Field Electrical Resistivity	Resistivity Meter	Advanced Geosciences, Inc.	STING R1 Resistivity Meter	990324	6/16/2006		

Table A1 Field Equipment List Constellation Generation Group (CGG) COLA Project Calvert Cliffs Nuclear Power Plant (CCNPP) Calvert County, Maryland

	Equipment Used				
Field Activity	General Description	Manufacturer	Model	Serial Number	Calibration Certification Date
	Accelerometer	Pile Dynamics, Inc.	N/A	P548	11/11/2005
	Accelerometer	Pile Dynamics, Inc.	N/A	K0280	11/17/2005
	Accelerometer	Pile Dynamics, Inc.	N/A	K0018	6/29/2005
	Accelerometer	Pile Dynamics, Inc.	N/A	K0262	6/30/2005
	Accelerometer	Pile Dynamics, Inc.	N/A	K0277	5/30/2006
	Accelerometer	Pile Dynamics, Inc.	N/A	K0019	5/16/2006
	Accelerometer	Pile Dynamics, Inc.	N/A	122J	11/3/2005
	Accelerometer	Pile Dynamics, Inc.	N/A	K0363	9/22/2005
SPT Hammer Energy Study	Accelerometer	Pile Dynamics, Inc.	N/A	K0455	2/2/2006
	Accelerometer	Pile Dynamics, Inc.	N/A	K0417	12/1/2005
	Accelerometer	Pile Dynamics, Inc.	N/A	K0397	12/1/2005
	Accelerometer	Pile Dynamics, Inc.	N/A	K0281	7/20/2005
	Accelerometer	Pile Dynamics, Inc.	N/A	K0286	7/20/2005
	Accelerometer	Pile Dynamics, Inc.	N/A	K0287	7/20/2006
	Accelerometer	Pile Dynamics, Inc.	N/A	K0288	12/13/2005
	Pile Driving Analyzer	Pile Dynamics, Inc.	Model PAK	1702	5/19/2006
	Pile Driving Analyzer	Pile Dynamics, Inc.	Model PAK	1638	3/23/2005
	Caliper Calibration Plate	Robertson Geo Logging	N/A	201	4/6/2006
	Suspension Logger	Oyo Corp.	3331-A	19029	4/21/2006
Downhole Coonducies	Suspension Telemetry	Oyo Corp.	3403	160023	4/21/2006
Downnoie Geophysics	Seismograph	Geometrics	STRATAVIEW	75299	4/21/2006
	Counter	Hewlett Packard	2626A09881	5335A	4/21/2006
	FCTN Gen	Hewlett Packard	2847A14447	3325B	4/21/2006

Table A1 Field Equipment List Constellation Generation Group (CGG) COLA Project Calvert Cliffs Nuclear Power Plant (CCNPP) Calvert County, Maryland

	Equipment Used						
Field Activity Permeability Testing Pocket Penetration Index Testing	General Description	Manufacturer	Model	Serial Number	Calibration Certification Date		
	Pressure Transducer	InSitu, Inc.	Level Troll 700	104259	1/24/2006		
Permeability Testing	Pressure Transducer	InSitu, Inc.	Level Troll 700	104213	1/19/2006		
	Pressure Transducer	InSitu, Inc.	Level Troll 700	104255	1/23/2006		
	Water Level Meter	Heron Instruments	Dipper-T	WLP-001	7/20/2006		
	Pocket Penetrometer	Ben Meadows Company	5JF-49015	PP-01	4/25/2006		
Pocket Penetration	Pocket Penetrometer	Ben Meadows Company	5JF-49015	PP-02	4/25/2006		
Index Testing	Pocket Penetrometer	Ben Meadows Company	5JF-49015	PP-03	4/25/2006		
	Pocket Penetrometer	Ben Meadows Company	5JF-49015	PP-04	4/25/2006		

Schnabel Project No. 06120048 Appendix A: Summary Tables

Table A2As-Built Subsurface Exploration Point Locations

Location	Depth (ft)	Termination Elevation (ft)	Coordin Maryland (NAD	nates (ft) State Plane 9 1927)	Ground Surface Elevation	Elevation (ft) Top of Concrete at Base of Well Head	Elevation (ft) Ground Water Level Measuring Point	Date of As Built Survey
			North	East	(III) (NGVD 29)	Protector	(V-Notch)	
B-301	403.0	-308.5	217024.06	960815.05	94.51	N/A	N/A	9/15/2006
B-302	200.0	-123.6	217122.24	960766.98	76.41	N/A	N/A	9/15/2006
B-303	200.0	-112.6	217016.91	960867.69	87.40	N/A	N/A	9/15/2006
B-304	200.0	-132.0	217188.61	960896.88	68.00	N/A	N/A	9/15/2006
B-305	151.5	-79.5	217166.25	960686.74	72.01	N/A	N/A	9/15/2006
B-306	150.0	-31.4	217024.31	960681.82	118.58	N/A	N/A	9/15/2006
B-307	201.5	-82.2	216955.27	960690.13	119.28	N/A	N/A	9/15/2006
B-308	150.0	-42.9	216906.69	960771.28	107.10	N/A	N/A	9/15/2006
B-309	150.0	-49.9	216949.24	960890.70	100.06	N/A	N/A	9/15/2006
B-310	100.0	-8.4	217081.40	960616.60	91.62	N/A	N/A	5/15/2006
B-311	150.0	-91.6	217268.61	960771.76	58.43	N/A	N/A	9/15/2006
B-312	99.5	-44.2	217293.00	960740.00	55.27	N/A	N/A	5/15/2006
B-313	150.0	-99.3	217372.34	960713.67	50.73	N/A	N/A	9/15/2006
B-314	100.0	-47.2	217321.89	960654.50	52.78	N/A	N/A	9/15/2006
B-315	100.0	-34.5	217184.68	960559.43	65.54	N/A	N/A	9/15/2006
B-316	100.0	8.1	216767.16	960864.35	108.07	N/A	N/A	9/15/2006
B-317	100.0	-5.6	217094.70	961249.20	94.42	N/A	N/A	5/15/2007
B-318	200.0	-102.2	217019.30	961227.20	97.82	N/A	N/A	5/15/2006
B-319	100.0	2.9	216963.62	961123.01	102.87	N/A	N/A	9/15/2006
B-320	150.0	-43.6	216943.50	961044.10	106.43	N/A	N/A	5/15/2006
B-321	150.0	-79.3	217152.50	960333.20	70.66	N/A	N/A	5/25/2006
B-322	100.0	-10.1	217170.03	960202.65	89.87	N/A	N/A	9/15/2006
B-323	200.0	-92.5	217027.97	960060.86	107.48	N/A	N/A	9/15/2006
B-324	101.5	3.7	216906.40	960114.44	105.20	N/A	N/A	9/15/2006
B-325	100.0	-15.0	216948.98	960549.73	84.97	N/A	N/A	9/15/2006
B-326	100.0	3.1	216859.22	960652.25	103.11	N/A	N/A	9/15/2006
B-327	150.0	-63.1	216865.70	960573.37	86.92	N/A	N/A	9/15/2006
B-328	150.0	-73.7	216828.86	960493.21	76.29	N/A	N/A	9/19/2006
B-329	100.0	-25.2	216800.38	960379.43	74.83	N/A	N/A	9/19/2006
B-330	100.0	-14.5	216715.40	960523.70	85.46	N/A	N/A	9/15/2006
B-331	100.0	-31.7	216970.57	960481.79	68.32	N/A	N/A	9/15/2006
B-332	100.0	-34.6	217127.42	960400.52	65.40	N/A	N/A	9/15/2006
B-333	98.8	-9.3	216657.04	960386.24	89.49	N/A	N/A	9/15/2006
B-334	100.0	-13.3	216515.53	960556.61	86.75	N/A	N/A	9/15/2006
B-335	100.0	-0.5	216732.70	960703.30	99.47	N/A	N/A	5/15/2006
B-336	100.0	-3.1	216632.91	960750.27	96.87	N/A	N/A	9/15/2006
B-337	100.0	-28.2	217257.88	960264.41	71.77	N/A	N/A	9/15/2006
B-338	99.6	-1.6	217121.10	960150.10	97.97	N/A	N/A	5/25/2006
B-339	100.0	-8.0	217095.21	960211.99	91.96	N/A	N/A	9/15/2006

Location	Depth (ft)	Termination Elevation (ft)	Coordir Maryland (NAD	nates (ft) State Plane 9 1927)	Ground Surface Elevation	Elevation (ft) Top of Concrete at Base of Well Head	Elevation (ft) Ground Water Level Measuring Point	Date of As Built Survey
			North	East	(ft) (NGVD 29)	Protector	(V-Notch)	
B-340	100.0	-15.4	217171.34	961225.22	84.57	N/A	N/A	9/15/2006
B-341	100.5	-2.3	217036.40	961104.48	98.16	N/A	N/A	9/15/2006
B-401	401.5	-329.4	216344.12	961516.81	72.06	N/A	N/A	9/15/2006
B-402	200.0	-117.8	216405.10	961463.50	82.22	N/A	N/A	5/15/2006
B-403	200.0	-136.6	216305.80	961562.90	63.41	N/A	N/A	5/15/2006
B-404	200.0	-132.1	216441.34	961596.49	67.90	N/A	N/A	9/21/2006
B-405	150.0	-28.0	216487.38	961408.73	122.00	N/A	N/A	9/15/2006
B-406	150.0	-31.6	216315.62	961352.01	118.36	N/A	N/A	9/15/2006
B-407	200.0	-118.4	216238.96	961412.45	81.63	N/A	N/A	9/15/2006
B-408	150.0	-81.6	216261.74	961482.04	68.41	N/A	N/A	9/15/2006
B-409	150.0	-88.5	216253.80	961614.80	61.55	N/A	N/A	4/20/2006
B-410	55.0	64.1	216374.30	961323.70	119.05	N/A	N/A	4/20/2006
B-410A*	98.7	20.4	216381.30	961323.70	119.05	N/A	N/A	4/20/2006
B-411	150.0	-68.6	216556.31	961517.19	81.45	N/A	N/A	9/15/2006
B-412	98.9	-6.7	216589.24	961495.42	92.17	N/A	N/A	9/15/2006
B-413	150.0	-27.1	216694.88	961413.25	122.90	N/A	N/A	9/15/2006
B-414	100.0	21.2	216630.18	961354.48	121.20	N/A	N/A	9/15/2006
B-415	98.7	20.6	216480.90	961264.20	119.26	N/A	N/A	4/20/2006
B-416	100.0	-13.8	216084.50	961596.34	86.22	N/A	N/A	9/15/2006
B-417	101.5	-52.3	216435.75	961901.11	49.23	N/A	N/A	9/15/2006
B-418	200.0	-156.3	216340.25	961976.71	43.67	N/A	N/A	9/22/2006
B-419	100.0	-44.7	216267.83	961895.60	55.29	N/A	N/A	9/21/2006
B-420	150.0	-87.4	216213.53	961670.44	62.57	N/A	N/A	9/15/2006
B-421	150.0	-34.4	216497.56	961019.77	115.58	N/A	N/A	9/15/2006
B-422	100.0	4.0	216478.23	960915.01	104.02	N/A	N/A	9/15/2006
B-423	201.5	-91.4	216331.76	960850.21	110.14	N/A	N/A	9/15/2006
B-424	100.0	18.9	216263.30	960818.60	118.92	N/A	N/A	4/26/2006
B-425	101.5	16.9	216247.50	961274.70	118.43	N/A	N/A	4/20/2006
B-426	100.0	-16.3	216193.04	961386.57	83.73	N/A	N/A	9/21/2006
B-427	150.0	-33.7	216164.05	961272.73	116.27	N/A	N/A	9/19/2006
B-428	150.0	-35.9	216109.19	961210.06	114.11	N/A	N/A	9/19/2006
B-429	100.0	3.7	216087.85	961119.27	103.66	N/A	N/A	9/19/2006
B-430	100.0	2.5	216006.88	961193.12	102.48	N/A	N/A	9/19/2006
B-431	101.5	16.9	216271.10	961177.30	118.43	N/A	N/A	4/20/2006
B-432	100.0	18.6	216399.00	961139.10	118.62	N/A	N/A	4/20/2006
B-433	100.0	-2.5	215963.80	961107.50	97.49	N/A	N/A	4/27/2006
B-434	100.0	5.2	215827.10	961244.30	105.15	N/A	N/A	5/2/2006
B-435	100.0	7.7	216020.06	961404.74	107.71	N/A	N/A	9/15/2006
B-436	100.0	8.3	215923.92	961441.55	108.29	N/A	N/A	9/22/2006

Location	Depth (ft)	Termination Elevation (ft)	Coordir Maryland (NAD	nates (ft) State Plane 1927)	Ground Surface Elevation	and Elevation (ft) Elevation (ft) ace Top of Concrete at tion Ground Water Level attion Base of Well Head Measuring Point		Date of As Built Survey
			North	East	(ft) (NGVD 29)	Protector	(V-Notch)	
B-437	100.5	10.1	216521.76	960968.80	110.63	N/A	N/A	9/15/2006
B-438	6.5	99.5	216414.91	960848.90	105.95	N/A	N/A	9/28/2006
B-438A	100.0	6.6	216411.98	960867.31	106.59	N/A	N/A	9/28/2006
B-439	100.0	13.8	216340.49	960948.68	113.80	N/A	N/A	9/15/2006
B-440	100.0	-43.7	216349.47	961813.66	56.34	N/A	N/A	9/21/2006
B-701	75.0	-66.3	219485.54	960507.60	8.66	N/A	N/A	9/21/2006
B-702	50.0	-39.7	218980.62	961183.23	10.33	N/A	N/A	9/21/2006
B-703	100.0	-54.6	218171.00	960957.01	45.42	N/A	N/A	9/21/2006
B-704	50.0	-10.4	217991.06	960926.05	39.58	N/A	N/A	9/21/2006
B-705	50.0	-3.3	217581.30	960917.90	46.75	N/A	N/A	4/19/2006
B-706	50.0	27.4	217140.14	961339.74	77.42	N/A	N/A	9/21/2006
B-707	50.0	17.4	217396.98	961481.84	67.38	N/A	N/A	9/21/2006
B-708	100.0	-62.7	217585.84	961810.64	37.35	N/A	N/A	9/28/2006
B-709	50.0	-18.8	217642.82	961978.18	31.25	N/A	N/A	9/28/2006
B-710	75.0	-27.0	217542.51	962136.88	47.96	N/A	N/A	9/28/2006
B-711	50.0	3.0	216755.70	961743.50	53.01	N/A	N/A	4/19/2006
B-712	50.0	-7.6	216506.16	961997.56	42.41	N/A	N/A	9/22/2006
B-713	50.0	8.0	216117.68	962283.16	57.99	N/A	N/A	9/28/2006
B-714	50.0	66.0	215705.73	962034.37	116.02	N/A	N/A	10/16/2006
B-715	50.0	36.3	214951.76	962639.59	86.29	N/A	N/A	10/17/2006
B-716	49.5	32.9	215003.21	961364.57	82.35	N/A	N/A	10/16/2006
B-717	50.0	40.7	214302.45	962349.27	90.72	N/A	N/A	10/17/2006
B-718	50.0	67.5	214130.52	961929.05	117.47	N/A	N/A	10/18/2006
B-719	49.4	25.8	213978.69	961500.20	75.23	N/A	N/A	10/18/2006
B-720	75.0	-1.5	215674.48	962378.47	73.47	N/A	N/A	9/28/2006
B-721	100.0	1.3	215545.80	962462.10	101.30	N/A	N/A	5/4/2006
B-722	73.9	25.9	215386.10	962467.00	99.78	N/A	N/A	5/4/2006
B-723	75.0	15.0	215108.00	963000.80	90.02	N/A	N/A	4/28/2006
В-724	100.0	-3.0	214780.00	963106.20	96.97	N/A	N/A	4/28/2006
В-725	75.0	-16.0	214664.30	963219.40	59.02	N/A	N/A	4/28/2006
В-726	75.0	3.3	215564.67	961709.57	78.33	N/A	N/A	10/16/2006
B-727	100.0	4.9	215300.85	961884.98	104.88	N/A	N/A	10/16/2006
B-728	75.0	37.3	215163.63	961910.05	112.30	N/A	N/A	10/16/2006
B-729	75.0	42.3	214861.87	962454.60	117.28	N/A	N/A	10/17/2006
B-730	75.0	40.4	214728.50	962523.84	115.36	N/A	N/A	10/17/2006
B-731	99.3	16.4	214546.48	962547.88	115.67	N/A	N/A	10/17/2006
B-732	75.0	15.7	215034.10	961594.70	90.72	N/A	N/A	5/11/2006
B-733	100.0	-12.1	214866.80	961697.70	87.92	N/A	N/A	5/11/2006
B-734	75.0	30.7	214589.60	961812.50	105.73	N/A	N/A	5/9/2006

Location Depth Termination (ft) Elevation (ft)		Termination Elevation (ft)	Coordinates (ft) Maryland State Plane (NAD 1927)		Ground Surface Elevation	Elevation (ft) Top of Concrete at Base of Well Head	Elevation (ft) Ground Water Level Measuring Point (V Natab)	Date of As Built Survey
			North	East	(III) (NGVD 29)	Protector	(V-Notch)	
В-735	75.0	16.2	214805.48	961021.83	91.20	N/A	N/A	10/16/2006
B-736	75.0	23.3	214681.67	961154.26	98.29	N/A	N/A	10/16/2006
B-737	100.0	-36.5	214511.91	961147.40	63.47	N/A	N/A	10/16/2006
B-738	75.0	12.3	213826.30	961679.62	87.29	N/A	N/A	10/19/2006
B-739	99.8	0.5	213719.60	961793.32	100.35	N/A	N/A	10/19/2006
B-740	75.0	-0.7	213605.13	961781.13	74.29	N/A	N/A	10/19/2006
B-741	75.0	6.4	213760.48	961029.82	81.38	N/A	N/A	10/18/2006
B-742	100.0	2.4	213472.84	961217.19	102.39	N/A	N/A	10/18/2006
B-743	75.0	28.6	213315.70	961232.00	103.60	N/A	N/A	5/9/2006
B-744	100.0	13.3	216377.30	959963.38	113.28	N/A	N/A	9/29/2006
B-745	75.0	36.7	215971.20	960529.02	111.71	N/A	N/A	9/29/2006
B-746	75.0	7.8	215743.35	960721.36	82.79	N/A	N/A	9/29/2006
B-747	75.0	15.3	216176.28	959944.95	90.34	N/A	N/A	9/29/2006
B-748	100.0	-17.6	216039.74	960288.74	82.40	N/A	N/A	9/29/2006
B-749	75.0	27.5	215775.08	960332.24	102.53	N/A	N/A	9/29/2006
B-750	73.9	-1.6	215849.16	959930.06	72.35	N/A	N/A	9/29/2006
B-751	73.9	18.3	215588.86	960146.20	92.23	N/A	N/A	9/29/2006
B-752	100.0	-4.2	215489.21	960257.57	95.79	N/A	N/A	9/29/2006
B-753	40.0	8.8	217831.20	960648.86	48.81	N/A	N/A	9/21/2006
B-754	50.0	17.0	217369.78	960290.37	67.00	N/A	N/A	9/21/2006
B-755	40.0	55.0	215923.66	961637.86	94.98	N/A	N/A	9/22/2006
B-756	50.0	56.9	215504.60	961215.10	106.85	N/A	N/A	4/21/2006
B-757	40.0	66.9	215135.13	960760.60	106.86	N/A	N/A	10/16/2006
B-758	40.0	42.6	215133.29	960332.67	82.63	N/A	N/A	10/16/2006
B-759	100.0	-1.7	214526.25	960025.32	98.35	N/A	N/A	10/19/2006
B-765	102.0	-4.6	216424.51	959701.22	97.37	N/A	N/A	9/29/2006
B-766	50.0	58.9	216932.89	959791.50	108.89	N/A	N/A	9/19/2006
B-768	100.0	-51.6	217116.03	962242.98	48.39	N/A	N/A	9/28/2006
B-769	50.0	4.2	216589.75	962559.47	54.23	N/A	N/A	9/28/2006
B-770	50.0	71.6	215466.60	962826.95	121.59	N/A	N/A	10/18/2006
C-301	52.3	42.5	217041.78	960820.13	94.84	N/A	N/A	9/15/2006
C-302	61.7	29.3	217088.90	960833.77	90.94	N/A	N/A	9/15/2006
C-302-2*	55.3	39.2	217026.56	960817.55	94.51	N/A	N/A	7/26/2006
C-302-2a*	138.0	-43.5	217026.56	960817.55	94.51	N/A	N/A	7/26/2006
C-303	25.4	36.2	217230.60	960804.00	61.58	N/A	N/A	4/24/2006
C-303a*	47.1	14.5	217230.60	960804.00	61.58	N/A	N/A	7/25/2006
C-303a-1*	71.4	-9.8	217230.60	960804.00	61.58	N/A	N/A	7/25/2006
C-303b*	123.4	-61.8	217230.60	960804.00	61.58	N/A	N/A	7/25/2006

Location	Depth (ft)	Termination Elevation (ft)	Coordinates (ft) Maryland State Plane (NAD 1927)		Ground Surface Elevation	Elevation (ft) Top of Concrete at Base of Well Head	Elevation (ft) Ground Water Level Measuring Point	Date of As Built Survey
			North	East	(ft) (NGVD 29)	Protector	(V-Notch)	
C-304	26.7	34.2	217235.29	960606.73	60.95	N/A	N/A	9/15/2006
C-305	74.3	41.6	216876.50	960961.50	115.91	N/A	N/A	4/24/2006
C-306	56.9	40.4	217042.12	961184.89	97.31	N/A	N/A	9/15/2006
C-306a*	102.5	-5.2	217038.92	961181.69	97.31	N/A	N/A	7/27/2006
C-307	75.3	42.4	216853.68	961079.64	117.64	N/A	N/A	9/15/2006
C-308	48.2	36.1	217129.90	960263.70	84.33	N/A	N/A	5/1/2006
C-309	70.1	36.0	217045.62	960110.76	106.04	N/A	N/A	9/15/2006
C-311	34.9	39.0	216869.75	960488.16	73.97	N/A	N/A	9/15/2006
C-312	56.4	43.3	216799.20	960596.36	99.75	N/A	N/A	9/15/2006
C-313	37.2	42.7	216757.92	960336.75	79.93	N/A	N/A	9/15/2006
C-314	39.5	40.6	216531.40	960493.83	80.09	N/A	N/A	9/15/2006
C-401	28.1	39.4	216384.26	961574.09	67.46	N/A	N/A	9/15/2006
C-401-2a*	81.9	-14.4	216381.06	961570.89	67.46	N/A	N/A	7/27/2006
C-401-2b*	131.2	-63.8	216381.06	961570.89	67.46	N/A	N/A	7/27/2006
C-402	34.5	38.7	216333.85	961494.18	73.13	N/A	N/A	9/15/2006
C-403	43.8	39.2	216517.33	961511.47	82.96	N/A	N/A	9/15/2006
C-404	80.1	39.2	216524.30	961308.90	119.21	N/A	N/A	4/20/2006
C-405	40.0	35.5	216163.49	961666.32	75.54	N/A	N/A	9/15/2006
C-406	15.6	28.3	216380.92	961901.51	43.89	N/A	N/A	9/28/2006
C-407	32.3	30.9	216159.20	961732.20	63.23	N/A	N/A	6/22/2006
C-407-2a*	96.3	-33.1	216161.50	961726.70	63.23	N/A	N/A	7/28/2006
C-407-b*	142.4	-79.2	216161.50	961726.70	63.23	N/A	N/A	7/31/2006
C-408	77.4	40.8	216396.64	961001.81	118.18	N/A	N/A	9/15/2006
C-408a*	98.3	19.9	216398.76	960999.69	118.18	N/A	N/A	7/24/2006
C-408-2a*	123.7	-5.5	216393.81	961004.64	118.18	N/A	N/A	7/31/2006
C-409	80.5	38.6	216288.45	960760.56	119.12	N/A	N/A	9/15/2006
C-411	80.4	36.2	216178.94	961178.21	116.60	N/A	N/A	9/19/2006
C-412	76.8	37.5	216093.75	961306.66	114.31	N/A	N/A	9/28/2006
C-413	13.6	86.3	216045.53	961037.78	99.90	N/A	N/A	9/28/2006
C-414	62.5	39.9	215893.42	961201.10	102.36	N/A	N/A	9/28/2006
C-415	20.0	36.6	216305.70	961857.40	56.63	N/A	N/A	5/26/2006
C-701	29.5	-18.6	219262.19	960933.61	10.95	N/A	N/A	9/21/2006
C-701a*	28.1	-17.1	219265.39	960936.81	10.95	N/A	N/A	7/21/2006
C-702	20.3	-9.0	218720.05	961033.95	11.34	N/A	N/A	9/21/2006
C-703	32.6	35.2	217361.27	961165.03	67.82	N/A	N/A	10/17/2006
C-704	48.2	-2.9	217500.74	961710.02	45.36	N/A	N/A	9/28/2006
C-705	34.0	-2.9	217637.26	961983.10	31.08	N/A	N/A	9/28/2006
C-706	50.0	55.2	216958.95	961494.86	105.28	N/A	N/A	9/21/2006
C-707	19.5	20.8	216308.12	962079.42	40.35	N/A	N/A	9/22/2006

Location	Depth (ft)	Termination Elevation (ft)	Coordinates (ft) Maryland State Plane (NAD 1927)		Ground Surface Elevation	Elevation (ft) Top of Concrete at Base of Well Head	Elevation (ft) Ground Water Level Measuring Point	Date of As Built Survey
			North	East	(ft) (NGVD 29)	Protector	(V-Notch)	
C-708	50.0	62.9	215658.28	961962.86	112.97	N/A	N/A	10/16/2006
C-709	50.0	61.7	215027.59	962824.89	111.73	N/A	N/A	10/18/2006
C-710	21.2	85.0	214875.83	961187.31	106.15	N/A	N/A	10/16/2006
C-711	34.9	65.6	214222.13	962176.75	100.54	N/A	N/A	10/17/2006
C-712	29.7	29.4	213909.83	961370.06	59.05	N/A	N/A	10/18/2006
C-713	41.8	21.3	215855.86	962296.57	63.11	N/A	N/A	9/28/2006
C-714	85.1	24.2	214920.30	963057.62	109.32	N/A	N/A	10/18/2006
C-715	57.3	33.6	215445.62	961798.99	90.85	N/A	N/A	10/16/2006
C-716	20.5	75.7	214432.49	962659.44	96.21	N/A	N/A	10.17/2006
C-717	66.6	35.8	214698.14	961692.58	102.35	N/A	N/A	10/16/2006
C-718	34.1	33.6	214343.71	961205.59	67.67	N/A	N/A	10/16/2006
C-719	12.0	78.2	214025.30	961636.90	90.21	N/A	N/A	10/18/2006
C-720	70.7	28.0	213593.77	961134.09	98.66	N/A	N/A	10/18/2006
C-721	52.0	35.6	216157.88	960330.47	87.62	N/A	N/A	9/29/2006
C-722	38.4	36.1	215478.76	960648.26	74.52	N/A	N/A	10/16/2006
C-723	68.7	28.9	215988.18	959760.36	97.60	N/A	N/A	9/29/2006
R-1	N/A	N/A	215837.30	960255.80	85.45	N/A	N/A	5/3/2006
R-2	N/A	N/A	215837.30	960255.80	85.45	N/A	N/A	5/3/2006
R-3	N/A	N/A	216622.50	960406.80	89.12	N/A	N/A	5/2/2006
R-4	N/A	N/A	215915.40	961114.00	99.40	N/A	N/A	4/27/2006
OW-301	80.0	14.5	217048.02	960814.47	94.51	94.78	96.27	9/15/2006
OW-313A	57.5	-6.5	217367.31	960705.30	51.03	51.31	53.20	9/15/2006
OW-313B	110.0	-59.3	217372.34	960713.67	50.73	51.16	53.54	9/15/2006
OW-319A	35.0	68.1	216962.56	961116.12	103.13	103.31	104.91	9/15/2006
OW-319B	85.0	18.5	216957.32	961125.02	103.53	103.85	105.35	9/19/2006
OW-323	43.5	63.5	217034.46	960057.07	106.96	107.55	109.69	9/19/2006
OW-328	72.0	4.3	216828.86	960493.21	76.29	76.55	77.85	9/19/2006
OW-336	74.0	23.1	216643.18	960746.61	97.11	97.50	99.07	9/16/2006
OW-401	77.5	-6.1	216348.86	961530.99	71.38	71.91	73.49	9/21/2006
OW-413A	50.0	73.2	216703.14	961418.81	123.15	123.51	125.04	9/15/2006
OW-413B	125.0	-2.1	216694.88	961413.25	122.90	123.25	124.85	9/15/2006
OW-418A	40.0	3.7	216340.41	961966.46	43.66	44.31	45.83	9/22/2006
OW-418B	92.0	-48.3	216340.25	961976.71	43.67	44.13	45.77	9/22/2006
OW-423	43.0	68.1	216339.99	960882.24	111.12	111.67	113.16	9/15/2006
OW-428	50.0	63.9	216105.21	961212.38	113.92	114.32	115.92	9/19/2006
OW-436	50.0	58.1	215922.47	961446.87	108.13	108.53	110.39	9/22/2006
OW-703A	49.0	-5.0	218171.23	960967.72	44.02	44.44	45.65	9/21/2006

Location	Depth (ft)	Termination Elevation (ft)	Coordinates (ft) Maryland State Plane (NAD 1927)		Ground Surface Elevation	Elevation (ft) Top of Concrete at Base of Well Head	Elevation (ft) Ground Water Level Measuring Point	Date of As Built Survey
			North	East	(ft) (NGVD 29)	Protector	(V-Notch)	
OW-703B	80.0	-34.4	218171.67	960958.91	45.57	45.97	47.53	9/21/2006
OW-705	52.0	-4.3	217566.62	960917.18	47.71	47.77	50.22	9/15/2006
OW-708A	34.0	3.4	217586.23	961803.52	37.44	37.82	39.61	9/28/2006
OW-711	50.0	2.9	216748.48	961741.61	52.92	53.26	55.31	9/22/2006
OW-714	50.0	66.0	215705.73	962034.37	116.02	116.32	117.98	10/16/2006
OW-718	43.0	75.5	214133.58	961924.87	118.53	118.96	120.41	10/18/2006
OW-725	60.0	-2.0	214649.30	963212.73	58.04	58.38	59.94	10/18/2006
OW-729	42.0	76.9	214872.58	962445.93	118.88	119.44	121.11	10/17/2006
OW-735	72.0	19.2	214805.48	961021.83	91.20	91.81	93.44	10/16/2006
OW-743	55.0	48.7	213320.62	961234.01	103.65	104.05	105.89	10/18/2006
OW-744	50.0	47.5	216405.37	960089.41	97.50	97.96	99.81	9/29/2006
OW-752A	37.0	58.3	215482.18	960250.12	95.30	95.73	97.00	9/29/2006
OW-752B	97.0	-1.2	215489.21	960257.57	95.79	96.09	97.41	9/29/2006
OW-754	44.0	23.0	217369.78	960290.37	67.00	67.21	68.85	9/15/2006
OW-756	42.0	64.6	215497.07	961212.39	106.56	107.07	108.77	10/16/2006
OW-759A	35.0	62.8	214536.47	960055.02	97.78	98.05	99.69	10/19/2006
OW-759B	90.0	8.3	214526.25	960056.32	98.35	98.72	100.14	10/19/2006
OW-765A	29.0	68.4	216424.51	959701.22	97.37	97.92	99.60	9/29/2006
OW-765B	102.0	-5.2	216420.42	959693.64	96.82	97.19	98.47	9/29/2006
OW-766	50.0	58.9	216932.89	959791.50	108.89	109.32	110.72	9/19/2006
OW-768A	42.0	6.5	217106.06	962238.98	48.48	48.96	49.84	9/28/2006
OW-769	42.0	12.2	216589.75	962559.47	54.23	54.39	56.43	9/28/2006
OW-770	42.0	79.6	215466.60	962826.95	121.59	121.79	123.08	10/18/2006
TP-B307	6.7	112.7	216957.53	960690.62	119.35	N/A	N/A	9/19/2006
TP-B314	9.0	43.8	217320.35	960658.25	52.78	N/A	N/A	9/15/2006
TP-B315	8.5	57.3	217182.50	960563.12	65.80	N/A	N/A	9/15/2006
TP-B334	10.0	77.0	216515.64	960560.94	87.03	N/A	N/A	9/19/2006
TP-B335	8.0	91.6	216730.79	960706.97	99.64	N/A	N/A	9/19/2006
TP-B407	7.0	74.3	216391.76	961465.02	81.25	N/A	N/A	9/21/2006
TP-B414	6.5	114.3	216631.18	961530.95	120.83	N/A	N/A	9/15/2006
TP-B415	6.5	112.4	216490.91	961298.37	118.92	N/A	N/A	9/15/2006
TP-B423	8.0	97.9	216414.95	960849.03	105.86	N/A	N/A	9/19/2006
TP-B434	8.5	96.7	215825.90	961244.18	105.24	N/A	N/A	9/22/2006
TP-B435	10.0	97.7	216020.06	961404.74	107.71	N/A	N/A	9/19/2006
TP-B715	8.5	79.7	214964.18	962637.77	88.16	N/A	N/A	10/17/2006
TP-B716	8.8	88.3	214983.83	961289.79	97.13	N/A	N/A	10/16/2006
TP-B717	8.0	82.5	214297.68	962346.36	90.53	N/A	N/A	10/17/2006
TP-B719	8.0	64.3	213966.93	961493.94	72.28	N/A	N/A	10/18/2006

Location	Depth (ft)	Termination Elevation (ft)	Coordinates (ft) Maryland State Plane (NAD 1927)		Ground Surface Elevation	Elevation (ft) Top of Concrete at Base of Well Head	Elevation (ft) Ground Water Level Measuring Point (V Natab)	Date of As Built Survey
			North	East	(NGVD 29)	riotector	(v-Noten)	
TP-B727	7.0	97.3	215299.14	961883.13	104.33	N/A	N/A	10/16/2006
TP-B744	6.5	106.8	316377.30	959963.38	113.28	N/A	N/A	9/29/2006
TP-B758	9.0	73.6	215133.29	960332.67	82.63	N/A	N/A	10/16/2006
TP-C309	8.0	100.5	217020.05	960105.24	108.45	N/A	N/A	9/19/2006
TP-C723	7.0	89.8	215989.07	959754.78	96.75	N/A	N/A	9/29/2006

* Location and elevation approximated based on offset observed in the field and recorded on Field Checklist

Schnabel Project No. 06120048 Appendix A: Summary Tables

Table A3Subcontractors
Table A3 Subcontractors Constellation Generation Group (CGG) COLA Project Calvert Cliffs Nuclear Power Plant (CCNPP) Calvert County, Maryland

Subcontractor Name	Contact Information	Services Provided
	Mr. Al Muirhead	Test pit excavation, and path construction and
	P.O. Box 402	grading for boring access.
ABM Construction	Lusby, MD 20657	
	(410) 326-4277	
	Mr. Ken Williams	Underground utility location.
	12750 Twinbrook Parkway	
A. Morton Thomas and Associates Inc	Rockville, MD 20852-1700	
rissociates, me.	(301) 881-2545	
	Mr. Richard Lewis	Test location surveying.
	P.O. Box 2209	
Collinson, Oliff & Associates, Inc.	Prince Frede4rick, MD 20678	
115500111005,11101	(301)-855-1599	
Connelly and Associates,	Mr. Sam Connelly	SPT drilling and sampling, and ground water
	260 Interstate Ct.	observation well installation and development.
	Frederick, MD 21704-6627	
inc.	(301) 696-8820	
	Mr. Stephen Shelley	Soil (pH, chloride, sulfate, cation exchange capacity)
Engine Cham	100 Lakefront Dr.	alkalinity, ammonia) chemical laboratory testing.
Laboratories, Inc.	Hunt Valley, MD 21030	
	(410) 785-9739	
	Mr. Gary Torosian	Soil laboratory testing (moisture content, grain size,
	1145 Massachusetts Ave.	specific gravity, consolidation, unconfined
GeoTesting Express	Boxborough, MA 01719	compression, unconsolidated-undrained triaxial
	(978) 635-0424	compression, consolidated-undrained triaxial compression direct shear)
GEOVision, Inc.	Mr. John Diehl	Borehole geophysical logging (natural gamma, long- and short-normal resistivity, spontaneous potential
	1151 Pomona Rd., Unit P	three-arm caliper, direction survey, and P-S velocity
	Corona, CA 92882	logging)
	(951) 549-1234	

Table A3 Subcontractors Constellation Generation Group (CGG) COLA Project Calvert Cliffs Nuclear Power Plant (CCNPP) Calvert County, Maryland

Subcontractor Name	Contact Information	Services Provided
	Mr. Wondem Toferra	SPT hammer energy testing.
	4535 Renaissance Parkway	
GRL Engineers, Inc.	Cleveland, OH 44128	
	(216) 831-6131	
	Mr. Mark Cox	Silt fence construction.
	50 Mulberry Lane	
Mark's Lawn Service, Inc.	Huntington, MD 20639	
	(410) 257-3885	
	Ms. Joan Baer	SPT drilling and sampling, and ground water
	P.O. Box 407	observation well installation and development.
Uni-Tech Drilling Co., Inc.	Franklinville, NJ 08322-0407	
	(856)-694-4200	

<u>APPENDIX B</u> UNDERGROUND UTILITIES

• Underground Utility Location Report

Schnabel Project No. 06120048 Appendix B: Underground Utilities

UNDERGROUND UTILITY LOCATION REPORT

Underground Utility Detection Report A Morton Thomas and Associates, Inc. October 3, 2006



October 3, 2006

Mr. Brian K. Banks, P.G. Schnabel Engineering North, LLC 656 Quince Orchard Road, Suite 700 Gaithersburg, MD 20878

Subject:

Underground Utility Detection Report CGG Combined Operating License Application (COLA) Project, Calvert Cliffs Nuclear Power Plant (CCNPP), Calvert County, Maryland AMT Project No. 106-219.001U

Dear Mr. Banks:

A Morton Thomas and Associates, Inc. (AMT) is pleased to submit this Underground Utility Detection Report for the above referenced project. This report contains a summary of the equipment and methods used for, and results of the underground utility detection activities. Underground utility detection activities for this project were performed in accordance with the Subcontractor Agreement between AMT and Schnabel Engineering North, LLC, dated May 31, 2006, and according to the pre-approved project technical specification, technical procedures, and work plans.

1.0 Introduction

AMT performed underground utility location activities under the direction of Schnabel personnel to support the subsurface investigation. Geophysical prospecting techniques including conductive and inductive techniques were used to investigate the occurrence and approximate horizontal location of underground utilities within a 10-foot radial distance of each of the subsurface exploration point locations. 1. Inductive refers to "dropping the box" in the vicinity of a known utility and "sweeping" that area to pick up the electromagnetic signature and alignment of the utility. 2. Conductive refers to "directly connecting to any and all utilities in the dig area to verify there exact location. This work is considered quality Level B. Quality level B refers to utility designating. The marking of the utility in 2 dimensions

on the ground's surface, with paint depicting its approximate horizontal location. This method was needed to clear all bore hole locations.

2.0 Equipment Used

The equipment used on this project included:

- 1) Metro Tech 810 DX (calibrated on March 13, 2006), and
- 2) RD 4000 RX (calibrated January 26, 2006)

The Metro Tech 810 DX and the RD 4000 RX are geophysical prospecting instruments that apply a radio signal to a conductive utility with the use of a transmitter. The receiver "senses" that signal and shows a approximate measurement of the location of said utility, both horizontally and vertically. The accuracy of this unit is within 2 feet vertically and horizontally.

3.0 Results

Nine subsurface exploration point locations were found to have a conflicting utility present, either within the ten foot radius of the staked location or directly outside of this area. These locations include: B-316, B-421, B-408, B-702, B-707, B-717, C-703, C-715, and TP-B415. A site plan showing the approximate locations will be submitted with highlighted bubbles that will include type of utility found to be in conflict with an approximate location of that utility.

We appreciate the opportunity to be of service to you for this project. Please contact Mr. Ken Williams at (301) 881-2545 if you have any questions regarding this report.

Very truly yours, A MORTON THOMAS AND ASSOCIATES, INC.

Ken Williams Kunneth Williams

Director of S.U.E.

KW: kw

<u>APPENDIX C</u> BORINGS AND TEST PITS

- Test Boring and Test Pit Log General Notes
- SPT Boring Logs
- Test Pit Logs

Schnabel Project No. 06120048 **Appendix C:** Boring and Test Pits

TEST BORING AND TEST PIT LOG GENERAL NOTES

Test Boring and Test Pit Log General Notes

- 1. Test borings and test pits were logged by Schnabel personnel to provide a record for geotechnical evaluation, construction inspection or other specialized purposes. The log itself includes a description of soil materials encountered using visual classification in the field. The group symbols on the logs represent the Unified Soil Classification System Group Symbols (ASTM D-2487) based on visual observation and limited laboratory testing of the samples. Criteria for visual identification of soil samples are included in this appendix. Some variation may be expected between samples visually classified and samples classified in the laboratory. Boundary lines between various strata are identified where possible and a graphical presentation is included based on the material excavated from the pit. Any significant features such as fill conditions, underground structures, ground water, or water seepage conditions are recorded.
- 2. Numbers in the sampling data column of test boring logs indicate the standard penetration test (SPT) blow counts, N value, and recovery length for each SPT sample, and the recovery length for each undisturbed sample. The blow counts indicate the number of SPT hammer blows required to drive the SPT sampler three successive 6 in intervals. The first 6 in interval typically represents a seating interval. The total number of blows for the second and third intervals is the N value, unless the standard penetration testing for a given interval was stopped when blow counts reached 50 blows in any 6 in interval (i.e., stopped at "refusal"). In cases where refusal is reached, the N value is defined as the total number of blows performed in the last two intervals (or the total number of blows performed in the first interval if refusal was achieved in the first interval) over the penetration length resulting from those blows (e.g., 60/8").
- 3. Strata descriptions are based on visual inspection and are in accordance with the Unified Soil Classification System. Representative soil samples are recovered from the boring logs and test pits, generally from each stratum, for later identification and testing. The locations of samples obtained during test pit excavation are generally not shown on the logs unless laboratory tests performed on samples are referred to in the geotechnical analysis.
- 4. The values following "PP=" in the Sampling Data column of the logs represent pocket penetrometer readings. Pocket penetrometer readings provide an estimate of the unconfined compressive strength of fine-grained soils.
- 5. Key to abbreviations and symbols:
 - PL = Plastic Limit

w = Moisture Content

- LL = Liquid Limit
- WOW = Ground Water Observation Well
- ≤ = =

Interval Sampled by SPTTube Sample Pushed

6. The boring and test pit logs and related information depict subsurface conditions at these specific locations and at the particular time when drilled or excavated. Soil conditions at

other locations may differ from conditions occurring at these boring and test pit locations. The passage of time may result in a change in the subsurface soil and ground water conditions at these boring and test pit locations.

- 7. The stratification lines represent the approximate boundary between soils and/or rock types as observed in the drilling and sampling operation. Some variation may be expected vertically between samples taken. The soil profile, water level observations and penetration resistances presented on the boring and test pit logs have been made with reasonable care and accuracy, but must be considered only an approximate representation of subsurface conditions to be encountered at the particular location.
- 8. Estimated ground water levels are indicated on the logs. These are only estimates from available data and may vary with precipitation, porosity of the soil, site topography and similar factors.

Schnabel Project No. 06120048 **Appendix C:** Borings and Test Pits

SPT BORING LOGS

Schnal	TEST Project: C bel Engineering LOG C	alvert Cli alvert Co	Cliffs Nuclear Power Plant County, Maryland					Boring Number: Contract Number: 061200 Sheet: 1 of 13		
Denimer (Ground	vater Obs	ervations		
	MALAGA, NEW JERSEY					Date	Time	Depth	Casing	Caved
Boring F	oreman: J. Evans		Encountered		5/25		10.5'			
Drilling I Drilling I	Method: Mud Rotary Equipment: Failing-1500 (Truck)		Start	of day	y	5/26		25.0'		
Schnabe	el Representative: K. Megginson		Start	of day	y	5/30		41.0'		
Dates	Started: 5/25/06 Finished: 6/6/06		Start	of day	У	6/1		10.0'		
Locatior	n: Northing: 217024.06 ft Easting: 960815.05 ft									
Ground	Surface Elevation: 94.5 (feet)				1					
DEPTH (FT)	STRATA DESCRIPTION	CLASS	ELEV. (FT)	WL	DEP	SAMPL TH [ING DATA	TEST	s	REMARKS
-	CLAYEY SAND, fine to medium grained, contains root fragments, moist, brown. Majority of root system extends about 0.7 ft below ground surface.	SC	02.5		_	3+3+ N =7 REC	4 =9"			
2.0 -	POORLY GRADED SAND WITH SILT, trace gravel, fine to medium grained, moist, stratified orangeish brown and brown, contains fine to coarse silty sand lense at 3.5 ft.	SP-SM	92.5		_	3+4+ N =9 REC	5 =13"	w=6.6°	%	
-	fine to coarse grained, brown.				5 - - -	4+7+ N =1 REC	7 4 =10"			
-	fine to medium grained,stratified light brown and yellowish brown				-	4+7+ N =1 REC	8 5 =12"			
- -	wet, brown and light brown			Ţ			9 8 =9"	w=14.3 *	%	
- - 14.5	light orangeish brown.		- 80.0		-	- - N =14 N =14	8 4			
-	grained, moist, brown	SC			-15-		=10"			
17.0 -	POORLY GRADED SAND WITH SILT, trace gravel, fine to coarse grained, wet, dark orangeish brown and orangeish brown, contains fine to medium clayey	SP-SM	77.5			- - 6+11	+10	w=19%	Dr us % Dr	illing foreman ed 5.4" O.D. ag Bit from 0
	sand pockets.				20- -		1 =14"	*	to Sv 4-: Dr 18	18.5 ft. vitched to 3/4" O.D. ag bit below .5 ft.
22.0 -	SANDY LEAN CLAY, fine to medium, trace mica, moist, gray.	CL	- 72.5		-					
-					-	3+3+ N =8 REC	5 =18"			
	continued on next page									

	20		Project: C	alvert Cliff	alvert Cliffs Nuclear Power Plant alvert County, Maryland				Boring	Boring Number: B-3		
-	Schna	bel Engineering LOG			inty, ivia	inyianu			Contra Sheet:	act Number: 00 2 of 13	5120048	
D	EPTH (FT)	STRATA DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	DEPTH	SAMP	LING DATA	TESTS	REMARKS	
				CL				-				
	- 27.0 -	SANDY LEAN CLAY, with fin	e to	CL	67.5							
	-	medium sand, trace mica, co to medium sandy fat clay and medium clayey sand pockets gray.	ntains fine I fine to , moist,				 30	2+4 N = REC	+3 7 2 =18"	w=28.9% LL=48 PL=17 *		
	-				00.5							
	32.0 -	FAT CLAY, with fine to media and mica, moist, gray.	um sand	СН	62.5						Osterberg sampler tube	
	-						 35	REC	; =22"	LL=59 PL=17	push from 33.5 to 35.5 ft	
	-											
	-											
	_	gray and dark gray, trace org (±1%), contains fine to mediu sand pockets.	anic matter m silty				 40	4+5 N = REC	+5 10 C =18"			
	-											
	-	gray and light greenish gray.						REC	2 =22"	PP=2.00 tsf	Osterberg sampler tube push from 43.5	
							-45				to 45.2 ft	
6/08	470 -				47 5							
3EL.GDT 3/		SANDY LEAN CLAY, fine to trace mica, contains indurate pockets, moist, gray.	medium, d lean clay	CL	47.0		– –	7 5+6	+8	w=29.6%		
PJ SCHNA								N =	14 C =18"	*		
0 & 400.G	- 52.0 -				42.5							
20048 PLOG SPT 30	-	CLAYEY SAND, fine to medi grained, trace fine to medium fragments (±5%), strong HCI moderate cementation, moist gray, contains indurated silt is 54.5 to 54.7 ft (layer exhibits	um shell reaction, dark ayer from fissility).	SC			 [55	11+ N =9 REC	48+50/3" 98/9" C =16"		Switched to 4-3/4" Tri-cone roller bit below 53.5 ft. Moderate	
3 LOG 0612	-				37 5						rotary advancement from 54.5 to	
TEST BORING	-	POORLY GRADED SAND, to fine to medium grained, wet, continued on next page	ace silt, gray, weak ge	SP							56.5 tt (slight rig chatter).	

Γ		TEST	Boring Number: B-301								
	Schna	bel Engineering LOG		alvert Cou	nty, Ma	ryland			Contract Sheet: 3	t Number: 06 3 of 13	6120048
ſ	DEPTH (FT)	STRATA DESCRIPT	TION	CLASS.	ELEV. (FT)	WL	S		G TA	TESTS	REMARKS
	-	HCI reaction, trace coarse gr	avel.	SP			⊠ 60	50/3" N =50/3 REC =1	3" "		Sampler refusal at 54.7 ft. Sampler refusal at 58.8 ft.
	- - -	few fine to coarse shell fragn (±10%), moderate HCI reacti	nents on.				 65 	44+50/2 N =50/2 REC =8	2" <u>2</u> " 3"	w=20.4%	Switched to 4-3/4" O.D. Drag Bit below 63.5 ft. Sampler refusal at 64.2 ft.
	-	contains fine to medium stron cemented sand pockets, stro reaction.	ngly ng HCl				 ⊠ 70 	50 REC =6	5"		
	-	moist and light gray, mostly cemented sand layers (±80% fine to coarse shell fragments weak HCl reaction.	strongly), trace s (±5%),				 [X] 75 	50/5" N =50/5 REC =3	5"		Slow rotary advancement from 72.5 to 73.5 ft Sampler refusal at 73.9 ft. Slight to difficult rotary advancement from 74 to 75 ft. Slight to
:L.GDT 3/6/08	-	light oliveish gray, mostly fine medium strongly cemented s (±95%), trace fine to coarse s fragments (±5%), moderate h reaction.	e to and layer shell HCl				 80 	50/5" N =50/5 REC =3	5" 3"		difficult rotary advancement from 77 to 78.5 ft. Switched to 4-3/4" O.D. Tri-cone roller bit below 78.5 ft.
SPT 300 & 400.GPJ SCHNABE	82.0 - - - -	SILTY SAND, fine to medium wet, gray, trace fine to coars fragments (±5%), weak HCI n	n grained, e sheil reaction.	SM	12.5		 85	4+5+8 N =13 REC =1	16"	w=26.5% *	Sampler refusal at 78.9 ft. Moderate to difficult rotary advancement from 80 to 82 ft. Switched to 4-3/4" O.D. Drag Bit below 83.5 ft.
ORING LOG 06120048 PLOG	87.0 - - -	No sample recovery.			7.5		 90	REC =0)"		Osterberg sampler tube push from 88.5 to 90.5 ft
ESTB		continued on next pag	ge								

	hnabel DODWO	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	Boring Number: B-301			
Schnal	bel Engineering LOG		alvert Cou	nty, Ma	aryland		Contract Number: 0 Sheet: 4 of 13	Contract Number: 06120048 Sheet: 4 of 13		
DEPTH (FT)	STRATA DESCRIPT	ΓΙΟΝ	CLASS.	ELEV. (FT)	WL	SAMPL	ING TESTS	REMARKS		
92.0 -	SILTY SAND, fine to medium wet, gray, trace mica, very w reaction.	n grained, eak HCI	SM	2.5		 	+12 2 =16" w=25.8%			
-	moist, gray, contains fine to r moderately cemented sand p moderate HCI reaction.	nedium pockets,				 100- 	=6"	Osterberg sampler tube pushed from 98.5 to 99.8 ft		
102.0 - - 104.5 _ -	LEAN CLAY, moist, greenish light greenish gray, little fine shell fragments (±20%), cont medium silty sand and silt po strong HCI reaction, trace fin medium sand. SILTY SAND, fine to medium wet, light gray, some fine to o fragments (±40%), strong HC	a gray and to coarse ains fine to ockets, e to a grained, coarse shell Cl reaction.	CL	-7.5		 	8+24 2 =18" w=17.8%			
-	trace fine to medium shell fra (±5%). contains fine to medium wea cemented sand pockets belo	igments kly w 109.7 ft				 22+2 N =50 REC	9+30 w=23.2% 9 =15"			
112.0 - - 10.011 	SANDY LEAN CLAY, fine to moist, greenish gray and gra to coarse shell fragments (±5 HCI reaction.	medium, y, trace fine 5%), strong	CL	-17.5		 115- 	+15 5 =18"			
117.0 - 117.0 - 100.4 × 100.6	SILTY SAND, fine to medium wet, gray and light greenish of fine to medium shell fragmen weak HCI reaction.	n grained, gray, trace tts (±1%),	SM	-22.5			5+19 4 =18" w=33.1%	Resumed drilling at 7:50 AM on 5/26/06.		
122.0 - 122.0 - - - -	ELASTIC SILT, moist, green trace fine to medium sand ar medium shell fragments (±19 HCI reaction. <i>continued on next pag</i>	ish gray, nd fine to %), weak ge	MH	-27.5		 X 9+10	+16			

	TEST Project: Calvert Cliffs Nuclear Power Plant							Boring	B-301	
Schnal	bel Engineering LOG	Ca	alvert Cou	nty, Ma	ryland			Contra Sheet:	ct Number: 06 5 of 13	6120048
DEPTH	STRATA DESCRIPTIO	Л	CLASS.	ELEV.	WL	:	SAMPLIN	IG	TESTS	REMARKS
(,			MH	(1)			DA N =26	TA		
						-125-	REC =	18"		
-										
127.0 -	CLAYEY SAND, moist, greenis	sh gray,	SC	-32.5						
-	trace fine to medium shell frage (±5%) and mica, weak HCI rea	ments iction,							w-42 20/	
-	contains sit pockets.					$ \rangle$	N =29	19	*	
_						-130-	J KEC -	17		
				07.5						
132.0 -	CLAYEY SAND, fine grained, r greenish gray, trace fine to me	moist, dium	SC	-37.5						
	shell fragments (±5%), weak H reaction.	ICI					5+8+12	2		
						-135-	N =20 REC =	17"		
-										
-										
-										Osterberg sampler tube
-	fine to medium grained, moist, fine to coarse shell fragments (gray, few (±10%)					REC =	4"		138.5 to 140.5
_						-140-				n (
-										
142.0 -	SANDY LEAN CLAY, moist, da areenish gray, with fine sand, t	ark trace	CL	-47.5						
	mica, weak HCI reaction.						8+13+	15	w=45%	
_						-145-	N =28 REC =	18"	^	
- 147.0 -	FLASTIC SILT moist dark are	enish	МН	-52.5						
	gray, trace fine to medium san mica, moderate HCl reaction.	d and								
						$ + + \rangle$	8+10+2 N =23	13	w=62.2% LL=114	Posumod
400.61						-150-	∬ REC =	18"	FL-55 *	drilling at 8:45 AM on 5/30/06.
, 152.0 − S	SILTY SAND, moist, dark gree few fine to medium shell fragm	enish gray, ients	SM	-57.5						
	(±10%), strong HCl reaction.						6+8+1 ⁻	l	w=34%	
				-60 5			N =19 REC =	18"	*	
	FAT CLAY, with fine to mediun trace mica, very weak HCI read	n sand, ction.	СН							
	continued on post									
	continuea on next page									

Γ	-	hnabel TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	Borir	ng Number:	B-301
	Schna	bel Engineering LOG	C	aivert Cou	inty, Ma	aryland		Cont Shee	ract Number: 0 t: 6 of 13	6120048
	DEPTH (FT)	STRATA DESCRIPT	STRATA DESCRIPTION CLASS.		ELEV. (FT)	WL	SA		TESTS	REMARKS
	-			СН			DEPTH	REC =13"	w=38.7% LL=76 PL=30 PP=>4.5 tsf	Osterberg sampler tube push from 158.5 to 159.6 ft
	162.0 - - - -	CLAYEY SAND, fine to medi grained, moist, dark greenish trace mica, very weak HCI re	um ı gray, action.	SC	-67.5		 165-	7+8+11 N =19 REC =18"		
	- 167.0 - - -	SANDY FAT CLAY, gray.		CH	- 72.5		 170	REC =9"	w=65.4% LL=112 PL=39 *	Osterberg sampler push from 168.5 to 170.4 ft
	172.0 - - - -	SANDY ELASTIC SILT, mois gray, trace fine to medium sa mica, weak HCI reaction.	st, greenish ind and	MH	77.5		 	7+10+13 N =23 REC =18"		
HNABEL.GDT 3/6/08	-	trace fine to medium shell fra (±<5%), moderate HCI reacti indurated elastic silt pockets wet, weak HCI reaction belov	gments on, and (<1/4 inch). v 179.5 ft.				 180-	6+9+10 N =19 REC =18"	w=60.4% LL=111 PL=47 *	
48 PLOG SPT 300 & 400.GPJ SC	-	moist, mostly indurated elasti (±100%).	ic silt layers				 185 	REC =10"	PP=>4.5 tsf	Osterberg sampler tube push from 183.5 to 184.3 ft
TEST BORING LOG 061200	-	dark greenish gray.	ge				 _190-	8+10+15 N =25 REC =18"		

ſ		TEST Pro	oject: Calvert Cliffs	Nucle	ar Pow	er Plant	Boring Number: B-301		
	Schna	bel Engineering LOG	Calvert Cour	nty, Ma	ryland		Contract Number: 0 Sheet: 7 of 13	6120048	
	DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL	SAMPLI DEPTH D	NG TESTS	REMARKS	
	- - - - - - - - - - - - - - - - - - -	with fine to medium sand, trace or matter (±1%). greenish gray, trace fine to mediu sand, moderate HCI reaction	Irganic				-13 LL=98 =18" PL=45 * 12 w=82.6% LL=157 PL=71 *	Resumed drilling at 7:20 AM on 5/31/06.	
	202.0 204.0	CLAYEY SAND, fine to medium grained, moist, dark greenish gray fine to coarse shell fragments (±10 strong HCI reaction. SILTY SAND, fine to medium grain moist, dark gray, few fine to coars fragments (±10%), strong HCI reac	y, few 0%), ined, se shell action.	-107.5 -109.5)+22 w=27.5% =18"		
	· · -	wet, dark greenish gray, trace fine medium shell fragments (±5%), str HCl reaction	e to trong			 N =33 REC = 	-21 w=32.4% =18"		
400.GPJ SCHNABEL.GDT 3/6/0	212.0	CLAYEY SAND, fine to medium grained, wet, greenish gray, weak reaction.	k HCI	-117.5		 215- 	9 =3"	Driller notes increase in rotary resistance in formation below 214 ft.	
RING LOG 06120048 PLOG SPT 300 &	217.0	SANDY LEAN CLAY, moist, greer gray, trace mica, very weak HCI reaction.	enish CL	-122.5		6+10+ 	-23 w=47.9% *		
TEST BC		continued on next page							

G	hnabel ROPING	Project: Ca	alvert Cliffs	s Nucle	ar Pow	er Plant	В	oring Number:	B-301
Schnat	bel Engineering LOG	Ca				C S	Contract Number: 06120048 Sheet: 8 of 13		
DEPTH (FT)	STRATA DESCRIPTI	ION	CLASS.	ELEV. (FT)	WL	S/ DEPTH	AMPLING DATA	TESTS	REMARKS
-	greenish gray and gray, trace medium circular, orangeish br organic matter (±1%).	fine to own	CL			 225- 	5+8+18 N =26 REC =18'		
228.5	CLAYEY SAND, greenish gra HCl reaction.	y, weak	SC	-134.0		 	7+10+17 N =27 REC =18'	w=54% *	
-	with fine sand.					 	7+9+16 N =25 REC =18'		
 238.5 	LEAN CLAY, moist, greenish fine sand, trace mica, very we reaction.	gray, with ak HCl	CL	-144.0		 240-	8+11+17 N =28 REC =18'	w=56.8%	Resumed drilling at 7:05 AM on 6/1/06.
-						 245-	8+13+19 N =32 REC =18'		No SPT conducted at
- - - 252.0 -	SANDY ELASTIC SILT moiet	areenich	MH	-157.5		 			248.5 ft because 210 ft of rods free fell 40 ft (slipped free of slide ring), thus penetrating soil to 251.4 ft due to drill rod free fall momentum.
	continued on next page	a, very	1711			 	7+9+19 N =28 REC =18'	w=72.7% LL=137 PL=87 *	

	hpabol TEST	alvert Cliff	s Nucle	ar Pow	er Plant		Boring Number: B-301			
Schna	Del Engineering LOG	C	Calvert County, Maryland					Contract Number: 06120048 Sheet: 9 of 13		
DEPTH (FT)	STRATA DESCRIPT	ΓΙΟΝ	CLASS.	CLASS. ELEV. WL		S		B TESTS	REMARKS	
			МН				DAI	A		
257.0 -	LEAN CLAY, moist, greenish	gray, with	CL	-162.5						
-	fine sand, trace mica, and or brown organic matter (+1%)	angeish verv weak								
-	HCI reaction.						9+12+23	3		
						<u>–260–</u> []	REC =18	3"		
-										
-										
_										
_	trace fine sand, moderate HC	CI reaction.					8+12+24	w=100.9%		
_							N =36 REC =18	3"		
267.0				170 5						
207.0 -	ELASTIC SILT, moist, green trace fine sand and mica, mo	ish gray, derate HCl	MH	-172.5						
-	reaction.						10+12+2	23		
-							N =35 REC =18	3"		
						-270-1-1				
-										
-										
-								w=102%		
-	(±1%), weak HCl reaction.	ic matter					N =29	LL=199		
-						-275-	REC = 18	*		
-										
_ ∞										
- 3/6/0										
- 191	trace fine sand and mica.						8+12+21 N =33			
– NABE						- <u>280</u> -[/]	REC =18	3"		
- SCH										
0 282.0 -	I FAN CLAY with sand mois	t areenish	CI	-187.5						
- 00 & 4	gray, trace fine sand and mic	a, weak				-				
- SPT 3						M	7+11+20) w=91.3%		
						85	REC =18	3"		
- 20048										
287.0 -		ah ana	NAL I	-192.5						
- 10	with fine sand, trace mica an	d dark	MH							
BORIN -	weak HCl reaction.	uer (±1%),					8+11+21			
TEST	continued on next pag	ge								

Γ		TEST Project: C	alvert Cliff	s Nucle	ear Pow	er Plant	Boring Number:	B-301	
	Schnal	bel Engineering LOG	alvert Cou	inty, Ma	aryland		Contract Number: 06120048 Sheet: 10 of 13		
		STRATA DESCRIPTION	CLASS.	ELEV.	WL	SAMPLIN	IG TESTS	REMARKS	
┢	(,		MH	(,		DEPTH DA			
	_					REC =	18"		
	-								
	_								
	_								
	-	fine sandy.				– – – 7+11+2 N =32	21 W=64.4% LL=117	Desumed	
						295/ REC =	18" PL=73 *	drilling at 6:55	
	-							AW 01 0/2/00.	
	-								
	_								
	-	trace fine sand, very weak HCI reaction.				– – – 9+14+2 N =36	22		
							18"	Moderate to	
	-							advancement from 301 5 to	
	302.0 -	CLAYEY SAND, fine to coarse grained,	SC	-207.5				303 ft (moderate rig	
	-	contains fine to coarse sandy fat clay					w=24.8%	chatter).	
	-	trace organic matter (+1%) yer/week				N =40	18"		
	_	HCl reaction below 304.5 ft				-305-12 110-	10		
	-								
	307.0 -	SANDY FAT CLAY, fine to medium, moist, dark greenish gray and dark	СН	-212.5					
	_	gray, contains fine to medium clayey sand pockets and lenses , and				[_]∏ 10+13·	+22		
		indurated fat clay pockets, trace fine to coarse shell fragments (±1%), strong				N =35	10"		
6/08	_	HCI reaction.							
SDT 3/	3120 -			-217 5					
ABEL.G		CLAYEY SAND, fine to coarse grained, moist, dark greenish gray and greenish	SC	217.0					
SCHN	_	gray, trace fine gravel, few fine to coarse shell fragments (±10%), contains				9+17+2	28 w=20%		
0.GPJ						-315- A REC =	18"		
0 & 40	-								
SPT 30	-								
PLOG (_							Sampler refused	
20048	-					⊠ 50/2" N =50/	2"	at 318.7 ft.	
G 061.						-320- REC =	ō"		
NG LO	-	contains indurated clayey sand pockets, weak HCI reaction, glauconitic						Very to	
BOR	_	continued on next page						difficult rotary	
TESI									

	hnabel TEST	В	oring Number:	B-301					
Schnat	bel Engineering LOG	C	Calvert Cou	nty, Ma	aryland		C S	ontract Number: 0 heet: 11 of 13	6120048
DEPTH (FT)	STRATA DESCRIPTION	ION	CLASS.	ELEV. (FT)	WL	S		TESTS	REMARKS
			SC				DATA 11+13+22	w=27.8%	advancement from 319 to 320.5 ft (strong rig chatter).
324.7	LEAN CLAY, wet, dark gray, coarse sand, trace mica, stro reaction.	with fine to ng HCl	CL	-230.2			N =35 REC =18"	, *	
327.0 -	CLAYEY SAND, fine to coars moist, dark greenish gray an gray, trace fine gravel and m weak HCl reaction, glauconit	se grained, d dark ica, very ic.	SC	-232.5		 330-	10+15+19 N =34 REC =18")	Slight to moderate difficulty in rotary advancememt below 328.5 ft.
	light blueish gray and greenis contains fine to coarse sandy pockets, weak HCl reaction.	sh gray, / fat clay		242 5		 	9+14+29 N =43 REC =18"	w=31.8%	Resumed drilling at 6:50 AM on 6/3/06. Start of day at 6:56 AM
-	CLAYEY SAND, moist, dark gray and dark greenish gray, mica, contains indurated lear pockets and clayey sand poo HCI reaction, glauconitic.	blackish trace n clay kets, weak	SC	-242.0		 	18+30+40 N =70 REC =18")	Below 338.5 ft, drillers describe rotary advancement moderately slow due to dense/stiff soils.
-	fine to coarse sandy, trace sl fragment, strong cementatior	nell 1.				 345 	20+50 N =50 REC =12"	w=22.9% LL=47 PL=24 *	Moderate to difficult rotary advancement
	dark greenish gray and dark fine to medium sand, contain medium sandy lean clay poc	gray, with s fine to kets.				 	8+17+35 N =52 REC =8"		(moderate to strong chatter).
-	fine to medium sandy, dark b gray and dark gray, very wea reaction. <i>continued on next pa</i>	lackish ik HCl ge				 	14+18+28 N =46 REC =13"	w=36.1% LL=58 PL=22	Slight difficulty in rotary advancement

Γ		TEST	Project: Ca	alvert Cliff	s Nucle	ar Pow	er Plant		Boring Number	r: B-301
	Schna	bel Engineering LOG	i Ci	alvert Cou	inty, Ma	iryland			Contract Numb Sheet: 12 of 1	er: 06120048 3
ſ	DEPTH (FT)	STRATA DESCRIP	ΓΙΟΝ	CLASS.	ELEV. (FT)	WL	рертн		G TES	TS REMARKS
		-		SC					*	from 355 to 356 ft (slight wobble in kelly bar rotation).
		fine to coarse sandy, trace c gravel, and mica, weak HCI	oarse reaction.				 360-	16+27+ N =77 REC =1	50 5"	
3	362.0 ·	SILTY SAND, fine to mediun moist, dark blackish gray and gray, trace mica, weak HCI r glauconitic.	n grained, d brownish eaction,	SM	-267.5		 365 -	11+15+: N =42 REC =1	27 w=37. LL=5 8" PL=3 *	2% 54 36 Resumed drilling at 6:55 AM on 6/4/06. Start of day at 7:05 AM, drilling mud at
							 [- 370- 	14+30+4 N =73 REC =1	43 8"	35 ft on 6/4/06. Mubtub (270 gallons) was empty of mud except for soil cuttings at the bottom of the tub on 6/4/06.
	372.0 ·	CLAYEY SAND, fine to medi grained, moist, dark gray, co pockets, very weak HCI reac glauconitic.	ium ntains silt tion,	SC	277.5		 - 375-	15+28+4 N =70 REC =1	42 w=30. LL=6 8" PL=2	3% 51 26
.GPJ SCHNABEL.GDT 3/6/08	377.0 ·	CLAYEY SAND, fine to medi grained, wet, dark blackish g mica, very weak HCl reaction glauconitic.	ium ray, trace ı,	SC	282.5		 380- _	24+50 N =50 REC =1	2"	
RING LOG 06120048 PLOG SPT 300 & 400	- - - -	dark blackish gray and dark gray.	brownish				 385- 	34+50/5 N =50/5 REC =1	;" " 0"	Moderately difficult rotary advancement from 383 to 383.5 ft. Sampler refusal at 384.4 ft. Moderately difficult rotary advancement from 383.5 to 384.5 ft.
EST BO		continued on next pa	ge							

	TEST Project: Calvert Cliffs Nuclear Power Plant Chnabel BORING Calvert County, Maryland							Boring	Number:	B-301	
Schnal	bel Engineering	LOG	С	alvert Cou	nty, Ma	iryland			Contra Sheet:	ct Number: 0 13 of 13	6120048
DEPTH (FT)	STRATA DESCRIPTION CLASS. ELEV. (FT) WL SL DEPTH fine to coarse grained, dark blackish SC Image: Class of the second				SAMPLI	NG	TESTS	REMARKS			
	fine to coarse gr gray.	rained, dark b	lackish	SC			 - <u>390</u> -	16+28 N =78 REC =	+50 :12"	w=32.7% *	
							 395 	18+50 N =50 REC =	•O"		Resumed drilling at 6:45 AM on 6/5/06. Start of day at 6:53 AM, drilling mud at 25 ft on 6/5/06.
-	fine to medium (gray and dark bi clayey sand poo	grained, dark rownish gray, kets.	blackish contains				 400- 	19+28 N =71 REC =	+43 :3"	w=33.7% *	
403.0 -					-308.5						Start of day at 7:20 AM, drilling mud at 48 ft on 6/6/06.
500 2											
400.0FJ SCHNABEL.GDI S											
00120048 FLOG SF1 300 &											

Sabad	hnabel TEST BORING	Calvert (Calvert (Cliffs Nu County,	uclea , Ma	ar Pow ryland	ver Plai	nt		Boring Contra	Number:	er: 06120	B-302	
Schhat	bei Engineering LOG							^		Sneet:			
Boring C	contractor: CONNELLY AND	ASSOCIAT	ES, INC.				1	Gro	ounav	ater Obs	ervations	0	0
Boring F	FREDERICK, MAI	RYLAND		Eı	nco	untere	d	5	ate /30		40.0'		
Drilling N	Method: Mud Rotary					of do.		-	10.4		20.01		
Drilling E	Equipment: CME-550			5	otart	of day	/	5	/31		38.0		
Schnabe	I Representative: K. Bell												
Dates S	Started: 5/30/06 Finished:	5/31/06											
Location	: Northing: 217122.24 ft Easting: 960766.98 ft												
Ground	Surface Elevation: 76.4 (feet)												
DEPTH (FT)	STRATA DESCRIPT	ΓΙΟΝ	CLAS	SS. EL (F	EV. T)	WL	DEP	S. TH	AMPL C	ING DATA	TEST	S	REMARKS
0.5	ROOTMAT AND TOPSOIL.			75	5.9				4.0	2			
-	POORLY GRADED SAND W fine to coarse grained, moist brown, trace root fragments	/ITH SILT, , yellowish	SP-S	SM					1+2+2 N =4 REC	2 =11"			
	blown, trade root nagmente.						ļ .	-0	2+3+4	4			
-								Щ	REC	=16"			
	yellowish brown and orange,	trace					- 5 -	M	4+5+	6			
-	gravei.			60				ЧΔ	REC	=18"			
	CLAYEY SAND, fine to coars moist, orangeish brown, trac	se grained, e gravel.	SC	; 05	9.4		[.]_	4+5+	3			
-								Щ	N =8 REC	=14"			
-							-10-		0.7.	0			
	fragments	ace root		6/	1 4				3+7+6 N =15 REC	5 =17"		co	or change in
-	FAT CLAY, moist, gray, trace	e sand.	CH	+ ⁰			ļ .	_				mi ora	id tub from angeish
00/0/0								-0	2+2+4 N =6	4			Swin to gray
							-15-		REC	=18"			
							ļ .	_					
							- .	-0	3+3+3 N =8	5			
							-20-		REC	=18"			
							Ļ .	-	4+4+ N =11	7 I			
	continued on next pag	ge					-25-		REC	=18"			
: L							I						

Γ		2	TEST Project: Calvert Cliffs Nuclear Power Plant Calvert County, Maryland Calvert County, Maryland							Boring	y Number:	B-302	
	Schn	ab	el Engineering	BORING LOG	С	alvert Cou	nty, Ma	aryland			Contra Sheet	act Number: 0	6120048
	DEPTH (FT)	1	STRATA	DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	DEPTH	SAMP		TESTS	REMARKS
f						СН					27171		
													water loss from
										7 6+8	+10		mud tub
									-30-4		18 C =18"		
		-											
	32.0	+	SILTY SAND, fin	e to medium	grained,	SM	44.4						
		-	moist, gray and g	ireenish gray	/.					7 6+1	0+14		
											24 C =17"		
		_											
		-											
		-	greenish gray and coarse shell fragr	d white, trac ments, trace	e fine to cobbles,				2	24+ N =	50/4" 50/4"		
		-	20-30%, HCl rea	action moder	ate.			Ϋ́	-40	RE	C =7"		
		_								≤ 50/	5" 50/5"		
		_							-45	RE	C =5"		
		-											
T 3/6/0	47.0	+	SANDY SILT, we	et, gray and v	white, with	ML	29.4						
BEL.GD		-	organic matter, I	HCI reaction	strong.				Ι _Γ	7 26+	30+30		
SCHNA											60 C =15"		
0.GPJ		_											
00 & 40		_											
3 SPT 3		-							$\left - \right _{\mathbf{F}}$				
48 PLOC		-	greenish gray and coarse shell fragr	d white, with ments, 10-20	fine to 0%, HCl					3+5 N =	0/5" 50/5" 2 -0"		
061200		-	reaction moderat	с.					-55-		5-9		
DOL 6													Rig chatter
BORING		_											
TEST I			continue	ed on next pag	le								

	6	hnahal	Project: Ca		Boring	Number:	B-302							
	Schnal			Ca	alvert Cou	nty, Ma	ryland			Contrac	ct Number: 06	P=2.00 tsf		
	Schnar	bei Engineering	LUG					•		Sneet:	3 01 7			
	DEPTH (FT)	STRATA	DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	5			TESTS	REMARKS		
					ML	. ,		DEPTH	DA					
	-							0	6+50/4"					
									N =50/4 REC =1	0"				
								00						
	_													
	_													
	_													
									5+5+7					
								IX	N =12 REC =1	7"				
								-65-1		'				
	-													
	-													
	_													
									5+4+7					
	_							- 1	N =11	0"				
								-70-1	REC =1	8				
	-													
	_													
	_								1+1+0					
	_							X	4+4+0 N =12					
								-75-1	REC =1	7"				
	-													
	_													
	-								0.4.5					
	_							X	2+4+5 N =9					
3/6/0								-80-1	REC =1	8"				
GDT	-													
BEL	820 -					-5.6								
NHO	02.0	SILTY SAND, fine	to medium	grained, fine to	SM	-0.0								
PJ S	_	coarse shell fragm	nents, 20-30	%, weak					<i>(</i>		PP=2 00 tof			
00.G	_	cementation, HCI	reaction stro	ong.					REC =1	6"	FF-2.00 (SI			
00 & 4								-85-						
PT 30	_													
S 90														
48 PL														
31200	-													
90 00	-							M	11+11+ N =29	18				
10 LC								0[[]	REC =1	6"				
30RIN	_													
ESTE		continued	d on next pag	е										
۴l														

	TEST Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	Boring Number:	B-302
Schna	BORING C	alvert Cou	nty, Ma	ryland		Contract Number: 0	6120048
DEPTH		01.400	ELEV.	14/1	SAMPLIN		DEMARKO
(FT)	STRATA DESCRIPTION	CLASS.	(FT)	WL	DEPTH DA	ATA	REMARKS
		SM					
-							
-							
-					5+8+12 N =22	4	
					95- <u> </u> REC =	18"	
-							
-							
-	with fine to coarse shell fragments,					2	
					-100 REC =	16"	
-							
-							
_							
	trace fine to coarse shell fragments,				5+7+1 [.]	1	
	5-10%, HCl reaction weak.				N =18	18"	Resumed drilling on
					-105		5/31/06 @ 7:30am
-							
107.0 -	SANDY SILT, moist, greenish gray,	ML	-30.6	6			
-	2-5%, HCl reaction weak.						
-							
					-110 - 110 - 100 REC =	18.	
- 3/6/05							
- [9]					6+8+9 N =17		
					-115-	18"	
29 117.0 -	CII TV CAND find to modium surfaced	C14	-40.6				
- 0 & 40	wet, greenish gray and white, with fine	SIVI					
	reaction strong.				6+19+2	20	
- 100					N =39	18"	
048 P							
102 0			15.0				
	SANDY SILT, moist, greenish gray, trace fine to medium shell fragments.	ML	-40.0				
	2-5%, HCI reaction weak.					1	
	continued on next page						
≓ ∟							

	hnahal	TEST	Project:	Calvert Cliff	s Nucle	ar Pow	er Plant		Boring	Number:	B-302
Schna	bel Engineering	LOG		Calvert Cou	nty, Ma	ryland			Contra	ct Number: 06	6120048
DEPTH					FI FV		S		G		
(FT)	STRATA	A DESCRIPT	ION	CLASS.	(FT)	WL	DEPTH	DA	TA	TESTS	REMARKS
_				ML				N =19 REC =1	8"		
127.0 -	SANDY ELASTI	C SILT, mois	t, greenish	MH	-50.6						
	gray, trace fine to fragments, 2-5%	o medium sh , HCl reactio	ell on weak.								
-								REC =1	2"	PP=>4.5 tst	
							-130-				
								6+7+10 N =17			
							- <u>135</u> -[/]	REC =1	8"		
-											
-											
-											
-							M	5+7+9 N =16			
							- <u>140-</u> [/]	REC =1	8"		
-											
-											
							M	4+7+9 N =16			
							- <u>145</u>	REC =1	8"		
147.0 -	SANDY FAT CL	AY moist ar	eenish	СН	-70.6						
	gray and gray.	,,									
-							M	6+8+12 N =20			
							- <u>150-</u> [/]	REC =1	8"		
- 	SANDY FLASTI	C SILT mois	t areenish	МН	-75.6						
	gray.	, 11010	., 9. 56 101								
							M	6+9+12 N =21			
							- <u>155</u> - /	REC =1	8"		
- 20											
-	continu	ed on next pag	le								

	hnahal	TEST	Project: C	alvert Cliff	s Nucle	clear Power Plant Boring Number: B-30					B-302
Sahaa		С	alvert Cou	nty, Ma	ryland			Contra	ct Number: 06	6120048	
Schha	bei Engineering	200					6		Sneet:	6 OF 7	
(FT)	STRATA	DESCRIPT	ION	CLASS.	ELEV. (FT)	WL			G TA	TESTS	REMARKS
				MH							
-											
-							M	5+7+10			
								N =17 REC =1	8"		
-							- 1				
-											
-											
-							M	7+9+12			
								N =21 REC =1	8"		
							-105				
-											
-											
-											
-							M	7+7+10			
							170	N =17 REC =1	8"		
-											
-											
-											
-							L -M	8+11+14	4		
							175	N =25 REC =1	8"		
							175				
-							- 1				
-											
-											
00/0	trace fine to med	ium shell fra	gments,				L -M	6+9+13			
° 	2-5%, HCI react	ion weak.						N =22 REC =1	7"		
							100				
182.0 -	SILTY SAND, fin	e to medium	grained,	SM	-105.6						
- -	wet, greenish gra	ay, trace fine	to medium								
- 18	weak.	2-370, 110110	caction				L -M	4+5+9			
							105 M	N =14 REC =1	8"		
2 2							-105-1-1				
							F 1				
- 1004											
- ⁸							-				
- 10							L IM	8+11+16	6		
NINO							L	N =27 REC =1	8"		
ā —	continue	ed on next pag	e								
Ľ											

	TEST Project: Calvert Cliffs Nuclear Power Plant Calvert County Maryland								Boring	Number:	B-302
Schnal		BORING	С	alvert Cou	nty, Ma	ryland			Contra	act Number: 06	6120048
DEPTH	ber Engineering	200			EI EV			SAM	PI ING		
(FT)	STRAT	A DESCRIPT	ION	CLASS.	(FT)	WL	DEPT	•∧	DATA	TESTS	REMARKS
				SM				·			
-								5+	8+16		
_							105		=24 EC =18"		
-											
								∬ 6+	7+14 =21		
200.0 —	POTTOM OF D				-123.6		-200-		EC =18"		
			U.U F I.								
χ											
3/0/											
19											
NABEI											
GPJ											
& 40C											
- 300											
12004											
9											

Schna	TEST Project: C BORING C bel Engineering LOG	Calvert Cli Calvert Co	iffs Nucle ounty, Ma	ar Pow ryland	/er Plar	nt	Boring Contra Sheet:	Number: oct Numbe 1 of 7	er: 061200	B-303
Boring						Ground	water Obs	ervations		
Bornig	MALAGA, NEW JERSEY					Date	Time	Depth	Casing	Caved
Boring	Foreman: J. Evans		Enco	untere	d	5/9		15.0'		
Drilling	Method: Mud Rotary		Start	of Da	у	5/10		20.0'		
Schnab	el Representative: R. Vinzant									
Dates	Started: 5/9/06 Finished: 5/10/06									
Locatio	n: Northing: 217016.91 ft Easting: 960867.69 ft									
Ground	Surface Elevation: 87.4 (feet)	_								
DEPTH (FT)	STRATA DESCRIPTION	CLASS	6. ELEV. (FT)	WL	DEP	SAMPL	.ING DATA	TEST	S F	EMARKS
20	Silty sand FILL, fine to medium grained, moist, dark brown, contains root fragments, organic matter, and brick fragments	FILL	- 85.4			2+2+ N =8 REC	6 =6"			
	POORLY GRADED SAND WITH SILT, fine to medium grained, moist, light brown.	SP-SN	1			2+3+ N =6 REC	3 =15"			
-	-				- 5 -	2+3+ N =7 REC	4 =14"			
	medium to coarse grained, orangeish brown, some organic matter.		70.4			3+5+ N =1: REC	7 2 =15"			
9.0	CLAYEY SAND, fine to medium grained, moist, light brown, layers of white clay.	SC	- 78.4		-10-	 	3			
						N =6 REC	=14"			
	light orange, contains mottles of white clay.			Ā	- · ·	2+1+ N =2 REC	1 =18"			
· · · · ·	- - - -					-	2			
	_ uaik yiay.						=18"			
20.0 -	LEAN CLAY with sand, fine to medium grained, moist, dark gray.	CL	- 67.4		- 20-		10			
	-					2+3+ N =8	5			
	continued on next page				-25-		-10			

	6	hnabel DODING	Project: C	Calvert Cliffs Nuclear Power Plant Calvert County, Maryland			er Plant Boring Number:			B-303	
	Schnal	bel Engineering LOG		alvert Cou	nty, Ma	ryland			Contra Sheet:	act Number: 00 2 of 7	6120048
	DEPTH (FT)	STRATA DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	s DEPTH		IG .TA	TESTS	REMARKS
				CL							
	_										
	_										
	_							REC =	24"	PP=4.25 tsf	
								_			
	_										
	-										
	-										
	_	trace sand.					17	7+7+10 N =17)		
	35.0 —	CLAYEY SAND fine to medi	um	SC	52.4		_35_	REC =	18"		
	-	grained, moist, dark gray.		00							
	-										
	_							REC =	24"	PP=4.50 tsf	
	-										
							-40				
	41.0 -	SILTY SAND, fine to medium	grained,	SM	46.4						
	_	organic matter.	liloa, and								
	_							10+14+	-23		
	45.0 —				42.4		Å	N =37 REC =	12"		
	-	POORLY GRADED SAND W fine to medium grained, mois	/ITH SILT, t, greenish	SP-SM							
3/6/08	-	reaction, coarse flat shells.	eak noi								
GDT	_										
INABEI	_						⊠	50/5" N =50/	5"		
PJ SCI							50	REC =	5"		
400.G	51.0 -	CLAYEY SAND, fine to medi	um	SC	36.4						
T 300 8	_	coarse shell fragments, weak reaction.	, 50% HCI								
OG SP								50/3"			
048 PL					32.4			N =50/3 REC =4	3" 4"		
3 0612C		POORLY GRADED SAND W medium to coarse grained, m	/ITH SILT, loist,	SP-SM							
NG LOG	-	shell fragments, weak HCI re	action.								
BORIN	-	continued on peyt per	ae -								
TESI		commod on noxt pag	-								

		hnabol	EST	Project: C	Calvert Cliffs Nuclear Power Plant					Boring Number: B-303		
	Schna	bel Engineering	BORING Ca			alvert County, Maryland				Contract Number: 06120048		
ł	DEPTH		STRATA DESCRIPTION			EI EV						
	(FT)	STRATA DE			CLASS.	(FT)	WL				REMARKS	
ł					SP-SM							
		-						X	38+35+ N =54	19		
		-						-60-	REC =1	15"		
	61.0					26.4						
		fine to medium grain	SAND W ed, mois	t, greenish	SP-SC							
		gray, , 5% shell fragr coarse shell fragmen	nents, fir its. weak	ne to HCI								
	- 65.0 —	POORLY GRADED SAND WITH SILT.			SP-SM	22.4						
								110	5+9+25 N =34 REC =18"			
								-65-				
		fine to medium grain	ed, mois	t, light								
		medium to coarse sh	iell fragm	ients,								
		weak HCI reaction.										
	·								0+50/2"			
		-						- 14	N =50/3	3"		
		-						-70-	REC =10"	10		
	- 73.0 -	-										
		-										
						14 4						
		SILTY SAND, fine to moist, light greenish	medium gray, 5%	grained, shell	SM				5+6+8			
		fragments, medium to fragments, weak HC	o coarse I reactior	shell 1.					N =14 REC =1	8"		
	-							-/5				
		-										
		-										
		-										
		-						10	3+7+12			
6/08	_	_						<u>80</u> []	REC =1	8"		
DT 3/												
EL.G	_											
HNAB	82.0 -	POORLY GRADED	SAND W	VITH SILT,	SP-SM	5.4						
J SC		greenish gray, 5% sh	ed, mois nell fragn	t, light nents,								
DO.GP		medium to coarse sh weak HCl reaction.	ell fragm	nents,				10	6+7+9 N =16			
0 & 4(_	-						-85-	REC =1	8"		
PT 30		_										
OG S												
48 PL												
61200		1										
0000		1						11	N =13			
NG L(-	-						-90-1	REC =1	8"		
BORI		continued a	n nevt ner	10								
TEST			, пехі рад	5								

Γ	-	TEST	Project:	Calvert Cliff	s Nucle	ar Pow	er Plant	Boring	Number:	B-303			
	C	BORIN	G	Calvert Cou	inty, Ma	ryland		Contra	ct Number: 0	6120048			
P	Schnat	el Engineering LUG						Sheet:	4 of 7				
	DEPTH (FT)	EPTH STRATA DESCRIPTION			ELEV. (FT)	WL	SAM DEPTH	PLING DATA	TESTS	REMARKS			
	91.0	0 SILTY SAND, fine to medium grained, moist, light gray, 40% shell fragments,			-3.6								
	_	and cemented sand pockets, moderate HCI reaction.											
	-						12	+23+50/5" =73/11"					
							25[]	EC =17"					
	-												
	-												
		greenish gray, 15% shell fr	agments.					+18+27					
	_							=45 EC =18"					
	-												
	-												
	-	50% shell fragments, laver	s of shells.				⊢ - 	11+15					
	_							=26 EC =18"					
	-												
	_												
	_							10+14					
	_							=24 EC =18"					
	_												
	-												
T 3/6/08	-												
BEL.GD	-	3% shell fragments.						11+20 =31 EC =18"					
SCHNA													
00.GPJ	_												
300 & 4(-												
DG SPT	-							8+12 =20 =C =18"					
048 PLC	_							-0 - 10					
06120													
NG LOG	-												
T BORI	-	25% shell fragments. continued on next p	age				7+	11+15					
Γ	6	hachal	TEST	Project:	Calvert Cliff	s Nucle	ar Pow	er Plant	t		Boring	Number:	B-303
--------------------	--------	-------------------	----------------	----------	---------------	---------------	--------	----------	--------------	------------------	----------	--------------	---------
	C	nnabel	BORING	(Calvert Cou	nty, Ma	ryland				Contra	ct Number: 0	6120048
H	Schnat	bei Engineering	LUG						6		Sneet:	5017	
	(FT)	STRATA	DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	DEDT	ы Ц		э гл	TESTS	REMARKS
┢					SM				M	N =26			
	_							-125-		REC =18	8"		
	-												
	_												
	_												
									М	7+18+15	5		
									XI	N =33 RFC =18	8"		
								-130-1		1120 11	0		
	-												
	-												
	-												
	-	5% shell fragmer	nts.						M	5+8+12 N = 20			
	_							-135-	Ш	REC =18	8"		
	_												
	-									0.0.40			
	-	contains mica.							XI	N =21	.		
	_							-140-		REC =18	8"		
	-												
	-												
	_												
	_	greenish gray, 59	% shell fragm	nents,					M	8+8+14			
	_	weak HCI reaction	on.					_145_	Ŵ	N =22 REC =18	8"		
80%													
0T 3/6													
EL.G	-												
HNAB	-							┝ ┤					
J SC	-	3% shell fragmer	nts.					┝ ╢	M	7+8+10 N =18			
00.GF	_							-150-	Ш	REC =18	8"		
<u> 00 & 4</u>	-							┝ ┤					
SPT 3(_							└					
rog (
048 P		contains mica.							∇	6+10+15	5		
06120	7								\mathbb{M}	N =25 REC =18	8"		
- DG	_							-155-1	-		-		
RING	-												
T BO	-	continue	ed on next pag	e									
TES													

	-	hnahal	TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant		Boring	Number:	B-303
		babel Engineering LOG		С	alvert Cou	nty, Ma	ryland		Γ	Contra	ct Number: 06	6120048
5	cnnar	bel Engineering	LUG							Sneet:	6 OT /	
DE (F	PTH 'T)	STRAT	A DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	5			TESTS	REMARKS
					SM			DEPTH	DAI			
	_											
	_							L -M	9+10+14	1		
									N =24 REC =18	8"		
								100				
	_							- 1				
	-											
	-											
	_							M	8+10+12	2		
	_							<u>165</u>	REC =1	8"		
	-											
	-											
	-							F -IM	7+8+10 N =18			
	_							-170-0	REC =1	8"		
	_											
	_											
	_								0.10.1			
	-							F -1 X	N =26	+		
	_							-175-1	REC =1	8"		
	-											
	_											
	_											
000									7+8+11			
									N =19 REC =1	8"		
	_							-180				
	-											
	-											
50	_											
8	_							M	7+11+14	4		
	_							Å	N =25 REC =18	8"		
000												
40 T L	-							[]				
	-											
5 2	-							$ \mid \mid $				
	-							∏	6+8+13 N =21			
	_							<u> </u>	REC =1	8"		
		continu	ea on next pag	e								

6	TEST Project: C	alvert Cliff	s Nucle	ar Pow	er Plant		Boring Number:	B-303
Schnat	bel Engineering LOG	alvert Cou	inty, Ma	ryland			Contract Number: Sheet: 7 of 7	06120048
DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL	DEPTH		IG TESTS	REMARKS
		SM						
	dark greenish gray, 25% shell				10	4+6+15	5	
195.0 —		SP	-107.6		-195-	REC =	18"	
-	medium grained, moist, dark greenish gray, 5% shell fragments, moderate HCl	JF						
-	reaction.							
-								
					$ \rangle$	N =25	15	
200.0 -	BOTTOM OF BORING @ 200.0 FT.		-112.6		-200-1			
3/0/08								
ורפח								
HINABE								
& 400.0								
200								
LOG								
120048								
90 00								
זאואפר								

Schnat	bel Engineering TEST Project: 0	Calvert Clif Calvert Cou	fs Nucle unty, Ma	ar Pov aryland	ver Pla	nt		Boring Contra Sheet:	Number: Act Number 1 of 7	er: 06120	B-304
Boring C	contractor: UNI-TECH DRILLING					Gr	oundw	ater Obs	ervations		
	MALAGA, NEW JERSEY					D	ate	Time	Depth	Casing	Caved
Boring F	oreman: J. Blemings		Enco	untere	d	5	/26		Dry	0.0'	
Drilling N	Method: Mud Rotary		Star	t of da	у	5	/30		10.0'	0.0'	
Schnabe	Equipment: CME-750 (ATV)		Star	t of da	у	5	/31		12.0'	0.0'	
Dates S	Started: 5/26/06 Finished: 5/31/06		Star	t of da	v	F	5/1		5.0'	0.0'	
Location	: Northing: 217188.61 ft Easting: 960896.88 ft		otan	. or uu	,				0.0	0.0	
Ground	Surface Elevation: 68.0 (feet)										
DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL	DEP	S. TH	AMPLI D	NG ATA	TEST	S	REMARKS
0.5	Forest litter, rootmat, and topsoil.		67.5			M	2+3+5		w=17.1	%	
-	SILTY SAND, fine to coarse grained, moist, yellowish orange, trace gravel.	SIM			_		REC =	:16"			
-	fine to medium grained, dark orange, contains cemented sand.				_	-0	10+3+ N =7	4	w=25.9	9% 3'- sof	Driller noted ter material
-					F	ЦЦ	REC =	:6"			
4.5	SANDY SILT, fine to medium, moist, mottled brownish orange, with clay.	ML	- 63.5		- 5 -	M	2+2+3		w=29.4	1%	
_					-	-10	N =5 REC =	:18"			
7.0 -	FAT CLAY with sand, fine to medium, moist, mottled brownish orange, with shell fragments, 10-15% shell frag, brown colored.	СН	- 61.0		-		1+2+3 N =5 REC =	-18"	w=34.1 LL=57 PL=23	% 7 3	
_	dark gray, with sand.				-10-	_					
-	fine to medium sandy.				-		2+4+5 N =9 REC =	-18"	w=31.4 LL=59 PL=19	4% 9 9	
-					-	-					
_	with sand.				-	-0	3+3+5 N =8		w=31.7 LL=63	3	
_	fine to medium sandy				-15-		REC =	:18"	PL=2, *	3	
					_						
-					-	_					
_	very stiff.				Ļ		3+6+8		w=32.1	%	
_					-20-	<u> </u>	N =14 REC =	:18"	PL=2	1	
_					-	-					
22.0 -	SANDY LEAN CLAY, fine to medium grained, moist, dark gray.	CL	46.0		-	-					
						<u> </u>	4+5+6		w=25.6	5% 3	
_	continued on next page				-25-	4	N =11 REC =	:18"	PL=20	õ	
	·····										

Comments: 1. Boring backfilled with cement/bentonite grout through tremie pipe upon completion. 2. Downhole Geophysical Testing Performed on 6/1/2006 3. * = See Appendix I for additional lab testing data.

	-	hpabol TEST	Project: C	Calvert Cliff	s Nucle	ar Pow	er Plant	В	oring Number:	B-304
	Schnal	bel Engineering LOG	C	Calvert Cou	inty, Ma	ryland		C S	ontract Number: 0 heet: 2 of 7	6120048
D	EPTH (FT)	STRATA DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	S DEPTH		TESTS	REMARKS
				CL					*	
	-						F 1			
	- 27.0 - -	SILTY SAND, fine to coarse moist, mottled brown and ora shell fragments, 25-30% brow frag.	grained, inge, with wn/red shell	SM	41.0			6+15+45	w=32.3%	
	29.4 	CLAYEY SAND, fine to medi grained, moist, dark gray, con cemented sand, slightly ceme	um ntains ented.	SC	38.6			REC =18"		
	32.0 -	POORLY GRADED SAND, fi	ine to	SP	36.0					
	-	medium grained, moist, dark contains cemented sand.	gray,				 🖂 35	50/5" N =50/5" REC =5"	w=20.1%	
	37.0 -	POORLY GRADED SAND W	/ITH SII T	SP-SM	31.0					
	-	fine to medium grained, mois green, with fine to coarse she fragments, strong HCI reaction shell frag.	it, grayish ell on, 30-40%				 X 40 	28+50/5" N =50/5" REC =11"	w=19.3%	
	-	wet, green and white, 60-70%	6 shell frag.				 45	16+11+10 N =21 REC =14"	w=21.9%	
3/6/08	47.0 -	SILTY and CLAYEY ROCK		GM-GC	21.0					
J SCHNABEL.GDT	-	FRAGMENTS, fine to mediur moist, greenish gray, contain cemented sand. 4" shell layer at 49.3 ft	n grained, s				 	21+15+50 N =65/10" REC =16"	/4" w=14.5% LL=25 PL=18 *	49.3'- 4" shell layer
400.GF	-									
6120048 PLOG SPT 300 &	52.0 - - -	SILTY SAND, fine to medium moist, green and white, with coarse shell fragments, conta cemented sand, strong HCI r 80% shell frag.	n grained, fine to ains eaction,	SM	16.0		 ×	50/2" N =50/2" REC =3"	w=13.5% *	55'- Harder drilling
LOG 0	-									
DRING	_									
TEST B(_	continued on next pag	ge							

ſ		TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant		Boring Number:	B-304
	Schna	bel Engineering LOG	С	alvert Cou	nty, Ma	iryland			Contract Number: 0 Sheet: 3 of 7	6120048
	DEPTH (FT)	STRATA DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	S DEPTH		G TESTS	REMARKS
		20-30% shell frag.		SM			10	5+6+11	w=29.1%	
	_	-					_60_ <u>_</u>	REC =18	8" PL=NP	
		-								
		-								
								5.7.0	w=29.4%	
		10-20% snell frag.						N =16	LL=30 PL=23	65'- Start of
									*	day, 5/30/06
		-								
		-								
		dark green.						5+5+6 N =11	w=29.5% *	
	_	-					-70-	REC =18	8"	
		green, with fine to coarse she	II 45.000/					REC =22	2"	
	_	shell frag.	n, 15-20%							
		-								
	77.0	CLAYEY SAND, fine to mediu	um	SC	-9.0					77'- Rig chatter
		fine to coarse shell fragments cemented sand, strong HCI re	, contains eaction.					12+20+1	15 w=16.3%	
6/08		45-55% shell frag.	,					N =35 REC =18	LL=32 8" PL=19	
GDT 3/		-								
NABEL.		-								
J SCH	83.0	SILTY SAND, fine to medium	grained,	SM	-15.0				04.00/	
400.GF		moist, green, with fine to coar fragments, moderate HCl rea	se shell ction,					5+12+15 N =27	5 W=21.8%	
T 300 &	_	13-23 /0 Shell hag.					-85-		5	
-OG SP	•									
0048 PI		1								
G 0612		strong HCl reaction,10-15% s	hell frag.				∏	9+11+11 N =22	1 w=38.7% LL=49	
ING LO	_	-					-90-1	REC =18	8" PL=28	
TEST BOR		continued on next pag	e							

		TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant		Boring Number:	B-304
	Schna	bel Engineering LOG	IG C	Calvert Cou	inty, Ma	iryland			Contract Number: 0 Sheet: 4 of 7	6120048
	DEPTH (FT)	STRATA DESCR	PTION	CLASS.	ELEV. (FT)	WL	S		G TESTS	REMARKS
				SM			DEFIN			
	-									
	-								- w=33%	
	-						F -1X	5+12+15 N =27	w=0070	
							-95	REC = R	5	
	-									
	97.0 -	CLAYEY SAND, fine to me	edium	SC	-29.0					
	-	medium shell fragments, n reaction 0-5% shell frag	noderate HCl						w=42.1%	
	-								LL=79 PL=28	
		•					-100-		*	
	-									
	-				25.0					
	103.0 -	SILTY SAND, fine to medi moist, green, trace fine to	um grained, coarse shell	SM	-35.0			8+9+18	w=44%	
		fragments, strong HCI read shell frag.	ction, 5-10%					N =27 REC =18	8"	
	_									
	_									
	-									
	-	fine to coarse shell fragme	nts, 20-30%					6+9+17	w=33.8%	
		shell frag.					<u> </u>	N =26 REC =18	8"	
	-									
	-									
3/6/08	-									
GDT :	-	with fine to coarse shell fra	igments, % shell frag					9+9+15 N =24	w=43.9%	
NABEL			/o shen nag.				-115-0	REC =18	8"	
J SCHI	-									
00.GP,	-	-								
300 & 4	-						$\left - \right _{-}$			
SPT:	-	trace fine to medium shell 5-10% shell frag.	fragments,				N	8+11+12 N =23	2 w=47.9%	
8 PLOC							-120-	REC =18	8"	
312004.	-									
00 06	-									
RING L	123.0 -	SILT, moist, oliveish greer	l.	ML	-55.0			_	w=60.2%	
ST BOI	-	continued on next	page				\vdash	5+10+14	t w-00.2 /0	
비										

	TEST Project: C	Calvert Cliff	s Nucle	ar Pow	er Plant	Boring Number:	B-304
Schna	bel Engineering LOG	Calvert Cou	nty, Ma	ryland		Contract Number: 0 Sheet: 5 of 7	6120048
DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL		NG TESTS	REMARKS
127.0 -	CLAYEY SAND, fine to medium grained, moist, oliveish green, with fine to coarse shell fragments, strong HCI reaction, 10-15% shell frag.	ML SC	-59.0		-125 - 25 - 25 - 25 - 25 - 25 - 25 - 25	* 18") w=34.9% 18"	
- - 133.0 - - -	FINE TO MEDIUM SANDY SILT, moist, oliveish green, moderate HCI reaction.	ML	-65.0		 - -	1 w=45% *	
137.0 -	CLAYEY SAND, dark green	SC	-69.0		 REC =	10" w=36.5% LL=43 PL=26 *	140'- Start of
145.0 -	FAT CLAY, trace sand, dark green SANDY ELASTIC SILT, moist, oliveish green, with sand, moderate HCl reaction.	СН	-77.0		 	5 w=70% LL=134 18" PL=49 *	day, 5/31/06
					 - -	3 w=72.1% 18"	
	trace fine to medium shell fragments, moderate HCI reaction, 0-3% shell frag.					16 w=70.9% *	
	continued on next page						

	-	hashal	TEST	Project: Ca	alvert Cliff	s Nucle	ar Pow	er Plant		Boring Number:	B-304
	chast		BORING	C	alvert Cou	nty, Ma	ryland			Contract Number: 0	6120048
5	cnnar	bei Engineering	200								
	FT)	STRATA	DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	БЕЛТИ		TESTS	REMARKS
-	-				MH				DAI		
	_										
	_	weak HCI reaction	on.						8+10+12	w=55.1%	
								l M	N =22 REC =18	8" PL=53	
								-160-		*	
	-										
	-										
	_										
								L Jm	8+10+10) w=47.2%	
								I III	N =20	8"	
								-165-			
	-										
	-										
	_										
	_							L JM	8+11+14	w=62.9%	
								l .== M	N =25 RFC =18	8"	
										-	
	-										
	-										
	_										
	_								8+8+10	w=84%	
								175 M	N =18 REC =18	8" PL=84	
										*	
	-										
17	7.0 -	CLAYEY SAND.	fine to medi	um	SC	-109.0					
	_	grained, moist, g	reen, with fir	ie to a HCI							
/9/08	_	reaction, 25-30%	% shell frag.	grioi				M	12+14+2	23 w=27.5%	
									N =37 REC =18	8"	
л Ц Ц											
INA	-										
	-										
10.0	-										
0 & 4	_							M	8+15+15	5 w=39.2%	
20	_							L_185-10	REC =18	8"	
200											
48 PL	1							[]			
01200	-										
5	-										
	-							M	7+12+16	6 w=42.8%	
	_							L <u>_190</u> _∐	REC =18	8"	
EQ		continue	ed on next pag	e							
- ட						i		I	I		1

Sc	hnabel TEST BORING	Project: Ca	lvert Cliffs lvert Cou	s Nucle nty, Ma	ar Pow ryland	er Plant	B	oring Number: ontract Number: 0	B-304
DEPTH (FT)	STRATA DESCRIP	ΓΙΟΝ	CLASS.	ELEV. (FT)	WL	S	AMPLING	heet: 7 of 7 TESTS	REMARKS
- 193.0 - -	SANDY LEAN CLAY, fine to green, moist	medium,	SC CL	-125.0		 195-	9+10+13 N =23 REC =18"	w=51.1%	
- - - 200.0 —	with sand, small 1/4" pockets sand BOTTOM OF BORING @ 20	s of gray 10.0 FT.		-132.0		 200-	4+5+17 N =22 REC =18"	w=55.8%	

Schnal	hnabel Engineering LOG	Project: Ca	alvert Clif alvert Co	ffs Nucle unty, Ma	ar Pow ryland	er Pla	nt		Boring Contra Sheet:	Number: ct Number 1 of 5	e r: 06120	B-305
Boring C	Contractor: CONNELLY AND	ASSOCIATES	. INC.				Gro	oundw	ater Obs	ervations		
j =	FREDERICK, MAR	RYLAND	,				D	ate	Time	Depth	Casing	Caved
Boring F	oreman: T. Connelly			Enco	untere	d	7.	/18		37.5'		
				Start	of Day	/	7.	/19		35.0'		
Schnabe	el Representative: K. Bell			Start	of Day	/	7.	/20		24.0'		
Dates \$	Started: 7/17/06 Finished:	7/20/06										
Location	1: Northing: 217166.25 ft Easting: 960686.74 ft											
Ground	Surface Elevation: 72.0 (feet)											
DEPTH (FT)	STRATA DESCRIPT	ION	CLASS	ELEV. (FT)	WL	DEP	S/ TH	AMPLI D	ING ATA	TEST	s	REMARKS
0.5 - 2.0 -	POORLY GRADED SAND W fine to medium grained, mois brown, trace root fragments, fragments.	/ITH SILT, it, yellowish trace wood	SP-SM SP-SM	71.5		_		woh+ N =3 REC =	1+2 =11"			
45	fine to medium grained, mois brown, trace root fragments, fragments.	trace wood		- 67 5		_		1+1+3 N =4 REC =	3 =7"			
-	grained, moist, yellowish brov orangeish brown, trace root trace wood fragments.	um wn and ragments,	SM	0110		5 - -		2+2+3 N =5 REC [;]	3 =12"			
-	and orangeish brown, trace r fragments.	oot				-		woh+ N =1 REC :	woh+1 =4"			
10.0 —	FAT CLAY, moist, gray and c brown, trace sand.	orangeish	СН	- 62.0			-8	2+2+2 N =4 REC =	2 =15"			
-						-	-	REC	=22"	PP=2.50) tsf	
								2+3+4 N =7 REC :	4 =18"		co mi ora	lor change in ud tub from angeish
- 19.0	SILTY SAND fine to medium	arained	SM	- 53.0		-		3+4+6 N =10 REC :	6) =18"		bro	own to gray
-	moist, gray.					-20-	-	REC	=16"			
22.5	ELASTIC SILT, moist, gray, t	race sand.	MH	49.5		- - -		4+4+6 N =10 REC :	6) =18"			
	continued on next pag	ge				-25-						

50	hnabel BORING	ect: Calvert Cliff	s Nucle	ar Pow	er Plant	Boring Number:	B-305
Schna	bel Engineering LOG		inty, ivia			Sheet: 2 of 5	5120048
DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL		NG TESTS	REMARKS
		MH			5+7+9 N =16 REC =	:18"	
27.0	SANDY SILT, moist, gray.	ML	45.0		5+5+7		
					N =12 REC =	18"	
-	weak cementation					18"	
					 	25	
35.0 -	CLAYEY SAND, fine to medium grained, wet, gray and white, contai	ns SC	37.0			5"	Harder drilling
	fine to medium shell fragments, 30-40%, HCI reaction strong.			Ā			resumed drilling on 7/18/06 @7:30am
					0 32+45 N =93 REC = REC =	+48 :12" :23" w=34.7%	
						PL=22 *	
					30+50 N =50/ REC =	/5" /5" 10"	
					45	/5" -4"	
47.0 47.0	CLAYEY SAND, fine to medium grained, wet, white and gray, with fin coarse shell fragments, 60-70%, Ho reaction strong.	ne to Cl	25.0		40+50 	/5" /5" 8"	
	LEAN CLAY wet gray trace sand	CI	21.2		50	8	
SPT 300 & 40	contains fine to medium shell fragments, 20-30%, HCI reaction moderate.				 REC =	.8" PP=>4.5 tsf	harder
50048 PL00 55.0 -	CILITY CAND find to modium article	od OM	17.0				
G LOG 061:	wet, greenish gray, strong cemental	tion.				/5" :5"	
TEST BORIN	with fine to coarse shell fragments, continued on next page				🛛 36+50	/1"	

	2	hpabel TEST	Project:	Calvert Cliff	s Nucle	ar Pow	er Plant		Boring	Number:	B-305
Sch	nat	BORIN	IG	Calvert Cou	inty, Ma	aryland			Contra	ct Number: 0	6120048
DEPT	гн		I		ELEV		s		3		
(FT)	STRATA DESCRI	IPTION	CLASS.	(FT)	WL	DEPTH	DA1	A	TESTS	REMARKS
		50-60%, HCI reaction stron	ng	SM				N =50/1			Harder drilling
	-						- 1				
	-	contains fine to coarse she	ell fragments,				-60-	3+4+12			
	-	20-30%					Ă	N =16 REC =18	8"		
	-										
	-	HCI reaction moderate					10	4+6+8			
	_						L IV	REC =18	8"		
	_						-65				
								8+9+12 N =21			
								REC =18	8"		
								4+5+0			
	-						F 1 X	N =14	.		
	-						$ \mu$	REC =1	5		
	-						-70-	4+4+7			
	-						X	N =11 REC =18	3"		
	-								-		
	_						10	4+5+7			
	_						L IV	REC =18	8"		
	_						-75	1			
		trace fine to medium shell 2-5%, HCl reaction weak	fragments,					3+4+7 N =11			
							עך ק	REC =18	3"		
								1+5+0			
	-						F 1 X	N =13			
∞ 79.5	; -				-7.5			REC = R	5		
3/6/0	-	SANDY SILT, wet, greenis white, contains fine to coal	sh gray and rse shell	ML			-80-	4+7+9			
GDT	-	fragments, 30-40%, HCI r strong.	eaction				X	N =16 REC =18	3"		
82.0) -	SILTY SAND find to modi	um grainod	SM	-10.0				-		
SCH	_	wet, white and gray, with fi	ine to coarse	Sivi			17	8+34+50)/2"		
a 9. 84.0	,	cementation, HCl reaction	strong.		-12.0			REC =1	3"		Rig chatter
& 400		CLAYEY SAND, fine to me	edium	SC			-85				
1 300		coarse shell fragments, 60)-70%, HCl					9+15+9 N =24			
DG SP		reaction strong.					F 74	REC =18	8"		
길 87.0 8) †	SILTY SAND, fine to medi	um grained,	SM	-15.0			10144.0	20		
21200	-	fragments, 30-40%, strong	g				F -1 X	N =40	29		
0000	-	cementation, HCI reaction	strong.				⊢ <u>⊣∟</u>	REC =18	5"		resumed drilling
NG L	-						-90-	REC =8'			7:15am
BOR	-	continued on payt	nage				╞╴╶╢┻				
TEST		continued on next j	puge								

	6	hashal TEST	Project: 0	Calvert Cliff	s Nucle	ar Pow	er Plant	В	oring Number:	B-305
	Schnat	BORING	0	Calvert Cou	inty, Ma	iryland		C	ontract Number:	06120048
	ЕРТЦ						s			
	(FT)	STRATA DESCRIPT	ION	CLASS.	(FT)	WL	DEPTH		TESTS	REMARKS
				SM				2,,	•	
	-						╞╴╶┥ <u>┣</u>			
	-	contains fine to coarse shell to 10-20%. HCl reaction moder	fragments, ate				M	6+9+14 N =23		
	-						L 10	REC =18"		
	95.0 —				-23.0		-95			
	_	white, contains fine to coarse	gray and shell	ML			L JX	7+9+12 N =21		
	07.0	fragments, 20-30%, HCI rea moderate.	ction		05.0			REC =18"		
	97.0 -	SILTY SAND, fine to medium	n grained,	SM	-25.0			617110		
	-	wet, greenish gray and white fine to coarse shell fragments	, contains s, 10-20%,				F 1 X	N =17		
	-	HCl reaction moderate.					\vdash \dashv	REC =18"		
							-100-	4+7+11		
	-						X	N =18 REC =18"		
1	02.0 -				-30.0					
	_	white, trace fine to coarse sh	gray and ell	ML			L JM	8+10+17		
		fragments, 5-10%, HCI react moderate, weak cementation.	tion				I W	N =27 REC =18"		
							[]			
1	05.0 —	SANDY ELASTIC SILT, mois	st, greenish	МН	-33.0		-105-M	7+13+13		
	-	fragments, 2-5%, HCl reaction	on weak.				F -10	N =26 REC =18"		
1	07.0 -	SANDY SILT, wet, greenish	arav and	ML	-35.0					
	-	white, trace fine to medium s	shell n weak				10	7+7+11 N =18		
	-						L JM	REC =18"		
	_						-110			
	_							6+8+13 N =21		
								REC =18"		
g	_							6+6+11		
000	-						F 1 X	N =17		
	-							REC =18"		
							-115-	7+8+12		
	-						X	N =20 REC =18"		
29.0	-									
Q 40	_						L IM	8+9+16		
1 300							l M	N =25 REC =18"	,	
	-									
40 LL(^{_120−}	5+7+11		
	-						F 10	REC =18	,	
	-						+ +			
NG LL	-						⊢ - ∏	7+10+14 N =24		
BORI	-	and the second second					Ļ ⊣∆	REC =18"	,	
Ē		continued on next pag	<i>ј</i> е							

	hnabal -	TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant		Boring Number:	B-305
Schnal				alvert Cou	nty, Ma	ryland			Contract Number: Sheet: 5 of 5	06120048
DEPTH (FT)	STRATA D	DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	S. DEPTH		G TESTS	REMARKS
(FT)	HCI reaction mode	rate		ML	(FT)	WL	DEPTH125	DA1 6+9+12 N =21 REC =18 9+10+12 N =24 REC =18 8+9+11 N =20 REC =18 7+7+12 N =19 REC =18 6+8+10 N =18 REC =18 7+8+11 N =19 REC =18	TESTS 8" 4 8" 8" 8" 8" 8" 8"	resumed drilling on 7/20/06 @ 7:15am
	CLAYEY SILT	IING @ 15	1.5 FT.		-79.5			7+7+10 N =17 REC =18 5+8+9 N =17 REC =18 8+8+12 N =20 REC =18 8+9+11 N =20 REC =18 10+10+1 N =22 REC =18	8" 8" 8" 12 8"	

Schnat	hnabel TEST BORING bel Engineering LOG	Project: Calv Calv	ert Cliff ert Cou	fs Nucle unty, Ma	ar Pow ryland	er Plai	nt		Boring Contra Sheet:	Number: Ict Number 1 of 5	er: 06120	B-306
Boring C	ontractor: UNI-TECH DRILLI	NG					Gro	oundwa	ter Obs	ervations		
	MALAGA, NEW JE	ERSEY					D	ate	Time	Depth	Casing	Caved
Boring F	oreman: J. Evans			Enco	untere	d	5	5/5		18.5'		
Drilling N	Method: Mud Rotary											
Drilling E	-quipment: FAILING-1500											
Schnabe	Representative: R. vinzant	19/06										
Dates :	Starteu: 5/5/06 Finisheu: 5/	0/00										
Location	Easting: 960681.82 ft											
Ground	Surface Elevation: 118.6 (feet)											
DEPTH (FT)	STRATA DESCRIPT	TION C	LASS.	ELEV. (FT)	WL	DEP	S/ TH	AMPLIN DA	G TA	TEST	S F	REMARKS
	SILTY SAND, fine to medium	grained,	SM				M	3+3+2				
	moist, orangeisn brown.						Ш	N =5 REC =1	16"			
							$\left \right $					
	light orangeish brown and bla	ack.				Ļ .	-0	2+2+3				
						L .	$ \Delta $	REC = 1	6"			
						_						
	light gray and black.					- 5 -	M	3+4+4 N =8				
						F .	ТΔ	REC =1	3"			
	light orangeish gray and blac	k.					HM	4+3+4 N =7				
-							Ш	REC =1	3"			
_						-10-						
						L.		4+4+5				
							Ŵ	N =9 REC =1	3"			
						F .						
-						- ·						
-	light orangeish gray.						HXI	3+4+5 N =9				
-						-15-	- ĽJ	REC =1	4"			
-						Ļ .						
-						Ļ.						
	wet no black trace fine grav	ol			$\overline{\Delta}$	[5+6+6				
-	wet, no black, trace line grav	CI.				F .	٦XI	N =12				
-						-20-		REC =1	13			
-						- ·	$\left \right $					
-						Ļ .	$\left \right $					
						Ļ.						
	light orangeish grav and blac	k.						5+7+8				
						[_ `		N =15 REC =1	2"			
	continued on next pag	je				-25-		110-	· -			

		TEST Pro	ject: Calvert Cl	ffs Nucle	ear Pow	er Plant	Boring Number:	B-306
	Schna	BORING	Calvert Co	ounty, Ma	aryland		Contract Number: (06120048
	DEPTH	STRATA DESCRIPTION	CLASS	ELEV	wi	SAMPLI		REMARKS
	(FT)		ULAU	' (FT)		DEPTH D	ATA	
	_		SM					
	-							
	-	traco fino graval					17	
	-	trace line graver.				N =30	-16"	
		orangeish brown.					-10	
	-							
	-							
	-							
	-	orangeish brown and black.				5+8+1 N =18	10	
						REC =	=13"	
	-							
	-							
	-							
	-	light orangeish brown, with 3" laye	er of			4+9+1	10	
		nne gravei.					=14"	
	41.0 -			77.6				
	-	CLAYEY SAND, fine to medium grained, moist, orange and gray.	SC					
	_							
	_						2	
						N =4 REC =	=18"	
						-43		
/08	-							
0T 3/6	-							
EL.G	-	arov, containo mico					-	
HNAB	-	gray, contains mica.				N =8	-10"	
PJ SC							- 10	
400.G	51.0 -	LEAN CLAY, with sand, fine to me	edium CL	67.6				
300 &	-	grained, moist, gray.						
3 SPT	-							
PLOG	-					\ 3+3+5 N =8	5	
120046						-55-K REC =	=18"	
G 061	-							
NG LO	-							
BORI	-	continued on next news						
TEST		continued on next page						

	TEST Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	Boring Number:	B-306
Schnal	Del Engineering LOG	alvert Cou	inty, Ma	iryland		Contract Number: 06 Sheet: 3 of 5	6120048
DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL		IG TESTS	REMARKS
	aroonich arou	CL			REC =	24" PP=2.00 tsf	
-	greenish gray.						
_					60		
_							
-	with fine to medium sand lenses.				6+6+7	PP=1.50 tsf	
-					-65-0 REC =	18"	
67.0 -	FAT CLAY, trace fine sand, moist, light	СН	51.6				
-	gray.				REC =	24" w=30.7%	
-						PL=24 PP=3.15 tsf	
			47.0		-70	*	
/1.0 -	SILTY SAND, fine grained, moist, greenish gray, contains mica.	SM	47.6				
_							
-)	
					75	18"	
-							
-	dark grav, with fine shall fragments					4 "	
	weak HCl reaction.				-	4" 10"	
810 -			37.6				
	POORLY GRADED SAND, fine to medium grained, moist, gray, with fine	SP	07.0				
	reaction.						
					<mark>⊠</mark> 50/3" N =50/3	3"	
						4"	
87.0 -	SILTY SAND, fine to medium grained,	SM	31.6				
	shell fragments, strong HCI reaction.					+41	
					0 N =70 REC =	18"	
	continued on next page						

6	TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant		Boring I	Number:	B-306
Schnat	bel Engineering LOG	C C	alvert Cou	nty, Ma	iryland			Contrac Sheet: 4	tNumber: 0 of 5	6120048
DEPTH (FT)	STRATA DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	S		G	TESTS	REMARKS
			SM							
92.0 -	CLAYEY SAND, fine to medi grained, moist, gray, with fine medium shell fragments, stro reaction. with fine to medium shell frag strong HCI reaction	um e to ng HCl jments,	SC	26.6			8+9+9 N =18 REC =1	8"		
				22.0		-95		-		
96.0 -	SILTY SAND, fine and coars wet, gray, with fine shell frag weak HCl reaction.	e grained, ments,	SM	22.6						
_	trace fine to medium shell fra weak HCl reaction, contains sand.	gments, cemented				⊠ 100	³ 50/4" N =50/4 REC =4			
_										
	with fine to coarse shell fragr cemented sand, moderate H	nents, no Cl reaction.				 	8+10+1 [:] N =27 REC =1	7 8"		
-	fine to medium grained, mois gray, with fine to coarse shel fragments, moderate HCI rea	t, greenish ction.				 - 110- -	8+14+11 N =32 REC =1	8 8"		
	gray, trace fine to medium sh fragments, weak HCl reaction	ell 1.				 115- 	10+14+ N =33 REC =1	19 8"		
40 FLOG SF1 3000 & 400.0	no shell fragments, no HCl re	eaction.				 120-	5+9+12 N =21 REC =1	8"		
121.0 -	CLAYEY SAND, fine to medi grained, wet, gray, with fine t shell fragments, moderate Ho on shells only.	um o coarse Cl reaction	SC	-2.4						
	continued on next pag	ge					4+11+2	1		

	TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant		Boring	Number:	B-306
Schnat	BORING	C C	alvert Cou	nty, Ma	iryland			Contra Sheet	ct Number: 0	6120048
DEPTH				ELEV.		s		G		
(FT)	STRATA DESCRIPT	ION	CLASS.	(FT)	WL	DEPTH	DA	TA	TESTS	REMARKS
			SC				N =32 RFC =1	8"		
						-125-1				
						- 1				
127.0 -	SILTY SAND, fine to medium	n grained,	SM	-8.4						
	wet, light gray and white, with medium shell fragments, stro	n fine to ong HCl								
	reaction, contains cemented	sand.				X	34+50/2 N =50/1	1" "		
						-130-	REC =7	7"		
	greenish gray, trace fine to m	adium								
	shell fragments, weak HCl re	action.								
							17+14+	20		
						Å	N =34 REC =1	8"		
						[]				
							0+17+2	6		
						F 1 X	N =43	.0		
-						-140-		10		
-										
-										
	no visable shell fragments, n reaction.	o HCI				N	8+10+1 N =28	8		
						-145-	REC =1	8"		
3/6/08										
	maint ann aich anns tana fi	1-								
ABEL.	medium shell fragments, mo	derate HCI								
- SCHN	reaction.					10	8+9+17			
				-31.4		L_150-	N =26 REC =1	8"		
8 400	BOTTOM OF BORING @ 15	60.0 FT.								
1 300										
048 PL										
06120										
LOG										
RING										
ST BC										
끤				1						

Schna	chnabel TEST BORING bel Engineering LOG	Project: C C	alvert Cl alvert Co	iffs Nucle ounty, Ma	ar Pow ryland	ver Pla	nt		Boring Contra Sheet:	Number: Ict Number 1 of 7	er: 0612	B-307
Boring C	Contractor: UNI-TECH DRILLI	NG					Gr	oundw	ater Obs	ervations		
	MALAGA, NEW JE	ERSEY					D	ate	Time	Depth	Casing	J Caved
Boring F	Foreman: J. Evans			Enco	untere	d	6	/15		23.5'		
Drilling	Method: Mud Rotary			Start	of da	y	6	/16		42.0'		
Drilling I	Equipment: Failing-1500 (Truck	() n	_									
Dates	Started: 6/14/06 Einished: (8/16/06	-									
	Northing: 216055 27 ft	5/10/00										
Location	Easting: 960690.13 ft											
Ground	Surface Elevation: 119.3 (feet)											
DEPTH (FT)	STRATA DESCRIPT	ION	CLASS	S. ELEV. (FT)	WL	DEP	S. TH	AMPLI D	NG ATA	TEST	s	REMARKS
0.3	Rootmat and topsoil.	/	СН	119.0			M	3+6+7				
	FAT CLAY, moist, brown, tra	ce fine to				F	łŴ	N =13 REC =	:8"			
2.0 -	contains clayey sand and lea	ragments, n clay		117.3		F	-	-				
_	lenses.		SC			L		2+1+2				
	CLAYEY SAND, trace gravel medium grained moist brow	, fine to n. contains					X	N =3	:17"			
-	clayey sand pockets.	,				F			17			
	fine to coarse grained, light o	rangeish				- 5 -		4+5+6		w=11.6	%	
5.5	CLAYEY SAND fine to coars	e grained	SC	113.8		L		N =11		*		
	moist, orangeish brown and I	ight brown.		110.0				REC =	:11"			
7.0 -	SILTY SAND, fine to medium	grained,	SM	112.3				0.7.0				
	moist, brown and orangeish t	prown.				-	HXI	N =16				
-						-	ЦШ	REC =	:15"			
9.5	POORLY GRADED SAND, fi	ne to	SP	109.8		L_10-						
	medium grained, moist, strati	fied light trace silt						5+0+1	3			
-						F	1	N =22	405			
12.0 -	SILTY SAND. fine to medium	arained.	SM	107.3		F		REC =	:12"			
-	moist, light brown and orange	eish brown,				F	_					
	with Silt.					L		22+32	+38	w=7.9	%	
								N =70	13"	LL=NI PL=NI	P	
	•					-15-		REC =	10	*		
-	1					╞	-					
17.0 -				102.3		L						
	SILTY SAND, fine to coarse moist, stratified light brown a	grained, nd light	SM								*C	Drilling
-	yellowish brown.					Γ		0.10	10		fo	reman used 4" O.D. Drag
-	4					F		9+12+ N =24	12		bi	t from 0 to
	-					-20-	ЦЦ	REC =	:11"		18 *S	s.ο π. Switched to
_						L					4-	3/4" O.D.
											18	3.5 ft.
22.0 -	POORLY GRADED SAND W	ITH SILT,	SP-SM	/ 97.3		F	1					
	trace gravel, fine to coarse gravel, fine to coarse gravel, light brown	ained,			∇	╞	-					
24.0 -				95.3	<u> </u>	L	-10	7+10+	13	w=139	%	
-	SILTY SAND, tine to coarse g wet, light brown.	grained,	SM			_ 25]Ŵ	N =23 REC =	:13"			
	continued on next page	<i>je</i>										

	1	hachel	TEST	Project: C	alvert Cliffs	s Nucle	ar Pow	er Plant		Вс	oring Nur	nber:	B-307
	Schn		BORING	C	alvert Cou	nty, Ma	ryland			Co	ontract N	umber: 0	6120048
E	SCHIL	iber Engineering	200						67			1 7	
1	(FT)	STRATA	A DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	NEDTL	ЗА 」			TESTS	REMARKS
┢		stratified light bro	own and light	yellowish	SM			DEFIF	1	DATA			
		brown below 24.	.5 ft.										
		_											
		light orangeish b	prown fine sil	tv gravel				Γ	7	8+14+20			
		layer below 29.8	3 ft.	iy grate.					XIII	N = 34			
	-	-						30 ^L	_' '	NEC = 12			
		_											
		_											
		_											
		fine to medium g	grained, orang	geish				[71	8+11+13	w	=14.5%	
		brown and light	brown.					25	Ň	N =24 REC =11"	F	LL=NP PL=NP	
	-							-35				*	
		-											
		_											
		_											
		fine to coarse gr	ained, orang	eish brown,				[71	7+7+7			
	-	trace fine graver						40	M	N = 14 REC =8"			
		_											
		_										04.00/	
		fine to medium g	grained, light aeish brown.	grayish					$\ $	3+1+2 N =3	W	=24.8%	
	-	fine to coarse gr	ained, gray b	elow 44 ft .				-45-	<u> </u>	REC =18"			
		_											
8/08	47.0					72.3							
DT 3/	47.0	SANDY LEAN C	CLAY, fine to ult soil to field	medium, I classify -	CL	12.5							
EL.G		may lab classify	as SC with h	igh					ᆔ.	2.2.0	w	=25.1%	
HNAB			163).)	XII i	N =9		*	
l SCI	-	-						—50— [[]		REC =18"			
00.GP		_											
0 & 40	52.0					67.3							
PT 30		Iight gray, with fi	AY, moist, gr ine sand, trac	ay and e mica.	CH								
OG SI								Γ		3+4+4	w	=28.1%	
48 PL		1							XIII	N =8		*	
31200	-	1						-55-	_" '	110 - 10			
g QG		-											
NG LC		-											
BORI													
TEST		continu	ied on next pag	e									

	6	hnabel	TEST	Project: (Calvert Cliff	s Nucle	ar Pow	er Plant	E	Boring Number:	B-307
-	Schnal	bel Engineering	LOG		Calvert Cou	inty, Ma	aryland		C S	Contract Number: 0 Sheet: 3 of 7	6120048
DI	EPTH (FT)	STRAT	A DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	S DEPTH	AMPLING	TESTS	REMARKS
		gray and light gr medium sand, c lense (1/8 inch t	reenish gray, ontains claye hick) at 59.5 t	with fine to y sand ft.	СН				4+4+6 N =10 REC =18	w=33.1% LL=62 PL=20 *	
6	- 64.5 	trace fine to me sandy fat clay p SILTY SAND, fin wet, dark gray.	dium sand, co ockets. ne to medium	ontains grained,	SM	- 54.8		 65	4+11+16 N =27 REC =18	w=35.5% LL=52 PL=18 *	
6	67.0 - -	FAT CLAY, moi with fine sand.	st, gray and li	ght gray,	СН	52.3					
	_	light greenish gr organic matter (ay, trace fine ±1%).	sand and					6+9+11 N =20 REC =18	w=34% LL=66 PL=23 *	
7	72.0 - - -	CLAYEY SAND grained, moist, g medium sandy i mica.	, fine to media gray, contains ean clay pock	um s fine to kets, trace	SC	47.3		 	4+7+11 N =18 REC =18	w=24.9%	
EL.GDT 3/6/08	- 77.0 - - - -	SILTY SAND, fir moist, dark gray fragments (±10 cemented sand,	ne to medium r, few fine to c %), contains r moderate H0	grained, coarse shell noderately Cl reaction.	SM	- 42.3		 80 	28+50/5" N =50/5" REC =11	"	*Switched to 5" O.D. Tri-cone roller bit below 78.5 ft.
DG SPT 300 & 400.GPJ SCHNABE	-	wet, gray, conta inch), strong HC	ins black part I reaction.	icles (1/16				 85 	36+50/3" N =50/3" REC =10	w=20.6% *	
ING LOG 06120048 PL	-	Silt, gray and lig coarse shell fra	ht gray, most gments (±50%	ly fine to 6).				 90-	16+22+3 [.] N =53 REC =15	1 w=21.5% LL=NP " PL=NP *	*Switched to 4-3/4" O.D. Drag bit below 88.5 ft.
TEST BOF	_	continu	ied on next pag	e							

	TEST Project	ct: Calvert Cliff	s Nucle	ar Pow	er Plant	Boring	g Number:	B-307
Schnal	bel Engineering LOG	Calvert Cou	nty, Ma	ryland		Contra Sheet	act Number: 0 : 4 of 7	6120048
DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL	SAM	PLING DATA	TESTS	REMARKS
	some fine to coarse shell fragments (±40%).	SM	24.8		 	10+17 =27	w=27.7%	
97.5	LEAN CLAY, moist, gray, trace fine t medium sand, little fine to coarse shi fragments (±25%), strong HCI reaction	to CL ell on.	21.8		95/_] Rt 	<u>-</u> C =18"		*Very difficult rotary advancement from 97.5 to 98 5 ft (slow
	CLAYEY SAND, fine to medium grained, moist, light greenish gray ar light brownish gray, contains strongly cemented sand pockets, weak HCI reaction.	nd y			 ⊠ 50 N RE 	/5" =50/5" EC =5"		advancement rate). *Switched to 5" O.D. Tri-cone roller bit below 98.5 ft. *Very to extremely difficult rotary advancement from 0.9 5 to
103.0 -	POORLY GRADED SAND with silt, trace shells, green	SP-SM	16.3		8+ 105- 8+ - 105- 8+ 	12+15 =27 EC =18"		100 ft (very strong rig chatter). *Very to extremely difficult rotary advancement from 101 to 103 ft (very strong rig chatter). *Potany
- 110.0 — - - - -	SILTY SAND, fine to medium grainer wet, gray, trace fine to coarse shell fragments (±5%), moderate HCl reaction.	d, SM	9.3			+14+19 =33 EC =18"	w=29.2% LL=NP PL=NP *	advancement from 98.5 to 103 ft is extremely difficult. *Switched to 4-3/4" O.D. Drag bit below 103.5 ft.
& 400.GPJ SCHNABEL.GDT	gray and light greenish gray, trace fin to medium shell fragments (±5%), we HCI reaction.	ne eak			6+ 	10+14 =24 EC =18"		
	light greenish gray, trace fine to med shell fragments (±1%), very weak H0 reaction.		-2.7			7+14 =21 EC =18"	w=28.9% LL=32 PL=25 *	
TEST BORING LOC	continued on next page	50			 ∎ RE	EC =14"	w=29.8%	*Osterberg

	hnabel TEST	alvert Cliff	s Nucle	ar Pow	er Plant		Boring Number: B-307			
Schna	bel Engineering LOG	Ci	alvert Cou	nty, Ma	aryland			Contra Sheet:	ct Number: 0 5 of 7	6120048
DEPTH (FT)	STRATA DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	DEPTH		IG TA	TESTS	REMARKS
-			SC			-125-	l		LL=35 PL=19 *	sampler tube push from 123.5 to 124.7 ft .
	moist, little fine to coarse she fragments (±25%), contains s cemented sand layer, strong reaction.	ll strongly HCl				 ₽ 130 	50 REC =	6"		*Slight to moderate difficulty in rotary advancement from 128.5 to 128.8 ft (slight rig chatter).
132.0 - - - -	SILTY SAND, wet, light green trace fine to medium shell fra (±5%).	nish gray, gments	SM	12.7		 - 135- 	13+20+ N =50 REC =	⊦30 17"	w=26% *	
	moist, greenish gray, trace fi coarse shell fragments (±1% reaction.	ne to), weak HCl				 [140	10+13+ N =33 REC =	+20 18"		
142.0 - - - 	FINE TO MEDIUM SANDY E SILT, moist, greenish gray, tr weak HCl reaction.	LASTIC ace mica,	MH	22.7		 - 145- 	9+11+ ⁻ N =29 REC =	18 18"	w=36.8% LL=59 PL=33 *	
SPT 300 & 400.6PJ SCHNABEEL.C	fine sandy.					 [150- 	7+12+2 N =32 REC =	20 18"	w=50.6% *	
153.5 - 153.5 - -	SILTY SAND, fine to medium trace fine to medium shell fra (±1%), very weak HCI reaction	i sandy, gments n.	SM	-34.2		 -155- 	7+13+7 N =30 REC =	17 18"	w=38.8% LL=58 PL=37 *	
	continued on next pag	ge				[]				

	-	TEST Project:	Calvert Cliff	s Nucle	ar Pow	ver Plant	Boring Number:	B-307	
•	Schnal	bel Engineering LOG	Calvert Cou	inty, ivia	ryiand		Contract Number: 06120048 Sheet: 6 of 7		
D	EPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL	SAMPLI	NG TESTS	REMARKS	
	57.0 - - -	CLAYEY SAND, fine to medium grained, wet, greenish gray, little fine to coarse shell fragments (±15%), strong HCI reaction.	SC	-37.7			-18 -18"		
1	62.0 - - - -	FINE TO MEDIUM SANDY LEAN CLAY, moist, gray and light greenish gray, trace fine to medium shell fragments (±5%), strong HCI reaction.	CL	42.7		 	-18 =18"		
1	67.0 - - - -	FINE SANDY SILT, moist, gray and greenish gray, trace fine to medium shell fragments (±5%) and mica, weak HCI reaction.	ML	- 47.7			-18 =18"		
1	72.0 - - - -	CLAYEY SAND, moist, dark greenish gray, trace fine sand and mica, contain indurated elastic silt pockets, weak HC reaction.	s SC	52.7		 	-14 =18"		
PJ SCHNABEL.GUI 3/6/08	- - - -	trace fine to medium sand, mostly indurated elastic silt layers, strong HCI reaction.				 REC = 180	=23" w=33.5% LL=41 PL=25 PP=>4.5 tsf	*Osterberg sampler tube push from 178.5 to 180.4 ft	
5 06120048 PLOG SP1 300 & 400.6 L	- 83.5 - - -	SILTY SAND, very weak HCI reaction .	SM	-64.2			-14 =18"		
	_	continued on next page					5 w=43% LL=61 =18" PL=39		

	TEST	В	oring Number:	B-307					
Schna	bel Engineering LOG	G	alvert Cou	nty, Ma	ryland		C S	ontract Number: 0 heet: 7 of 7	6120048
DEPTH (FT)	STRATA DESCRI	PTION	CLASS.	ELEV. (FT)	WL	S DEPTH		TESTS	REMARKS
- - 193.5 - - - -	Sandy ELASTIC SILT, trac weak HCl reaction.	e fine sand,	MH	-74.2		 195- - 	7+11+14 N =25 REC =18"		
- 201.5	very weak HCl reaction.	201.5 FT.		-82.2		 	7+11+14 N =25 REC =18"	w=68.7% LL=137 PL=61 *	**Resumed grouting at 7:45 AM on 6/16/06.

	Schnat	TEST Project: C bel Engineering LOG C	alvert C alvert C	Cliffs Count	Nucle ty, Ma	ar Pow ryland	er Plar	nt	Boring Contra Sheet	g Number: act Numbe : 1 of 5	er: 061200	B-308
	Borina C	ontractor: UNI-TECH DRILLING						Gro	oundwater Obs	servations		
	5 -	MALAGA, NEW JERSEY						D	ate Time	Depth	Casing	Caved
	Boring F Drillina N	oreman: J. Evans /ethod: Mud Rotary	-		Enco	untere	d	5	5/3	23.5'		
)rillina E	auipment: FAILING-1500										
s	chnabe	I Representative: R. Vinzant										
	ates S	Started: 5/3/06 Finished: 5/4/06	F									
ŀ	ocation	: Northing: 216906.69 ft Easting: 960771.28 ft	-									
6	Fround S	Surface Elevation: 107.1 (feet)										
	DEPTH (FT)	STRATA DESCRIPTION	CLAS	ss. ^E	ELEV. (FT)	WL	DEP [.]	S. ⊺н	AMPLING DATA	TEST	S F	REMARKS
	0.0	SILTY SAND, fine to medium grained,	SM		106.4			М	3+3+3			
	0.0	trace fine gravel.	SP		100.4			Ш	N =6 REC =18"			
	-	POORLY GRADED SAND, fine to						$\left \right $				
	-	trace silt.						\mathbb{N}	2+2+4 N =6			
	_						L .	$ \Delta $	REC =14"			
		grayish brown.					E					
							- 5 -	M	2+6+5 N =11			
	-							Ш	REC =16"			
	-	orangeish brown.										
	_							-M	4+4+6 N =10			
	_						L .	$ \Delta $	REC =16"			
	_	medium to coarse grained, orangeish brown.										
									6+6+9			
	_							1 X	N =15			
	-								REC = 10			
	-							$\left \right $				
	-							\mathbb{N}	10+13+14 N -27			
	15.0 -				92.1		-15-	Ш	REC =14"			
		SILTY SAND, fine to medium grained, moist, orangeish brown, contains mica.	SM				L.					
		-										
Ď Z	-							1				
0.00	-											
ð S	-							HM	7+10+12 N =22			
212	_						-20-	ĮΔ	REC =13"			
200	_	medium to coarse grained, dark orange.										
101	7											
	-							1				
	-					$\overline{\nabla}$						
	-					-		HM	12+12+14 N =26			
	_						-25-	ĮΔ	REC =12"			
		continued on next page										

	TEST	Project:	Calvert Cliffs Nuclear Power Plant					Boring Number: B-308		
Schnal	bel Engineering LOG	j	Calvert Cou	inty, Ma	iryland		C	Contract Number: 06120048 Sheet: 2 of 5		
DEPTH				EI EV		s				
(FT)	STRATA DESCRIP	TION	CLASS.	(FT)	WL	DEPTH		A TESTS	REMARKS	
	wet, orange, with organic ma	atter, trace	SM							
-										
-										
-										
-						M	2+2+3			
30.0				77.1		<u>_</u> 00	REC =14'			
_	CLAYEY SAND, fine to med grained, moist, dark gray.	ium	SC							
-										
-										
-						F -1 X	2+2+3 N =5			
35.0 —	SANDY LEAN CLAY, fine, n	noist, dark	CL	72.1		-35-0	REC =18'	'		
-	gray.									
-										
-										
_							2+3+2			
							N =5 REC =18'	,		
						-40				
-										
-										
-							REC =24'	PP=3.00 tsf		
-										
						-45-				
_										
- and										
ر رو										
- פ ביניפ							1+5+6			
	•					F 1 X	N =11	,		
- N	contains mica.					-50-0	REC = 10			
- 00	-					$\left - \right $				
-						╞╴╶┤ <u></u>		PP=3.25 tsf		
-	-									
1048 -						-55-				
100121										
-										
	-									
	continued on next pa	ge				$\left \right $				

	hpabol TEST	Project: C	Calvert Cliffs Nuclear Power Plant						Boring Number: B-308		
Schnal	BORING	C C	alvert Cou	nty, Ma	iryland			Contract Number: 06120048			
DEPTH (FT)	STRATA DESCRIPT	ΓΙΟΝ	CLASS.	ELEV. (FT)	WL	S		G G FA	TESTS	REMARKS	
			CL				5+7+7				
-						X	N = 14	0"			
60.0 —	SILTY SAND, fine to mediun	n grained,	SM	47.1		-60-		0			
-	moist, dark gray, with cemen	ited sand.									
-											
-							REC =0				
-											
65.0	CLAYEY SAND, fine grained	l, moist,	SC	42.1		-65-					
-	fragments, moderate HCl rea	action.									
-											
-							17+21+	50/5"			
-							N =71/1 REC =1	1" 6"			
_											
73.5	SILTY SAND, fine to mediun	n grained,	SM	33.6			50/4"				
_	moist, dark gray, with cemen	ited sand.					N =50/4 REC =1				
_											
_											
-											
-	gray, with fine to coarse she	1					50/4"				
- 108	hagments, strong nor reacting	UII.				-80-	REC =1				
- ABEL											
2 83.5 5 -	CLAYEY SAND, fine to medi grained, moist, gray, with fine	ium e to coarse	SC	23.6			¹ 50/2" N =50/2				
	shell fragments, moderate H	Cl reaction.				85	REC =0				
- 12004							1				
۲ – ۲ ۵							50/5" N =50/5				
						-90-	REC =1				
	continued on next pa	ge									
Ľ											

	TEST	Project: 0	Calvert Cliff	s Nucle	ar Pow	er Plant	Вс	Boring Number: B-308		
School	BORING	6	Calvert Cou	inty, Ma	ryland		Co	Contract Number: 06120048 Sheet: 4 of 5		
DEDTU	ber Engineering EOO					6				
(FT)	STRATA DESCRIP	TION	CLASS.	ELEV.	WL			TESTS	REMARKS	
			SC							
93.5	SILTY SAND, fine grained, r	noist, dark	SM	13.6			7+14+14			
	greenish gray, with fine to co fragments, moderate HCI rea	arse shell					N =28 REC =18"			
-										
-	contains mica.					L -M	9+11+14			
							N =25 REC =18"			
-										
-										
102 5				26						
	CLAYEY SAND, fine to med	ium	SC	5.0		M	4+7+13 N =20			
	grainea, molet, greenier gra	y.				<u> 105 </u> []	REC =18"			
_										
-										
						X	3+5+7 N =12			
						-110-1	REC =18"			
-										
- 008										
^m / _{113.5}	SILTY SAND fine to medium	n arained	SM	-6.4			15+24+50/	/4"		
- <u>-</u>	moist, light gray, with fine to	coarse				r im	N =74/10"			
HNAB		eaction.				-115-	REC - 15			
- 10.01	_									
×	-									
1 20	greenish gray and white.						34+29+23			
200							N =52 REC =18"			
48 7							_			
	-									
5 –										
- NG	-									
	trace fine to coarse shell frag	gments,				¤	10+19+21			
	continued on next pa	ge								

	TEST Project: C	alvert Cliff	s Nucle	ar Pow	er Plant		Boring Number: B-308		
Schna	bel Engineering LOG	alvert Cou	inty, Ma	iryland			Contract Number Sheet: 5 of 5	: 06120048	
DEPTH	STRATA DESCRIPTION	CLASS	ELEV.	wi	5	SAMPLIN		REMARKS	
(FT)		OLAGO.	(FT)		DEPTH	DA	ТА		
_	strong HCI reaction.	SM			125	N =40 REC =1	18"		
					[]				
	-				- 1				
128.5			-21.4						
	grained, moist, trace fine shell	SC			$ \rangle$	9+10+2 N =31	21		
	fragments, weak HCI reaction				-130- ^L	REC =1	18"		
	-								
	-								
	-								
133.5	SANDY SILT, fine to medium grained,	ML	-26.4		17	9+13+2	22		
-	medium shell fragments, weak HCI				-135-	REC =1	18"		
	present								
	_								
138.5	SILTY SAND. fine to medium grained.	SM	-31.4			10+10+	-15		
	moist, greenish gray, few fine to coarse shell fragments, strong HCI reaction.					N =25 REC =1	18"		
-					-140				
	-								
	-								
	-					7			
	-				$\vdash \dashv X$	7+10+1 N =26	6		
	-				-145-	REC =1	18"		
3/6/05	-								
- 601	-								
VABEL	-								
SCH	-				17	10+17+	-30		
유) 150.0 -			-42.9		-150-	REC =1	18"		
0 & 40	BOTTOM OF BORING @ 150.0 FT.								
LOG &									
048 P									
06120									
LOG									
NING									
Ŭ									

Schnat	TEST Project: C bel Engineering LOG C	Calvert Clit Calvert Co	t Cliffs Nuclear Power Plant t County, Maryland					Boring Number: Contract Number: 061200 Sheet: 1 of 5			
Boring C	CONNELLY AND ASSOCIATES					Gro	oundwater Obs	ervations	;		
Doning o	FREDERICK, MARYLAND	, ii (0.				D	ate Time	Depth	Casin	g Caved	
Boring F	oreman: D. Reese		Start	of da	у	5	/12	12.5'	14.0'		
Drilling M	Method: Mud Rotary		Start	ofda		5	/15	21.5'	14.0'		
Drilling E	Equipment: CME-75 (Truck)		Start	. OI UA	У	5		21.5	14.0		
Schnabe	I Representative: M. Arles										
Dates S	Started: 5/11/06 Finished: 5/12/06										
Location	: Northing: 216949.24 ft Easting: 960890.7 ft										
Ground	Surface Elevation: 100.1 (feet)				1						
DEPTH (FT)	STRATA DESCRIPTION	CLASS	ELEV. (FT)	WL	DEP	S. TH	AMPLING DATA	TEST	S	REMARKS	
0.4	ROOTMAT AND TOPSOIL.	FILL	99.7			M	2+2+2 N =4			orill hollow tem auger	
20	Clayey Sand FILL, fine to medium grained, moist, brownish orange.		QR 1		-		REC =17"		F	ill, water loss nd hole	
2.0	Poorly graded sand FILL, fine to coarse grained moist brownish orange	FILL	50.1				WOH/18"		C d	rillers cased	
-	contains wood fragments, with clay,				F	1	N = WOH/18"		a	uger to 14' to	
-	trace silt.				F	- 14	REC =11"			- 56 000 0001	
		FILL			- 5 -		4.11/00				
							1+WOR +WOR				
1						ןשך	N = WOR				
7.0 -	Silty Sand FILL, fine to coarse grained,	FILL	93.1		F	1_	110 -4				
-	moist, grayish brown, contains wood				F	-	WOH/18" N = WOH/18"				
_	ingriono.				Ļ	$ \Delta $	REC =18"				
					10						
-					1 0-		WOLLOOS				
11.0 -	wet, brown, trace gravel.		89.1		F	- \/	vvOH+2+2 N =4				
12.0 -	moist, brown, trace gravel.		88.1		╞	- 14	REC =18"				
_	SANDY LEAN CLAY, fine to coarse,				L						
	moist, brown.						2+2+3	PP=0.25	5 tsf		
-					F	1	N =5				
_					-15-	- 14	REC =13"				
-					F						
17.0			82.1		L						
17.0	POORLY GRADED SAND WITH SILT	SP-SM	00.1								
-	moist, orangeish brown.				F	1_					
-					F	HM	7+10+11 N =21				
_					-20-	40	REC =17"				
-					Γ	7					
-					F						
-					F						
	orange.				L		9+14+8				
24 0	, , , , , , , , , , , , , , , , , , ,		75 0		Γ		N =22				
24.8	continued on next page		/ 5.3		-25-	- 11	REC = 14				
	· · · · · ·										

DEPTH (FT) STRATA DESCRIPTION CLASS. ELEV. (FT) WL 27.0 CLAYEY SAND, fine to medium grained, moist, dark gray. SC 73.1	er Plant Boring Number	Boring Number: B-309		
DEPTH (FT) STRATA DESCRIPTION CLASS. ELEV. (FT) WL 27.0 SILTY SAND, fine to medium grained, moist, orange. SM SM 27.0 CLAYEY SAND, fine to medium grained, moist, dark gray. SC 73.1	Contract Num	ber: 06120048		
27.0 SILTY SAND, fine to medium grained, moist, orange. SM 27.0 CLAYEY SAND, fine to medium grained, moist, dark gray. 73.1		STS REMARKS		
27.0 CLAYEY SAND, fine to medium SC 73.1				
CLAYEY SAND, fine to medium SC 73.1 grained, moist, dark gray.				
	1+3+2			
	N =5 REC =18"			
32.0 SANDY LEAN CLAY find maint dark CL 68.1				
_ gray.				
	REC =23"			
	-35-			
	PP=2.	50 tsf		
	N =10 REC =18"			
_ trace sand.	REC =24" PP=3.	75 tsf		
	-45-			
5 – – – – – – – – – – – – – – – – – – –	3+4+7			
	N =11 REC =18"			
52.0 CLAVEY SAND fine to medium SC 48.1				
grained, moist, greenish gray.				
	REC =23"			
	-55-			
57.0 POORLY GRADED SAND WITH CLAY, fine to medium grained, moist, grayish continued on next page 43.1				

Comments: 1. Boring backfilled with cement/bentonite grout through tremie pipe upon completion. 2. * = See Appendix I for additional lab testing data.

DORNUS Calvert County, Mayland Contract Number: 0120048 DEPTH STRATA DESCRIPTION CLASS. ELEV. (FT) WL SAMPLING DEPTH DATA TESTS REMARKS PREC = 10° grane, with fine to coarse shell remembed sand. SP-SC a - a 31:500° N =503° =60- a 62.0 CLAYEY SAND, fine to medium grained, moist, grayish green, 14° isysts of day and sand. SC 38.1 - a 67.0 POORLY GRADED SAND, fine to medium grained, moist, grayish green, 14° isysts of day and sand. SP-SK 33.1 - - a 72.0 POORLY GRADED SAND, fine to medium grained, moist, grayish green, 14° isysts of day and sand. SP-SM 28.1 - - - 72.0 POORLY GRADED SAND WITH SUT. Fine to medium grained, moist, grayish green, 14° isysts of day on coarse shell fragments (0-10%). SP-SM 28.1 - - - 72.0 POORLY GRADED SAND WITH SUT. Fine to medium grained, moist, grayish green, 14° isysts of day on coarse shell fragments (0-20%). HCH- SP-SM 28.1 - - - 76 POORLY GRADED SAND WITH SUT. Fine to medium grained, moist, grayish green, 14° isysts of day on coarse shell fragments (10-20%). SP-SM 28.1 - - - 76 POORLY GRADED SAND WITH SUT. Fine to medium grained, moist, gray	ſ	6	TEST Pro	oject: Calvert	Calvert Cliffs Nuclear Power Plant					Boring Number: B-309		
DEPTH STRATA DESCRIPTION CLASS. ELEV. (PT) WL SAMPLING DEPTH Data TESTS REMARKS 02.0 GLAYEY SAND, fine to coarse shell fragments (15:20%). HCH, contains emented sand. SP-SC 38.1		Schnat	BORING LOG	Calvert	Cou	nty, Ma	ryland			Contract Number: 06120048		
(FT)STRATA DESCRIPTIONCLASS.(FT)WLDEPTHDATATESTSREMARKSgreen, with fine to coarse shell cemented sand.green, with fine to coarse shell regments (band, most, greyten green, trace sit, with fine to medium shellSP-SC38.1 $ -$ <th>ŀ</th> <th>DEPTH</th> <th></th> <th></th> <th></th> <th>FI FV</th> <th></th> <th>5</th> <th></th> <th>G</th> <th></th> <th></th>	ŀ	DEPTH				FI FV		5		G		
$\begin{array}{c} \label{eq:second} \end{tabular} \\ \begin{tabular}{ c c c c c } \hline \end{tabular} \\ t$		(FT)	STRATA DESCRIPTION	CLA	SS.	(FT)	WL	DEPTH	DA	TA .	TESTS	REMARKS
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Ī		green, with fine to coarse shell	SP-	SC				1 21 50/2	,		
62.0 CLAYEY SAND, fire to medium grained, moist, gravish green, 1/4" algers of clay and sand. 67.0 POORLY GRADED SAND, fine to medium shell fragments (0-10%). 72.0 POORLY GRADED SAND WITH SUT, fore to medium shell fragments (0-10%). 72.0 POORLY GRADED SAND WITH SUT, fore to medium shell fragments (0-10%). 72.0 POORLY GRADED SAND WITH SUT, fore to medium shell fragments (0-10%). 72.0 POORLY GRADED SAND WITH SUT, fore to coarse shell fragments (10-20%). HCI+. 72.0 POORLY GRADED SAND WITH SUT, SP-SM algorithm of the coarse shell fragments (10-20%). HCI+. 72.0 POORLY GRADED SAND WITH SUT, fore to coarse shell fragments (10-20%). HCI+. 72.0 POORLY GRADED SAND WITH SUT, SP-SM algorithm of the coarse shell fragments (10-20%). HCI+. 72.0 POORLY GRADED SAND WITH SUT, fore to coarse shell fragments (10-20%). HCI+. 72.0 POORLY GRADED SAND WITH SUT, fore to coarse shell fragments (10-20%). HCI+. 73.0 REC = 10° 74.0 POORLY GRADED SAND WITH SUT, fore to coarse shell fragments (10-20%). HCI+. 75.0 REC = 10° 75.0 REC = 10°		-	cemented sand.	115				14	N = 50/3) ''		
$ \begin{array}{c} 62.0 \\ \hline \\ CLAVEY SAND, fine to medium prained, molst graysh green, 1/4" \\ green of day and sand. \\ \hline \\ $		-						-60-	REC =1	0"		
62.0 CLAYEY SAND, fine to medium grained, moist, gravish green, 1/4" layers of clay and sand. SC 38.1 67.0 POORLY GRADED SAND, fine to medium grained, moist, gravish green, trace sit, with fine to medium shell fragments (0-10%). SP 33.1 72.0 POORLY GRADED SAND WITH SLIT, fine to medium grained, moist, gravish green trace sit, with fine to coarse shell fragments (30-40%), HCH. SP-SM 28.1 72.0 POORLY GRADED SAND WITH SLIT, fine to medium grained, moist, green and write, with fine to coarse shell fragments (10-20%). SP-SM 28.1 72.0 POORLY GRADED SAND WITH SLIT, first to medium grained, moist, green and write, with fine to coarse shell fragments (10-20%). SP-SM 28.1 9 9 9 9 9 9 9 9 9 <t< td=""><td></td><td>-</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>		-										
Och RE medical mythol medical and the second structureSCa given of clay and sand. 14^{er} byters of clay and sand. 14^{er} byters of clay and sand. 14^{er} byters of clay and sand. 14^{er} control of clay and sand. 14^{er} <		62.0 -	CLAVEY SAND find to modium		<u> </u>	38.1						
$\begin{array}{c c c c c c c c c c c c c c c c c c c $		_	grained, moist, grayish green, 1/4	."								
$\begin{array}{c c c c c c c c c c c c c c c c c c c $		_	layers of clay and sand.						6+12+1	6		
67.0 POORLY GRADED SAND, fine to medium grained, moist, grayish green, trace siti, with fine to medium shell fragments (0-10%). POORLY GRADED SAND WITH SILT, fine to medium grained, moist, green and while, with fine to coarse shell fragments (30-40%), HCP. greenish gray, with fine to coarse shell fragments (10-20%). greenish gray, with fine to coarse shell fragments (10-20%). with fine to coarse shell fragments (15-30%). continued on next page									N =28 REC =1	8"		
$\begin{array}{c c c c c c c c c c c c c c c c c c c $		_						-05				
67.0 POORLY GRADED SAND, fine to medium grained, moist, grayish green, trading to the total standing fine to medium grained, moist, grayish green, trading medium grained, moist, green and while, with fine to coarse shell tragments (10-20%). POORLY GRADED SAND WITH SILT, fine to medium grained, moist, green and while, with fine to coarse shell tragments (10-20%). greenish gray, with fine to coarse shell tragments (10-20%). with fine to coarse shell fragments (10-20%). with fine to coarse shell fragments (10-30%). method on next page		-										
$\begin{array}{c} & \text{medium grained, moist, grayish green, trace sill, with fine to medium shell fragments (0-10%). \\ \hline \\ & \text{POORLY GRADED SAND WITH SILT, fine to medium grained, moist, green and while, with fine to coarse shell fragments (30-40%), HCl+. \\ \hline \\ & \text{greenish gray, with fine to coarse shell fragments (10-20%). \\ & \text{with fine to coarse shell fragments (10-20%). \\ & \text{with fine to coarse shell fragments (10-30%), \\ & \text{continued on next page} \end{array} $		67.0 -	POORLY GRADED SAND, fine to	b S	P	33.1						
72.0 POORLY GRADED SAND WITH SILT, fine to medium grained, moist, green and white, with fine to coarse shell fragments (30-40%), HCl+. 28.1		-	medium grained, moist, grayish g trace silt, with fine to medium she	reen, ll								
72.0 POORLY GRADED SAND WITH SILT, fine to medium grained, moist, green and white, with fine to coarse shell ragments (30-40%), HCH. greenish gray, with fine to coarse shell fragments (10-20%). with fine to coarse shell fragments (15-30%). continued on next page		-	fragments (0-10%).						¹ 50/3" N =50/3			
72.0 POORLY GRADED SAND WITH SILT, fine to medium grained, moist, green and white, with fine to coarse shell fragments (30-40%), HCI+. greenish gray, with fine to coarse shell fragments (10-20%). with fine to coarse shell fragments (15-30%). continued on next page		_						70	REC =4			
72.0 POORLY GRADED SAND WITH SILT, fine to coarse shell fragments (30-40%), HCl+. SP-SM 28.1 -		_										
POORLY GRADED SAND WITH SILT, fine to medium grained, moist, green and while, with fine to coarse shell fragments (30-40%), HCl+. greenish gray, with fine to coarse shell fragments (10-20%). = $=$ $=$ $=$ $=$ $=$ $=$ $=$ $=$ $=$		720 -				28.1						
and white, with fine to coarse shell fragments (30-40%), HCl+. $ \begin{array}{c} - \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\$		12.0	POORLY GRADED SAND WITH fine to medium grained, moist, gra	SILT, SP- een	SM	20.1						
$= \frac{1}{2} = $			and white, with fine to coarse she fragments (30-40%) HCI+	II					23+10+	14		
$\begin{array}{c c} & -75 \\ \hline \\ & -75 \\ \hline$		-						- 11	N =33	6"		
greenish gray, with fine to coarse shell fragments (10-20%). with fine to coarse shell fragments (15-30%). continued on next page								-75-		0		
greenish gray, with fine to coarse shell ragments (10-20%). with fine to coarse shell fragments (15-30%). continued on next page		-										
$ \begin{array}{c} & & & & & \\ & & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & & \\ $		-										
$ \begin{array}{c} $		-										
$= \frac{1}{10000000000000000000000000000000000$		-							50/4"			
$\begin{array}{c} & & & & \\ & & & & \\ & & & & \\ & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & & \\ & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & & \\ & & & & & \\ & & & & & & \\ & & & & & & \\ & & & & & & \\ & & & & & & \\ & & & & & & \\ & & & & & & \\ & & & & & & \\ & & & & & & \\ & & & & & & \\ & & & & & & \\ & & & & & & \\ & & & & & & \\ & & & & & & \\ & & & & & & \\ & & & & & \\$	6/08								REC =2			
$ \begin{array}{c} \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\$	DT 3	_										
$ \begin{array}{c} & \\ & \\ & \\ & \\ & \\ & \\ & \\ & \\ & \\ & $	BEL.G											
$ \begin{array}{c} $	ANHO	_						_]				
$= \frac{1}{10000000000000000000000000000000000$	PJ SC	-										
with fine to coarse shell fragments (15-30%). continued on next page	400.G	-	fragments (10-20%).	snell				X	8+17+2 N =39	2		
with fine to coarse shell fragments (15-30%). <i>continued on next page</i>	300 &							-85-	REC =1	8"		
with fine to coarse shell fragments (15-30%). <i>continued on next page</i> $ -$	SPT :	-										
with fine to coarse shell fragments (15-30%). - $continued on next page$	PLOG	-										
with fine to coarse shell fragments (15-30%). <i>continued on next page</i>	0048	-										
$ \begin{array}{c} (15-30\%). \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\ $	0612	_	with fine to coarse shell fragments	s					9+10+9			
continued on next page	5 LOG		(15-30%).						N =19 REC =1	8"		
continued on next page	ORING							90				
	STB	-	continued on next page					- 1				

	TEST	Project: C	Calvert Cliffs Nuclear Power Plant					Boring Number: B-309		
School	bol Engineering	C	alvert Cou	nty, Ma	ryland		Γ	Contract Number: 06120048		
DEDTU								G	1015	
(FT)	STRATA DESCRIPT	TION	CLASS.	ELEV. (FT)	WL	ПЕРТИ			TESTS	REMARKS
			SP-SM							
-	-									
	-									
	trace fine to medium shell fra	igments					6+7+8			
	(<1%).	-					N =15 REC =1	8"		
-						-95	,	Ū		
-	-									
	-									
-	-									
	-						3+3+4			
						100 M	N =7 REC =1	8"		
_						-100		_		
-	-									
-	-									
	-									
-	grayish green, with fine to co	arse shell				10	5+6+11			
	fragments (15-30%).						N =17 REC =1	8"		
						105				
-										
107.0 -	SILTY SAND, fine to mediun	n grained,	SM	-6.9						
· ·	moist, grayish green, with fin shell fragments (30-40%).	e to coarse								
						10	23+10+2	26		
_	-					L_110-	REC =1	8"		
g 112.0 -	POORLY GRADED SAND V	/ITH SILT,	SP-SM	-11.9						
- 3/6/0	green, with fine to coarse sh	st, grayish ell								
- GDT	fragments (10-15%), with silt	, HCI+.				10	9+9+14 N =23			
I IABEI	-					-115-	REC =1	8"		
- SCHN	-									
GPJ										
400.										
300 8										
- Tes	-					10	5+6+7 N =13			
– LOG	-					-120-	REC =1	8"		
0048	-									
122 0 -				-21 0						
	POORLY GRADED SAND, f	ine to n. trace silt	SP	-21.3						
RING		, 11400 011.								
- BO	continued on next pa	ge				F 1 ^M	∦ 8+8+10			
TES										
	TEST Project: C	Calvert Cliff	s Nucle	ar Pow	er Plant	Boring Number: B-309		B-309		
---------	---	---------------	----------	---------	--------------	-----------------------------	---------------	---------		
Schnal	bel Engineering LOG	Calvert Cou	inty, Ma	iryland		Contra Sheet:	ct Number: 00	6120048		
DEPTH			FI FV		SAMP	LING				
(FT)	STRATA DESCRIPTION	CLASS.	(FT)	WL	DEPTH	DATA	TESTS	REMARKS		
		SP				8				
-						, = 10				
-										
127.0 -	SILTY SAND fine to medium grained	SM	-26.9							
	moist, green, trace fine to medium shell from the first $(0, 5\%)$									
_	nagments (0-3%).				7+7-	+9				
						6 ; =18"				
132.0 -	POORLY GRADED SAND WITH SILT,	SP-SM	31.9							
	fine to medium grained, moist, green, trace fine to medium shell fragments									
	(0-5%), HCl+.				5+7- N =1	+7 4				
					-135-10 REC	;=18"				
_										
	with fine to coarse shell fragments					+8				
	(10-25%).					4				
						, = 10				
-										
-						+9				
_						; =18"				
			46.0							
147.0 -	SILTY SAND, fine to medium grained,	SM	-40.9							
	fragments (0-10%).					. 0				
						5				
150.0 —	BOTTOM OF BORING @ 150.0 FT.		-49.9			, =18"				
8	-									
5										
7100										
1			1							

Schnabel Engineering				alvert Cliffs Nuclear Power Plant alvert County, Maryland						Boring Number: Contract Number: 061200 Sheet: 1 of 4			B-310
_ .								Gr	oundwat	ter Obs	ervations		
Boring	Contractor: CONNELLY AND EREDERICK MA	ASSOCIATE: RYLAND	S, INC.					П	ate	Time	Depth	Casing	Caved
Boring	Foreman: D. Bender			E	nco	untere	d	6	/15		48.5'		
Drilling	Method: Mud Rotary		-										
Drilling	Equipment: CME-550												
Schnab	el Representative: K. Bell												
Dates	Started: 6/15/06 Finished:	6/15/06											
Locatio	n: Northing: 217081.4 ft Easting: 960616.6 ft		-										
Ground	Surface Elevation: 91.6 (feet)			1									
DEPTH (FT)	STRATA DESCRIP	ΓΙΟΝ	CLAS	SS. EL (F	.EV. FT)	WL	DEP [.]	S. TH	AMPLIN DA	G TA	TEST	S I	REMARKS
0.5	ROOTMAT AND TOPSOIL.			9	1.1								
	 POORLY GRADED SAND V fine to medium grained, moi 	VITH CLAY, st,	SP-S	SC				M	1+1+1 N =2 REC =6	;"			
2.0	orangeish brown, trace grav	el.	SC	; 89	9.6								
	CLAYEY SAND, fine to med	ium own_trace						HM	3+4+4 N =8				
	root fragments, trace gravel, cementation.	moderate							REC =1	8"			
-	yellowish brown						- 5 -	M	4+3+5 N =8				
	-							ТΔ	REC =1	6"			
7.0	POORLY GRADED SAND V	VITH CLAY,	SP-S	SC 84	4.6								
	fine to coarse grained, moist	, yellowish						HM	4+6+6 N =12				
							L.	\square	REC =1	5"			
												eta	rt of mud
10.0 -	SILTY SAND, fine to mediur	n grained,	SM	1 ⁸	1.6		-10-					rota	ary drilling
	moist, yellowish brown and o	orangeish						HM	3+6+6 N =12				
							Ļ.	\square	REC =5	;"			
13.0	SANDY LEAN CLAY, wet, y	ellowish	CL	. 78	8.6								
	brown and gray.							HM	1+1+2				
							15	Μ	REC =1	8"			
	-												
8	_						Ļ.						
5													
	1						- ·						
5	-							HM	2+2+2 N =4				
-	4						-20-	ЦШ	REC =1	8"			
												col	or change in
	1						F -	1				ora	ingeish
	-							$\left \right $				bro	own to gray
	4						Ļ.						
2									2+2+3				
	1						F -	1	N =5				
ā –		ae					-25-	Ľ	REC =1	8"			

Γ	6	TEST Pro	ject: Ca	alvert Cliff	s Nucle	ar Pow	er Plant	Boring Number:	B-310	
	Schnal	bel Engineering LOG	Ca	alvert Cou	nty, Ma	ryland		Contract Number: 06120048 Sheet: 2 of 4		
I	DEPTH (FT)	STRATA DESCRIPTION		CLASS.	ELEV. (FT)	WL		NG TESTS	REMARKS	
┢				CL						
	_									
	_									
	_									
	-						N =9	=18"		
	320 -				59.6					
	52.0	ELASTIC SILT, moist, gray, trace	sand.	MH	00.0					
	_									
							-35- REC =	=17"		
	-									
	37.0 -	CLAYEY SAND. fine to medium		SC	54.6					
	-	grained, moist, gray.							Harder drilling	
	_						4+5+7 N =12			
							-40-10 REC =	=18		
	_									
	-									
	_	strong cementation					[_] <mark>∏</mark> 11+21 [;]	+50/5"		
		-					N =71/ REC =	/11" =16"		
	_								Harder drilling	
3/6/08	47.0 -		d	SM	44.6					
GDT	_	wet, gray, trace fine to medium she fragments, 2-5%. HCl reaction we	ell ek.	Sivi		∇				
INABEL	_		-			<u> </u>	⊠ 50/5" N =50/	/5"		
J SCF							50	=5"		
400.GF	-									
F 300 &	-									
OG SP	-						⊢			
048 PL	-						N =50/ REC =	/4" =4"		
06120										
G LOG	_								Rig chatter	
BORIN	-	<i>"</i>							The oraller	
TEST		continued on next page								

	6	hnabol T	EST Project: 0	Calvert Cliff	s Nucle	ar Pow	er Plant	В	oring Number:	B-310	
	Schnat	BC	ORING (Calvert Cou	inty, Ma	ryland		C	Contract Number: 06120048		
	соти	bei Eligineering									
	(FT)	STRATA DE	SCRIPTION	CLASS.	ELEV.	WL	ЛЕРТИ		TESTS	REMARKS	
				SM				DATA	•		
	_	gray and white, with f	ine to coarse shell				M	10+13+9 N =22			
	_		Tiel reaction strong				0[]	REC =18"	•		
	_						F 1				
-	62.0 -	CLAYEY SILT, moist	, greenish gray.	ML	29.6						
	_	,								Harder drilling	
	_						L JM	4+50			
								N =50 RFC =12"			
	_						65			Rig chatter	
	-										
	_										
	_										
		No recovery						50/2"			
	-	No recovery.						N =50/2"		Harder	
	_						70	REC =0"		drilling/rig	
	_									chatter	
.	720 -				19.6						
	/ 2.0	CLAYEY SAND, fine	to medium	SC	10.0						
	-	contains fine to coars	e shell fragments,								
	-	20-30%, HCI reaction	n moderate.				F -IM	5+7+10 N =17			
	_							REC =18"	•		
	-										
	-										
	_							REC =15"	•		
80/0											
3/											
וי	-						- 1				
NAB	-										
E S S	_										
i cirj	_	trace fine to medium	shell fragments,				L JM	5+6+8			
& 400		2-5%, HCI reaction	weak.					N =14 REC =18"			
2002	-										
	-										
	-						\vdash \downarrow				
10481											
1012(4+4+8			
500	-						f 1 X	N =12	.		
L DNG	-						<u>−</u> 90– ∐	REC =18"			
NCK NCK	-						\vdash \downarrow				
E		continued of	next page								

6	TEST Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	Boring Number:	B-310	
Schnal	bel Engineering LOG	alvert Cou	inty, ivia	ryiand		Contract Number: 06120048 Sheet: 4 of 4		
DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL	SAMPLII DEPTH D/	NG TESTS	REMARKS	
-	white and gray, with fine to coarse shell	SC			 ⊠ 50/5"	/5"	Rig chatter	
	cementation, HCI reaction strong.					5 4"	Rig chatter	
- - 100.0 —	contains fine to medium shell fragments, 10-20%, HCI reaction moderate. BOTTOM OF BORING @ 100.0 FT.		8.4		 27+27 N =53 REC =	+26 :18"		

Schnal	bel Engineering	alvert Claivert Cl	ert Cliffs Nuclear Power Plant ert County, Maryland					Boring Number: B-31 Contract Number: 06120048 Sheet: 1 of 5			B-311
Boring	Contractor: CONNELLY AND ASSOCIATES	. INC.				Gr	oundw	ater Obs	ervations		
	FREDERICK, MARYLAND	_				D	ate	Time	Depth	Casing	Caved
Boring F	oreman: D. Bender		Enco	untere	d	5	/15		23.5'		
Drilling I	Method: Mud Rotary		Start	ofda	v	5	/16		10.0'		
Drilling E	Equipment: CME-550X (ATV)	_	otart		,		, 10		10.0		
Schnabe	el Representative: K. Bell										
Dates	Started: 5/15/06 Finished: 5/16/06										
Location	n: Northing: 217268.61 ft Easting: 960771.76 ft										
Ground	Surface Elevation: 58.4 (feet)										
DEPTH (FT)	STRATA DESCRIPTION	CLAS	S. ELEV. (FT)	WL	DEP	S. TH	AMPLI D	ING ATA	TEST	s	REMARKS
0.8	ROOTMAT AND TOPSOIL.		57.6								
-	POORLY GRADED SAND WITH SILT, fine to medium grained, moist, yellowish brown, trace root fragments.	SP-SN	и 07.0		-		1+1+2 N =2 REC :	1 =14"			
_	yellowish brown and brown, with wood				L	-M	4+3+2	2			
	fragments.					Ŵ	N =5 REC :	=8"			
					Γ	1					
					- 5 -	M	1+3+5	5			
-					F	HŴ	N =8 REC :	=0"			
7.0 -		011	51.4		F						
_	brown and gray, trace root fragments.	CH			L		2+4+5	5			
						IX	N =9 REC :	=12"			
-					F		NLO -	-12			
					-10-	-					
-					F	-M	1+3+5	5			
120 -			46.4		L	\square	REC :	=17"			
12.0	SILTY SAND, fine to medium grained,	SM	40.4								
2 -					F						
-					F	HM	6+9+1 N =19	10)			
					-15-	ЦШ	REC :	=20"			
					L						
					F	1					
-					F	-					
	gray and greenish gray.				_	-M	4+5+9	Ð			
-						\mathbb{N}	N =14 REC :	• =20"			
					F	1				Ha	arder drilling
22.0 -	POORLY GRADED SAND WITH SILT	SP-SM	36.4		F	-					
- 1	fine to medium grained, wet, gray and		.		F						
_	greenisi gray.			⊻	L		10+15	5+17			
							N =32	2 =15"			
	continued on next page				-25-		110.	15			

Γ	6	hpabol TEST	TEST Project: Calvert Cliffs Nuclear Power Plant						Boring Number: B-311		
	Schna	bel Engineering LOG	С	alvert Cou	inty, Ma	ryland		Contra Sheet:	ct Number: 00 2 of 5	6120048	
C		STRATA DESCRIPT	ION	CLASS.	ELEV.	WL	SAI	MPLING	TESTS	REMARKS	
┢	(11)			SP-SM	(11)		DEPTH	DATA			
	-										
	-										
	_										
	-	trace fine to medium shell frag HCl reaction weak.	gments,					23+17+15 N =32			
							-30-14	KEC = 14			
	-										
	32.0 -	SILTY SAND, fine to medium wet, gray and white, with fine	grained, to coarse	SM	26.4						
	_	shell fragments, HCI reaction	strong.				[] <u>[</u>]	1+11+18			
							Å F	N =29 REC =12"			
	_										
	37.0 -	SANDY I FAN CLAY moist o	reenish	CI	21.4						
	-	gray, trace fine to coarse she fragments, HCI reaction mode	erate.								
	-						2 N	28+22+50/3" N =72/9"			
							-40- ²³ F	REC =21"			
	-										
	42.0 -	CLAYEY SAND, fine to coars wet, oliveish gray and gray, tr	e grained, ace fine to	SC	16.4						
	_	coarse shell fragments, HCl re moderate, weak cementation.	eaction					1+19+17			
							45Ŭ F	N =36 REC =17"		Harder drilling	
	_										
3/6/08	47.0 -	SILTY SAND find to modium	grainod	SM	11.4						
GDT	-	wet, greenish gray and white, to coarse shell fragments. HC	trace fine	5101							
INABEL	-	weak.					4	I+4+6 N =10			
oJ SCF							-50-K	REC =14"			
400.GI	-										
T 300 &	-										
OG SP	-							+4+5			
048 PL	_							N =9 REC =14"			
06120	-										
IG LOG	-										
BORIN	-	continued as seed as	.								
TEST		continued on next pag	e								

	6	TEST	Project: Ca	alvert Cliff	s Nucle	ar Pow	er Plant		Boring	Number:	B-311
	Schnat	BORING	C	alvert Cou	nty, Ma	ryland			Contract Number: 06120048		
E	Бертц						s		G	5015	
	(FT)	STRATA DESCRIPT	ION	CLASS.	(FT)	WL	DEPTH		ТА	TESTS	REMARKS
				SM							
	-	greenish gray.					HX	2+3+5 N =8			
							-60- L	REC =1	7"		
	_										
								4+4+7			
	-						F - 1 X	N =11	.		
	_						-65	REC =1	8"		
	-										
	67.0			60	-8.6						
	_	grained, wet, light gray and w	hite, with	50							
		fine to coarse shell fragments reaction strong.	s, HCl					50/3"			
								N =50/3			
							70				
	-										
	72.0	SILTY SAND, fine to medium	grained,	SM	-13.6						
	_	wet, greenish gray, trace fine shell fragments. HCI reaction	to coarse								
	_	onen nugmente, ner redetten	moderate.				0	18+17+2	23		
								REC =1	7"		
	-										
	-										
	-	HCI reaction weak.					\	8+12+18 N =27	5		
3/6/08	_						— ₈₀ —[]	REC =1	8"		
GDT	_										
ABEL.	_										
CHN											
S L L S		aroonish arov and white HCI	reaction					0+8+10			
400.0	-	moderate.	Teaction					N =18	0"		
300 &	_						-85	REC =1	8		
SPT	-										
PLOG	87.0		aray and	мц	-28.6						
0048	-	greenish gray.	gray and								
0612							L JM	6+7+10			
LOG								N =17 REC =1	8"		
RING	-						-90				
ST BC	-	continued on next pag	e								
μĹ											

Γ		TEST	Project: C	Calvert Cliffs Nuclear Power Plant					Boring Number: B-311		
	Schna	bel Engineering LOG	C C	alvert Cou	nty, Ma	aryland		Cont	Contract Number: 06120048 Sheet: 4 of 5		
	DEPTH (FT)	STRATA DESCRIPT	ΓΙΟΝ	CLASS.	ELEV. (FT)	WL	SA	AMPLING	TESTS	REMARKS	
┢	. ,			MH			DEPTH	DATA			
		-									
		(5%), HCl reaction weak.	igments				X	6+8+12 N =20			
	_	-					-95-0	REC =18"			
		-									
	·										
		greenish gray						7+14+12		Resumed drilling 5/16/06	
								N =26 REC =18"		@ 7:15am	
		-									
	102.0			014	-43.6						
		wet, greenish gray and white	, and fine	SM							
		HCl reaction stronng.	, 40,00),					11+12+31 N =43			
	-	-					-105-0	REC =20"			
		-									
	107.0	LEAN CLAY with sand, wet,	greenish	CL	-48.6						
		shell fragments (2-5%), HCl	reaction					7+7+10			
								N =17 REC =19"			
]									
		_									
/6/08		-									
GDT 3		trace fine to medium shell fra	igment				M	5+7+10 N -17			
NABEL	_	-					<u>-115-</u>	REC =19"			
J SCH		-									
400.GP		-									
- 300 &		-									
DG SP1		1									
048 PL(_						-120-				
06120(]									
3 LOG											
BORIN		trace fine to medium shell fra	igments					5+7+9			
TEST		continued on next pag	ge								

	TEST Project: C	alvert Cliff	fs Nucle	ar Pow	er Plant	Boring Number:	B-311	
Schnat	BORING C	alvert Cou	unty, Ma	iryland		Contract Number: 06120048 Sheet: 5 of 5		
DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL		NG TESTS	REMARKS	
	(2-5%), HCI reaction weak.	CL			N N =16 REC =	18"		
-	greenish gray.					20"	Softer drilling	
132.0 - - - - -	FAT CLAY with sand, moist, greenish gray and gray.	СН	73.6		 	2 21"		
-	trace fine to medium shell fragments (<5%), HCl reaction weak.				 - - 140- - - - - - - - - - - - - - - - - - -	2 19"		
	trace fine to medium shell fragments (5%).					1 20"		
150.0 —	trace fine to medium shell fragments (<5%). BOTTOM OF BORING @ 150.0 FT.		91.6		 	13 20"		

Schna	bel Engineering LOG	alvert Cli alvert Co	iffs Nucle ounty, Ma	ar Pow ryland	ver Plai	nt	Boring Contra Sheet:	Number: Not Number 1 of 4	er: 0612	B-312
Boring	Contractor: CONNELLY AND ASSOCIATES					Gr	oundwater Obs	ervations		
	FREDERICK, MARYLAND	,,				D	ate Time	Depth	Casin	g Caved
Boring F	Foreman: D. Bender		Enco	untere	d	5	/18	23.5'		
Drilling										
Drining										
Schnabe	Presentative: K. Bell	-								
Dates	Started: 5/18/06 Finished: 5/18/06									
Location	Easting: 960740 ft									
Ground	Surface Elevation: 55.3 (feet)									
DEPTH (FT)	STRATA DESCRIPTION	CLASS	ELEV. (FT)	WL	DEP	S. TH	AMPLING DATA	TEST	s	REMARKS
0.5	ROOTMAT AND TOPSOIL.		54.8				web 1 1 0			
20-	POORLY GRADED SAND WITH SILT, fine to medium grained, moist, yellowish brown trace root fragments	SP-SM	53.3			M	won+1+2 N =3 REC =15"			
2.0	FAT CLAY moist vellowish brown and	CH	00.0				2+3+4			
-	orangeish brown, trace sand and root				- ·	TIXI	N =7			
-	tragments.						REC =11"			
_	-				- 5 -					
						IM	3+4+5 N =9			
-					- ·	Π	REC =0"			
-	_				- ·					
-	orangeish brown and gray, trace wood					-M	2+3+3			
_	nagments.				L.	\square	REC =13"			
					-10-				tof	
-							REC =21"	PP=>4.0	o isi	
12.0 -			43.3		Ļ .	_			C tu	Color change in ub from vellow
	gray.	МН			L .				b	prown to gray
							21419			
-	-					HXI	N =12			
-	-				-15-	-141	REC =18"			
_					L .					
47.0										
17.0 -	SILTY SAND, fine to medium grained,	SM	38.3		F .	1			C	Color change in
-	moist, dark gray and black, organic odor, weakly cemented with no HCl				- ·				b	prown
-	reaction.				Ļ .		38+50/5"			
_							REC =10"			
					20-					
-	-				F .	1				
22.0 -	POORLY GRADED SAND WITH SILT	SP-SM	33.3		- ·	-				
-	fine to coarse grained, wet, light gray,		'	<u> </u>	Ļ .					
	(2-5%), HCI reaction weak.			¥	L		50			
					[.		REC =10"			
	continued on next page				-25-					

ſ		TEST Pro	ject: Calvert Cliff	s Nucle	ar Pow	er Plant	Boring Number:	B-312	
	Schna	bel Engineering LOG	Calvert Cou	nty, Ma	iryland		Contract Number: 06120048 Sheet: 2 of 4		
	DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL			REMARKS	
-		trace fine to medium shell fragmen (5-10%), HCl reaction weak.	SP-SM			 ⊠ 50/5" N =50/ REC =	/5" -5"		
	32.0	ELASTIC SILT with sand, wet, gra trace organic matter and fine to m shell fragments (2-5%), HCI reacti weak.	ay, MH edium ion	23.3		 	15"		
	-			10.0		 ■ REC = 40 	0"	Rig chatter Rig chatter	
5/08	42.0	SILTY SAND, fine to coarse grain wet, greenish gray and gray, trace to coarse shell fragments (15-20% HCl reaction moderate.	ed, SM e fine 6),	13.3		4+6+12 	2 18"		
0 & 400.GPJ SCHNABEL.GDT 3/	_	greenish gray and white.				6+8+14 N = 22 REC = 	4 17"		
.OG 06120048 PLOG SPT 30	_	greenish gray, trace fine to coarse fragments (10-15%).	e shell				17"		
TEST BORING L	57.0	CLAYEY SAND, fine to medium grained, wet, greenish gray, trace continued on next page	fine to SC	-1.7					

	hnabel POPING	Project: Ca	alvert Cliff	s Nucle	ar Pow	er Plant	E	Boring Number:	B-312
Schnal	bel Engineering LOG	Ca	alvert Cou	nty, Ma	ryland		S	Contract Number: (Sheet: 3 of 4	6120048
DEPTH (FT)	STRATA DESCRIPTIC	ON	CLASS.	ELEV. (FT)	WL	S/ DEPTH	AMPLING DAT	TESTS	REMARKS
-	medium shell fragments (2-5%) reaction weak.), HCI	SC				3+4+5 N =9 REC =15	n	
62.0 -	SANDY FAT CLAY, wet, green trace fine to coarse shell fragm (30-40%), HCI reaction strong.	ish gray, ents	CH	-6.7		 65 -	5+7+11 N =18 REC =18	"	
67.0 -	SILTY SAND, fine to coarse gra wet, gray and white, with ceme sand, HCI reaction strong.	ained, nted	SM	-11.7		 M	47+10+7		Rig chatter
69.5	CLAYEY SAND, fine to coarse wet, greenish gray and white, tr to coarse shell fragments (30-4 HCI reaction strong.	grained, race fine 0%),	SC	-14.2		70Å	N =17 REC =16		
-	fine to medium grained, greenis and light gray, trace fine to med shell fragments (5-15%), HCl r moderate.	sh gray dium reaction					17+26+29 N =55 REC =18	9	
- 0.77	SANDY ELASTIC SILT, wet, gr gray, trace fine to coarse shell fragments (10-20%), HCI react moderate.	reenish tion	MH	-21.7		 	4+6+11 N =17 REC =17	n	
	greenish gray and white, trace medium shell fragments (5-10% reaction weak.	fine to 6), HCl				 85 	7+8+13 N =21 REC =18		
	with sand, trace fine to medium fragments (2-5%).	n shell				 <u></u>	7+9+12 N =21 REC =20	n	
	continued on next page								

	bachal	TEST	Project:	Calvert Cliff	s Nucle	ar Pow	er Plant		Boring	Number:	B-312
Sahas		BORING		Calvert Cou	nty, Ma	ryland			Contrac	ct Number: 00	6120048
Schha	bei Engineering	200							Sneet:	4 01 4	
(FT)	STRAT	TA DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	ПЕРТИ			TESTS	REMARKS
				MH							
								5+9+3			
							05	N =12 REC =2	20"		
-							-95				
-	_										
								REC =1	12"	PP=>4.5 tsf	
							-100-				
100.5			0 5 FT		-45.2						
			0.011.								
3											
5											
5											
8											
5											
8											
í											

Schna	TEST Project: Caracteristic bel Engineering LOG Caracteristic	alvert Cli alvert Co	ffs Nucle ounty, Ma	ar Pov aryland	ver Pla	int		Boring Contra Sheet:	Number: Act Number: 1 of 5	er: 06120	B-313
Deriver						Gr	ound	vater Obs	ervations		
Boring	MALAGA NEW JERSEY						ate	Time	Depth	Casing	Caved
Boring F	Foreman: J. Blemings		Enco	untere	d	5	/19		8.7'		
Drilling	Method: Mud Rotary		Start	t of da	у	5	/22		20.0'		
Schnabe	el Representative: K. Megginson		Start	t of da	у	5	/23		0.0'		
Dates	Started: 5/19/06 Finished: 5/22/06		Watar	Doodi	20	7	707		20.21		
Location	n: Northing: 217372.34 ft Easting: 960713.67 ft		Water	Reau	iig	,	721		20.0		
Ground	Surface Elevation: 50.7 (feet)			1	1						
DEPTH (FT)	STRATA DESCRIPTION	CLASS	ELEV. (FT)	WL	DEP	S TH	AMPL	ING DATA	TEST	s i	REMARKS
0.5	Forest litter, rootmat and topsoil.		50.2			M	WOF	l+1+1	w=9.9	%	
-	SILTY SAND, fine to coarse grained, moist, brown, contains root fragments.	SM			-	-M	N =2 REC	=13"			
2.0 -	Sandy SILTY CLAY, fine to medium	CL-ML	48.7		F				w-11 9	20/	
-	grained, moist, light brown, trace organic matter, contains root fragments.				F	HM	WO⊢ N =3	1+2+1	LL=19	9	
-					F	ЦШ	REC	=10"	PL=14	4	
4.5	FAT CLAY, moist, light orangeish brown	СН	46.2		_ 5 -				07.0		
	and light brown, trace fine to medium					M	2+4+ N =8	4	W=27.6 LL=67	5% 7	
-					F	ΠD	REC	=18"	PL=2	1	
7.5	-		42.2		F	-					
- 7.5	Sandy LEAN CLAY, light gray and	CL	43.2		-	-M	3+4+	6	w=15.1 LL=30	%)	
8.7	sand.	SM	42.0	$ \Sigma$	L	\square	REC	=13"	PL=1	7	
9.5	SILTY SAND, fine to medium grained, wet, grayish brown and brown.	ML	- 41.2		-10-	_					
-	SANDY SILT, fine to medium, wet, light				F	$-\square$	2+3+	3	w=279	% *SI	iaht drill ria
_	grayish brown and orangeish brown.				L	\square	REC	=17"		cha 11	atter from
										''.	5 10 15.5 11.
-					F			•	w=31.5	5%	
-	orangeish brown, trace mica.				F	HXI	N =4	2	*	,,,,	
	-				-15-	40	REC	=16"			
_	-				L	4					
47.0			00 7								
17.0 -	POORLY GRADED SAND, fine to	SP-SM	- 33.1 		Γ	1					
-	silt.				F	1_					
-	4				\vdash	-	4+11	+15	w=23.1	%	
					20-	\square	REC	=16"			
					20						
-	1				F	1					
22.0 -	SILTY SAND, fine to medium grained	SM	28.7		F	-					
-	wet, dark orangeish brown.				F	-					
_					L		16+1	7+10	w=21.1	%	
						X	N =2	7 =15"	LL=NI PL=N	P	
	continued on next page				-25-			-15			

	hnabel TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	I	Boring Number:	B-313
Schnal	bel Engineering LOG		alvert Cou	nty, Ma	iryland			Contract Number: 0 Sheet: 2 of 5	6120048
DEPTH (FT)	STRATA DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	S DEPTH		G TESTS	REMARKS
-	arou mostly find to opprove d		SM				11+14+1	* w=18.2%	
	gray, mostly line to coarse sr fragments (±60%), strong HC contains black particles (<1/1 SANDY LEAN CLAY, moist.	arav. with	CL	18.7		 30	N =28 REC =16	LL=NP D" PL=NP	
- 33.9 _ 	fine to medium sand, weak H reaction. SILTY SAND, fine to medium moist, gray, mostly strongly o sand (±95%), moderate HCI	n grained, emented reaction.	SM	16.8		 ⊠ 35	50 REC =6"	w=28.1% LL=38 PL=21 *	*Switched to 3-7/8" Tri-cone roller bit below 33.5 ft. *Very to extremely difficult rotary
	wet, oliveish gray, little fine to shell fragments (±30%), cont cemented sand pockets, stro reaction.	o coarse ains ng HCl		0.7		 40	24+50/4" N =50/4" REC =10	w=17.1%	advancement from 34 to 35.5 ft (strong rig chatter). *Moderate difficulty with rotary advancement from 35.5 to 37.5 ft.
41.0 -	SANDY SILT, fine to medium wet, gray, few fine to coarse fragments (±10%), contains s pockets, weak HCl reaction.	n grained, shell silty sand	ML	9.7		 45-	4+5+6 N =11 REC =18	w=29.3% LL=34 PL=27 *	*Very difficult rotary advancement from 37.5 to 38 ft (moderate to strong rig chatter). *Moderate to difficult rotary advancement from 40.5 to 41 ft (moderate rig
	SILTY SAND, fine to medium wet, greenish gray and gray, coarse shell fragments (±10% moderate HCI reaction.	n grained, few fine to 6),	SM	3.7		 50 -	6+7+8 N =15 REC =18	w=27.9% *	chatter).
52.0 -	SILTY SAND, fine to medium wet, greenish gray and gray, reaction, contains black parti inch). trace fine to medium shell fra (±5%) below 54.8 ft.	n grained, weak HCl cles (<1/16 gments	SM	-1.3			5+6+9 N =15 REC =18	w=31.5% LL=NP g" PL=NP *	**Resumed drilling at 8:40 AM on 5/22/06.
	continued on next pag	ge							

	hnabel TEST	Project: C	alvert Cliff	s Nucle	ar Pow	ver Plant	Bori	ng Number:	B-313
Schnat	bel Engineering LOG	i C	alvert Cou	inty, Ma	iryland		Con Shee	tract Number: 0 et: 3 of 5	6120048
DEPTH (FT)	STRATA DESCRIPT	ΓΙΟΝ	CLASS.	ELEV. (FT)	WL	SA DEPTH		TESTS	REMARKS
-	light greenish gray and gray, to coarse shell fragments (±5	trace fine 5%).	SM				3+5+9 N =14 REC =18"		
62.0 -	SANDY LEAN CLAY, fine to wet, gray and light gray, mos coarse shell fragments (±60% clayey sand pockets, strong reaction.	medium, tły fine to %), contains HCl	CL	11.3		 65	11+14+50/5" N =64/11" REC =17"	w=26.2% LL=33 PL=17 *	*Moderate to difficult rotary advancement from 65 to 67 ft (moderate to strong rig
67.0 -	SILTY SAND, fine to mediun wet, gray, little fine to mediur fragments (±20%), strong HC	n grained, n shell Cl reaction.	SM	16.3		 70 -	6+13+22 N =35 REC =18"		chatter).
72.0 -	SANDY SILT, fine to medium light greenish gray and gray, to coarse shell fragments (±5 moderate HCI reaction.	n, moist, trace fine 5%),	ML	21.3		 75	5+10+16 N =26 REC =18"	w=28.4% *	
77.0 -	CLAYEY SAND, fine to medi grained, moist, greenish gray to coarse shell fragments (±1 contains cemented shell poc strongly cemented sand laye to 77.8 ft, strong HCI reaction	um /, few fine 0%), kets and r from 77.7 1.	SC	26.3		 80 	50/4" N =50/4" REC =4"		
82.0 -	SANDY ELASTIC SILT, fine moist, greenish gray, trace m HCI reaction.	to medium, nica, weak	MH	31.3		 85	5+6+13 N =19 REC =18"	w=37.3% *	
87.0 -	ELATIC SILT, moist, light gre trace fine to medium sand, m fine to medium shell fragmer weak HCI reaction.	eenish gray, nica and nts (±1%),	MH	36.3		 	7+9+12 N =21 REC =18"	w=55% LL=98 PL=47	
_	continued on next pag	ge							

	TEST Project	: Calvert Cliff	s Nucle	ar Pow	ver Plant	Boring	y Number:	B-313
Schnal	bel Engineering LOG	Calvert Cou	inty, Ma	iryland		Contra Sheet:	act Number: 00 4 of 5	6120048
DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL	SAMPI		TESTS	REMARKS
		MH						
92.0 -	LEAN CLAY, gray, with fine to mediun sand, trace mica, weak HCl reaction, trace fine to coarse shell fragments (±<5%).	n CL	41.3		 REC 95 	:=14"	w=35.6% LL=49 PL=25 PP=>4.5 tsf *	*Shelby tube sampler push from 93.5 to 94.7 ft.
97.0 -	SANDY SILT. moist. dark grav. some	ML	-46.3					
	fine to coarse shell fragments (±40%), trace mica, weak HCl reaction.				8+13 8+13 N = 3 REC	3+18 1 5 =18"	w=32.4% LL=42 PL=28 *	
102.0 -	SANDY ELASTIC SILT. fine to mediur	m. MH	-51.3					
	moist, dark greenish gray, trace fine to medium shell fragments (±<5%), trace mica, moderate HCI reaction.				6+84 6+84 N =2 REC	-12 :0 :=18"	w=43.4% LL=70 PL=45 *	
-	trace fine to medium sand and mica, moderate HCI reaction.)+11 1	w=57.7% LL=106 PI =55	
					KEU	- = 18	*	
	with fine to medium sand, trace mica and fine to coarse shell fragments (±5%), moderate HCI reaction.)+12 2 5 =18"	w=44.3% LL=72 PL=46 *	
	weak HCl reaction.				 	-11 9 : =18"	w=43.5% LL=81 PL=42 *	*Considered pushing tube at 118.5 ft, but drilling resistance increased from 117.5 to 118.5 ft.
122.0 - -	CLAYEY SAND, dark greenish gray, trace mica, contains indurated sandy s pockets, weak HCI reaction.	silt	-71.3			=10"	w=33.1%	*Shelby tube
	continued on next page							

	hnahel		ject: Ca	lvert Cliffs	s Nucle	ar Pow	er Plant		Boring Numb	ber:	B-313
Schnal	bel Engineering	LOG	Ca	Ivert Cou	nty, Ma	ryland			Contract Nur Sheet: 5 of	nber: 0 5	6120048
DEPTH (FT)	STRATA DI	ESCRIPTION		CLASS.	ELEV. (FT)	WL	S	AMPLIN		STS	REMARKS
				SC			-125-		LL PL PP=>	.=44 .=26 >4.5 tsf *	sampler push from 123.5 to 124.3 ft.
127.0 - - - - -	ELASTIC SILT, dark trace mica, contains pockets, weak HCL	greenish gray indurated san reaction.	y, idy silt	MH	-76.3		 	7+9+12 N =21 REC =1	w= LL: 8" PL	66% =132 _=60 *	
							 -135- 	8+10+1 N =21 REC =1	1 w=6 8"	39.1% *	*Relatively slow rotary advancement below 135 ft.
- - -							 	7+8+12 N =20 REC =1	w=6 LL: 8" PL	\$2.9% =106 _=51 *	
142.0 - - - - -	Sandy FAT CLAY, n trace fine to medium weak HCl reaction.	noist, greenish ı sand, and mi	ı gray, ca,	СН	-91.3		 145	7+11+1- N =25 REC =1	4 w=4 8"	₩9.1% *	**Degumed
- - - 150.0 —	dark greenish gray, reaction. BOTTOM OF BORII	moderate HCI NG @ 150.0 F	T.		-99.3		 150-	7+12+1/ N =26 REC =1	4 w=4 LL: 8" PL	I9.4% =103 _=30 *	observation well construction for SPT borehole at 7:00 AM on 5/23/06.

Schnat	TEST Project: C bel Engineering LOG C	alvert Clif	ffs Nucle unty, Ma	ar Pov Iryland	ver Pla	nt	Boring Contra Sheet:	Number: ct Numbe 1 of 4	r: 061200	B-314
Boring C	Contractor: CONNELLY AND ASSOCIATES					Gro	oundwater Obs	ervations		
g -	FREDERICK, MARYLAND	.,				D	ate Time	Depth	Casing	Caved
Boring F	oreman: D. Bender		Enco	untere	d	5	/16	3.5'		
Drilling N	Method: Mud Rotary		Start	ofda		5	/17	10.5'		
Drilling E	Equipment: CME-550X (ATV)		Start	u ua	У	5		10.5		
Schnabe	el Representative: K. Bell									
Dates \$	Started: 5/16/06 Finished: 5/17/06									
Location	i: Northing: 217321.89 ft Easting: 960654.5 ft									
Ground	Surface Elevation: 52.8 (feet)				1					
DEPTH (FT)	STRATA DESCRIPTION	CLASS	ELEV. (FT)	WL	DEP	S. TH	AMPLING DATA	TEST	S F	REMARKS
0.4	ROOTMAT AND TOPSOIL.	SM	52.4				WOH/18"	w=9.79	%	
	SILTY SAND, fine to medium grained, moist, yellowish brown, trace silt and root fragments.				-	10	N = WOH/18" REC =6"	*		
	fine to coarse grained, wet, trace gravel.				F		2+2+5	w=14.1	%	
3.5	FAT CLAY with sand, moist, orangeish brown and gray, trace root fragments.	СН	49.3	<u> </u>	-	4	N =7 REC =15"	PL=NI *	D	
_					- 5 -	-M	1+2+3 N =5	w=35% LL=73	6	
-					_		REC =12"	PL=25	5 Sta	rted drilling
_					-	-	2+4+5 N =9 REC =19"	w=41.2 LL=59 PL=2	% 5/1) 7:30	7/06 @ Dam
							110 - 10	*	Col tub, vell	or change in
-					-	-0	5+7+9 N =16	w=26.2 LL=73	% grag 3 ft.	y below 10
_					-		REC =19"	PL=2:		
13.5	CLAYEY SAND, moist, light gray and	SC	39.3		_		REC =12"	w=25.9	%	
	gray.					-		PL=1 PP=>4.5	tsf	
17.0			35.8						Har at 1	der drilling 6.5 ft.
	SILTY SAND, fine to medium grained,	SM	55.0							
-	to medium shell fragments (5%), HCl				F			w-24.2	0/	
-	reaction weak.				F	-121	26+50/5" N =50/5"	*	/0	
-					-20-	-	REC =11"			
					L					
22.0			20.0							
	SILTY SAND, fine to medium grained, wet, light gray and white, trace fine to medium shell fragments (5-10%), HCl reaction moderate	SM	- JU.8		_		20,50/5"	w=22 6	%	
					F	12	29+50/5 N =50/5"	LL=NF		
	continued on next page				-25-	-	REC =13"	PL=NI	-	

	TEST Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	Boring Number:	B-314
Schnal	bel Engineering LOG	alvert Cou	inty, Ma	iryland		Contract Number: 0 Sheet: 2 of 4	6120048
DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL		NG TESTS	REMARKS
		SM				*	
-							
27.0 -	SILTY SAND, fine to coarse grained,	SM	25.8				
-	shell fragments (60-70%), HCl reaction					+17 w=20.3%	
-					N =27	* 15"	
_							
			20.0				
32.0 -	Sandy LEAN CLAY with sand, moist, greenish gray.	CL	20.0				
_					3+4+6	w=25.4%	
_					N =10 REC =	:20" LL=42 PL=22	
_							
37.0 -		014	15.8				Rig chatter at 36.5 ft.
	wet, gray and greenish gray, trace fine	SM					
-	reaction strong, (50-60% medium to coarse grained shell fragments from				5+5+5	0/3" w=26.8% /o" LL=NP	
_	39.9-40.0 ft).				-40-10 REC =	19" PL=NP	
-							
-						04.00%	
-						w=31.9%	
					-45-12 REC =	:16"	
- 8							
- 3/6/							
EL.GD					⊢ – ∏ 5+9+7	w=25.4%	
- CHNAE					N =16	:18"	
			0.8				
02.0 J	SILTY SAND, fine to medium grained, wet, gray and greenish gray, trace fine	SM	0.0				
LOG S	to medium shell fragments (2-5%), HCl reaction weak.				4+4+6	w=32.8%	
0048 F						18" PL=NP	
0612							
ŏ 1957.0 –	POORLY GRADED SAND trace silt	QD	-4.2				
BORIT	fine to medium grained, wet, gray and	35					
TEST	continued on next page						

	TEST Project:	Calvert Cliff	s Nucle	ar Pow	er Plant	Boring Number:	B-314
Schnat	bel Engineering LOG	Calvert Cou	inty, Ma	aryland		Contract Number: Sheet: 3 of 4	06120048
DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL	SAMPL	ING DATA	REMARKS
-	greenish gray, trace fine to medium shell fragments (2-5%), HCl reaction weak.	SP				6 w=33% 0 LL=NP =16" PL=NP *	
62.0 -	SANDY FAT CLAY with sand, wet, greenish gray and white, trace fine to coarse shell fragments (35-45%), HCI reaction strong.	СН	9.2		 N =1: N =1: REC	8 w=40.3% 3 LL=59 =18" PL=24	
67.0 - - - -	SANDY SILT, fine to coarse grained, wet, greenish gray and white, trace fine to medium shell fragments (10-15%), HCI reaction moderate.	ML	14.2		 	+17 w=19.5% 8 LL=NP =18" PL=NP *	Rig chatter at 67.5 ft.
-	fine to medium grained, gray and greenish gray, trace fine to medium shell fragments (2-5%), HCI reaction weak.				8+13 8+13 N = 29 REC	+16 w=27.9% 9 LL=NP =15" PL=NP *	
ABEL.GDT 3/6/08	greenish gray and white, trace fine to medium shell fragments (20-30%), HCl reaction moderate.					0/5" w=36.5% 0/5" LL=NP =16" PL=NP *	
3 SPT 300 & 400.GPJ SCHNA	SANDY ELASTIC SILT, trace fine to medium shell fragments (15-20%), HCl reaction moderate.	MH	30.7		 5+7+ N =18 - 85- 	11 w=41.2% 8 LL=57 =18" PL=36 *	
ING LOG 06120048 PLOC	SANDY FAT CLAY, wet, greenish gray and, trace fine to medium shell fragments (<5%), HCI reaction weak, (strongly cemented lense at 89.6 ft exhibits strong HCI reaction).	СН	-34.2		 N =2! REC	+15 w=34.3% 5 LL=68 =18" PL=20 *	
- ITEST BOF	continued on next page						

	test	Project:	Calvert Cliff	s Nucle	ar Pow	er Plant	_	Boring Number:	B-314
Schnal	bel Engineering LOG	IG (Calvert Cou	inty, Ma	ryland			Contract Number: 0 Sheet: 4 of 4	06120048
DEPTH (FT)	STRATA DESCRI	PTION	CLASS.	ELEV. (FT)	WL	S		G TESTS	REMARKS
			СН						
92.0 -	SILTY SAND, fine to medi wet, greenish gray, trace f shell fragments (5-10%), moderate.	um grained, ine to medium HCI reaction	SM	39.2		 95	7+12+1 N =27 REC =1	5 w=36.4% *	
-									
- 100.0	greenish gray and white, t medium shell fragments (2 organic matter, HCI reactio	race fine to 20-30%), trace on strong.		-47.2		 	7+9+14 N =23 REC =1	w=31% *	
	Dorrow of Dorrivo @	100.011.							

Schnal	bel Engineering	Project: C	Project: Calvert Cliffs Nuclear Po Calvert County, Maryland				nt	Boring Contra Sheet	Boring Number: B Contract Number: 06120048 Sheet: 1 of 4		
Borina C	Contractor: CONNELLY AND	ASSOCIATES	6. INC				Grour	ndwater Obs	servations		
	FREDERICK, MA	RYLAND					Date	Time	Depth	Casing	Caveo
Boring F	oreman: D. Bender			Enco	untere	d	5/22		14.0'		
orilling I	Method: Mud Rotary										
Drilling E	Equipment: CME-550X (ATV)										
chnabe	el Representative: K. Bell										
Dates	Started: 5/19/06 Finished:	5/22/06									
ocation	n: Northing: 217184.68 ft Easting: 960559.43 ft										
iround	Surface Elevation: 65.5 (feet)					1					
DEPTH	STRATA DESCRIP	TION	CLASS	ELEV.	WL		SAM	PLING	TEST	s	REMARKS
(, , ,				(, , ,		DEP	TH	DATA			
0.8 _			CD CM	64.7				4 . 4			
	fine to coarse grained, mois	t, yellowish	5P-5N	1				=2			
_	brown and orangeish brown	, trace root				-		EC =12"			
-	trace gravel.					-	- 3+	4+4 =8			
_						L .		EC =17"			
						5					
							4+	6+8			
-								=14 EC =17"			
_						- ·	+				
_							6+	6+7	w=5.6	%	
								=13 =C =14"			
-						-					
10.0 —	SILTY SAND, fine to coarse	grained,	SM	55.5		-10-	1_				
_	moist, yellowish brown and o	orangeish				- ·	- 8+	8+9 -17			
_	biown, trace graver.							EC =16"			
										Pa	sumed
-						-			w-28.3	dri	lling on
_	fine to medium grained, wet	, gray.			¥	-	- \ 4+ N	7+6 =13	w-20.3	2 ⁷⁰ 5/2 8:3	22/06 at 30am.
						-15-	RE	EC =15"			
17.0 -	CLAYEY SAND, moist, gray	, trace	SC	48.5		F .	1				
-	sand.					-	+				
_						L .	4+	7+8	w=28.3	8%	
								=15 EC =18"			
_						20-		-			
-						-	+				
-						- ·	+				
_						L.					
								-C =14"	w=23.3	8%	
-	•								LL=4 PL=1	1	
	continued on next pa	ae		-		-25-	┤■┛│			•	
		J *									

	6	hnabal	TEST Project:	Calvert Cliff	s Nucle	ar Pow	er Plant	E	Boring Number: B-3*		
	Schnal	bel Engineering	DRING LOG	Calvert Cou	nty, Ma	aryland			Contract Number: 06120048 Sheet: 2 of 4		
C	DEPTH (FT)	STRATA DE	SCRIPTION	CLASS.	ELEV. (FT)	WL	S DEPTH		TESTS	REMARKS	
	<u>25.0</u> - - - - - -	SILTY SAND, fine to wet, gray and white, shell fragments (30-4 moderate.	medium grained, trace fine to coarse 40%), HCI reaction	SM	40.5		 	26+21+2: N =43 REC =18	PP=>4.5 tsf * 2 w=27.6%		
	-						 - 35 	38+44+4: N =86 REC =14	2		
	- - 42.0 -	fine to coarse grained white, with fine to coa fragments (60-70%), strong.	d, light gray and arse shell HCI reaction		23.5		 40	14+16+10 N =32 REC =14	6 w=22.2% LL=NP PL=NP *		
JI 3/6/08	-	SILTY SAND, fine to moist, greenish gray organic matter.	medium grained, and gray, trace	SM			 45 	3+4+4 N =8 REC =18	,"	Rig chatter at 46.5 ft.	
P1 300 & 400.GPJ SCHNABEL.GL	-	strong cementation, I strong.	HCI reaction				⊢ - ⊠ 50 	50 REC =6"			
DRING LOG 06120048 PLOG S	53.5 - -	SANDY SILT, light gr fine to coarse shell fr HCI reaction modera	ray and white, trace agments (10-20%) te.	e ML	12.0		 55	5+7+8 N =15 REC =17	w=25.6% LL=NP PL=NP *		
TESI B(continued or	n next page								

		Project: Calvert (Cliffs Nucle	ar Pow	ver Plant	Boring Number:	B-315
Schn	abel Engineering LOG			iryianu		Contract Number: 0 Sheet: 3 of 4	06120048
DEPTH (FT)	STRATA DESCRIPT		SS. ELEV. (FT)	WL	SAMPL	ING TESTS	REMARKS
	trace fine to coarse shell frag (35-45%), HCI reaction stron	ments ig .	-			8 5 =16"	Rig chatter at 61 ft.
63.5	 POORLY GRADED SAND W greenish gray, trace fine to m shell fragments (5-10%), HC weak. 	/ITH SILT, SP-S ledium I reaction	3M 2.0		 	9 w=29.4% 4 LL=NP =15" PL=NP *	
					4+4+1 	6) =18"	
73.5	SANDY FAT CLAY, trace fine medium shell fragments (20-3 reaction moderate, green.	e to CH 30%), HCI	-8.0		4+5+ 4+5+ N =1 ² REC	6 w=36.3% 1 LL=58 =20" PL=18	
77.0 3/0/08	SILTY SAND, fine to coarse g wet, light gray and white, trac coarse shell fragments (20-30 HCI reaction, cemented layer 79.9 ft.	grained, SM se fine to 0%), strong from 79' to	-11.5		 	1+9) =18"	
0G SP1 300 & 400.GPJ SCHNA	 fine to medium grained, green trace fine to medium shell fra (2-5%), HCl reaction weak. 	nish gray, gments	04.5		 	+10 w=29.6%) LL=NP =19" PL=NP *	
0.78 06120048 PL	SANDY ELASTIC SILT, wet, gray and white, trace fine to r shell fragments (20-30%), He moderate.	greenish MH nedium Cl reaction			 	13) =18"	
IESI BC	continued on next pag	ge					

	Schnabel TEST BORING Project:				s Nucle	ar Pow	er Plant		Boring	Boring Number: B-315			
Schnal	bel Engineering	LOG		alvert Cou	nty, Ma	ryland			Contr Sheet	Contract Number: 06120048 Sheet: 4 of 4			
DEPTH (FT)	STRAT	A DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	DEPTH	SAM	PLING DATA	TESTS	REMARKS		
				MH									
92.0 -	SILTY SAND, fir wet, greenish gr shell fragments weak.	ne to medium ay, trace fine (2-5%), HCI	grained, to medium reaction	SM	26.5		 95	5+ N : RE	7+11 =18 :C =18"	w=35.6%			
-													
			0.0 ET		-34.5		 100-	7+ N : RE	11+12 =23 :C =19"				
			0.0 F1.										

Schnal	bel Engineering	Calvert Cli Calvert Co	iffs Nucle ounty, Ma	ar Pov aryland	ver Pla	nt	Boring Contra Sheet:	Number: Act Number 1 of 4	er: 06120	B-316
Boring C	Contractor: CONNELLY AND ASSOCIATES	S. INC				Gro	oundwater Obs	ervations		
	FREDERICK, MARYLAND	, into.				D	ate Time	Depth	Casing	Caved
Boring F	Foreman: D. Reese		Enco	untere	d	5	5/4	24.0'		
	Method: Mud Rotary									
Drilling E	Equipment: CME-75									
Schnabe	el Representative: M. Arles									
Dates \$	Started: 5/3/06 Finished: 5/3/06									
Location	1: Northing: 216767.16 ft Easting: 960864.35 ft									
Ground	Surface Elevation: 108.1 (feet)			1	1					
DEPTH (FT)	STRATA DESCRIPTION	CLASS	S. ELEV. (FT)	WL	DEP	S/ דה	AMPLING DATA	TEST	s i	REMARKS
0.5	ROOTMAT AND TOPSOIL.		107.6			TM	2+3+4		Au	ger
-	POORLY GRADED SAND WITH CLAY, fine to medium grained, moist, brown, contains root fragments.	SP-SC	;		_	<u>الا</u>	N =7 REC =18"			
2.5	SANDY LEAN CLAY, moist, brown.	CL	105.6		L		2+2+2	w=19.1	%	
						IXI	N =4 REC =16"	LL=3	5 6 ob/	angod to 2
-	-				F		REC = 10	PP=2.00) tsf 7/8	" roller bit
					- 5 -	-	0.4.0	Â		
					L		2+1+2 N =3			
					Γ	ןשך	REC =11"			
					F	+				
-	fine to coarse grained, moist, brown.				F	-M	2+1+1	w=14.5	5%	
						M	N =2 REC =10"			
_					Γ					
10.5			07.6		-10-					
- 10.5	SILTY SAND, fine to medium grained,	SM	97.0		F	-M	2+3+2			
	moist, yellowish brown.					M	N =5 REC =12"			
					Γ					
125			04.6		F	+				
- 13.5	POORLY GRADED SAND WITH SILT,	SP-SN	1 94.0		F	-M	6+8+8			
	fine to coarse grained, moist, brownish orange.				45	Ŵ	N =16 REC =12"			
					-15-					
-					-	-				
_	-				F	4				
18.5			89.6		Γ	1_	• • •			
-	CLAYEY SAND, fine to coarse grained,	SC			F	HM	3+3+4 N =7			
_					-20-	40	REC =12"			
					Γ	1				
-					F	-				
_					L					
23.5		CD. CM	84.6				3+4+5	w=20°	%	
-	fine to medium grained, wet, orangeish	331	'	<u> </u>	F	1	N =9	LL=N		
-	brown, .				-25-	- 121	REC =15"	PL=N		
	commued on next page									
		1			1					

	hnahal	TEST	Project: (Calvert Cliff	s Nucle	ar Pow	er Plan	t	E	Boring Number: B-3		
Sahara	maper	BORING	(Calvert Cou	nty, Ma	ryland			C	Contract Number: 06120048		
DEPTH	STRATA	DESCRIPT	ION	CLASS.	ELEV.	WL		S		sneet:	Z OF 4	REMARKS
(FT)					(FT)		DEPT	Ή	DAT	A	*	
				SP-SM								
-	_											
-												
-	brownish orange,	1" clay sea	m					M	3+5+3 N =8			1" clay seam
							-30-	Ш	REC =12			
-												
-											00 40/	
-								M	2+3+3 N =6		W=20.1% LL=43	
							-35-	Ш	REC =18	"	PL=17 *	
-												
_												
38.5		AV moist (lark grav	CL	69.6				1+3+2		w=28.5%	
-			laik gray.					X	N =5	.	*	
-							-40		REC = 18			
-												
-												
-												
_	with sand.								REC =24		w=28.6%	
							45				LL=44 PL=16	
							-45				PP=2.00 tsf	
	_											
3/6/0	_											
⊟ 48.5 	SANDY ELASTIC	SILT, mois	t, dark	MH	59.6			М	3+4+4		w=38.0% PP=1.50 tsf	
– sch	gray, trace sand.							М	REC =18	"	*	
GPJ												
8 400.												
- 300							[]					
	·				54.6					_	W-26 20/	
	LEAN CLAY, moi sand.	st, dark gray	r, with	CL					REC =24	"	w=20.2% LL=33	
- 2004{							-55-				PL=11 PP=3.25 tsf	
- 061											*	
ORIN												
ESTB	continue	d on next pag	е									
۳ L												

		roject: Calvert Cli	ffs Nucle	ar Pow	er Plant	E	Boring Number: B-3 1		
Schnat	bel Engineering LOG	Calvert Co	unty, Ma	iryiand			Contract Number: 0 Sheet: 3 of 4	6120048	
DEPTH (FT)	STRATA DESCRIPTIO	N CLASS	ELEV. (FT)	WL	S DEPTH	AMPLING	TESTS	REMARKS	
58.5	CLAYEY SAND, fine to medium grained, moist, dark gray.	SC	- 49.6		 60	5+5+6 N =11 REC =18	w=24.4%		
	greenish gray, trace cemented s	sand.				9+10+13 N =23 REC =17	w=31.3% *	changed to 2 15/16" roller bit	
68.5	SILTY SAND, fine to medium gr	rained, SM	- 39.6		 X	42+50/4" N =50/4"	w=19.8%	Harder drilling	
-	medium shell fragments, modera reaction.	ate HCI			70 	REC =10	n	softer drilling	
73.5	POORLY GRADED SAND, fine medium grained, moist, gray, tra to medium shell fragments, trace moderate HCI reaction.	to SP ace fine e clay,	- 34.6			50/5.5" N =50/5.5 REC =6"	5" w=21.2%		
GDT 3/6/08 	with fine to coarse shell fragmer strong HCI reaction.	nts,			 80	50/2" N =50/2"			
LOG SPT 300 & 400.GPJ SCHNABEL	with fine to coarse shell fragmer strong HCI reaction, 1" cemente frag.	nts, ed sand			 	50/3" N =50/3" REC =1"		Rig chatter	
RING LOG 06120048 F	trace fine to medium shell fragm moderate HCl reaction.	ients,			 ⊠ 90	50/3" N =50/3" REC =1"			
- IEST BO	continued on next page								

6	TEST Project: (Calvert Cliff	s Nucle	ar Pow	er Plant	Boring Number: B-31		
Schnat	bel Engineering LOG	Calvert Cou	nty, Ma	iryland		Contract Number: 06120048 Sheet: 4 of 4		
DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL		NG TESTS	REMARKS	
- 93.5 -	CLAYEY SAND, fine to medium grained, moist, grayish green, with silt,	SP SC	14.6			w=32%	Easier drilling	
 100.0 —	trace medium to coarse shell fragments, weak HCl reaction.		8.1		REC =	w=27.7% *18"		

Schna	hnabel TEST BORING bel Engineering LOG	G Project: Calvert Cliffs Nuclear Power Plant Calvert County, Maryland							Boring Number: Contract Number: 06120 Sheet: 1 of 4			B-317
Boring	CONNELLY AND	ASSOCIATES					Gr	oundwa	ater Obs	ervations		
	FREDERICK, MAI	RYLAND	,				D	ate	Time	Depth	Casing	Caved
Boring F	Foreman: D. Reese			Start	of day	y	į	5/8		21.0'	4.5'	
Drilling	Equipment: CME-75											
Schnabe	el Representative: M. Arles											
Dates	Started: 5/4/06 Finished: 5	/8/06	F									
Location	1: Northing: 217094.7 ft Easting: 961249.2 ft											
Ground	Surface Elevation: 94.4 (feet)											
DEPTH (FT)	STRATA DESCRIPT	ΓΙΟΝ	CLAS	S. ELEV. (FT)	WL	DEP	S. TH	AMPLIN DA	NG ATA	TEST	S	REMARKS
0.5	ROOTMAT AND TOPSOIL.			93.9			M	2+2+2			Ho	ollow stem
-	POORLY GRADED SAND W trace fine gravel, fine to coar	VITH CLAY, se grained, frogmonts	SP-S(È.	ď	REC =	12"		a	2901
2.0 -	CLAYEY SAND, fine to coars	se grained,	SC	92.4		- ·	\mathbb{Z}	1+1+1				
	moist, orangeish brown.	-					M	N =2 REC =	12"			
4.5	POORLY GRADED SAND V	vith fine	SP	89.9								
	gravel, medium to coarse gra moist, orangeish brown.	ained,				_ 5 _		1+2+3 N =5				
70 -				87.4				REC =	12"			
1.0	POORLY GRADED SAND W trace gravel, fine to coarse g	VITH SILT, rained,	SP-SN	M		L		2+5+7				
	moist, brownish orange.						Ň	N =12 REC =	14"			
9.5	CLAYEY SAND, with siltfine	to coarse	SC	84.9								
	grained, moist, brownish ora	nge.						4+5+6				
							Ň	N =11 REC =	12"			
12.5	POORLY GRADED SAND V	VITH SILT,	SP-SN	M 81.9								
	fine to medium grained, mois orange.	st, brownish										
5						15						
						[.	1					
						[.	1					
-	fine to coarse grained grand	Δ				F .	1	6+7+7				
-		0.				F .	IX	N =14	12"			
	-					-20-		1.20 -			Fi	ner sand
-	-					- ·	1					
22.0 -	SANDY SILT, fine to medium orange.	n, moist,	ML	72.4		F .						
						F .	1	2+2+3		w=28.4	%	
24.5	SANDY LEAN CLAY fing to	medium		69.9		F	٦XI	N =5	18"	PP=1.25	tsf	
	continued on next pa	ge				-25-			10			
<u>الــــــــــــــــــــــــــــــــــــ</u>												

	TEST	Project: Calvert Cliffs	s Nucle	ar Pow	er Plant	Borin	g Number:	B-317	
Sch	BORING	Calvert Cou	nty, Ma	ryland		Contr	Contract Number: 06120048 Sheet: 2 of 4		
DEPT (FT)	H STRATA DESCRIPTIO	ON CLASS.	ELEV. (FT)	WL	SA		TESTS	REMARKS	
	moist, gray.	CL				DATA	PP=1.5, 1.2		
	_ _ _ _ dark gray.					REC =24"	w=31.7%	lean clay	
32.0		adium CH	62.4		30		LL=27 PL=19 PP=2.25 tsf *		
	moist, dark gray, Pockets of m sand.	nore/less			 35	2+3+3 N =6 REC =18"	w=30.2% PP=1.25,1.0 tsf *		
	dark gray, trace sand. 				 40 	REC =24"	PP=3.50 tsf		
	gray.				 45-	4+6+7 N =13 REC =18"	PP=3.5,3.75 tsf		
47 0			47 4						
	SANDY LEAN CLAY, fine to m grained, moist, grayish green.	nedium CL				DEC -22"	w=22.8%		
	-				50		LL=35 PL=17 *		
51.0	POORLY GRADED SAND WI contains cemented sand, fine t medium grained, moist, dark b orange.	TH SILT, SP-SM to prownish	43.4						
	-					50/4" N =50/4"			
					<u>55</u>	REC =1"		2 15/16" OD roller bit	
	continued on next page	9							

	TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	В	Boring Number: B-3		
Schna	bel Engineering LOG	C	alvert Cou	nty, Ma	iryland		Co Si	Contract Number: 06120048 Sheet: 3 of 4		
DEPTH (FT)	STRATA DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	S/ DEPTH	AMPLING DATA	TESTS	REMARKS	
-	light orangeish brown.		SP-SM				16+12+50, N =62/10" REC =14"	/4" w=26%		
61.0 -	CLAYEY SAND, fine to medi grained, moist, gray.	um	SC	33.4		 	28+50/4"			
-	trace chell fragments, contain	20				<u> </u> 65 	N =50/4" REC =5"			
	cemented sand, shell frag fin size, moderate HCl reaction.	e to coarse				 ⊠ 70	5+50/1" N =50/1" REC =4"		Harder drilling	
-	wet, greenish white, with fine shell fragments, strong HCl n	to coarse eaction.				 75 	8+50/5" N =50/5" REC =11"	w=22.3%		
- 777.0 - 	SILTY SAND, fine to medium moist, green, 15% medium to shell frag, strong HCI reaction	ı grained, o coarse 1.	SM	17.4		 	4+6+7 N =13 REC =18"			
0G SPT 300 & 400.GPJ SCHNAE	contains cemented sand, 25 ⁴ to coarse shell frag, strong H	% medium Cl reaction.				 85 -	9+10+13 N =23 REC =18"			
- 0.78 PLC - 0.78 PLC -	POORLY GRADED SAND W fine to medium grained, mois trace shell fragments, 5% f-n	/ITH SILT, t, green, n shell frag.	SP-SM	7.4		 <u>90</u>	5+6+8 N =14 REC =18"			
- IEST BOI	continued on next pag	ge								

	TEST Proj	ect: Calvert Cliff	s Nucle	ar Pow	er Plant	Boring Number: B-317			
Schnal	BORING	Calvert Cou	inty, Ma	ryland		Contra	Contract Number: 06120048		
DEDTU	ber Engineering LOO				SAME		4 01 4		
(FT)	STRATA DESCRIPTION	CLASS.	ELEV.	WL			TESTS	REMARKS	
		SP-SM							
-									
-									
_					3+5	5+5			
_						C =18"			
_									
-									
_									
-	20-30% medium to coarse shell fra	ıg,			9+1	1+20 31			
100.0 —		г	-5.6		-100-10 RE	C =18"			
	BOTTOM OF BORING @ 100.0 F	1.							
20/02									
BEL									
ANH									
б Г									
00.0									
7 Ø 00									
2									
LOG									
048 L									
07190									
90									
1 DAUD									
Da l									

Schnal	TEST Project: C bel Engineering LOG C	Calvert C Calvert C	Cliffs Nuclear Power Plant County, Maryland						Boring Contra Sheet:	B-318 048		
Boring C							Gr	ound	water Obs	ervations		
	MALAGA, NEW JERSEY						D	ate	Time	Depth	Casing	Caved
Boring F	Foreman: J. Blemings		E	Enco	untere	d	6	6/2		20.0'	0.0'	
Drilling	Equipment: CME_{750} (ATV)			Start	of day	/	6	6/3		0.0'	0.0'	
Schnabe	el Representative: M. Arles			Start	of day	/	6	6/4		31.0'	0.0'	
Dates \$	Started: 6/2/06 Finished: 6/5/06			Start	of day	/	6	6/5		31.0'	0.0'	
Location	n: Northing: 217019.3 ft Easting: 961227.2 ft			Start	of day	/	(6/5		28.0'	0.0'	
Ground	Surface Elevation: 97.8 (feet)	_ [
DEPTH (FT)	STRATA DESCRIPTION	CLAS	s. E	LEV. (FT)	WL	DEP	S. TH	AMPL [ING DATA	TEST	s i	REMARKS
0.5	CRUSHED STONE.			97.3			M	5+5+	8			
-	POORLY GRADED SAND WITH CLAY, fine to coarse grained, dry, brown.	SP-S0	C	75.0			ď	N =1 REC	3 =15"			
2.0 -	POORLY GRADED SAND, fine to	SP		95.8		F .		-	-			
-	gravel.					- ·	HXI	5+6+ N =1	5 1			
-							ЦШ	REC	=15"			
_						- 5 -						
	yellowish orange						M	5+5+ N =1	5 0			
-						F .	Π	REC	=12"			
7.0 -	POORLY GRADED SAND WITH SILT	SP-SI	M S	90.8			-					
_	fine to coarse grained, moist, yellowish					Ļ .	-M	4+6+	6			
	orange.						M	N =1 REC	2 =12"			
						F .	1					
						-10-	1_					
	with gravel, 1/8" orange layers with						ЧM	5+7+	8			
_	more sit.					L.	\square	REC	=16"			
_						F .						
-							HM	11+1 N =2	8+7 5			
						-15-	ЦШ	REC	=14"			
						F .	1					
							-					
18.0 -		N 41	- 7	79.8		Ļ .	_					
8	orange.	ML						5+6+	7			
					∇	Γ	IXI	N =1	3 -12"			
					<u> </u>	-20-	-	REG	-12			
- 12						<u> </u>	-					
						L.						
						F '						
2 -	moist, mottled orange and gray.					+ -	-M	2+1+ N -2	1			
						-25-	\square	REC	=18"			
	continued on next page					25						

Comments: 1. Boring backfilled with cement/bentonite grout through tremie pipe upon completion. 2. Downhole Geophysical Testing Performed on 6/5/2006. 3. * = See Appendix I for additional lab testing data.
	TEST Pro	ject: Calvert Cliff	s Nucle	ar Pow	er Plant	Boring	Number:	B-318
Schnat	bel Engineering LOG	Calvert Cou	inty, Ma	iryland		Contra Sheet:	ct Number: 0	6120048
DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL	SAMP DEPTH	PLING DATA	TESTS	REMARKS
		ML						
27.0 -	FINE TO MEDIUM SANDY LEAN	CL	- 70.8					
						2+3		
						5 C =18"		
33.0 -			64.8					
_	FAT CLAY, moist, dark gray, with	sand. CH				+4		
_						8 C =18"		
-								
-								
-								
-						+4 8		
						C =18"		
-								
-								
-								
-	3" Clayey sand layer				4+8 N =	3+9 17 C =19"		
_						0 - 10		
00								
					「	8+12		
						20 C =18"		50' Start of day
L L								6/3
53.0 -			44.8					
	grained, moist, dark gray.					3+9 17		
	Cemented sand lenses 55-58'					C =18"		
57.0 -	POORLY GRADED SAND. fine to) SP	40.8					
	medium grained, moist, reddish or continued on next page	range,						

TEST Project: Calvert Cliffs Nuclear Power Plan Schnabel Engineering LOG Project: Calvert County, Maryland									Boring Number:	B-318
	Schna	bel Engineering LOG	C	alvert Cou	nty, Ma		Contract Number Sheet: 3 of 7	r: 06120048		
	DEPTH (FT)	STRATA DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	S DEPTH		G TESTS	B REMARKS
	-	1/4" red lenses.		SP			60-	³ 50/2" N =50/2 REC =2	ун ун	
	63.0	POORLY GRADED SAND W fine to medium grained, mois	/ITH SILT, t, gray.	SP-SM	- 34.8		 65 	³ 50/2" N =50/2 REC =2	ju ju	
	67.0	POORLY GRADED SAND, fi medium grained, moist, gray smaller clay lenses.	ne to 1/8" and	SP	30.8		 - <u>-</u> ⊠ 70	[]] 50/5" N =50/5 REC =5	91 11	
	73.0	CLAYEY SAND, fine to medi grained, moist, gray, with silt, cemented sand, 80% cemen	um contains ted sand.	SC	24.8		 75 	³ 50/3" N =50/3 REC =2	ju ju	
3EL.GDT 3/6/08	77.0	SILTY SAND, fine to medium moist, green and white, with coarse shell fragments, stron reaction, 60-70% shell frag.	grained, fine to g HCl	SM	20.8		 80	15+8+1 N =23 REC =1	5 8"	
DG SPT 300 & 400.GPJ SCHNAE		green, 15-25% shell frag.					 	5+8+12 N =20 REC =1	8"	
T BORING LOG 06120048 PL(87.0	POORLY GRADED SAND W fine to medium grained, mois strong HCI reaction, 15-20%	/ITH SILT, t, green, shell frag.	SP-SM	10.8		 90-	7+11+1 N =27 REC =1	6 8"	
TES'										

		TEST	Project: Ca	alvert Cliffs	s Nucle	ar Pow	er Plant	Вог	ing Number:	B-318
	Schna	bel Engineering	Ca	alvert Cou	nty, Ma	ryland		Cor	ntract Number: 0	6120048
	FPTH				EI EV		s			
	(FT)	STRATA DESCRIPTIC	N	CLASS.	(FT)	WL	DEPTH		TESTS	REMARKS
				SP-SM						
	-									
	-									
	-	trace fine to coarse shell fragm	ents,				10	6+10+12		
		frag.	511011				95[][]	REC =18"		
	_									
1	97.0 -	SILTY SAND, fine to medium g	grained,	SM	0.8					
	-	fragments, moderate HCl react	tion,							
	-	0-5% shell frag.					HXI	5+6+11 N =17		
	_	_					-100- /]	REC =18"		
	-									
	-									
	_									
		green and white with fine to co	arse					10+13+33		104' thicker
	-	shell fragments, strong HCl rea	action,				- 10	N =46		shell beds
							-105-	KLC - 10		
	-	_								
10	07.0 -	POORLY GRADED SAND WIT	TH SILT	SP-SM	-9.2					
	-	with fine to coarse shell fragme	ents, , fine	0. 0						
	-	HCl reaction, 50-60% shell frag	j.					13+22+30		
							<u>110</u>	N =52 REC =18"		
	-									
æ	-									
3/6/	-									
L.GD1	-	25-35% shell frag.					HM	7+12+19 N =31		
NABE	_						-115- []	REC =18"		
SCH	-									
	17.0 -				-19 2					
& 40C		SILTY SAND, fine to medium g moist, green, with fine to coars	grained, e shell	SM						
T 300	-	fragments, strong HCI reaction shell frag.	, 10-20%					9+12+14		
IG SP	-						- 1	N =26		
8 PLC	-						-120- []			
12004	-									
G 06	-									
IG LC	-									
BORI	-	trace fine to coarse shell fragm	ients,					6+10+13		
TEST		continued on next page								

50	TEST Project: Calvert Cliffs Nuclear Power Plant BORING Calvert County, Maryland				-	Boring Number:	B-318		
Schna	bel Engineering LOG							Sheet: 5 of 7	1. UUIZUU 1 0
DEPTH (FT)	STRATA DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	S		G TEST	S REMARKS
	moderate HCI reaction, 0-5%	shell frag.	SM				N =23		
-	-					-125-	REC =1	8"	
-	-								
-	-								
.	-								
-	-					17	8+11+12 N =23	2	
-	-					- <u>130-</u> [/]	REC =1	8"	
-	-								
.	-								
.	-								
-	with fine to coarse shell fragr	nents,				17	8+10+12	2	
_		shell hay.				<u> </u>	REC =1	8"	
.	-								
-	-								
	-								
.	45-55% shell frag.						10+17+	15	
_							N =32 REC =1	8"	
	_								
	_								
	trace fine to medium shell fra	gments,					5+7+10		
	weak HCl reaction, 0-5% she	ell frag.					N =17 REC =1	8"	
						145			
5									
	contains shell fragments						REC =3		Shelby tube
									150' Start of
	-					-150-			day 6/4
-									
-	-						619140		
-						F - X	N = 18	0"	
	-					-155-		0	
-	-								
-	continued on next pag	ye		-					
Ĺ									

3	6	bnabal	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant		Boring	Number:	B-318	
	Schnat			C	Calvert Cou	inty, Ma	ryland			Contra	6 of 7	6120048
	ертц	Ser Engineering	200					s		G		
	FT)	STRAT	A DESCRIPT	ION	CLASS.	(FT)	WL	DEPTH		ТА	TESTS	REMARKS
15	57.0	FINE TO MEDIL	JM SANDY S	ILT, moist,	ML	-59.2						
	-	green, trace fine fragments, weak	to medium s	hell 1. 0-5%								
	_	shell frag.		, / -				M	4+5+7			
									N =12 REC =1	8"		
								100				
	-											
	-											
	_											
	_							L JM	4+7+8			
								l M	N =15 RFC =1	8"		
	_							-165-1		•		
	-											
16	67.0 -	ELASTIC SILT	moist green	trace	МН	-69.2						
	_	sand.	moist, green,	lidee								
									6+7+12			
								r ixi	N =19	8"		
	_							-170-		0		
	-											
	_											
	_											
		with clay.							4+8+13			
								F 1 X	N =21	۵.		
								-175-		0		
	_											
	_											
	_											
/08		moist areen wit	th clav						4+8+9			
T 3/6	_	molot, groon, m	ar oldy.					F 1 X	N =17	0"		
6	_							-180-12	REC =1	0		
NABE	_											
표))) 18	32.0 -					-84.2						
GPJ		LEAN CLAY, wit	th silt, moist,	green.	CL							
× 400									6+10+1	3		
3008	-							F 1 X	N =23	0"		
SPT	_							-185-1	REC =1	8"		
	_											
81 18	37.0					-89.2						
0612	-	ELASTIC SILT,	moist, green.		MH							
LOG									1+5+10			
SING.	-							F 1 X	N =15			
BO	_	continu	ed on next pac	ne -				<u>−</u> 190– ∐	REC =1	8"		

SC	hnabel BORING	Project: Ca	lvert Cliff	s Nucle	ar Pow	er Plant		Boring	Number:	B-318
Schnat	bel Engineering LOG	Ca		iity, ivia	Tylanu			Contra Sheet:	ct Number: 06 7 of 7	3120048
DEPTH (FT)	STRATA DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	DEPTH	SAMPLIN	NG ATA	TESTS	REMARKS
	STRATA DESCRIPT	10N 0.0 FT.	CLASS. MH	ELEV. (FT)	WL		SAMPLIN I DA I N = 22 REC = Image: State of the	NG ATA 3 18" 18"	TESTS	REMARKS

Schnal	bel Engineering LOG	Project: C. C.	alvert C alvert C	Cliffs Nucle County, Ma	ar Pow Iryland	ver Pla	nt		Boring Contra Sheet:	Number: Ict Number 1 of 4	er: 06120	B-319
Boring C	contractor: UNI-TECH DRILLI	NG					Gr	oundv	vater Obs	ervations		1
	MALAGA, NEW JE	RSEY	-				D	ate	Time	Depth	Casing	Caved
Boring F	oreman: J. Blemings			Enco	untere	d	!	5/5		10.5'		
Drilling I	Method: Mud Rotary			Star	of day	у	Į	5/8		26.0'		
Drilling	Equipment: CME-750 (ATV)	_	F									
Schnabe	el Representative: K. Megginsol		-									
Dates :	Started: 5/5/06 Finished: 5/	8/06										
Location	Easting: 961123.01 ft											
Ground	Surface Elevation: 102.9 (feet)											
DEPTH				ELEV.	14/1		S	AMPL	ING	терт		
(FT)	STRATA DESCRIPT		CLAS	5 . (FT)	VVL	DEP	тн	0	ΔΑΤΑ	1531	5 I	KEMARNO
0.3	ROOTMAT AND TOPSOIL.		SP-S	M 102.6			M	3+4+ N =6	2			
-	POORLY GRADED SAND W fine to coarse grained, moist, contains clayey sand pockets	ITH SILT, brown,					10	REC	=12"			
-						- ·	-10	3+3+	4	w=5.7	%	
_						L .	10	REC	=10"			
5.0				07.0		5						
5.0	POORLY GRADED SAND, w	vet, brown	SP	97.9			M	4+6+ N =1	6			
-						-	70	REC	=11"			
-						-	┤_					
						-	HM	5+5+ N =13	8 3	LL=N	% >	
-						- ·	ЦЦ	REC	=11"	PL=N	P	
10.0 -				92.9		-10-						
	POORLY GRADED SAND W light yellowish brown and ligh	ITH SILT, t gravish	SP-S	M	ĮΫ			6+6+	7			
	brown	0 7						N =13	3 =10"			
-						-		INLO	-10			
							-					
-						-	-10	5+5+	7	w=7.6	%	
<u> </u>						-15-	10	REC	=10"			
						-	-					
						-	-					
	orangeish brown, trace fine g	ravel.					-10	8+9+	8			
						L_20-	10	REC	, =7"			
							1					
						-	-					
						-	-					
23.5	CLAYEY SAND, trace gravel	yellowish	SC	79.4		L .	-10	5+3+	2	w=19.8	8%	
24.8	<pre>contains clayey sand (<1/4 inch thick).</pre>	lenses		78.1		-25-	\square	REC	=15"			
	continued on next pag	e				25						
:L												

	TEST P	roject: Ca	lvert Cliff	s Nucle	ar Pow	er Plant	Во	ring Number:	B-319
Schnat	bel Engineering LOG	Ca	Ivert Cou	nty, Ma	ryland		Co	ntract Number: 0 eet: 2 of 4	6120048
DEPTH (FT)	STRATA DESCRIPTIO	N	CLASS.	ELEV. (FT)	WL	S/ DEPTH	AMPLING DATA	TESTS	REMARKS
_	SANDY FAT CLAY, fine to med wet, light gray and dark brown.	lium,	СН						
27.0 -	CLAYEY SAND, fine to medium grained, wet, mottled yellowish t and light gray (high percentage	brown of	SC	75.9			MOL1/19"	w=24 5%	
29.5	SANDY LEAN CLAY, fine to me wet, gray, trace mica.	dium,	CL	73.4			N = WOH/18 REC =18"	8" *	
-						 	REC =24"	w=29.2% LL=49 PL=12 PP=2.75 tsf	*Shelby tube sampler push from 33.5 to 35.5 ft.
37.0 -	FAT CLAY, moist, gray, trace sa mica.	and, and	СН	65.9		 40-	WOH+3+5 N =8 REC =18"	w=27.9%	
						 45	REC =20"	w=32.1% LL=58 PL=13 PP=3.25 tsf *	*Shelby tube sampler push from 43.5 to 45.2 ft.
	light gray.					 	4+4+8 N =12 REC =18"	w=38.6% LL=79 PL=27 *	
						 55 	REC =4"	PP=4.25 tsf	*Shelby tube sampler push from 53.5 to 54.3 ft.
57.0 -	FINE TO MEDIUM SILT, with sa moist, gray and dark greenish gr continued on next page	and, ray,	ML	45.9					

	-	TEST Pr	roject: C	alvert Cliff	s Nucle	ar Pow	er Plant		Boring	g Number:	B-319
Sc	hnat	bel Engineering LOG	C	alvert Cou	nty, Ma	ryland			Contra Sheet:	act Number: 06	6120048
DEP	тн	STRATA DESCRIPTION	N	CLASS.	ELEV.	WL		SAMPL	ING	TESTS	REMARKS
(F1)			M	(FT)		DEPTH		ΑΤΑ		
	_	pockets.	an clay	IVIL				7+10-	+17 ,	w=26.7%	
							-60-	REC	=18"	PL=32	
	_										
62.	0 -	CII TV CAND fine to medium and		014	40.9						
	_	moist, brown.	ameu,	5111							
	_						[2	≤ 50/5"	/5"		
	_						-65	REC	"5 =1"		
	_										
	_										
	_										
	_	gray, trace mica.						⊠ 50/4"	\/ / /"		
	_						70	REC	"4 =1"		
	_										
	_										
	_										
	_	wet, gray and light gray, mostly f	ine to					31+36	6+50/3"	w=17.5%	
	_	HCl reaction, (shell fragments up	to $1/2$				-75-	REC	=13"		**Resumed drilling at 8:30
	_	1101 III 0120).									AM on 5/8/06.
	-										
	-										
	-	light gray, mostly strongly cemer sand (+>90%), weak HCl reaction	nted				2	⊠ 50/5" N =50)/5"		
3/6/08	_						-80-	REC	=1"		
GDI	_										*Slight to
NABEL	-										moderate drill
l SCH	-										82 ft.
00.GP	-	light oliveish gray and light gray, fine to coarse shell fragments (±	few 10%),				[32+43 N =93	3+50/3" 5/9"	w=18.2%	
800 & 4 8	_	moderate HCl reaction, strong cementation.	,,				-85-	REC	=11"		*Moderately difficult drilling
SPT	-										Deiow 85 ft.
PLOG	-										
120046	-										
00 00	-							6+6+9 N =15	9	w=29.8% PP=0.25 tsf	
NGLC	_						-90-	REC	=18"	*	
BOR	-	continued on next page									
ESI		communed on next page									

	hnabel	TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant		Boring	Number:	B-319
Schna	bel Engineering	LOG		alvert Cou	nty, Ma	ryiand			Contra Sheet:	4 of 4	6120048
DEPTH (FT)	STRAT	A DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	DEPTH		NG ATA	TESTS	REMARKS
	BOTTOM OF BO	eaction. DRING @ 10	0.0 FT.	SM	2.9			6+7+1 ⁻ N =18 REC = 6+7+1 ⁻ N =18 REC =	1 18" 1 18"	w=30% LL=NP PL=NP *	

Schna	bel Engineering LOG	Project : Ca Ca	Ilvert Clif Ilvert Cou	fs Nucle unty, Ma	ar Pow ryland	ver Pla	nt	Boring Contra Sheet:	Number: ct Number 1 of 5	er: 061200	B-320
Boring	Contractor: CONNELLY AND 4		INC				Grou	ndwater Obse	ervations		
	FREDERICK, MAR	RYLAND					Date	e Time	Depth	Casing	Caved
Boring F	Foreman: D. Reese			Enco	untere	d	5/8		28.0'	3.5'	
Drilling				Start	of day	/	5/9		11.3'	3.5'	
Schnabe	Equipment: CME-75 (Truck)										
Dates	Started: 5/8/06 Finished: 5/	8/06	-								
Location	n: Northing: 216943.5 ft Easting: 961044.1 ft	0,00									
Ground	Surface Elevation: 106.4 (feet)										
DEPTH (FT)	STRATA DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	DEP	SAN TH	IPLING DATA	TEST	S F	REMARKS
0.5	ROOTMAT AND TOPSOIL.		SP-SM	105.9				-2+2 =4			
-	POORLY GRADED SAND W fine to medium grained, moist contains root fragments.	ITH SILT, t, brown,	37-311			-		EC =18"			
-	no observable root fragments					-	2+ N	+3+3 =6	w=10.4	.%	
4.5				101.0		F		EC =18"			
4.5	CLAYEY SAND, fine to coars moist, brownish orange, with	e grained, fine gravel.	SC	101.9		- 5 -	3+	+3+5 =8			
							RI	EC =16"			
7.0 -	POORLY GRADED SAND, fir coarse grained, moist, browni	ne to ish orange.	SP	- 99.4		-	5+	+6+7 =13	w=6.3°	%	
-	-							EC =13"			
-	with gravel.					-		+7+8 =15 EC =14"			
	reddish orange.					- - 15-		+8+7 =15 EC =12"			
	-					-					
- - - - -	orange.					- 20-)+12+10 =22 EC =14"	w=9.1° *	%	
-	-					_					
	orangeish white.					-		+14+11 =25 FC =15"			
	continued on next pag	e				25-		0			

	TEST Project:	Calvert Cliff	s Nucle	ar Pow	er Plant	Borin	g Number:	B-320
Schnat	bel Engineering LOG	Calvert Cou	nty, Ma	ryland		Contr Sheet	act Number: 06 : 2 of 5	6120048
DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL	SAMP		TESTS	REMARKS
		SP						
27.0 -	POORLY GRADED SAND WITH SILT, fine to coarse grained, wet, orange,	SP-SM	79.4					
					7+5	+4		
29.5	SILTY SAND, fine to medium grained,	SM	76.9) 2 =18"		
-	wet, orange.							
32.0 -		80	74.4					
-	CLATET SAND, MOISI, dark gray.							
-					– – WO N =:	H+1+2 }	w=26.1% LL=33	
-					-35-1		PL=18 *	
-								
-								
-	with sand.					; =24"	w=29.4%	
							LL=36 PL=16	
							PP=1.50 tst	
42.0 -			64.4					
-	with sand.	СП						
-						+3	w=30% LL=56	
-						2 =18"	PL=19 *	
- 18								
- <u>1 3/6/(</u>	fine to medium grained, moist, dark							
EL.GD	gray.					:=18"	w=34.4%	
CHNA							LL=59 PL=19	
CGPJ 6								
- 0 & 400								
SPT 30	trace sand.							
- brog					5+6	+7 3	w=34.9% LL=69	
120048						2 =18"	PL=24 *	
- 00								
שעט אואט אוא	SILTY SAND, fine to medium grained,	SM	49.4					
- BO	continued on next page							
۳ ــــــ ا								

	-	hnahal TE	ST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plan	t	Во	oring Nur	nber:	B-320
Sci	inat	bel Engineering L	ring Dg	c	alvert Cou	inty, Ma	iryland			Co Sh	ntract N eet: 3 0	umber: 0 f 5	6120048
DEP (FT	тн)	STRATA DES	CRIPT	ION	CLASS.	ELEV. (FT)	WL	DEPT	S. H		-	TESTS	REMARKS
					SM					5+7+7			
	_								X	N =14 REC =18"			
62.0	о –					44.4							
64.1	_	fine to medium grained gray,contains snail she	AND W I, mois ell fragi	t, reddish ments.	SP-SM	42.4			М	13+24+20			
64.	5_	POORLY GRADED SA medium grained, moist trace silt, 10% fine to n fragments	AND, fi t, oranç nedium	ne to geish red, n shell	SP SP-SM	41.9		-65-	Å	N =44 REC =18"			
67.0	- - - 0	POORLY GRADED SA medium grained, moist with silt.	AND, fi t, greei	ne to nish gray,	SM	39.4							
	_	SILTY SAND, fine to m moist, brownish yellow	nedium	grained,						50/3" N =50/3"			
								70		REC =2"			
	_												
	-	grayish green, contains 30-40% fine to mediun HCl+.	s ceme n shell	ented sand, fragments,				 75		35+50/2" N =50/2" REC =8"	w	=18.8% *	
	-												
0	_	5% fine to medium she	ell fragr	ments.					Ø	50/2" N =50/2"			
								80 		REC =2"			
OUTIVADE	_												
010.00t x	_								M	50/1" N =50/1" REC =0"			
	_												
87.0) - -	CLAYEY SAND, fine to grained, moist, gray, 5 sand.	o medi 0% cei	um mented	SC	19.4							
	_								Ø	50/2" N =50/2" REC =0"			
	_	continued on r	next pag	ge									

	TEST Project	: Calvert Cliff	s Nucle	ar Pow	er Plant	Boring Number:	B-320
Sch	abel Engineering LOG	Calvert Cou	nty, Ma	iryland		Contract Number: 0	6120048
DEPT (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL		NG TESTS	REMARKS
		SC					
92.0	SILTY SAND, fine to medium grained,	SM	14.4				
	moist, green, trace silt, with 10-20% fir to coarse shell fragments. HCl+.	ne					
	-				7+10+	12 w=25.4%	
	_				REC =	:18"	
	_						
	_						
	_						
	fine to medium grained.				6+6+9		
					N =15	:18"	
	-						
	fine to medium grained, moist, dark						
						w=29.2%	
	-					w-23.270	
	_				105 <u>/</u> REC =	:18"	
	-						
	_						
	_						
	_				4+5+5		
	20-30% fine to coarse shell fragments	,			-110-10 REC =	:18"	
	HCI+ below 109.7.						
112.0			-5.6				
6/08	SANDY LEAN CLAY, fine to medium grained, wet, dark green and white,	CL					
DT 3/	contains cemented sand, 25-35% fine coarse shell fragments, HCI+.	to			20+18	+14 w=28.5%	
BEL.G					N =32	-18" LL=44 PL=16	
CHNA					-115	*	
S [d]	-						
400.0	-						
300 8							
119 5	_ 20-30% fine to coarse shell fragments		-13 1		- 10+14 N =28	+14	
	SILTY SAND, fine to medium grained, moist, dark green, 0-5% fine to mediur	m SM			-120- <u> </u> REC =	:18"	
12004	_ shell fragments.						
90 90	-						
NGLO	-						
BORI					5+7+1	2	
TEST	continued on hext page						

SC	hnabel BORING	t: Calvert Cliff Calvert Cou	s Nucle inty, Ma	ar Pow aryland	er Plant	B	oring Number: ontract Number: 0	B-320
Schnat	bel Engineering LUG						heet: 5 of 5	
DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL		DATA	TESTS	REMARKS
124.5	ELASTIC SILT, fine to medium graine moist, green, with silt, 25-35% fine to coarse shell fragments, HCI+.	ed, MH	-18.1			N =19 REC =18"		
-	dark green.				 	7+8+10 N =18 REC =18"	w=34.1% LL=50 PL=30 *	
132.0 -	CLAYEY SAND, fine to medium grained, moist, dark green.	SC	-25.6					
-					 135-	7+7+9 N =16 REC =18"		
137.0	SILTY SAND, fine to medium grained moist, dark green, 0-10% fine to medium shell fragments.	I, SM	30.6		 140 -	4+6+8 N =14 REC =18"		
- - - -					 	5+6+6 N =12 REC =18"		
	10-30% fine to coarse shell fragments	s.	-43.6		 	5+7+7 N =14 REC =18"	w=37% *	
	BUTTOM OF BORING @ 150.0 FT.							

Schn	chnabel TEST BORING abel Engineering LOG	Project: Ca	alvert Clif alvert Cou	fs Nucle unty, Ma	ar Pow ryland	ver Pla	nt		Boring Contra Sheet:	Number: Ict Number 1 of 5	er: 061200	B-321
Boring	Contractor: CONNELLY AND	ASSOCIATES	INC				Gr	oundw	ater Obs	ervations		
	FREDERICK, MAR	RYLAND					D	ate	Time	Depth	Casing	Caved
Boring	Foreman: D. Bender			Enco	untere	d	6	6/5		13.5'		
Drilling	Fauinment: CME 550			Start	of day	у	6	6/6		15.0'		
Schnat	el Representative: K. Bell											
Dates	Started: 6/5/06 Finished: 6	/6/06										
Locatio	n: Northing: 217152.5 ft Easting: 960333.2 ft											
Ground	Surface Elevation: 70.7 (feet)			1		1						
DEPTH (FT)	STRATA DESCRIPT	ΓΙΟΝ	CLASS.	ELEV. (FT)	WL	DEP	S. TH	AMPLI D	NG ATA	TEST	S F	REMARKS
0.5	ROOTMAT AND TOPSOIL.		80	70.2				1.2.2				
	 CLAYEY SAND, trace gravel medium grained, moist, yello brown, trace wood fragments 	, fine to wish s. trace root	30			-		N =4 REC =	=12"			
	fragments.	,				-	-	3+3+4 N =7	ļ	w=9.7	%	
	-					-	ЦШ	REC =	=17"			
4.5	POORLY GRADED SAND W	/ITH SILT, st.	SP-SM	- 66.2		- 5 -		7+7+8	5	w=7.4	%	
	_ orangeish brown, trace root f	ragments.				-	-	N =15 REC =	=18"	*		
7.0	SANDY LEAN CLAY, moist,	orangeish	CL	63.7		-		2.2.2		w=25.2	%	
		agments.				-		N =4 REC =	=18"	*		
10.0 -	-			60.7								
	SANDY FAT CLAY, moist, or brown and gray.	rangeish	СН			_	-10	1+1+2	2	w=36.2	%	
	_					-	ЧМ	REC =	=18"	PL=20)	
13.0		um	50	57.7	∇	-	-					
000	grained, wet, gray.	um	30		<u> </u>	F	-10	1+2+3	5	w=309	6	
-	_						ЦМ	N =5 REC =	=18"			
	_					-	-					
	_					-	-					
LD.00+	-					-	┤_				0/	
8 000	-					F	-	2+4+7 N =11	,	w=29.7	70	
	-					-20-		REC =	=18"			
	-					-	-					
23.5	I FAN CLAY moist grav		CI	47.2		[RFC =	=18"	w=26.2	%	
			0L			Ē _				LL=4 PL=1	5	
	continued on next pag	ge				-25-						
· L	1			1		1				1		

D	Schna EPTH	bel Engineering LOG		alvert Cou	nty, ivia	iryiand			Contra		
D				1					Sheet	2 of 5	\$120048
	(11)	STRATA DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	DEDT			TESTS	REMARKS
				CL						PP=3.50 tsf	
		_									
	27.0	SILTY SAND, wet, gray.		SM	43.7						
								7 3+4+7	7	w=27%	
	_							N =11	=18"	PL=29	
		_									
	33.0	POORLY GRADED SAND W	ITH SILT,	SP-SM	37.7			7			
		fine to coarse grained, wet, g cementation, platty structure.	ray, strong				2	39+50 N =50)/3")/3" -10"	w=30.9% *	
		_						REC	-10		
		white, with fine to coarse she						15+17	7+31	w=27.1%	
	_	strong.					-40	REC	, =16"		
		-									
		_					 K	7 9+9+7	7	w=26%	
								N =16	; =18"	*	
		-									
3/6/08	47.0		av traco	мц	23.7						
L.GDT		fine to medium shell fragmen HCl reaction weak	ts, 2-5%,								
HNABE							2	4+4 N =4		w=35.1% *	
PJ SC	_						-50-				
& 400.G	50.0	-			10.7						
PT 300	52.0	SILTY SAND, fine to medium wet, light gray and greenish g	grained, Iray,	SM	18.7						
LOG S		contains fine to coarse shell f 20-30%, HCI reaction strong	ragments, , weak				[30+1	I+10	w=25%	
20048 F	_						-55-	REC	=18"	PL=NP	
DG 061		_									
RING L(fine to medium grained, wet,	greenish								
EST BOI		gray, trace fine to coarse she continued on next pag	ll Ie								

Γ	6	TEST	Project: Ca	alvert Cliff	s Nucle	ar Pow	er Plant		Boring I	Number:	B-321
	Schnat	BORING	Ca	alvert Cou	nty, Ma	ryland			Contrac	t Number: 06	6120048
E							9		G	5 01 5	
'	(FT)	STRATA DESCRIPT	ION	CLASS.	(FT)	WL	ОЕРТН		та	TESTS	REMARKS
		fragments, 5-10%, HCI react	ion	SM						w-07.40/	
	-	moderate.						4+4+6 N =10		w-27.470 *	
	_						- <u>60</u>	REC =1	8"		
	_										
	-									w-27.6%	
	_	gray and white, trace fine to c shell fragments, 20-30%, HC	coarse I reaction					8+9+14 N =23		w-27.070 *	
	_	strong, strong cementation.					-65-U	REC =1	8"		
	_										
	_										
	-							4		w=28.4%	
	-	2-5%, HCl reaction weak.	gments,					4+7+9 N =16		*	
	_						70- <u> </u> []	REC =1	8"		
	_										
	_										
									A "	w=28.5%	
	-								.4	LL=NP PL=NP	
							75			PP=3.75 tsf	
	-										
	_										
	_										
								4+6+12		w=34.9%	
80							F 7 X	N =18	8"	*	
F 3/6/	_						-80		0		
- GD -	-										
NABE	-	fine to medium grained wet	light grav								
SCH	_	and white, contains fine to me	edium shell								
GPJ	_	strong, strong cementation.	cuon					22+16+	9	w=20.6%	
& 400							L of M	N =25 REC =1	7"	~	
300							-85				
LdS D	-										
PLO	-	fine to medium arained, wet	gray, trace								
20048	-	fine to medium shell fragmen	ts, 2-5%,				-				
061	_	HOHEAUUUH WEAK.					L 10	6+12+1	8	w=31%	
POG	_						L	N =30 REC =1	8"		
RING							-90				
ST BO	-	continued on next pag	e								
Ш											

BORNS Calvert County, Maryland Contract Number: 00120048 DEPTH STRATA DESCRIPTION CLASS ELEX (FT) WL SAMPLING DEPTH TESTS REMARKS 92.0 CLAVEY SAND, wet, gray, trace fine to reaction weak. SM -21.3 -44.9-12 w-36.9% 97.0 SILTY SAND, wet, greenish gray. SM -28.3 -49.9% REC = 18" w=36.1% 97.0 SILTY SAND, wet, greenish gray. SM -28.3 -49.9% resc = 18" w=36.1% 97.0 SILTY SAND, wet, greenish gray. SM -28.3 -49.9% resc = 18" w=36.1% 97.0 SILTY SAND, wet, greenish gray. SM -28.3 -49.9% resc = 18" w=36.1% -100-1 REC = 18" x=20.8% resc = 18" w=36.1% m=36.1% -101-1 REC = 18" s+49.9% s+49.9% s=4.4% m=4.6% m=4.6% -105-1 Fig.11 N = 21.8% s+4.9% s=4.6% m=4.6% resc = 18" m=4.6% -115-1 -115-1		TEST Pro	oject: Calvert Clif	fs Nucle	ar Pow	er Plant	Вс	oring Number:	B-321
DEPTH (FT) STRATA DESCRIPTION CLASS. ELEV (FT) WL SAMPLING DEPTH TESTS REMARKS 92.0 CLAYEY SAND, wet, gray, trace fine to madum shall fragments, 2-5%, HCI residon weak. SM -21.3 -1 -469+12 w=36.5%, HCI = 16° w=36.9%, LL=59 97.0 SILTY SAND, wet, greenish gray. SM -28.3 -1 -1 449+13 N=22 w=36.1%, N=22 w=36.1%, N=22 97.0 SILTY SAND, wet, greenish gray. SM -28.3 -1 -1 -1 w=36.1%, N=22 w=36.1%, N=22 w=36.1%, N=22 -100-12 N=22, N=22, N=22, N=22	Schnal	bel Engineering LOG	Calvert Co	unty, Ma	aryland		Co	ontract Number: 0 neet: 4 of 5	6120048
92.0 CLAYEY SAND, wet, gray, trace fine to reaction weak. SC -21.3 -44.9+12 w=36.9% 97.0 SIL TY SAND, wet, greenish gray. SM -28.3 -44.9+13 w=36.1% 97.0 SIL TY SAND, wet, greenish gray. SM -28.3 -44.9+13 w=36.1% 100 SIL TY SAND, wet, greenish gray. SM -28.3 -44.9+13 w=36.1% 105 ft:Resumed Drilling on 6/606 @ -106 7*10+13 w=38.2% Resumed Drilling on 6/606 @ 105 ft:Resumed Drilling on 6/606 @ -106 5+7+11 w=32.6% w=34.6% -106 S+4+9 w=34.6% -44.9+15 w=34.6% -106 S+4+9 w=34.6% -44.9+15 w=34.6% -106 S+4+9 w=34.6% -44.9% w=34.6% -106 S+4+9 w=34.6% -44.9% w=34.6% -106 S+8+13 w=34.6% -26.9% -26.9% -106 S+8+13 w=34.6% -26.9% -26.9% -106 S+8+13 w=34.6% -26.9% -26.9% -106 S+8+15 w=43.1% -26	DEPTH (FT)	STRATA DESCRIPTION	CLASS	ELEV. (FT)	WL	S DEPTH		TESTS	REMARKS
92.0 CLAYEY SAND, vet, gray, trace free to reaction weak. SC -21.3 -4+8+12 w=36.9% 97.0 SILTY SAND, wet, greenish gray. SM -26.3 -4+8+12 w=36.1% 97.0 SILTY SAND, wet, greenish gray. SM -26.3 -4+9+13 w=36.1% 106 ft:Resumed Drilling on 6/6/06 @ -4 -4+9+13 w=36.1% -4+9+13 w=59.2% 106 ft:Resumed Drilling on 6/6/06 @ -4 -4 -4+9+13 w=42.6% -4 106 ft:Resumed Drilling on 6/6/06 @ -4 -4 -4 -4 -4 106 ft:Resumed Drilling on 6/6/06 @ -4 -4 -4 -4 -4 106 ft:Resumed Drilling on 6/6/06 @ -4 -4 -4 -4 -4 107 -4 -4 -4 -4 -4 -4 -4 108 ft:Seamed Drilling on 6/6/06 @ -4			SM					<u> </u>	
97.0 SILTY SAND, wet, greenish gray. SM -28.3 -449+12 N + 20 -95-11 w=38.9% L=59 PL=26 97.0 SILTY SAND, wet, greenish gray. SM -28.3 -449+13 N + 22 REC = 18" w=38.1% N + 22 REC = 16" 97.0 SILTY SAND, wet, greenish gray. SM -28.3 -449 REC = 16" w=38.1% REC = 16" 97.0 SILTY SAND, wet, greenish gray. SM -28.3 -449 REC = 16" w=38.2% REC = 16" 97.0 SILTY SAND, wet, greenish gray. SM -28.3 -449 REC = 18" w=38.9% REC = 18" 97.0 SILTY SAND, wet, greenish gray. SM -28.3 -449 REC = 18" w=38.9% REC = 18" 97.15 am -449 REC = 18" w=42.6% REC = 18" w=34.6% REC = 18" w=34.6% REC = 18" 98.415 w=43.1% w=39.8% -449 REC = 18" w=39.8%	92.0 -	CLAYEY SAND, wet, gray, trace	fine to SC	21.3					
97.0 SILTY SAND, wet, greenish gray. SM -28.3 	-	reaction weak.					4.9.10	w=36.9%	
97.0 SILTY SAND, wet, greenish gray. SM - 26.3 	-					X	N =20	LL=59 PL=26	
97.0 SILTY SAND, wet, greenish gray. SM 	-					-95-1		*	
97.0 SILTY SAND, wet, greenish gray. SM -28.3 - - 4+9+13 N = 22 REC = 18* w=36.1% -									
Remarks	97.0 -	SILTY SAND, wet, greenish gray.	. SM	26.3					
Remarks	-						4+9+13	w=36.1%	
Remarks -00-2 -00-1 W=59.2% 105 thResumed Drilling on 6/6/06 @ -05 F+10+13 W=59.2% 7.15 am -05 F7+11 W=42.6% -105 F7+11 N=18 W=42.6% -105 F7+13 N=18 -105 F7+11 N=4.6% -105 F7+11 N=4.6% -105 F7+11 N=4.6% -116 F7+13 N=34.6% -116 F7+13 N=30.8% -120 F7+13 N=30.8% -120 F7+13 N=30.8% -120 F7+15 N=43.1%	-						N =22 REC =18"	*	
Remarks 105 ft:Resumed Drilling on 6/6/06 @ 105 ft:Resumed Drilling on 6/6/06 @ 7:15 am 105 ft:Resumed Drilling on 6/6/06 @ 106 ft:Resumed Drilling on 6/6/06 @ 110 ft:Resumed Drilling on 6/6/06 @ 1110 ft:Resumed Drilling on 6/6/06 @	_								
Remarks 105 ft:Resumed Drilling on 6/6/06 @ 105 ft:Resumed Drilling on 6/6/06 @ 7:15 am 105 ft:Resumed Drilling on 6/6/06 @									
Remarks 105 ft.Resumed Drilling on 6/6/08 @ 105 ft.Resumed Drilling on 6/6/08 @ 7:15 am 9 105 ft.Resumed Drilling on 6/6/08 @ 105 ft.Resumed Drilling									
Remarks 105 ft:Resumed Drilling on 6/6/06 @ 105 ft:Resumed Drilling on 6/6/							7+10+13	w=58.2%	
Remarks 105 ft:Resumed Drilling on 6/6/06 @ 6/6/06 @ 7:15 am - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - <td>_</td> <td></td> <td></td> <td></td> <td></td> <td>Ň</td> <td>N =23 REC =17"</td> <td>*</td> <td>Resumed Drilling on</td>	_					Ň	N =23 REC =17"	*	Resumed Drilling on
7.15 am 7.15 am 7.1	_	Remarks 105 ft:Resumed Drilling on 6/6/06	6@						6/6/06 @ 7:15 am
$ \begin{array}{c} & & & & & \\ & & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & & \\ & & & & \\ & & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & $	_	7:15 am							
continued on next page continued on next page w=43.1% w=43.1%	_								
- - <td>-</td> <td></td> <td></td> <td></td> <td></td> <td>L -M</td> <td>5+7+11</td> <td>w=42.6%</td> <td></td>	-					L -M	5+7+11	w=42.6%	
continued on next page	_					<u>–110–</u> Ш	N =18 REC =18"		
$ \begin{array}{c} $									
$ \begin{bmatrix} -1 \\ -1 \\ -1 \\ -1 \\ -1 \\ -1 \\ -1 \\ -1$									
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $									
$ \begin{array}{c} -115 \\ -115 \\ -16 \\ -16 \\ -17 \\ -1$						M	5+4+9 N =13	w=34.6%	
$ \begin{array}{c} & & & & \\ & & & & \\ & & & & \\ & & $						-115-0	REC =18"		
$\begin{bmatrix} -1 \\ -1 \\ -1 \\ -1 \\ -1 \\ -1 \\ -1 \\ -1 $	-								
$\begin{bmatrix} - & - & - & - & - & - & - & - & - & - $	-								
- - - - 5+8+13 w=39.8% - - - - - - - - - - - - - - - -	- 80 								
						M	5+8+13 N =21	w=39.8%	
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -						-120- /]	REC =18"		
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>									
- -									
continued on next page								W-13 10/	
		continued on next page					6+9+15	vv-43.170	

	hnabal	TEST	Project:	Calvert Cliff	s Nucle	ar Pow	er Plant		Borin	g Number:	B-321
Schnal	bel Engineering	BORING LOG		Calvert Cou	inty, Ma	iryland			Contr Sheet	act Number: 0 : 5 of 5	6120048
DEPTH (FT)	STRAT	A DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	DEPTH	SAMPI	ING	TESTS	REMARKS
125.0 —	SANDY ELASTI	C SILT, wet,	greenish	SM MH	-54.3		-125-	N =2 REC	4 =18"	*	
_	fragments, 5-10 moderate	%, HCl react	ion								
-							 130	8+11 N =2 REC	+15 6 =17"	w=49.5% *	
-							 	7 5+7+	11	w=42.3%	
-								N =1 REC	8 =18"	*	
-	ELASTIC SILT, trace sand	moist, greeni	sh gray,					6+7+	11 8 -18"	w=39.7%	
-							140 ^L 		-10		
							 [145	7+10 N =2 REC	+14 4 =18"	w=60.2%	
ABEL GUI 3/6/05											
	BOTTOM OF B	DRING @ 15	0.0 FT.		-79.3			7+12 N =2 REC	+15 7 =18"	w=66% *	
		_									

Schnal	TEST Project: C bel Engineering LOG	alvert Clit alvert Co	ffs Nucle unty, Ma	ar Pow ryland	ver Pla	nt	Boring Contra Sheet:	Number: ct Number 1 of 4	er: 061200	B-322
Boring C	Contractor: UNI-TECH DRILLING					Gr	oundwater Obs	ervations		
	MALAGA, NEW JERSEY					D	ate Time	Depth	Casing	Caved
Boring F	oreman: J. Blemings		Enco	untere	d	5	/18	10.5'		
Drilling	Method: Mud Rotary									
Drilling E	Equipment: CME-750 (ATV)									
Schnabe	el Representative: K. Megginson									
Dates \$	Started: 5/18/06 Finished: 5/18/06									
Location	i: Northing: 217170.03 ft Easting: 960202.65 ft									
Ground	Surface Elevation: 89.9 (feet)									
DEPTH (FT)	STRATA DESCRIPTION	CLASS	ELEV. (FT)	WL	DEP	S. TH	AMPLING DATA	TEST	S R	EMARKS
0.4	Forest litter, rootmat and topsoil.	CM	89.5			M	1+2+2			
-	SILTY SAND, fine to medium grained, moist, brown.	5101			-	ď	N =4 REC =14"			
							0.0.4			
					-	HXI	3+3+4 N =7			
					F	ЦШ	REC =13"			
					_ 5 -					
	stratified brown and light brown					M	3+3+4 N -7	*		
-					F	HΜ	REC =10"			
7.0 -	CLAVEY SAND find to opprove argined	80	82.9		-	-				
_	moist, brown, contains fat clay pockets.	30				Π	2+4+4			
						IŴ	N =8 RFC =12"			
9.5			80.4		F	1				
-	SILTY SAND, fine to medium grained, wet, dark vellowish brown, contains lean	SM		∇	-10-	-				
_	clay lenses (<1/8 inch).			<u> </u>	L	-M	5+8+10			
						IM	N =18 REC =15"			
						1				
					-	1_				
-	dark yellowish brown and yellowish				F	-M	4+4+5			
-	brown.				15	M	N =9 REC =13"			
					-15-					
_					-	1				
3 17.0 -	OLAVEN CAND find to medium		72.9		F	-				
5	grained, wet, mottled dark yellowish	SC								
	brown and light gray.									
-					-	HXI	N = WOH/18"			
					-20-	ЦЦ	REC =18"			
8					L					
22.0 -	SANDY LEAN CLAY, fine to medium,	CL	67.9		F	-				
3 -	moist, gray, trace mica.				F	-				
					L	\square	2+2+4			
						M	N =6 REC =18"			
	continued on next page				-25-					

	hnabel TEST	Project:	Calvert Cliff	s Nucle	ar Pow	er Plant	В	oring Number:	B-322
Schnat	bel Engineering LOG		Calvert Cou	nty, Ma	iryland		C S	ontract Number: 0 heet: 2 of 4	06120048
DEPTH (FT)	STRATA DESCRIPT	ΓΙΟΝ	CLASS.	ELEV. (FT)	WL	S DEPTH		TESTS	REMARKS
	with fine to medium sand.		CL			 	REC =28'	PP=2.75 tsf	*Shelby tube sampler push from 28.5 to 30.5 ft.
32.0 -	FAT CLAY, moist, light greer and gray, trace fine to mediu and mica, contains silty sand	nish gray m sand I lenses.	СН	57.9		 35	2+3+5 N =8 REC =18'		
37.0 -	SILTY SAND, fine to mediun wet, gray.	n grained,	SM	52.9		 40	REC =27'	PP=NP tsf	*Shelby tube sampler push 38.5 from 39.9 ft.
42.0 -	ELASTIC SILT, moist, light g gray, trace fine sand, and mi	reenish ca.	MH	47.9		 45-	5+7+9 N =16 REC =18'	PP=3.50 tsf	
47.0 -	CLAYEY SAND, fine to medi grained, moist, gray, trace m	um ica.	SC	42.9		 50 	REC =10'	PP=NP tsf	*Shelby tube sampler push from 48.5 to 49.3 ft.
52.0 -	SANDY SILT, fine to mediun gray, trace mica.	n, moist,	ML	37.9		 	19+34+50 N =84/11' REC =17')/5"	*Switched to 3-7/8" O.D. Tri-cone roller bit below 53.5 ft. *Sampler refusal at 54.9 ft. *Difficult to very
57.0 -	SILTY SAND, fine to mediun wet, gray, trace fine to mediu continued on next page	n grained, ım shell ge	SM	32.9					difficult rotary advacement

5	Chnabel BORING	roject: Calvert Cliff Calvert Cou	s Nucle inty, Ma	ar Pow aryland	er Plant	Boring	y Number:	B-322
Schr	abel Engineering LOG		-	-		Sheet:	3 of 4	120040
DEPT (FT)	STRATA DESCRIPTION	N CLASS.	ELEV. (FT)	WL	SAI	MPLING	TESTS	REMARKS
	fragments (±5%), contains black particles (1/16 inch), strong HCI (strong HCI reaction with shell fragments only).	reaction SM			3 3 60	81+50 N =50 REC =10"		from 55.5 to 56 ft. *Moderate to difficult rotary advancement below 57 ft.
62.0	LEAN CLAY, moist, gray, trace f medium sand, and mica, weak H reaction.	fine to CL ICI	27.9		 65	9+7+9 N =16 REC =18"		
	 with fine to medium sand. 				 	8+4+6 V =10 REC =18"		*Moderate to difficult rotary
72.0	CLAYEY SAND, fine to medium grained, moist, greenish gray, tra to coarse shell fragments (±5%) contains indurated clayey sand I from 73.5 to 73.8 ft, strong HCI r contains strongly cemented sand from 73.8 to 74 ft.	ace fine , layers reaction. d layer	17.9		 	50/5" 1 =50/5" REC =5"		advancement below 72 ft (moderate to strong rig chatter). *Very difficult rotary advancement from 75 to 76 ft (strong rig chatter).
78.5	 SILTY SAND, fine to medium gr wet, gray, few fine to coarse she fragments (±10%), strong HCI re 	ained, SM ell eaction.	- 11.4		 	′+9+11 V =20 REC =18"		*Moderately difficult rotary advancement from 76 to 78 ft. *Very difficult rotary advancement from 78 to 78.5 ft (strong rig chatter).
	 dark greenish gray, little fine to o shell fragments (±20%), modera reaction. 	coarse ite HCI			 85 	2+13+13 N =26 REC =18"		
	 light greenish gray, trace fine to shell fragments (±5%), weak HC reaction. 	medium X			 90 - 7 F	/+11+14 √=25 REC =18"		
	continued on next page							

	hashal	TEST	Project: (Calvert Cliff	s Nucle	ar Pow	er Plant		Boring	g Number:	B-322
Schnat	Del Engineering	BORING LOG	(Calvert Cou	nty, Ma	ryland			Contra Sheet	act Number: 0 : 4 of 4	6120048
DEPTH (FT)	STRATA	DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	DEPTH	SAM		TESTS	REMARKS
				SM				·	27177		
92.0 -	CLAYEY SAND, fi	ne to medi	um .	SC	-2.1						
-	grained, wet, gray	, trace mica	i, weak								
-								5+ N:	7+14 =21		
							-95- ^l		C =18"		
-											
_											
_								_			
-	blueish gray and g coarse shell fragm	ray, trace f ents (±5%)	ine to					4+	5+11 =16		
100.0 —	BOTTOM OF BOF	RING @ 10	0.0 FT.		-10.1		-100- ^l		C =18"		
2											

Groundwater User USE Groundwater User User User User User User User Us	Schnal	hnabel TEST BORING bel Engineering LOG	Project: C	Calvert Clif Calvert Co	fs Nucle unty, Ma	ar Pow ryland	ver Pla	nt		Boring Contra Sheet:	I Number: Ict Number 1 of 7	er: 0612	B-323
Image Set Number Mark Area, NEW JERSEY Boring Foreman: J. Blemings Date Time Depth Cesing Caved Boring Foreman: J. Blemings Diffing Method: Mud Rotary Billing Method: Mud Rotary 0.0° 18.5 0.0° Dates Started 70%6 Fillshowskie: 94000.056 ft Start of Day 68 0.0° 0.0° Dates Started 67/06 Fillshowskie: 94000.056 ft Start of Day 6/13 0.0° 0.0° Ground Surface Elevation: 107.5 (feet) Start of Day 6/13 POORLY GRADED SAND, fine grained, most, orange. SP Milling Method: Multiplication of the start of	Boring		NG					Gro	oundw	ater Obs	ervations		
Boring Foreman: J. Bismings Encountered 67 18.8 0.0° Drilling Equipresentative: M. Aries Start of Day 6/8 0.0° 0.0° Start of Day 6/8 0.0° 0.0° Start of Day 6/8 0.0° 0.0° Start of Day 6/8 0.0° 0.0° Cottion: Northing: 21702:73 ft Easting: 980060.88 ft 5 5 5 0.0° 0.0° Cound Surface Elevation: 107.5 (feet) CLASS ELEV WL SAMPLING TESTS REMARKS POORLY GRADED SAND, fine grained, moist, orange SP-SM 10.0 5 17.49.8 N=4 N=4 10.0 POORLY GRADED SAND WITH SILT, fine to modium grained, moist, yellow. SP-SM 10.0 5 17.49.8 N=18 V=19.2% 15.45° orange mud return 17.0 SILTY SAND, fine to coarse grained, wet, orange and brown, with silt, 1/8° SM 90.5 V 10.20/20.20 N=11.2% 15.45° orange mud return 2		MALAGA, NEW JE	RSEY					D	ate	Time	Depth	Casin	g Caved
Start of Day Start of Day Start of Day Gr - 0.0° 0.0° Dates Start of Day 6/8 0.0° 0.0° Dates Start of Day 6/8 0.0° 0.0° Location: Northing: 21702: 79 ft Easting: 90000.06 ft Start of Day 6/13 0.0° 0.0° Ground Surface Elevation: 107.5 (feet) CLASS ELEV WL SAMPLING TESTS REMARKS POORLY GRADED SAND, fine grained, moist, orange SP 10.0	Boring F	oreman: J. Blemings			Enco	untere	d	6	6/7		18.5'	0.0'	
Driming Equipment: Current Values Stantable Representative: NAME Start of day $6/12$ - 20.0° 0.0° $-$ Dates Start of day $6/12$ - 20.0° 0.0° $-$ Dates Start of Day $6/13$ - 0.0° 0.0° $-$ Dependence Start of Day $6/13$ - 0.0° 0.0° $-$ Continued on rest page Start of Day $6/13$ - 0.0° 0.0° $-$ Dependence Start of Day $6/13$ - 0.0° 0.0° $-$ Dependence Start of Day $6/13$ - 0.0° 0.0° $-$ Dependence Start of Day $0/13$ CLASS. ELEV WL SAMPLING TESTS REMARKS Dependence Start of Day $0/13$ 0.10° 0.10° 0.10° 0.0° <					Start	of Da	у	6	6/8		0.0'	0.0'	
Dates Start of: 6/13 0.0' 0.0' Location: Northing: 217027.97 ft Start of Day 6/13 0.0' 0.0' Ground Surface Elevation: 107.5 (feet) Image: Control of the prained, moist, orange. SP V SAMPLING TESTS REMARKS 4.5 POORLY GRADED SAND, fine grained, moist, orange. SP Image: Control of the prained, moist, orange. SP Image: Control of the prained, moist, orange. V SP-SM Image: Control of the prained, moist, orange. V SP-SM Image: Control of the prained, moist, orange. V=10.0 Image: Control of the prained, moist, prained, mo	Schnabe	Representative: M. Arles			Start	of da	у	6	/12		20.0'	0.0'	
Location: Northing: 217027.97 ft Easting: 960060.86 ft Ground Surface Elevation: 107.5 (feet) DEPTH FT STRATA DESCRIPTION CLASS. ELEV. POORLY GRADED SAND, fine grained, most, orange 4.5 POORLY GRADED SAND WITH SILT, POORLY GRADED SAND WITH SILT, SP-SM 10.0 POORLY GRADED SAND WITH SILT, SP-SM 10.0 POORLY GRADED SAND WITH SILT, SP-SM 10.0 CLASS. ELEV. WL SAMPLING DEPTH DATA TESTS REMARKS D-2' drag bit 10.4 SP POORLY GRADED SAND WITH SILT, SP-SM 10.0 POORLY GRADED SAND WITH SILT, SP-SM 10.0 CLAYEY SAND, fine to coarse grained, wet, orange and brown, with silt, 1/8' color lenses. CLAYEY SAND, fine to coarse grained, wet, orange and red, 1/4' pink clay lenses. CLAYEY SAND, fine to coarse grained, wet, orange and red, 1/4' pink clay lenses. CLAYEY SAND, fine to coarse grained, wet, orange and red, 1/4' pink clay lenses. CLAYEY SAND, fine to coarse grained, wet, orange and red, 1/4' pink clay lenses. CLAYEY SAND, fine to coarse grained, wet, orange and red, 1/4' pink clay lenses. CLAYEY SAND, fine to coarse grained, wet, orange and red, 1/4' pink clay lenses. CLAYEY SAND, fine to coarse grained, wet, orange and red, 1/4' pink clay lenses. CLAYEY SAND, fine to coarse grained, wet, orange and red, 1/4' pink clay lenses. CLAYEY SAND, fine to coarse grained, wet, orange and red, 1/4' pink clay lenses. CLAYEY SAND, fine to coarse grained, wet, orange and red, 1/4' pink clay lenses. CLAYEY SAND, fine to coarse grained, wet, orange and red, 1/4' pink clay lenses. CLAYEY SAND, fine to coarse grained, wet, orange and red, 1/4' pink clay lenses. CLAYEY SAND, fine to coarse grained, wet, orange and red, 1/4' pink clay lenses. CLAYEY SAND, fine to coarse grained, wet, orange and red, 1/4' pink clay lenses. CLAYEY SAND, fine to coarse grained, wet, orange and red, 1/4' pink clay lenses. CLAYEY SAND, fine to coarse grained, wet orange and red, 1/4' pink clay lenses. CLAYEY SAND, fine to coarse grained, wet orange and red, 1/4' pink clay clayer	Dates \$	Started: 6/7/06 Finished: 6/	/14/06		Start	of Da	v	6	/13		0.0'	0.0'	
Ground Surface Elevation: 107.5 (feet) DEPTH (FT) STRATA DESCRIPTION (FT) CLASS. ELEV (FT) WL SAMPLING DEPTH TESTS REMARKS 0-4' drag bit	Location	: Northing: 217027.97 ft Easting: 960060.86 ft					,						
DEPTH (FT)STRATA DESCRIPTIONCLASS ELEV. (FT)WL SAMPLING DEPTH TESTS REMARKS POORLY GRADED SAND, fine grained, moist, orangeSP14143 14143 $N=4$ REC =16"0-4" drag bit4.5Fine to coarse, with gravel.103.0	Ground	Surface Elevation: 107.5 (feet)			_		1						
$ \begin{array}{c} $	DEPTH (FT)	STRATA DESCRIPT	ION	CLASS	ELEV. (FT)	WL	DEP	S/ TH	AMPLI D	ING ATA	TEST	s	REMARKS
$4.5 - \frac{1}{10.0} = \frac{1}{10.0} \frac{1}{10.0} + \frac{1}{10.0} \frac{1}{10.0} = \frac{1}{10.0} \frac{1}{10.0} + \frac{1}{10.$		POORLY GRADED SAND, fi moist, orange.	ne grained,	SP			-	-	1+1+3 N =4 REC =	3 =16"		0	-4' drag bit
4.5 POORLY GRADED SAND WITH SILT. SP-SM moist, orange 10.0 POORLY GRADED SAND WITH SILT. SP-SM 10.0 POORLY GRADED SAND WITH SILT. SP-SM 10.0 SILTY SAND, fine to coarse grained, wet, orange and brown, with silt, 1/8" color lenses. 22.0 CLAYEY SAND, fine to coarse grained, wet, orange and red, 1/4" pink clay lenses. continued on next page SC so SC CLAYEY SAND, fine to coarse grained, wet, orange and red, 1/4" pink clay lenses. $continued on next pageSCCLAYEY SAND, fine to coarse grained, wet, orange and red, 1/4" pink clay CLAYEY SAND, fine to coarse grained, wet, orange and red, 1/4" pink clay CLAYEY SAND, fine to coarse grained, wet, orange and red, 1/4" pink clay CLAYEY SAND, fine to coarse grained, wet, orange and red, 1/4" pink clay CLAYEY SAND, fine to coarse grained, wet, orange and red, 1/4" pink clay CLAYEY SAND, fine to coarse grained, SC CLAYEY SAND, fi$	-	fine to coarse, with gravel.					-		3+3+6 N =9 REC :	6 =13"	w=5% *	Ď	
$10.0 - \frac{1}{10.0} + \frac{1}{10.0$	4.5	POORLY GRADED SAND W moist, orange	/ITH SILT,	SP-SM	- 103.0		- 5 -		7+9+8 N =17 REC =	} =12"			
$10.0 - \frac{POORLY GRADED SAND WITH SILT,}{fine to medium grained, moist, yellow.} = 97.5$ $97.5 - 10 - \frac{1}{200} = 7+9+11$ $REC = 15^{\circ}$ $- \frac{1}{200} = \frac{10}{REC} = 15^{\circ}$ $- \frac{1}{200} = \frac{10}{REC} = 15^{\circ}$ $- \frac{1}{200} = \frac{10}{REC} = 15^{\circ}$ $- \frac{10}{REC} = 16^{\circ}$	_						_		9+11- N =21 REC :	⊦10 =14"	w=139	%	
$17.0 = \frac{1}{22.0} = \frac{1}{22.0$	10.0 —	POORLY GRADED SAND W fine to medium grained, mois	/ITH SILT, t, yellow.	SP-SM	97.5				7+9+ N =20 REC =	11) =15"			
17.0 $\begin{bmatrix} 17.0 \\ SILTY SAND, fine to coarse grained, wet, orange and brown, with silt, 1/8" SM color lenses. \\ \begin{bmatrix} 22.0 \\ CLAYEY SAND, fine to coarse grained, wet, orange and red, 1/4" pink clay lenses. \\ \begin{bmatrix} CLAYEY SAND, fine to coarse grained, wet, orange and red, 1/4" pink clay lenses. \\ \begin{bmatrix} CLAYEY SAND, fine to coarse grained, wet, orange and red, 1/4" pink clay lenses. \\ \begin{bmatrix} CLAYEY SAND, fine to coarse grained, wet, orange and red, 1/4" pink clay lenses. \\ \begin{bmatrix} CLAYEY SAND, fine to coarse grained, wet, orange and red, 1/4" pink clay lenses. \\ \begin{bmatrix} CLAYEY SAND, fine to coarse grained, wet, orange and red, 1/4" pink clay lenses. \\ \begin{bmatrix} CLAYEY SAND, fine to coarse grained, wet, orange and red, 1/4" pink clay lenses. \\ \begin{bmatrix} CLAYEY SAND, fine to coarse grained, wet, orange and red, 1/4" pink clay lenses. \\ \begin{bmatrix} CLAYEY SAND, fine to coarse grained, wet, orange and red, 1/4" pink clay lenses. \\ \begin{bmatrix} CLAYEY SAND, fine to coarse grained, wet, orange and red, 1/4" pink clay lenses. \\ \begin{bmatrix} CLAYEY SAND, fine to coarse grained, wet, orange and red, 1/4" pink clay lenses. \\ \begin{bmatrix} CLAYEY SAND, fine to coarse grained, wet, orange and red, 1/4" pink clay lenses. \\ \begin{bmatrix} CLAYEY SAND, fine to coarse grained, wet, orange and red, 1/4" pink clay lenses. \\ \begin{bmatrix} CLAYEY SAND, fine to coarse grained, wet, orange and red, 1/4" pink clay lenses. \\ \begin{bmatrix} CLAYEY SAND, fine to coarse grained, wet, orange and red, 1/4" pink clay lenses. \\ \begin{bmatrix} CLAYEY SAND, fine to coarse grained, wet, orange and red, 1/4" pink clay lenses. \\ \begin{bmatrix} CLAYEY SAND, fine to coarse grained, wet, orange and red, 1/4" pink clay lenses. \\ \begin{bmatrix} CLAYEY SAND, fine to coarse grained, wet, orange and red, 1/4" pink clay lenses. \\ \begin{bmatrix} CLAYEY SAND, fine to coarse grained, wet, orange and red, 1/4" pink clay lenses. \\ \begin{bmatrix} CLAYEY SAND, fine to coarse grained, wet, orange grained, wet, orange grained, grained,$							- - 15-	-	6+9+9 N =18)	w=16.2 *	%	5-45' orange nud return
17.0 SILTY SAND, fine to coarse grained, wet, orange and brown, with silt, 1/8" color lenses. 22.0 CLAYEY SAND, fine to coarse grained, wet, orange and red, 1/4" pink clay lenses . <i>Continued on next page</i> 22.0 CLAYEY SAND, fine to coarse grained, <i>CLAYEY SAND</i> , fine to c	_						F	-					
$22.0 \xrightarrow{\text{CLAYEY SAND, fine to coarse grained,}}_{\text{continued on next page}} \text{SC} 85.5 \xrightarrow{\text{CLAYEY SAND, fine to coarse grained,}}_{\text{REC = 17"}} \text{SC} S$	17.0 -	SILTY SAND, fine to coarse g wet, orange and brown, with color lenses	grained, silt, 1/8"	SM	90.5		-	_					
22.0 CLAYEY SAND, fine to coarse grained, wet, orange and red, 1/4" pink clay lenses . 						<u> </u>	20-		10+20 N =40 REC :)+20) =17"	w=11.9 LL=NI PL=NI *	% > -	
22.0 CLAYEY SAND, fine to coarse grained, wet, orange and red, 1/4" pink clay lenses . 	-						F	$\left \right $					
$\begin{bmatrix} - & - & - & - & - & - & - & - & - & - $	22.0 -	CLAYEY SAND, fine to coars wet, orange and red, 1/4" pin lenses.	e grained, k clay	SC	- 85.5		-		0.0.5				
		continued on next pag	je				- 25-		2+2+2 N =4 REC	<u>-</u> =16"			

	-	TEST Project:	Calvert Cliff	s Nucle	ar Pow	er Plant	Boring Number:	B-323
Sch	inal	bel Engineering LOG	Calvert Cou	inty, Ma	ryland		Contract Number: 0 Sheet: 2 of 7	06120048
DEP (FT	ГН)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL		NG TESTS	REMARKS
			SC					
	-							
27.0) –	POORLY GRADED SAND, fine to coarse grained wet orange trace	SP	80.5				
	_	gravel.				F	w=17.6%	
						N =19	*	
	_							
32.0) –		0.5.014	75.5				
	_	POORLY GRADED SAND WITH SILT, fine to coarse grained, wet, orange	SP-SM					
	_					7+8+9 N = 17		
						REC =	13"	
	_							
	-							
	_						w=20.7%	
	-					N = 24	17"	
42.0				65.5				
42.0	, _	SILT, wet, gray, with sand.	ML	05.5				
	_					8+9+9		
	_	mottied grayish orange.				45 N = 18 REC =	18"	45-70' grayish
	_							
^{80/9/2} 47.0) –	SANDY FAT CLAY, fine to medium,	СН	60.5				
EL.GD1	-	moist, dark gray.					w-29.1%	
HNAB	-						LL=50 PL=17	
DS [di						-50-10 100-	*	
& 400.0	-							
1 300								
LOGS	_					3+3+4		
20048 F						-55-N REC =	18"	
G 0612	_							
NGLO	_	no sand, very stiff.						
- BORI	-	continued on next page						
E		······································						

Γ		TEST	Project: Ca	alvert Cliffs	s Nuclea	ar Pow	er Plant	В	Boring Number:	B-323
	Schna	bel Engineering LOG	Ca	alvert Cou	nty, Ma	ryland		C	Contract Number: 0	6120048
╞	DEPTH				ELEV.		S			
	(FT)	STRATA DESCRIPTIO	ON	CLASS.	(FT)	WL	DEPTH	DAT	A TESTS	REMARKS
				СН				1+4+6	w=35.1%	
	-						- 1	N =10	LL=65 PL=22	
							-60-		*	
	-									
	-									
	-									
	-	with sand.					M	6+10+12 N =22		
	_						-65- []	REC =18	"	
	-									
	67.0 -	CLAYEY SAND fine to mediur	m	SC	40.5					
	-	grained, moist, green.								
	-						M	8+12+12 N =24	w=29% LL=46	
	_							REC =18	" PL=24	70' greenish
	71.0 -			CD CM	36.5					71' harder
	-	fine to coarse grained, moist, d	lark	37-311						anning
	-	fragments, strong HCl reaction	I.							
	-						0	34+50/3"		
							-75-	REC =6"		
	_									
	770 -				30.5					
	-	FINE TO MEDIUM SANDY LE CLAY, moist, green, with fine to	AN o coarse	CL						
	_	shell fragments, strong HCl rea 60-70% shell frag.	action,				M	5+5+7		
6/08		trace sand, no shells.					Ň	N =12 REC =18		
DT 3/										
BEL.G	_									
CHNA	-	moist, green, contains fine to c shell fragments, moderate HCl	oarse reaction.							
GPJ S	-							RFC =16	w=36.2%	
\$ 400.0	-								LL=42 PL=20	
T 300 8							85		*	
G SP	-									
48 PLC	-									
61200-	88.0 -	SILTY SAND, fine to medium g	grained,	SM	19.5			20100.47	-	
0 90	-	fragments, strong HCl reaction	, 50-60%				X	N =48	D	
RINGL		snen nag .					-90-	KEC =18		
ST BOF	-	continued on next page								
ЩГ										

ſ		2	TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant		Boring Number:	B-323
	Schn	nak	bel Engineering LOG	C C	alvert Cou	nty, Ma	iryland			Contract Number: 0 Sheet: 4 of 7	6120048
	DEPTH (FT)	н	STRATA DESCRIPT	ΓΙΟΝ	CLASS.	ELEV. (FT)	WL	S		G TESTS	REMARKS
ł					SM			DEPTH	DAI	A	
		-									
		-								w=26.3%	
		-						F -1X	24+16+3 N =49	3 UL=NP PI =NP	
		_						-95-0	REC = 10	*	
			30-40% shell frag.						4+8+11		
			0						N =19 REC =18	3"	
	102.0			// T LL OU T	05.014	5.5					
		_	fine to medium grained, mois	st, green,	SP-SM						
		_	strong HCl reaction, 20-30%	shell frag.				M	8+12+14	w=28.6%	
		_						-105-0	REC =18	B" PL=NP	
		-									
	107.0	+	SILTY SAND, fine to medium	n grained,	SM	0.5					
		-	moist, green, trace fine to me fragments, moderate HCI rea	edium shell action,							
		-	0-5% snell frag.					X	3+6+9 N =15	511	1101
		-									sandy drilling
3/08											
BDT 3/6								$[]_{M}$	4+7+12	w=30.2%	
ABEL.G								_ ₁₁₅	N =19 REC =18	3"	
SCHN		_									116' hard layer
0.GPJ		_	with fine to operate shall from	monto							snells
00 & 40		_	strong HCl reaction, 70-80%	shell frag.							118 5 switch to
SPT 3		-						<u> </u>	50/5" N =50/5"	,	roller bit 118.5 ria
3 PLOG		_						-120-	REC =5"		chatter
120046		+									
0G 06		-									
RING L		+							10.50/5	w=19.4%	
TEST BO		-	continued on next pag	ge					10+50/5		

	TEST	Project: Cal	vert Cliffs	s Nucle	ar Pow	er Plant		Boring	g Number:	B-323
Schna	bel Engineering LOG	Cal	vert Cou	nty, Ma	ryland			Contra Sheet:	act Number: 00	6120048
DEPTH (FT)	STRATA DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	DEPTH	SAMPL	ING DATA	TESTS	REMARKS
	_		SM			-125-	⊠ N =5 REC	0/5" =11"	*	125' start of day 6/8/06
	-									
	-									
	trace fine to coarse shell frag moderate HCI reaction, 0-10 frag.	ments, ⁄⁄6 shell				[_130_	8+15 N =4 REC	+25 0 =18"		
. .	with fine to coarse shell fragn strong HCl reaction, 10-20%	nents, shell frag.				 135	9+12 N =2 REC	+15 7 =18"	w=33.1% *	
	-									
138.0 - -	POORLY GRADED SAND W fine to medium grained, mois trace fine to medium shell fra weak HCl reaction, 0-5% she	ITH SILT, t, green, gments, II frag.	SP-SM	-30.5		 140	6+9+ N =2 REC	20 9 =18"		
	_									
142.0 -	SANDY ELASTIC SILT, fine f grained, moist, green, trace f medium shell fragments, wea reaction, 0-5% shell frag.	o medium ne to k HCl	MH	-34.5		 	7+10 N =2 REC	+13 3 =18"	w=48.3% LL=73 PL=38 *	144.5 switch to drag bit
L.GDT 3/6/08										
GPJ SCHNABE							10+1 N =2 REC	2+15 7 =18"		
PT 300 & 400.	-									
90 153.0 ·	SILT with sand fine to mediu	marained	MI	-45.5						
G LOG 06120048	moist, green, with fine to neath fragments, strong HCI reaction shell frag.	n, 60-70%				 _155	11+1 N =4 REC	7+27 4 =18"	w=31.3% LL=39 PL=30 *	
LEST BORIN	continued on next pag	e								

	6	TES	T Project: (Calvert Cliff	s Nucle	ar Pow	er Plant	E	Boring Number:	B-323
	Schnal	bel Engineering LOC	NG (Calvert Cou	inty, Ma	ryland			Contract Number: 0	6120048
D	EPTH (FT)	STRATA DESCR		CLASS.	ELEV. (FT)	WL	S		TESTS	REMARKS
				ML			DEPTH	DAT	A	
	-	trace fine to coarse shell 0-10% shell frag.	fragments,				 160-	6+10+12 N =22 REC =18	, n	
1	- 63.0 -	FINE TO MEDIUM SAND	OY ELASTIC	MH	-55.5					
	-	SILT, moist, green.						7+12+16 N =28 REC =18	w=54.2%	
	670 -				59 5					
	-	SILTY SAND, fine to mec moist, green, with fine to fragments, strong HCI rea shell frag.	lium grained, coarse shell action, 10-20%	SM			 170	7+8+13 N =21 REC =18	, n	
	_									
1	72.0 -	SANDY FAT CLAY, mois sand, moderate HCI reac	t, green, with tion.	СН	-64.5					
	-						 175-	6+8+13 N =21 REC =18	w=44% LL=97 PL=31 *	
	-									
x	_									
	79.2 ⁻ 	SAND, fine to coarse gra grayish green, with silt.	ined, moist,	SP-SM	-71.7		∎ 180	REC =0"		180' Start of day 6/12/06
	820 -				74 5					
0.6PJ	_	FAT CLAY, trace sand,	moist, green.	СН						
0 & 40	_						M	8+11+16	w=68.3%	
SP1 30	_						- <u>185</u> -0	REC =18	PL=33	
PLOG	_									
120048	-						$\left - \right $			
90 90	-									
RING	-							7+11+12 N =23		
		continued on nex	t page				-190-	KEC =18		

50	hnabel	TEST BORING	Project:	Calvert Cliff	s Nucle ntv. Ma	ar Pow	er Plant		Borin	g Number:	B-323
Schna	bel Engineering	LOG			nty, ma	iryiana			Sheet	act Number: 0	6120048
DEPTH (FT)	STRAT	A DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	DEPTI	SA H∣	AMPLING DATA	TESTS	REMARKS
-				СН							
- 195.0 — -	SANDY ELASTI medium shell fra frag.	IC SILT, trace agments, 0-5°	e fine to % shell	MH	-87.5		 195 	X	7+11+14 N =25 REC =18"	w=58.1% LL=116 PL=36 *	
	BOTTOM OF B	ORING @ 20	0.0 FT.		-92.5		 200	X	7+11+12 N =23 REC =18"	w=52.9% LL=97 PL=62 *	
BEL.GUI 20000											

Schnat	TEST Project: C bel Engineering LOG C	Calvert Clif	ffs Nucle unty, Ma	ar Pov Iryland	ver Pla	nt	_	Boring Contra Sheet:	Number: Inct Number 1 of 4	er: 061200	B-324
Borina C	contractor: CONNELLY AND ASSOCIATES	S, INC				Gr	oundwat	er Obs	ervations		
	FREDERICK, MARYLAND					D	ate 1	Гime	Depth	Casing	Caved
Boring F	oreman: W. Wolfe		Enco	untere	d	7	/13		27.0'		
Drilling N	Method: Mud Rotary		Start	of Da	у	7	/14		25.0'		
Schnabe											
Dates S	Started: 7/12/06 Finished: 7/14/06										
Location	: Northing: 216906.4 ft Easting: 960114.44 ft										
Ground §	Surface Elevation: 105.2 (feet)										
DEPTH (FT)	STRATA DESCRIPTION	CLASS	ELEV. (FT)	WL	DEP	S TH		G FA	TEST	S F	REMARKS
0.6	ROOTMAT AND TOPSOIL.		104.6								
	POORLY GRADED SAND WITH SILT, fine to coarse grained, moist, yellowish brown, trace gravel.	SP-SM			-	10	1+2+1 N =3 REC =1(0"			
_	yellowish brown and reddish brown				_	-M	2+2+2				
-					-	μ	REC =1:	3"			
_					- 5 -	M	2+2+3				
-					-	-M	N =5 REC =12	2"			
-					-		2+4+4				
							N =8 REC =1	5"			
_					_	JX	1+1+3 N =4	4 11			
12.0 -	OU TV CAND fine to secret strained	CM	93.2		-		REC =1	I			
-	SILTY SAND, fine to coarse grained, moist, orangeish brown, trace gravel.	SIVI			-	-M	4+4+5				
-					Ļ	ЦМ	REC =10	6"			
_					-15-		3+1+5				
-					Ļ	- X	N =9	6"			
17.0 -			88.2		Ļ			0			
	fine to medium grained, moist, yellowish	SP-SM			Ļ	M	5+7+7				
	gravel.				Ļ	40	REC =14	0"			
19.5	SILTY SAND, fine to coarse grained,	SM	85.7		-20-		0.4				
	moist, orangeish brown and yellowish brown, trace gravel.				Ļ		3+4+7 N =11	-"			
22.0			83.2		Ļ		REC =1	D			
	CLAYEY SAND, fine to medium grained, wet, orangeish brown and reddish brown.	SC			-	-0	5+4+5 N =9				
-					-		REC =9'	•			
	continued on next page				-25-						

6	TEST Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	Boring Number:	B-324
Schnat	bel Engineering LOG	alvert Cou	inty, Ma	ryland		Contract Number: 0 Sheet: 2 of 4	6120048
DEPTH	STRATA DESCRIPTION	CLASS	ELEV.	wi	SAMPLIN		REMARKS
(FT)		OLAGO.	(FT)		DEPTH DA	TA	
		SC			N 3+2+2		
				∇	REC =	10"	Resumed drilling on
	Remarks			-			7-13-06 @ 7:00
_	7:00 am				N =5	11"	am
_						11	
30.0 -	POORLY GRADED SAND WITH SILT,	SP-SM	75.2		-30-3+4+5		
-	fine to medium grained, wet, orangeish brown.				N =9 REC =	7"	
-							
_					4+6+7		
_						10"	
34.5	CLAYEY SAND, fine to coarse grained,	SC	70.7		-35-0	_	
_	wet, orangeish brown and yellowish brown.				0+6+10)	
					<u> </u> REC =	12"	
	orangeish brown and reddish brown				3+5+7		
38.5	trace gravel	СН	66.7		N =12	18"	
_	SANDY FAT CLAY, moist, orangeish brown and reddish brown, iron staining,						
	_ strong cementation.				-40-1+2+3		
-	9.39				– – – 📙 N =5 REC =	18"	
-							
_					2+2+3 N =5		
-						18"	
					-45-0 2+2+2		
_					N =5	4.0"	
000						18"	
					N =6 REC =	18"	
	black cemented sand lenses						
						18"	
52.0 -	SILTY SAND, fine to medium grained,	SM	53.2				
	wet, gray.				⊢ – 10+18- N =46	+28	
			50 7			18"	
	FAT CLAY, moist, gray, trace sand.	СН	50.7		-55-		
						18"	
					3+4+7		
	continued on next page						

		TES	T Project: (Calvert Cliff	s Nucle	ar Pow	er Plant		Boring Numbe	er:	B-324
	Schna	bel Engineering LOC	NG (G	Calvert Cou	inty, Ma	aryland			Contract Numb Sheet: 3 of 4	ber: 06	6120048
		STRATA DESCR	RIPTION	CLASS.	ELEV.	WL	s	AMPLIN	G TES	TS	REMARKS
	(11)			СН	(1)		DEPTH	DA1	ΓΑ		
	-	-						REC =1	8"		
	_	-					-60-	REC =2	1" PP=>4	.5 tsf	
	-	-									
		-			10 7						
	62.5	SANDY LEAN CLAY, we	t, gray.	CL	42.7		17	4+5+7 N =12			
		-			40.7		F -147	REC =1	8"		
	64.5	SANDY FAT CLAY, mois	t, light gray.	CH	40.7		-65-	5+6+10			
	-	-					X	N =16 REC =1	8"		
	67.0 ·	SILTY SAND, fine to mee	lium arained.	SM	38.2						
	-	wet, gray, strong cementa	ation.				17	13+36+5 N =86/1	50/4" 0"		
	-	-						REC =1	6" 2"		
	_	-					70	_			
		-									
		-									
	-	gray and white, with fine fragments, 50-60%, HCI	to coarse shell reaction				N	23+16+2 N =42	26		
	74.5	strong			30.7			REC =1	8"		
		SANDY ELASTIC SILT, w white, contains fine to coa	wet, gray and arse shell	MH	50.7		-75-	4+7+9			
	-	fragments, 30-40%, HCI strong.	reaction				K	N =16 REC =1	8"		
	-	greenish gray, trace sanc medium shell fragments,	l, trace fine to 2-5%, HCl				IX	4+5+6 N =11			
8	-	reaction weak						REC =1	8"		
- 3/6/0	_						-80-	4+5+6			
EL.GD1	-	-					F - Å	N =11 REC =1	8"		
HNAB	-										
PJ SC	-	trace organic matter					F -1X	3+3+4 N =7	0"		
400.G	84.5			014	20.7			REC = 1	8		
300 &		wet, greenish gray and w	hite, with fine	SM			-85-	50/5"			
G SP1	-	strong cementation, HCI	reaction					REC =5			
48 PLC	-		all fragmanta					10,12,1	10		
61200	-	40-50%, strong cementa	ition, HCl				f 1 X	N =25	8"		
DOG (-								-		
DRING								9+19+50 N =69/10	0/4" 0"		
EST BC	-	continued on nex	t page				$ \begin{bmatrix} 1 \\ 1 \end{bmatrix} $		-		
≓I											

	TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant		Boring	Number:	B-324
Schnal	BORING	C	alvert Cou	nty, Ma	ryland			Contra	ct Number: 06	6120048
DEDTU								G	4 01 4	
(FT)	STRATA DESCRIPT	TION	CLASS.	ELEV. (FT)	WL			тл	TESTS	REMARKS
			SM				REC =1	6"		
-	contains fine to coarse shell	fragments,				$\vdash \dashv \nabla$	5+7+9			
_	30-40%						REC =1	8"		
						05				
	contains fine to coarse shell	fragments,					5+6+11 N =17			
-		ale				F 70	REC =1	8"		
-										
-	gray and white, contains fine	to coarse				N	9+13+10 N =29	6		
						L 10	REC =1	8"		
						_100				
							4+6+10 N =16			
101.5		1 5 ET		3.7		עך ק	REC =1	8"		
		1.511.								

Schna	chnabel TEST BORING	Project:	Calvert (Calvert (Cliffs Coun	Nuclea ty, Ma	ar Pow ryland	er Plar	nt		Boring Contra	Number:	er: 0612	B-325
Conna								Gra	hundw	ator Obe	orvations		
Boring	Contractor: CONNELLY AND		ES, INC.				1		ato	Timo	Donth	Casing	Caved
Boring F	FREDERICK, MAR	TLAND	-		Enco	untere	d	5	/23		23.5'		
Drilling	Method: Mud Rotary		ŀ										
Drilling	Equipment: CME-550X (ATV)		-										
Schnabe	el Representative: K. Bell												
Dates	Started: 5/23/06 Finished:	5/23/06											
Location	n: Northing: 216948.98 ft Easting: 960549.73 ft		-										
Ground	Surface Elevation: 85.0 (feet)												
DEPTH (FT)	STRATA DESCRIPT	ION	CLAS	ss. ^E	ELEV. (FT)	WL	DEP [.]	S/ ⊺H	AMPLI D	NG ATA	TEST	s	REMARKS
0.6	ROOTMAT AND TOPSOIL.				84.4								
-	POORLY GRADED SAND W fine to coarse grained, moist, brown, trace root fragments,	/ITH SILT, yellowish trace	SP-S	SM	04.4			-	1 REC :	=12"			
-	orangeish brown.				01.0			-	3+2+2 N =4 REC =	2 =18"			
4.0 -	SILTY SAND, fine to coarse moist, orangeish brown and i brown trace gravel	grained, reddish	SM	1	81.0		- 5 -		2+2+3	2			
-	biowii, trace gravei.							-8	N =5 REC =	, =18"			
-	orangeish brown and gray, fi	ne to							3+2+3	3			
-	medium grained.							Ш	N =5 REC =	=17"			
-	trace root fragments.						-10-		3+3+3	3			
-								Ň	N =6 REC =	=11"			
-	gray and orangeish gray.								3+3+3	3		C	olor change in
							15	<u> </u>	N =6 REC =	=17"		tu or br	b from angeish own to gray at
								$\left \right $				14	4.5 ft.
6 17.0 -	FAT CLAY, moist, gray and g gray, trace sand.	greenish	СН	1	68.0								
× -								M	2+3+3 N =6	3			
	-						-20-		REC :	=18"			
-						$\underline{\nabla}$							
	wet.								2+3+4 N =7 REC =	l =18"			
	continued on next pag	ge					-25-		-				
BORING Schnabel Engineering BORING LOG Calvert County, Maryland Contract N Sheet: 2 d DEPTH (FT) STRATA DESCRIPTION CLASS. ELEV. (FT) WL SAMPLING DEPTH DEPTH DATA	lumber: 06120048 of 4 TESTS REMA	ARKS											
---	--	----------											
DEPTH (FT) STRATA DESCRIPTION CLASS. ELEV. (FT) WL SAMPLING DEPTH DATA	TESTS REMA	ARKS											
СН													
SILTY SAND, fine to medium grained, SM wet, gray and black.													
$-30 - \square REC = 16"$													
32.0 FAT CLAY, moist, gray, trace sand. CH 53.0													
X =17 REC =18"													
37.0 CLAYEY SAND, fine to medium SC 48.0													
_ grained, moist, greenish gray and gray.													
- $ -$													
42.0 43.0 43.0	Harder dr	drilling											
moist, gray, trace fine to medium shell fragments (5-10%), HCI reaction weak.	at 42 it.												
model model <t< td=""><td></td><td></td></t<>													
To REC =12"													
trace fine to coarse shell fragments (50-60%), HCI reaction strong.													
¹ ¹													
57.0 SANDY ELASTIC SILT, wet, gray and MH 28.0													
greenish gray, trace line to medium continued on next page													

BURNO Clavert County, Maryland Contract Number: 6:12048 Sheet: S of 4 Sheet: S of 4 BETH STRATA DESCRIPTION CLASS, Weak. shell fragments (2-5%), HCl reaction MH shell fragments (2-5%), HCl reaction MH grand, well light gray and greenish grand, well gray and greenish gray, trace file to coarse shell fragments (20-30%), HCl reaction SK grand, well gray and greenish grand, well gray and greenish gray, trace file to coarse shell fragments (-5%), HCl reaction SM file to medium grained, trace file to coarse atell fragments (-5%), HCl reaction moderate. SM file to medium grained, trace file to coarse atell fragments (-5%), HCl reaction moderate. SM file to medium grained, trace file to medium shell fragments (-5%), HCl reaction moderate. SM file to medium grained, trace file to medium shell fragments (-5%), HCl reaction weak. MH state file to medium shell fragments, 		test	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant		Boring I	Number:	B-325
DEPTH (FT) STRATA DESCRIPTION CLASS. ELEV (FT) WL SAMPLING DETH TESTS REMARKS abeli fragments (2-5%). HCI reaction weak. MH	Schna	bel Engineering LOG	C	alvert Cou	nty, Ma	iryland			Contrac Sheet: 3	t Number: 06 3 of 4	6120048
(r) Detrift DATA Data shell fragments (2-5%), HCI reaction MH weak. MH classes Set and grained, (2-5%), HCI reaction fragments (2-5%), HCI reaction MH classes Set and grained, (2-5%), HCI reaction fragments (2-5%), HCI reaction SC grained, wet, light gray and greenish gray, trace fine to coarse shell fragments (10-20%), HCI reaction fragments (2-5%), HCI reaction fragments (15-25%), HCI reaction	DEPTH	STRATA DESCRIPT		CLASS.	ELEV.	WL	S	AMPLIN	G	TESTS	REMARKS
Brief ragination (2-5%), Pick reaction Min 92.0 CLAYEY SAND. fire to medium grained, well, light gray and greenish gray, trace fine to coarse shell fragments (2-30%), HCI reaction SC 23.0 -	(FT)		no o oti o n		(FT)		DEPTH	DA	ТА		
62.0 CLAYEY SAND, fine to medium grained, wei, light gray and greenish grained, wei, light gray and greenish grained, wei, light gray and greenish grained, wei, light gray, tace fine to coarse shell fragments (20-30%), HCI reaction 23.0 23.0 -		weak.	reaction	MH			M	2+4+6			
62.0 CLAYEY SAND, fine to medium grained, wet, light gray and greenish grained, wet, gray and greenish gray, trace fine to coarse shell fragments (10-20%). 23.0 23.0	_						<u>60</u>	REC =1	6"		
62.0 CLAYEY SAND, fine to medium grained, well light gray and greenish gray, trace fine to coarse shell moderate. 23.0 - <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>60.5 ft.</td></t<>											60.5 ft.
$\begin{array}{c} CLAYEY SAND, the to medium figure and greenish gray and greenish gray index (het is to coarse shell fragments (2-05%), HCI reaction moderate. \\ \hline \\ $	62.0 -				23.0						
gray, lazer minibility, licereaction moderate. 38+10+12 REC = 18" 67.0 SILTY SAND, fine to coarse grained, wet, gray and greenish gray, trace fine to coarse self fragments (10-20%), HCI reaction moderate. SM 18.0		grained, wet, light gray and g	lreenish	30							
67.0 SILTY SAND, fine to coarse grained, well, gray and greenish gray, frace fine to coarse set lift fragments (-5%), HCI reaction moderate. fine to medium grained, trace fine to medium shell fragments, (-5%), HCI reaction weak. 87.0 SANDY ELASTIC SILT, wet, gray and while, trace fine to coarse shell moderate. 87.0 SANDY ELASTIC SILT, wet, gray and while, trace fine to coarse shell moderate. 87.0 SANDY ELASTIC SILT, wet, gray and while, trace fine to coarse shell moderate. 87.0 SANDY ELASTIC SILT, wet, gray and while, trace fine to coarse shell moderate. 87.0 SANDY ELASTIC SILT, wet, gray and while, trace fine to coarse shell moderate. 87.0 SANDY ELASTIC SILT, wet, gray and while, trace fine to coarse shell moderate. 87.0 SANDY ELASTIC SILT, wet, gray and moderate. 87.0 SANDY ELASTIC SILT, wet		fragments (20-30%), HCl rea	action				M	36+10+	12		
67.0 SILTY SAND, fine to coarse grained, wet, gray and greensh gray, trace fine to coarse shell fragments (10-20%), HCI reaction moderate. SM 18.0 -	-						<u>65</u>	REC =1	8"		
67.0 SILTY SAND, fine to coarse grained, wet, gray and greenish gray, trace fine to coarse shell fragments (10-20%), HCI reaction moderate. SM 18.0 - <td></td>											
$ \begin{array}{c} $	67.0 -		arainad	SM	18.0						
$ \frac{1}{100} = 1$		wet, gray and greenish gray,	trace fine	5101							
a -70 REC = 18" - -70 REC = 18" - -70 REC = 18" - -71 -71 - -71 <		HCl reaction moderate.	, 20,0),				M	7+7+7 N =14			
Big Honoreau Fine to medium grained, trace fine to medium shell fragments (<5%), HCl reaction weak.		-					<u>–70</u>	REC =1	8"		
87.0 SANDY ELASTIC SILT, wet, gray and white, trace fine to coarse shell fragments (15-25%), HCl reaction moderate. MH -2.0 -4 4+7+10 87.0 SANDY ELASTIC SILT, wet, gray and moderate. MH -2.0 -4 5+5+7											
Bige formed and the process of the proces of the process of the process of the process of the p											
Big -											
87.0 SANDY ELASTIC SILT, wet, gray and white, trace fine to coarse shell fragments (15-25%), HCl reaction MH -2.0 -4 -4 -75 MREC = 17" 87.0 SANDY ELASTIC SILT, wet, gray and white, trace fine to coarse shell fragments (15-25%), HCl reaction MH -2.0 -4 -4 -75 MREC = 18"							M	7+10+9 N =19			
$87.0 = \frac{1}{2}$ $87.0 = \frac{3}{2}$ $87.0 = \frac{3}{2}$ $87.0 = \frac{3}{2}$ $\frac{3}{2}$ $\frac{3}{2}$ $\frac{1}{2}$ $\frac{1}{2$	-	_					-75-0	REC =1	7"		
87.0	-										
87.0 SANDY ELASTIC SILT, wet, gray and white, trace fine to coarse shell fragments (15-25%), HCl reaction moderate. MH -2.0 -4.7 6+7+10 N = 17 87.0 SANDY ELASTIC SILT, wet, gray and white, trace fine to coarse shell fragments (15-25%), HCl reaction MH -2.0 -4.7 5+5+7 Note: Note: Note: -4.7 -4.7 5+5+7 Note: Note: -4.7 -4.7 -4.7 -4.7 Note: -4.7 -4.7 -4.7 -4.7 -4.7 -4.7 Note: -4.7<	-										
87.0 SANDY ELASTIC SILT, wet, gray and white, trace fine to coarse shell fragments (15-25%), HCl reaction moderate. MH -2.0 -4.7 5+5+7 87.0 SANDY ELASTIC SILT, wet, gray and white, trace fine to coarse shell fragments (15-25%), HCl reaction MH -2.0 -4.7 5+5+7 87.0 SANDY ELASTIC SILT, wet, gray and white, trace fine to coarse shell fragments (15-25%), HCl reaction MH -2.0 -4.7 5+5+7		-									
$87.0 = \frac{\text{SANDY ELASTIC SILT, wet, gray and white, trace fine to coarse shell fragments (15-25%), HCl reaction moderate.} MH = 2.0 = 1000000000000000000000000000000000000$	-	fine to medium grained, trace medium shell fragments (<59	e fine to %), HCl				10	6+7+10 N =17			
$87.0 \frac{1}{2.5\%, HCl reaction weak.}$ $87.0 \frac{1}{2.5\%, HCl reaction weak.}$ $RT.0 \frac{1}{2.5\%, HCl reaction weak.}$	- 3/6/05	reaction weak.					-80-0	REC =1	7"		
$87.0 = \frac{1}{2-5\%, HCl reaction weak.}$	-	-									
87.0 SANDY ELASTIC SILT, wet, gray and white, trace fine to coarse shell fragments (15-25%), HCl reaction moderate. MH -2.0 4+7+10 N=17 REC =18" 5+5+7 N=12 REC =18"	- NABE	-									
87.0 SANDY ELASTIC SILT, wet, gray and MH vhite, trace fine to coarse shell fragments (15-25%), HCl reaction moderate. SANDY ELASTIC SILT, wet, gray and MH vhite, trace fine to coarse shell fragments (15-25%), HCl reaction moderate. SANDY ELASTIC SILT, wet, gray and MH vhite, trace fine to coarse shell fragments (15-25%), HCl reaction moderate.		-									
87.0 SANDY ELASTIC SILT, wet, gray and MH ragments (15-25%), HCl reaction moderate.	- 100.GF	trace fine to medium shell fra 2-5%, HCl reaction weak.	igments,				M	4+7+10 N =17			
87.0 SANDY ELASTIC SILT, wet, gray and MH white, trace fine to coarse shell fragments (15-25%), HCI reaction moderate. 	- 2008	-					-85-0	REC =1	8"		
87.0 SANDY ELASTIC SILT, wet, gray and white, trace fine to coarse shell fragments (15-25%), HCl reaction moderate.	- SPT										
white, trace fine to coarse shell fragments (15-25%), HCl reaction moderate. 	ŏ 87.0 -	SANDY ELASTIC SILT, wet,	gray and	MH	-2.0						
$\begin{bmatrix} 3 & & & & & \\ 9 & & & & \\ 9 & & & & \\ 9 & & & &$	- 120048	white, trace fine to coarse sh fragments (15-25%), HCI rea	ell ction								
	- 00	moderate.					M	5+5+7 N =12			
							-90- L	REC =1	8"		
continued on next page	- BOF	continued on next pag	ge								

Sc	hnabel	TEST BORING	Project: C	Calvert Cliff Calvert Cou	s Nucle nty, Ma	ar Pow	er Plant		Boring	Number:	B-325
Schnat	oel Engineering	LOG				,			Sheet:	4 of 4	5120048
DEPTH (FT)	STRATA	DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	DEPTI	SAN H	IPLING DATA	TESTS	REMARKS
				MH							
92.0 - - - -	SILTY SAND, fine wet, light gray and shell fragments (3 moderate.	e to medium d, trace fine 30-40%), HC	grained, to coarse Cl reaction	SM	-7.0		 95	8- N R	+6+8 =14 EC =18"		
-											
-											
-	gray, trace fine to fragments (2-5%)) medium sh), HCl reacti	ell ion weak.		15.0			6- N R	+10+9 =19 EC =16"		
100.0	BOTTOM OF BO	RING @ 10	0.0 FT.		-15.0		-100-1				
				1							

Schna	TEST Project: C bel Engineering LOG C	Calvert Cl Calvert Co	iffs Nucle ounty, Ma	ar Pow ryland	ver Pla	nt	Boring Contra Sheet:	Number: Inct Number 1 of 4	er: 061200	B-326
Boring (Contractor: UNI-TECH DRILLING					Gr	oundwater Obs	ervations		
	MALAGA, NEW JERSEY					D	ate Time	Depth	Casing	Caved
Boring F	Foreman: J. Blemings		Enco	untere	d	Ę	5/4	13.5'		
Drilling	Equipment: CME-750 (ATV)	-								
Schnabe	el Representative: K. Megginson									
Dates	Started: 5/4/06 Finished: 5/4/06									
Location	n: Northing: 216859.22 ft Easting: 960652.25 ft									
Ground	Surface Elevation: 103.1 (feet)				1					
DEPTH (FT)	STRATA DESCRIPTION	CLASS	S. ELEV. (FT)	WL	DEP	S. TH	AMPLING DATA	TEST	S F	REMARKS
0.5	Forest litter, rootmat and topsoil.	05.01	102.6			M	2+2+2			
-	POORLY GRADED SAND WITH SILT, fine to medium grained, moist, light brown, contains root fragments.	SP-SN	//			- M	N =4 REC =18"			
_	fine to coarse grained.				L.		3+2+4			
						IŴ	N =6 RFC =13"			
-					F .					
-	fine to medium grained, stratified light brown and light orangeish brown.				- 5 -	-	4+4+3 N =7 REC =11"	w=8.2	%	
-	fine to coarse grained, yellowish brown and grayish brown, trace fine gravel. fine to medium grained, light orangeish brown below 8.5 ft.						7+6+11 N =17 REC =11"			
-	fine to coarse grained.				- 10- -		10+9+10 N =19 REC =12"			
	fine to medium grained, wet, light yellowish brown.			Ţ	_ 15		5+5+6 N =11 REC =11"	w=12.2	%	
	orangeish brown and dark brown.				 20		10+12+8 N =20 REC =10"			
23.5	SILTY SAND, fine to coarse grained,	SM	- 79.6			- - - M	5+2+2	w=22.7	%	
	wet, light orangeish brown and light grayish brown. <i>continued on next page</i>				-25-	_ Ŭ	N =4 REC =16"	*		

	TEST Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	Boring Number:	B-326
Schna	bel Engineering LOG	alvert Cou	nty, Ma	iryland		Contract Number: 0 Sheet: 2 of 4	6120048
DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL	SAMPLIN DEPTH DA	NG TESTS	REMARKS
28.5		SM	74.6		 		
-	wet, gray, contains silt pockets and mica.	GL			$ \begin{array}{c} - & - \\ N & = 3 \\ - & - \\ - & $	18"	*Shelby tube
-	moist, with sand.				■ REC =: 35 ■ 	24" w=27.6% LL=41 PL=16 PP=2.00 tsf	sampler push from 33.5 to 35.5 ft.
38.5	FAT CLAY, moist, gray, trace fine to medium sand and mica.	СН	64.6		2+4+5 N =9 REC =	18"	*Shelhy tube
43.5	ORGANIC CLAY, moist, gray, trace fine to medium sand and mica, contains fine to medium clayey sand pockets.	OH	59.6		REC =: 45∎ 	24" w=33.9% LL=63 PL=22 PP=2.25 tsf	sampler push from 43.5 to 45.5 ft.
48.5 200 & 400.6FJ 2	FAT CLAY, moist, gray and light gray, trace fine to medium, mica and organic matter (±1%).	СН	54.6			18"	
100 2013 100 2014 8-100 2013 100 2014 8-100 2013 100 2013 100 2013 100 2013 100 2013 100 2013 100 2013 100 2013	SANDY LEAN CLAY, fine to medium, wet, gray, trace mica.	CL	49.6		REC = 55 ■ 	24" PP=2.25 tsf	*Shelby tube sampler push from 53.5 to 55.5 ft.
	continued on next page						

20		Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	В	oring Number:	B-326
Schna	bel Engineering LOG						C S	ontract Number: 0 heet: 3 of 4	6120048
DEPTH (FT)	STRATA DESCRIPT	ΓΙΟΝ	CLASS.	ELEV. (FT)	WL	S DEPTH	AMPLING	TESTS	REMARKS
			CL				17+8+28	PP=2.00 tsf	
59.5	SILTY SAND, fine to medium moist, gray, trace mica, conta cemented sand pockets.	n grained, ains	SM	43.6		60 	N =36 REC =16"		
- 63.5 -	POORLY GRADED SAND W fine to medium grained, mois	/ITH SILT, it, gray	SP-SM	39.6		 ⊠	50/3" N =50/3" REC =1"		
- - 68.5 -	SILTY SAND, fine to medium wet, gray, trace fine to mediu	n grained, Im shell	SM	- 34.6		 	50/5" N =50/5"		
-	little fine to coarse shell fragr (±25%), contains clayey sand	nents d pockets.					19+24+23 N =47 REC =12"		
- - - - -	moist, light gray, mostly mod cemented sand, weak HCl re	erately action.				 	50/3" N =50/3" REC =4"		*Rotary advancement considerably slower below 78.5 ft (Moderately difficult rotary advancement). *Rotary
006 SPT 300 & 400.00PJ 300 	wet, oliveish gray and gray, t coarse shell fragments (±5% HCl reaction.	race fine to), strong				 85	23+13+50 N =63/10" REC =14"	//4"	advancement comparatively easier from 81 to 83 ft; moderately difficult rotary advancement below 83 ft.
	CLAYEY SAND, fine to medi grained, wet, gray, trace fine shell fragments (±5%), strong reaction.	um to coarse g HCl ge	SC	14.6		 - 90 -	9+7+12 N =19 REC =18"	,	*Switched to 3-7/8" 0.D. Tri-cone roller bit below 88 ft.

	hnabal	TEST	Project:	Calvert Cliff	s Nucle	ar Pow	er Plant		Boring	Number:	B-326
Schnal		BORING LOG		Calvert Cou	nty, Ma	iryland			Contra	ct Number: 06	6120048
DEPTH					ELEV.			SAMPLIN	IG		
(FT)	STRAT	A DESCRIPT	ION	CLASS.	(FT)	WL	DEPTH	DA	ТА	TESTS	REMARKS
				SC							
-											
93.5					9.6			7			
-	wet, gray, trace	he to medium fine to mediu	grained, m shell	SM)	(/+/+12 N =19	2		
	fragments (±5%), strong HCl	reaction.				-95] REC ='	18"		
-											
-											
-											
-	SILTY SAND, fir	ne to medium	grained,				10	6+8+12	2		
100.0	(±1%), weak HC	Tine shell frag	Iments		3.1		_100-1	REC ='	16"		
	BOTTOM OF BO	ORING @ 10	0.0 FT.								
00/0/0											
ADEL											
PD .											
& 400											
500											
70 PL											
90-											
6											

Schnal	bel Engineering	Calvert Co	ounty, Ma	iryland	/er Pla	ii it	Bo Co She	ring Nu ntract eet: 1	umber: Numbe of 5	er: 061200	B-32
Borina C		SOCIATES INC				Gr	oundwater (Observ	ations		
Joining C	FREDERICK, MARYI	_AND				D	ate Tim	ne C	Depth	Casing	Caved
Boring F	oreman: D. Bender		Enco	untere	d	5	/25		28.0'		
Drilling I	Method: Mud Rotary		Stort	ofda		5	/26		20 01		
Drilling E	Equipment: CME-550	_	Start	u u ua	У	5	/20	· ·	30.0		
Schnabe	el Representative: K. Bell										
Dates \$	Started: 5/25/06 Finished: 5/2	6/06									
_ocation	n: Northing: 216865.7 ft Easting: 960573.37 ft										
Ground	Surface Elevation: 86.9 (feet)				1						
	STRATA DESCRIPTIO		ELEV.	WL		S	AMPLING		TEST	S F	REMARKS
(F1)			(F1)		DEP	тн	DATA				
0.5	RUUTMAT AND TUPSUIL.	inod SM	86.4		L		2+3+3				
2.0 -	moist, brown and yellowish brow root fragments.	vn, trace	84.9		-	Ň	N =6 REC =11"				
-	POORLY GRADED SAND WITH	H SILT,			F	$-\square$	2+3+3				
_	brown and orangeish brown, tra	ce root			L		N =6 REC =3"				
4.5	tragments.		82.4								
_	CLAYEY SAND, fine to coarse moist, orangeish brown and red	grained, 50 dish			- 5 -	M	3+5+6				
-	brown, trace root fragments.				╞	-W	N =11 REC =12"				
7.0 -			79.9		F	_					
	SILTY SAND, fine to medium gr moist, orangeish brown and gra	ained, SM y.					5+4+3				
_					Γ		N =7				
_					F		REC = 10				
					-10-	-					
_					L	$-\square$	3+2+1				
						Ŵ	N =3 REC =18"				
_					Γ						
13.0 -	CLAYEY SAND, fine to medium	SC	73.9		F						
-	grained, moist, gray.				F	-M	3+4+3 N =7				
					-15-	_0	REC =17"				
-					Γ	7					
17.0 -	SANDY LEAN CLAY, moist, gra	y. CL	69.9		F						
-					╞	-					
_	-				Ļ	$-\square$	2+3+3				
					0	Ŵ	N =6 REC =18"				
							-				
-	-				F						
22.0 -	SILTY SAND fine to medium or	ained SM	64.9		F	-					
_	moist, gray and light gray.				F						
							3+3+4				
-					Γ		N =7				
-	continued on next page				-25-	-12	REC =18"				
					1						

		TEST	Project: Ca	lvert Cliffs	s Nucle	ar Pow	er Plant		Boring Numb	er:	B-327
	Schna	bel Engineering LOG	Ca	Ivert Cou	nty, Ma	ryland			Contract Num Sheet: 2 of 5	iber: 06	6120048
	DEPTH			CI A CO	ELEV.	\ A /I	S			, 0.T.0	DEMADKO
	(FT)	STRATA DESCRIPTIC	N	CLASS.	(FT)	VVL	DEPTH	DAT	A	515	REMARKS
				SM							
	-										
	-					∇					
	-					<u> </u>		4.5.5			
	-						X	4+5+5 N =10			
	-	-					-30-1	REC =18	5		
	-	_									
	-										
	33.0	FAT CLAY, moist, light gray, tra	ace sand.	СН	53.9						
	-	_		-				5+6+4 N =10			
	_						/_/	REC =18	3"		
	-	-									
	37.0	SANDY SILT maint groonigh	arov and	N/I	49.9						
	-	gray.	gray anu								
	-	-					101	4+4+5			
	_						40	N =9 REC =16	6"		
		_									
	-										Llardar drilliag
	43.0				13.0						
	43.0	SILTY SAND, fine to medium g moist, gray and white, trace fine	rained, e to	SM	43.9			27+50			
	-	medium shell fragments, 15-25	%, HCI					N =50 REC =12	2"		
	_	trace fine to medium shell fragr	ments,				-45				
80	-	structure.	.y								Rig chatter
T 3/6/	-										
EL.GD	-	_						40.50			
HNAB	-						🛛	13+50 N =50			
J SC	_	-					-50-	REC =1	I		
400.GI	-										
300 &	-										
SPT	-	-									
PLOG	-	-						50/5" N =50/5"	,		
20048	_						-55-	REC =5"			
G 061	-										
IG LO	57.0	SANDY LEAN CLAY moint an	avand	CI	29.9						
BORIN	-	greenish gray, trace fine to me	ay anu dium	ΟL							
TEST		continued on next page									

	TEST Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	Boring Number:	B-327
Schnal	BORING C	alvert Cou	inty, Ma	iryland		Contract Number: 0 Sheet: 3 of 5	6120048
DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL		NG TESTS	REMARKS
-	shell fragments, 2-5%, HCI reaction weak.	CL			4+4+7 N =11 REC =	18"	Rig chatter
62.0 - - - - - - -	SILTY SAND, fine to medium grained, moist, greenish gray and gray, trace fine to medium shell fragments, 2-5, cementation, HCI reaction strong.	SM	- 24.9		 ⊠ 50/4" N =50/ - 65 - REC = 	4" 2"	
- 	wet, trace fine to coarse shell fragments, 20-30%, HCl reaction moderate.					18"	
					 7+8+8 N =16 REC =	17"	Rig chatter
77.0 - - - - - - - - - - - - - - - - - - -	ELASTIC SILT wet, greenish gray, trace fine to medium shell fragments, 2-5%, HCI reaction weak.	MH	9.9		 	16"	
			0 1		4+4+8 N =12 REC =	18"	
	SILTY SAND, fine to medium grained, wet, greenish gray, trace fine to coarse shell fragments, 20-30%, HCI reaction moderate.	SM	-0.1		 	2 17"	
	continued on next page						

	hashal TEST	Project:	Calvert Cliff	s Nucle	ar Pow	er Plant	E	Boring Number:	B-327
Schnal	BORING	i (Calvert Cou	nty, Ma	iryland			Contract Number: (06120048
Schnal	bei Engineering LOG							Sneet: 4 of 5	
DEPTH (FT)	STRATA DESCRIPT	ΓΙΟΝ	CLASS.	ELEV. (FT)	WL			TESTS	REMARKS
			SM				DAT	A	Rig chatter
	fine to coarse grained, light o	ray and				L Jm	20+17+1	3	
	white, with fine to coarse she	éll í				I IX	N =30	, "	
	cementation, HCI reaction s	trong.				-95-1			
-									Rig chatter
_						L JM	6+15+18		
						I IX	N =33	` "	
						-100-1		,	
-									
_						L JM	6+12+19		
						I IX	N =31 REC =18	{ "	
						-105-1			
107.0 -	FAT CLAY wet greenish gr	av trace	СН	-20.1		-			
-	fine to medium shell fragmer	nts, 2-5%,	011						
_	HCI Teaclion weak.					L JM	5+7+12		
							N =19 REC =18	3"	
-									
-									
_						└	REC =9"	w=44.3%	
						115		PL=24	
								PP=>4.5 tsf	
-									
-									
						L -M	5+7+11		
							N =18 REC =18	3"	
						F 1			
122.0 -	SILTY SAND, fine to coarse	grained,	SM	-35.1		\vdash \dashv			
-	wet, light gray and white, trac coarse shell fragments 30-4	ce fine to				+ +			
-	cementation, HCl reaction st	rong.					50/3"		
	continued on next pa	ge							
							1		

B-327	umber:	Boring		ant	ver Pla	ar Pov	s Nucle	alvert Cliff	Project: Ca	TEST	hal	hnal	
18	Number: 06 ⁻ of 5	Contra Sheet:				ryland	nty, Ma	alvert Cou	Ca	BORING LOG	neering	bel Engine	Schnab
	теете	LING	SAMPLI	S		\A/I	ELEV.	CI 499		DESCRIPT	CTDAT.		DEPTH
IWARNS	12313	DATA	DA	РТН	DEP	VVL	(FT)	CLASS.		DESCRIPT	SIRAI		(FT)
		50/3" C =2"	N =50/ REC =	-	125			SM					
					-125								
				1									
				-	F								
med g on			7		-								-
06 @ am		+11 18	N =18	HX	-								-
		2 =0"	REC =	ъЦЦ	-130								-
				-	F								-
				-	-								-
				-	F								-
		+11	5+6+1	-10	F				t, greenish	rained, mois	o medium g	fine to n	
		C =18"	REC =	5-W	-135				eaction	ace fine to m 2-5%, HCI re	fragments, ti	shell fra	_
					L							weaк.	
	P=>4.5 tsf	2 =10"	RFC =										
					Ē								
)	-140								
				1	F								
				-	F								-
			_		F								-
		+7 12	3+5+7 N =12	HM	F				gments,	ium shell frag tion weak.	fine to meo %, HCl rea	trace fin 5-10%,	-
		2 =18"	REC =	5- Ľ	-145								-
				-	F								-
				-	-								-
				-	F								-
		+10	5+7+1	-10	F								
		2 =18"	REC =	щΜ	-150		-63.1					DOTTO	150.0
									0.0 FT.	RING @ 15		BOLLO	
	'P=>4.5 tsf	+11 +11 +7 =18" +7 +7 +2 =18" +10 +10 +7 =18"	S+6+11 N =18 REC = REC = 3+5+7 N =12 REC = S+7+11 N =17 REC = S+7+11 N =17 REC =				-63.1		t, greenish ledium eaction gments, 0.0 FT.	rained, mois ace fine to m 2-5%, HCI re ium shell fra- ction weak.	fine to medium g fine to med fine to med %, HCl rea	fine to n gray an shell fra weak.	

Schna	bel Engineering	alvert Clif alvert Co	ffs Nucle unty, Ma	ar Pow ryland	ver Plai	nt		Boring Contra Sheet:	Number: act Number 1 of 5	er: 0612	B-328	
Boring	Contractor: CONNELLY AND	ASSOCIATES	INC				Gro	oundw	vater Obs	ervations		
	FREDERICK, MAR	RYLAND					D	ate	Time	Depth	Casing	Caved
Boring I	Foreman: D. Bender			Enco	untere	d	6	/19		9.0'		
Drilling				Start	of day	,	6	/20		9.0'		
Schnab	Equipment: CME-550											
Dates	Started: 6/19/06 Finished: 6	6/20/06										
Location	n: Northing: 216828.86 ft Easting: 960493.21 ft											
Ground	Surface Elevation: 76.3 (feet)											
DEPTH (FT)	STRATA DESCRIPT	ION	CLASS	ELEV. (FT)	WL	DEP	S/ ТН	AMPL D	ING DATA	TEST	s	REMARKS
0.2	ROOTMAT AND TOPSOIL.		SP-SM	76.1			∇	2+1+2	2			
	POORLY GRADED SAND W fine to medium grained, moist brown, trace root fragments.	ITH SILT, t, yellowish						N =3 REC	=16"			
-	-					- ·	-0	2+2+4 N =6 REC	4 =15"	w=4.5 LL=NI PL=NI	% > P	
4.5	SANDY LEAN CLAY, moist, of brown and gray, trace root fra	orangeish agments.	CL	- 71.8		- 5 -		2+3+3 N =6	3			
7.0				00.0				REC	=18"			
7.0 -	SANDY FAT CLAY, trace sar gray.	nd, wet,	СН	- 69.3	Ţ			2+2+2 N =4 REC	2 =18"	w=309	%	
-						- 10-		3+3+4 N =7 REC	4 =18"	w=28.8 LL=59 PL=1	sta % ro 7	art of mud tary drilling
												lor change in
	FAT CLAY, trace sand, moist	, gray.		- 63.3		- 		2+3+4 N =7 REC	4 =18"		m or br	ud tub from angeish own to gray
	-						_					
+ 18.5 	ELASTIC SILT, gray		MH	- 57.8				5+4+6 N =10 REC	6) =18"	w=35.1 LL=64 PL=36 *	% 4 6	
				52.9			-					
	FAT CLAY, dark green		СН	52.0		- ·	-	4+6+9 N =15	9 5 - 10"	w=339 LL=77 PI =29	% 7 8	
	continued on next pag	e				-25-		REC	=18"			

DEPTH (FT) STRATA DESCRIPTION CLASS. ELEV. (FT) WL SAMPLING DEPTH TESTS REN 27.0 CLAYEY SAND, contains shells, moist, gray and black. CH 49.3 -	-J∠O
DEPTH (FT) STRATA DESCRIPTION CLASS. ELEV. (FT) WL SAMPLING DEPTH TESTS REN 27.0 CLAYEY SAND, contains shells, moist, gray and black. CH 49.3 -	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	ARKS
$\begin{array}{c} 27.0 \\ \hline \\ CLAYEY SAND, contains shells, moist, \\ gray and black. \\ \hline \\ \\ 32.0 \\ \hline \\ \\ \end{array} \\ \begin{array}{c} \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\$	
$\begin{array}{c} 27.0 \\ \hline \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ $	
$32.0 \begin{array}{c} & & & \\ & & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & $	
$32.0 - \frac{1}{32.0} = \frac{1}{32.0} + \frac{1}{32.0$	
$32.0 \qquad \qquad$	
32.0 POORLY GRADED SAND WITH SILT, fine to medium grained, wet, gray, contains fine to coarse shell fragments, 30-40%, HCl reaction strong.	drilling
32.0 POORLY GRADED SAND WITH SILT, fine to medium grained, wet, gray, contains fine to coarse shell fragments, 30-40%, HCl reaction strong.	, initing
fine to medium grained, wet, gray, contains fine to coarse shell fragments, 30-40%, HCl reaction strong.	
= = = =	
□ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □	
w=22.6%	
N =50/4" *	
\sim	
fragments, 50-60%.	
47.0 CLAYEY SILT, moist, greenish gray, ML 29.3	
strong. \square strong. \square	
■	
\overrightarrow{a} \overrightarrow{b} \overrightarrow{b} \overrightarrow{b} \overrightarrow{b} \overrightarrow{b} \overrightarrow{b} harder	drilling/
heavy r	g
SILTY SAND, fine to medium grained, SM 24.3	
coarse shell fragments, 25-35%, HCl	
$\begin{bmatrix} 2 \\ 8 \\ 8 \\ 8 \end{bmatrix} = \begin{bmatrix} 2 \\ 8 \\ 8 \\ 8 \\ 8 \\ 8 \\ 8 \\ 8 \\ 8 \\ 8 \\$	
	iter
Image: Second	

Γ	6	hpabol TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	в	oring Number:	B-328
	Schnal	bel Engineering LOG	C	alvert Cou	nty, Ma	iryland		C S	ontract Number: 0 heet: 3 of 5	6120048
ſ	DEPTH (FT)	STRATA DESCRIPT	TION	CLASS.	ELEV. (FT)	WL	S. DEPTH		TESTS	REMARKS
	_			SM			60-	5+5+8 N =13 REC =18'	,	
	61.0 -	ORGANIC SILT, wet, greenis contains fine to coarse shell 25-35%, HCI reaction, strong	sh gray, fragments, l.	ОН	15.3			REC =24'	w=44.2%	
	 67.0 –		argingd	SM	9.3		65 		LL=72 PL=41 *	
	-	wet, greenish gray, trace fine shell fragments, 2-5%, HCl i weak.	to medium eaction	3141			 	4+6+9 N =15 REC =18'	w=29.4% LL=NP PL=NP *	
	-						 75 -	4+4+7 N =11 REC =18'	w=32.2% LL=NP PL=NP *	
3EL.GDT 3/6/08	-	greenish gray and white, with coarse shell fragments, 50-6 cementation, HCl reaction st	n fine to 0%, strong rong.				 80 -	8+18+28 N =46 REC =18'		Rig chatter
DG SPT 300 & 400.GPJ SCHNAE	- - 85.0 —	contains fine to coarse shell 30-40% SANDY ELASTIC SILT, gree	fragments,	MH	8.7		 85-	8+16+50/ N =66/11' REC =16'	5" w=21.2% LL=NP PL=NP *	Rig chatter
- BORING LOG 06120048 PL	- - -	continued on next pe	76					9+10+16 N =26 REC =18'	w=34% LL=47 PL=31 *	
TEST		continuou on next pa	y -							

	TEST	Project:	Calvert Cliff	s Nucle	ar Pow	er Plant	Bori	ng Number:	B-328
Schna	bel Engineering LOG	i	Calvert Cou	inty, Ma	iryland		Con	tract Number: 0 et: 4 of 5	6120048
DEPTH (FT)	STRATA DESCRIPT	ΓΙΟΝ	CLASS.	ELEV. (FT)	WL	SA DEPTH	MPLING DATA	TESTS	REMARKS
-			MH			 95 ■ 	REC =13"		
-				25.7		 - <u>100</u> -	5+6+12 N =18 REC =18"	w=38.2% LL=53 PL=34 *	softer drilling
102.0 -	SILTY SAND, wet, greenish fine to medium shell fragmen HCI reaction weak.	gray, trace its, 2-5%,	SM	25.7		 	6+9+12 N =21 REC =18"	w=62.7%	
-						 	5+8+13 N =21 REC =18"		Resumed drilling on 6/20/06 @ 7:30am
	SANDY ELASTIC SILT, fine grained, wet, greenish gray, fine to coarse shell fragments HCI reaction strong.	to medium contains s, 20-30%,	MH	35.7		 115 -	6+7+14 N =21 REC =18"	w=30.5%	
	ELASTIC SILT, moist, green trace fine to medium shell fra 5-10%, HCl reaction weak.	ish gray, gments,	MH	-40.7		 120- F	5+6+8 N =14 REC =18"	w=44.7%	softer drilling
	continued on next pag	ge				 ■ F	REC =11"	w=45.6%	

	hnabal	TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant		Boring	y Number:	B-328
Schoo	hal Engineering	BORING	C	alvert Cou	inty, Ma	ryland			Contra	act Number: 06	6120048
DEDTU	ber Engineering	200					6		Sheet:	. 5 01 5	
(FT)	STRATA	A DESCRIPT	ION	CLASS.	(FT)	WL	DEPTH			TESTS	REMARKS
				MH						LL=72	
	-						-125-			PP=>4.5 tsf	
-	-						-			*	
-	-										
_											
	oliveish grav							5+7+10)		
-]						F 1 X	N =17	18"		
							-130-		10		
-	-										
-	-										
-	-										
-	-							6+6+9		w=48.2%	
_							135-	N =15 REC =	18"	PL=51	
-	1										
-							- 1				
-	-										
-	-						N	6+7+9 N =16			
-	-						-140-	REC =	18"		
-	-										
_											
-	1							5+7+0		w=59.3%	
-	-						F 1 X	N =15	4.0."	*	
	-						-145-	REC =	18"		
3/9/06	-										
- פּר	-										
- ABEL	-										
CHN								6+8+11	1	w=74.8%	
					70 7			N =19 REC =	18"	LL=134 PL=100	
150.0 -	BOTTOM OF BO	DRING @ 15	0.0 FT.		-/3./					*	
200											
2 PLO											
20048											
100											
e CO											

Schnak	hnabel BORI bel Engineering LOC	T Project: NG G	Calvert C Calvert C	Cliffs Nucle County, Ma	ar Pov ryland	ver Pla	nt		Boring Contra Sheet:	I Number: Inct Number 1 of 4	er: 06120	B-32 0048
Boring C	CONNELLY A		S INC				Gro	ound	vater Obs	ervations		
Joining C	FREDERICK,	MARYLAND	_0, 110.				D	ate	Time	Depth	Casing	Caved
Boring F	oreman: D. Bender			Enco	untere	ed	6	/13		33.5'		
Drilling N	Method: Mud Rotary			Start	of da	у	6	/14		28.0'		
Drilling E	Equipment: CME-550		F	Stort		, ,	6	/1 E		20.0'		
Schnabe	Representative: K. Bell	d. 6/15/06		Start	OI Da	у	0	/15		30.0		
Jates a	• Northing: 216800 38 ft	a: 6/15/06										
	Easting: 960379.43 ft											
Ground §	Surface Elevation: 74.8 (fe	et)										
DEPTH			CI 48	ELEV.	\A/I		S	AMPL	ING	терт		
(FT)	STRATA DESCH	RIPTION	CLAS	^{/S.} (FT)	VVL	DEP	тн	[ΔΑΤΑ	IESI	3	REMARKS
0.5	ROOTMAT AND TOPSO	<u>IL.</u>	SP-SI	74.3				2+2+	2			
-	POORLY GRADED SAN fine to coarse grained, m brown, trace root fragmen	D WITH SILT, oist, yellowish nts.					10	N =4 REC	=5"			
2.5	CLAYEY SAND, fine to n	nedium	SC	72.3			-0	3+4+	4			
_	gramed, moist, orangeist					L .	$ \Delta $	REC	=10"			
4.5	SILTY SAND, fine to mee	lium grained,	SM	70.3		<u> </u>						
	moist, orangeish brown.							3+4+ N =8	4			
							714	REC	=18"			
7.0 -	SANDY FAT CLAY, mois	t, gray.	СН	67.8		- ·			•			
-						-	HXI	3+3+ N =6	3			
-						-		REC	=18"			
_						-10-	$\left \right $					
-						- ·	-0	1+4+ N -1	6			
_						L .	$ \Delta $	REC	=18"			
_												
							Π	2+3+	3			
						Γ	IXI	N =6 REC	=18"			
						-15-			10		Sc	ofter drilling
-						-	1					
17.0 -	ELASTIC SILT with sand	, moist, gray.	MH	57.8		+	+					
-		- •				-	$\left \right $					
-						-	-0	3+4+ N =0	5			
_						-20-	μΔ	REC	=18"			
_						L .						
22 0				52 A								
22.0	SANDY SILT, moist, gray	<i>.</i>	ML	52.0				4+6+	8			
-								N =1	- 4 =18"			
-								INE O	10			
_	continued on nex	t page				-25-	+					

		TEST Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	Boring Number:	B-329
	Schna	bel Engineering LOG	alvert Cou	inty, Ma	ryland		Contract Number: 00 Sheet: 2 of 4	6120048
	DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL			REMARKS
	32.0 -	SILTY SAND, fine to medium grained, wet, light gray.	ML	- 42.8	Ÿ	$\begin{array}{c c} \hline DEPTH & DP \\ \hline \\ $	-33 18"	
	- - - 42.0 - -	gray and white, contains fine to medium shell fragments, 10-20%, HCl reaction moderate CLAYEY SILT, moist, gray, trace fine to medium shell fragments, 2-5%, HCl reaction weak.	ML	- 32.8		$ \begin{bmatrix} - & - \\ -$	+31 13" 18"	
J SCHNABEL.GDT 3/6/08	47.0 - -	SILTY SAND, fine to coarse grained, wet, gray, with fine to coarse shell fragments, 40-50%, srong cementation, HCI reaction strong.	SM	- 27.8		 - 50/4" N =50/4 REC =	4" 2"	Rig chatter
06120048 PLOG SPT 300 & 400.GF	- 52.0 - - -	CLAYEY SAND, fine to medium grained, wet, light gray, with fine to coarse shell fragments, 40-50%, srong cementation, HCI reaction strong.	SC	22.8		 N =63 REC =	+33 17"	
TEST BORING LOG (57.0 -	SILTY SAND, fine to medium grained, wet, greenish gray, contains fine to continued on next page	SM	17.8				

Γ	6	hpabol TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant		Boring	Number:	B-329
	Schnal	bel Engineering LOG	C	alvert Cou	nty, Ma	ryland			Contra Sheet:	ct Number: 00	6120048
	DEPTH (FT)	STRATA DESCRIPT	ION	CLASS.	ELEV. (FT)	WL			NG	TESTS	REMARKS
		coarse shell fragments, 20-3	0%, HCI	SM							
	_	reaction moderate.					$ - \rangle$	(4+5+6 N =11	4.0"		
							-60		18		
	_										
	-										
	_										
	_							REC =	22"		
							-65				Resumed
	-										drilling on 6/14/06 @
	-										7:00am
	_										
	_							5+5+1 N =15	0		
							-70-4	REC =	18"		
	-										
	-										
	_										
	_							REC =	24"		
	_						75				
	-							-			
	-										
	_										
	_	with fine to coarse shell fragr	nents,					S0/3"	2"		
3/6/08		reaction strong	, 1101				-80-	REC =	2"		
GDT	_										Rig chatter
IABEL.	_										Ū
SCHN	-										
0.GPJ	_	contains fine to coarse shell	fragments,					14+50			
0 & 40		30-40%					-85	REC =	10"		
SPT 30	_										
PLOG S	87.0 -				-12.2						
0048 F	-	CLAYEY SAND, tine to medi grained, wet, greenish gray,	um trace fine to	SC							Resumed
0612	-	reaction moderate.	u%, HCI				L 1	10+12	+24		drilling on6/15/06 @
GLOG	_							N =36 REC =	18"		1:00am
30RIN	-										
TESTE		continued on next pag	ge								

	bachel	TEST	Project: 0	Calvert Cliffs Nuclear Power Plant						Boring Number: B-329		
Schnal	bel Engineering	BORING LOG	0	Calvert Cou	inty, Ma	iryland			Contra	act Number: 0	6120048	
DEPTH					ELEV.			SAM				
(FT)	STRAT	A DESCRIPT	ION	CLASS.	(FT)	WL	DEPTI	н	DATA	TESTS	REMARKS	
				SC								
-												
-												
-	greeninsh gray	and white, co	ntains fine					∬ 5+ N =	10+14 =24			
	HCI reaction str	ong .	0 40 %,				_95_		C =16"			
_												
_									0.12			
-									=21			
100.0 —	BOTTOM OF B	ORING @ 10	0.0 FT.		-25.2		-100-1		C =18"			
		-										
200												
פו												
10.00												
0 & 4												
20												
148												
071.90												
0,00												
х Од												

Schna	bel Engineering LOG	Calvert Clif	ts Nucle unty, Ma	ar Pow Iryland	ver Pla	nt	Borin Cont Shee	ng Number ract Number t: 1 of 4	: er: 06120	B-33(048
Sorina (Gr	oundwater Ob	servations	;	
oning C	MALAGA, NEW JERSEY					D	ate Time	Depth	Casing	Caved
Boring F	Foreman: J. Blemings		Enco	untere	d	5	5/25	10.0'	0.0'	
rilling l	Method: Mud Rotary									
Drilling I	Equipment: CME-750 (ATV)									
chnabe	el Representative: M. Arles									
)ates	Started: 5/25/06 Finished: 5/26/06									
ocation	1: Northing: 216715.4 ft									
	Easting: 960523.7 ft									
Ground	Surface Elevation: 85.5 (feet)									
(FT)	STRATA DESCRIPTION	CLASS	(FT)	WL		тц		TEST	'S F	REMARKS
0.3	ROOTMAT AND TOPSOIL		85.2		DEP	107	WOH+2+2			
-	POORLY GRADED SAND, fine to	SP			F	-IXI	N =4			
20 -	coarse grained, moist, yellowish orange,		83.5				REC = 13			
2.0	POORLY GRADED SAND WITH SILT	SP-SM	05.5				5+4+6			
-	trace gravel, fine to coarse grained,				-	IXI	N =10			
-	moist, orangeish yellow.				-	40	REC =18"			
5.0 —			80.5		- 5 -	\square				
	POORLY GRADED SAND, fine to coarse grained, moist, yellow, with	SP				IV	2+4+4 N =8			
_	gravel, contains cemented sand.				Γ	שך	REC =10"			
7.0 -	POORLY GRADED SAND WITH SILT,	SP-SM	78.5		-	1_				
-	trace gravel, fine to coarse grained,				-	ЧM	2+3+3 N =6			
_	noist, brownish orange.					\square	REC =10"			
				<u> </u>	-10-					
-	wet, dark orange, with gravel.				-	HVI	4+6+9 N =15			
-					-	ЦШ	REC =15"			
130 -			72 5		L					
10.0	SANDY LEAN CLAY,fine to medium, moist_dark gray	CL	12.0				1+2+3			
_					-	IXI	N =5			
					-15-		REC =18"			
-					F	-				
_					L					
-					-					
-					-	HM	3+3+3 N =6			
					-20-	ЦЦ	REC =18"			
_					L					
_										
-	1				F	1				
-					┝	-				
_	with sand.				L	\square	4+5+6			
					0.5	Ŵ	N =11 REC =18"			
	continued on next page				25-					
					1					

	1	tes	ST Project: (Calvert Cliffs Nuclear Power Plant					Boring	Boring Number: B-33		
	School	bel Engineering	Calvert Cou	inty, Ma	aryland			Contra	act Number: 00	6120048		
E	Schna		0					64	MDUNC	2014		
'	(FT)	STRATA DESC	RIPTION	CLASS.	ELEV.	WL	DEDTL	ЪА 」		TESTS	REMARKS	
\vdash				CL				╧	DATA			
		-										
	27.0				58.5							
		CLAYEY SAND, fine to grained, moist, dark grav	medium v.	SC								
		-					╞╴╶┨	-				
	-	-					-30-					
		_										
	32.0				53.5							
		LEAN CLAY, moist, gray	y, trace sand.	CL								
							۱ آ		5+8+0			
								XII i	N =17			
	-	-					-35-1		REC =18"			
		-										
	37.0				48.5							
		grained, moist, greenish	medium gray.	SC								
								ا ر	6+6+8			
		-						XII i	N =14			
	-	-					-40-4		REC = 18			
		-										
	42.0				43.5							
		medium grained, moist,	greenish gray,	5P								
		with clay, with fine to coa fragments, strong HCI re	arse shell eaction, 10-15%					7	34+50/5"			
		shell frag.					F 74		N =50/5"			
	-	-					-45					
		-										
3/6/05		-										
BDT		-										
BEL.(fine to coarse grained, g	ıravish green.						50/5"			
ANHO									N =50/5" REC =5"			
PJ S	_	1					-50-					
100.G		-										
00 & ²		-										
SPT 3		-					$ \downarrow \downarrow$					
00		fine to medium grained,	with fine to				L Jp	21.	42+50/3"			
148 PI		medium shell fragments	, strong HCI				^e		N =50/3" REC =10"			
6120(-						-55-					
000		-										
NGL		-										
BORI					-		├ ┤					
TEST		continued on ne	xi page									

ſ		hnahal	TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant		Boring Num	ber:	B-330
	Schna		BORING LOG	C	alvert Cou	nty, Ma	ryland			Contract Nu Sheet: 3 of	mber: 0	6120048
┢		Ser Engineering				9		G	-			
	(FT)	STRAT	A DESCRIPT	ION	CLASS.	(FT)	WL	DEPTH			ESTS	REMARKS
	58.0 -	CLAYEY SAND, grained, moist, g with fine to coars 25-30% shell fra	, fine to medii grayish green se shell fragn g.	um nents,	SC	27.5		60-	4+3+5 N =8 REC =1	8"		
	-	with fine to coars strong HCI react	se shell fragn ion, 10-20%	nents, shell frag.				 K	50/5" N =50/5 REC =5			
	-											
	67.0 - - - -	SILTY SAND, fir wet, green, with fragments, stron shell frag.	ne to medium fine to coars g HCI reactio	ı grained, e shell n, 15-25%	SM	18.5		 	6+4+9 N =13 REC =1	8"		
	- - - -	- - -						 75	9+11+11 N =21 REC =1	0 8"		
DT 3/6/08	-	trace fine to coa moderate HCI re frag.	rse shell frag eaction, 5-109	ments, % shell				 80-	6+7+14 N =21 REC =1	8"		
0 & 400.GPJ SCHNABEL.GL	-	0-5% shell frag.						 	5+6+12 N =18 REC =1	8"		
DG 06120048 PLOG SPT 30	-	with fine to coars	se shell fragn ion, 20-30%	nents, shell frag.					6+11+11 N =29	8		
TEST BORING L(-	continu	ed on next pag	ge				90 <u> /\</u> 	REC =1	8"		

6120048 REMARKS
REMARKS

Schnat	hnabel BORING	Project: Ca Ca	alvert Clif alvert Co	fs Nucle unty, Ma	ar Pow ryland	ver Pla	nt		Boring Contra Sheet:	Number: Inct Number 1 of 4	e r: 061200	B-331
Boring C	Contractor: CONNELLY AND	ASSOCIATES	, INC.				Gro	oundw	ater Obs	ervations		
D	FREDERICK, MAR	RYLAND					D	ate	Time	Depth	Casing	Caved
Boring F	oreman: D. Bender			Enco	untere	d	5/	24		14.0'		
Schnabo												
Dates 9	Started: 5/24/06 Finished:	5/24/06										
Location	: Northing: 216970 57 ft	5/24/00										
	Easting: 960481.79 ft											
Ground	Surface Elevation: 68.3 (feet)											
DEDTU							6					
(FT)	STRATA DESCRIPT	ION	CLASS	· (FT)	WL		- 7ц ∣		NG ATA	TEST	S F	REMARKS
	ROOTMAT AND TOPSOIL.						;;; †					
0.7	POORLY GRADED SAND W	ITH SILT,	SP-SM	67.6		-	-M	1/18"	0"			
-	brown, trace root fragments,	orangeish trace wood				-	-101	N =1/1 REC =	8" •18"			
	fragments.					L		4+3+3				
	yellowish brown.						IM	N =6 REC =	:14"			
4.5				63.8		F						
	LEAN CLAY, moist, orangeis and gray, trace sand, trace ro	h brown oot	CL			- 5 -		3+4+6		w=20.2	%	
-	fragments.					-	- X	N =10	11"	LL=43 PL=15	5	
_								RLC -	• • • •	*	-	
	sandy							3+2+7				
_	oundy.						1	N =9	10"			
-						-		REC -	-10			
						-10-	-					
_						-	-M	7+9+9	I			
11.5	SILTY SAND, fine to medium	grained,	SM	56.8		L	Ш	REC =	:0"			
	wet, gray.	-										
_												
14.2	EAT CLAX moist grov troop	aand	<u>сп</u>	54.1	<u> </u>	-	HXII	5+6+6 N =12				
	TAT CLAT, moisi, gray, trace	sanu.	CIT			-15-	-121	REC =	:16"			
_						L						
-						F	┤│				0/	
-						┝		REC =	:24"	w=30.8 LL=57	70 7	
						-20-				PL=23	3 itsf	
						L				*		
21.5	SANDY SILT moist grav		М	46.8								
						F	1					
-						╞	-					
-						F	-M	7+12+ N = 29	16			
						-25-	M	REC =	18"			
	continued on next pag	<i>je</i>				_						
						<u> </u>						

	6	hnabol	TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plan	ıt		Boring	Number:	B-331
	Schnal	Del Engineering	oring Log	C	Calvert Cou	nty, Ma	iryland				Contra Sheet:	ct Number: 0 2 of 4	6120048
D	EPTH (FT)	STRATA DE	ESCRIPT	ION	CLASS.	ELEV. (FT)	WL	DEPT	S. тн		G	TESTS	REMARKS
					ML								
	26.5	POORLY GRADED	SAND W	ITH SILT,	SP-SM	41.8							
	_	fine to coarse graine white, trace fine to c	ed, moist, oarse she	gray and ell									
	-	strong, weak cemer	, HCI reantation.	ction					M	30+50			
								-30-		REC =12	2"		
	-												
	-												
	-	fine to modium chall	fragman	to.						21.40.5	0/4"	w=21 9%	Dis chatter at
	-	(40-50%).	nagmen	15					Ю	N =90/10 REC =16	50/4)" 5"	*	34 ft.
	_												
	-								-				
	-								-				
	-	wet, fine to coarse s	hell fragn	nents.					M	11+8+12 N =20	2		
	_							-40-		REC =18	3"		
4	41.5	SILTY SAND fine to	medium	arained	SM	26.8							
	-	moist, gray and gree to medium shell frag	enish gray ments (2	, trace fine -5%), HCl									
	-	reaction weak.							M	3+4+7		w=31.6%	
								-45	М	REC =18	8"		
	-												
T 3/6/0	-												
3EL.GD	-									8+6+7			Rig chatter at
SCHNAE	_								X	N =13 REC =18	3"		49 ft.
0.GPJ (_								-				
00 & 40	-												
SPT 3	-												
18 PLOC	-	white, fine to coarse (15-25%).	shell frag	gments					M	6+5+5 N =10	711		
0612004								-55-		REC =1	1		
) 100 (-												
BORING	-												
		continued o	n next pag	е									

Γ	6	test	Project: Ca	alvert Cliff	s Nucle	ar Pow	er Plant	Borin	g Number:	B-331
	Schnat	BORING	Ca	alvert Cou	nty, Ma	ryland		Contr	act Number: 0	6120048
C	DEPTH (FT)	STRATA DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	SA DEPTH		TESTS	REMARKS
				SM				3+4+10 N =14 REC =18"	w=26.6%	
	-	greenish gray, fine to mediun fragments (2-5%), HCI react	n shell on weak.					5+6+8 N =14 REC =16"		
	-							3+4+6 N =10 REC =18"		
	-	fine to coarse shell fragments HCI reaction strong.	s (35-45%),				 75	3+5+12 N =17 REC =18"	w=35.8% *	
EL.GDT 3/6/08	-						 - 80-	6+6+6 N =12 REC =18"		
PLOG SPT 300 & 400.GPJ SCHNAB		fine to medium shell fragmen HCl reaction weak.	ts (2-5%),				 85- 	7+11+12 N =23 REC =16"		
RING LOG 06120048	-	fine to coarse shell fragments cementation with strong HCI	s (5-10%), reaction .				 - 90	5+7+16 N =23 REC =18"	w=32.7% *	
rest Bof	_	continued on next pag	je							

SC	TEST Project:	Calvert Cliff	s Nucle	ar Pow	ver Plant	Boring Number:	B-331
Schnat	bel Engineering LOG		inty, we	iryiana		Sheet: 4 of 4	06120048
DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL	SAMPL	ING TESTS	REMARKS
		SM					
-							
-					5+7+1 N =17	10	
					-95-10 REC	=18"	
_							
96.5	CLAYEY SAND, fine to medium	SC	28.2				
_	coarse shell fragments (5-10%), HCl						
_	reaction moderate.				7+10-	+17/5"	
100.0			- 31 7		N =27	7/11" =18"	
100.0	BOTTOM OF BORING @ 100.0 FT.		-51.7				
5							

Schna	bel Engineering LOG	Calvert C	ounty, Ma	ryland			Boi Coi She	ring Num ntract Nu eet: 1 of	iber: imbe 4	er: 06120	D-33 048
Boring (Contractor: CONNELLY AND ASSOCIAT	ES, INC.				Gro	oundwater (Observati	ions		
j	FREDERICK, MARYLAND					D	ate Tim	e Dep	oth	Casing	Caveo
oring F	Foreman: D. Bender		Enco	untere	d	6	5/1	13.	5'		
rilling l	Method: Mud Rotary	-	Start	ofda	v	6	3/2	10	0'		
rilling l	Equipment: CME-550	-	Otari		y		<i>"'</i>	10.			
chnabe	el Representative: K. Bell										
ates	Started: 6/1/06 Finished: 6/2/06										
ocatior	n: Northing: 217127.42 ft Easting: 960400.52 ft										
Ground	Surface Elevation: 65.4 (feet)				1						
OEPTH (FT)	STRATA DESCRIPTION	CLAS	S. ELEV. (FT)	WL	DEP	S/ ТН	AMPLING DATA	Т	EST	S F	REMARKS
0.4	ROOTMAT AND TOPSOIL.	SC	65.0				1+1+2				
-	CLAYEY SAND, fine to coarse grained, moist, yellowish brown, trace root fragments.				-		N =3 REC =5"				
-	fine to medium grained, moist, orangeish brown and reddish brown, trace wood fragments, cemented sand		61 /		_		22+2+3 N =5 REC =16"				
ч.0 [–]	gravel size.	/ СН	01.4								
-	 FAT CLAY, moist, orangeish brown and gray, trace sand. 				- 5 -	-	2+2+3 N =5 REC =14"				
- 80	-		57.4		_		3+3+4				
-	SANDY SILT, moist, gray.	ML	01.4		_	_Å	N =7 REC =18"				
	-					- -M	2+5+7				
-	-				_		N =12 REC =18"				
13.0 -	SILTY SAND, fine to medium grained,	SM	52.4	$\overline{\Delta}$	-						
-	wet, dark gray.				- 15-	-	1+2+3 N =5 REC =18"				
-	-		- 48.4								
	ELASTIC SILT, moist, light gray, trace sand.	MH	-0.4								
-	-				L		4+6+10				
	-				-20-	_Ŵ	N =16 REC =18"				
-											
22.0			12.4		L						
22.0 -	SILTY SAND, fine to coarse grained, moist, greenish gray and gray, weak cementation.	SM	43.4		-						
-	-				F	-	3+6+11 N =17				
	continued on next page				-25-	- 12	REC =16"				

		TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	В	oring Number:	B-332
	Schna	bel Engineering LOG	C	alvert Cou	nty, Ma	iryland		C	ontract Number: 0 heet: 2 of 4	6120048
	DEPTH			01.400	ELEV.		s			DEMARKO
	(FT)	STRATA DESCRIPT	ION	CLASS.	(FT)	WL	DEPTH	DATA	A IESIS	REMARKS
				SM						
	-									
	-									
								00.50/5"		
		and white, contains fine to me	edium shell				F 78	32+50/5 N =50/5"		
	_	fragments, 20-30%, HCI read	tion strong.				-30-	REC =8		
		-								
	-	-								
		-					-			
		with fine to coarse shell fragn 60-70%	nents,				M	16+15+16 N =31	3	
	_	-					-35-0	REC =16"		
		-								
	37.0	CLAYEY SAND fine to medi	Jm	SC	28.4					
		grained, wet, gray and white, coarse shell fragments 40-50	with fine to							
		reaction strong.	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,				M	7+8+15 N =23		
	_	-					<u>–40–</u> []	REC =16"		
		-								
	42.0			N 41	23.4					
		organic matter.	jray, trace	ML						
		-					M	3+3+5		
		-					<u>45</u>	REC =18"		
		-								
/6/08		-								rig chatter
GDT 3		-								
ABEL.(-						50/0.5"		
SCHN/	_	-						N =50/0.5	,"	
.GPJ		_								
& 400										via chattar
⁵ T 300										ng chatter
OG SF		white, contains fine to coarse	shell					5+6+7		
048 PL		fragments, 20-30%, HCI read	ction					N =13 REC =18"	,	
06120(
LOG C		1					F 1			
RING	57.0	SILTY SAND, fine to medium	grained,	SM	8.4		F 1			
EST BC		continued on next pag	e				F 1			
۳L										

Schnabel Engineering BORING LOG Calvert County, Maryland Contract Number: 06120048 Sheet: 3 of 4 DEPTH (FT) STRATA DESCRIPTION CLASS. ELEV. (FT) WL SAMPLING DEPTH TESTS REMAR - </th <th></th> <th>hnabel TEST</th> <th>Project: Ca</th> <th>lvert Cliffs</th> <th>s Nucle</th> <th>ar Pow</th> <th>er Plant</th> <th></th> <th>Boring</th> <th>Number:</th> <th>B-332</th>		hnabel TEST	Project: Ca	lvert Cliffs	s Nucle	ar Pow	er Plant		Boring	Number:	B-332
DEPTH (FT) STRATA DESCRIPTION CLASS. ELEV. (FT) WL SAMPLING DEPTH TESTS REMAR - fine to coarse shell fragments, 20-30%, strong cementation, HCI reaction strong. SM SM - - 6+9+50/5" N=59/11" REC = 16" - <td< th=""><th>Schna</th><th>bel Engineering LOG</th><th>Ca</th><th>livert Cou</th><th>nty, Ma</th><th>ryland</th><th></th><th></th><th>Contrac Sheet:</th><th>ct Number: 00 3 of 4</th><th>6120048</th></td<>	Schna	bel Engineering LOG	Ca	livert Cou	nty, Ma	ryland			Contrac Sheet:	ct Number: 00 3 of 4	6120048
(FT) CHORE DECENT NEW CLOSE (FT) The DEPTH DATA TARE THE COMPLEX STORE CONTRICT TO THE DEPTH DATA TARE THE COMPLEX STORE CONTRICT TO THE DEPTH DATA TARE THE COMPLEX STORE CONTRICT TO THE DEPTH DATA TARE THE COMPLEX STORE CONTRICT TO THE DEPTH DATA TARE THE COMPLEX STORE CONTRICT TO THE DEPTH DATA TARE THE CONTRICT TO THE DEPTH DATA TARE THE COMPLEX STORE CONTRICT TO THE DEPTH DATA TARE THE COMPLEX STORE CONTRICT TO THE DEPTH DATA TARE THE COMPLEX STORE CONTRICT TO THE DEPTH DATA TARE THE COMPLEX STORE CONTRICT TO THE DEPTH DATA TARE THE CONTRICT TO THE DEPTH DATA TARE THE COMPLEX STORE CONTRICT TO THE DEPTH DATA TARE THE CONTRICT TO THE DEPTH DATA TARE THE COMPLEX STORE CONTRICT TO THE DEPTH DATA TARE THE CONTRICT TO THE DATA TARE THE TARE	DEPTH	STRATA DESCRIPT		CLASS	ELEV.	wi	S	SAMPLIN	G	TESTS	RFMARKS
fine to coarse shell fragments, 20-30%, strong cementation, HCl reaction strong. The tot coarse shell fragments, 20-30%, strong cementation, HCl reaction strong. The tot coarse shell fragments, strong. The trace fine to medium shell fragments, 2-5%, HCl reaction weak. The trace fine to medium shell fragments, 2-5%, HCl reaction weak. The trace fine to medium shell fragments, 2-5%, HCl reaction weak. The trace fine to medium shell fragments, 2-5%, HCl reaction weak. The trace fine to medium shell fragments, 2-5%, HCl reaction weak. The trace fine to medium shell fragments, 2-5%, HCl reaction weak. The trace fine to medium shell fragments, 2-5%, HCl reaction weak. The trace fine to medium shell fragments, 2-5%, HCl reaction weak. The trace fine to medium shell fragments, 2-5%, HCl reaction weak. The trace fine to medium shell fragments, 2-5%, HCl reaction weak. The trace fine to medium shell fragments, 2-5%, HCl reaction weak. The trace fine to medium shell fragments, 2-5%, HCl reaction weak. The trace fine to medium shell fragments, 2-5%, HCl reaction weak. The trace fine to medium shell fragments, 2-5%, HCl reaction weak. The trace fine to medium shell fragments, 2-5%, HCl reaction weak. The trace fine to medium shell fragments, 2-5%, HCl reaction weak. The trace fine to medium shell fragments, 2-5%, HCl reaction weak. The trace fine to medium shell fragments, 2-5%, HCl reaction weak. The trace fine to medium shell fragments, 2-5%, HCl reaction weak. The trace fine to medium shell fragments, 2-5%, HCl reaction weak. The trace fine to medium shell fragments, 2-5%, HCl reaction weak. The trace fine to medium shell fragments, 2-5%, HCl reaction weak. The trace fine to medium shell fragments, 2-5%, HCl reaction weak. The trace fine to medium shell fragments, 2-5%, HCl reaction weak. The trace fine to medium shell fragments, 2-5%, HCl reaction weak. The trace fine to medium shell fragments, 2-5%, HCl reaction weak. The trace fine to medium shell fragments, 2-5%, HCl reaction weak. The	(FT)			02400.	(FT)		DEPTH	DA	TA		
strong. - 60^{-1} - 1^{-1} - 1^{-		fine to coarse shell fragments strong cementation, HCI rea	s, 20-30%, ction	SM				6+9+50	/5"		
Trace fine to medium shell fragments, 2-5%, HCl reaction weak. - $ -$		strong.						N =59/1 REC =1	1" 6"		
$\begin{bmatrix} - & - & - & - & - & - & - & - & - & - $							-00-				
trace fine to medium shell fragments, 2-5%, HCl reaction weak. 	-						- 1				rig chatter
$\begin{bmatrix} - & - & - & - & - & - & - & - & - & - $	-										
$ \begin{array}{c} - \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\$	-										
	-	trace fine to medium shell fra 2-5%, HCl reaction weak.	gments,					5+6+11 N =17			
							-65-	REC =1	8"		
	-										
	-										
	-										
-70 - M REC = 18"	-						10	4+4+8			
	_							REC =1	8"		
■ REC =13" on 6/2/06 (RFC =1	3"		resumed driling on 6/2/06 @
7:15am	-										7:15am
	-						-75-				
l – – – – – – – – – – – – – – – – – – –	-						- 1				harder drilling
	-										0
	-										
_ light gray and white, with fine to medium	-	light gray and white, with fine shell fragments, 40-50%, str	to medium				11	38+17+ N =32	15		
$\begin{bmatrix} 2 \\ \infty \end{bmatrix}$ cementation, HCl reaction strong. $\begin{bmatrix} -80 \\ -80 \end{bmatrix}$ REC =18"		cementation, HCI reaction s	trong.				-80-	REC =1	8"		
	-										
	-										
	-										
$\begin{bmatrix} 2 \\ 0 \\ 0 \end{bmatrix}$ trace fine to medium shell fragments, $\begin{bmatrix} 2 \\ 5\% \end{bmatrix}$ $\begin{bmatrix} 2 \\ 10 \\ 10 \end{bmatrix}$	-	trace fine to medium shell fra	gments,				10	8+12+2	1		
	_						-85-1	REC =1	8"		
	-										
	87.0 -				-21.6						
SANDY SILT, wet, greenish gray, trace ML		SANDY SILT, wet, greenish g fine to medium shell fragmen	gray, trace its,	ML							
№ 10-20%, HCl reaction moderate. 6+8+18	-	10-20%, HCl reaction moder	rate.					6+8+18			
00 1								N =26 REC =1	8"		
							-90				
m continued on next page	-	continued on next pag	ge				- 1				

	hnabol	TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant		Boring I	Number:	B-332
Schnal	bel Engineering	LOG	C	alvert Cou	nty, Ma	ryland			Contrac	t Number: 06	6120048
DEPTH					ELEV.		5	SAMPLIN	G		
(FT)	STRAT	A DESCRIPT	ION	CLASS.	(FT)	WL	DEPTH	DA	TA	TESTS	REMARKS
				ML							
								_			
	HCI reaction we	ak					\	6+8+14 N =22			
-							—95—Ľ	REC =1	17"		
_											
_											
								7+12+1	1		
-)	N =26			
100.0 —	BOTTOM OF B	ORING @ 10	0.0 FT.		-34.6		-100- ^L		18		
200											
8											
-											
2											
7100											
5											

Schna	bel Engineering TEST BORING LOG	Project: C C	alvert Cl alvert Co	iffs Nucle ounty, Ma	ar Pow Iryland	ver Plai	nt		Boring Contra Sheet:	Number: Ict Number 1 of 4	er: 061200	B-333
Boring		NG					Gro	oundw	ater Obs	ervations		
	MALAGA, NEW JE	ERSEY					D	ate	Time	Depth	Casing	Caved
Boring F	Foreman: J. Blemings			Enco	untere	d	5/	/17		10.5'		
Drilling	Method: Mud Rotary											
Drilling	Equipment: CME-750 (ATV)		-									
Schnabe	el Representative: K. Megginso	n										
Dates	Started: 5/17/06 Finished: 5	5/17/06										
Location	n: Northing: 216657.04 ft Easting: 960386.24 ft											
Ground	Surface Elevation: 89.5 (feet)			-	1							
DEPTH (FT)	STRATA DESCRIPT	ION	CLASS	s. ELEV. (FT)	WL	DEP	S/ ТН ∣	AMPLI D	NG ATA	TEST	S F	REMARKS
0.5	Forest litter, rootmat and tops	soil.		. 89.0			M	1+4+3				
-	POORLY GRADED SAND W fine to coarse grained, moist, contains root fragments.	/ITH SILT, brown,	SP-SN	1			-M	N =7 REC =	-17"			
-	fine to medium grained.					Ļ .	-M	2+3+5	;	w=6.2	%	
-	-						W	N =8 REC =	=13"			
-	fine to coarse grained, light b contains clayey sand pockets	rown, S.				- 5 -		3+4+4 N =8 REC =	=10"			
-	fine to medium grained.							5+5+6 N =11 REC =	=11"	w=4.8° *	%	
- -	fine to coarse grained, wet, b	rown.			Ā			4+8+8 N =16 REC =	=10"			
-	dark yellowish brown, trace fi	ne gravel.						2+3+5 N =8 REC =	=17"			
- 17.0	CLAYEY SAND, fine to coars wet, dark orangeish brown ar yellowish brown, contains fine medium cemented sand pock moderate HCI reaction	e grained, nd dark e to kets,	SC	72.5			- - M	12+10 N =20	+10			
19.5	FAT CLAY, moist, mottled ye brown and light gray, trace fir medium sand, contains fine to clayey sand pockets.	llowish ne to o medium	СН	70.0				REC =	=14"			
	gray, trace mica.	7e						2+2+3 N =5 REC =	=18"	w=329 LL=57 PL=33	% 7 3	

Γ		TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant		В	oring	Number:	B-333
	Schna	bel Engineering LOG	C	alvert Cou	nty, Ma	aryland			C S	Contract Number: 06120048 Sheet: 2 of 4		
	DEPTH (FT)	STRATA DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	DEPTI	SA H	AMPLING DATA	4	TESTS	REMARKS
				СН							*	
	·						[]					
		moist, gray, trace fine to med	ium sand.									*Shelbv tube
		_							REC =24"		w=38.9%	sampler push from 28.5 to
	_	-									LL=52 PL=19 PP=2 25 tsf	30.5 ft.
		-					 -				*	
		-										
		-										
		gray and dark gray, trace mic	a.					χŀ	4+4+6 N =10			
	-	-					35		REC =18"	'		
		-										
		moist, gray, with fine to medi	um sand,									*Shalby tuba
									REC =24"		w=39.7%	sampler push from 38.5 to
											LL=61 PL=23	40.5 ft.
		-									* *	
		-										
	40.5	-			40.0							
	43.5	SILTY SAND, fine to medium moist, dark blackish gray, tra	grained, ce fine to	SM	46.0			X	5+8+8 N =16		w=26.1%	
	-	fine to medium moderately ce	6), contains emented				-45		REC =18"			
88			aion.									
DT 3/6/		-										*Shelby tube
BEL.G	48.5	CLAYEY SAND, wet, gray, so	ome fine to	SC	41.0				REC =4"		w=25.2%	sampler push from 48.5 to
SCHNA	_	coarse shell fragments (±30% clayey sand and lean clay po	6), contains ckets,				50				LL=34 PL=13 *	48.8 ft
0.GPJ		strong HCI reaction.										
00 & 40		-										
SPT 3	52 F	-			26.0							
8 PLOG	55.5	SILTY SAND, moist, gray, wi medium sand, trace fine to m	th fine to edium	SM	30.0			X	18+32+33 N =65	3	w=20.9% *	
612004	_	shell fragments (±5%), mode reaction, trace mica.	rate HCI				55		REC =16"			
LOG 0												
ORING	•]										
TEST B		continued on next pag	<i>je</i>									

	TEST Project:	Calvert Cliff	s Nucle	ar Pow	er Plant	Boring Number:	B-333	
Schnal	bel Engineering LOG	Calvert Cou	inty, Ma	aryland		Contract Number: 0 Sheet: 3 of 4	6120048	
DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL	SAMPLI DEPTH D	NG TESTS	REMARKS	
-		SM			4+4+6 60	w=34.5% *	*Slight to moderate	
62.0 -	SANDY SILT, fine to medium, moist, gray, contains strongly cemented sand pockets and indurated silt pockets, weak HCl reaction, trace fine to medium shell fragments (±1%).	ML	27.5		 22+12 N =27 REC =	+15 -8"	difficulty in rotary advancement below 62 ft. *Slight to moderately difficult drilling as rotary advanced below 65.5 ft.	
67.0 - - - - - -	SILTY SAND, with gravel, fine to medium grained, wet, light oliveish gray and greenish gray, contains thin (1 inch) shell bed layer and strongly cemented sand pockets, trace fine to coarse shell fragments (±5%), strong HCI reaction.	SM	- 22.5		 ⊠ 50 REC = 70 	w=19.3% *	3-7/8" Tri-cone roller bit below 68.5 ft. *Moderate difficultly in rotary advancement below 68 ft (moderate drill rig chatter). *Difficult to very	
	gray, few fine to coarse shell fragments (±10%), weak HCl reaction, (weak HCl reaction applicable to test area where no shell fragments were observed).				 	4 :18"	advancement from 69.5 to 70 ft (moderate to strong rig chatter).	
78.5 	POORLY GRADED SAND WITH SILT, trace fine to medium shell fragments (±5%).	SP-SM	- 11.0		 	2 w=28.7% LL=NP 18" PL=NP *		
	light greenish gray and gray, trace fine to medium shell fragments (±1%), contains silt pockets, weak HCl reaction.		25		4+6+7 4+6+7 N =13 REC =	-18"		
	SILTY SAND, fine to medium grained, wet, light greenish gray and gray, trace fine to medium shell fragments (±1%), moderate HCI reaction.	SM	2.5			1		
	continued on next page							
ne to %), contains lay pockets, particles	CLASS. SM	ELEV. (FT)	WL	DEPTH 	SAMPLIN I DA	Sheet: NG ATA	4 of 4 TESTS	REMARKS
---	-------------------	-------------------	-------------------	--------------------------	----------------------------	--	--	---
TION ine to %), contains lay pockets, particles	SM	ELEV. (FT)	WL		SAMPLIN I DA	NG ATA	TESTS	REMARKS
ne to %), contains lay pockets, particles	SM				/ 11+39-			
ne to %), contains lay pockets, particles				 [/ 11+39-			
				95 	N =89/ REC =	+50/5" 11" 17"	w=16.1% *	*Moderate to dufficult rotary advancement below 95.5 ft (moderate to strong rig chatter at 95.5, 97, and 98 ft).
d sand 8.8 FT.		-9.3			⊠ 50/4" N =50/ REC =	4" 4"		
2	d sand 8.8 FT.	d sand 8.8 FT.	d sand 8.8 FT.	d sand 8.8 FT.	d sand 8.8 FT.	d sand 8.8 FT. -9.3 -9.3 -9.3 -9.3 -0.4" N=50/ REC =	d sand 8.8 FT. -9.3 -9.3 -9.3 -9.3 -9.3 -0.4" REC =4" -9.3 -9.5 -9.	d sand 8.8 FT.

Schna	TEST BORING abel Engineering	Project:	Calvert C Calvert C	Cliffs Nucle County, Ma	ar Pow Iryland	ver Pla	nt	Boring Contra Sheet:	Number: act Number 1 of 4	e r: 061200	B-334
Boring		NG					Gro	oundwater Obs	ervations		
Bornig	MALAGA, NEW JE	ERSEY					D	ate Time	Depth	Casing	Caved
Boring	Foreman: J. Evans			Enco	untere	d	5	/23	11.0'		
Drilling				Start	of day	y	5	/24	4.0'		
Drilling	el Representative: R Vinzant		-								
Dates	Started: 5/23/06 Finished:	5/24/06	-								
Locatio	n: Northing: 216515.53 ft Easting: 960556.61 ft	5/24/00	-								
Ground	Surface Elevation: 86.8 (feet)		-								
DEPTH (FT)	STRATA DESCRIPT	ION	CLAS	S. ELEV. (FT)	WL	DEP	S. TH	AMPLING DATA	TEST	S F	EMARKS
	POORLY GRADED SAND W fine to medium grained, wet, brown, and organic matter.	/ITH SILT, dark	SP-S	M			-	1+1+2 N =3 REC =18"	w=9.6° *	%	
	 Yellowish brown, contains roo fragments. 	ot				-		1+1+1 N =2 REC =18"			
5.0 -	SILTY SAND, light brown		SM	81.8		5 -	-	4+2+2 N =4 REC =12"	w=15.9 *	%	
75	_			70.3		-	1_				
7.5	LEAN CLAY, moist, oliveish g sand, Fine-med. sand.	gray, with	CL	75.5				1+1+1 N =2 REC =18"			
9.5	SILTY SAND fine to medium	arained	SM	77.3							
_	wet, light gray.	i grained,			Ţ			4+4+3 N =7 REC =18"	w=15.6 LL=NI PL=NI *	% > >	
_	_ _ Orangeish brown, Med coa _	rse sand.				- - 15-		4+7+7 N =14 REC =18"			
18.5	SANDY LEAN CLAY, moist, gray, contains mica.	greenish	CL			_ - 		1+1+2 N =3 REC =18"	w=31.3	%	
23.0	FAT CLAY with sand, moist, greenish gray	dark	СН	63.8		-	-	REC =24"	w=35.3 LL=5 ⁻ PL=16 PP=2.00	% I S	
_	continued on next pag	ge				-25-					

Γ		TEST Proje	ect: Calvert Clif	fs Nucle	ar Pow	er Plant	В	oring Number:	B-334
	Schna	bel Engineering LOG	Calvert Cou	unty, Ma	iryland		Co	ontract Number: 0	6120048
		STRATA DESCRIPTION	CLASS.	ELEV.	WL	S		TESTS	REMARKS
┝	(ГІ)			(F1)		DEPTH	DATA	*	
			СП						
		_							
							3+5+5	w=42.5%	
	-					Г., 1)(M	N =10 RFC =18"	*	
	_					-30-1-			
	-								
	-	_							
	33.0	LEAN CLAY, moist, gray	CL	53.8			REC =13"	w=32.6%	bent tube
	-							PL=13	
	_					-35-			
	-								
		-							
	оо г -			40.0					
	38.5	SILTY SAND, fine to medium graine	ed, SM	48.3		M	6+6+7 N =13		
	-					<u>40</u>	REC =18"		
		-							
	-								
	-								
	-						10+15+24	w=27%	
	_					Å	N =39 REC =18"		
	_								
80%									
DT 3/6	-								
EL.G	-						15+27+50	/2" w=27.2%	
HNAE	-					F 700	N =77/8"	*	
PJ SC	-	_				-50-			
400.G									
300 &	-								
3 SPT	53 5			33.3		+ - + + + + + - +		0.1.101	Start of drilling
3 PLOG		POORLY GRADED SAND WITH S fine to medium grained, wet, light qu	LT, SP-SM ay,	55.5		M	16+26+36 N =62	w=21.4%	harder drilling
20048	-	shell fragments, moderate HCI read	tion,			-55-1	REC =18"		
G 061	56.0	SILTY SAND fine to medium graine	ed SM	30.8		-			
NG LO	-	wet, light gray, shell fragments, stro	ng						
BORIT	-								
TEST		continued on next page							

ſ	6	TEST Project: (Calvert Cliff	s Nucle	ar Pow	er Plant	Boring Number:	B-334
	Schnak	bel Engineering LOG	Calvert Cou	inty, Ma	ryland		Contract Number: 0 Sheet: 3 of 4	6120048
ľ	DEPTH	STRATA DESCRIPTION	CLASS	ELEV.	wi	SAMPLIN	IG TESTS	REMARKS
	(FT)			(FT)		DEPTH DA	ТА	
			SM			12+12+	+9	
						N =21	18"	
	61.0 -	SILTY GRAVEL with sand, fine to	GM	25.8				
	-	medium grained, wet, greenish gray, shell fragments, contains cemented						
	-	sand, weak HCI reaction, 5% med						
	_					⊠ 50/5"	w=19%	
						REC =	5" PL=NP	
	66.0 -			20.8				
	00.0	SILTY SAND, fine to medium grained, wet, greenish gray, shell fragments.	SM	20.0				
		contains cemented sand, weak HCl						
	_							
	-					- $ $		
							18"	
	-							
	_							
	_							
		Moderate HCI reaction, 15% med					+15 w=27.3%	
		coarse shell.				N =26	18"	
						_/5		
	_							
	-							
	-							
	-	3% med coarse shell.				5+7+13	3	
3/6/08	_						18"	
GDT	_							
ABEL.	_							
SCHN								
GPJ		3% fine - med shell				₩ 4+6+10	w=28%	
400.0	_					N =16	18"	
300 8	_					-85-11 1120 -		
3 SPT	-							
PLOC	_							
20048	_							
061	-	25% med coarse shell.				4+7+12	2	
010						$ _{-90}$ $	18"	
ORIN								
ESTB		continued on next page						
۳L				1				1

	hnabal	TEST	Project: 0	Calvert Cliff	s Nucle	ar Pow	er Plant		Boring	g Number:	B-334
Schnal	bel Engineering	LOG	(Calvert Cou	inty, Ma	ryland			Contra	act Number: 0	6120048
DEPTH					EI EV			SAMPLI	NG	. + 01 +	
(FT)	STRAT	A DESCRIPT	ION	CLASS.	(FT)	WL	DEPTH	i D	ATA	TESTS	REMARKS
				SM							
-											
-	Light gray, stror	ng HCl reactio	n, 40%				[21+50	/5"		
	med coarse s	inell.					L	N =50	/5" =11"		
-											
-											
-											
-	Light gray, 25%	med coarse	e shell.					9+14+	22	w=28.9%	
100.0					-13.3		-100-0	REC =	=18"		
	BOTTOM OF B	ORING @ 10	0.0 FT.								
00/0											
5											
50											
6 4 F											
1200											

Schna	bel Engineering LOG		unty, Ivid	in yrar iù			Contra Sheet:	act Number 1 of 4	er: 061200)48
oring C	Contractor: UNI-TECH DRILLING					Gro	oundwater Obs	servations	;	
	MALAGA, NEW JERSEY					D	ate Time	Depth	Casing	Caveo
oring F	Foreman: J. Blemings		Enco	untere	d	5	5/2	19.0'		
rilling l	Method: Mud Rotary									
rilling	Equipment: CME-750	-								
chnabe	el Representative: B. Bradfield									
ates	Started: 5/2/06 Finished: 5/3/06									
ocatior	n: Northing: 216732.7 ft Easting: 960703.3 ft									
round	Surface Elevation: 00 5 (feet)									
						6/				
(FT)	STRATA DESCRIPTION	CLASS.	ELEV.	WL		че ∣ нте		TEST	'S F	REMARKS
0.4	ROOTMAT AND TOPSOIL.		99.1			ĪM	2+3+3			
-	POORLY GRADED SAND WITH SILT,	SP-SM			╞	-IM	N =6 REC =15"			
-	fine to medium grained, moist, orangeish brown, trace root fragments.				_		KLC = 15			
2.5	LEAN CLAY with sand, moist, orangeish	CL	97.0				1+3+4			
-	brown, trace root fragments.				Γ		N =7			
-					F		REC = 13			
5.0 —	SILTY CAND find to modium grained	CM	94.5		- 5 -		1.0.1			
_	moist, orangeish brown.	5101			L		N =3			
	-					Ш	REC =8"			
75	-		92.0		F					
	POORLY GRADED SAND WITH SILT,	SP-SM	52.0		F	HM	4+5+10 N =15			
_	and orangeish brown.				L	ЦШ	REC =16"			
10.5			89.0		-10-	ᅰ				
-	SILTY SAND, fine to medium grained, moist brown and orangeish brown	SM			F	HM	12+12+7 N =19			
-					F	ЦШ	REC =14"			
13.5			86.0		Γ		7.0.40			
-	fine to coarse grained, moist, white and	SP-SM			F	HVI	7+8+13 N =21			
	orangeish brown.				-15-	44	REC =12"			
_										
_										
-	-				F	-				
-					-	-				
_	wet, orange and brownish yellow.			∇	L		7+9+10			
				-		IXI	N =19			
					-20-		NLC = 10			
-	-				╞	-				
_					L					
- 23.5			76.0		F					
	CLAYEY SAND, fine to coarse grained, moist, brown and reddish vellow trace	SC			╞	- M	7+7+2 N =9			
24.5	fine gravel.	SM	75.0		-25-	<u> </u>				
	continued on next page									
		1	1		1			1		

	TE:	ST Project:	Calvert Cliff	s Nucle	ar Pow	er Plant	Borin	q Number:	B-335
C	BOR	ING	Calvert Cou	nty, Ma	ryland		Contr	act Number: 0	6120048
Schnal	bel Engineering LO	G					Sheet	: 2 of 4	
DEPTH (FT)	STRATA DESC	RIPTION	CLASS.	ELEV. (FT)	WL	SA DEPTH	AMPLING DATA	TESTS	REMARKS
-	SILTY SAND, trace fine coarse grained, wet, yel orangeish brown.	gravel, fine to low and	SM						
28.5				71.0					
-	LEAN CLAY with sand,	moist, gray.	CL			<u> </u>	WOH+WOH +9 N =9 PEC =18"		Resumed drilling on 5/3/06, drilling
-							REC =24"	PP=2.50 tsf	mud @ ground surface
-				66.0					
-	FAT CLAY with sand, m	ioist, gray.	СН	00.0		<u> </u>	WOH+3+3 N =6 REC =18"		
-									
-							REC =24"	PP=2.50 tsf	
-						 			
43.5	LEAN CLAY with sand,	moist, gray.	CL	56.0		 M	4+4+5		
_						45Å	N =9 REC =18"		
-									
								PP=>4.5 tsf	
						50			
	gray and light gray.						4+4+5 N =9 REC =18"		
	continued on ne	ext page							

	6	hnahol	TEST	Project: C	Calvert Cliff	s Nucle	ar Pow	er Plant		Boring	y Number:	B-335
	Schna	bel Engineering	LOG	C	Calvert Cou	nty, Ma	aryland			Contra Sheet:	act Number: 06 3 of 4	6120048
	DEPTH (FT)	STRAT	A DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	DEPTH	SAMPL	.ING DATA	TESTS	REMARKS
	58.8 _	POORLY GRAD fine to coarse gr light gray, trace fragments, mode	DED SAND W rained, moist, fine to mediu erate HCI rea	ITH SILT, gray and m shell ction.	CL SP-SM	40.7		 60 	REC 30+5 N =5 REC	=1" 0/2" 0/2" =13"		tube refusal at 13 inches bent tube
	-											hard pan ∖encountered
	63.5 - 	SILTY SAND, m fine to medium s moderate HCI re	noist, light gra shell fragmen eaction.	y, trace ts,	SM	36.0		 65	15+1 N =3 REC	8+21 9 =18"		
	-	fine to coarse sh HCl reaction.	nell fragments	s, strong				 70	18+2 N =4 REC	0+20 0 =17"		
	- 73.5 - -	LEAN CLAY wit and white, trace fragments, stron	h sand, moist fine to mediu ig HCI reactio	, light gray ım shell n.	CL	26.0		 75 	10+5 N =5 REC	0/2" 0/2" =17"	PP=1.50 tsf	Changed to roller bit
EL.GDT 3/6/08	78.5 79.2 ⁻ -	POORLY GRAE fine to coarse gr and white, with f fragments, stron SILTY SAND, fir moist, light gray	DED SAND W ained, moist, fine to coarse Ig HCI reaction ne to medium and grayish l	/ITH SILT, light gray shell n. grained, prown, with	SP-SM	21.0		 [80	8+8+ N =3 REC	24 2 =18"		
G SPT 300 & 400.GPJ SCHNAB	-	fine to coarse sh HCI reaction. gray and white.	nell fragments	s, strong				 85	6+8+ N =1 REC	7 5 =18"		
ST BORING LOG 06120048 PLO	- - - -	dark gray and w	hite. Jud on next pag	re				 90	5+3+ N =8 REC	5 =18"		

	6	hnahal	TEST	Project: 0	Calvert Cliff	s Nucle	ar Pow	er Plant		Boring	y Number:	B-335
	Schnat	el Engineering		C	Calvert Cou	nty, Ma	ryland			Contra	act Number: 0	6120048
-	DEPTH (FT)	STRATA D	ESCRIPT	ION	CLASS.	ELEV. (FT)	WL	DEPTH	SAMP		TESTS	REMARKS
GPJ SCHNABEL.GDT 3/6/08	DEPTH (FT)	STRATA D wet, gray and greer to coarse shell frag SILTY SAND, fine t wet, gray and greer fragments. BOTTOM OF BORI	escription of medium nish gray, 1 ING @ 100	ION trace fine grained, trace shell 0.0 FT.	CLASS. SM	ELEV. (FT)	WL	DEPTH	SAMP 1 4+5 N= REC 5+7 N= REC	+5 10 C = 18" +9 16 C = 18"	TESTS	REMARKS
T BORING LOG 06120048 PLOG SPT 300 & 400.GF												

Sch	C	TEST Proje BORING BORING Del Engineering LOG	ct: C	alvert Clif alvert Co	ffs Nucle unty, Ma	ar Pov Iryland	ver Pla	nt	Borin Contr Sheet	g Number: act Numbe :: 1 of 4	er: 06120	B-336
Borin	~ C							Gro	oundwater Ob	servations		
	уc	MALAGA, NEW JERSEY						D	ate Time	Depth	Casing	Caved
Borin	g F	oreman: J. Blemings			Enco	untere	d	5	/12	10.5'		
Drillir	ng N	Method: Mud Rotary			Star	of da	у	5	/15	12.8'		
Drillin	ng E	equipment: CME-750 (ATV)					-					
Schn	abe	I Representative: K. Megginson										
Dates	5	Started: 5/12/06 Finished: 5/15/06	6									
Locat	ion	: Northing: 216632.91 ft Easting: 960750.27 ft										
Grou	nd S	Surface Elevation: 96.9 (feet)				I	1					
DEPT (FT)	тн)	STRATA DESCRIPTION		CLASS	ELEV. (FT)	WL	DEP	S/ ТН ∣	AMPLING DATA	TEST	s	REMARKS
0.3		Forest litter, rootmat and topsoil.		EILI	96.6		- - -	ТМ.	3+4+3		*N	IWJ rods
	_	Silty sand PROBABLE FILL, fine to coarse grained, moist, brown, FILL.		FILL			-	-M	N =7 REC =18"		us	ed.
		fine to use divuse sustanted					Γ		0.0.0			
	-	line to medium grained.					F	IXII	2+2+2 N =4			
	-						F	-121	REC =11"			
	_						- 5 -					
		brown and grayish brown.						IM	WOH+1+2 N =3			
							Γ	12	REC =12"			
	-						F	1_				
	-	brown.					-	-M	1+1+1 N -2			
							L	$ \Delta $	REC =10"			
							10					
10.5			4		86.4	$\overline{\Delta}$	-10-					
11 5	-	medium grained, wet, brown, contai	to ns	FILL	85 /		F	HXII	+6			
11.5	' –	leaf fragments.	/	SC	05.4		F	- 121	N =6 REC =16"			
	-	CLAYEY SAND, fine to medium grained, moist, brown.					-	-				
	-	light blueish gray.					F	-M	2+6+4 N =10	w=11.4	.%	
									REC =14"			
							F	1				
3 17.0	+	SANDY LEAN CLAY, fine to mediur	n.	CL	79.9		F	+				
	_	moist, light blueish gray and light	,				F	-				
e B		orangeish brown.					L		WOH+3+6	PP=2.00) tsf	
								IXI	N =9 REC =14"			
5	-						-20-	-				
	-						F	+				
22.0					74.9		F					
		SANDY SILT, tine to medium, wet, yellowish brown and light grav.		ML	-		L					
<u>S</u>									1+0+4	PP=1 00) tsf	
	-						F	- \/	N =3			
Ā	_	continued on next name					-25-	- ĽI	REC =18"			
		comment on next page										

SC	hnabel BORING	oject: Calvert Clif Calvert Cou	fs Nucle unty, Ma	ar Pow aryland	er Plant	-	Boring Numbe	r:	B-336
Schna	bel Engineering LOG		, ,				Sheet: 2 of 4		120040
DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL	S		G TES	TS	REMARKS
		ML							
-					-				
27.0 -	FAT CLAY moist gray trace fine	e to CH	69.9						
-	medium sand and mica.								
-						1+3+4	w=26	.9%	
_						N =7 REC =18	8"		
-									
-					- 1				
-								05 4-6	
-	trace fine sand.					REC =2	7" PP=2.2	25 IST	
					-35				
-						-			
37.0 -			- 59.9						
	ELASTIC SILT, moist, light greer gray and gray, trace fine sand an	nish MH nd mica.							
						3+4+6			
-					F 1 X	N =10	0"		
					-40-4		D		
-									
42.0 -	FAT CLAY moist gray trace fine	e sand CH	54.9						
-	and mica.								
-						REC =2	7" PP=3.2	25 tsf	
					45				
80/ 17.0			40.0						
9/8 47.0 - ⊢	SANDY LEAN CLAY, fine to med	dium, CL	49.9		F 1				
- 19	moisi, gray, trace mica.						w-25	0%	
- HNABE					F -11X	6+6+7 N =13	*	.970	** De europe d
					-50-1	REC =18	8"		drilling at 8:45
- 00.0G									AM on 5/15/06.
% 8 52.0 -			44.9						
- PT 30	grained, moist, gray, contains cla	ayey SC							
00 20	sand pockets.					REC =1	9" PP=N	A tsf	
148 PL									
61200					-55-				*Relative
ອ 56.0 -	POORLY GRADED SAND WITH	I SILT, SP-SM	40.9						rotary
	gravel, contains clayey sand poo	arse ckets,			├ ┤				advancement below 56 ft.
- BOR	moist, gray.								
TESI									

	-	TEST	Project:	Calvert Cliff	s Nucle	ar Pow	er Plant		Boring Number:	B-336
Sc	hnat	el Engineering LOG		Calvert Cou	nty, Ma	ryland			Contract Number: 0 Sheet: 3 of 4	6120048
DEP (F	РТН Т)	STRATA DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	S DEPTH		G TESTS	REMARKS
	_			SP-SM			 60 	33+50 N =50 REC =1	2"	
62.	.0 -	SILTY SAND, fine to medium moist, gray, trace fine to med fragments (±5%), weak HCI r	grained, ium shell eaction.	SM	34.9		 65 	3 50/5" N =50/5 REC =4	n n	
	-	wet, gray, little fine to coarse fragments (±20%), strong HC	shell I reaction.				 70	20+17+2 N =37 REC =1	20 w=19.6% 4"	
	-	moist, light gray, mostly mod cemented sand layers, weak reaction.	erately HCl				 	³ 50/3" N =50/3 REC =2	n n	*Moderate to difficult rotary advancement below 73.5 ft. *Slight to moderate difficultly in rotary advancement
ABEL.GU1 3/0/00	-	wet, oliveish gray and light gr fine to coarse shell fragments moderate HCI reaction, mode cementation.	ay, few s (±10%), srate				 ⊵ 80 	³ 50/3" N =50/3' REC =4'	n u	below 75 ft.
	-	gray, trace fine to coarse she fragments (±5%), strong HCl (strong HCl reaction with she fragments only).	ll reaction, ll				 - 85 	6+7+12 N =19 REC =1	w=27.3% 8"	
	-	weak HCI reaction.					 90	7+6+14 N =20 REC =1	8"	
	_	continued on next pag	je							

	TEST Proje	ect: Calvert Cliff	s Nucle	ar Pow	er Plant	Bor	ing Number:	B-336
Schnal	bel Engineering LOG	Calvert Cou	inty, Ma	ryland		Contract Number: 06120048 Sheet: 4 of 4		
DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL	SA		TESTS	REMARKS
97.0 -	gray, trace fine to medium shell fragments (±5%), contains contains clayey sand layers, weak HCl reacti CLAYEY SAND, fine to medium grained, wet, gray, trace fine to med shell fragments (±1%), weak HCl reaction.	on.	0.1		DEPTH	DATA 7+7+11 N =18 REC =18" 4+6+7 N =13	w=32.1%	
	BOTTOM OF BORING @ 100.0 FT		3.1		<u>100</u> <u>[</u>]	REC =18"		

Schnal	TEST Project: O bel Engineering LOG	Calvert Cli Calvert Co	ffs Nucle unty, Ma	ar Pov ryland	ver Pla	int	Boring Number: B-3 Contract Number: 06120048 Sheet: 1 of 4			
Boring C	contractor: CONNELLY AND ASSOCIATE	S, INC.				Ground	water Obs	ervations	;	
J	FREDERICK, MARYLAND					Date	Time	Depth	Casing	Caved
Boring F	oreman: D. Bender		Enco	untere	ed	6/6		9.0'		
Drilling I	Method: Mud Rotary		Start	of da	у	6/7		10.0'		
Drilling E	Equipment: CME-550				-					
Schnabe	Representative: K. Bell	_								
Jates :	Started: 6/6/06 Finished: 6/7/06									
ocation	Easting: 960264.41 ft									
Ground	Surface Elevation: 71.8 (feet)									
DEPTH	STRATA DESCRIPTION	CLASS	ELEV.	wi		SAMPI	LING	TEST	s	REMARKS
(FT)			. (FT)		DEP	тн	DATA	1201	.	
0.8	ROOTMAT AND TOPSOIL.		71.0							
0.0 _	POORLY GRADED SAND WITH SILT, fine to coarse grained, moist, vellowish	SP-SM			F	1+2+	+2 ↓			
25	brown and orangeish brown, trace root		69.3		F	REC	; =9"			
	CLAYEY SAND, fine to coarse grained.	SC	00.0		F	- N 3+3+	+4			
_	moist, orangeish brown, trace root				-		; =15"			
4.5	POORLY GRADED SAND WITH SILT.	SP-SM	67.3		- 5 -					
	fine to coarse grained, moist, orangeish					3+3+ N =5	+2 5			
	blown.						; =7"			
7.0 -	SILTY SAND, fine to medium grained,	SM	64.8		F					
-	wet, gray.				-	- 2+3+ 	+3 S			
_				Ā	-		; =16"			
					-10-	-				
_						3+3+	+6			
) ; =18"			
_					F					
13.0 -	SANDY ELASTIC SILT, wet, gray.	MH	- 58.8		F					
_					-	-	+4			
					-15-		; =18"		re	sumed drill
_					L	_			7:	30am
170 -			5/ 8							
17.0	SILTY SAND, fine to medium grained, wet, grav.	SM	0.40							
-					†		- 7			
-					F	= 1	4			
_					-20-		; =18"			
-					F	-				
22.0 -	FAT OLAY		49.8		Ļ					
-	FAT CLAY, moist, gray, trace sand.	CH								
						4+54	+7			
-					F		2			
_	continued on next page				-25-		, = 10			

	TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	1	Boring Number: B-		
Schna	bel Engineering LOG	С	alvert Cou	nty, Ma	iryland			Contract Number: 06120048 Sheet: 2 of 4		
DEPTH (FT)	STRATA DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	S. DEPTH		B TESTS	REMARKS	
			СН					<u>^</u>		
-										
27.0 -	CLAYEY SILT, moist, gray, tr	ace sand.	ML	44.8						
-							4.0.0			
-						- 1X	A+0+0 N =12	2"		
-						-30-1-1				
-										
-										
-							9+19+50	w=29%		
-							N =69 REC =16	· · · · · · · · · · · · · · · · · · ·		
_						-35				
37.0 -				34.9						
57.0	SILTY SAND, fine to medium moist, gray and white, contain	grained, ns fine to	SM	54.0						
_	medium shell fragments, 20-3 cementation, HCI reaction str	30%, weak ong.					29+50/4'			
_						-40-	N =50/4" REC =9"			
-										
-										
-										
-	wet, with fine to coarse shell	fragments,				M	13+17+1	7		
	40-50%.					<u>45</u>	REC =15	5"		
-										
80/9/2 47.0 -	CLAYEY SAND moist green	nish arav	SC	24.8						
- 105	trace fine to medium shell fra 2-5%. HCl reaction weak.	gments,								
- NABEI						M	3+5+5 N =10	w=39.9%		
						-50-1	REC =18	3"		
- 400.GF										
- 300 &										
- de set						╞╴╶┤ _{┻┻}				
							REC =13	3" w=25.7% LL=38 PI =10		
- 61200						-55-		PP=2.00 tsf		
- 000										
57.0 -	SILTY SAND, fine to medium	grained,	SM	14.8						
- BC	continued on next pag	ie Ie								
₽∟										

	-	TEST Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	Boring	Number:	B-337	
Sc	chnab	BORING C	Calvert County, Maryland					Contract Number: 06120048 Sheet: 3 of 4		
DEF	ртн	STRATA DESCRIPTION	CLASS	ELEV.	wi	SAMF	PLING	TESTS	REMARKS	
(F	T)		OLAGO.	(FT)	~~~	DEPTH	DATA	12010		
		coarse shell fragments, 20-30%, HCI reaction strong.	SM			21+	+20+10			
	_					N =	⊧30 C =18"			
62	.0 -	LEAN CLAY with sand, wet, greenish	CL	9.8						
		fragments, 10-20%, HCl reaction weak.					2+10			
	-						-18 -18			
	-					-65-0	0 - 10			
	-									
67	.0 +	SILTY SAND, fine to medium grained,	SM	4.8						
	-	wet, greenish gray and white, trace fine to medium shell fragments, 5-10%, HCI								
	-	reaction weak.					6+9 •15			
	_						C =18"			
	-									
	-									
	_									
	_					5+8	5+9	w=30.9%		
	_						⁼14 C =18"			
						□ □	5+8			
20							-13 C =18"			
9/2						80				
EL.GL	-								Rig chatter	
HINAE	-									
	-									
400.6	-	tine to coarse grained, gray and white, with fine to coarse shell fragments,				050/ N =	5" •50/5"			
300 &	_	50-60%, strong cementation, HCI reation strong.				-85- RE	C =4"			
	-									
FLOG	-					$\left \right $				
20048	-								Rig chatter	
	-	contains fine to coarse shell fragments,					+14+50/5" =64/11"	w=21%		
le LO	_	IV-∠V /0.					C =16"			
BURIN	4	<i>"</i>								
EX		continued on next page								

SC	hnabel BORING	Project: 0	Calvert Cliff	s Nucle	ar Pow	er Plant		Boring Number:	B-337	
Schnat	bel Engineering LOG			, me	iryiana			Sheet: 4 of 4		
DEPTH (FT)	STRATA DESCRIP	TION	CLASS.	ELEV. (FT)	WL	DEPTH	SAMPLIN	IG TESTS	REMARKS	
			SM							
92.0 -	SANDY SILT, wet, greenish	gray, trace	ML	-20.2						
_	fine to medium shell fragme HCI reaction weak.	nts, 5-10%,								
-						10	4+7+12	2		
_						95	REC = 19	18"		
_										
-							_			
_						$- + \rangle$	4+5+7 N =12			
100.0 —		00 0 FT		-28.2		-100-	REC =	18"		
		00.011.								
1										

Schnat	hnabel Engineering LOG	ct: Calvert Cliffs Nuclear Power Plant Calvert County, Maryland					nt Boring Number: Contract Number: 0612004 Sheet: 1 of 4			B-33	
orina C	Contractor: CONNELLY AND	ASSOCIATE	S, INC.				Ground	water Obs	ervations	5	
	FREDERICK, MAR	RYLAND					Date	Time	Depth	Casing	Caved
oring F	oreman: D. Bender			Enco	untere	əd	6/8		25.0'		
rilling N	Method: Mud Rotary		ľ	Star	t of da	v	6/13		35.0'		
rilling E	Equipment: CME-550		-			,					
chnabe	I Representative: K. Bell		-								
ates S	Started: 6/8/06 Finished: 6/	13/06									
ocation	Easting: 960150.1 ft		-								
iround	Surface Elevation: 98.0 (feet)										
DEPTH (FT)	STRATA DESCRIPT	ION	CLAS	SS. ELEV.	WL		SAMPI		TEST	s	REMARKS
0.5	ROOTMAT AND TOPSOIL.			97.5		DEP					
- 0.5	POORLY GRADED SAND W fine to coarse grained, moist, brown.	ITH SILT, yellowish	SP-S	SM 97.5		-	2+2+ N =4 REC	-2 =12"			
-	orangeish brown and reddish	brown.					3+3+ N =6 REC	-3 =18"			
_	trace gravel					- 5 -	3+4-	-5			
_								=16"			
							5+6+	-7			
_							N =1 REC	3 =18"			
						10					
	trace gravel					- 10-		-0			
-	liace gravel.					F	N =1	7			
-						F		-10			
-						-	-				
-						-	- 6+8-	-6 ⊿			
						-15-		=16"			
_											
17.0 -	CLAYEY SAND, fine to coars	e grained,	SC	81.0		F	7				
-	wet, orangeisn brown.					F				re	sumed
-						F	- \/ 6+4+ N =1	-9 3		6/9	9/06 @ 7:0
						-20-		=18"		fa	it clay layer
-						F	-				
_						L					
-						F		2			
-						F	- X 2+2+ N =4	-2			
_	continued on next pac	ie.			$ \Sigma$	-25-		=16"			
	commuted on next pay	-									

	TEST Project:	Calvert Cliff	s Nucle	ar Pow	er Plant	Boring Number:	B-338	
Schna	bel Engineering LOG	Calvert Cou	nty, Ma	ryland		Contract Number: 06120048 Sheet: 2 of 4		
DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL		NG TESTS	REMARKS	
		SC						
-								
27.0 -	LEAN CLAY, moist, gray, with sand.	CL	71.0					
-							color change in	
-					N = 4	18"	orangeish brown to gray	
22.0			66.0					
52.0	FAT CLAY, moist, gray, with sand.	СН	00.0					
_					2+3+3			
_					N =6 REC =	18"		
_								
-								
-								
-					1+3+4			
					-40-10 REC =	18"		
-								
42.0 -	SANDY SILT, moist, gray.	ML	56.0					
-								
-					– – – – – – – – – – – – – – – – – – –	40"		
					-45-10 REC =	18"		
- 8								
/0/2 -								
						-24" PP=>4.5 tsf		
49.5	ELASTIC SILT, moist, gray, trace sand.	MH	48.5			-		
- 00 × 400								
- 12								
- 100					6+8+1	1		
					REC =	18"		
- 10								
57.0 -	SANDY SILT, moist, grav, weak	ML	41.0					
	cementation.							
	······································							

Γ		TEST	alvert Cliff	s Nucle	ar Pow	er Plant		Boring Number: B-338			
	Schna	bel Engineering LOG	GC	alvert Cou	inty, Ma	ryland			Contract Number: 06120048 Sheet: 3 of 4		
	DEPTH (FT)	STRATA DESCRIP	ντιον	CLASS.	ELEV. (FT)	WL	S		G TESTS	REMARKS	
┢				ML							
	-	_						9+11+14 N =25	1		
	_						-60-1	REC =18	8"		
	-										
	-										
	-	-									
	-							50/5"			
							65	REC =5'	"		
	_									Pig chatter	
	670 -				31.0						
	07.0	SILTY SAND, fine to mediu wet, gray and white, contain	m grained, ns fine to	SM	51.0						
		coarse shell fragments, 30- reaction strong, 1/2" clay le	40%, HCl nse.				$ \Box \nabla$	10+17+1	19		
	-							N =36 REC =15	5"		
	_						70		-		
	-										
	72.0 -	LEAN CLAY, moist, greenis	sh gray, trace	CL	26.0						
	-	fragments, 2-5%, HCl reac	tion weak.								
	-							N =12	0"		
	_						75	REC = R	0		
	-										
	77.0 -	CLAYEY SAND, fine to me	dium	SC	21.0						
	-	grained, moist, greenish gra to coarse shell fragments, 2	ay, trace fine 2-5%, HCl								
	-	reaction weak.						4+4+6 N =10			
3/6/0		_					-80	REC =18	8"		
L.GDT	-									Dig obottor	
INABE	82.0 -	SILTY SAND, fine to coarse	e grained,	SM	16.0					Rig chatter	
J SCF	-	wet, light gray, contains fine shell fragments, 20-30%, s	e to coarse trong							no shelby tube taken due to	
00.GP	-	cementation, HCI reaction s	strong.					7+19+21 N =40	1	heavy rig chatter	
00 & 4	_	_					-85-	REC =18	8"	Resumed drilling on	
SPT 3	-									6/13/06 @ 7:00am	
PLOG	-										
20048	-										
G 061	-	greenish gray and white.						7+9+12 N =21			
NG LO							<u>⊢₉₀ </u>	REC =18	8"		
BORIN	-										
TEST		continuea on hext p	aye								

Sc	hnabel TEST BORING	Project: C	alvert Cliffs Nuclear Power Plant alvert County, Maryland					Boring Number: B-33 Contract Number: 06120048		
Schnal	bel Engineering LOG						Sheet: 4 of 4			
DEPTH (FT)	STRATA DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	S DEPTH		G TESTS	REMARKS	
			SM							
-										
_	with first to some shall for an	4 -					1 50/4"			
-	50-60%, strong cementation.	nents,					N =50/4			
-						-95-	REC =3			
-	contains fine to medium shell	tion				11	N = 12	0"		
-	moderate.							0		
-								" PP=2 00 tsf		
99.6				-1.6			REC =/			
	BOTTOM OF BORING @ 99	.6 F1.								

Schnat	TEST Project: BORING BORING Del Engineering LOG	Calvert C Calvert C	Cliffs Nuclear Power Plant County, Maryland					Boring Number: Contract Number: 06120048 Sheet: 1 of 4			B-33
orina C	contractor: CONNELLY AND ASSOCIATE	S. INC				Gro	oundw	ater Obs	ervations	;	
5g 0	FREDERICK, MARYLAND					D	ate	Time	Depth	Casing	g Cave
oring F	oreman: D. Bender		Enco	untere	ed	6	6/7		15.0'		
rilling N	lethod: Mud Rotary	F	Start	ofda	v	6	3/8		13.5'		
rilling E	quipment: CME-550	-	Otari	. or uu	y		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		10.0		
chnabe	I Representative: K. Bell										
ates S	Started: 6/7/06 Finished: 6/8/06										
ocation	: Northing: 217095.21 ft Easting: 960211.99 ft										
round S	Surface Elevation: 92.0 (feet)				1						
EPTH	STRATA DESCRIPTION	CLAS	S. ELEV.	WL		S	AMPL	ING	TEST	s	REMARK
()			(,		DEP	тн	D	ΑΤΑ			
0.5	POORLY GRADED SAND, trace gravel, trace silt, fine to coarse grained, moist, vellowish brown.	SP	91.5		-		1+4+6 N =10 REC :	6) =15"			
_	orangeish brown.				L		3+2+3	3			
1	5						N =5	=10"			
-					F		NEO .	10			
					- 5 -		3+3+4	1	w=6.9	%	
-					+	$- \chi $	N =7	=16"	*		
					L		NLO -	10			
	reddish brown and orangeish brown.						5+6+6	5			
	· · · · · · · · · · · · · · · · · · ·				Γ		N =12	-17"			
-					F		KLC -	-17			
					-10-						
-					\vdash	-M	4+6+6 N =12	5			
_					F		REC	=16"			
					L						
13.5	SILTY SAND trace rock fragmonte	SM	78.5		Γ		7+11-	-0	w=19.9	9%	
-	red-brown, 0.5" cemented sand lense	5101			F		N =20)	*		
-					-15-		REC	=18"			
-					+	-					
17.0 -			75.0		Ļ						
-	CLAYEY SAND, fine to medium grained, wet, orangeish brown and grav.	SC			L						
1							1+1+1	2		l re	sumed dril n 6/8/06 @
-					t		N =3	-		7	30am
					-20-	- Ľ	KFC :	=18"			
-					\vdash	-					
22.0 +			70.0		F	4					
_	LEAN CLAY, wet, gray, with sand.	CL									
1							1+2+4	3			
-					F		N =9				
_	continued on next name				-25-	- 14	REC	=18"			
	continuou on noxi pugo				1						

	hnabal	Project: 0	Calvert Cliff	s Nucle	ar Pow	er Plant		Boring Number: B-33			
Schnal		BORING	0	Calvert Cou	nty, Ma	ryland			Contract Number: 06120048		
DEDTU	bei Engineering	200					6		Sneet: 4	2 01 4	
DEPTH (FT)	STRATA	A DESCRIPT	ION	CLASS.	ELEV. (FT)	WL				TESTS	REMARKS
				CL			DEFIN				
27.0 -					65.0						
	SANDY FAT CL sand.	AY, wet, gray	/, with	СН							
								2+2+3		w=31.5%	
							F -1 X	N =5		LL=55	
-							-30-1	REC =1	8"	*	
								21214		w=27%	
							F -1 X	2+3+4 N =7		LL=62	
							-35-1	REC =1	8"	FL-21 *	
-											
								2+3+2		w=28.6%	
-							F -1 X	N =8		LL=71	
							<u> </u> −40– ∐	REC =1	8"	FL-17 *	
-											
								2+4+7		w=31%	
-							F -1 X	N =11	.	LL=60 PL=22	
							-45 []	REC =1	8"	FL-22 *	
- (9/08											
9 48.5		AV dark ar	21/	CL	43.5			4+6+7		w=27.8%	
	SANDT LEAN C	ich i , uaik gi	ay				F 1 X	N =13		LL=40 PL=20	
							-50-0	REC =1	/"	*	
– 10.GP											
- 0 × 4											
<u>ה</u> 19 53.5		oist groonict	arav	SW	38.5			6+11+1	5	w=30.8%	
	trace sand.	oisi, yreenisi	ı yıay,				F 1	N =26	0"	LL=48 PL=30	
							55 ^[]	REC =1	8	*	
- n							+ +				
57.0 -					35.0						Harder drilling
	POORLY GRAD fine to medium a	ED SAND W grained, wet.	ITH SILT, gray and	SP-SM							
	continu	ed on next pag	je j								
<u> </u>								1			

	-	hnabel TEST	Project: (Calvert Cliffs Nuclear Power Plant					Boring Number:	B-339
Sc	hnat	bel Engineering LOG		Calvert Cou	inty, Ma	aryland			Contract Number: 0 Sheet: 3 of 4	6120048
DEP (F	РТН T)	STRATA DESCRIP	TION	CLASS.	ELEV. (FT)	WL	S DEPTH	AMPLING	TESTS	REMARKS
		white, contains fine to coarso fragments, 10-20%, strong cementation, HCl reaction n	e shell noderate.	SP-SM			X 60 	28+50/5" N =50/5" REC =10	w=28.1% LL=NP PL=NP *	
62.	.0	CLAYEY SAND, fine to coar wet, gray and white, with fine shell fragments, 60-70%, Ho strong.	se grained, e to coarse Cl reaction	SC	30.0		 65	8+8+7 N =15 REC =18	w=25% LL=49 PL=21 *	
67.	.0 -	ELASTIC SILT, moist, gray a greenish gray, trace sand.	and	MH	25.0		 70	4+5+5 N =10 REC =18	w=38.8% LL=53 PL=38 *	
72.	.0 -	SILTY SAND, fine to coarse wet, gray, Strong cementatio reaction strong.	grained, n, HCl	SM	- 20.0			50/2" N =50/2" REC =1"		No shelby tube taken due to heavy rig chatter Rig chatter
ABEL.GUI 3/6/08	-	fine to medium grained, gray with fine to coarse shell frag 40-50%.	v and white, ments,					21+22+1 N =37 REC =18	5 w=16.6% ;"	
G SP 1 300 & 400.GPJ SCHN	-	greenish gray and white, cor to coarse shell fragments, 10 reaction moderate.	ntains fine)-20%, HCl				 85	5+7+12 N =19 REC =18	w=31.5% *	Rig chatter
		POORLY GRADED SAND V contains shells, dark gray	VITH SILT,	SP-SM	3.5			7+7+14 N =21 REC =18	w=29% *	
		continued on next pa	ge							

Schnabel Engineering LOG Constrained with county, marginal Constrained with county, marginal DEPTH STRATA DESCRIPTION CLASS ELEV WL SAMPLING TESTS REMARKS Image: Straine in the s
DEPTH (FT) STRATA DESCRIPTION CLASS ELEV (FT) WL SAMPLING DEPTH TESTS REMARKS
SP-SM - - - - - - - - - - - - -

Schnat	TEST Project: C bel Engineering LOG C	Calvert Clif Calvert Co	Cliffs Nuclear Power Plant				Boring Contra Sheet	Boring Number: E Contract Number: 06120048 Sheet: 1 of 4		
Boring C						Gro	oundwater Obs	servations		
	FREDERICK, MARYLAND	5, INC.				D	ate Time	Depth	Casing	Caved
Boring F	oreman: T. Chew		Enco	untere	d	8	3/3	13.5'		
	-quipment: Diedrich D-50 (ATC)									
Schnabe	Representative: B. Bradfield									
Dates	Started: 8/3/06 Finished: 8/7/06									
Location	E Northing: 217/17.34 ft Easting: 961225.22 ft									
Ground	Surface Elevation: 84.6 (feet)				1					
DEPTH (FT)	STRATA DESCRIPTION	CLASS	· (FT)	WL	DEP	TH	DATA	TEST	s	REMARKS
0.4	TOPSOIL.	SM	84.2			M	3+5+5 N =10		0-	15'- Used 6 4" HSA to
-	SILTY SAND, fine to coarse grained, moist, orangeish brown, trace root fragments, trace gravel, PROBABLE				-	-0	REC =18"		er tal sa	large hole for king Pitcher imples
-					-	-	3+3+2 N =5 RFC =18"			
_	brown trace group						21212			
-	biowii, liace gravei.				-	-	N =4 REC =18"			
-					-	- 	4+2+2			
-					-	Δ	REC =18"			
	grayish brown.				-10-	- - M	5+5+5			
-					-	ЦМ	N =10 REC =18"			
13.0 -	CLAYEY SAND, fine to coarse grained,	SC	71.6	Ţ	-		4+9+9			
							N =18 REC =16"		15	5'- Start of day
					-	$\left \right $			8/- 15 ro	4/06 5'- Begin mud tary
g 17.0 -	SILTY SAND, fine to coarse grained,	SM	67.6		F	$\left \right $				
	wet, orangeish brown.				F	+				
					F	-0	4+6+6			
					20-		REC =13"			
					20-					
					F	1				
22.0 -	SANDY FAT CLAY, fine to medium,	СН	62.6		-					
	moist, dark gray.				-	-				
					F	-	4+2+4 N =6			
	continued on next page				-25-	40	REC =18"			
Ľ										

ſ	6	TEST Project:	Calvert Cliff	s Nucle	ar Pow	er Plant	Boring Number: B-34		
	Schnat	bel Engineering LOG	Calvert Cou	nty, Ma	iryland		Contract Number: 06120048 Sheet: 2 of 4		
	DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL		NG TESTS	REMARKS	
-	- - - - -	with sand, contains mica.	СН				18"		
	-	gray.				4+6+8 4+6+8 N =14 REC =	18"		
	37.0 - - - -	CLAYEY SAND, fine to medium grained, wet, dark gray, contains mica.	SC	47.6		 	18"		
6/08	42.0	POORLY GRADED SAND WITH SILT, fine to coarse grained, wet, dark orangeish brown, trace cemented sand, weak cementation.	SP-SM	42.6		 	18"	45'- Driller noted harder drilling	
00 & 400.GPJ SCHNABEL.GDT 3	- - - -	fine to medium grained, light brownish white.				 29+34- N =84/ REC =	+50/4" 10" 0"		
OG 06120048 PLOG SPT 3	-	light gray.				31+50/ N =50/ REC =	/5" 5" 7"		
TEST BORING L	57.0 -	FINE TO MEDIUM SANDY FAT CLAY, moist, gray and brownish white, 0-10% continued on next page	СН	27.6					

	TEST Project:	Boring Number: B-340						
Schnal	bel Engineering LOG	Calvert Cou	inty, Ma	aryland		Contract Number: 06120048 Sheet: 3 of 4		
DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL			REMARKS	
-	fine to medium shell fragments, moderate HCI reaction, HCI reaction localized to decomposed shell fragments.	СН			4+4+2 - 60	20 =18"		
62.0 -	CLAYEY SAND, fine to medium grained, wet, light gray and brownish white, 20-30% fine to coarse shell fragments, some cemented sand, strong HCI reaction, moderate cementation, HCI reaction localized to decomposed shell fragments.	SC	22.6		 7+13+ 7+13+ N =28 REC :	+15 3 =18"	CCI Ditabas	
-	1' zone of strongly cemented sand and fine to coarse shell fragments, strong HCI reaction, gray weak cementation, HCI reaction localized to decomposed shell fragments.				6+8+1 6+8+1 2 REC = 70	12) =11"	68'- Start of day 8/7/06	
	20-30% fine to coarse shell fragments, with cemented sand, strong HCl reaction, moderate cementation, 1" of highly cemented sand at tip of shoe.				 75 	+40 =12"		
- 77.0 -	POORLY GRADED SAND WITH CLAY, fine to medium grained, wet, dark gray and brownish white, 0-10% fine to medium shell fragments, moderate HCI reaction, HCI reaction localized to shell fragments.	SP-SC	7.6		 	9 =16"		
06 SPT 300 & 400.6FJ SCHNA	dark gray, 0-10% fine to medium shell fragments, weak HCI reaction, HCI reaction localized to shell fragments.				 4+7+1 N =21 REC =	14 =13"		
- 0.78	CLAYEY SAND, fine to medium grained, wet, greenish gray and brownish white, 30-40% fine to coarse shell fragments, strong HCI reaction, HCI reaction generally localized to shell fragments.	SC	- 2.4		 	11) =18"		
	continued on next page							

6	TEST	TEST Project: Calvert Cliffs Nuclear Power Plant						Boring Number: B-		
Schnat	bel Engineering LOG	G	Calvert Cou	inty, Ma	iryland		Contract Number: 06120048 Sheet: 4 of 4			
DEPTH (FT)	STRATA DESCRI	PTION	CLASS.	ELEV. (FT)	WL	S		G TESTS	REMARKS	
_			SC							
-	light gray and brownish wh fine to coarse shell fragme cemented sand, strong HC strong cementation.	ite, 30-40% nts, with I reaction,					7+10+44 N =56 REC =1	6 5"		
97.0 -	POORLY GRADED SAND wet, dark gray, 0-10% fine shell fragments, weak HCI reaction localized to very s fragments.	WITH CLAY, to medium reaction, HCI mall shell	SP-SC	-12.4		 X	14+15+; N =42	27		
100.0 —	BOTTOM OF BORING @	100.0 FT.		-15.4		-100-	∬ REC =1	4"		
9EL.GU - 3/9/09										
000 01 000 4 4										
00 200400 1										

Schnat	hnabel BORING Del Engineering	alvert Cli alvert Co	Cliffs Nuclear Power Plant County, Maryland					Boring Number: B Contract Number: 06120048 Sheet: 1 of 4			
Boring C	ontractor: UNI-TECH DRILL	ING					Ground	dwater Obs	ervations		
	MALAGA, NEW JI	ERSEY					Date	Time	Depth	Casing	Caved
Boring F	oreman: J. Evans			Enco	untere	d	7/11		13.5'		
		、 、									
Drilling E	equipment: Failing-1500 (Truck	<)									
Schnabe	I Representative: K. Megginso	n									
Dates S	Started: 7/11/06 Finished:	7/12/06									
Location	: Northing: 217036.4 ft Easting: 961104.48 ft										
Ground S	Surface Elevation: 98.2 (feet)				1						
DEPTH (FT)	STRATA DESCRIPT	TION	CLASS	ELEV. (FT)	WL	DEPT	SAMF	PLING DATA	TEST	s i	REMARKS
0.5	Poorly graded sand FILL, find	e to coarse	FILL	97 7			2+5	5+7			
-	grained, moist, light brown, to contains black filter fabric fra 0.5 ft.	ace silt, gment at	SM					12 C =10"			
	¬ SILTY SAND, fine to coarse	/									
-	moist, brown	9.0					3+4 N =	+5 9			
	_ yellowish brown and light bro _ stratified below 3.8 ft	own.						C =12"			
						5					
	stratified brown and yellowish	n brown,					4+5	5+6			
-	trace fine graver							C =12"			
-											
	vellowish brown.						3+4	+4			
								8			
-								6 = 13			
_						-10-					
_	trace fine to coarse gravel.					L .	5+8	8+11			
								19 C =12"			
-								0 12			
-							-				
_	wet, yellowish brown and ligh	nt orangeish			<u> </u>	L -	6+1	0+11			
	brown.							21 C =11"			
	stratified below 14.7 ft.					-15-	1	-			
-											
										*5.4 bit	4" O.D. Drag from 0 to
						L				18.	5 ft.
	hanning and Robits									^Sv 4-3	vitched to /4" O.D.
-	brown and light brown.)/ 3+7)/ N =	+10 17		Dra	ag bit below
_						-20-		C =11"		10.	0 it.
						L .					
-							1				
-											
	fine to medium grained, light	brownish				L .	1+3	3+2			
	gray, yellowish brown, and o	rangeish laver below						5 C =4"			
	continued on next page	je				-25-		- - +			

Comments: 1. Boring backfilled with cement/bentonite grout through tremie pipe upon completion. 2. * = See Appendix I for additional lab testing data.

	TEST	TEST Project: Calvert Cliffs Nuclear Power Plant						Boring Number: B-		
Schna	bel Engineering LOG	Ca	alvert Cou	nty, Ma	iryland		Cont Shee	Contract Number: 06120048 Sheet: 2 of 4		
DEPTH (FT)	STRATA DESCRIPTI	ON	CLASS.	ELEV. (FT)	WL	SA DEPTH	MPLING DATA	TESTS	REMARKS	
	24.7 ft .		SM							
27.0				71.2						
-	SANDY LEAN CLAY, fine to m wet, yellowish brown and light brown, contains clayey sand p	nedium, grayish ockets.	CL	71.2			2+3+3			
_	gray, trace mica below 29 ft.						N =6 REC =18"			
-										
- 32.0	FAT CLAY, moist, brownish gr dark gray, trace fine to mediun and mica, contains fine to mec clayey sand pockets.	ay and n sand Jium	СН	66.2			2+2+4 N =6			
-										
-	brownish gray and gray, conta clay with fine to medium sand	ins fat pockets.				 	2+4+4 N =8 REC =18"			
-	trace organic matter (±1%), (so lab classify as MH).	oil may				 45	3+5+7 N =12 REC =18"			
- 80										
- 0.14 [GD1 3/6	ELASTIC SILT, moist, gray, tra medium sand and mica, conta sand and clayey sand pockets lenses.	ace fine to ins silty and	МН	51.2		 50 -	6+8+12 N =20 REC =18"			
- 400.GP										
52.0 -	CLAYEY SAND, fine to mediu grained, moist, gray, trace mic	m ;a.	SC	46.2		 	2+15+07			
LOG 06120048 PLC	grayish brown and dark reddis little fine to coarse oxidized sh fragments (±20%), contains sil pockets below 54.5 ft.	h brown, ell Ity sand					N =42 REC =18"			
- 0.12 BORING	POORLY GRADED SAND WI fine to medium grained, moist, continued on next page	TH SILT, dark	SP-SM	1 41.2						

SC	Schnabel Engineering LOG			s Nucle inty, Ma	ar Pow Iryland	ver Plant	E	Boring Number: B-341 Contract Number: 06120048		
Schnab	el Engineering LOG					1	5	Sheet: 3 of 4		
DEPTH (FT)	STRATA DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	S		TESTS	REMARKS	
-	brown and brown.		SP-SM			X	40+50/4" N =50/4" REC =10	,"	*Switched to 5" O.D. Tri-cone roller bit below 58.5 ft.	
62.0 - - - -	POORLY GRADED SAND, to fine to medium grained, mois	race silt, t, gray.	SP	36.2		 ×	50 REC =5"		*Switched to 4-3/4" O.D. Drag bit below 63.5 ft.	
67.0 -	SILTY SAND, fine to medium moist, gray, some fine to coa Fragments (±40%), strong He	n grained, rse shell Cl reaction.	SM	31.2		 	27+50/5" N =50/5" REC =9"	,		
-	mostly strongly cemented sa (±80%), little fine to coarse sl fragments (±20%).	nd layers hell				 75 	50/2" N =50/2" REC =1"		*Very difficult rotary advancement from 73 to 73.5 ft (slow rotary advancement). *Very to extremely difficult rotary advancement from 73.5 to	
-	oliveish gray, mostly weak to cemented sand pockets.	strongly				 	21+50/3" N =50/3" REC =9"		78.5 ft (very strong rig chatter). *Switched to 5" O.D. Tri-cone roller bit below 73.5 ft. *Extremely difficult rotary advancement	
	gray, trace fine to coarse she fragments (±5%), moderate H reaction.	il ICI				 85-	6+7+11 N =18 REC =18	р.	fron 78.5 to 82.5 ft (very strong rig chatter). *Switched to 4-3/4" O.D. Drag bit below 83.5 ft.	
	trace fine to medium shell fra (±<5%).	gments				 - 90	REC =24		*Osterberg sampler tube push from 88.5 to 90.5 ft	
_	continued on next pag	ge				$\left - \right ^{\bullet}$				

	TEST Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	Boring Number:	B-341	
Schna	bel Engineering LOG	alvert Cou	inty, Ma	ryland		Contract Number: 06120048 Sheet: 4 of 4		
DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL		NG TESTS	REMARKS	
	very weak HCI reaction	SM	12		5+8+1 	1 :15"	*Osterberg sampler tube	
	POORLY GRADED SAND WITH SILT, fine to medium grained, wet, gray, trace fine to medium shell fragments (±1%), moderate HCI reaction, (soil may lab classify as SP).	SP-SM	- 1.2		REC =	-24"	push from 98.5 to 100.5 ft	
	BOTTOM OF BORING @ 100.5 FT.		2.3					

Schna	bel Engineering LOG	ct: Calvert C Calvert C	Cliffs Nucle County, Ma	ar Pow ryland	ver Plant	:	Boring Contra Sheet:	Boring Number: Contract Number: 06120 Sheet: 1 of 13		
Poring (Grour	ndwater Obs	ervations		
Boring C	MALAGA, NEW JERSEY					Date	e Time	Depth	Casing	Caved
Boring F	Foreman: J. Evans		Enco	untere	d	6/19)	33.5'		
Drilling	Method: Mud Rotary		Start	of day	v	6/20)	12.0'		
Drilling Schnabe	Equipment: Failing-1500 (Truck)	_	Start	of day	y	6/22		35.0'		
Dates	Started: 6/19/06 Finished: 6/29/06		Start of day			6/26	,	22.01		
Location	n: Northing: 216344.12 ft Easting: 961516.81 ft	-	Start	. or uay	y	0/20	,	33.0		
Ground	Surface Elevation: 72.1 (feet)									
DEPTH (FT)	STRATA DESCRIPTION	CLAS	S. ELEV. (FT)	WL	DEPT	SAM H	IPLING DATA	TEST	s i	REMARKS
-	SILTY SAND, fine to coarse grained moist, brown, contains root fragment stratified brown and light brown, trac fine gravel.	, SM s. e				2+ N RE 2+ N	+3+3 =6 EC =13" +3+2 =5	w=3.6°	*Re diff adv froi (dif (dif % adv pro	elatively icult rotary /ancement m 2 to 2.5 ft ficult /ancement /bably due to pe root
-	fine to medium grained, light brown.				 - 5 		EC =14" +6+12 =18 EC =13"		frag *5. bit	gment). 4" O.D. Drag below 0 ft.
9.5	fine to coarse grained, brown. fine to medium grained, light grayish brown and light orangeish brown bel	ow	62.6				+6+7 =13 EC =14"			
	8.5 ft. FAT CLAY, trace fine to medium sand, moist, light gray, yellowish brown and orangeish brown, contains root fragments.					2+ N RE	+4+5 =9 EC =16"	w=26.6 LL=66 PL=20 *	% *SI 5 cha	ight rig atter at 11 ft.
- - -	light gray and yellowish brown, conta dark reddish brown pockets and subvertical planes.	ains			 - 15		+4+4 =8 EC =18"	w=34.2 LL=62 PL=20 *	% 2	
- 18.5 -	SANDY ELASTIC SILT, with shells, gray, trace mica and organic matter (±1%).	MH	53.6		 20	2+ N RE	+3+6 =9 EC =18"	w=36.9 LL=7(PL=37 *	%) 7 *4- Dra 18.	3/4" O.D. ag bit below 5 ft.
- 23.5 -	SANDY LEAN CLAY, with fine to medium sand, contains clayey sand lenses and pockets, moist, grayish continued on next page	CL			 25	3+ N RE	+5+6 =11 EC =18"	w=27.9 LL=47 PL=28	%	

Comments:
1. Boring backfilled with cement/bentonite grout through tremie pipe upon completion.
2. Downhole geophysical logging performed on 6/29/06.
3. * = See Appendix I for additional lab testing data.
4. Ground water observation well OW-401 installed at a nearby location.

Γ		TES	T Project: C	alvert Cliff	s Nucle	ar Pow	er Plant		Boring Number:	B-401	
	Schna	bel Engineering LOC	NG C G	alvert Cou	nty, Ma	iryland			Contract Number: 06120048 Sheet: 2 of 13		
	DEPTH (FT)	STRATA DESC	RIPTION	CLASS.	ELEV. (FT)	WL	9		G TESTS	REMARKS	
┢		brown and dark yellowish contains dark orangeish	n brown, brown pockets.	CL			DEPTH		*		
		-									
	-	fine to medium sandy, gr brown, contains dark ora pockets.	ay and grayish ngeish brown					4+7+16 N =23 REC =1	8"		
		-									
	32.0	POORLY GRADED SAN medium grained, trace si	D, fine to It, wet, light	SP	40.1						
		brown				$ \Sigma$		23+50/5	w=20.8%		
	-	-					-35-	REC =1	1"		
		-									
	37.0	POORLY GRADED SAN fine to medium grained, v	D WITH SILT, wet, gray.	SP-SM	35.1						
		-					2	36+50/5 N =50/5	5" "		
	-	-					-40-	REC =8	"		
	42.0	-			30.1						
	42.0	SILTY SAND, fine to mee wet, gray.	dium grained,	SM	00.1					*\/or/to	
		moist, oliveish gray, mos cemented sand (±100%), reaction below 44 ft.	tly moderately , moderate HCl				×	WOH+5 N =50/4 REC =4	;0/4" w=21.4% "	difficult rotary advancement from 44 to 48 ft (moderate to	
/6/08		-								strong rig chatter).	
L.GDT 3		-								**Resumed	
CHNABE		wet, gray, little fine to coa fragments (±15%), strong	arse shell g HCl reaction.				- +	7+6+15 N =21	8"	AM on 6/20/06. *Switched to 5"	
.GPJ S(-					50/^	11/20 - 1		O.D. Tri-cone roller bit below 48.5 ft.	
00 & 400		-								*Moderate to difficult rotary	
G SPT 3		 							W=31 6%	from 50 to 53.5 ft (moderate to	
048 PLO		trace fine to coarse shell (±5%), very weak HCI rea	tragments action.					4+7+10 N =17 REC =1	8"	strong rig chatter). *Switched to	
G 06120		-								4-3/4" O.D. Drag bit below 53.5 ft.	
RING LO		-									
rest Bo	-	continued on nex	t page								

Comments:
1. Boring backfilled with cement/bentonite grout through tremie pipe upon completion.
2. Downhole geophysical logging performed on 6/29/06.
3. * = See Appendix I for additional lab testing data.
4. Ground water observation well OW-401 installed at a nearby location.

Γ	Schnabel BORING Project: C					s Nucle	ar Pow	er Plant		Boring	Boring Number: B-401		
	Schnal	pel Engineering	LOG		alvert County, Maryland					Contra Sheet:	Contract Number: 06120048 Sheet: 3 of 13		
	DEPTH	STRATA	DESCRIPT	ION	CLASS.	ELEV.	WL		SAMPL	ING	TESTS	REMARKS	
┝	(F1)				SM	(F1)		DEPTH		ATA			
	-	little fine to coarse	e shell fragm	nents	5101			1	7+14	+50	w=25%		
		gray and light gra	y, some fine	to coarse				-60-4		+ =18"			
	_	shell fragments (± moderately ceme	:30%), conta nted sand p	ains ockets,									
	_	strong HCI reaction	on below 59	.5 ft.									
	_												
	_	gray, trace fine to	medium sh	ell					7 5+7+	10			
		fragments (±1%), reaction.	very weak I	HCI				-65-	N =1 REC	7 =13"			
								05					
	_											*Osterberg	
	-	weak HCI reaction	-						REC	=23"		sampler tube	
	-	weak not reaction	1.							-25		to 70.5 ft	
	_							70					
	-												
	-											*Moderate to	
	-		-						7			advancement from 74 to 78 ft	
	-	gray and light gra shell fragments (±	y, some fine :40%), stron	e to coarse lg HCl				2	16+5 N =5	0/5")/5"		(moderate to strong rig	
		reaction.						75	REC	=11"		chatter).	
	-												
	-												
	-								_		47.50/		
	-	gray and oliveish coarse shell fragn	gray, mostly nents (±50%	/ fine to b), contains)	(5+20 N =4	+27 7	w=17.5%		
3/6/0		strongly cemented	d sand pock	ets.				-80-4	REC	=13"			
L.GDT	-												
INABE	-												
J SCF	-												
00.GP	-	gray and greenish medium shell frag	n gray, trace Iments (±1%	fine to b), trace					5+9+	13 2			
00 & 4		organic matter (± reaction, contains	<1%), weak clayey san	HCI d pockets.				-85-4	REC	=16"			
SPT (-			-									
PLOG	-												
20048	-												
G 061	-							1	9+12	+17 a	w=35.3%		
Q LO	_							-90-1		=18"			
BORIN	-	11 .	d an f					┝ ┤					
TEST		continue	u on next pag										

Comments:
1. Boring backfilled with cement/bentonite grout through tremie pipe upon completion.
2. Downhole geophysical logging performed on 6/29/06.
3. * = See Appendix I for additional lab testing data.
4. Ground water observation well OW-401 installed at a nearby location.
| | bachal | TEST | Project: | Calvert Cliff | s Nucle | ar Pow | er Plant | | Boring Number: | B-401 |
|-----------------|--------------------------------------|--------------------------------|---------------------|---------------|---------------|---------|--------------------|------------------|--------------------------------------|-----------------------------|
| Schnal | bel Engineering | BORING
LOG | | Calvert Cou | inty, Ma | aryland | | | Contract Number: (
Sheet: 4 of 13 | 06120048 |
| DEPTH
(FT) | STRATA | A DESCRIPT | ION | CLASS. | ELEV.
(FT) | WL | S
DEPTH | | G TESTS | REMARKS |
| | | | | SM | | | | | | |
| 92.0 - | ELASTIC SILT, | moist, gray a | nd light | MH | -19.9 | | | | | |
| - | fragments (±<5% | ace fine to co
%),weak HCl | reaction. | | | | $ - _{\square}$ | | | |
| - | | | | | | | M | 6+11+16
N =27 | 6 | |
| | | | | | | | 95[[] | REC =1 | 8" | |
| - | | | | | | | | | | |
| - | | | | | | | | | | |
| _ | | | | | | | | | | *Osterberg |
| _ | | | | | | | | REC =1 | 5" w=50.5% | sampler tube push from 98.5 |
| | | | | | | | -100- | | PL=48 | to 99.8 ft |
| | | | | | | | 100 | | PP=>4.5 tst | |
| - | | | | | | | | | | |
| - | | | | | | | | | | |
| 103.5 | | | | | -31.4 | | | | | |
| - | light greenish gr | ay, trace fine | to coarse | SIM | | | - | N =31 | 0.1 | |
| _ | matter (±<1%), c | (±5%) and or
contains claye | ganic
ey sand | | | | -105- | REC =1 | 8 | |
| - | layers. | | | | | | | | | |
| - | | | | | | | | | | |
| - | | | | | | | | | | |
| - | | | | | | | 17 | 5+10+17
N =27 | 7 w=35.6% | |
| | | | | | | | <u>–110–</u> [] | REC =1 | 3" | |
| - | | | | | | | | | | |
| 112.0 - | | viet arey and | light | | -39.9 | | | | | |
| <u>م</u> رامه – | greenish gray, w | with fine to me | edium | UL | | | | | | |
| | fragments (±5%) |), strong HCl | reaction. | | | | 10 | 4+8+10 | w=46.1% | |
| | | | | | | | L_115-0 | REC =1 | 8" | |
| | | | | | | | | | | |
| 2
1170 - | | | | | -44 9 | | | | | |
| 400 | SILT, moist, gray gray, with fine to | y and light gr | eenish
nd, trace | ML | | | | | | |
| 1 300 | mica and fine to
fragments (±5%) | medium she
), weak HCl r | ll
eaction. | | | | | 5+9+12 | | |
| | , | | | | | | | N =21
REC =1 | 8" | |
| 748 FL | | | | | | | | | | |
| | | | | | | | F 1 | | | |
| 122.0 - | ELASTIC SILT, | moist, gray, t | race fine to | MH | -49.9 | | F 1 | | | |
| - IN | shell fragments (| (±1%), weak | HCI | | | | | | ou w=57.4% | *Osterbera |
| | continu | ed on next pag | ge | | | | ╞╴╶┤ ^{┻┻} | REC =1 | 0 | |
| Ľ. | | | | | | | | | | |

	6	TEST	Project: Ca	alvert Cliff	s Nucle	ar Pow	er Plant		Boring I	Number:	B-401
	Schna	bel Engineering LOG	Ca	alvert Cou	nty, Ma	ryland			Contrac Sheet: 5	t Number: 06 5 of 13	6120048
D	EPTH (FT)	STRATA DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	S		G	TESTS	REMARKS
		-		МН			-125- 			LL=85 PL=54 PP=>4.5 tsf *	sampler tube push from 123.5 to 124.8 ft
1	28.5 - - -	SANDY SILT, gray and greer with fine to medium sand, trac medium shell fragments (±<5 HCI reaction.	iish gray, ce fine to %), strong	ML	-56.4		 -130- 	5+6+11 N =17 REC =1	18"	w=43.8% *	
	- - -	fine to medium sandy, greeni very weak HCI reaction.	sh gray,				 135	7+9+11 N =20 REC =1	8"		
1	37.0 - - - -	SANDY FAT CLAY, moist, gr gray, fine to medium sand, st reaction.	eenish rong HCI	СН	-64.9		 140 	REC =2	23"	w=44.1% LL=80 PL=31 PP=>4.5 tsf *	*Osterberg sampler tube push from 138.5 to 140.5 ft
GDT 3/6/08	42.0 - - - - -	ELASTIC SILT, moist, greeni trace fine to medium sand, we reaction	sh gray, eak HCl	MH	69.9		 145- 	7+9+11 N =20 REC =1	18"	w=77.1% LL=142 PL=104 *	
SP1 300 & 400.GPJ SCHNABE	-	trace mica.					 150- 	8+10+1 N =22 REC =1	2 8"	w=72.7% LL=150 PL=89 *	**Resumed drilling at 6:55 AM on 6/21/06.
DRING LOG 06120048 PLOG	-						 155	6+8+11 N =19 REC =1	18"	w=68.8% LL=142 PL=93 *	
IEST B(-	continued on next pag	e								

	hnabal	TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant		Boring Nu	mber:	B-401
Schna	bel Engineering	LOG	С	alvert Cou	nty, Ma	ryland			Contract M Sheet: 6	Number: 00 of 13	6120048
DEPTH (FT)	STRATA	A DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	S DEPTH		G TA	TESTS	REMARKS
-	dark greenish gr	ay.		МН			 160	REC =1	0" ^V Pl	v=49.9% LL=81 PL=54 P=>4.5 tsf	*Osterberg sampler tube push from 158.5 to 159.3 ft
-	with fine to medi	um sand.					 165 				
	-						 - 170- 	8+10+15 N =25 REC =18	5 V 8"	v=53.9% LL=103 PL=52 *	
172.0 - - - -	FAT CLAY, trace gray.	e fine sand, g	reenish	СН	-99.9		 175 	REC =1	1" ^V Pl	v=33.7% LL=57 PL=17 P=>4.5 tsf *	*Osterberg sampler tube push from 173.5 to 174.4 ft
	-						 - <u>180</u> -	4+10+2 ⁻ N =31 REC =0'	1		
77 182.0 -	SILTY SAND, fir contains clayey s greenish gray, tr shell fragments (reaction.	te to medium sand pockets ace fine to m (±1%), mode	grained, s, wet, dark edium rate HCI	SM	-109.9		 - 185-	7+15+22 N =37 REC =18	2 V 8"	v=31.2% *	
187.0 -	CLAYEY SAND, grained, contain pockets, wet, da brownish gray, tr shell fragments (continu	fine to media is sandy lear rk greenish g race fine to n (±1%) ed on next pag	um a clay gray and nedium	SC	-114.9		 190-	5+9+19 N =28 REC =1	1"		
Ŭ											

	6	TEST	Project: Ca	alvert Cliff	s Nucle	ar Pow	er Plant	Bori	ng Number:	B-401
•	Schna	bel Engineering LOG	Ca	alvert Cou	nty, Ma	ryland		Cont Shee	tract Number: 00 et: 7 of 13	6120048
D	EPTH (FT)	STRATA DESCRIPTI	NC	CLASS.	ELEV. (FT)	WL	SA DEPTH	AMPLING DATA	TESTS	REMARKS
	_			SC						
1	92.0 - - -	SANDY SILT, fine to medium, clayey sand pockets, moist, da greenish gray, very weak HCI	contains ırk reaction	ML	-119.9		 195-	6+9+17 N =26 REC =18"	w=49.2%	
	- 970 -				-124 9					
	-	SILTY SAND, fine grained, mo greenish gray, very weak HCL trace mica.	ist, reaction,	SM			 -200-	REC =22"	w=48.8% LL=82 PL=55 PP=>4.5 tsf *	*Osterberg sampler tube push from 198.5 to 200.3 ft
2	02.0 -	ELASTIC SILT with fine to me	dium	MH	-129.9					
	-	sand, trace mice and organic r (±1%), moist, greenish gray, v HCl reaction.	natter ery weak				 	5+8+13 N =21 REC =18"	w=58.4% LL=94 PL=69 *	
	- - - -	trace fine to medium shell frag (±1%).	ments				 210 -	7+11+16 N =27 REC =18"	w=62.7% LL=113 PL=74 *	**Resumed drilling at 7:00 AM on 6/22/06.
SCHNABEL.GD1 3/6/08	12.0 - - -	ELASTIC SILT, trace fine to m sand, contains indurated silt po moist, greenish gray, very wea reaction.	edium ockets, ik HCl	MH	139.9		 - -215-	REC =13"	PP=>4.5 tsf	*Osterberg sampler tube push from 213.5 to 214.6 ft
ring Log 06120048 PLOG SP1 300 & 400.6	- - - -	trace mica.					 220 -	7+11+15 N =26 REC =18"	w=77.4%	
IESI BUH	-	continued on next page								

Γ	6	TEST Project:	Calvert Cliff	s Nucle	ar Pow	er Plant	Boring Number:	B-401
	Schnab	el Engineering LOG	Calvert Cou	inty, Ma	ryland		Contract Number: 0 Sheet: 8 of 13	6120048
F	DEPTH			ELEV.		SAMPLI	NG	
	(FT)	STRATA DESCRIPTION	CLASS.	(FT)	WL	DEPTH D	ATA TESTS	REMARKS
		trace organic matter (+<1%)	MH			 ∏ 0+13+	18	
	-					N =31	10	
	_					-225-10 REC =	18	
	-							
	-							
	_							*Osterberg sampler tube
	_	contains indurated silt pockets.				REC =	13" W=58.6%	push from 228 5 to 229 6
						-230-	PL=88	ft
						230	PP=>4.5 ISI *	
	1							
	-							
	-							
	-					10+15 N =36	+21	
	-					-235- / REC =	18"	
	-							
	_							
	_							
	_	weak HCI reaction.					21 w=122.5%	
						N =32	18"	
	-							
	-							*Osterberg
	-							sampler tube
	-	mostly indurated silt layers.				_ REC =	8" W=96.2% LL=140	243.5 to 244.4
3/6/08	_					-245-	PL=65 PP=>4.5 tsf	11
GDT	-						*	
IABEL	-							
SCHN	_							
.GPJ	_					7+8+1	7 w=122.8%	
& 400						N =25	18" PL=100	
T 300								
OG SF	1							
48 PL(-							
61200 [.]	-							
ð 00	-					– – – – – – – – – – – – – – – – – – –	15	
NGL	-					-255- <u>/</u> REC =	18"	
BOR	-	continued on next page						
TEST		continued on none page						

		TEST	Project: C	alvert Cliff	s Nucle	ear Pow	er Plant	Boring	Number:	B-401
	Schna	bel Engineering LOG		alvert Cou	inty, Ma	aryland		Contra Sheet:	oct Number: 00 9 of 13	6120048
	DEPTH (FT)	STRATA DESCRIP	ΓΙΟΝ	CLASS.	ELEV. (FT)	WL	SAI DEPTH		TESTS	REMARKS
	-	trace fine to medium sand, v HCI reaction.	ery weak	МН			 8 N R -260-	8+11+19 N =30 REC =18"	w=130.2%	
	-						 265	9+16+21 ↓=37 REC =0"		**Resumed drilling at 7:15 AM on 6/23/06.
	267.0 - - - -	SILTY SAND, dark green, w medium sand, trace organic (±<1%), very weak HCI reac	vith fine to matter tion.	SM	194.9		 270- 	7+12+18 √ =30 REC =18"	w=63.5% *	
	-	greenish gray, weak HCl rea	ction.				 8 N -275-	8+12+15 √=27 REC =18"		
J SCHNABEL.GDT 3/6/08	-	trace fine to medium sand, n HCl reaction.	noderate				 ⊠ 5 N -280- F	i0/3" ↓ =50/3" REC =4"		*Switched to 5" O.D. Tri-cone roller bit below 278.5 ft.
120048 PLOG SPT 300 & 400.GF	- 283.0 - - -	SANDY ELASTIC SILT, moi greenish gray, trace fine to c some fine to coarse shell fra (±30%), strong HCI reaction.	st, dark oarse sand, gments	MH	210.9		 -285- 	1+13+17 √=30 REC =18"	w=30.2% LL=76 PL=42 *	very to extremely difficult rotary advancement from 278 to 280 ft (moderate rig chatter). *Switched to 5" O.D. Drag bit below 284.5 ft.
TEST BORING LOG 06	287.0 -	CLAYEY SAND, fine to med grained, wet, dark brownish blackish gray, few fine to coa fragments (±10%), trace mic continued on next pa	ium gray and arse shell a, strong ge	SC	-214.9		 X 9)+17+23		drilling at 11:00 AM on 6/26/06.

Comments:

	TE	ST Project: C	alvert Cliff	s Nucle	ar Pow	er Plant		Boring	Number:	B-401
Schn	abel Engineering L	C C C C	alvert Cou	nty, Ma	iryland			Contra Sheet:	ct Number: 0 10 of 13	6120048
DEPTH (FT)	STRATA DES	CRIPTION	CLASS.	ELEV. (FT)	WL	S		G TA	TESTS	REMARKS
	HCI reaction, glauconit	ic	SC				N =40	0"		
-	-					-290-		0		
	_									
	dark brownish gray and	d dark greenish					8+12+5	0/2"	w=20.7% *	
	fragments (±5%).	moist dark				-295-	REC =1	4"		O.D. Tri-cone
	 brownish gray and blac fine gravel and fine to r 	ckish gray, trace medium shell								293.5 ft. *Extremely
	_ fragments (±<5%) belo	w 294.5 ft.								difficult rotary advancement from 294.5 to
	brownish gray and light	t blackish grav.					9+14+1	8		295.5 ft (very strong rig
	trace fine to coarse she (±5%), weak HCI react	ell fragments ion, contains lean				[_ ₃₀₀ _][]	N =32 REC =1	8"		chatter). *Extremely
	- clay layers and pockets	5.								advancement from 297.3 to
	_									298.3 ft (mod to strong rig
	_									**Resumed drilling at 7:20
	-									AM on 6/27/06. *Switched to
306.0				-233.0		-305-				4-3/4 O.D. Drag bit below 298.5 ft.
000.0	SILTY SAND, fine to co clayey sand pockets, m	oarse, contains noist, dark	SM	-200.0						
	very weak HCl reaction)					10+12+ N =32	20	w=27.4% LL=57	
	_						REC =1	8"	PL=42 *	
- 8	_					-310-				
D1 3/6/										
ABEL.G	_									
SCHN	_									
- 100.GP	_					-315-				
300 & 4	_									
317.0	SANDY FAT CLAY, fin grained, moist, dark ark	e to medium eenish gray and	СН	-244.9						
0048 PL	dark blackish gray, ver reaction, glauconitic.	y weak HĆI				$[]_{M}$	18+26+	35	w=28.9%	
- 0612	_					<mark>320−</mark> ∭	N =61 REC =1	8"	PL=38 *	
ING LO	-									
-SI BOK	_ continued on n	ext page				$\left - \right $				

	hnahal	TEST	Project: C	Calvert Cliff	s Nucle	ar Pow	er Plant		Boring	Number:	B-401
Schna	bel Engineering	BORING LOG	C	Calvert Cou	inty, Ma	ryland			Contra	ct Number: 00	6120048
DEPTH	STRAT			CLASS.	ELEV.	WL	S	SAMPLIN	G	TESTS	REMARKS
(FT)					(FT)		DEPTH	DA	ТА		
-	-										
-	-										
_	-						-325-				
_	_										
_											
								11+11+	17		
								N =28 REC =0)"		
							- 330 -				
-											
-											
-											
_							-335-				
-											
337.0 -	SILT with fine t	to coarse sand	d, trace fine ndv lean	ML	-264.9						
-	clay pockets, m	oist, dark brov	wnish gray HCl					8+12+2	۹	w=25.3%	
-	reaction, silt ext	hibits fissility.						N =41	."	*	
							-340-/		,		
-	-										
-	-										
- 9	-										
- 6 -	-										
345.0 —	SILTY SAND, fi	ine to coarse g	grained,	SM	-272.9		-345-				
	gay, moderate l	HCI reaction	u Diackish								
- 20 -	-										*Osterberg
0.00	-						╞╴╴┤			W=35 6%	sampler tube
× –	-							REC =7		LL=52 PI =30	348.5 to 350.5 ft
	-						-350-			*	
	-										
	-										
5 _	-						\vdash \dashv				
	-										
	continu	ued on next pag	e				-355-				

[hnabel	TEST	Project: Ca	alvert Cliffs	s Nucle	ar Pow	er Plant		Boring N	Number:	B-401
	Schna	bel Engineering		Ca	alvert Cou	nty, Ma	ryland			Contrac Sheet: 1	t Number: 06 12 of 13	6120048
	DEPTH (FT)	STRATA DE	SCRIPTI	ON	CLASS.	ELEV. (FT)	WL	S		G TA	TESTS	REMARKS
	-	contains clayey sand mica, very weak HCI	l pockets, reaction	trace	SM			 	30+50/5 N =50/5 REC =9	5" 5" 9"		
	- 367.0	POORLY GRADED fine to medium grain sand and lean clay p moist, dark brownish gray, very weak HCI	SAND WI ed, contai ockets, tra gray and reaction.	TH SILT, ins silty ace mica, blackish	SP-SM	-294.9		365 370 	16+25+ N =69 REC =1	44 8"	w=36.9% *	**Resumed drilling at 7:00 AM on 6/28/06.
3 LOG 06120048 PLOG SPT 300 & 400.GPJ SCHNABEL.GDT 3/6/08	- 377.0 -	SILTY SAND, fine to moist, dark brownish gray, trace mica, ver reaction.	medium g gray and y weak H0	grained, blackish Cl	SM	-304.9			16+21+ N =57 REC =1	36 8"		
FEST BORING		fine to coarse graine clay pockets, moist, o <i>continued or</i>	d, contair dark brow n next page	ns lean mish gray								

Schnabel Engineering LOG Construction of the Number of the Numer of the Number of the Number of the Numer of the Number of the	SC	hnabel	TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	_	Boring	Number:	B-401
DEPTH (FT) STRATA DESCRIPTION CLASS. ELEV. (FT) WL SAMPLING DEPTH TESTS REMARK and blackish gray, trace mica, very weak HCI reaction. SM SM I Image: Constraint of the sector of t	Schna	bel Engineering	LOG			inty, ma	ryiana			Sheet:	13 of 13	6120048
Autor of Borling @ 401.5 FT.	DEPTH (FT)	STRATA	DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	S DEPTH		G TA	TESTS	REMARKS
	(FT)	and blackish gra weak HCl reaction fine to medium g BOTTOM OF BC	rained.	1.5 FT.	SM	(FT)		DEPTH	DA 12+20+: N =52 REC =1 11+15+: N =44 REC =1	TA 32 8" 29 8"	w=33.1%	**Resumed grouting at 7:00 AM on 6/29/06.

Schnat	TEST Project: C bel Engineering LOG C	Calvert Clif Calvert Cou	fs Nucle unty, Ma	ar Pow ryland	ver Pla	nt	Boring Contra Sheet	g Number: act Numbe : 1 of 7	er: 061200	B-402
Boring C	Contractor: UNI-TECH DRILLING					Gr	oundwater Obs	servations		
	MALAGA, NEW JERSEY					D	ate Time	Depth	Casing	Caved
Boring F	oreman: J. Blemings		Enco	untere	d	7	/19	7.5'	0.0'	
Drilling N	Method: Mud Rotary		Start	of da	у	7	/20	15.0'	0.0'	
Schnabe	Representative: M. Arles		Start	of da	у	7	/21	12.0'	0.0'	
Dates S	Started: 7/19/06 Finished: 7/21/06									
Location	: Northing: 216405.1 ft Easting: 961463.5 ft									
Ground	Surface Elevation: 82.2 (feet)				1					
DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL	DEP	S. TH	AMPLING DATA	TEST	S F	REMARKS
-	POORLY GRADED SAND, fine to coarse grained, moist, brown, contains root fragments, contains organic matter.	SP			_	-	1+3+4 N =7 REC =18"			
2.5	SILTY SAND, fine to coarse grained, moist, brown.	SM	- 79.7		-		1+1+2 N =3 REC =12"			
4.5	POORLY GRADED SAND, fine to coarse grained, moist, orangeish brown,	SP	- 77.7		5 - -	-	1+4+4 N =8 REC =14"			
-	wet, orange, with gravel.			Ţ	-		3+4+2 N =6 REC =8"			
10.0	SILTY SAND, fine to medium grained, moist, orange.	SM	- 72.2				2+3+4 N =7 REC =14"			
13.0 - - -	SANDY SILT, fine to medium grained, wet, mottled grayish orange.	ML	- 69.2		- - 15-	-	1+3+6 N =9 REC =16"			
- 17.0			65.2		_	_				
	FAI CLAY, MOIST, gray, with sand.	СН			_ _ 20-		WOH+2+3 N =5 REC =18"			
-	no sand.				 - -	-	2+3+4 N =7			
	continued on next page				-25-		REC =18"			

Calvert County, Maydand Contract Number: 0120048 Depth (FT) STRATA DESCRIPTION CLASS. ELEV (FT) WL SAMPLING DEPTH DATA TESTS REMARKS 0 CH CH CH -		2	TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant		Boring	Number:	B-402
DEPTH (T) STRATA DESCRIPTION CLASS. ELEV (T) WL SAMPLING DEPTH DEPTH DATA TESTS REMARKS 0	Sch	mak	BORING	С	alvert Cou	nty, Ma	aryland			Contra Shoot	ct Number: 0	6120048
CFT) STRATA DESCRIPTION CLASS CFT WL DEPTH DATA TESTS REMARKS 0 </th <th>DEPT</th> <th>гн</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th>5</th> <th></th> <th>G</th> <th></th> <th></th>	DEPT	гн						5		G		
37.0 SLTY SAND, fine to medium grained, most, motiled graysh red, contains SM 45.2 -	(FT))	STRATA DESCRIPTI	ON	CLASS.	(FT)	WL	DEPTH	DA	TA	TESTS	REMARKS
37.0 fine to medium sandy 37.0 SiLTY SAND, fine to medium grained, comtains amount of the distribution of thedistribution of thedistribution of the distribution of the					СН							
$\begin{array}{c} 1 \\ 37.0 \\ \hline \\ 37.0 \\ \hline \\ \\ 37.0 \\ \hline \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ $		-										
37.0 fine to medium sandy 37.0 SILTY SAND, fine to medium grained, molet, molet, molet, wellowish white, cemented sand. 42.0 POORLY GRADED SAND, fine to medium grained, molet, wellowish white, semented sand. 42.0 POORLY GRADED SAND, fine to medium grained, molet, wellowish white, semented sand. gray,		-										
37.0 Fine to medium sandy		-										
37.0 SiLTY SAND, fine to medium grained, commented sand. SM 45.2 444+5 37.0 SiLTY SAND, fine to medium grained, commented sand. SM 45.2 6+10+10 42.0 POORLY GRADED SAND, fine to medium grained, medium grained, commented sand. SM 40.2 6+10+10 9 POORLY GRADED SAND, fine to medium grained, medium grained, commented sand. SP 40.2 6+10+10 9 POORLY GRADED SAND, fine to medium grained, medium grained, second with shells, strong HCI reaction. SP 40.2 21+50 9 Gernented sand with shells, strong HCI reaction. SM 27.2 50/2* N=50/2* 9 SILTY SAND, fine to medium grained, strong HCI reaction. SM 27.2 50/2* N=50/2* 9 SILTY SAND, fine to medium grained, seagnemited seagnemi		-						10	3+4+6 N =10			
37.0 Fine to medium sandy 37.0 SILTY SAND, fine to medium grained, contains SM 45.2 Bit TY SAND, fine to medium grained, contains SM 42.0 POORLY GRADED SAND, fine to medium grained, contains gray.		_						-30-1	REC =1	8"		
37.0 SILTY SAND, fine to medium grained, moist, motiled grayish red, contains comented sand. 45.2 44.4+5 -35 - 10 REC = 18" 42.0 POORLY GRADED SAND, fine to medium grained, moist, yellowish white. 54' hard drilling 97.0 SILTY SAND, fine to medium grained, contains comented sand. 40.2 97.0 POORLY GRADED SAND, fine to medium grained, moist, yellowish white. 40.2 97.0 Genented sand, moist, yellowish white. 54' hard drilling 97.0 SLTY SAND, fine to medium grained, moist, yellowish white. 50/2" 97.0 Cemented sand with shells, strong HCI reaction. 55.0 97.2 -65 - 50/2" 50/2" 97.2 -65 - 50/2" 50/2" 97.2 -65 - 50/2" 50/2" 97.2 -65 - 50/2" 50/2" 97.2 -65 - 50/2" 50/2" 97.2 -65 - 50/2" 50/2" 97.2 -65 - 50/2" 50/2" 97.2 -65 - 50/2" -65 - 50/2" 97.2 -65 - 50/2" -65/2" 97.2 -65 - 50/2" -7/2" 97.2 -65 - 50/2" -7/2" 97.2 -7/2"		_										
37.0 SILTY SAND, fine to medium grained, moist, motiled grayish red, contains cemented sand. SM 45.2		_										
37.0 fine to medium sandy 37.0 SILTY SAND, fine to medium grained, contains cemented sand. SM 42.0 POORLY GRADED SAND, fine to medium grained, moist, yellowish white. SP 42.0 POORLY GRADED SAND, fine to medium grained, moist, yellowish white. SP gray.												
$\begin{array}{c} 37.0 \\ 37.0 \\ \hline \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ $			fine to medium sandy						4+4+5			
37.0 SILTY SAND, fine to medium grained, moist, motiled grayish red, contains carented sand. SM 45.2 45.2 42.0 POORLY GRADED SAND, fine to medium grained, moist, yellowish white. SP 40.2 6+10+10 42.0 POORLY GRADED SAND, fine to medium grained, moist, yellowish white. SP 40.2 40.2 gray.			, , , , , , , , , , , , , , , , , , ,						N =9 RFC =1	8"		
37.0 SILTY SAND, fine to medium grained, moist, motiled grayish red, contains comented sand. SM 45.2 6+10+10 R=20 REC = 14* 42.0 POORLY GRADED SAND, fine to medium grained, moist, yellowish white. SP 40.2 21+50 REC = 9* gray. -40 -40 -40 -40 -40 gray. -50 -50 -50 -50 -50 55.0 SILTY SAND, fine to medium grained, wet, graysh green, contains comented sand with shells, strong HCI reaction. -50 -50 -50 55.0 SILTY SAND, fine to medium grained, wet, graysh green, contains comented sand, with the coarse shell fragments, strong HCI reaction, 70-80% shell frag. 27.2 -55 -50		_						-35		0		
37.0 SILTY SAND, fine to medium grained, moist, mottled grayish red, contains commented sand. SM 45.2 - <td< td=""><td></td><td>-</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td<>		-										
amolt, motiled graysh red, contains cemented sand. amolt, motiled graysh red, contains cemented sand. b+10+10 42.0 POORLY GRADED SAND, fine to medium grained, moist, yellowish white. SP 40.2 amolt, medium grained, moist, yellowish white. 9000 gray.	37.0) +	SILTY SAND, fine to medium	grained,	SM	45.2						
42.0 POORLY GRADED SAND, fine to medium grained, moist, yellowish white. SP 40.2 40.2 21+50 N=50 REC = 14* 900 gray.		-	moist, mottled grayish red, con cemented sand.	ntains								
42.0 POORLY GRADED SAND, fine to medium grained, moist, yellowish white.		-						N	6+10+1 N =20	0		
42.0 POORLY GRADED SAND, fine to medium grained, moist, yellowish white. gray.		_						-40-	REC =1	4"		
42.0 POORLY GRADED SAND, fine to medium grained, moist, yellowish white. SP 40.2 - - 21+50 N=50 REC = 9" - - - - - 21+50 N=50 REC = 9" - - - - - - - - - - - -		_										
BODE LEGODATE Y GRADELD SAND, time to medium grained, moist, yellowish white. SP SP 21+50 N = 50 REC = 9" - - - - - - -	42.0	,			0.5	40.2						
gray. -		_	medium grained, moist, yellow	vish white.	5P							
9000000000000000000000000000000000000									21+50			
gray. - <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>N =50 REC =9</td> <td>)"</td> <td></td> <td></td>									N =50 REC =9)"		
B000 gray. - -								45				
gray. - - - - - 29+50/5" N = 50/5" REC = 11" -	80											
G0 Hardward of the formula of the f	T 3/6/	-										
and gray. - gray. - - 29+50/5" N =50/5" REC =11" - </td <td>EL.GD</td> <td>-</td> <td></td>	EL.GD	-										
1 -	INABE	-	gray.					1X	29+50/5 N =50/5	5" 5"		
a -	L SC							-50-	REC =1	1"		
Cemented sand with shells, strong HCI reaction. SilLTY SAND, fine to medium grained, wet, grayish green, contains cemented sand, with fine to coarse shell fragments, strong HCI reaction, 70-80% shell frag. Continued on next page 27.2 Continued on next page Continued on next page Continued on next page	00.GP	-										
55.0 SILTY SAND, fine to medium grained, wet, grayish green, contains cemented sand with fine to coarse shell fragments, strong HCl reaction, 70-80% shell frag. 27.2 -55- 50/2" REC =1" 54' hard drilling	00 & 4(_	comported cand with shalls, at									
Store Cemented sand with shells, strong HCl reaction. Store 55.0 SiLTY SAND, fine to medium grained, wet, grayish green, contains cemented sand, with fine to coarse shell fragments, strong HCl reaction, 70-80% shell frag. 27.2 Store 55.0 50/2" N =50/2" REC = 1" 54' hard drilling	SPT 3(_	reaction.									
Sill TY SAND, fine to medium grained, wet, grayish green, contains cemented sand, with fine to coarse shell fragments, strong HCI reaction, 70-80% shell frag. 27.2 N =50/2" REC =1" N =50/2" REC =1"	LOG		Cemented sand with shells, st	trong HCI					50/2"			54' hard drilling
SILTY SAND, fine to medium grained, wet, grayish green, contains cemented sand, with fine to coarse shell fragments, strong HCI reaction, 70-80% shell frag.	0048 b 55 0	, _	reaction.			27.2			N =50/2 REC =1	<u></u>		or naro uniing
001 sand, with fine to coarse shell 1 fragments, strong HCI reaction, 70-80% 2 shell frag. 0 continued on next page	06120		SILTY SAND, fine to medium wet, grayish green, contains c	grained, emented	SM	-1.2						
Shell frag. Continued on next page	FOG		sand, with fine to coarse shell fragments, strong HCI reaction	n, 70-80%								
Image: Second se	DRING		shell frag.					F 1				
	IST BC	-	continued on next page	e								

ſ	6	hpabol TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant		Boring Number:	B-402
	Schnal	bel Engineering LOG	c	alvert Cou	inty, Ma	iryland			Contract Number: Sheet: 3 of 7	06120048
	DEPTH	STRATA DESCRIPT		CLASS.	ELEV.	WL	s	AMPLING	G TESTS	REMARKS
	(FT)			014	(FT)		DEPTH	DAT	га	
	_			SM				50		
	_						60	REC =6'		
	_									
	62.0				20.2					
	02.0	POORLY GRADED SAND W fine to medium grained, wet.	/ITH SILT, areen, with	SP-SM	20.2					
	_	fine to coarse shell fragments HCI reaction, 20-30% shell fr	s, strong aq.					4+6+9		
	-	,	- 5					N =15 REC =18	8"	
							-65			
	-									
	67.0 -	SILTY SAND, fine to medium	grained,	SM	15.2					
	-	fragments, strong HCI reaction	on, 30-40%							
	-	shell frag.						6+8+11 N =19		
							70 <u> </u> []	REC =18	8"	
	-									
	72.0 -	POORLY GRADED SAND W	/ITH SILT,	SP-SM	10.2					
	-	fine to medium grained, wet, weak HCI reaction.	green,							
	-						17	6+9+13 N =22		
							-75	REC =16	6"	
	-									
	77.0 -	SILTY SAND find to modium	arainod	SM	5.2					
	-	wet, green, weak HCl reactio	n.	Sivi						
	_						10	3+4+7		
/6/08	_						L_80_A	REC =18	8"	
3DT 3	_									
ABEL.0	_									
SCHN	_									
GPJ (contains cemented sand, with	n fine to					9+13+21	1	
& 400.		coarse shell fragments, stron reaction, 70-80% shell frag.	g HCI					N =34 REC =18	8"	
T 300		,					-85			
JG SP	-						F 1			
48 PL(-									
61200	-	atrong UCI monthing 50,000/						10.44.4	17	
0 90	-	strong HCI reaction, 50-60%	snell frag.				$\vdash \dashv X$	N =28	17	
RING L							<u> </u> _90_ ∐	REC =18	8	
T BOF	-	continued on next pag	ge							
TES										

	TEST	Project: Calvert Cliff	s Nucle	ar Pow	er Plant	Boring	Number:	B-402
Schna	bel Engineering LOG	Calvert Cou	nty, Ma	iryland		Contra	ct Number: 00	6120048
DEPTH (FT)	STRATA DESCRIPTIO	ON CLASS.	ELEV. (FT)	WL	SAN		TESTS	REMARKS
		SM			DEPTH	DATA		
	-							
	-							
	moist, trace fine to coarse she	ll			8	8+12+21		
-	0-10% shell frag.					REC =18"		
	-							
	-							
	_							
	moist, with fine to coarse shell				∏6	6+9+12		
_	fragments, strong HCI reaction shell frag.	ı, 30-40%				N =21 REC =18"		
	trace fine to medium shell frag	ments				+8+11		
	weak HCl reaction, 0-5% shell	frag.				N =19 REC =18"		
-					-105-1-1			
	-							
107.0	SANDY SILT, fine to medium,	moist, ML	-24.8					
	green, weak norreaction.							
	-					0+8+9 N =17		
-	-					KEC =18"		
	-							
112.0	SILTY SAND, fine to medium g	grained, SM	-29.8					
3/6/0	moist, green, trace fine to coar fragments, moderate HCI react	se shell tion,						
L.GDT	0-10% shell frag.					6+9+11 √=20		
– NABE	-				-115-12 R	REC =18"		
I SCH	-							
00.GP	-							
00 & 4(-							
SPT 30	with fine to coarse shell fragme	ents,				/+10+13		
- 100		nen nag.				REC =18"		
0048 F	-							
122.0			-39.8					
0 TOC	GRANDY SILT, tine to medium, green, with fine to coarse shell	moist, ML	_					
20KIN	tragments, strong HCI reaction shell frag.	ı, 10-20%				6+9		
TESTE	continued on next page							

	TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant		Boring	Number:	B-402
School	BORING	C C	alvert Cou	inty, Ma	iryland			Contra	ct Number: 0	6120048
DEDTU						6		Sheet:	5017	
(FT)	STRATA DESCRIP	ΓΙΟΝ	CLASS.	(FT)	WL			ТА	TESTS	REMARKS
			ML				N =15			
						-125-1	REC =1	8"		
-										
127.0 -				-44 8						
121.0	ELASTIC SILT, moist, oliveis	sh green.	MH	11.0						
-							0.0.44			
-						F -IXI	N = 19			
						-130- []	REC =1	8"		
-										
_										
-							4.0.0			
-	moderate HCI reaction, 0-5%	agments, 5 shell frag.				F -1 X	4+6+8 N =14			
		-				- <u>135</u> - []	REC =1	8"		
-										
-										
-						F -IM	4+7+8 N =15			
_						<u> -140-</u> ∐	REC =1	8"		
_										
-						F 1				
-										
-						M	4+6+7 N =13			
_						<u>–145–</u> [[]	REC =1	8"		
00/0										
0										
						╞╶┤_				
- 15						M	4+8+9 N =17			
						<u>–150–</u> ∐	REC =1	8"		
~										
						F 1				
						$ \left - \right _{-} $				
						∏	5+9+11 N =20			
						L_155_	REC =1	8"		
	continued on next pa	ge				├ ┤				
<u> </u>										

	TEST Proj BORING LOG			Project: C	alvert Cliff	s Nucle	ar Pow	er Plant		Boring	Number:	B-402
	C	maper	BORING	C	alvert Cou	nty, Ma	iryland			Contra	ct Number: 0	6120048
Sch	nab	el Engineering	LUG		1	1		1		Sheet:	6 of 7	
DEP (FT	ТН `)	STRAT	A DESCRIPT	ION	CLASS.	ELEV.	WL	S		G	TESTS	REMARKS
	, 				MLI	(,		DEPTH	DA	ТА		
									1+6+8			
	-							F 1 X	N =14			
	-							-160-1	REC =1	8"		
	_											
	-											
	-							M	6+9+11 N =20			
	_							<u>165</u>	REC =1	8"		
	-											
	-											
	_	with sand.						M	7+7+10			
									REC =1	8"		
	-											
	-											
	_											
		no sand.							4+5+9			
								r ixi	N =14	Q"		
	-							-175-		0		
	-											
	_											
g									E. 9.0			
3/0/	-							F -1 X	N =17			
19	-							-180- []	REC =1	8"		
ABEL	_											
NH22												
L.												
500.0	-											
ð N	-							M	5+9+12 N =21			
<u>ت</u> م								<u>⊢185</u> _]	REC =1	8"		
200												
	1							Γ 1				
<u>)</u> 187.0) +	SILTY SAND, fi	ne to medium	grained,	SM	-104.8		├ ┤				
5	-	moist, oliveish g	strong HCL	e to coarse				├ ┤				
le LO		20-40% shell fra	ig.					L IM	10+13+1	10+13+16		
									N =29 REC =1	8"		
й Л	7	continu	ied on next pag	e								

	hnabel POPING	Project: Ca	alvert Cliff	s Nucle	ar Pow	er Plant		Boring	Number:	B-402
Schnat	bel Engineering LOG	Ua	alvert Cou	nty, ivia	ryiano			Contrac Sheet:	t Number: 06	3120048
DEPTH (FT)	STRATA DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	S DEPTH	SAMPLIN	IG TA	TESTS	REMARKS
	40-60% shell frag. no sand, weak HCl reaction. BOTTOM OF BORING @ 20	0.0 FT.	SM	-117.8			8+10+1 N =22 REC = 1 S+6+14 N =20 REC = 1	12 18" 1		

Schna	bel Engineering	Project: Ca	alvert Cl alvert Co	liffs Nuclea ounty, Ma	ar Pow ryland	er Pla	nt		Boring Contra Sheet:	Number: oct Number 1 of 7	er: 06120	B-403
Boring	Contractor: CONNELLY AND	ASSOCIATES	. INC.				Gr	oundv	vater Obs	ervations		
	FREDERICK, MAI	RYLAND	,				D	ate	Time	Depth	Casing	Caved
Boring F	Foreman: D. Bender			Enco	untere	d	6	/20		13.5'		
Drilling	Equipment: CME-550X (ATV)			Start	of day	'	6	/21		10.5'		
Schnabe	el Representative: K. Bell			Start	of day	'	6	/22		9.5'		
Dates	Started: 6/20/06 Finished:	6/22/06										
Location	n: Northing: 216305.8 ft Easting: 961562.9 ft											
Ground	Surface Elevation: 63.4 (feet)											
DEPTH (FT)	STRATA DESCRIPT	ΓΙΟΝ	CLAS	S. ELEV. (FT)	WL	DEP	S. TH	AMPL C	ING DATA	TEST	s	REMARKS
0.5	ROOTMAT AND TOPSOIL.			62.9				1+2+	3			
2.0 -	POORLY GRADED SAND W fine to medium grained, mois trace root fragments, trace w fragments	VITH SILT, st, brown, rood	SP-SC	61.4		_		N =5 REC	=4"			
-	POORLY GRADED SAND V fine to coarse grained, moist	VITH CLAY, , yellowish				_	1	3+2+ N =4 REC	2 =11"			
4.5	CLAYEY SAND, fine to coars moist, yellowish brown and g	se grained, Iray.	SC	- 58.9		- 5 -	M	4+3+: N =6	3			
-						-	٦Ц	REC	=10"			
7.0 -	SANDY LEAN CLAY, moist, gray, trace root fragments, in	orange and on staining.	CL	56.4		_		3+2+ N =5 REC	3 =18"			
10.0 -		han we had	011	- 53.4		-10-						
-	gray, trace sand, iron stainin	g.	Сп			_		2+3+ N =6 REC	3 =18"			
-					∇	_	-					
-	_				÷	_	-0	3+5+ N =1 ⁻ REC	6 =18"			
17.0 -	SANDY LEAN CLAY, wet. ar	ay.	CL	46.4		_	-					
-	-					-	-				sta	art mud rotarv
-	-					-	-	3+4+ N =9	5		dri	lling
	-					-20-		REC	=17"			
- 10						-	-					
22.0 -	SILTY SAND, fine to medium	n grained,	SM	41.4		-	-					
-	brown.	angeisn				-		34+5	0/5"			
-						-	٦Ŭ	N =50)/5" =10"			
	continued on next page	ge				-25-						
L												

ſ		TEST Project: C	Calvert Cliff	s Nucle	ar Pow	er Plant	Boring Number:	B-403
	Schna	bel Engineering LOG	Calvert Cou	inty, Ma	iryland		Contract Number: 0 Sheet: 2 of 7	6120048
	DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL		NG TESTS	REMARKS
	32.0 34.0	gray CLAYEY SAND, fine to medium grained, wet, gray and black. SILTY SAND, fine to medium grained, wet, light gray, strong cementation, HCI reaction strong.	SM SC SM	- 31.4			+50/4" 10" 12" 5" 12"	Resumed drilling on6/21/06 @ 7:00am
	37.0	CLAYEY SAND, fine to medium grained, wet, light gray, contains fine to coarse shell fragments, 20-30%, moderate cementation, HCI reaction strong.	SC	- 26.4		 	3 18"	
DT 3/6/08	-					 	18"	
& 400.GPJ SCHNABEL.G	-			11.4		7+7+1 ⁻ - 50 - 7+7+1 ⁻ N =18 REC =	1 18"	
RING LOG 06120048 PLOG SPT 300	52.0	SILTY SAND, fine to medium grained, wet, greenish gray, trace fine to medium shell fragments, 2-5%, HCI reaction weak.	SM	11.4		4+6+7 N =13 REC =	18"	
TEST BOF		continued on next page						

Γ	6	hachal	TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant		Boring	Number:	B-403
		maper	С	alvert Cou	nty, Ma	ryland			Contra	ct Number: 00	6120048	
	Schnat	bel Engineering	LUG					-		Sheet:	3 Of 7	
	DEPTH (FT)	STRATA	DESCRIPT	ION	CLASS.	ELEV. (FT)	WL			5 FA	TESTS	REMARKS
					SM				DAI			
	-							M	2+3+4 N =7			
								<u>60</u>	REC =18	8"		
	-											
	-											
	-								REC =20	0"		
	_							-65-				Rig chatter
	_											0
	67.0					26						
	07.0	CLAYEY SAND,	fine to medi	um nd white	SC	-3.0						
	-	with fine to coarse	e shell fragn	nents,								
	-	40-50%, HCI Teat	suon suong.					X	N =30	12		
								70- <u> </u> []	REC =18	8"		
	-											
	_											
	_											
		trace fine to coars	se shell fraq	ments					6+7+12			
	-	5-10%, HCl react	ion moderat	e				- 18	N =19	Q"		
								-75-0		0		
	-											
	77.0 -	SANDY I FAN CI	AY wet an	enish	CI	-13.6						
	-	gray, contains fin	e to coarse	shell								
	_	moderate.						L -M	11+7+9			
80/0								Å	N =16 REC =18	8"		
3/6								-80				
פו	-											
HNAB	82.0 -	SANDY SILT, we	t, greenish g	gray, trace	ML	-18.6						
	-	fine to medium sh HCl reaction mod	nell fragmen	ts, 2-5%,								
0.GF	-								5+8+13 N =21			
U & 4C								85[]	REC =18	8"		
1 30	_											
500												
48 PL												
01200	-											
50	-								6+6+10 N =16			
NG L	-							<u>⊢90</u> ⊣∐	REC =17	7"		
ROK	-		d on not not									
		commue	u on next pag	<u> </u>								

	bachel	TEST	Project: 0	Calvert Cliff	s Nucle	ar Pow	er Plant	В	oring Number:	B-403
	maber	BORING	0	Calvert Cou	inty, Ma	ryland		Co	ontract Number: 0	6120048
Schna	bel Engineering	LUG			-			Si	neet: 4 of 7	
DEPTH	STRAT	A DESCRIPT	ION	CLASS.	ELEV.	WL	S	AMPLING	TESTS	REMARKS
()				NAL	(,		DEPTH	DATA	L	
	_			IVIL						
-	-									
							M	6+9+13 N =22		
							<u>95</u> [/]	REC =18"		
								REC =12"	PP=3.00 tsf	
							100			
							-100-			
	_									
								4+6+9		
-							F 1 X	N =15		
							-105-10	REC = 10		
-								E : 0 : 11		
							X	5+6+11 N =17		
-							-110- []	REC =18"		
α –										
- 2/0/							_			
- <u>-</u>	1						MI	5+7+9 N =16		
							L_115-10	REC =18"		
CHN										
							- 1			
- 10	-									
	1									
й 								4+6+8		
00								N =14 REC =18"		
	1						-120-1			
- 12004	1									
								RFC =12"	PP=>4.5 tsf	
	contin	ued on next pag	ie				┝╶╶┤━┛│			

Γ	6	TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	B	oring Number:	B-403
	Schnat	BORING	C	alvert Cou	nty, Ma	ryland		C	ontract Number: 0	6120048
	DEPTH (FT)	STRATA DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	S DEPTH		TESTS	REMARKS
				ML						
	127.0 - - - -	ELASTIC SILT, moist, greeni trace sand, trace fine to medi fragments, 2-5%, HCI reaction	sh gray, ium shell on weak.	MH	-63.6		 130-	4+8+10 N =18 REC =18"		
	- - - -						 135-	6+8+11 N =19 REC =18"		
	137.0 - - - - -	SANDY SILT, moist, greenisl trace fine to medium shell fra 2-5%, HCI reaction moderate	n gray, gments, e.	ML	73.6		 140- 	6+7+10 N =17 REC =18"		
SDT 3/6/08	-						 145 	7+8+13 N =21 REC =18"		
[300 & 400.GPJ SCHNABEL.C	- - -						 - <u>150-</u>	7+9+12 N =21 REC =18"		
ING LOG 06120048 PLOG SP.	- - - -						 155-	5+8+12 N =20 REC =18"		resumed drilling on 6/22/06 @ 7:30am
TEST BOR	_	continued on next pag	ge							

		hnahal	TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant		Boring	Number:	B-403
	Schna	hel Engineering	C	alvert Cou	nty, Ma	iryland			Contra	ct Number: 0	6120048	
	DEDTU	ber Engineering	200							Sneet:	0 01 7	
	(FT)	STRAT	A DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	о Пертн			TESTS	REMARKS
ł					ML					<u> </u>		
		-										
	-	-						M	6+8+11 N =19			
	_	-						<u>–160–</u> [/]	REC =18	3"		
		-										
	-								5+8+12			
	-	-						- 1X	N =20	2"		
	_	-						-165-		5		
	-	-										
	-	-										
	-	-										
		oliveish gray, tra	ace fine to me	edium shell				M	3+6+9 N =15			
	_	moderate.						-170-0	REC =18	3"		
	-	-										
	172.0 -					-108.6						
		grained, wet, oli	, fine to mediı veish gray, tra	um ace fine to	SC							
		medium shell fra reaction weak.	agments, 2-5%	%, HCI					6+10+23	3		
	-							[<u> </u>	N =33 RFC =17	7"		
	_							-1/5				
	-	-										
	177.0	SANDY SILT, m	oist, oliveish	gray, trace	ML	-113.6						
	-	HCl reaction we	shell fragmen ak.	ts, 2-5%,								
3/6/0	-	_						M	6+10+20 N =30)		
GDT		-						- <u>180-</u> [/]	REC =18	3"		
IABEL	-	-										
SCH	-	-										softer drilling
.GPJ	-	-										5
& 400		_							6+8+15			
T 300								105	N =23 REC =18	8"		
DG SF								-185				
48 PL	-							F 1				
61200	-	-										
0 90		-										
ING L		-						M	5+8+13 N =21			
T BOR	_	continu	ied on next pad	e				-190- []	REC =18	3"		
TES												

	bachal	TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant		Boring	Number:	B-403
Schnal		С	alvert Cou	nty, Ma	ryland			Contra	act Number: 06	6120048	
DEDTH	ber Engineering	200						SAM	PI ING		
(FT)	STRAT	A DESCRIPT	ION	CLASS.	(FT)	WL	DEPT	•∧	DATA	TESTS	REMARKS
				ML				<u> </u>			
-											
-											
-								6+	6+12		
_							105		=18 EC =18"		
-											
-											
-											
-							1	∦ 7+ N	·9+14 =23		
200.0 —	BOTTOM OF B		0 0 FT		-136.6		-200-		EC =18"		
			0.011.								
80											
30											
פר											
0.0											
0 & 4											
بر م											
2 0 0											
148 71											
07190											
100											
NO4											

Schna	TEST Project: bel Engineering LOG	Calvert C Calvert C	liffs Nuclea ounty, Ma	ar Pow ryland	ver Pla	nt	Boring Contra Sheet:	Number: Act Number: 1 of 7	er: 06120	B-404
Deviner						Ground	water Obs	ervations		
Boring C	MALAGA, NEW JERSEY					Date	Time	Depth	Casing	Caved
Boring F	oreman: J. Blemings		Enco	untere	d	6/22		30.0'		
Drilling I	Method: Mud Rotary Equipment: CMF-750 (ATV)		Start	of day	/	6/23		27.5'		
Schnabe	el Representative: B. Bradfield									
Dates	Started: 6/22/06 Finished: 6/27/06									
Location	n: Northing: 216441.34 ft Easting: 961596.49 ft									
Ground	Surface Elevation: 67.9 (feet)									
DEPTH (FT)	STRATA DESCRIPTION	CLAS	S. ELEV. (FT)	WL	DEP	SAMPI TH	LING DATA	TEST	s i	REMARKS
-	SILTY SAND, fine to coarse grained, moist, orangeish brown, trace fine rounded gravel, contains root fragments	SM			-	1+2+ N =4 REC	-2 =13"		1.5 wit	'- Mud rotary n 3 7/8" drag
2.0 -	SANDY SILT, fine to coarse, moist, orangeish brown and gray, contains decomposed root fragments.	ML	65.9		-	5+5+ N =1 REC	-5 0 =8"		bit	
4.5	LEAN CLAY with sand, moist, orangeish brown and gray, colors layered <1/2" thick.	CL	63.4		5 -	4+4+ N =9 REC	-5 =12"			
7.0 -	FAT CLAY with sand, moist, gray and orangeish brown, colors layered 1/4" to 3/4" thick.	СН	60.9		-	- _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _	-2 =18"			
10.0 — - -	LEAN CLAY with sand, moist, gray, contains mica.	CL	57.9				-5 =18"			
- - - -	With darker gray pockets up to 1" thick.				- 15- -		-6 1 =18"			
- - - -					- - 20-		-7 3 =18"			
22.0 -	CLAYEY SAND, fine to medium grained, moist, dark gray, contains mica.	SC	45.9		 - -	- - 	-7			
-	continued on next page				-25-		=18"			

Sc	hnabel TEST BORING	Project: C	alvert Cliffs Nuclear Power Plant Calvert County, Maryland						Boring Number: B-4 Contract Number: 06120048		
Schnal	bel Engineering LOG			-	-			Sheet:	2 of 7	120040	
DEPTH (FT)	STRATA DESCRIPT	TION	CLASS.	ELEV. (FT)	WL	DEPTH		IG TA	TESTS	REMARKS	
			SC								
-											
27.5	POORLY GRADED SAND, f medium grained, wet, orange yellowish brown, trace silt.	ine to and	SP	40.4						29-30'- Harder	
-					Ţ	-30-	40+50/3 N =50/3 REC =8	3" 3" 3"		aniing	
-	None silt, with gray clay lens thick.	es <1/4"				 [2 35	21+50/5 N =50/5 REC =1	5" 5" 10"			
-											
-				28.0			WOH/1 N = WC REC =2	8")H/18" 2"			
	CLAYEY SAND, fine to medi grained, moist, gray.	um	SC	20.0							
43.0 -	SILTY SAND, fine to coarse wet, light gray and brownish 20-30% cemented sand, 30- coarse shell fragments.	grained, white, 40% fine to	SM	24.9							
				20.4			48+32+ N =61 REC = ⁻	-29 18"			
- CGPJ SCHNABEL.GDT 	POORLY GRADED SAND W fine to medium grained, wet, brownish white, 20-30% fine shell fragments, moderate He HCI reaction localized to she fragments.	/ITH SILT, gray and to medium Cl reaction, Il	SP-SM	20.4		 50	4+4+5 N =9 REC =1	18"			
5 SPT 300 & 40	20-30% fine to medium shell strong HCI reaction.	fragments,					REC =	18"	w=27.7% LL=NP PL=NP	52'- Shelby tube pushed	
06120048 PLOC	10-20% fine to medium shell HCI reaction localized to she fragments.	fragments, ll					5+10+1 N =20 REC =1	0 18"	~		
				10.1							
- 5.15 BORI	SILTY SAND, fine to medium continued on next page	n grained, ge	SM	10.4							

	TEST	er Plant	Boring Number:	B-404				
Schr	abel Engineering LOG	Calvert Co	unty, Ma	aryland		Contract Number: 06120048 Sheet: 3 of 7		
DEPT (FT)	STRATA DESCRIPT	ION CLASS	ELEV. (FT)	WL	SAMPL	LING TESTS	REMARKS	
	wet, dark gray, 0-10% fine to shell fragments, weak HCI rea	medium SM action.			 60 4+5+ N =1 REC	-7 2 =18"		
62.5	CLAYEY SAND, fine to mediu grained, wet, dark gray, 0-109 medium shell fragments, wea reaction, HCI reaction localize fragments.	um SC % fine to k HCl ed to shell 30% fine trong HCl	- 5.4		2+3+ 2+3+ N =7 REC	-4 =18" =18"	66'- Shelby tube pushed	
	 Wet, dark gray and brownish 30-40% fine to medium shell f strong HCI reaction. 	white, fragments,			 	4+13 7 =18"	68.5'- Start of day 6/23/06	
77.5	20-30% fine to medium shell f 10-20% cemented sand, stror reaction, cemented sand frag <3/4" in diameter.	fragments, ng HCl ments	9.6		 	9+21 0 =13"		
CHNABEL.GDT 3/6/08	 SILTY SAND, fine to medium wet, dark gray, 0-10% fine to shell fragments, weak HCl rea - 	grained, SM medium action.			 	-10 7 =15"		
B PLOG SPT 300 & 400.GPJ St 20	greenish gray and brownish w 20-30% fine to medium shell f strong HCI reaction.	vhite, fragments,	19.6		REC	=17" w=32.2% LL=53 PL=28 *	83.5'- Shelby tube pushed	
BORING LOG 0612004	SILTY SAND, fine to medium wet, greenish gray and dark g 0-10% fine to medium shell fra weak HCI reaction.	grained, SM gray, agments,			 90	-11 9		
TES								

Γ	TEST Project: Calvert Cliffs Nuclear Power Plant Calvert County, Maryland Calvert County, Maryland									Boring	Number:	B-404
	Schna	bel Engineering	LOG	(Calvert Cou	nty, Ma	iryland			Contract Number: 06120048 Sheet: 4 of 7		
	DEPTH (FT)	STRATA	DESCRIPT	ION	CLASS.	ELEV. (FT)	WL			G	TESTS	REMARKS
┢	. ,				SM				REC =1	1 A 8"		
	92.5 - -	SANDY ELASTIC moist, greenish gr medium shell frag weak HCl reactior	SILT, fine t ray, 0-10% f ments, cont n.	o medium, îne to tains mica,	MH	-24.6		 95-	6+9+10 N =19 REC =1	8"		
	- 97.5 -	SILTY SAND, fine wet, greenish gray medium shell frag weak HCl reactior	to medium y, 0-10% fin ments, cont	grained, e to ains mica,	SM	-29.6		 	4+9+12 N =21			
	 - 103.0 -	CLAYEY SAND f	ine to medi	ım	SC	· -35.1		100 ^{[/} 	REC =1	8"		
		grained, moist, gre brownish white, 30 shell fragments, c HCl reaction, shel decomposed and	eenish gray 0-40% fine t ontains mic I fragments fractured.	and to medium a, strong		20.6		 105 	7+12+1 N =27 REC =1	5 8"		
		FINE TO MEDIUM SILT, moist, greer to medium shell fr mica, moderate H fragments decom	/ SANDY E nish gray, 10 agments, cc Cl reaction, posed.	LASTIC 0-20% fine ontains shell	MH	-39.0		 110	4+6+10 N =16 REC =1	8"		
400.GPJ SCHNABEL.GDT 3/6/08	- - - - 117 5	0-10% fine to mec weak HCl reactior decomposed.	dium shell fr n, shell fragi	agments, ments		-49.6		 	5+7+10 N =17 REC =1	8"		
VG LOG 06120048 PLOG SPT 300 & 4		SANDY SILT, fine greenish gray, 0-1 shell fragments, c HCI reaction, HCI shell fragments.	to medium 0% fine to i ontains mic reaction loc	, moist, medium a, weak calized to	ML	-+3.0		 	5+8+10 N =18 REC =1	8"		
TEST BORI	_	continued	d on next pag	e					5+5+7			

<sup>Comments:
1. Boring backfilled with cement/bentonite grout via tremie pipe upon completion.
2. Downhole geophysical logging performed on 6/27/06.
3. * = See Appendix I for additional lab testing data.</sup>

	-	TEST Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	Boring Number:	B-404	
Se	chnat	bel Engineering LOG	Calvert Cou	inty, Ma	ryland		Contract Number: 06120048 Sheet: 5 of 7		
DEI (F	PTH [:] T)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL		NG TESTS	REMARKS	
127		ELASTIC SILT with sand, moist, greenish gray, contains mica.	ML	59.6		N =12 -125- N =12 REC = - - - - - - - - - - - - -	10"	128.5'- Start of day 6/26/06	
137	- - - - - - - - - - - -	FAT CLAY with sand, moist, greenish gray, contains mica.	СН	69.6		$\begin{bmatrix} - & - \\ - $	0 18" 18"		
7HIVABEL: GUT 3/6/08		SANDY ELASTIC SILT, fine to coarse, moist, greenish gray, contains mica.	MH	79.6		 145- 	1 18"		
1 BORING LOG 06120048 PLOG SP1 300 & 400.GPJ SC		continued on next page					2 18"		

<sup>Comments:
1. Boring backfilled with cement/bentonite grout via tremie pipe upon completion.
2. Downhole geophysical logging performed on 6/27/06.
3. * = See Appendix I for additional lab testing data.</sup>

ſ		TE TE	ST Project:	Calvert Cliff	s Nucle	ar Pow	er Plant	В	Boring Number: B-40		
	Schna	bel Engineering	RING OG	Calvert Cou	nty, Ma	iryland		C	Contract Number: 06120048		
	DEPTH				EI EV		S				
	(FT)	STRATA DES	CRIPTION	CLASS.	(FT)	WL	DEPTH	DATA	A TESTS	REMARKS	
				MH							
		-									
		-					IMI	6+8+12 N =20			
		-					-160- []	REC =18'	,		
		-									
		-									
	-						-165-M	7+9+9			
		-					- 10	REC =18	,		
	167 5	-			-99.6						
		LEAN CLAY, moist, gro sand, contains mica.	eenish gray, trace	CL							
		-					MI	6+8+11 N =19			
	-	-					-170-0	REC =18'	'		
		-									
	172.0				-104.1						
		CLAYEY SAND, fine to grained, wet, greenish	o medium gray and white,	SC							
		10-20% fine to medium moderate HCI reaction	n shell fragments, , shell fragments					3+5+12			
		decomposed.					X	N =17 REC =18'			
	_						-1/5-0				
		-									
		-									
_		-									
3/6/08		-									
GDT	-	0-10% fine to medium	shell fragments				-180-	6+14+20			
IABEL		weak HCl reaction, she	ell fragments				X	N = 34	,		
SCHN		decomposed.						INEC - 10			
.GPJ											
& 400		no shell fragments.						5+7+18		183.5'- Start of day 6/27/06	
T 300	-							N =25 REC =18'	,		
JG SP		1						0 10			
18 PLC		1									
31200	187.0	SANDY LEAN CLAY W	vith silt, fine to	CL	-119.1						
30 90		<pre>medium, moist, greenis sand.</pre>	sn gray, trace								
ING L(-					M	4+6+15 N =21			
BOR			next page				- <u>190-</u> []	REC =18'	,		
TEST			ion pago								

	TEST Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	Boring	Number:	B-404
Schnal	bel Engineering LOG	alvert Cou	nty, Ma	ryland		Contra Sheet:	ct Number: 06 7 of 7	6120048
DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL			TESTS	REMARKS
		CL						
-								
193.0 -	SANDY ELASTIC SILT, fine to medium, wet, greenish gray.	МН	-125.1					
_					195	-8+13 =21		
197 5			-120 6		「	EC =3"		
-	SANDY LEAN CLAY, fine to medium, moist, greenish gray.	CL	-120.0		3+	5+9		
200.0 —	BOTTOM OF BORING @ 200.0 FT.		-132.1			=14 EC =18"		
3								
5 -								

Schna	TEST Project: C BORING C C abel Engineering LOG	alvert Clif alvert Co	ffs Nucle unty, Ma	ar Pow ryland	ver Pla	nt	Borin Cont Shee	ng Number: rract Numbe et: 1 of 5	e r: 06120	B-405
Boring	Contractor: CONNELLY AND ASSOCIATES	INC				Gr	oundwater Ob	oservations		
	FREDERICK, MARYLAND	, 110.				D	ate Time	Depth	Casing	Caved
Boring	Foreman: D. Reese		Enco	untere	d	5	/15	43.5'	19.0'	
Drilling	Method: Mud Rotary		Start	of day	y	5	/16	25.0'	18.0'	
Drilling	Equipment: CME-75 (Truck)	-			-					
Schnab	el Representative: M. Arles									
Dates	Started: 5/15/06 Finished: 5/16/06									
Locatio	n: Northing: 216487.38 ft Easting: 961408.73 ft									
Ground	Surface Elevation: 122.0 (feet)				1					
DEPTH (FT)	STRATA DESCRIPTION	CLASS	ELEV. (FT)	WL	DEP	S TH	AMPLING DATA	TEST	s I	REMARKS
0.3	ROOTMAT AND TOPSOIL.	SM	121.7			M	WOH+2+2		4-1 LLA	/4" I.D. llow stem
	 SILTY SAND, fine to coarse grained, moist, orangeish brown, contains root fragments. 				- -	- Ň	N =4 REC =18"		au	gers to 18 ft.
	brownish orange, trace gravel.				L	\square	2+1+2			
						M	N =3 RFC =18"			
4.5	-		117 5		F	1	1120 10			
-	POORLY GRADED SAND WITH SILT, fine to coarse grained, moist, brownish	SP-SM			- 5 -	M	2+1+1			
					F	ΗM	REC =18"			
7.0		80	115.0		-	_				
	coarse grained, moist, orange, trace silt,	5P			L		2+1+1			
	with gravel.					IX	N =2			
	-				F	1				
-	_				-10-	-				
	_				L	\square	1+1+1			
						IŇ	N =2 REC =14"			
12.0	POORLY GRADED SAND WITH CLAY,	SP-SC	110.0		F	1	NEC - 14			
	_ fine to coarse grained, moist, light				F	-				
					L	\square	2+4+6			
5						IX	N =10 REC =18"			
- 1	-				-15-	-				
	_				F	-				
	_				L					
									NA.	d roton/
	-				F				bel	ow 18 ft.
5	_ orange (small 1/8" layers of clay sand).				F	-М	4+5+6 N -11			
-	_				20-	\square	REC =16"			
					20-					
	-				F	-				
	-				F	-				
	_				L					
	with gravel						8+8+0			
					F		N =17			
il –					-25-	40	REC =16"			

	TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant		Boring Number: B-405		
Schnal	BORING	C	alvert Cou	nty, Ma	iryland			Contract Number: 06120048		
DEPTH				EI EV		9		IG	2013	
(FT)	STRATA DESCRIPT	ION	CLASS.	(FT)	WL	DEPTH	DA	TA	TESTS	REMARKS
			SP-SC							
-										
27.0 -	POORLY GRADED SAND V	/ITH SILT.	SP-SM	95.0						
	fine to coarse grained, moist	orange,								
-						L -17	4+7+10)		
_							REC =8	3"		
-						F 1				
-										
						\vdash \dashv				
-						1	6+9+13 N =22	3		
_						-35-	REC =	12"		
_										
-							1 5.40.4	•		
-	with gravel.					$\vdash \dashv X$	N =20	0		
						-40-	REC =	14"		
-										
42.0 -			0.5	80.0						
_	with gravel, fine to coarse gra	race silt, ained, wet,	SP		_					
	yellowish white.				$ \Sigma$		7+15+1	5		
							N =30	12"		
						-45		12		
_ ∞										
9 9 8 47.0 -	SILTY SAND, fine to medium	arained.	SM	75.0						
- (6D1	moist, yellowish orange.	. g,								
- ABEL						L -17	4+2+1			
NHON							REC ='	18"		
6 Lag										
400.0						F 1				
°°00000000000000000000000000000000000	SANDY SILT, fine to medium	n, moist,	ML	70.0						
- Las	orange.					$ \mid \mid $				
53.8 _	SANDY LEAN CLAY, fine to	medium,	CL	68.2			2+2+1 N =3			
84 54.5 	moist, dark gray.		GP-GC	67.5		-55-	REC =	18"		
- 0612	CLAY, fine to medium graine	₋ vvi i H d, wet,								
901 57 0	orange.			GE O						
97.0 -	LEAN CLAY, moist, dark gra	y, with	CL	05.0		[]				
- ST BC	continued on next page	ge								
μ										

Γ	6	TEST	Project: Ca	alvert Cliff	s Nucle	ar Pow	er Plant		Boring Number:	B-405	
	Schnal	bel Engineering LOG	Ca	alvert Cou	nty, Ma	ryland			Contract Number: 06120048 Sheet: 3 of 5		
	DEPTH (FT)	STRATA DESCRIPTIO	ЛС	CLASS.	ELEV. (FT)	WL	S		G TESTS	REMARKS	
				CL				REC =2	2"		
							60				
	_										
	62.0 -	EAT CLAY moist dark grav to	200	<u>сн</u>	60.0						
	_	sand.	ace	On							
	-							2+4+4 N =8			
	_						-65-	REC =18	8"		
	-										
	67.0 -	LEAN CLAY, moist, dark gray.		CL	55.0						
	_							REC =24	4"		
	_						-70-				
	_										
	72.0 -	CLAYEY SAND, fine to mediur	m	SC	50.0						
	_	grained, moist, dark gray.						4+5+7			
								N =12 REC =18	8"		
	77.0 -	CILITY CAND, find to opproduce	ainad	<u>en</u>	45.0						
	_	moist, red and gray.	anieu,	SIVI							
80	-							9+15+15 N =30	5		
T 3/6/0	_						-80-	REC =18	8"		
BEL.GD	-				10.0					Harder drilling	
SCHNAI	82.0 -	POORLY GRADED SAND WI fine to medium grained, moist,	TH SILT, yellowish	SP-SM	40.0						
0.GPJ	_	brown.						50/4"			
00 & 40(85	REC =2'	"		
SPT 3	-										
8 PLOG	_										
612004	_							1 50			
DOG C	-	yıay.						REC =4'	"		
BORING	_						90-				
TESTE		continued on next page									

	hpabol TEST	Project: Calver	rt Cliffs	Nucle	ar Pow	er Plant	В	Boring Number: B-4		
Schnal	bel Engineering LOG	Calver	rt Cour	nty, Ma	ryland		C	Contract Number: 06120048 Sheet: 4 of 5		
DEPTH (FT)	STRATA DESCRIPTI	ON CL	ASS.	ELEV. (FT)	WL			TESTS	B REMARKS	
		SP	P-SM							
- 94.0	SILTY SAND, fine to coarse g	rained, S	SM	28.0			15+26+50 N =76/8")/2"	Start of drilling for the day (5/16/06).	
-	moist, white and gray, with fine coarse shell fragments (15-25 contains cemented sand, stror reaction.	e to %), ng HCI				—95— 	REC =14			
-	fine to medium grained, grayis with fine to medium shell fragn (10-20%), moderate HCI react	h green, nents ion.				 _100-	5+5+7 N =12 REC =18'			
102.0 -	-			20.0						
-	POORLY GRADED SAND WI fine to medium grained, moist, green, with fine to coarse shel fragments (10-20%), moderate reaction	TH SILT, SP grayish I Ə HCI	P-SM			 M	7+5+4 N =9			
-						 	REC =18	n		
-	grayish green, with fine to coa fragments (15-25%), strong He reaction. 4 inch shell bed below 109 ft.	rse shell Cl				 - <u>110</u>	9+12+16 N =28 REC =18'	"		
- - ∞										
3EL.GDT 3/6/C	trace fine to medium shell frag (0-10%), strong HCl reaction.	ments					6+6+7 N =13 RFC =18			
3PJ SCHNAI										
T 300 & 400.	dark green					 	3+3+7			
048 PLOG SF	g,					-120-	N =10 REC =18			
122.0 -				0.0		_]				
	moist, green, with fine to coars fragments (15-30%), strong He reaction.	grained, S se shell Cl	SIVI				4+9+22			
	continued on next page	;								

6	hnabel TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant		Boring N	umber:	B-405
Schnat	bel Engineering LOG	C	alvert Cou	inty, Ma	iryland	d Contract Number: 061200 Sheet: 5 of 5				6120048
DEPTH (FT)	STRATA DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	S DEPTH		G TA	TESTS	REMARKS
			SM			-125-	N =31 REC =1	8"		
127.0 -	CLAYEY SAND, fine to medi grained, moist, greenish whit to coarse shell fragments (20 strong HCI reaction.	um e, with fine I-35%),	SC	5.0		 130-	7+9+11 N =20 REC =1	8"		
132.0 - - - - -	POORLY GRADED SAND W fine to medium grained, mois with fine to coarse shell fragr (10-15%), moderate HCI read	/ITH SILT, t, green, nents ction.	SP-SM	10.0		 135	8+12+1 N =24 REC =1	2 8"		
137.0 - - - - -	CLAYEY SAND, fine to medi grained, moist, green, with fir coarse shell fragments (10-2 HCI reaction.	um ne to 0%), strong	SC	15.0		 	6+7+12 N =19 REC =1	8"		
142.0 - - - - -	SILTY SAND, fine to medium moist, green.	grained,	SM	20.0		 145 - -	6+8+10 N =18 REC =1	8"		
147.0 -	CLAYEY SAND, fine to medi grained, moist, grayish green	um I.	SC	-25.0			6+7+12 N =19	0.1		
150.0	BOTTOM OF BORING @ 15	0.0 FT.		-28.0		-150		0		
Schna	TEST Project: C bel Engineering LOG C	alvert Clif alvert Co	ffs Nucle unty, Ma	ar Pow ryland	ver Pla	nt	Boring Contra Sheet:	Number: Act Number 1 of 5	ər: 06120	B-406
----------	--	--------------------------	-----------------------	------------------	---------	------------------	----------------------------	--	------------	--------------------
Boring	Contractor: UNI-TECH DRILLING					Gro	oundwater Obs	ervations		
	MALAGA, NEW JERSEY					D	ate Time	Depth	Casing	Caved
Boring F	Foreman: J. Evans		Enco	untere	d	5	/17	18.5'		
Drilling	Equipment: Eailing-1500									
Schnabe	Benresentative: B Bradfield / B Vinzant									
Dates	Started: 5/17/06 Finished: 5/17/06	-								
Location	n: Northing: 216315.62 ft									
Ground	Easting: 961352.01 ft									
DEPTH	STRATA DESCRIPTION	CLASS	ELEV.	WL		S	AMPLING	TEST	s i	REMARKS
	TODOOU				DEP	TH	DATA		Dri	lling with N3
-	Silty sand FILL, fine and coarse grained, moist, orangeish brown, trace gravel	FILL	- 110.1		_	- X	N =6 REC =15"		roc	S
-	fine to medium grained.				Ļ	-M	2+5+2			
-					-	$ \square $	REC =15"		4.0 cha	-5.0'-rig atter
-	fine and coarse grained.		110.4		- 5 -	-M	1+2+2 N =4			
6.0 -	CLAYEY SAND, fine to coarse grained, moist, orangeish brown and gray, <1/8"	SC	- 112.4		-		REC =17"			
-	ciay lenses throughout sample.				-	-	4+5+5 N =10			
9.0 -	POORLY GRADED SAND WITH SILT, fine to coarse grained, moist, orangeish	SP-SM	- 109.4		-		REC =18"			
-	brown and yellowish brown.				-	-0	3+3+3 N =6			
-					-	40	REC =18"			
-							5+3+4			
	1.1/0" piece of limenitie computed cond					_Ň	N =7 REC =1"			
					F	$\left \right $				
17.0 -	SILTY SAND, fine to coarse grained,	SM	101.4		F	$\left \right $				
	wet, orangeish brown.			Ţ	-	-	0.0.4			
-					-		3+3+4 N =7 RFC =12"			
					20-					
-					-					
-					F	$\left \right $				
-	orangeish brown and yellowish brown.				F	-	8+11+7 N =18			
24.8 _	continued on next page		93.6		-25-		REC =1/"			
· L	I		1		1			1		

	TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	Boring Number:	B-406
Schn	abel Engineering LOG	C	alvert Cou	nty, Ma	ryland		Contract Number: Sheet: 2 of 5	06120048
DEPTH (FT)	STRATA DESCRIPT	ΓΙΟΝ	CLASS.	ELEV. (FT)	WL		ING TESTS	REMARKS
	POORLY GRADED SAND W fine and coarse grained, wet yellowish brown.	/ITH SILT, , white and	SP-SM			REC	=0"	
	 slight layering (<1 1/2") throu sample. 	ghout				 	2+12 4 =14"	30'-change from 6" to 4" drag bit
32.0	 POORLY GRADED SAND, f coarse grained, moist, orang and yellowish brown, trace fi trace silt. 	ine and eish brown ne gravel,	SP	86.4		 ↓ 14+1.	4+15	34.5'- 1" lense
	-						=14"	of fine rounded gravel
	 medium to coarse grained, g limonitic cemented sand. - 	ravel is				 	15 4 =9"	39.8' - 1" limonitic cemented sand lense
42.0	CLAYEY SAND, fine to medi grained, moist, mottled orang and brown, some grayish bro pockets <1/8" thick.	um geish brown wn clay	SC	76.4		3+7+ 3+7+ N =14 REC	7 4 =8"	45'-Penetrol
T 3/6/08	-							~48'-driller
0.06PJ SCHNABEL.GD	SANDY ELASTIC SILT, fine moist, orangeish brown and	to medium, gray.	MH	70.4		 2+1+ N =2 REC	1 =18"	noted probable change from sand to silt/clay
G 06120048 PLOG SPT 300 & 40 2520	SILTY SAND, fine to medium wet, gray, contains mica.	n grained,	SM	66.4		 	3+22 5 =17"	53.5'-return mud changed color from brown to grayish brown
57.0	LEAN CLAY with sand, mois dark gray, contains mica, fine continued on next page	t, gray and e to ge	CL	61.4				

	20	TEST Project:	Calvert Cliff	s Nucle	ar Pow	er Plant	Boring Number:	B-406
	Schnal	bel Engineering LOG		inty, ivia	iryiand		Contract Number: 0 Sheet: 3 of 5	06120048
	EPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL	SAMPLII DEPTH D	NG TESTS	REMARKS
	-	medium grained.	CL			2+3+4 N =7 REC =	:15"	
	62.0 - - - -	ORGANIC SILT, with sand, moist, gray, contains mica, fine to medium grained,	ОН	- 56.4		 ■ REC = 65 	w=36.1% LL=63 PL=19	63.5'- Pushed tube using Osterberg
	67.0 - - -	LEAN CLAY with sand, moist, light gray, fine to medium grained. 1" clay lense	CL	51.4		 	:18"	69.2' - 1" clayey sand lense
	- 72.0 - - -	CLAYEY SAND, fine to medium grained, moist, gray.	SC	46.4		 - 75-	:12"	73.5'- Pushed tube using Osterberg
EL.GDT 3/6/08	- 77.0 - - - -	POORLY GRADED SAND, fine to coarse grained, moist, dark orangeish brown and gray, trace silt, with fine to coarse gravel consisting of limonitic cemented sand.	SP	- 41.4		 	+31 :14"	78.5'- Distinct shell patterns imprinted on surfaces of cemented sand gravel
OG SPT 300 & 400.GPJ SCHNABI	- - - -	fine to medium grained, yellowish brown. gray.				 20+15 N =28 N =28 REC =	+13 :12"	86'-Lost 200 gallons of drilling mud to formation
ORING LOG 06120048 PL	- 01.0 - -	POORLY GRADED SAND WITH SILT, fine to medium grained, wet, gray and white, 40-50% fine to medium shell fragments, strong HCI reaction.	SP-SM	31.4		33+29 	+19 :16"	
TEST B	_	continued on next page						

		oject: Calvert Cliff	s Nucle	ar Pow	er Plant	Borin	g Number:	B-406
Schnal	bel Engineering LOG	Calvert Col	inty, ivia	iryiand		Contr Sheet	act Number: 0 : 4 of 5	6120048
DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL	S/ DEPTH	AMPLING DATA	TESTS	REMARKS
00.0		SP-SM	00.4					
92.0 -	FINE TO MEDIUM SANDY LEAN CLAY, moist, gray and brownish <10% fine to medium shell fragm weak HCl reaction.	I CL white, ents,	20.4			27+50/5" N =50/5"		94.4'- change to 3 7/8" tri-cone roller
-					95	REC =10"		bit and encountered slight rig chatter
97.0 -	POORLY GRADED SAND WITH fine to medium grained, wet, light and brownish white, 10-20% fine coarse shell fragments, moderate reaction.	SILT, SP-SM gray to HCI	21.4		 	35+25+12 N =37 REC =18"		
102.0 -	POORLY GRADED SAND, fine to medium grained, wet, gray and brownish white, trace silt, 10-20%	o SP	16.4					
	to coarse shell fragments, moder HCI reaction.	ate			 105	6+13+15 N =28 REC =18"		
107.0 - - -	POORLY GRADED SAND WITH fine to medium grained, wet, gray brownish white, <% fine to mediu fragments, weak HCI reaction.	SILT, SP-SM v and m shell	11.4		 	8+10+11 N =21		
			64		110 ^[_] 	REC = 14		
	SILTY SAND, fine to medium gra wet, greenish gray, weak HCI rea <5% fine to medium shell fragme	ined, SM iction, nts.			 -115-	6+8+8 N =16 REC =17"		
	CLAYEY SAND, fine to medium grained, wet, greenish gray, weal reaction, <5% fine to medium she fragments.	K HCI HI	1.4		 	3+4+6 N =10 REC =15"		
			2.0					
	SILTY SAND, fine to medium gra wet, light gray, strong HCI reactio 45-55% fine to coarse shell.	ined, SM n,	-3.0			7+50/3"		
	continued on next page					1 1000		

ſ		hpabol TEST	Project: C	alvert Cliffs	s Nucle	ar Pow	er Plant		Bori	ng Number:	B-406
	Schnal	BORING	C	alvert Cou	nty, Ma	ryland			Con	tract Number: 0	6120048
┟	DEDTU							6 V V			
	(FT)	STRATA DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	NEDTL	3AN 1		TESTS	REMARKS
ŀ				SM				∎ ⊠ N	=50/3"		
							125	R	EC =10"		
	_										
	_										
	-								0.00.00		
	-	greenish gray.					$ \rangle$	(N	6+28+20 =48		
							-130- ^L	R	EC =18"		
	_										
	_										
	_										
		trace mica, weak HCI reaction	h				Γ	7 3.	+8+17		133.5'-No return water
	-							(∥ N	=25		
							-135- ^L		EC = 15		
	-										
	_										
	_										
	_	<5% medium to coarse shell	fragments,					74	+9+14		
		weak HCI reaction, HCI reacti to shell fragments.	ion limited					∛∥ N N R	=23 EC =18"		140'-Drilled
							-140				blind to 140', 1 bag quck gel
	-										141.5'-added 1 bag guick gel
	142.0 -	SANDY LEAN CLAY, fine to r	nedium,	CL	-23.6						and 500 gallons
	-	moist, greenish gray, trace mi medium to coarse shell fragm	ica, <5% ients								return
	_	weak HCl reaction.	,				[7 9·	+12+24		
							-145-		EC =18"		
8)/08											
DT 3/(
EL.G	_										
HNAB	-							_			quick get
J SCI	-)	6- N	+11+14 =25		added, no return
00.GP	150.0 —				-31.6		-150-				
0 & 40			0.011.								
oT 30											
OG SF											
48 PL											
31200											
<u> 2</u>											
NGLC											
BORI											
TEST											

Schna	chnabel TEST BORING bel Engineering LOG	Project:	Calvert (Calvert (Cliffs Nucle County, Ma	ar Pov aryland	ver Pla	nt		Boring Contra Sheet:	y Number: act Number 1 of 7	er: 06120	B-407
During							Gr	oundv	vater Obs	ervations		
Boring	MALAGA, NEW J	ING ERSEY					D	ate	Time	Depth	Casing	Caved
Boring F	Foreman: J. Blemings			Enco	untere	d	6	/14		10.5'	0.0'	
Drilling	wethod: Mud Rotary			Start	t of da	у	6	/15		30.0'	0.0'	
Schnabe	el Representative: M. Arles			Start	t of Da	у	6	/16		20.0'	0.0'	
Dates	Started: 6/14/06 Finished:	6/16/06										
Location	n: Northing: 216238.96 ft Easting: 961412.45 ft											
Ground	Surface Elevation: 81.6 (feet)				1	1						
DEPTH (FT)	STRATA DESCRIPT	TION	CLAS	SS. ELEV. (FT)	WL	DEP	S. TH	AMPL	ING DATA	TEST	S I	REMARKS
-	SANDY SILT, fine to coarse moist, brown, contains root fr	grained, agments.	ML	-		_	-	2+2+ N =4 REC	2 =18"			
40 -	goldenish brown, with gravel			77.6		_		2+2+ N =7 REC	5 =14"	w=4.8 LL=N PL=N	% P P	
-	POORLY GRADED SAND W fine to coarse grained, moist brown, with gravel.	/ITH SILT, , light	SP-S	SM 77.0		5 - -	-0	4+4+ N =8 REC	4 =16"			
-	orange.					-		3+6+ N =1 ⁻ REC	5 1 =12"			
-	with gravelly sand, wet.				Ţ			4+5+ N =12 REC	7 2 =12"	w=12.3	3%	
	with gravel.					- - 15-		2+3+ N =9 REC	6 =15"			
- 17.0 - 17.0	SILTY SAND, fine to medium orange.	n, moist,	SM	64.6		-		6+11 N =23	+12 3 -18"	w=24.9	9%	
23.0	ELASTIC SILT. moist. dark c	iray, trace		58.6		20- - -		REU	-10			
	sand.	ge				_ —25-	-	2+2+ N =5 REC	3 =18"			

		TEST	Project: Ca	alvert Cliff	s Nucle	ar Pow	er Plant		Boring	Number:	B-407
	Schna	bel Engineering	i Ci	alvert Cou	nty, Ma	ryland			Contra	ct Number: 0	6120048
	DEDTU						e		2 2	2 01 7	
	(FT)	STRATA DESCRIPT	ΓΙΟΝ	CLASS.	ELEV. (FT)	WL	ЛЕРТН		ΓΔ	TESTS	REMARKS
				МН							
	-	-									
	-	-									
	-	-									
	_							3+4+4		w=35.1%	
							l og M	N =8 REC =18	8"	^	
									-		
	-	-									
	-	-									
	-	-									
	-	-					M	4+6+6		w=39.4%	
		-					<u>35</u>	REC =12	8"	PL=43	
	37.0 -	SANDY LEAN CLAY, fine to	medium,	CL	44.6						
	-	moist, dark gray.									
	-	-					IM	3+5+7 N =12			
	_	-					<u>–40–</u> []	REC =1	8"		
	-	-									
	42.0 -				39.6						
		SILTY SAND, fine to coarse moist, reddish orange, conta	grained, ins	SM							
		cemented sand, small 1/4" m sand lenses, 1/8" cemented	ore silty or sand					6+13+2	1	w=23.3%	
	-	layers.					- 18	N =34	o"	*	
	_						-45		5		
_	-	-									
3/6/08	47.0 -	POORLY GRADED SAND W	/ITH CLAY	SP-SC	34.6						
GDT	-	fine to medium grained, mois	st, dark								
ABEL		gray.					M	4+10+14	1		
SCHN	_						<u>50</u>	N =24 REC =10	6"		
GPJ (
400.4	_]					[]				
300 8	52.0 -	SILTY SAND, fine to coarse	grained,	SM	29.6						
SPT	-	fragments, strong HCl reaction	nse snell on.				╞╴╶┤				
PLOC	-	-						REC =1	1"		
20048	_	-					-55-				55' start of day
061	-	-									55' grinding,
DOL C	-										rollerbit
ORINC											
EST B	-	continued on next page	ge								
۳ſ											

	TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	1	Boring Number:	B-407
Schna	bel Engineering LOG	C C	alvert Cou	inty, Ma	iryland			Contract Number: 0 Sheet: 3 of 7	6120048
DEPTH (FT)	STRATA DESCRIP	TION	CLASS.	ELEV. (FT)	WL	S		TESTS	REMARKS
-	gray, contains cemented sau moderate HCI reaction, 60-7 cemented sand.	nd, '0%	SM			K	50/5" N =50/5" REC =5"		
- 63.0 - - -	SILTY SAND, fine to coarse moist, green, with fine to co fragments, strong HCI reacti shell frag.	grained, arse shell on, 25-35%	SM	- 18.6		 65	5+6+8 N =14 REC =16	w=28.1% *	
-						 	6+8+15 N =23 REC =18	w=30% *	
-	-					 75	4+6+13 N =19 REC =18	w=27.3% 3"	
	greenish gray, 0-5% shell fra	ag.				 	REC =4"		drilling, try tube
	green, with clay, with fine to fragments, strong HCI reacti shell frag.	coarse shell on, 40-60%				 85 -	3+6+9 N =15 REC =18	w=38.3% *	
	70-90% shell frag, 10-20% c sand.	emented				 90-	21+29+3 N =59 REC =10	0 w=12.4% *	90' Rig chatter
	continued on next pa	ge							

	bnabal	TEST	Project:	Calvert Cliff	s Nucle	ar Pow	er Plant		Boring Number:	B-407
Schnal	bel Engineering	Engineering LOG				iryland			Contract Number: Sheet: 4 of 7	06120048
DEPTH	STRAT	A DESCRIPT		CLASS.	ELEV.	WL	5	SAMPLIN	G TESTS	REMARKS
(F1)		-	-	SM	(F1)		DEPTH	DAT	ТА	
92.0 -					-10.4					
-	medium grained	l, moist, greer	n, with silt,	5P-5M						
-	strong HCI react	tion, 15-25%	shell frag.					6+11+24	4	
_								N =35 REC =1	6"	
_										
_										
_										
_	moderate HCI re	eaction, 5-15%	% shell					5+12+14	4 w=30.8%	
	frag.							N =26 REC =1	8"	
_										
102.0 -					-20.4					
102.0	SILTY SAND, fir moist, green, wit	ne to medium th fine to coai	grained, rse shell	SM	-20.4					
_	fragments, stron shell frag.	ig HCI reactio	on, 20-30%					4+5+8		
_							105	N =13 REC =1	8"	
_										
107.0 -					-25.4					
	SANDY SILT, fir green, weak HC	ne to medium I reaction.	ı, moist,	ML	20.4					
_								6+9+10	w=47.8%	
_								N =19 REC =1	8"	
_										
1120 -					-30.4					
80/9	SILTY SAND, fir moist, green, tra	ne to medium Ice fine to coa	grained, arse shell	SM	00.4					
1 3/	fragments, mode 0-10% shell frag	erate HCl rea J.	ction,					8+9+11		
BEL.G								N =20 REC =1	8"	
SCHNA										
GPJ										
8 400										
РТ 300	with fine to coars	se shell fragn	nents,					5+11+16	6 w=34.2%	
00.51	strong HCI react	tion, 30-40%	shell frag.					N =27 REC =1	8"	
0048 P										
0612(
90 01 01 123.0 -					-41 4					
NING ORIN	SANDY ELASTI moist, green, wit	C SILT, fine t th fine to mee	to medium, lium shell	MH				4+7+7	w=42.2%	
TEST E	continu	ied on next pag	<i>je</i>							

	test	Project:	Calvert Cliff	s Nucle	ar Pow	er Plant		Boring	Number:	B-407
Schna	bel Engineering LOG		Calvert Cou	inty, Ma	aryland			Contra Sheet:	ct Number: 06 5 of 7	6120048
DEPTH (FT)	STRATA DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	S DEPTH	AMPLIN DA	G TA	TESTS	REMARKS
-	fragments, strong HCI reactio shell frag.	n, 10-20%	MH			-125-	N =14 REC =1	8"	*	125-128' harder drilling then softer
127.0 - 	SANDY SILT, fine to medium green, with fine to coarse she fragments, moderate HCI rea	, moist, Il ction.	ML	45.4			REC =6		PP=4.00 tsf	128.5' Pushed tube 6" recovered 6"
-	trace fine to medium shell frag 0-5% shell frag.	gments,				 135-	4+8+10 N =18 REC =1	8"		
136.0 - - -	SILTY SAND, fine to medium moist, green, with fine to coar fragments, strong HCI reactio shell frag.	grained, se shell n, 20-30%	SM	54.4			3+4+8		w=49.2%	
				60.4			N =12 REC =1	8"	*	
-	SANDY ELASTIC SILT, fine t moist, oliveish green.	o medium,	MH	-00.4		 145-	4+7+8 N =15 REC =1	8"	w=56.4% LL=92 PL=63 *	
147.0 -	FAT CLAY, moderate HCI rea	action.	СН	-65.4					10.40	
						 150	5+5+8 N =13 REC =1	8"	w=43.1% LL=81 PL=45 *	
- 153.5 - -	SANDY ELASTIC SILT, conta	ains sand.	MH	71.9		 - 155	REC =5	"	PP=0.17 tsf	
-	continued on next pag	е								

		bachal	TEST	Project: C	alvert Cliffs	s Nucle	ar Pow	er Plant		Boring N	lumber:	B-407
	Schna		BORING	С	alvert Cou	nty, Ma	ryland			Contract	t Number: 0	6120048
┢	DEDTU	ber Engineering	200					6				
	(FT)	STRATA	A DESCRIPT	ION	CLASS.	ELEV. (FT)	WL			га	TESTS	REMARKS
┟					MH							
	-											
	-	with clay.						101	3+5+8		w=78.4%	
									N =13 REC =18	8"		
								100				
	-											
	-											
	-											
	_								5+7+11		w=62.7%	
								105 M	N =18 REC =18	8"	PL=50	
								-165-0			*	
	-											
	-											
	_											
	_								5+7+8		w=55.2%	
	-							[] X	N =15	o"	LL=104 PL=69	
	170.0 —	FAT CLAY, olive	eish brown.		СН	-88.4		-170-		0	*	
	-											
	-											
	_											
									4+7+12		w=53.7%	
	-							F 1 X	N =19	o"	LL=102 PL=37	
								-175-	REC =1	8	*	
	-											
	-											
	_											
08									6+0+12		w=50.9%	
3/6/	-							F - 1 X	N =20		LL=102	
GD	180.0 —	ELASTIC SILT.	moist, oliveis	h green.	MH	-98.4		<u> </u> −180– ^[]	REC =1	8"	*	
IABEI	-		,	J ··								
SCH	_	•										
: LGE												
400.(-								0.5.14		w=82.2%	
300 &	-							F - X	3+5+11 N =16		LL=154	
SPT	_							<u> </u> −185– ∐	REC =1	8"	PL=97 *	
Ő	-							╞╶╶┤│				
048 P	107.0					105 4						
6120(ιö/.U -	SILTY SAND, fir	ne to medium	grained,	SM	-105.4						
000	-	fragments, stron	g HCl reactio	n, 10-25%				╞╶╶┤ _{┏╴} │				
NGL	-	shell frag.						⊢ -IMI	4+7+25 N =32		w=32.6%	
BORI								<u>⊢190–</u> ∐	REC =1	8"		
IEST		continu	ed on next pag	e								

	hnabel TEST	Project: Ca	lvert Cliffs	s Nucle	ar Pow	er Plant		Boring	g Number:	B-407
Schnat	bel Engineering LOG	Ca	lvert Cou	nty, Ma	ryland			Contra Sheet:	act Number: 06 7 of 7	3120048
DEPTH (FT)	STRATA DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	DEPTH	SAMPL		TESTS	REMARKS
	trace fine to coarse shell frag weak HCl reaction, 0-5% she	ments, Il frag.	SM				7+9+ N =22 REC	13 2 =18"	w=31.6% *	
- 200.0 —	BOTTOM OF BORING @ 20	0.0 FT.		-118.4			5+7+ N = 15 REC	12 9 =18"	w-32.770 *	

Schn	TEST Project: C Chnabel BORING C abel Engineering LOG	Calvert Clit Calvert Co	ffs Nucle unty, Ma	ar Pow ryland	ver Pla	nt		Boring Contra Sheet:	Number: ct Number 1 of 5	e r: 061200	B-408
Boring						Gro	oundw	ater Obs	ervations		
Богінд	MALAGA. NEW JERSEY					D	ate	Time	Depth	Casing	Caved
Boring	Foreman: J. Blemings		Enco	untere	d	7	/24		6.0'		
Drilling	Method: Mud Rotary		Start	of day	v	7	/25		20.0'		
Drilling	J Equipment: CME-750 (ATV)				,						
Datos	Started: 7/24/06 Einished: 7/25/06	-									
Locatio	on: Northing: 216261.74 ft Easting: 961482.04 ft										
Ground	d Surface Elevation: 68.4 (feet)										
DEPTH (FT)	STRATA DESCRIPTION	CLASS	ELEV. (FT)	WL	DEP	S. TH	AMPLI D	NG ATA	TEST	S F	REMARKS
0.5	Forest litter, rootmat and topsoil.	C14	67.9				01014				
	 SILTY SAND, fine to medium grained, moist, light brown, contains root fragments, and organic matter. 	SM			-		2+2+1 N =3 REC =	-18"			
	Yellowish brown						3+6+5	;			
					Γ		N =11	10"			
	-				F		REC =	18.			
4.5	CLAYEY SAND, fine to medium	SC	- 63.9		- 5 -	-					
	contains root fragments, trace mica.			∇		IV	2+4+3 N =7				
						٦Ш	REC =	=15"			
	-				╞	-					
	Mottled orangeish gray.				L		2+3+3				
						IŇ	N =6	-18"			
	1				F			10			
10.0	CANDY CILT fine to modium moint	N/I	58.4		-10-	-					
	_ gray, contains mica.	IVIL			L		2+2+4				
						IXI	N =6	-10"			
	-				F		REC -	-10			
13.0			55.4		F	-					
2	dark greenish gray, contains mica.	ML					2+3+4				
5					F		N =7				
	-				-15-	-14	REC =	=18"			
					L						
	-				F	-					
5	-				F	-					
							3+4+5				
	1				F		N =9				
-	-				-20-	-121	REC =	=18"			
8					L						
2											
22.0	SANDY SILT, fine to medium, moist,	ML	46.4		F	1					
8	dark greenish gray, contains mica.				╞	-					
					L		4+6+6	i			
						$\ X\ $	N =12	-10"			
	continued on next page				-25-	- Ľ	REU =	-10			

-	TEST Project: Calvert Cliffs Nuclear Power Plant Chnabel BORING Calvert County, Maryland							ant Boring Number: B-408		
Schnat	BORING	C	alvert Cou	nty, Ma	iryland			Contra	act Number: 0	6120048
DEPTH				ELEV.			SAMPLIN	IG		
(FT)	STRATA DESCRIPT	ION	CLASS.	(FT)	WL	DEPTH	DA	ТА	TESTS	REMARKS
			ML							
						- 1				
27.0 -	SILTY SAND, fine to medium	grained,	SM	41.4						
-	moist, reddish brown.									
-						$\vdash \dashv M$	11+11+ N =41	+30		
						-30-	REC =	18"		
-										
_										
_										
	Gray.						24+28+	+49		
							N =77 REC =	18"		
_										
	14/-4						1 10.0.0			
_	vvet.					$ \rangle$	N =9	5		
						-40-	KEC =	11.		
-										
42.0 -	SANDY SILT, fine to medium	, moist,	ML	26.4						
-	greenish gray, strong HCI rea strong cementation, 5% med	action, coarse								
-	shell fragments.					2	34+50/	2" 2"		
						-45	REC =	8"		
-										
-										
2 _										
	Moderate HCI reaction, no ce	emented					7+6+8			Rig chatter
	sand, 15% med coarse she fragments.	ell					N =14 REC =	18"		
						[]				
						[]				
	Dark groonich grou moderat						0+12.4	16		
	reaction, 15% med coarse	shell				F 1 X	N =29	10"		
	nayments.					<u> </u> −55–		10		
						├ ┤				
-						\vdash \dashv				
-	continued on next pac	<i>ie</i>				\vdash \dashv				
	· · · · · · · · · · · · · · · · · · ·									

ſ	6	hnahal	TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant		Boring	Number:	B-408
	Schnat			C	alvert Cou	nty, Ma	ryland			Contra Sheet	act Number: 00	6120048
ł	DEDTU	Lighteening	200							NG	5015	
	(FT)	STRAT	A DESCRIPT	ION	CLASS.	(FT)	WL	DEPTH		ΔΤΔ	TESTS	REMARKS
ł					ML							
	-	Weak HCI reacti shell fragments.	on, 5% med.	- coarse				$ - \rangle$	/ 5+8+7 N =20	12		
		Ū						-60	REC	=18"		
	_											
	-									_		
	_	5% med coars	e shell fragm	ents.)	/ 4+3+5 N =8	5		
								-65-	REC	=18"		
	_											
	_											
		5% mod	o sholl fraam	onte					7 24640	2		
	-	5 % med coars	e sheli hayin	ents.				$ \rangle$	N =12			
								-70	I REC	=18.		
	_											
	_											
	_											
		Light greenish g	ray, strong H	CI					26+48	8+50/5"		
		reaction, strong	cementation,	40% med.					N =98	/11" =17"		
			gineme					-/5				
	-											
	-											
	_											
	_	Dark greenish g	ray, weak HC	l reaction,				10	6+11-	-12		
6/08	_	3% med coars	e snell fragm	ents.				80	REC	=18"		
DT 3/												
EL.G												
HNAE	-											
J SC	_											
00.GF	_	Greenish gray, r	no shell fragm	ients.				}	6+9+ ²	17		
0 & 4	_							-85-	REC	=18"		
PT 30	_											
OG S												
48 PL												
31200	-											
00 00	_							$\vdash \dashv$	(5+8+7 N =20	12		
NGLC	_							-90-1	REC	=18"		
BORI	_		ad an art f									
TEST		continu	eu on next pag									

	hnahal	TEST	Project: C	Calvert Cliffs Nuclear Power Plant Calvert County, Maryland					Boring	Number:	B-408
Schna		BORING	C	alvert Cou	nty, Ma	iryland			Contra Sheet	act Number: 0	6120048
DEDTU	ber Engineering	200							Sheet:	4 01 5	
(FT)	STRAT	A DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	перти		ы Тл	TESTS	REMARKS
				ML							
-	-										
-	-										
	Weak HCI reacti	ion, 3% med.	- coarse					7+8+11			
	shell fragments.	,					r ik	N =19	8"		
							-95-		0		
-	-										
-	-										
-	-										
	Weak HCI reacti	ion. 3% med.	- coarse					4+8+11			
	shell fragments.	,					r ik	N =19	8"		
-							-100-		0		
-	-										
-	-										
-	-										
	Weak HCI reacti	ion. 3% med.	- coarse					4+6+7			
-	shell fragments.	,					r ix	N =13	Q"		
-	-						-105-		0		
-	-										
-	-										
_	-										
	Weak HCI reacti	ion. 3% med.	- coarse					5+7+13			
-	shell fragments.	,					r ix	N =20	Q"		
	-						-110-		0		
-	-										
-	-										
- (9)	-										
DT 3/	Dark greenish g	rav. weak HC	I reaction.					6+7+9			Start of drilling for the day
	5% med coars	se shell fragm	ients.				r ix	N =16	Q"		
- HNAB	-						-115-		0		
	-										
- 0.GP	-										
8 40	-										
1 30	Weak HCI reacti	ion, 3% med.	- coarse					5+8+8			
	shell fragments.	,					[] X	N =16	8"		
	1						-120-		0		
- 12004	{										
.90 -	-						-				
	Weak HCI reacti	ion, 5% med	- coarse					5+6+9			
ST B	continu	ied on next pag	ie Ie								
۳ L											

	TEST Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	Boring Number:	B-408
Schnal	BORING C	alvert Cou	inty, Ma	iryland		Contract Number: 0 Sheet: 5 of 5	6120048
DEPTH			ELEV.		SAMPLI		
(FT)	STRATA DESCRIPTION	CLASS.	(FT)	WL	DEPTH DA	ATA TESTS	REMARKS
	shell fragments.	ML			N =15	18"	
_					-125		
-							
-							
-							
-	shell fragments.				-	4.01	
					-130-10 REC =	18.	
-							
-							
-							
-	No shell fragments.				– – – 5+7+7 N =14		
					-135-	18"	
-							
-							
-							
-	Greenish gray.				4+6+8 N =14		
					-140- C REC =	18"	Rig chatter
-							
-							
-							
-	Dark greenish gray, weak HCI reaction,				6+9+1:	2	
	3% med coarse shell fragments.				-145- A REC =	18"	
- /6/08							
- 301 3							
- ABEL.							
- SCHN	Greenish gray, no shell fragments.				5+8+10	0	
150.0			-81.6		N =18 REC =	18"	
8 400	BOTTOM OF BORING @ 150.0 FT.		01.0				
PT 300							
00 8							
0048 P							
0612(
9016							
ORING							
IEST E							

	test	ST Project: Calvert Cliffs Nuclear Power Plant						Boring Number: B-4		B-409			
Schna	bel Engineering LOG	i	Calvert (Coun	ity, Ma	ryland				Contra Sheet:	1 of 5	er: 06	120048
Boring	Contractor: CONNELLY AND		SINC					Gro	oundv	vater Obs	ervations		
	FREDERICK, MA	RYLAND	0, INC.					D	ate	Time	Depth	Cas	ing Caved
Boring F	Foreman: D. Reese				Enco	untere	d	6	21		7.5'	7.5	5'
Drilling	Equipment: CME-75 (Truck)				Start	of day	/	6	22		3.0'	14.	0'
Schnabe	el Representative: M. Arles				Start	of day	/	6	23		5.0'	14.	0'
Dates	Started: 6/21/06 Finished:	6/27/06			Start	of day	/	6	26		19.5'	14.	0'
Location	Easting: 961614.8 ft				Start	of day	/	6	27		20.0'	14.	0'
Ground	Surface Elevation: 61.6 (feet)						1						
DEPTH (FT)	STRATA DESCRIPT	ΓΙΟΝ	CLAS	ss. ^I	ELEV. (FT)	WL	DEP	S/ ⊺н ∣	AMPL r	ING DATA	TEST	s	REMARKS
0.5	Crushed Stone				61 1			M	3+3+	4			0-14'- 6-1/4"
-	Poorly graded sand FILL, tra fine to coarse grained, moist	ice gravel, , brown.	FILI	L	01.1			-W	N =7 REC	=12"			hollow stem auger
	traco silt								37.07	2			
-	brownish gray.						F	IXI	N =4 REC	- =18"			
-													
-	contains wood fragments, FI	LL.						IM	1+1+: N =3	2			
-	-						-		REC	=18"			
-	wet, blackish gray, with grave	el,			50.4	<u> </u>	F	-0	3+1+ N =2	1			
8.5	LEAN CLAY, moist, gray, tra	ce sand.	CL		53.1		F	ЧШ	REC	=18"			9' very soft augering
-	with silt.						-10-		1+2+:	2			
-	-						-	-14	N =4 REC	=16"			
-	-						-		~ -	_			
- 2	-						-	IXI	3+5+ N =10	5) —19"			
- ۳ – 14.5					47.1		-		REC	-10			14' start of day 6/22/06
	_ FAT CLAT, MOISI, gray, tract	e sanu.					-15-	M	1+4+: N =7	3			bit
- HNAE	-						F	14	REC	=18"			
אן 17.0 - היו	CLAYEY SAND, fine to med	ium v	SC	;	44.6		F		REC	=24"			17.5' Tube
& 400.0		,.					Γ		n.eo				puoliou
200													
	green.								3+4+ N =8	4			
22 0 -					39.6		L		REC	=18"			
23.0 -	SANDY FAT CLAY, fine to m moist, gray.	nedium,	СН	I	38.6		L		4+2+	4			22.5' harder drilling
	CLAYEY SAND, fine to medi grained, moist, reddish orang	ium ge.	SC	;			Ļ	ĮЩ	N =6 REC	=18"			
24.5 	POORLY GRADED SAND V continued on next page	VITH CLAY, ge	SP-S	SC	37.1		-25-						
-							1						

	TEST Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	Boring Number:	B-409
Schnal	BORING C	alvert Cou	nty, Ma	iryland		Contract Number: 0	6120048
DEDTH					SAMPLI	Sheet. 2 of 5	
(FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL			REMARKS
	fine to medium grained, moist, orange,	SP-SC			15+26	5+28	
	small 1/16" clay layers.				N =54 REC =	=18"	
27.0 -		<u> </u>	34.6				
_	medium grained, moist, orange.	55			38+50)/5"	
20.0			22.6		N =50/ REC =	/5" =11"	
29.0 -	POORLY GRADED SAND with silt, fine	SP-SM	32.0				
-	to medium grained, moist, gray					/5"	
					[_] N =50, REC =	/5" =11"	
-							
-					30+40	+40	
_						=18"	
					05		nitcher sample
_					-35-	w=23.3%	pushed
-						PL=NP	
37.0 -	CLAYEY SAND, fine to medium	SC	24.6				
	grained, moist, gray, contains cemented				3+26+	6	
-	fragments, 10% shell frag, gray colored.					=12"	
_							
	wet, grayish green.					+WOR	
						OR =18"	
-						- 10	
-	contains cemented sand.				– – – – – – – – – – – – – – – – – – –	-28	43' cemented layer, grinding
-						=18"	
44.5	SILTY SAND, fine to medium grained,	SM	17.1				
_	fragments, contains cemented sand,				N =12		
80)/0	strong HCI reaction, 20-30% shell frag.					=18"	
1 3/6							
- <u>-</u>							
						=18"	
					50	=24"	tube pushed
- 0.GP						27	
- X 40							
1 300					4+5+5	;	
					N =10	-18"	
54.5		05.5	7.1				
12007	FOURLY GRADED SAND WITH SILT, fine to medium grained, moist, green,	SP-SM			-55-44+5+6	;	
- 00	strong HCI reaction, 10-20% shell frag.				N =11 REC =	=18"	
	weak HCl reaction.				4+3+5	;	
ESI	continued on next page						

	6	hnabol TES	T Project:	Calvert Cliff	s Nucle	ar Pow	er Plant	в	oring Number	B-409
-	Schnat	bel Engineering LO	NG G	Calvert Cou	nty, Ma	aryland		C S	ontract Numb heet: 3 of 5	er: 06120048
D	EPTH (FT)	STRATA DESCI	RIPTION	CLASS.	ELEV. (FT)	WL	S DEPTH		TEST	S REMARKS
				SP-SM				N =8 REC =18'		
	59.5	SILTY SAND, fine to men moist, green, with fine to fragments, strong HCI re shell frag.	dium grained, coarse shell action, 10-20%	SM	2.1		60	2+3+2 N =5 REC =18'		
	-	contains fine to coarse sl moderate HCI reaction.	hell fragments,					REC =24'		tube pushed
		with fine to coarse shell f strong HCI reaction, 30-4	ragments, 10% shell frag.				- 65-	3+6+9 N =15 REC =18'	1	
	67.0 - - 	CLAYEY SAND, fine to r grained, moist, green and contains cemented sand coarse shell fragments, s reaction, 70-80% shell fra	nedium d white, , with fine to strong HCI ag.	SC	-5.5			8+14+16 N =30 REC =18'	,	
	- 69.5 - -	WELL GRADED SAND V fine to medium grained, v white, with fine to coarse fragments, strong HCI re shell frag.	WITH CLAY, wet, green and shell action, 70-90%	SW-SC	-8.0			11+6+12 N =18 REC =18'		
		moist, green, with silt, wi coarse shell fragments, s reaction, 60-80% shell fr	th fine to strong HCI ag.		12.0			7+29+45 N =74 REC =18'		
	74.5 - -	SILTY SAND, fine to mer moist, green, trace fine to fragments, moderate HC 0-10% shell frag.	dium grained, o coarse shell I reaction,	SM	-13.0			5+7+13 N =20 REC =18'		
08	-	with fine to coarse shell f strong HCI reaction, 20-3	ragments, 30% shell frag.					5+7+9 N =16 REC =18'	,	79' start of day 6/23/06
VABEL.GDT 3/6/	-							5+7+10 N =17 REC =18'	,	
400.GPJ SCH	-							7+8+11 N =19 REC =18'	,	
PLOG SPT 300 {	-	trace fine to medium she moderate HCI reaction, 0 frag.	ll fragments,)-10% shell					4+5+7 N =12 REC =18'	,	
G 06120048	-	with fine to coarse shell f strong HCI reaction, 10-2	ragments, 20% shell frag.		00.0			4+5+8 N =13 REC =18'	"	
TEST BORING LO	δ9.5 	SANDY SILT, fine to mee green, trace fine to medii fragments, moderate HC continued on new	dium, moist, um shell I reaction, <i>tt page</i>	ML	-28.0		-90- 	5+7+9 N =16		

	hnabel TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	I	Boring Number:	B-409
Schnat	bel Engineering LOG	С	alvert Cou	nty, Ma	iryland		(Contract Number: Sheet: 4 of 5	06120048
DEPTH (FT)	STRATA DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	S DEPTH		TESTS	REMARKS
	0-10% shell frag.		ML				REC =18	A }"	
92.0 -	SILTY SAND, fine to medium moist, green, trace fine to me fragments, moderate HCI rea 0-10% shell frag.	grained, dium shell ction,	SM	-30.5			5+6+6 N =12 REC =18	3"	
-	contains fine to medium shell fragments, greenish gray			25.5		95	REC =19	w=33.1% LL=61 PL=42	95' tube pushed
-	SILTY SAND, fine to medium moist, green, with fine to coar fragments, strong HCI reactio shell frag.	grained, se shell n, 10-20%	SM	-35.5			4+6+5 N =11 REC =18	3"	
- 102.0	30-50% shell frag.			-40.5			2+5+6 N =11 REC =18	3"	
-	CLAYEY SAND, fine to mediu grained, moist, green, with fin coarse shell fragments, strong reaction, 50-60% shell frag.	im e to g HCl	SC			0	8+10+8 N =18 REC =18	3"	
104.5	SANDY SILT, fine to medium green, with fine to coarse she fragments, strong HCI reactio shell frag.	, moist, ll n, 10-20%	ML	-43.0		105	4+5+8 N =13 REC =18	3"	105' start of day 6/26/06
_	oliveish green, trace fine to co fragments, weak HCI reaction shell frag.	barse shell 1, 0-5%					4+6+6 N =12 REC =18	3"	
-	moderate HCI reaction, 0-109 frag.	6 shell				110 	5+6+7 N =13 REC =18	3"	
	with sand.			52.0			5+6+8 N =14 REC =18	3"	
	ELASTIC SILT, moist, oliveisl trace fine to medium shell frag weak HCl reaction, 0-10% sh	n green, gments, ell frag.	MH	-55.0		115	6+6+9 N =15 REC =18	3"	
117.0 - 800 × 400	SANDY SILT, fine to medium oliveish green, trace fine to co fragments, moderate HCI rea 0-10% shell frag.	, moist, parse shell ction,	ML	-55.5			4+6+8 N =14 REC =18	3"	
06120048 PLO	with fine to coarse shell fragm strong HCI reaction, 10-25%	nents, shell frag.		60 5		-120-	4+5+5 N =10 REC =18	3"	
	ELASTIC SILT, moist, oliveisl trace fine to medium shell frag with sand, weak HCI reaction shell frag.	n green, gments, , 0-5% e	MH	6.00			4+5+7 N =12 REC =18	3"	
ES	commod on noxt pug								

	hnabal	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant		Boring	Number:	B-409	
Schnal			C	alvert Cou	nty, Ma	ryland			Contrac	ct Number: 06	6120048
DEPTH					FI FV		5		G	0 01 0	
(FT)	STRATA	A DESCRIPT	ION	CLASS.	(FT)	WL	DEPTH	DA	TA	TESTS	REMARKS
				MH							
_	no shells.						-125-	5+5+7			
-							10	N =12 REC =1	8"		
-											
	with clay.						10	4+5+6			
_							L IV	REC =1	8"		
_							-130	_			130' start of day
								5+5+7 N =12			6/27/06
_							F 74	REC =1	8"		
-								1			
-							F -11X	6+7+9 N =16			
-							$\vdash \dashv \square$	REC =1	8"		
_							-135-	7 5+6+0			
_							L - X	N =15	0"		
								I REC =1	8		
								REC =1	8"	PP=4.00 tsf	137.5' tube pushed
-											
							-140-	5+6+8			
-							Ľ	N =14 REC =1	8"		
-											
-							10	5+6+8			
_							L 10	REC =1	8"		
_							-145-	_			
80)/0								4+6+7 N =13			
							ך קע	REC =1	8"		
י 147.5 -		ist sliveish i			-86.0						
	silt.	dist, oliveish (green, with					1			
							X	7+8+10 N =18			
⁵ 150.0 —	BOTTOM OF BO	DRING @ 15	0 0 FT		-88.5		-150-	REC =1	8"		
0 0 & 4	201101101										
1 30											
200											
148 P											
02120											
90											

Schna	TEST Project: C bel Engineering LOG C	alvert Cli alvert Co	ffs Nucle unty, Ma	ar Pow ryland	ver Pla	nt	Boring Contra Sheet:	Number: Ict Number 1 of 2	er: 061200	B-410
Boring	Contractor: CONNELLY AND ASSOCIATES	INC				Gro	oundwater Obs	ervations		
Bonnig	FREDERICK, MARYLAND	,				D	ate Time	Depth	Casing	Caved
Boring	Foreman: D. Reese		Enco	untere	d	4	/28	44.0'	5.0'	
Drilling	Equipment: CME-75		Start	of day	y	5	5/1	35.1'	5.0'	
Schnab	el Representative: M. Arles		Start	of day	y	5	5/2	26.0'	5.0'	
Dates	Started: 4/28/06 Finished: 5/2/06									
Locatio	n: Northing: 216374.3 ft Easting: 961323.7 ft									
Ground	Surface Elevation: 119.1 (feet)									
DEPTH (FT)	STRATA DESCRIPTION	CLASS	ELEV. (FT)	WL	DEP	S/ TH	AMPLING DATA	TEST	S F	REMARKS
0.3	TOPSOIL.	SM	118.8			M	1+2+4 N =6			
	SILTY SAND, fine to coarse grained, moist, orange.						REC =18"			
2.5	POORLY GRADED SAND WITH SILT, fine to medium grained, moist, orange.	SP-SM	116.6		-	-\	3+3+4 N =7			
	-				-		REC =18"			
	-				- 5 -	-	4+3+2 N =5 REC =14"			
	fine to coarse grained, yellow orange.					-	3+3+3			
	-				_	-M	N =6 REC =12"			
10.8	fine to medium grained, orange.	00	- 108.3		-10-		2+3+3			
	POORLY GRADED SAND, fine to medium grained, moist, orange.	55			_	-M	N =6 REC =12"			
13.5		00.00	- 105.6		-		0.0.1			
	fine to medium grained, moist, orange white, small layers of color changes.	SP-SM			- 15-		2+3+4 N =7 REC =15"			
	-				-					
· · · · · · · · · · · · · · · · · · ·	fine to coarse grained, orange, grades fine to coarse.				- -	-	3+5+8 N =13			
, — , , , , , , , , , , , , , , , , , ,	1				20- -		NLU - 10			
	-									
	-				-	-	7+10+8 N =18 REC =17"			
	continued on next page				-25-					

Comments: 1. Boring backfilled with cement/bentonite grout through tremie pipe upon completion. 2. * = See Appendix I for additional lab testing data. 3. Boring abandoned due to stuck tube at 55 feet. Offset to 410A

	TEST Project: C	er Plant	Boring Number:	B-410			
Schna	bel Engineering LOG	alvert Cou	nty, Ma	iryland		Contract Number: 00 Sheet: 2 of 2	6120048
DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL		NG TESTS	REMARKS
		SP-SM					
-							
28.5	SILTY SAND, fine to coarse grained,	SM	90.6		[] <u>∏</u> 5+8+8		
	moist, orange.				N =16 REC =	12"	
-							
33.5	POORLY GRADED SAND WITH SILT,	SP-SM	85.6		6+9+1 ²	1	
	The to coarse granted, moist, orange.				35 REC =	18"	
-							
-							
-					4+13+1 N =27	14	
					-40- <u>/</u> REC =	16"	
-							
-							
43.5	SILTY SAND, fine grained, wet, orange	SM	75.6		 ∏ 3+1+1		
-	white.			<u> </u>	N =2 REC =	18"	
_					45		
-							
						3+3	
						18"	
-							
535			65.6		<u> </u>		
	LEAN CLAY, moist, dark gray, with sand.	CL	00.0		5+3+3 N =6		Pushed tube and some
55.0 -	BOTTOM OF BORING @ 55.0 FT.		64.1		-55- <u> </u> REC =	18"	metal; Bechtel abandon hole
							tube problem
· L			1				1

Comments: 1. Boring backfilled with cement/bentonite grout through tremie pipe upon completion. 2. * = See Appendix I for additional lab testing data. 3. Boring abandoned due to stuck tube at 55 feet. Offset to 410A

	Schnak	Schnabel Engineering TEST BORING LOG Project: Schnabel Engineering CONNELLY AND ASSOCIAT FREDERICK, MARYLAND				Nuclea y, Mai	ar Pow ryland	er Plar	nt		Boring Contra Sheet:	I Number: Ict Number 1 of 4	er: 06	E 61200	B-410A
ſ	Borina C	ontractor: CONNELLY AND	ASSOCIATE	SINC					Gro	oundv	vater Obs	ervations			
	2011ig 0	FREDERICK, MA	RYLAND	.0,					D	ate	Time	Depth	Cas	sing	Caved
	Boring F	oreman: D. Reese			E	Εηςοι	untere	d	4	/28	1:46	44.0'	5.	0'	
	Drilling K					Start	of day	,	5	5/1	9:07	35.1'	5.	0'	
	Schnabe	I Representative: M. Arles				Start	of day	,	5	5/2	7:14	26.0'	5.	0'	
	Dates S	Started: 4/28/06 Finished:	5/2/06	ľ											
	Location	: Northing: 216381.3 ft Easting: 961323.7 ft		-											
	Ground §	Surface Elevation: 119.1 (feet))												
	DEPTH (FT)	STRATA DESCRIP	ΓΙΟΝ	CLAS	ss. El	LEV. (FT)	WL		S/	AMPL		TEST	s	R	EMARKS
┟		SEE BORING LOG B-410 F	OR					DEP		L				Bori	ng was
	_	SAMPLE DESCRIPTIONS F 58.0 FEET.	ROM 0 TO						$\left \right $					adva with	anced out
	-								$\left \right $					sam 58.5	bling to b' (depth at
	_								$\left \right $					whic borii	ch original ng was
	_							L .						term	ninated)
								_							
								- 5 -							
	-														
	-								$\left \right $						
	_								$\left \right $						
	_								$\left \right $						
	_							-10-							
	_														
	_														
0	-														
20/0	-														
	_							-15-	$\left \right $						
	_								$\left \right $						
	_														
210.	_							Ļ.							
& 40C								L							
פטר	_							-20-	1						
	-								+						
7004	-								$\left \right $						
	-								$\left \right $						
	_							Ļ.							
	_							_25-							
		continued on next page	ge					20-							

	bachal	Project:	ect: Calvert Cliffs Nuclear Power Plant Calvert County, Maryland Boring Number: 06120048						B-410A		
	maper	BORING		Calvert Cou	nty, Ma	ryland			Contra	act Number: 00	6120048
Schnal	bei Engineering	LUG							Sneet	2 07 4	
DEPTH	STRAT	A DESCRIPT	ION	CLASS.	ELEV. (FT)	WL		SAMPL	.ING	TESTS	REMARKS
()					()		DEPTI	-			
_											
	SEE BORING I SAMPLE DESC	LOG B-410 FC CRIPTIONS FI	DR ROM 0 TO								
	58.0 FEET.						[]				
-											
							-30-				
_							- 1				
-											
_											
							-35-				
_											
-											
_							-40-				
-											
_											
-											
_						$\overline{\Delta}$					
_							45				
-							- 1				
							$ \downarrow \downarrow$				
б <u>—</u>							-50-				
							$ \downarrow \downarrow$				
-											
							ľ 1				
							-55-				
	contin	ued on next nac	le								
			-								

	hnabol	TEST	Project: 0	Calvert Cliff	s Nucle	ar Pow	er Plant		Boring Number:	B-410A
Schnat	Del Engineering	LOG	(Calvert Cou	nty, Ma	ryland			Contract Number: 0 Sheet: 3 of 4	6120048
DEPTH	075.17			0.000	ELEV.		s			DEMARKO
(FT)	SIRAIA	DESCRIPT	ION	CLASS.	(FT)	WL	DEPTH	DAT	TA TESTS	REMARKS
	FAT CLAY, mois	st. dark grav.	with sand.	СН				1+2+3		
		.,						N =5 REC =18	3"	
							-60			
_										
-										
_										
-	trace sand.							REC =7'	PP=2.25 tst	
_							65			
-										
-										
-										
_	with sand.						10	2+4+5		
								REC =18	8"	
_										
										Detterre of tasks
								REC =18	3"	contains fine
75.0							75			sand
/5.0	CLAYEY SAND,	fine grained	, moist,	SC	44.1		-/5			
	g g , .									
78.5					40.6			0.44.50		
<u>م</u> –	medium grained,	, moist, brow	n.	58			10	$N = 61/1^{\circ}$	//5 1" 2"	
- 3/0/							-80-	REC = I	5	
– פ										
00	yellowish brown.							50/2" N =50/2'	,	
00 &							85	REC =1'	•	
88.5	POORLY GRAD	ED SAND W	ITH SILT,	SP-SM	30.6		R	42+50/4		
	gray, with fine to	o medium sho	ι, greenisn ell ation				-90-	REC =10	ס"	
	fragments, mode	erate HCI rea	cuon.							
о Ц	continue	ed on next pag	ie							

SC	hnabel	Project: C C	alvert Cliff alvert Cou	s Nucle nty, Ma	ar Pow ryland	er Plan	t	Boring	Number:	B-410A	
Schnal	bel Engineering	LOG		1					Sheet:	4 of 4	
DEPTH (FT)	STRATA	DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	DEPT	SA H	MPLING DATA	TESTS	REMARKS
_				SP-SM							Rig chatter
93.5 _ 	POORLY GRADE coarse grained, n with fine to mediu moderate HCI rea	ED SAND, fi noist, greeni m shell frag action.	ne to sh gray, ments,	SP	25.6		 95	S N F	50/1" N =50/1" REC =1"		
- 98.5 98.6	POORLY GRADE fine to medium gr gray, with fine to fragments, moder BOTTOM OF BO	ED SAND W ained, mois coarse shel rate HCI rea RING @ 98	TTH SILT, t, greenish l ction. .6 FT.	SP-SM/	20.6 20.5			⊠ 5 N F	50/2" √ =50/2" REC =1"		

Schna	TEST Project: C BORING Abel Engineering LOG	Calvert Cli Calvert Co	ffs Nucle ounty, Ma	ar Pov Iryland	ver Pla	nt	Boring Contra Sheet:	Number: Inct Number 1 of 5	er: 06120	B-411
Boring	Contractor: CONNELLY AND ASSOCIATES	S, INC.				Gro	undwater Obs	ervations		
	FREDERICK, MARYLAND					Da	ate Time	Depth	Casing	Caved
Boring	Foreman: T. Connelly		Enco	untere	ed	7/	26	7.0'		
Drilling	Method: Mud Rotary		Start	of Da	v	7/	27	5.0'		
Drilling	Equipment: CME-550	-			,					
Schnab	el Representative: K. Bell									
Dates	Started: 7/26/06 Finished: 7/27/06									
Locatio	n: Northing: 216556.31 ft Easting: 961517.19 ft									
Ground	Surface Elevation: 81.5 (feet)				1					
DEPTH (FT)	STRATA DESCRIPTION	CLASS	ELEV. (FT)	WL	DEP	SА 	MPLING DATA	TEST	S F	REMARKS
0.5	ROOTMAT AND TOPSOIL.		81.0				woh+woh+2			
	 POORLY GRADED SAND WITH SILT, fine to medium grained, moist, yellowish brown, trace gravel. 	5r-3M			F		N =2 REC =11"			
	yellowish brown and orangeish brown, trace root fragments.				-	-	2+2+2 N =4	w=6.8	%	
	-				- -		REC =15"			
5.6		80	75.9		- 5 -	M	3+3+3 N =6			
	grained, wet, orangeish brown and reddish brown, trace root fragments,	50		⊥			REC =18"			
7.5	SANDY LEAN CLAY, wet, orangeish	CL	74.0		-	-	1+2+1 N =3	w=27.4 *	1%	
					-		REC =12"			
-	orangeish brown and gray				-10-		1+1+1		star rota	rt of mud ary drilling
	-				-	Ň	N =2 REC =16"			
13.0	FAT CLAY, moist, gray, trace sand.	СН	68.5		-		01010	w=31.0)%	
5 - -	-				- 15-		N =5 REC =18"	*		
	-									
	-				F					
	-				F	$\left \right $				
18.5	ORGANIC CLAY, moist, gray	ОН	63.0		F	-M	1+2+3 N =5			
							REC =18"			
					20					
	1				F	1				
	-				F	+				
	-				F					
					L		REC =16"	w=37.9	9%	
								LL=6 PL=1	9	
	continued on next page				-25-					

	TEST Project: C	er Plant	Boring Number:	B-411			
Schnal	bel Engineering LOG	Calvert Cou	nty, Ma	iryland		Contract Number: 00 Sheet: 2 of 5	6120048
DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL		IG TESTS	REMARKS
		ОН				PP=3.50 tsf	
-							
27.0 -	ELASTIC SILT, moist, gray, trace sand.	MH	54.5				
-					 ∏ 3+4+6		
-					N =10 REC =	18"	
32.0 -			49.5				
	SANDY SILT, moist, gray.	ML	40.0				
-					4+5+6	w=24.4%	
_					-35-	18"	
-							
37.0 -	CLAYEY SAND fine to medium	SC	44.5				
-	grained, wet, reddish brown and orangeish brown, contains fine to						
-	medium shell fragments, 10-20%, weak cementation,HCI reaction moderate.				– – – 10+12- N =26	+14	
					40 /_ REC =	13"	
-							
42.0 -	SILTY SAND, fine grained, moist,	SM	39.5				
-	yellowish brown and orangeish gray.				 ∏ 21+50	w=24.0%	
-					N =50	12"	
					-45-		
- 6/08							
- ABEL.C					50/5"		
sch					50 REC =	4"	
- 10.6PJ							
52.0 -	SANDY LEAN CLAY moist grav	CI	29.5				
					– – – 11+6+2 N =29	23 w=25.2% LL=44	
					55 [] REC =	18" PL=1/ *	
- 00							Harder drilling
ש 19 19 19 19 19 19 19 19 19 19 19 19 19	SILTY SAND, fine to medium grained,	SM	24.5				
	wet, light gray, with line to coarse snell continued on next page						
≝∟							

Comments: 1. Boring backfilled with cement/bentonite grout through tremie pipe upon completion. 2. * = See Appendix I for additional lab testing data.

	TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant		Boring Number:	B-411
Schnal	bel Engineering LOG	С	alvert Cou	nty, Ma	ryland			Contract Number: Sheet: 3 of 5	06120048
DEPTH (FT)	fragments, 50-60%, HCl reaction strong.		CLASS.	ELEV. (FT)	WL	S DEPTH		G TESTS	REMARKS
-	fragments, 50-60%, HCI read strong.	ction	SM			60-	28+6+13 N =19 REC =18	8"	
62.0 -	POORLY GRADED SAND W fine to medium grained, wet, white, contains fine to coarse fragments, 30-40%, HCI reac	/ITH SILT, gray and shell tion strong.	SP-SM	19.5			6+4+5 N =9 REC =18	w=34.4% *	
-	contains fine to coarse shell f 10-20%, HCl reaction modera	fragments, ate.				 70	6+5+7 N =12 REC =18	8"	
-	trace fine to medium shell fra 2-5%, HCl reaction weak	gments,				 75	5+4+6 N =10 REC =18	w=32.0% 8"	
UBEL.GDT 3/6/08						 	3+3+3 N =6 REC =18	8"	
06 SPT 300 & 400.GPJ SCHNA	gray and white, contains fine shell fragments, 40-50%, wea cementation, HCI reaction str	to coarse ak rong				 85	6+7+7 N =14 REC =18	w=36.4% 8"	
- 0.78 FL - 0.78	SILTY SAND, fine to medium wet, gray and white, contains coarse shell fragments, 20-30 reaction strong.	grained, fine to 0%, HCl	SM	-5.6		 90-	7+9+11 N =20 REC =18	8"	resumed drilling at 7/27/06 @ 7:45am
L LEST BOI	continued on next pag	ge							

	-	hnabal	TEST	Project: C	Calvert Cliffs Nuclear Power Plant Calvert County, Maryland				Boring Number: B-4		B-411	
Sch	inat		BORING	C	alvert Cou	nty, Ma	iryland			Contra	act Number: 0	6120048
DEP	гы	i Ligineenig	200						SAMPI	ING		
(FT)	STRATA	DESCRIPT	ION	CLASS.	(FT)	WL	DEPTH	1	DATA	TESTS	REMARKS
					SM							
92.0) +	SANDY SILT, we	et, greenish g	gray, trace	ML	-10.6						
	-	fine to coarse she HCI reaction wea	ell fragments	, 5-10%,								
	_								11+1	0+15	w=31.6%	
	_							_95_		5 =18"		
								[]				
	-							- 1				
	-							-				
	-							1	∬ 5+5+ N =1	-6 1		
	_							-100-1		=18"		
	_											
	-									10	w=38.2%	
	-								N =1	6	LL=43	
	-							-105-		=18"	PL=30 *	
	-											
	_											
	_											
									7 7+7+	-9		
								$\begin{bmatrix} & & \\ & & \end{bmatrix}$	N =1	6 =18"		
	_							-110		10		
	-											
	-	wet. areenish ara	av. trace fine	to medium								
3/6/08	-	shell fragments, 2	2-5%, HCI r	eaction								
GDT	_	weak.						L _1	7 5+8+	-11	w=40.4%	
ABEL.	_							-115-		9 =18"		
CHN												
S L d												
400.0	-							- 1				
300 &	-							╞╶╶┤	_			
SPT	-	contains fine to c 20-30%, HCI rea	oarse shell f action strona	ragments,				$\vdash \dashv$	6+84 N =2	-16 4		
PLOG	_	-,	3					-120-		=18"		
0048	_											
122 (, ↓					-40 6						
		ELASTIC SILT, v trace fine to med	vet, greenish ium shell fra	i gray, gments,	MH							
DRING		2-5%, HCI reacti	on weak	- '					3+64	-10	w=42.7%	
ST BC	-	continue	ed on next pag	e				F 1'		10		
μ												

	TEST Project: Calvert Cliffs Nuclear Power Plant Calvert County, Maryland Calvert County, Maryland								Boring	Number:	B-411	
	maper	BORING	C	alvert Cou	nty, Ma	ryland				Contra	ct Number: 0	6120048
Schnal	bei Engineering	200						_		Sneet:	5015	
DEPTH	STRAT	A DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	DEDT	ъ ч		G TA	TESTS	REMARKS
				МН			DEFI	M	N =16	IA	LL=63	
							-125-	Ш	REC =1	8"	PL=43 *	
_												
-									51710			
-								X	N =16			
							-130-		REC =1	8"		
_												
								М	5+7+7			
							[]	X	N =14 RFC =1	8"		
							-135-			•		
-												
								M	4+6+6			
_							-140	М	REC =1	8"		
-												
-												
								_				
								M	5+6+8 N =14			
							145	Ш	REC =1	8"		
- /9/08												
- INN									6+7+9			
ที่ - วิไ								X	N =15	0.1		
150.0	BOTTOM OF B	ORING @ 15	0.0 FT.		-68.6		-150-		REC =1	8		
8 00												
201												
048 L												
07100												
EX												

Schnab	TEST Project: bill BORING bill Engineering LOG	Calvert Clif Calvert Cou	fs Nucle unty, Ma	ar Pov ryland	ver Pla	nt	Borir Cont Shee	ig Number: ract Numbe t: 1 of 4	er: 06120	B-412
Boring C	ontractor: CONNELLY AND ASSOCIATE	S, INC.				Gro	oundwater Ob	servations		
	FREDERICK, MARYLAND	·				D	ate Time	Depth	Casing	Caved
Boring Fo	oreman: T. Chew		Enco	untere	d	8	3/7	13.5'		
Drilling N	lethod: Mud Rotary		24	hours		8	./8	6.5'		
Drilling E	quipment: Diedrich D-50 (ATC)							0.0		
Schnabe	I Representative: B. Bradfield									
Dates S	Started: 8/7/06 Finished: 8/8/06									
Location	: Northing: 216589.24 ft Easting: 961495.42 ft									
Ground S	Surface Elevation: 92.2 (feet)	_	1		1					
DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL	DEP	S/ ′тн ∣	AMPLING DATA	TEST	s i	REMARKS
	Silt with sand, PROBABLE FILL, moist, brown, contains root fragments.	FILL			-	-	3+6+6 N =12 REC =18"		Dri HS	lled 4 1/4" A to 13.5'
2.0 -			90.2		F					
	Silty sand PROBABLE FILL, fine to coarse grained, moist, reddish brown,	FILL			L		4+3+3			
	contains root fragments, trace gravel.				F		N =6			
45			87 7		F		REC - 10			
	POORLY GRADED SAND WITH SILT,	SP-SM	07.7		- 5 -		1+1+8			
_	brown and brown.			_	L		N =12			
				Ţ			REC =18"			
_	fine to medium grained, light yellowish				F					
-	brown and brownish white, some slight iron stained bands <1/4" thick.				-	HM	5+11+10 N =21			
-					+	14	REC =18"			
10.0 -			82.2							
10.0	SILTY SAND, fine to coarse grained,	SM	02.2				8+10+10			
-	reddish brown, trace cemented sand,				F	IXII	N =20			
-	moderate cementation, some iron stained bands ~1.5" thick.				-	-121	REC =18"			
13.0 +			79.2		F					
'	POORLY GRADED SAND WITH SILT, fine to coarse grained. wet. light gravish	SP-SM		⊥⊻			4+6+8			
1	brown and dark reddish brown, with				Γ		N =14		15	- Begin mud
	cementation, limonitic cemented bands				-15-	- Ľ-	REC =18"		rot 15/	ary with 2 16" tri-cone
-	up to 2" thick.				\vdash				roll	er bit
17.0 -			75 2		L					
	SILTY SAND, fine grained, wet, light vellowish brown and mottled grav	SM	10.2							
-	limonitic cemented bands up to 2" thick.				F	1_				
-					+	- \/	1+1+1 N =2			
_					-20-	ЦШ	REC =18"			
					L					
22.0 -	SANDY LEAN CLAY, fine, moist, dark	CL	70.2		F	+				
	gray, contains mica.				-	-				
					L		1+2+3			
							N =5 REC =18"			
	continued on next page				-25-	- 12	NEC - 10			
	, .									

3		TEST	Project: C	Calvert Cliffs Nuclear Power Plant Calvert County, Maryland					Boring Number: B-4		
-	Schnal	bel Engineering LOG		Calvert Cou	inty, Ma	iryland			Contract Numb Sheet: 2 of 4	er: 06120048	
DE (EPTH (FT)	STRATA DESCRIP	ΓΙΟΝ	CLASS.	ELEV. (FT)	WL	S		G TEST	S REMARKS	
				CL			DEPTH	DA			
	-										
	-	with sand, gray.									
	-							2+2+3			
	-							N =5 REC =1	8"		
3	20 -				60.2						
		FAT CLAY with sand, moist, contains mica.	gray,	СН	00.2						
	_						17	2+4+3		33.5'- Start of day 8/8/06	
							<u>35</u>	REC =1	8"		
	-										
3	87.0 -	LEAN CLAY with sand, mois	it, gray,	CL	55.2						
	-	contains mica.									
	-						$- \parallel X$	N =9	8"		
							-40				
	-				50.2						
	-	SANDY FAT CLAY, fine to n moist, gray, contains mica.	nedium,	CH	00.2						
	-						17	5+7+9 N =16			
							-45-	REC =1	8"		
_	-										
3/6/08	-	trace cemented sand, weak									
EL.GD	-	cementation.						1 5.5.40			
4 AB	-		arained	SM	42.7			N =21	8"		
GPJ S		wet, dark reddish brown and white, with limonitic cemente	grayish d sand,				50	, , , , , , , , , , , , , , , , , , , ,		51'- Driller	
08 400. 5	520 -	moderate cementation, impr fragments, highly oxidized zo	ints of shell one.		40.2					drilling	
SPT 30(POORLY GRADED SAND V fine to medium grained, wet,	VITH SILT, light	SP-SM							
PLOG	_	grayish white.						19+22+5 N =72	50	54.5'- Some	
120048							-55-	REC =1	2"	staining in sample	
DG 06	-									• -	
SING LI	-	light gray and mottled orange	eish brown.								
EST BO	-	continued on next pa	ge								
= 1											

ſ	6	TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant		Boring Number: E		
	Schnat	BORING	C	alvert Cou	nty, Ma	ryland			Contract Numbe	r: 061	20048
┢	DEDTH						s		3 1100 1		
	(FT)	STRATA DESCRIPT	ION	CLASS.	(FT)	WL	DEPTH			5	REMARKS
f				SP-SM							
	-							50/5" N =50/5'			
	_						-60-	REC =5'	1		
	_										
	_										
		light brown.									
	_										
	-							N =50/5"			
							65	REC =2'			
	-										
	67.0 -				25.2						
		CLAYEY SAND, fine to media grained, wet, gray and brown	um ish white,	SC							
		20-30% fine to coarse shell find trace cemented sand, moder	agments, ate HCl					24+11+1	11		
	_	reaction, moderate cementat	on.				F 1 X	N =22	0"		
	_						-70-1		D		
	-										
	_	aray and aravish white 10-20	1% fine to								
	_	medium shell fragments, mo	lerate HCI								
	_	decomposed shell fragments	- -				L JM	6+6+10			
							_r Ň	N =16 REC =18	8"		
	-										
	_	10-20% fine to coarse shell fr	agments,								
	-	strong HCI reaction, HCI reac localized to decomposed she	tion II								
	-	fragments.					10	9+9+10			
6/08							L_80_	REC =14	4"		
DT 3											
SEL.G											
HNAE	_	dark gray, 10-20% fine to me	dium shell								
J SC	-	reaction localized to decompo	osed shell				$ \mid \mid_{\square} $				
00.GF	-	fragments.					F - HM	7+9+15 N =24			
<u> 0 8 4</u>							85 []	REC =18	8"		
SPT 3(_										
00.5											
)48 PI		weak HCl reaction, <5% fine fragments, HCl reaction local	shell ized to								
6120(-	decomposed shell fragments						5+4+6			
00 0	_						F - X	N =10			
ING L	_						<u> </u> _90_ ∐	REC =18	8"		
BOR	-	continued on peyt page	ie.								
TEST		commued on next pag									
	hnabol TEST	Project:	Calvert Cliff	s Nucle	ar Pow	er Plant		Boring Number:	B-412		
---------------	--	--	---------------	---------------	--------	----------------	-------------------------------------	----------------	---------		
Schnat	bel Engineering LOG	Calvert Cou	inty, Ma	ryland			Contract Number: 0 Sheet: 4 of 4	6120048			
DEPTH (FT)	STRATA DESCRIP	ΓΙΟΝ	CLASS.	ELEV. (FT)	WL	DEPTH	SAMPLIN	G TESTS	REMARKS		
			SC								
	dark gray and brownish white fine to coarse shell fragment HCI reaction, HCI reaction lo decomposed shell fragments	e, 30-40% s, strong calized to s.				 95	4+9+18 N =27 REC =1	8"			
-	light gray and brownish white fine to coarse shell fragment cemented sand, strong HCI r	e, 40-50% s, with reaction,									
98.9	BOTTOM OF BORING @ 98	3.9 FT.		-6.7			≤ 50/5" N =50/5				
		.9 - 1.					REC =4	n			

	Schnat	hnabel BORING bel Engineering	Project: C	Calvert Cli Calvert Co	iffs Nucle ounty, Ma	ar Pow Iryland	ver Pla	nt	Boring Contra Sheet	g Number: act Numbe : 1 of 5	er: 061200	B-413
	Boring C		NG					Ground	water Obs	ervations		
	bornig C	MALAGA, NEW JE	ERSEY					Date	Time	Depth	Casing	Caved
	Boring F	oreman: J. Evans			Start	t of day	y	5/15		20.0'		
	Drilling N	Method: Mud Rotary			Water	Readi	ng	5/16		84.6'		
	Schnabe	Representative: R Vinzant	()									
	Dates S	Started: 5/12/06 Finished:	5/15/06	-								
	Location	: Northing: 216994.88 ft Easting: 961413.25 ft										
	Ground S	Surface Elevation: 122.9 (feet)										
	DEPTH (FT)	STRATA DESCRIPT	ION	CLASS	6. ELEV. (FT)	WL	DEP	SAMP	LING DATA	TEST	S F	REMARKS
F	0.4	Forest litter, root mat and top	soil.		122.5			4+6	+8			
	-	POORLY GRADED SAND W medium to coarse grained, m orangeish brown.	/ITH SILT, loist, light	5P-510	1		-		14 C =18"			
	_						-	5+4 N =	+6 10 2 =18"			
	_											
	_	light orangeish gray.					- 5 -	4+6 N =	+7 3 > -14"			
	_						_		, - 14			
	-	light orangeish brown.					-	4+5	+7 12	w=9.7	%	
	-						-		2=16"			
							-10-					
	-	light reddish brown.					-	- X 3+4 N =9	+5 9			
	-						-		2 =14"			
。	_						-					
0/0/0	-	light orangeish brown.					-	3+2 N =	+3			
							-15-		,=12"			
	_						F	1				
	-						-	1				
9.00t x	-						F		+6	w=12 9	%	
2000	-						F		12 15"	*		
200							-20-		, - 15			
40 LL	-						F	1				
01200	-						F	1				
200	-						F		0.44			
PNIN	-	3" layer of darker strata.					F	9+1	0+14 24 2-40"			
	_	continued on next pag	ge				-25-		;=16"			

	chnabel TEST BORING			Project: C	Calvert Cliffs Nuclear Power Plant Calvert County Mandand Boring Number: B-4					B-413		
	-			C	alvert Cou	nty, Ma	ryland			Contra	ct Number: 06	6120048
5	cnnac	bei Engineering	LUG							Sneet:	2 01 5	
	РТН •Т)	STRATA	DESCRIPT	ION	CLASS.	ELEV. (FT)	WL			G TA	TESTS	REMARKS
					SP-SM			DEPTH		IA		
	-											
	_											
									0+12+1	6		
	-							F 1 X	N =28			
								-30-1	REC =1	5"		
	-											
	_											
		orangeish brown							10+12+	14	w=8.6%	
	-	orangelon brown.						F 1 X	N =26	7"	*	
								-35-	REC = I	'		
	-							-				
	_											
	_											
		wet. light orangeis	sh arav.						16+18+	18		
			5 - 7					r ik	N =36	6"		
	_							-40-		0		
	-											
	-											
	_											
		moist, light orange	eish brown.					L JV	7+14+1	6		
	_								N =30 REC =1	6"		
4	o.0 —	SILTY SAND, fine	to medium	grained,	SM	//.9		-45	-	-		
α	-	clay.	e, moules of	white								
3/0/0	-											
en	_											
ABEL	_								3+2+2		w=26.9%	
NH NH NH									N =4 REC =1	8"	PL=NP	
, LTE												
400.0	-											
200 8	-											
	,							├ ┤				
	5.5	SANDY ELASTIC	SILT, mois	t, oliveish	MH	69.4		∏	2+3+3		w=25.7%	
00481	_	yray.						L_55_	REC =1	8"	PL=27	
121.00												
LOG LOG	1							1				
PNIN	-											
	-	continued	d on next pao	e								
			5									

	50	hnabel		Project: C	alvert Cliff	s Nucle	ar Pow	Boring Number: B-413 Contract Number: 06120048				
	Schna	bel Engineering	LOG			nty, wa	liyianu			Contra Sheet:	ct Number: 00 3 of 5	6120048
D	EPTH (FT)	STRAT	A DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	S DEPTH		IG TA	TESTS	REMARKS
	-	with sand, fine t moist, oliveish g	o medium gra ray,	ained,	MH				2+4+4 N =8 REC =	18"	w=27.5% LL=58 PL=29 *	
	-	-										
	-	-										
	-	-						65				
	-							 	4+5+7 N =12		PP=1.50 tsf	
-	70.0 —	FAT CLAY, mois	st, gray		СН	52.9			REC =	18"		
	-	-							REC =2	24"	w=35.5% LL=51 PL=15	
	75.0 — -	SILTY SAND, fir moist, greenish	ne to medium gray, contain	grained, s mica.	SM	47.9		75 - 			PP=4.25 tsf *	
3/6/08	-	-						 80	4+4+1(N =14 REC =) 18"	w=26.1% *	
CHNABEL.GD1	81.0 - -	POORLY GRAD fine to medium g orangeish browr	ED SAND W grained, mois n.	ITH SILT, t, dark	SP-SM	41.9						
300 & 400.GPJ S	-	-						 ×	25+50/ N =50/3 REC =	3" 3" 10"	w=21%	
1048 PLOG SP1	-											
AING LOG 0612	-	light greenish gr color.	ay, mottles o	forange				¤	¹ 50/3" N =50/3 REC =4	3" 4"		
ESI BUI	-	continu	ed on next pag	e								

	TEST BORING Project: Calvert Cliffs Nuclear Power Plant Boring Number: B-413 Contract Number: 06120048										
	Schnal	bel Engineering LOG	Calvert Cou	inty, Ma	iryland		Contract Number: 0 Sheet: 4 of 5	06120048			
D	EPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL	SAMPLI DEPTH D	ING TESTS	REMARKS			
	-	greenish gray, trace fine gravel, orang	SP-SM			 ⊠ <u>50/3"</u>					
ę	95.0 — - -	SILTY SAND, fine to medium grained, moist, greenish gray, trace shell fragments, moderate HCI reaction.	, SM	27.9		REC :	-4"				
	-						+50/5" w=34.9% /11" =17"				
	-	25% shell fragments, and cemented sand, weak HCl reaction.				 ⊠ 50/5" N =50)/5" _=="	Resumed on 5/15/06 8:30am			
1()5.0 — - -	POORLY GRADED SAND WITH SILT fine to medium grained, greenish gray moderate HCI reaction, 25% shell fragments, layers of flat shells.	r, SP-SM	17.9			=5"				
	-						2+18 w=24.8% =18"				
1 1	- - 13.5 -	SILTY SAND, fine to medium grained, light gray, strong HCl reaction, 50% shell fragments.	, SM	9.4		 N =22 REC =	13 w=26.3% =18"				
120040 FLOG SF1 300 & 400.GFJ 3	-					 120 	9 w=32.5% =18"				
	-	continued on next page				 N 3+7+9	9 w=35.1%				

Γ	6	Chnabel TEST BORING Project: Calvert Cliffs Nucle Calvert County. Ma						Nuclear Power Plant Boring Number: B-4				B-413
	Schnat		BORING	C	alvert Cou	nty, Ma	ryland			Contra	act Number: 0	6120048
┢	DEDTU	ber Engineering	200						SAMDI	ING		
	(FT)	STRATA	DESCRIPT	ION	CLASS.	(FT)	WL	DEPTH	[TESTS	REMARKS
F					SM				N =1	6 40"	*	
								-125-	REC	=18"		
	_							-				
	-											
	-											
	_								15+4	3+23	w=18.7%	
								120	N =6	6 =18"		
	-	15% shell fragme	ents.									
	-											
	-								_		04.00%	
	-							- +	28+2 N =6	7+34 1	w=24.8%	
	_	5% shell fraqme	nts moderat					-135-	REC	=18"		
	_	reaction, one laye	er of flat she	lls.								
	_											
	_											
									7 11+1	2+16	w=27.5%	
								$\begin{bmatrix} & & \\ & & & \end{bmatrix}$	N =2	3 =8"	*	
								-140		0		
	_											
	_	weak HCI reaction	on.									
	-											
	_							10	12+1 N =3	8+19 7	w=32.1%	
	_							-145-	REC	=18"		
(6/08	_											
DT 3	_											
BEL.G												
ANHO									7 8+13	+22	w=39.8%	
PJ SC	-							$ \rangle$	N =3	5 –19"	*	
400.G	150.0 —	BOTTOM OF BO	RING @ 15	0.0 FT.		-27.1		-150-		-10		
300 &												
SPT												
PLOG												
0048												
0612												
5 LOG												
ORING												
EST B												
≓L					1							

	Schnab	hnabel TEST BORING Del Engineering LOG	Project:	Calvert Calvert	Cliff Cou	s Nucle inty, Ma	ar Pow ryland	ver Plai	nt		Boring Contra Sheet:	Number: oct Number 1 of 4	er: 06120	B-414
в	oring C	ontractor: UNI-TECH DRILLI	NG						Gr	oundv	vater Obs	ervations		
		MALAGA, NEW JE	ERSEY						D	ate	Time	Depth	Casing	Caved
B	oring Fo rilling N	oreman: J. Evans lethod: Mud Rotary				Enco	untere	d	5	/11		13.5'		
D	rilling E	equipment: Failing-1500 (Truck	<)											
s	chnabe	I Representative: R. Vinzant												
D	ates S	Started: 5/11/06 Finished:	5/11/06											
-	ocation	: Northing: 216630.18 ft Easting: 961354.48 ft												
G	round S	Surface Elevation: 121.2 (feet)				1								
	EPTH (FT)	STRATA DESCRIPT	ION	CLA	SS.	ELEV. (FT)	WL	DEP	S. TH	AMPL	ING DATA	TEST	s i	REMARKS
	_	POORLY GRADED SAND W fine to coarse grained, moist, brown, with root fragments a matter.	/ITH SILT, orangeish nd organic	SP-S	SM				-	3+5+ N =1 ⁻ REC	6 =15"			
	_	light orangeish brown.								3+5+ N =12 REC	7 2 =14"			
	_	fine to medium grained, light orange.	reddish					- 5 -	-	5+7+ N =16 REC	9 6 =18"			
	-	fine to coarse grained.								6+8+ N =2(REC	12) =17"	w=4.2'	%	
	-									6+7+) N =1 REC	8 5 =16"			
	-	wet, light orangeish brown.					Ţ			5+9+ N =16 REC	7 5 =15"			
	_								-					
	-							- · · - · ·		6+7+ N =17 REC	10 7 =13"	w=9.2°	%	
	-							- ·						
24	1							F .	1					
	-								- M	13+1 N = 20	7+19			
		continued on next pag	ge					-25-		REC) =17"			

	hnabol TEST	Calvert Cliff	s Nucle	ar Pow	ver Plant	Bor	Boring Number: B-414		
Schnal	bel Engineering LOG		Calvert Cou	nty, Ma	ryland		Cor	ntract Number: 00	6120048
DEPTH (FT)	STRATA DESCRIP	ΓΙΟΝ	CLASS.	ELEV. (FT)	WL	SA DEPTH	AMPLING DATA	TESTS	REMARKS
			SP-SM						
27.0 -	POORLY GRADED SAND, t coarse grained, wet, grayish trace silt and white clay.	ine to brown,	SP	94.2			5+6+14		
29.5	POORLY GRADED SAND V		SP-SM	91.7			N =20 REC =15"		
_	fine to coarse grained, wet, o brown.	brangeish							
_							44 - 40 - 44	w=9.7%	
_							N =26 REC =18"	*	
_									
-							10+13+17 N =30		
-						40 <u>()</u> 	REC =14"		
42.0 -	SILTY SAND, fine to mediur moist, orange.	n grained,	SM	79.2					
-							2+3+2 N =5 REC =18"	w=20.6% LL=NP PL=NP *	
	light orange, mottles of white	e clay.				 M	2+1+1 N =2	w=27.7% LL=NP	
						— <u>50</u> —[]	REC =18"	PL=NP *	
53.5 -	SANDY LEAN CLAY, moist, gray, with fine sand.	greenish	CL	67.7			2+3+3 N =6 REC =18"	w=28.0% LL=42 PL=23 *	
						$\left - \right $			
57.0 -	FAT CLAY, moist, greenish	gray, with	СН	64.2		$\left - \right $			
	tine sand continued on next pa	ge							

Comments: 1. Boring backfilled with cement/bentonite grout through tremie pipe upon completion. 2. * = See Appendix I for additional lab testing data.

ſ		bnabal	TEST	Project:	Calvert Cliff	s Nuclear Power Plant Boring Number: B-4						B-414	
	Cabina		BORING		Calvert Cou	nty, Ma	iryland				Contra	ct Number: 06	6120048
┢	Schha	bei Engineering	200						~		Sneet:	3 01 4	
	DEPTH (FT)	STRATA	DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	DEDT	5A			TESTS	REMARKS
┢					СН	. ,		DEPTR	1	REC =24	A "	w=33.2%	
	-											LL=58 PL=19	
								60				PP=3.25 tsf	
	-												
	-												
	-												
	_								7	3+5+6		w=38.3%	
									XII	N =11	2"	*	
								-65-1	_		,	PP=2.50 tsf	
	-												
	-												
	_												
										REC =24	t"	w=36.7% LL=51	
	-											PL=15	
								-70-				*	
	-												
	720 -					49.2							
	72.0	SANDY LEAN C	LAY, moist, ថ្ ៅ	greenish	CL	40.2							
	-	gray, mo gramo.										w=22.0%	
	-								XII	4+6+9 N =15		LL=39	
	_							-75-	12	REC =18	3"	PL=20 PP=2.75 tsf	
	_											*	
	77.0					44.0							
	//.0 -	SANDY SILT, gr	eenish gray,	with	ML	44.2							
	-	black organic matter, 5	atter.	wh and								22 23/	
	-								\mathbb{N}	4+8+14 N =22		w=29.8% *	
/6/08								-80-	Δ	REC =18	3"		
DT 3	_												
EL.G	-							[]					
HNAB	82.0 -	SILTY SAND, fin	e to medium	grained,	SM	39.2							
Ś	-	wet, light greenis	sh gray.										
0.GP,	-							[42+50/4"		w=19.0%	
& 40(_	N =50/4" REC =10)"		
T 300								05					
C SP	-												
PLO	-												
0048	-												
0612	_	dark gray.								50/5"			
LOG										N =50/5" REC =5"			
SING								-90-		0			
BO	-	continue	ed on next pao	e				\vdash \dashv					
TES			5										

Schnal	hnabel bel Engineering	Project: C	alvert Cliff alvert Cou	s Nucle inty, Ma	ar Pow Iryland	er Plant		Boring Number: Contract Number: Sheet: 4 of 4	B-414 06120048
DEPTH (FT)	STRATA DESCRIPT	ΓΙΟΝ	CLASS.	ELEV. (FT)	WL	DEPTH		IG TESTS	REMARKS
95.0 —	SILTY GRAVEL, weak HCI r	eaction.	SM GM	26.2		 [2 95 	8+50/2' N =50/2 REC ={	w=20.1% * 3"	water loss from 93.5-95 ft, 1 bag quick gel
- - 100.0 —	BOTTOM OF BORING @ 10	0.0 FT.		- 21.2		 [2 100-	35+50/3 N =50/3 REC =7	3" w=13.5% 3" 10"	600 gal. water, 4 bag bentonite, still loosing water

Schna	TEST Project: C bel Engineering LOG C	Calvert Cli Calvert Co	iffs Nuclea ounty, Ma	ar Pow ryland	ver Pla	nt	Boring Contra Sheet:	Number: ct Number 1 of 4	e r: 06120	B-415
Boring	Contractor: CONNELLY AND ASSOCIATES	S. INC.				Gro	undwater Obs	ervations		
	FREDERICK, MARYLAND					Da	te Time	Depth	Casing	Caved
Boring F	oreman: D. Bender		Enco	untere	d	4/2	27	18.5'		
Drilling	Method: Mud Rotary									
Drilling	Equipment: CME-550X (ATV)	-								
Schnabe	el Representative: K. Megginson									
Dates	Started: 4/27/06 Finished: 4/28/06									
Locatior	n: Northing: 216480.9 ft Easting: 961264.2 ft									
Ground	Surface Elevation: 119.3 (feet)									
DEPTH (FT)	STRATA DESCRIPTION	CLASS	S. ELEV. (FT)	WL	DEP	SA TH	MPLING DATA	TEST	s I	REMARKS
-	Poorly graded sand FILL, fine to medium grained, contains lean clay layer, moist, brown.	FILL			_		3+2+5 N =7 REC =18"			
2.0 -	POORLY GRADED SAND WITH SILT, fine to medium grained, trace silt, moist, light brown.	SP-SM	1 117.3		_		4+3+4 N =7 REC =16"			
_	light brown and brown.				5 		3+4+4 N =8	w=3.6°	%	
-	light brown.				_	-M 5	REC =18"			
-	light brown and vellowish brown.				- 10-		N =9 REC =14"			
-			407.0		_		3+4+4 N =8 REC =17"			
12.0 -	POORLY GRADED SAND, fine to coarse grained, moist, light brown and orangeish brown, trace silt.	SP	- 107.3		_		1+4+6	w=2.5	%	
					- 15-		N =10 REC =17"	*		
_					_	$\left \right $			*Us	sed hollow
5 –	wet, contains lean clay pockets.			Ā			6+7+9 N =16 REC =15"		ste der *Sv 3-7	m augers to oth of 18.5 ft. witched to //8" O.D.
-					-20-				bit ft.	-cone roller below 18.5
22.0 -	POORLY GRADED SAND WITH SILT, fine to coarse grained, wet, yellowish brown.	SP-SM	97.3		- -					
	continued on next page				- 25-		o+6+8 N =14 REC =6"			

	TEST Project: Calvert Cliffs Nuclear Power Plant Innabel BORING Calvert County. Maryland							Boring Number: B-415		
Schoo	BORING	C	alvert Cou	nty, Ma	iryland			Contract Number: 0	6120048	
DEDTU						6				
(FT)	STRATA DESCRIPT	ION	CLASS.	ELEV. (FT)	WL			TESTS	REMARKS	
			SP-SM			DEPIN		A		
	orongoigh brown and vallowi	ah brown					5+7+0	w=13.5%		
-	trace gravel, contains clayey	sand				F -1 X	N =16	*		
	pockets.					-30-1	REC =9"			
-										
-										
	light brown						1+10+13			
-	light brown.					F -1 X	N =23			
						-35-1	REC =6"			
-										
-										
	light brown and brown, conta	ine clavov					4+0+13			
-	sand pockets.	IIIS Clayey				F - 1 X	N =22			
						-40-1	REC =8"			
42.0 -				77.3						
_	SILTY SAND, fine to medium gray, contains mica.	ı, wet, dark	SM	_						
							2+2+2	w=28.2%		
-						F 1 X	N =4	LL=26		
						-45	REC =15	PP=0.50 tsf		
-										
80 99 47.0 -				72.3						
	grained, wet, dark gray, conta	um ains mica.	SC							
BEL.(4+7+2			
	fine to second evolved heless	40 F 8				F 1 X	N =9	1"		
אר – גר	Tine to coarse grained below	49.5 II.				-50-1		•		
* 52.0 -				67.3						
- DE	trace sand, contains mica.	enish gray,								
000							2+3+3			
- 48 PL							N =6	2"		
						-55		,		
- 20										
ອງ 57.0 -	EAT OLAN maint light and an	high arou		62.3		-				
	trace sand, contains mica.	iisii gray,								
	continued on next pag	<i>je</i>								
- L			1							

6	TEST Project: C	alvert Cliff	s Nucle	ar Pow	ver Plant	Boring Number:	B-415
Schnat	bel Engineering LOG	alvert Cou	inty, Ma	ryland		Contract Number: 0 Sheet: 3 of 4	6120048
DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL	SAMPL DEPTH D	ING TESTS	REMARKS
-		СН			2+4+ N =9 REC	5 w=36.6% LL=61 PL=21 PP=1.50 tsf	
62.0 -	ELASTIC SILT, moist, light greenish gray and dark gray, trace sand, contains mica.	MH	57.3		 N =9 REC 	5 =18"	**Resumed drilling at 7:00 on 4/28/06.
67.0 -	FAT CLAY, moist, light greenish gray, trace sand.	СН	52.3		 	9 6 =18"	
72.0 -	SANDY SILT, fine to coarse, moist, gray, trace gravel, contains mica.	SM	47.3		 	B w=26.3% LL=40 PL=30 PP=2.00 tsf	
					 26+1(N =10 N =10 REC 	00 00 =11"	
	fine to coarse grained, wet, gray and greenish gray, contains shell fragments and lean clay lenses, strong HCl reaction.					2+31 w=17.0% 3 =14"	
	gray, contains clayey sand pockets.				⊠ 100 ⊠ 100 REC :	=6"	
	continued on next page						

SC	hnabel	TEST	Project: C	alvert Cliff	s Nucle	ar Pow	/er Plan	t	l	Boring I	Number:	B-415
Schnat	chnabel Engineering LOG				inty, ivia	iryianu				Contrac Sheet: 4	t Number: 06 1 of 4	6120048
DEPTH (FT)	STRAT	A DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	DEPT	S. TH		ο Δ	TESTS	REMARKS
				SM						<u> </u>		
92.0 - - - -	CLAYEY SAND wet, light gray, c and lean clay la reaction.	, fine to coars contains ceme yers, modera	e grained, ented sand, te HCI	SC	27.3		 95		100/3" N =100/3 REC =4"	3"		
07.0					22.3							
97.0 -	SILTY SAND, fir moist, light gray sand, and shell	ne to coarse o , contains cer fragments, st	grained, mented rong HCl	SM	22.3			M	100/0"			
90.7	BOTTOM OF B	ORING @ 98	.7 FT.						100/2" N =100/2 REC =2"	2"		

Schna	bel Engineering LOG	Calvert Clif Calvert Co	ffs Nucle unty, Ma	ar Pow ryland	ver Pla	nt	Boring Contra Sheet:	Number: ct Number 1 of 4	e r: 06120	B-416
Boring						Gro	undwater Obs	ervations		
	FREDERICK, MARYLAND	5, INC.				Da	te Time	Depth	Casing	Caved
Boring F	Foreman: T. Chew		Enco	untere	d	8/	3	58.5'		
Drining										
Drilling	Equipment: Diedrich D-50 (ATC)									
Schnabe	el Representative: B. Bradfield									
Dates	Started: 8/2/06 Finished: 8/3/06									
Locatior	n: Northing: 216084.5 ft Easting: 961596.34 ft									
Ground	Surface Elevation: 86.2 (feet)									
DEPTH (FT)	STRATA DESCRIPTION	CLASS	ELEV. (FT)	WL	DEP	SA TH	MPLING DATA	TEST	S F	REMARKS
-	SILTY SAND, fine to medium grained, moist, light brown, contains wood fragments.	SM			_		1+2+2 N =4 REC =13"		Dril 1/4	led with 4 HSA to 45'
-	Orangeish brown, trace gravel.				_		5+5+6 N =11 REC =18"			
4.5	POORLY GRADED SAND WITH SILT, fine to coarse grained, moist, light brown and orangeish brown, trace gravel.	SP-SM	- 81.7		- 5 - -		4+4+6 N =10 REC =16"	w=3.8	%	
-	Slight banding of colors 1/4-1/2" thick.				-		4+7+7 N =14 REC =17"			
-							5+6+6 N =12 REC =14"			
13.0 -	SILTY SAND, fine to medium grained, moist, light orangeish brown and gray, some iron staining visable.	SM	- 73.2		- - 15- -		4+4+4 N =8 REC =18"	w=13.0	%	
	Brown, colors are mottled.				- - 20-		2+1+1 N =2			
22.0 -	SANDY FAT CLAY, moist, dark gray and greenish gray, contains mica, some gray pockets of fine sand present <3/4".	СН	- 64.2		-		2+3+4 N =7			
	continued on next page				-25-	_ <u> </u> _ F	≺EC =18"			

Γ		TEST	Project: C	Calvert Cliffs Nuclear Power Plant					Boring Number: B-416		
	Schna	bel Engineering LOG	С	alvert Cou	nty, Ma	ryland		Con She	Contract Number: 06120048 Sheet: 2 of 4		
	DEPTH (FT)	STRATA DESCRIPTI	ION	CLASS.	ELEV. (FT)	WL	SA DEPTH	AMPLING DATA	TESTS	REMARKS	
		With sand, some clayey sand present <1/8".	lenses	СН			 <u>-</u>	4+4+7 N =11 REC =18"	w=33.7% LL=58 PL=17		
	32.0	LEAN CLAY with sand, moist, and greenish gray, contains m	, dark gray nica.	CL	54.2		 35-	3+4+4 N =8 REC =18"			
	37.0	FAT CLAY with sand, moist, c and greenish gray, contains m	lark gray nica.	СН	49.2		 40	3+4+6 N =10 REC =18"			
/6/08	42.0	CLAYEY SAND, fine to mediu grained, moist, greenish gray, mica, 1" pocket of gray clayey sample.	im , contains / sand in	SC	44.2		 - 45- 	3+4+7 N =11 REC =18"	w=25.6%	45'- Begin mud rotary with 2 15/16" tri-cone roller bit	
8 400.GPJ SCHNABEL.GDT 3	-	Moist, reddish brown and brow gray, with cemented sand, we cementation, impressions of s fragments, highly oxidized zor	wnish :ak :hell ne.		34.2		 	3+13+21 N =34 REC =18"			
JRING LOG 06120048 PLOG SPT 300	_	SILTY SAND, fine to medium moist, gray.	grained,	SM	01.2		 	22+33+50/3" N =83/9" REC =13"		55'- Start of day 8/3/06	
TEST B(continued on next page	e								

	-	TEST Project	: Calvert Cliff	s Nucle	ar Pow	er Plant	Bor	ing Number:	B-416	
Se	chnat	bel Engineering LOG	Calvert Cou	inty, Ma	iryland		Cor She	Contract Number: 06120048 Sheet: 3 of 4		
DEF	РТН	STRATA DESCRIPTION	CLASS	ELEV.	wi	S	AMPLING	TESTS	REMARKS	
(F	T)			(FT)		DEPTH	DATA			
		Wet, contains mica.	SM		<u> </u>	 60	41+35 +50/5.5" N =85/11.5" REC =16"	w=26.2%		
62	2.0 - - - -	SANDY LEAN CLAY with silt, moist, gray and brownish white, trace cemented sand, 0-10% fine to medium shell fragments, moderate HCI reactio moderate cementation, strong HCI reaction at decomposed shell fragments.	CL n,	24.2		 65 	49+50/3" N =50/3" REC =8"			
67	.0 -	CLAVEY SAND find to opprove grainer	4 80	19.2						
	-	 CLAYEY SAND, The to coarse grained wet, light gray and gray, trace cement sand, 10-20% fine to medium shell fragments, strong HCI reaction, moderate cementation, darker gray areas are similar to strata at 65'. Light gray, with cemented sand, 30-40 fine to coarse shell fragments, strong HCI reaction, strong cementation. 	%			 70	13+16+42 N =58 REC =16"			
72	- 0. - - -	POORLY GRADED SAND WITH CLA fine to medium grained, wet, gray and brownish white, 10-20% fine to coarse shell fragments, strong HCI reaction, HCI reaction localized to shell fragments.	Y, SP-SC	14.2		 75	6+8+10 N =18 REC =18"	w=29.5%		
L.GDT 3/6/08	-	20-30% fine to coarse shell fragments strong HCl reaction, HCl reaction localized to shell fragments.				 80-	6+8+9 N =17 REC =15"			
IG SPT 300 & 400.GPJ SCHNABE	- 0.0 - - -	CLAYEY SAND, fine to medium grained, wet, gray, 0-10% fine to coars shell fragments, moderate HCl reactio HCl reaction localized to shell fragments.	se n,	4.2		 85-	4+5+8 N =13 REC =16"			
BORING LOG 06120048 PLO	-	0-10% fine to medium shell fragments moderate HCI reaction, HCI reaction localized to shell fragments.	,			 	5+4+7 N =11 REC =18"	w=33.5%		
IESI		continued on next page								

	hnabol	Project:	Calvert Cliff	s Nucle	ar Pow	er Plant		Boring Number: B-416			
Schnal	bel Engineering	ORING LOG		Calvert Cou	nty, Ma	ryland			Contract Number: 06120048 Sheet: 4 of 4		
DEPTH (FT)	STRATA DI	ESCRIPT	ION	CLASS.	ELEV. (FT)	WL	S		G TESTS	REMARKS	
	Light gray and white coarse shell fragme sand, strong HCI rea cementation.	₂, 40-50% nts, with c action, str	fine to cemented ong	SC			 95 	24+17+1 N =32 REC =14	5 4"	93'- Harder drilling with rig chatter	
- 100.0 —	Light gray and brow fine to coarse shell f cemented sand, stro weak cementation. BOTTOM OF BORI	nish white fragments ong HCl re MG @ 100	e, 20-30% s, trace eaction, 0.0 FT.		-13.8		 100-	10+9+11 N =20			
- - -											

Schn	abel Engineering	Ivert Cliff Ivert Cou	rt Cliffs Nuclear Power Plant rt County, Maryland						Boring Number: Contract Number: 061200 Sheet: 1 of 4			
Boring	Contractor: CONNELLY AND A	SSOCIATES	INC.				Gro	oundv	vater Obs	ervations		
g	FREDERICK, MAR	YLAND					D	ate	Time	Depth	Casing	Caved
Boring	Foreman: T. Connelly			Enco	untere	d	7.	/24		10.8'		
Drilling	Method: Mud Rotary			Start	of Day	/	7	/25		7.0'		
Drilling	Equipment: CME-550					, 						
Schnal	bel Representative: K. Bell											
Dates	Started: 7/24/06 Finished: 7/	/25/06										
Locatio	n: Northing: 216435.75 ft Easting: 961901.11 ft											
Ground	Surface Elevation: 49.2 (feet)											
DEPTH (FT)	STRATA DESCRIPTI	ON	CLASS.	ELEV. (FT)	WL	DEP	S/ ТН ∣	AMPL C	ING DATA	TEST	s	REMARKS
0.5	ROOTMAT AND TOPSOIL.			48.7								
	SANDY LEAN CLAY, moist, b trace root fragments.	rown,	CL					2+2+ N =6 REC	4 =8"			
	trace wood fragments, iron sta	aining						5+5+	5			
		5				[IXI	N =10) =18"			
	-					- ·		RLC	-10			
	-					- 5 -		1+2+	3			
	_					Ļ .	-IXII	N =5	-7"			
70				42.2		L.		REC	-/			
7.0	 POORLY GRADED SAND wit to medium grained, moist, yell brown and orangeish brown, tu to coarse shell fragments, iron HCl reaction moderate. 	h silt, fine owish race fine n staining,	SP-SM	72.2		- ·		6+10 N =2 REC	+17 7 =16"		рс	ossible fill
10.0	SANDY I FAN CLAY moist h	rown and	CL	39.2		-10-		3171	16			
10.8	reddish brown, trace root fragr	ments.	SP-SM	38.4	Ţ	Ļ .	_IXII	N =2	3			
12.0	POORLY GRADED SAND wit to medium grained, wet, yellow brown and orangeish brown.	h silt, fine wish	SP-SC	37.2				REC	=18"		sta ro	art of mud tary drilling
	 POORLY GRADED SAND wit fine to medium grained, wet, g inch clay lenses throughout 	h clay, jray, 1/8th				- ·	10	6+6+ N =12 REC	6 <u>2</u> =11"			lan ahanna in
14.5	FAT CLAY, moist, gray, trace	sand.	СН	34.7							m	ud tub from
								2+2+ N =4	2		or br	angeish own to gray
								REC	=18"			
	1							4.0.	.			
	-					-	HXI	1+2+ N =4	2			
	-						-M	REC	=18"			
						-20-					ce	mented sand
	trace tine to coarse shell fragn 2-5%, HCl reaction weak	nents,						23+1 N =1	1+6 7		lei	nses
							12	REC	=18"		Ha	arder drilling
22.0	CLAYEY SAND, fine to mediu	m	SC	27.2		F .						5
	grained, wet, gray and greenis contains fine to coarse shell fr 30-40%, strong cementation,	sh gray, agments, HCl						14+3 N =76 REC	8+38 5 =18"			
24.5	reaction strong.		SM	24.7								
	continued on next page	•	Givi			25-						

	hnabol TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	Boring Number: B-4		B-417	
Schna	bel Engineering LOG	C	alvert Cou	nty, Ma	iryland		Contra Sheet	Contract Number: 06120048 Sheet: 2 of 4		
DEPTH				FI FV		SAMI	PLING			
(FT)	STRATA DESCRIPT	ION	CLASS.	(FT)	WL	DEPTH	DATA	TESTS	REMARKS	
-	SILTY SAND, fine to mediun wet, gray and greenish gray, fine to coarse shell fragment strong cementation, HCI read strong.	n grained, contains s, 30-40%, ction	SM				8+27 =35 :C =18" +5+6 =11 :C =18"			
30.0 -	CLAYEY SAND, fine to medi grained, wet, gray and white,	um contains	SC	19.2		30	4+4 =8			
-	fine to coarse shell fragment HCI reaction moderate. gray and white	s, 20-30%,				RE 4+3	C =18" 7+7			
-						N = RE	=14 EC =18"			
- 37.0				12.2		RE	10+9 =19 EC =16"		Rig chatter	
-	SIL I Y SAND, fine to mediun wet, gray and greenish gray, to medium shell fragments, 5 reaction weak.	trace fine 5-10%, HCI	SM				4+5 =9 EC =18"			
-						40	3+3 =6 5C =18"			
-						2+: RE	3+3 =6 :C =18"			
80/9/2 47.0 -		groonish	N4L	2.2		45	2+3 =5 :C =18"			
CHNABEL.GDT	gray, trace fine to medium sh fragments, 2-5%, HCl reacti	nell on weak.				2+: RE	3+4 =7 :C =18"			
- 52.0 - 08 400.09 400.09 400.09 400.09 400.09 400.09 400.09 400.09 400.09 400.09 400.09 400.09 400.09 400.09 400.09 40 09 52 52 52 52 50 50 50 50 50 50 50 50 50 50 50 50 50	greenish gray and white, con to coarse shell fragments, 40 strong cementation , HCI rea strong.	tains fine 0-50%, ction		-2.8			8+50/3" =58/9" EC =16"			
048 PLOG SPT 30	SILTY SAND, fine to medium wet, greenish gray and white fine to coarse shell fragment strong cementation, HCI read strong.	n grained, , contains s, 40-50%, ction	SM				10+44 =54 :C =18"			
NG LOG 06120							+14+20 =34 :C =18"		resumed drilling	
TEST BORIN	contains fine to coarse shell continued on next pag	fragments, ge				8+*	14+20		7:00am	

	TEST Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	Boring	Number:	B-417
Schnat	bel Engineering LOG	alvert Cou	inty, Ma	ryland		Contra Sheet:	oct Number: 00 3 of 4	6120048
DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL	SAN		TESTS	REMARKS
	10-20%, weak cementation , HCl reaction moderate	SM				=34 EC =16"		
						4 - 4 4 - 07		
-						=41 EC =18"		
62.0 -	SANDY SILT, wet, greenish gray,	ML	-12.8			+6+10		
-	10-20%, HCl reaction moderate.					=16 EC =18"		
_					-65-4-	+7+14		
-			4- 0			=21 EC =18"		
67.0 -	SILTY SAND, fine to medium grained, wet, greenish gray, contains fine to	SM	-17.8			+6+10		
-	coarse shell fragments, 10-20%, HCI reaction moderate.					=16 EC =18"		
70.0 —	SANDY SILT, wet, greenish gray,	ML	-20.8		-70-4-	+6+9 =15		
72.0 -	10-20%, HCl reaction moderate.		-22.8			EC =18"		
-	ELASTIC SILT, moist, blueish gray, trace sand, trace fine to medium shell fragments, 2-5%, HCl reaction weak.	MH				+7+10 =17		
-					(_) RI	EC =18"		
						+7+10 =17 EC =18"		
-						LC - 10		
-					– – – – – – – 64 N R	+6+8 =14 EC =18"		
79.5	SANDY SILT, moist, blueish gray, trace	ML	-30.3		-80-0 5	±7±10		
	HCl reaction weak.					=17 EC =18"		
					 <u>_</u> 5-	+6+8		
			05.0			=14 EC =18"		
τ δ4.5 Δ δ4.5 Δ δ4.5 Δ δ δ δ δ δ δ δ δ δ δ δ δ δ	SILTY SAND, fine to medium grained, moist, blueish gray, trace fine to medium shell fragments 2.5% LCL	SM	-35.3		-85-4-	+6+7		
	reaction weak.		-37.8			EC =18"		
	SANDY SILT, moist, blueish gray and white, contains fine to medium shell fragments, 10-20%, HCI reaction moderate.	ML	01.0			+7+14 =21 EC =18"		organic oder
	trace fine to medium shell fragments, 5-10%, HCI reaction weak continued on next page				N	+6+9 =15		

6	hnabel populo	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant		Boring	Number:	B-417
Schnat	Schnabel Engineering LOG		alvert Cou	nty, Ma	ryland			Contract Number: 06120048 Sheet: 4 of 4		
DEPTH (FT)	STRATA DESCRIPTI	ON	CLASS.	ELEV. (FT)	WL	S DEPTH		IG TA	TESTS	REMARKS
			ML				REC =	18"		
92.0 -	ELASTIC SILT, moist, greenis trace sand, trace fine to mediu fragments, 2-5%, HCI reaction	h gray, ım shell ı weak.	МН	-42.8			5+7+9 N =16 REC = ²	18"		
94.5	SANDY SILT, moist, greenish	gray,	ML	-45.3		05				
-	trace fine to medium shell frag 2-5%, HCl reaction weak.	ments,					5+6+9 N =15 REC =1	18"		
-							6+6+8 N =14 REC =1	18"		
						100				
							5+6+10)		
101.5		- -		-52.3		- 10	REC =	18"		
	BOTTOM OF BORING @ 101	.3 F I.								

Schna	bel Engineering LOG	Calvert Cliffs Nuclear Power Plant Calvert County, Maryland						Boring Number:D-41Contract Number:06120048Sheet:1 of 7			
Boring (Contractor: UNI-TECH DRILLING					Gro	oundwate	r Obs	ervations		
Joining C	MALAGA, NEW JERSEY					D	ate T	ime	Depth	Casin	g Caved
Boring F	Foreman: J. Blemings		Enco	untere	d	6/	/28		6.5'		
Drilling I	Method: Mud Rotary	-	Watar	Deedi		7			10.5'		
Drilling I	Equipment: CME-750 (ATV)		water	Readi	ng		/0		10.5		
Schnabe	el Representative: B. Bradfield										
Dates	Started: 6/28/06 Finished: 6/29/06										
ocation	n: Northing: 216340.25 ft										
	Easting: 961976.71 ft										
FPTH	Surface Elevation: 43.7 (feet)		FI EV			SA					
(FT)	STRATA DESCRIPTION	CLASS	(FT)	WL		тц ∣		^	TEST	S	REMARKS
0.3	TOPSOIL.		43.4			M	8+8+5	~			
-	POORLY GRADED SAND WITH SILT,	SP-SM			F	$\ \ $	N =13			1	.5'- Mud rota
2.0	fine to coarse grained, moist, brownish		44 7				REC =8"			w	ith 3 7/8" dra
2.0 -	fragments, weak limonitic cementation.	SC	41./		Ē		4.0.4		w=27 0	d 0	I
_	CLAYEY SAND, fine to coarse grained,				F	- \/	4+3+4 N =7		*	, /0	
_	moist, gray and orangeish brown.				F	121	REC =13	"			
4.5	SILTY SAND, fine to medium grained.	SM	39.2								
	wet, orangeish brown and reddish				- ⁵ -	M	6+7+8				
_	l biown.			∇	F	-1101	IN =15 REC =14	."			
7.0 -		014	36.7	-	F						
	gray.	SIM					5+4+3		w=30.9	9%	
_					Γ		N =7		LL=N PI =N	P P	
-	With sand.				F	-	REC =14		*		
	-				-10-	-					
						\square	3+2+3				
_					Γ		N =5				
-					F		REC = 18				
13.0 -			30.7		F	-					
	moist, gray, contains mica.	CL					4+4+5		w=32.7	%	
_							N =9		LL=4 PI =2	9	
					-15-		REC = 18		*	-	
_	-				F	-					
17.0			007								
17.0 -	POORLY GRADED SAND WITH SILT,	SP-SM	26.7		Γ	1					
-	fine to medium grained, wet, gray and brownish white 20-30% fine to coarse				F	-					
_	shell fragments, strong HCl reaction.				L		15+8+8				
						IŇ	N =16 REC =18				
	1				-20-	-[11]	110 - 10				
-	-				╞	+					
_					L						
_											
-	-				F	1_					
-	30-40% fine to coarse shell fragments,				F	-M	4+5+8 N =12		w=25.2	2%	
							N =13 REC =18				
	continued on next page				25-		-				
Obsorv	ts: ation Well OW-418B installed upon completion										
Devent	alon went over the instance upon completion	•									

	TEST Project:	Calvert Cliff	s Nucle	ar Pow	er Plant	Boring Number: B-418		
Schna	Schnabel Engineering LOG			aryland		Contract Number: 06120048 Sheet: 2 of 7		
DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL	SAMPL DEPTH D	ING TESTS	REMARKS	
_		SP-SM						
_								
-								
-	20-30% fine to coarse shell fragments,					10		
	strong hor reaction.					=14"		
-								
-								
-	10-20% fine to coarse shall fragments				 	w=28.4%		
-	strong HCl reaction.				N =12	* =15"		
-								
-								
-	Brownish, 0-10% fine to coarse shell fragments, weak HCl reaction.				N 1+1+2	2		
						=18"		
-								
42.0 -	CLAYEY SAND, fine to medium grained, wet, gray and brownish white,	SC	1.7					
_	30-40% fine to coarse shell fragments, strong HCI reaction.				3+8+	13 w=27.4%		
						=18"		
-								
- 3/6/08							47'- Grinding/ rig chatter	
- EL.GD]	White 20 40% fire to secret shall					2140		
- CHNAE	fragments, 40-50% cemented sand, strong HCI reaction, strong				N =31	=18"		
- GPJ S	cementation.							
⁸ 0 52.0 -			-8.3					
- SPT 30	fine to medium grained, wet, gray and brownish white, 10-20% fine to medium	, 3P-3C						
- 8 PLOG	shell fragments, moderate HCl reaction HCl reaction localized to shell	,			7+19- N =38	+19 w=23.3%		
10612004	nayments.				-55- <u> </u> REC :	=16"		
			10.0					
9 57.0 -	SANDY SILT with clay, fine to medium, moist, gray, 10-20% fine to medium	ML	-13.3					
TESTE	continued on next page							

	TEST Proj	ect: Calvert Cliff	s Nucle	ar Pow	er Plant	Boring	g Number:	B-418
Schnat	bel Engineering LOG	Calvert Cou	inty, Ma	iryland		Contr Sheet	act Number: 0 : 3 of 7	6120048
DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL	SA DEPTH	MPLING DATA	TESTS	REMARKS
	shell fragments, moderate HCI read HCI reaction limited to shell fragme	ction, ML nts.				5+10+5 N =15 REC =18"		
62.0 -	SILTY SAND, fine to medium grain moist, gray, 0-10% fine to medium fragments, weak HCI reaction, HCI reaction localized to shell fragment	ed, SM shell s.	18.3			6+9+14 N =23 REC =18"	w=32.1%	
67.0 -	SANDY LEAN CLAY with silt, fine t medium, moist, greenish gray, 10-2 fine to medium shell fragments, we HCI reaction, HCI reaction localized shell fragments.	o CL 20% ak 1 to	23.3		 	5+9+9 N =18 REC =18"		
72.0	CLAYEY SAND, fine to medium grained, wet, greenish gray, 0-10% to medium shell fragments, weak H reaction.	fine ICI	28.3		 75- 	6+8+15 N =23 REC =18"	w=41.7%	
	10-20% fine to medium shell fragm moderate HCI reaction	ents,			 80	5+6+8 N =14 REC =18"		
82.0 -	SILTY SAND, fine to medium grain moist, greenish gray, 10-20% fine t medium shell fragments, moderate reaction.	ed, SM o HCI	-38.3		 85 -	10+13+10 N =23 REC =18"		
87.0 -	SANDY ELASTIC SILT with clay, fi medium, moist, greenish gray, 10-2 fine to medium shell fragments, moderate HCI reaction.	ne to MH 20%	- 43.3		 90	4+8+9 N =17 REC =18"	w=49.8% LL=76 PL=49 *	
	continued on next page							

		TEST Project: (Calvert Cliff	s Nucle	ar Pow	er Plant	Boring Number:	B-418
	Schna	bel Engineering LOG	Calvert Cou	inty, Ma	iryland		Contract Number: 0	6120048
t,						SAMPL IN		
	(FT)	STRATA DESCRIPTION	CLASS.	(FT)	WL		TESTS	REMARKS
			MH					
	-	-						
	-							
		With sand, trace decayed organic				4+6+9		
		matter.				N =15	18"	
	_					-95		
	-	-						
	97.0	LEAN CLAY. fine to medium. moist.	CL	-53.3				
	-	greenish gray, 10-20% fine to medium						
						4+6+9	w=36.7%	
	_					N =15 REC =	18" PL=25	
							^	
	-							
	-	_						
		-						
		-						
	_					N = 16 REC =	18"	
	-							
1	07.0	SANDY ELASTIC SILT, fine to medium,	MH	-63.3				
	-	moist, greenish gray.						
	-	-				5+7+9	w=39.8% LL=55	
		-				REC =	18" PL=38	
	-							
	40.0							
80	12.0	FAT CLAY with sand, moist, greenish	СН	-68.3				
3/6/	-	gray.						
GD	-						0	
IABEI	_	-				-115-12 REC =	18"	
SCH		-						
GPJ	-							
& 400.								
300 8	-							
3 SPT	-	-				⊢ - \/ 5+8+1 N =19	1	
PLOC		-				-120- <u>/</u> REC =	18"	
20048								
0612	-							
LOG								
RING	-						o w=56.4%	
ST BO	-	continued on next page						

	test	Project:	Calvert Cliff	s Nucle	ar Pow	er Plant		Boring Number:	B-418
Schna	bel Engineering LOG		Calvert Cou	nty, Ma	ryland			Contract Number: 0 Sheet: 5 of 7	6120048
DEPTH (FT)	STRATA DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	S		G TESTS	REMARKS
	0-10% fine to medium shell f weak HCl reaction.	ragments,	СН			125	N =17 REC =18 8+11+12 N =23 REC =18	LL=106 B" PL=41 *	
135.0 -	ELASTIC SILT with sand, mo greenish gray, 0-10% fine to shell fragments, weak HCI re	oist, medium action.	МН	91.3		 - 135- 	8+8+11 N =19 REC =6'		
.						 140 	10+12+1 N =26 REC =18	14 w=64.4% LL=103 3" PL=63 *	140'- Start drilling on 6/29/06
145.0 -	FAT CLAY, moist, no shell fr	agments.	СН	101.3		 	4+7+9 N =16 REC =18	3"	
	CLAVEY SAND fine to medi	um	80	-108.3		 - 150 - 	5+8+8 N =16 REC =18	w=52.6% LL=69 B" PL=27 *	
	grained, moist, greenish gray fine to medium shell fragmer HCI reaction.	, 10-20% ts, weak				 55 	7+13+21 N =34 REC =14	4"	

Source BURING Calvert County, Maryland Contract Number: 06120048 DEPTH STRATA DESCRIPTION CLASS. ELEY. (FT) WL SAMPLING TESTS REMAY DEPTH STRATA DESCRIPTION CLASS. ELEY. (FT) WL SAMPLING TESTS REMAY SC SC Image: Source Strate S	Γ	6	hnabol TE	ST Project:	Calvert Cliff	s Nucle	ar Pow	er Plant	В	oring Number:	B-418
$\begin{array}{ c c c c c } \hline \hline DepTH & STRATA DESCRIPTION & CLASS. ELEY. WL & SAMPLING TESTS REMARKS (FT) & WL & SAMPLING TESTS (FT) &$		Schnat	BOR BOR	(ING) OG	Calvert Cou	inty, Ma	ryland		C	contract Number: 0	6120048
CFT) STRATA DESCRIPTION CLASS. CFT) WL DEPTH DATA TESTS REMAN 162.0	E	DEDTH				EI EV		SA			
SANDY ELASTIC SILT, fine to medium, moist, greenish gray. With sand. Fine to medium, moist, greenish gray. With sand, 0-10% fine to medium shell fragments, weak HCl reaction. With sand, 0-10% fine to medium shell fragments, weak HCl reaction. With sand, 0-10% fine to medium shell fragments, weak HCl reaction. Sample State St		(FT)	STRATA DESC	RIPTION	CLASS.	(FT)	WL	DEPTH	DATA	A TESTS	REMARKS
$ \begin{array}{c} 162.0 \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\ -$					SC						
$ \begin{array}{c} 162.0 \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\ -$		-									
162.0 SANDY ELASTIC SILT, fine to medium, MH MH +18.3		-						F -IMI	4+8+16 N =24		
$\begin{array}{c} 182.0 \\ \hline \\ SANDY ELASTIC SILT, fine to medium, \\ moist, greenish gray. \\ \hline \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ $								-160-12	REC =18'	•	
162.0 SANDY ELASTIC SILT, fine to medium, MH 118.3		-									
SANDY ELASTIC SLT, fine to medium, MH moist, greenish gray. With sand. The to medium, moist, greenish gray. With sand, 0-10% fine to medium shell fragments, weak HCl reaction. With sand, 0-10% fine to medium shell ragments, weak HCl reaction. With sand, 0-10% fine to medium shell ragments, weak HCl reaction. MH ragments, weak HCl reaction. MH ragments, weak HCl reaction. MH ragments, weak HCl reaction. ragments, weak HCl reaction.		162.0 -				-118.3					
With sand.		_	SANDY ELASTIC SILT, moist, greenish gray.	, fine to medium,	MH						
With sand. - With sand. - The to medium, moist, greenish gray. - The to medium shell - The to medium, moist, greenish gray. - The to medium, moist, greenish gra									4+8+15		
With sand. With sand. The to medium, moist, greenish gray. With sand, 0-10% fine to medium shell fragments, weak HCl reaction. With sand, 0-10% fine to medium shell 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -								Г. — ТХІ	N =23 REC =18'		
With sand. With sand. fine to medium, moist, greenish gray. With sand, 0-10% fine to medium shell fragments, weak HCl reaction. With sand, 0-10% fine to medium shell fragments, weak HCl reaction. How are also be as a set of the set of								-165-1	INEO IO		
With sand. With sand. fine to medium, moist, greenish gray. fine to medium, moist, greenish gray. With sand, 0-10% fine to medium shell ragments, weak HCl reaction. With sand, 0-10% fine to medium shell ragments, weak HCl reaction. With sand, 0-10% fine to medium shell ragments, weak HCl reaction. With sand, 0-10% fine to medium shell ragments, weak HCl reaction. With sand, 0-10% fine to medium shell ragments, weak HCl reaction. With sand, 0-10% fine to medium shell ragments, weak HCl reaction. How the sand shell reaction shell reaction. How the sand shell reaction. How the sand shell reaction shell reaction. How the sand shell reaction shell reaction. How the sand shell reaction shell reaction shell reaction. How the sand shell reaction shell reaction shell reaction. How the sand shell reaction shell reaction shell reaction shell reaction shell reaction. How the sand shell reaction s		-									
With sand. With sand. Fine to medium, moist, greenish gray. With sand, 0-10% fine to medium shell fragments, weak HCI reaction. With sand, 0-10% fine to medium shell 1000000000000000000000000000000000000		-									
With sand. Fine to medium, moist, greenish gray. With sand, 0-10% fine to medium shell fragments, weak HCl reaction. With sand, 0-10% fine to medium shell - - - - - - - -		-									
$\begin{array}{c} -170 \\ -170 \\ -170 \\ -170 \\ -170 \\ -170 \\ -170 \\ -170 \\ -175 \\ -1$		-	With sand.					M	3+6+9 N =15	w=57.3% LL=76	
$\begin{array}{c} 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 $		_						<u>–170–</u>	REC =18'	PL=49	
$\begin{array}{c} 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 $		_									
Image: Second		_									
$ \begin{array}{c} $			fine to medium, moist,	greenish gray.							
$ \begin{array}{c} $									7+0+15		
$ \begin{array}{c} $		-						F 1 X	N =24		
$ \begin{array}{c} $								-175-1	REC - 10		
S000 Tragments, weak HCI reaction. 100^{-1} Fragments, weak HCI reaction. 180^{-1} Fragments, weak HCI reaction. 180^{-1} Fragme		-									
$\begin{array}{c} \begin{array}{c} & & \\ & & & \\ & & \\ & & \\ & & & \\ & & \\ & & & \\ & & \\ & & & & \\ & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & $		-									
With sand, 0-10% fine to medium shell fragments, weak HCl reaction.		-									
$ \begin{array}{c} -180 \\ -$	3/6/08	-	With sand, 0-10% fine to	o medium shell				M	8+10+13 N =23		
1 - - - - - - 1 - - - - - - 1 - - - - - 1 - - - - - 1 - - - - - 1 - - - - - 1 - - - - - 1 - - - - - 1 - - - - - 1 - - - - - 1 - - - - - 1 - - - - - 1 - - - - - 1 - - - - - 1 - - - - - 1 - - - - - 1 - - - - - 1 - - - - - 1 - - - - -	GDT	_	hagments, weak none					<u>–180–</u> 0	REC =18'		
PTOS -	ABEL.	_									
$\begin{array}{c} & & & \\ & & & & \\ & & & \\ & & & & \\ & & & \\ & & & & & \\ & & & & \\ & & & & & \\ & & & & \\ & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & &$	SCHN	_									
$\begin{array}{c} 001 \\ 002 \\ 002 \\ 003 \\$	GPJ (
Image: Normal State of the	\$ 400.								6+0+11	w=56.7%	
	300 2	-						F 1	N =20	LL=100 PL=60	
	G SP1							-185- []	REC =18	*	
	3 PLO	-						$\left - \right $			
	20046	-									
	G 061	-									
\tilde{Q} No shell fragments.	lg Lo	-	No shell fragments.					M	7+9+13		
$\begin{bmatrix} 2 \\ 2 \\ 2 \\ 2 \\ 2 \\ 2 \\ 2 \\ 2 \\ 2 \\ 2 $	30RIN							L	N =22 REC =18	,	
continued on next page	EST E		continued on ne	ext page							

	hachel	TEST	Project: Ca	alvert Cliff	s Nucle	ar Pow	er Plant		Boring	Number:	B-418
Schnal	helEngineering	Ca	alvert Cou	nty, Ma	ryland			Contra	act Number: 0	6120048	
DEDTU	ber Engineering	200						SAMDI			
(FT)	STRAT	A DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	DEDTH		ΔΤΔ	TESTS	REMARKS
				MH							
-											
-											
_											
							Γ	7 5+6+	10		
-							$ \rangle$) -18"		
							-195-		-10		
-											
-											
-											
								6+7+	9	w=66.5%	
								N =16) =18"	LL=109 PL=71	
200.0	BOTTOM OF B	ORING @ 20	0.0 FT.		-156.3		-200			*	
88											
L 3/6/											
L.GD											
NABE											
SCH											
GPJ											
& 400											
L 300											
G S P											
S PLO											
20046											
. 061:											
100											
DRING											
STBC											
Ξ											

Schnat	TEST Project: C bel Engineering LOG	Calvert Clif Calvert Cou	fs Nucle unty, Ma	ar Pow Iryland	ver Pla	nt		Boring Contra Sheet:	I Number: Ict Number 1 of 4	er: 0612	B-419
Boring C						Gr	oundwa	ter Obs	ervations		
	MALAGA, NEW JERSEY					D	ate	Time	Depth	Casin	g Caved
Boring F	oreman: J. Blemings		Enco	untere	d	6	6/5		15.0'	20.0'	
			Start	of Da	у	6	6/6		30.0'	20.0'	
Drilling E	Equipment: CME-750 (ATV)										
	Startad: 6/5/06 Einishad: 6/6/06										
	Northing: 216267 92 ft										
Location	Easting: 961895.6 ft										
Ground	Surface Elevation: 55.3 (feet)										
DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL	DEP	S. TH	AMPLIN DA	IG TA	TEST	s	REMARKS
0.5	Crushed Stone		54.8			M	5+8+5			0	-20' Hollow
	Clayey sand FILL, fine to coarse grained, moist, yellow, with gravel.	FILL	_		F	-10	N =13 REC =6	6"		5	un augero
2.0 -	Lean clay FILL, moist, orange, with	FILL	- 53.3		F						
-	sand.				F	HV	2+1+W N =1	ОН			
-					F	ЦШ	REC =4	4"			
					5-5-						
						IM	WOH/1	8" วµ/18"			
-					F	ΗM	REC =()")"			
					F	-					
	fine to coarse sandy, wet.				L	$\neg \square$	1+WOF	++2			
8.3	Clayey Sand PROBABLE FILL, fine to	FILL	47.0			Ŵ	N =2 REC ='	12"			
	coarse grained, moist, gray, contains wood fragments				F			-			
	nood nagmonto.				-10-	-					
					F	-M	2+2+3				
11.6	Sandy lean clay PROBABLE FILL.	FILL	43.7		L	Ш	N =5 REC ='	18"			
	moist, gray, contains wood fragments.										
13.5			41 8		F						
-	SANDY LEAN CLAY, fine to coarse,	CL			F	HM	3+3+5 N =8				
	molot, gray.			$\overline{\Sigma}$	-15-	\square	REC =	18"			
					Γ	1					
17.0 -	POORLY GRADED SAND, fine to	SP	38.3		F	-					
-	medium grained, moist, orange and	_			F	-					
	gray, 1/o-1/4 COIOI Changes.				L		10+20+	-12			
						X	N =32	18"			15/16" Drog
-					-20-		1.20 -	.0		b	it
-					╞	-					
					F	_					
1					Γ		.				
-	wet, yellowish gray.				F		/+1+1 N =2				
_					-25-	40	REC =6	6"			
	continued on next page										
			1	l	1						

ſ		hnabel TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plan	t	Во	ring Number:	B-419
	Schnal	bel Engineering LOG		alvert Cou	inty, Ma	ryland			Co She	ntract Number: (eet: 2 of 4	06120048
Ī	DEPTH	STRATA DESCRIPT		CLASS.	ELEV.	WL		S	AMPLING	TESTS	REMARKS
	(FT)				(FT)		DEPT	н	DATA		
	-			55							
	_										
	_										
									50/0"		28.5' Harder drilling
	_								N =50/0" REC =0"		28.5'-100' 4 1/4" roller bit
							-30-				
	-										
	32.0 -	SILTY SAND, fine to coarse	grained,	SM	23.3						
	-	shell fragments, contains cen	nented								
	-	frag.	-45% snell					X	17+20+13 N =33		
							-35-	Ш	REC =18"		
	-										
	-										
	-										
	-	green						M	4+7+9 N =16		
							-40	Ш	REC =18"		
	-										
	_										
	_										
	_	fine to medium grained, wet,	contains					M	32+12+7		
		cemented sand.					-45	М	N =19 REC =14"		
	_										
6/08	_										
DT 3/	_										
BEL.G		trace fine to medium shell fra	gments.					М	4+4+6		
CHNA	_	moderate HCI reaction, 0-10 ^o frag.	% shell					Ň	N =10 REC =18"		
GPJ 0							_50_				
% 400.0	_										
T 300 c	_						F 1				
JG SP	_										53.5' Pushed
48 PLC	-										
<u>81200</u> ∠							55				
ŏ ОС	-										
SING L	_										
T BOR	-	continued on next pad	<i>ye</i>								
TES											

		hnabol	TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	1	Boring Number:	B-419
	Schnal		BORING	С	alvert Cou	nty, Ma	ryland			Contract Numbe	r: 06120048
H.		Ser Engineering	200					6			
'	(FT)	STRAT	A DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	о Перти			S REMARKS
					SM						
	-	moist, greenish coarse shell frac	white, with fin ments, conta	e to ins				F -IM	11+10+4 N =53	13	
		cemented sand,	strong HCI re	eaction,				<u>–₆₀–∐</u>	REC =18	8"	
	_	35-45% Shell Ita	ıg.								
	-							[]			
	-										63' Rig chatter
	-							F -IM	8+13+21 N =34	1	
								- <u>65</u> - []	REC =18	8"	
	_										
	_										
	-	25 20% aboll fra							6+7+12		
	-	23-30 % Shell II a	ıy.					F - IXI	N =19		
								-70	REC =18	8	
	-										
	_										
	_										
									4+5+9		
	_							Г _ 1X	N =14 REC =18	R"	
								-75			
	-										
	77.0 -	SANDY SILT fir	ne to medium	moist	MI	-21.7					
	_	green, trace fine	to medium s	hell							
	_	shell frag.	ig noneactio	11, 0-576				L IM	6+9+13		
80/9								L eo M	N =22 REC =18	8"	
0T 3/6											
EL.G	-							- 1			
INABI	-										
ŝ	-										
0.GP,	-	with clay, weak	HCI reaction,	0-5% shell				M	5+8+8		
0 & 40		ilag.						<u>85</u> 0	REC =18	8"	
PT 30(_										
OG SI	-										
48 PL/	-										
31200	-										
00	-	moderate HCI re frag.	eaction, 0-10%	6 shell				M	5+8+12 N =20		
NGLC	_	-						<u>⊢90</u> –∐	REC =18	8"	
BORI	-							$\left - \right $			
IEST		continu	ied on next pag	e							

G	hnabel	TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant		Borir	g Number:	B-419
Schnat	el Engineering	LOG			iity, ivia	iryianu			Cont Shee	ract Number: 0 t: 4 of 4	6120048
DEPTH (FT)	STRAT	A DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	DEPTH	SA H	MPLING DATA	TESTS	REMARKS
				ML							
92.0	SILTY SAND, fir	ne to medium	grained,	SM	-36.7						
-	moist, green, wit fragments, stron	th fine to coal g HCI reactio	rse shell on, 35-45%								
-	shell frag.	-						\mathbb{N}	6+11+13 N =24		
_							-95-	∐ i	REC =18"		
_											
_											
1									1+6+0		
-								XII	N =15		
00.0	BOTTOM OF BO	ORING @ 10	0.0 FT.		-44.7		-100-		REC =18"		

Schnat	TEST Project: Cit BORING Cit Cit Del Engineering LOG Cit	alvert Clif alvert Cou	fs Nucle unty, Ma	ar Pow aryland	ver Pla	nt	Boring Contra Sheet:	Number: act Numbe 1 of 5	r: 061200	B-420
Borina C	ontractor: UNI-TECH DRILLING					Grour	ndwater Obs	ervations		
y 0	MALAGA, NEW JERSEY					Date	Time	Depth	Casing	Caved
Boring F	oreman: J. Evans		Enco	untere	d	6/6		24.0'		
Drilling N	lethod: Mud Rotary		Star	t of day	v	6/7		15.0'		
Drilling E	Equipment: Failing-1500 (Truck)		otari		y	0/1		10.0		
Schnabe	I Representative: K. Megginson / B. Bradfield	1								
Dates S	Started: 6/6/06 Finished: 6/7/06									
Location	: Northing: 216213.53 ft Easting: 961670.44 ft									
Ground §	Surface Elevation: 62.6 (feet)									
DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL	DEP	SAM TH	PLING DATA	TEST	S F	EMARKS
0.5	Crushed stone FILL, moist, brown and dark gray, contains fine to coarse sandy silt pockets.	FILL FILL	62.1		-	7+	4+7 =11 EC =6"	w=17.2 LL=52 PL=21	% 2 	
2.0 -	Fat clay PROBABLE FILL, moist, yellowish brown and light gray, with fine to medium sand, trace mica, contains root fragments.	СН	60.6		-	2+	3+3 =6	w=28.6 LL=68 PI =22	%	
-	SANDY FAT CLAY, moist, stratified orangeish brown and light gray, trace fine to medium sand, contains iron oxide stained pockets (1/8 inch) and root fragments.				- 5 - -		2C =16" 3+4 =7 EC =18"	w=29.7 LL=64 PL=22	%	
-	light gray and dark yellowish brown.				-	2+ N RE	2+3 =5 EC =18"	w=38.3 LL=71 PL=19 *	%	
-	light gray, dark yellowish brown and dark orangeish brown gray, trace mica and organic matter (±1%) below 11 ft.					3+ N RE	4+7 =11 EC =18"			
-	contains fine to medium sandy fat clay pockets.				- - 15-		5+8 =13 EC =18"	w=42.1 LL=74 PL=31 *	% i	
	gray and dark gray, contains fat clay with sand pockets.				- - 20-		8+9 =17 EC =18"	w=28.6 *	%	
22.0			40.6		Ļ					
_	SANDY SILT, fine to medium grained, moist, yellowish brown and dark orangeish brown, contains moderately compared sand pockets	ML			-		47.07	w=24 4	%	
24.0 -		SP-SM	38.6	⊻	F	- X 5+ N	=54	LL=NF		
_					-25-		EC =16"	PL=Ni	-	
	continued on next page									

ſ	6	TEST Project: (Calvert Cliff	s Nucle	ar Pow	er Plant	Boring Number:	B-420
	Schnal	bel Engineering LOG	Calvert Cou	inty, Ma	iryland		Contract Number: 0 Sheet: 2 of 5	6120048
	DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL		NG TESTS	REMARKS
		fine to medium grained, wet, brown and yellowish brown, contains black particles.	SP-SM				*	
	-	contains iron oxidized zone from 28.5 to 28.6 ft				 ⊠ 50 REC =	5"	
	- 32.0 -	SILTY SAND, fine to medium grained, wet, dark gray.	SM	30.6				
	-					26+31- N =53 35	+22 w=24.2% *16"	*Very to
	37.0 - - -	LEAN CLAY with sand, fine to medium grained, moist, gray, trace fine to medium shell fragments (±5%), weak HCl reaction. wet, gray and light gray, trace fine to coarse shell fragments (±5%), contains sandy lean clay pockets, moderate HCl	CL	- 25.6		 40	+50/3" w=20% '9" LL=30 '16" PL=19 *	difficult rotary advancement from 37 to 38.5 ft (slow rotary advancement). Difficult rotary advancement may be in part be due to using
	- - 43.5 -	SILTY SAND, fine to medium grained, wet, gray, trace fine to coarse shell fragments (±5%), weak HCI reaction.	SM	- 19.1		 N =19 REC =	1 w=26.5% *18"	arag bit. *Difficult to very difficult rotary advancement from 38.5 to 39.5 ft. *Difficult to very difficult rotary advancement from 42.5 to
3PJ SCHNABEL.GDT 3/6/08	-	dark gray, little fine to coarse shell fragments (±15%).				 	+12 w=28.4% *18"	43.5 ft (Slight to moderate rig chatter).
OG 06120048 PLOG SPT 300 & 400.0	- - - -	gray, trace fine to coarse shell fragments (±5%), very weak HCl reaction.				 	w=28.0% *	
TEST BORING	_	continued on next page						

6	TEST Proje	ct: Calvert Cliff	s Nucle	ar Pow	er Plant	Bor	ing Number:	B-420				
Schnat	el Engineering LOG	Calvert Cou	nty, Ma	aryland		Con She	tract Number: 0 et: 3 of 5	6120048				
DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL	SA DEPTH	MPLING DATA	TESTS	REMARKS				
-	trace fine to medium shell fragments (±<5%).	s SM				3+4+5 N =9 REC =18"	w=34.9%					
62.0 -	CLAYEY SAND, few fine to coarse s fragments (±10%), strong HCl reacti moist, olive gray.	shell SC ion,	0.6		 65 	REC =24"	w=28.3% LL=49 PL=11 *	*Osterberg sampler tube push *Slight to moderate rotary resistance from				
67.0 -	SILTY SAND, light greenish gray, mostly fine to coarse shell fragments (±50%), contains strongly cemented sand pockets (1 inch), clayey sand pockets and shark teeth.	S SM	-4.4		 	20+20+32 N =52 REC =18"	w=16.8% *	66 to 68.5 ft.				
	gray, trace fine to coarse shell fragments (±5%). fine to medium grained, wet, gray, t fine to medium shell fragments (±1% and mica, moderate HCl reaction.	trace 6)			 	5+11+12 N =23 REC =16"	w=24.4% *					
	moist, gray and light greenish gray, trace fine to coarse shell fragments (±5%), weak HCl reaction.				 	10+14+16 N =30 REC =18"	w=26.2% LL=48 PL=32 *	**Resumed drilling at 7:00 AM on 6/7/06.				
83.5	SANDY ELASTIC SILT, trace fine to medium shell fragments (±<5%), dar green.	o MH rk	20.9		 85	5+9+13 N =22 REC =18"	w=47.3% LL=60 PL=39 *					
87.0 -	FAT CLAY, moist, light greenish gra trace fine to medium sand and mica and fine to medium shell fragments (±1%), weak HCl reaction.	iy, CH	-24.4		 90	7+10+12 N =22 REC =18"	w=55.3% LL=90 PL=35 *					
_	continued on next page											
		hnabol	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	t Boring Number:		B-420		
-------------------------------	----------------	---	--	----------------------------	------------	---------------	----------	------------------------	---------------------------------------	-----------------	---------------------------------	---------
	Schna	bel Engineering	LOG	C	alvert Cou	nty, Ma	iryland			Contract	t Number: 0 4 of 5	6120048
	DEPTH (FT)	STRAT	A DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	бертн		IG ITA	TESTS	REMARKS
		fine to medium s HCl reaction (hig	sandy, gray, v gh percentag	very weak e of sand).	СН			 95	7+12+1 N =31 REC = ⁻	19	w=39.4% *	
	98.5 - -	SANDY SILT, w shell fragments reaction.	et, trace fine (±5%), weak	to medium HCI	ML	35.9		 	5+7+12 N =19 REC = ²	<u>2</u> 18"	w=34.8% LL=49 PL=30 *	
	103.5 	SILTY SAND, m coarse shell frag HCl reaction.	ioist, gray, tra gments (±5%)	nce fine to a, moderate	SM	40.9		 - 105- 	6+10+1 N =29 REC = ⁻	19 18"	w=38.5% LL=57 PL=42 *	
	108.5 	SANDY ELASTI gray	C SILT, with	shells,	MH	45.9		 	7+10+1 N =24 REC = ²	14 18"	w=46.4% LL=80 PL=51 *	
J SCHNABEL.GDT 3/6/08	113.5 	FAT CLAY, gree trace fine to med indurated lean c	enish gray an dium sand, co lay pockets.	d gray, ntains	СН	50.9		 - 115- 	7+8+12 N =20 REC = ²	2	w=64.9% LL=118 PL=38 *	
06120048 PLOG SPT 300 & 400.G	118.5 	SANDY ELASTI fine to medium s reaction.	C SILT, dark sand, modera	gray, with te HCl	MH	55.9		 - 120-	7+9+15 N =24 REC =1	5 18"	w=41.6% LL=65 PL=40 *	
TEST BORING LOG (123.5	SANDY FAT CL	AY, dark gree led on next pag	enish gray, re	СН	-60.9			5+7+10)	w=47.5%	

SC	TEST Project: C BORING C	alvert Cliff alvert Coເ	s Nucle Inty, Ma	ar Pow Iryland	ver Plant	Boring	g Number: act Number: 0	B-420
Schnat	el Engineering LOG		-			Sheet	: 5 of 5	
DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL	SAMP	LING DATA	TESTS	REMARKS
	very weak HCI reaction.	СН			-125- N = REC	17 2 =18"	LL=83 PL=29 *	
- 127.0 - - -	SANDY ORGANIC SILT, weak HCI reaction.	OH	64.4		 130- ■	;=22"	w=39.0% LL=59 PL=34 PP=4.00 tsf	*Osterberg sampler tube push from 128.5 to 130.3 ft
- - 133.5 - - -	ELASTIC SILT, moist, dark greenish gray, trace fine to medium sand, and mica.	MH	70.9		 	+11 20 ; =18"	w=73.4% LL=147 PL=75 *	
- - - -					 -	+11 20 2 =18"	w=78.8% LL=145 PL=76 *	
	fine to medium shell fragments, moderate HCI reaction.				 N = ⁻ REC 	+11 9 2 =18"	w=58.9% LL=107 PL=56 *	
-	weak HCl reaction, blocky.							
- 150.0			87.4			2+12 24 2 =18"	w=74.2% LL=127 PL=100 *	

Schn	chnabel TEST BORING abel Engineering LOG	Project: Calv Calv	ert Cliff ert Cou	fs Nuclea Inty, Ma	ar Pow ryland	er Plai	nt	Bo Co Sh	Boring Number: Contract Number: 0612004 Sheet: 1 of 5			
Devine							Gro	oundwater	Observations			
Boring	FREDERICK, MA	ASSOCIATES, IN RYLAND	NC.				D	ate Tim	ne Depth	Casing	Caved	
Boring	Foreman: D. Reese			Enco	untere	d	5	/10	33.8'	3.5'		
Drilling	Method: Mud Rotary			Start	of day	,	5	/11	11.5'	3.5'		
Drilling	Equipment: CME-75 (Truck)					·						
Datas	Startad: 5/10/06 Einisbad:	5/11/06										
Locatio	on: Northing: 216497.56 ft Easting: 961019.77 ft	5/11/00										
Ground	I Surface Elevation: 115.6 (feet))										
DEPTH (FT)	STRATA DESCRIP	гіон с	LASS.	ELEV. (FT)	WL	DEP	S. TH	AMPLING DATA	TEST	S F	REMARKS	
0.3	ROOTMAT AND TOPSOIL.			115.3			M	1+3+2	w=11.6	6%		
	 POORLY GRADED SAND V fine to medium grained, mois contains root fragments. 	VITH SILT, st, brown,	5P-5M			- ·	-Ŵ	N =5 REC =10"				
	_							1+3+3 N =6 REC =14"	w=14.8 *	%		
4.5	CLAVEV SAND find to mod	ium	80	111.1								
-	grained, moist, brown.		00			5 		1+2+2 N =4 REC =12"	w=11.9 *	1%		
7.0		- avaired	<u> </u>	108.6		- ·						
	moist, yellowish brown.	r grained,	511			- ·		2+2+2 N =4 REC =12"	w=7.6°	%		
	_					-10-	$\left \right $					
10.5	POORLY GRADED SAND, t tan yellow	race silt,	SP	- 105.1		- ·		7+7+7 N =14 REC =16"	w=11.8 LL=NF PL=NI *	9% 		
	fine to coarse grained.					- ·		16+10+18	w=9.2	%		
- - - - -	_						Ŵ	N =28 REC =12"				
	-					 						
5	_					L .						
18.5	WELL GRADED SAND WITH	H SILT.	W-SM	97.1				5+8+8	w=9.4	%		
	trace gravel, light brown, cor thick clay lenses.	itains 1/8"						N =16 REC =12"	*			
	_					 -	$\left \right $					
	-					 	$\left \right $					
23.5	- SILTY SAND light brown		SM	92.1		- ·		8+12+11	w=11.0	1%		
			SIVI			- ·		N = 27	LL=NI PL=NI			
	continued on next pa	ge				25-		KEU = 14"				

	hnahol	TEST	Project:	Calvert Cliff	s Nucle	ar Pow	ver Plant	E	Boring Number:	B-421
Schna	bel Engineering			Calvert Cou	nty, Ma	ryland		(Contract Number:	06120048
DEPTH				01.400	ELEV.	14/1	S			DEMADIKO
(FT)	SIRAIA	DESCRIPT	ION	CLASS.	(FT)	WL	DEPTH	DAT	A TESTS	REMARKS
				SM					*	
-							F 1			
27.0 -	POORLY GRADE	D SAND W	ITH SILT,	SP-SM	88.6					
-	fine to coarse grai	ined, wet, o	range.							
-							M	10+14+1 N =29	5 w=15.6%	
							0[]	REC =10)"	
-										
-	wot					∇		2+1+1		
-	. wet.						F -1 X	N =2		
							-35-1	REC = 18	5	
-										
-	_									
-										
-							L -M	4+6+5	w=17.3%	
_								N =11 REC =14	t	
-										
42.0 -	SANDY ELASTIC	SILT, mois	t, mottled	MH	73.6					
-	white and orange.								04 50/	
-							M	WOH+W +1	OH w=31.5%	
							-45-0	N =1 REC =18	3"	
-										
47.0 -		X		011	68.6					
2 -	SANDY FAT CLA	Y, Moist, da	irk gray.	CH						
								REC =24	w=28.8%	
							50		LL=50 PL=18	
							50		*	
- 10	-						$ \left - \right _{-} $			
- 12							∏	3+3+4 N =7	w=29.6% PP=1.00 tsf	
							<u>⊢₅</u> _ ∆	REC =18	8" *	
- 100										
- 10										
	continue	d on next pag	e							
	1									

	6	hnahol	Project: C	Calvert Cliffs Nuclear Power Plant					Boring Number: B-421			
	Schnat		С	alvert Cou	nty, Ma	ryland			Contr	act Number: 0	6120048	
	DEPTH					FI FV			SAMP			
	(FT)	STRATA	A DESCRIPT	ION	CLASS.	(FT)	WL	DEPTH		DATA	TESTS	REMARKS
					СН					~=24"	w=34.2%	
	-) -24	LL=78 PL=32	
	_							-60-			PP=1.50 tsf	
	_											
	-											
	_											
	_								7 3+4	+5	w=28.6%	
								65	N =	9 C =18"	PP=2.50 tSf *	
								-05				
	-											
	67.0 -	SILTY SAND, fir	ne to medium	grained,	SM	48.6						
	-	moist, greenish g	gray.					-				
	-							1)	4+5 N =	+5 10	w=22.2%	
	_							-70-		2 =18"		
	_											
	_											
	_								3 50/		w=24.9%	
	-								N =	50/4"	*	
								-75-	REC	5 =6"		
	-											
	-											
	-											
	_							L 1	11+	11+45	w=19.7%	
6/08									REC	56 C =14"		
DT 3/												
EL.GI	_											
HNAE	-											
J SC	-										W-00 F0/	
:00.GF	-	with fine to medi (10%).	um shell frag	ments				┝ ┤थ	S0/4	." 50/4"	w=20.5%	
00 & 4		、 <i>,</i>						-85-	REC	2 =4"		
SPT 3	-							$ \downarrow \downarrow$				
FOG (_											
048 P												
06120		wet, greenish wh	nite, with fine	to coarse					7 22+	26+29	w=26%	
DOG	-	shell fragments ((25-30%), HC	Cl reaction.				$\begin{bmatrix} 1 \end{pmatrix}$		55 55 5 = 18"	*	
RING	_							-90-		-10		
T BOI	-	continu	ed on next pag	e								
TES												

Calvert County, Mayland Contract Number: 08120048 Decrement Contract Number: 08120048 Decrement Status Calvert County, Mayland Contract Number: 08120048 Decrement Status Calvert County, Mayland Contract Number: 08120048 Popel Status Status Calvert County, Mayland Contract Number: 08120048 92.0 POORLY GRADED SAND WITH CLAY, the medium shell fragments (10-20%), HCI reaction. SM 23.6 EEV WL SAMPLING Depth Tests REMARKS 97.0 POORLY GRADED SAND WITH CLAY, treations shell fragments (10-20%), HCI reaction. SP-SC 18.6	ſ		test	Project:	Calvert Cliff	s Nucle	ar Pow	er Plant	1	Boring Number:	B-421
DEPTH (PT) STRATA DESCRIPTION CLASS. ELEV (PT) WL SAMPLING DEPTH TESTS REMARKS 92.0 POORLY GRADED SAND WITH CLAY, trays with fund granedum shell regress (20.30%), HCI reaction. SP-SC 23.6		Schna	bel Engineering LOG		Calvert Cou	nty, Ma	aryland			Contract Number: 0 Sheet: 4 of 5	6120048
92.0 FOORLY GRADED SAND WITH CLAY, fragments (20:30%), HCI reaction. SM 23.6 FOORLY GRADED SAND WITH CLAY, fragments (20:30%), HCI reaction. 000000000000000000000000000000000000		DEPTH (FT)	STRATA DESCRIP	TION	CLASS.	ELEV. (FT)	WL	S DEPTH		B TESTS	REMARKS
92.0 POORLY GRADED SAND WITH CLAY, speed for medium grained most, greens (20.30%), HCI reaction. SP-SC 23.6 -	ł				SM					<u> </u>	
97.0 The bit medium graned, mostly, greenish grametins (20.30%), HCI reaction. 97.0 Pre-section Pre-section W=20.7%, L=NP 97.0 PCORLY CRADED SAND WITH SLT, fine to medium graned, mostly, green, with fine to coarse shell fragments (10-20%), HCI reaction. SP-SM 18.6 Pre-section W=20.7%, L=NP 102.0 SILTY SAND, fine to medium grained, mostly, green, with fine to coarse shell fragments (25-40%), HCI reaction. SM 13.6 Pre-section W=28.4% 102.0 SILTY SAND, fine to medium grained, fragments (25-40%), HCI reaction. SM 13.6 Pre-section W=28.1% 118.5 SILTY SAND, fine to coarse shell fragments SM 13.6 Pre-section W=28.1% 118.5 SILTY SAND, fine to coarse shell fragments SM 13.6 Pre-section W=28.1% 118.5 SILTY SAND, fine to coarse shell fragments SM 13.6 Pre-section W=28.1% 118.5 SILTY SAND, fine to coarse shell fragments SM 13.6 Pre-section W=28.1% 118.5 SANDY SILT, green, with fine to coarse shell fragments (20-30%), HCI reaction. ML -2.9 Pre-section W=27.8% 118.6 SANDY SILT, green, with fine to coarse shell fragments (20-30%), HCI reaction. ML -2.9 Sol4* W=27.8% 118.5 SANDY SILT,		92.0 -	POORLY GRADED SAND V	VITH CLAY,	SP-SC	23.6					
97.0 Fragments (20-30%), HCI reaction. III. Image: second se		-	gray, with fine to medium sh	st, greenish ell						00.70	
97.0		-	fragments (20-30%), HCI rea	action.				10	6+8+50 N =58	LL=NP	
97.0 POORLY GRADED SAND WITH SLT, fine to medium grained, moist, green, with fine to coase shell fragments SP-SM 18.6			contains cemented sand, wit medium shell fragments (10	th fine to -20%), HCl				95_ <u> </u> []	REC =18	3" PL=NP *	
97.0 POORLY GRADED SAND WITH SILT, fine to medium grained, moist, green, with fine to coarse shell fragments SP-SM 18.6		-	reaction.								
102.0 fine to medium grained, moist, green, with fine to coarse shell fragments (25-40%), HCl reaction. SM 13.6		97.0 -	POORLY GRADED SAND V	VITH SILT,	SP-SM	18.6					
102.0 SILTY SAND, fine to medium grained, moist, green, with fine to coarse shell fragments (25-40%), HCl reaction. 13.6 10.6+6+7 w=26.% 10.5 10.8+8 w=26.% 10.5 10.8+8 w=26.% 11.6 10.8+8 11.6 10.8+8 11.6 10.8+8 w=26.% 11.6 10.8+8 W=26.% 11.6 11.6 11.6 10.8+8 W=26.% 11.6 <t< td=""><td></td><td>-</td><td>fine to medium grained, mois with fine to coarse shell frag</td><td>st, green, ments</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>		-	fine to medium grained, mois with fine to coarse shell frag	st, green, ments							
102.0 SILTY SAND, fine to medium grained, moist, green, with fine to coarse shell fragments (25-40%), HCI reaction. SM 13.6 13.6 10+8+8 w=28% 102.0 SILTY SAND, fine to medium grained, moist, green, with fine to coarse shell fragments (25-40%), HCI reaction. SM 13.6 10+8+8 w=28% 103.0 SANDY SILT, green, with fine to coarse shell fragments (20-30%), HCI reaction. 13.6 13.6 13.6 10+8+8 w=28% 118.5 SANDY SILT, green, with fine to coarse shell fragments (20-30%), HCI reaction. -2.9 10+8+9 w=31.7% 118.5 SANDY SILT, green, with fine to coarse shell fragments (20-30%), HCI reaction. -2.9 10+8+9 w=27.8% 118.5 SANDY SILT, green, with fine to coarse shell fragments (20-30%), HCI reaction. -2.9 10+8+9 w=27.8% - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - <t< td=""><td></td><td>-</td><td>(10-20%).</td><td></td><td></td><td></td><td></td><td> </td><td>6+6+8 N =14</td><td>w=28.4%</td><td></td></t<>		-	(10-20%).						6+6+8 N =14	w=28.4%	
102.0 SILTY SAND, fine to medium grained, moist, green, with fine to coarse shell fragments (25-40%), HCI reaction. SM 13.6 10-8+8 N=16 REC=18" 10-8+8 N=16 REC=18" w=26% 1010 F6+7 N=13 REC=18" w=26.1% N=13 REC=18" w=26.1% N=13 REC=18" w=26.1% L=NP PL=NP 118.5 SANDY SILT, green, with fine to coarse shell fragments (20-30%), HCI reaction. ML -2.9 -4 10+8+9 N=17 REC=18" w=31.7% N=27.8% N=16 118.5 SANDY SILT, green, with fine to coarse shell fragments (20-30%), HCI reaction. ML -2.9 -4 10+8+9 N=17 REC=18" w=27.8% N=16		_						-100- []	REC =18	3"	
102.0 SILTY SAND, fine to medium grained, moist, green, with fine to coarse shell ragments (25-40%), HCl reaction. SM 13.6 10+8+8 w=26% 105-0		-									
118.5 SANDY SILT. green, with fine to coarse ML -2.9 -4 10+8+9 w=26% 118.5 SANDY SILT. green, with fine to coarse ML -2.9 -4 10+8+9 w=27.8% 118.5 Sandy SiLT. green, with fine to coarse ML -2.9 -4 10+8+9 w=27.8% 118.5 Sandy SiLT. green, with fine to coarse ML -2.9 -4 10+8+9 w=27.8% 118.5 Sandy SiLT. green, with fine to coarse ML -2.9 -4 10+8+9 w=27.8% 118.5 Sandy SiLT. green, with fine to coarse ML -2.9 -4 50/4" -4		102.0 -	SILTY SAND, fine to mediur	n grained,	SM	13.6					
118.5 SANDY SILT. green, with fine to coarse shell fragments (20-30%), HCl reaction. ML -2.9 -4 10+8+9 N=16 W=26.1% N=13 118.5 SANDY SILT. green, with fine to coarse shell fragments (20-30%), HCl reaction. ML -2.9 -4 10+8+9 N=16 W=31.7% N=8 118.5 Solution of the section. ML -2.9 -4 10+8+9 N=17 W=27.8% LL=NP 118.5 Solution of the section. ML -2.9 -4 10+8+9 N=17 W=27.8% LL=NP 118.5 Solution of the section. ML -2.9 -4 10+8+9 N=17 W=27.8% LL=NP 118.5 Solution of the section. ML -2.9 -4 10+8+9 N=17 W=27.8% LL=NP 118.5 Sold* -4 -4 -4 -4 -4		-	moist, green, with fine to coa fragments (25-40%), HCI rea	arse shell action.							
118.5 SANDY SILT, green, with fine to coarse shell fragments (20-30%), HCl reaction. ML -2.9 -4.9 -4.9 -4.9 w=27.8% 118.5 Continued on next page ML -2.9 -4.9 -4.9 w=27.8% 118.5 Continued on next page ML -2.9 -4.9 0.94.7 w=27.8% 118.5 Continued on next page ML -2.9 -4.9 0.94.7 w=27.8%		-						10	10+8+8 N =16	w=26%	
118.5 SANDY SILT, green, with fine to coarse shell fragments (20-30%), HCl reaction. ML -2.9 -4 -4 -4 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -								-105-	REC =18	3"	
118.5 SANDY SILT, green, with fine to coarse shell fragments (20-30%), HCl reaction. ML -2.9 -4 -4 -4 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -		-									
118.5 SANDY SILT, green, with fine to coarse shell fragments (20-30%), HCl reaction. ML -2.9 -4 -4 -4 -4 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - <t< td=""><td></td><td>-</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>		-									
118.5 SANDY SILT, green, with fine to coarse shell fragments (20-30%), HCl reaction. ML -2.9 -4 10-8+9 -110-4 w=21.7% -115-4 118.5 SANDY SILT, green, with fine to coarse shell fragments (20-30%), HCl reaction. ML -2.9 -4 10-8+9 -120-4 w=27.8% -15-4 118.5 Continued on next page ML -2.9 -4 50/4* w=27.8% -120-4		-									
118.5 - <td></td> <td>-</td> <td>_</td> <td></td> <td></td> <td></td> <td></td> <td>10</td> <td>6+6+7 N =13</td> <td>W=26.1% LL=NP PL=NP</td> <td></td>		-	_					10	6+6+7 N =13	W=26.1% LL=NP PL=NP	
118.5 SANDY SILT, green, with fine to coarse shell fragments (20-30%), HCl reaction. ML -2.9 -4 10+8+9 w=31.7% - - - - - - - - - -								-110-	REC =18		
000000000000000000000000000000000000		-									
118.5 - <td>8</td> <td>-</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	8	-									
$\begin{array}{c} 118.5 \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\ $	F 3/6/0	-								w-21 70/	
The second se	EL.GD	-						X	3+3+5 N =8	*	
000 118.5 - </td <td>HNAB</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>-115-</td> <td>REC = IC</td> <td></td> <td></td>	HNAB							-115-	REC = IC		
The second se	PJ SC	-									
118.5 - SANDY SILT, green, with fine to coarse shell fragments (20-30%), HCl reaction. ML -2.9 - - 10+8+9 N =17 REC =18" w=27.8% LL=NP PL=NP * * - <td< td=""><td>400.G</td><td>-</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td<>	400.G	-									
SANDY SIL1, green, with the to coarse with the to	F 300 &	- 118.5		a ta agarag	MI	-2.9			10,0,0	w=27.8%	
0101000000000000000000000000000000000	JG SP	-	shell fragments (20-30%), H	Cl reaction.	IVIL				N =17	LL=NP PL=NP	
0010000000000000000000000000000000000	48 PLC		-					-120-1		*	
OOT - OOT - - -	001200	-	-								
Open of the second s	LOG	-						- 1			
continued on next page	DRING	-							50/4"		
	EST B(-	continued on next pa	ge							

ſ		hnabal	TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	t		Boring	Number:	B-421
	Schna	bel Engineering	BORING LOG	C	alvert Cou	nty, Ma	ryland				Contra Sheet:	ct Number: 00	6120048
-	DEPTH (FT)	STRAT	A DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	DEPT	S/ H		G TA	TESTS	REMARKS
Ī					ML					N =50/4	."		
								125		RLC -0			
	-												
	-												
	-									10,11,	10	w=22.0%	
	-								XI	N =24	13 9"	*	
								-130-1		REC - I	0		
	-												
	-												
	- 133.5		ark green tra	ce fine to	SM	-17.9				7+13+1	А	w=29.0%	
	-	coarse shell frag	gments (0-5%).	OW				XI	N =27 RFC =1	- 8"	*	
								-135-1			•		
	-												
	-												
	138.5	SANDY FAT CL	AY. dark grav	/	СН	-22.9			М	4+6+8		w=38.5%	
	_		,		-				Ň	N =14 REC =1	8"	LL=53 PL=25	
	_											^	
	1420 -					-26.4							
	-	SILTY SAND, fii moist, dark gree	ne to medium n, trace fine t	grained, o medium	SM								
	-	shell fragments	(0-5%), HCl r	eaction.					M	6+7+8		w=46.8%	
								145	Ŵ	N =15 REC =1	8"		
(6/08	-												
GDT 3	-												
IABEL.	-												
SCHN	-								\mathbb{N}	6+6+8 N =14		w=47.4%	
00.GPJ	150.0 —					-34.4		150	Ш	REC =1	8"		
00 & 40				0.011.									
SPT 3													
FLOG													
120048													
90 DC													
ING LC													
T BOR													
TES													

	Schnal	TEST Project: C bold BORING C bold LOG	alvert Clif alvert Co	ffs Nucle unty, Ma	ar Pow ryland	/er Plai	nt	Boring Contra Sheet	Number: ct Number	er: 061200	B-422
E							Gro	oundwater Obs	ervations		
	Boring C	CONNELLY AND ASSOCIATES	, INC.				ח	ate Time	Denth	Casing	Caved
	Boring F	foreman: D. Bender		Enco	untere	d	5	5/4	Dry		
	Drilling I	Method: Mud Rotary									
1	Drilling B	Equipment: CME-550									
	Schnabe	el Representative: K. Bell									
	Dates 3	Started: 5/4/06 Finished: 5/4/06									
	Location	: Northing: 216478.23 ft Easting: 960915.01 ft									
ľ	Ground	Surface Elevation: 104.0 (feet)		1 1							
	DEPTH (FT)	STRATA DESCRIPTION	CLASS	ELEV. (FT)	WL	DEP	S/ ТН ∣	AMPLING DATA	TEST	S F	REMARKS
F	0.3	TOPSOIL.	SM	103.7				1+2+1			
	-	SILTY SAND, fine to coarse grained, moist, brown and orangeish brown, trace root fragments.	OW				<u> </u>	N =3 REC =14"			
	2.5	LEAN CLAY with sand, moist, brown,	CL	101.5			-M	2+1+2			
	-	fragments.					$ \Delta $	REC =14"			
		yellowish brown, trace root fragments.				- 5 -		2+3+4 N =7			
	-							REC =18"			
	7.5 -	SILTY SAND, fine to coarse grained,	SM	96.5		Ļ .	-M	6+6+8			
	-	moist, yellowish brown, trace root fragments.					$ \Delta $	N =14 REC =18"			
						-10-		51710			
	-							N =16 REC =13"			
	_					- ·	_				
	13.5 _	POORLY GRADED SAND WITH CLAY, fine to coarse grained, moist, orange and brownish white, trace gravel.	SP-SC	- 90.5		 15-		6+8+9 N =17 REC =14"			
	-										
0.00+	-					- ·	-				
2000	-	brownish orange, no gravel.						5+4+5 N =9 REC =13"			
	-						$\left \right $				
	-					- ·	$\left \right $				
	-						- m	3+2+2			
	_	continued on next page				-25-	_М	N =4 REC =16"			

	TEST	Project: C	Calvert Cliff	s Nucle	ar Pow	er Plant	E	Boring Number:	B-422
C	BORING		Calvert Cou	inty, Ma	ryland		(Contract Number: 0	6120048
Schnal	bel Engineering LUG							Sheet: 2 of 4	
DEPTH (FT)	STRATA DESCRIPT	TION	CLASS.	ELEV. (FT)	WL	S. DEPTH	AMPLING	G TESTS	REMARKS
25.5	CLAVEN SAND find to modi	um	80	78.5					
-	grained, moist, orange and g	rayish	30						
	white.								
	medium to coarse grained, o	range and				M	1+1+3		
	yellowish brown, trace grave	l.				A	REC =18	3"	
-									
33.5				70.5					
-	LEAN CLAY with sand, mois orange and reddish gray.	t, brownish	CL			M	1+1+2 N =3		
						<u>35</u>	REC =18	3"	
_									
-									
						-40-			
43.5	FAT CLAY with sand, moist,	gray.	СН	60.5		M	2+3+5		
_						<u>45</u>	N =8		
2									
2 – 7									
– –						╴╶┤ │ _		DD->1 E tof	
								rr	
						-50-			
- 15									
f 8 –									
							5+7+8		
						1X	N =15 REC =18	3"	
						-55-1-1		-	
-						$\left \right $			
- E	continued on next pa	ne.							
	Continued on next pay								

	test	Project: C	alvert Cliff	s Nucle	ar Pow	ver Plant	Boring	Number:	B-422
Schna	abel Engineering LOG		alvert Cou	nty, Ma	iryland		Contra Sheet:	of 4	6120048
DEPTH (FT)	STRATA DESCRIPT	ION	CLASS.	ELEV. (FT)	WL		MPLING DATA	TESTS	REMARKS
			СН				DAIA		
59.5	CLAYEY SAND, fine to coars moist, dark gray, trace organ organic oder.	e grained, ic matter,	SC	44.5			+11+26 =37 EC =18"		1/4 inch orgnic lense changed to a 2 7/8" roller bit
63.5	SILTY SAND, fine to coarse moist, light gray.	grained,	SM	40.5		 65- 	0+7+100/4" =107/10" EC =13"		
-	light gray and white.					 	9+100 =100 EC =14"		
-	wet, light gray and white, with coarse shell fragments, stron reaction.	n fine to g HCl				 1 N N R - 75-	7+15+18 =33 EC =15"		
78.5 79.4 	POORLY GRADED SAND W fine to coarse grained, wet, li and white, with fine to coarse fragments, strong HCI reaction SILTY SAND, fine to medium wet, light gray and white, trac coarse shell fragments, mod	/ITH SILT, ght gray shell on. grained, se fine to erate HCI	SP-SM SM	· 25.5 · 24.6		 ⊠ 1⊓ 80 R 	00/5" =100/5" EC =12		
0G SPT 300 & 400.GPJ_SCHN	reaction. fine to coarse grained, light g gray and white, with fine to co fragments, strong HCI reaction	reenish barse shell n.				 [™] 1 - 85 	00/4" =100/4" EC =5"		
BORING LOG 06120048 PLC	trace fine to medium shell fra moderate HCI reaction.	gments,				5 5 90	+5+8 ⊨=13 EC =18"		
ESI									

	bachel	TEST	Project:	t: Calvert Cliffs Nuclear Power Plant					Plant Boring Number: B-42		
C	nnapel	BORING		Calvert Cou	inty, Ma	ryland		Ē	Contract Number: (06120048	
Schna	bel Engineering	LUG							Sheet: 4 of 4		
DEPTH	STRAT	A DESCRIPT	ION	CLASS.	ELEV.	WL	s		G TESTS	REMARKS	
				SM	,		DEPTH	DA	TA		
				OW							
-											
							F -11X	6+7+10 N =17			
-							-95-1	REC =1	8"		
-											
							Γ				
98.5					5.5			1		1/4 inch shell	
	FOORLY GRA	DED SAND W grained wet	ITH SILT,	SP-SM	0.0		N	5+6+8 N =14		lense	
100.0	brownish gray,	trace fine to m	nedium		4.0		-100-1/	REC =1	8"		
	BOTTOM OF B	, weak HCI re			-						
			0.011.								
8											
-											
5											
8											
1											

Sch	chnabel nabel Engineering	TEST BORING LOG	Project: (Calvert C Calvert C	liffs Nucle ounty, Ma	ear Pow aryland	ver Pla	nt		Boring Contra Sheet:	Number: Ict Number 1 of 7	er: 0612	B-423
Borin	Contractor: UNI-T		NG					Gr	oundw	ater Obs	ervations		
	MALA	GA, NEW JE	RSEY					D	ate	Time	Depth	Casin	g Caved
Boring	J Foreman: J. Evans				Enco	ountere	d	6	6/8		10.5'		
Drillin	g Equipment: Failing	y ·1500 (Truck	.)		Star	t of day	y	6	/12		30.0'		
Schna	bel Representative:	K. Megginso	n		Star	t of day	y	6	/13		4.0'		
Dates	Started: 6/8/06 F	inished: 6/	14/06		Star	t of day	y	6	/14		0.0'		
Locat	on: Northing: 216331 Easting: 960850	.76 ft).21 ft											
Grour	d Surface Elevation:	110.1 (feet)											
DEPT (FT)	H STRATA	DESCRIPT	ION	CLAS	S. ELEV. (FT)	WL	DEP	S. TH			TEST	s	REMARKS
	SILTY SAND, fin moist, brown, tra- (±1%).	e to medium ce organic m	grained, natter	SM				-	2+3+3 N =6 REC :	3 =10"		*: b fe	5.4" O.D. Drag it from 0 to 20 eet.
	_ brown and light b	rown.					_	-	2+2+3 N =5 REC :	3 =11"	w=4.9°	%	
	contains clayey s	and pockets	i.				- 5 -		5+10- N =18	+8			
	-					-		REC	=14"				
	_ brown. _							-	4+5+6 N =11 REC	6 			
	fine to coarse gra	ined, wet, b	rown and			₽	-10-	- - M	4+4+6	6			
	light brown, conta _ sand with silt lens	ains poorly g ses.	raded					<u> </u> M	N =10 REC) =7"			
0000	yellowish brown.							-0	5+6+8 N =14	3	w=12.3 LL=NI	% >	
	_						-15-		REC	=6"	PL=NI *	P	
	_							-					
	-							-0	2+5+1 N =17	12	w=10.4	.%	
2	-						-20-		REC	=8"		*/ []	4-3/4" O.D. Drag bit used
	-						<u> </u>	-				b	elow 20 ft.
	-							-					
23.5	POORLY GRAD	ED SAND W rained.	ITH SILT,	SP-SN	86.6			-10	13+13 N =29	3+16)	w=16.6	6%	
	continue	ed on next pag	1e				-25-		REC	=10"			

ſ		TEST	Project: Ca	alvert Cliffs	s Nucle	ar Pow	er Plant		Boring	Number:	B-423
	Schnal	bel Engineering LOG	Ca	alvert Cou	nty, Ma	ryland			Contra	ct Number: 06	6120048
┟	DEDTH				EI EV		ę		G	2 01 7	
	(FT)	STRATA DESCRIPTIO	NC	CLASS.	(FT)	WL	DEPTH		TA	TESTS	REMARKS
f		stratified light brown and yellow	vish	SP-SM							
	-	Drown Delow 24.5 π .									
	-										
	-										
	28.5	SILTY SAND, yellowish brown	and light	SM	81.6		10	4+5+8		w=17.4%	
		brown.						REC =7			
	-										
	-										
	-							,		40.00/	
	-	yellowish brown.					10	8+11+1 N =22	1	W=13.6% LL=NP	
							-35-1	REC =1	0"	PL=NP *	
	-										
	370 -				73 1						
		CLAYEY SAND, wet, yellowish and light grayish brown, contai	n brown ns clayey	SC							
	-	sand lenses.	,,					1+3+8		w=43.9%	
	- 39.5				70.6		- 11	N =11	0"	LL=43 PL=15	
		wet, yellowish brown.	ained,	SM			-40-	REC = I	2	*	
	-										
	42.0 -	EAT CLAY moist grav with fi	ne to	СН	68.1						
	-	medium sand, trace mica.		On							
	_							2+3+4		w=30.9%	
							Å	N =7 REC =1	8"	PL=20	
							45			Â	
8	-										
F 3/6/	-										
L.GD	-										
NABE	-	gray and light greenish gray, tr	ace fine				10	3+3+4 N =7		w=36.6% LL=61	
SCH		matter pocket.					-50-//	REC =1	8"	PL=16 *	
GPJ	_										
& 400	_										
T 300											
JG SP	-	traco mice and organic metter	(+1%)					1+1+6		w=38.1%	
8 PLC	-	trace mica and organic matter	(±170).				F 1 X	N =10	0"	LL=80 PI =34	
12004							-55-	KEC =1	8	*	
G 06	-										
4G LO	-										
BORIN	_										
TEST		continued on next page									

Schna	BURIN							· · · · · · · · · · · · · · · · · · ·	
	ibel Engineering LUG		Calvert Cou	inty, Ma	ryland		0	Contract Number: 0 Sheet: 3 of 7	6120048
DEPTH (FT)	STRATA DESCRI	ΤΙΟΝ	CLASS.	ELEV. (FT)	WL	S DEPTH	AMPLING	TESTS	REMARKS
58.5 -	ELASTIC SILT, gray		MH	51.6			6+7+10 N =17 REC =18	w=33.8% LL=78 PL=45 *	
63.5	SANDY SILT, gray		ML	46.6		 	4+7+7 N =14	w=21.9% LL=37	
-						65	REC =18	" PL=27 *	
68.5 	SILTY SAND, trace fine to sand and organic matter (± indurated lean clay layers (medium 1%), mostly ±100%).	SM	41.6		×	34+50/2" N =50/2" REC =8"	w=25.4% LL=NP PL=NP *	*Switched to 5" O.D. Tri-cone roller bit below 69 ft.
· · · · · · · · · · · · · · · · · · ·						 75 	50 REC =5"	w=22.8%	*Moderately difficult rotary advancement from 69.5 to 72 ft (slow rotary advancement).
78.5	SANDY SILT, wet, mostly t shell fragments (±70%), str reaction.	ine to coarse ong HCI	ML	31.6		 	16+18+2 N =39 REC =12	1 w=21.9% *	
83.5	SILTY SAND, gray and ligh gray, contains strongly cen pockets.	t greenish ented sand	SM	26.6		 - 85-	9+8+17 N =25 REC =14	w=25.6% *	*Switched to 4-3/4" O.D. Drag bit below 83.5 ft. *Extreme difficultly in rotary advancement
	little fine to coarse shell fra (±15%), contains black par inch). continued on next p	gments icles (1/16 <i>age</i>				 	25+11+12 N =23 REC =18	2 w=23.1%	from 85.5 to 88.5 ft (moderate rig chatter, slow advancement). *Switched to 5" O.D. Tri-cone roller bit below 88.5 ft.

	-	hnabel DODWO	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	Borin	g Number:	B-423
Sc	chnal	bel Engineering LOG	C C	alvert Cou	inty, Ma	iryland		Contr Sheet	ract Number: 0 t: 4 of 7	6120048
DEF (F	PTH T)	STRATA DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	S/ DEPTH	AMPLING DATA	TESTS	REMARKS
		gray and dark gray, trace fine medium shell fragments (±5% HCl reaction.	e to 6), weak	SM			 95	5+6+10 N =16 REC =18"	w=29.8% *	*Very difficult rotary advancement from 88.5 to 92 ft (strong rig chatter).
100.	- - 0.0	light greenish gray and gray, coarse shell fragments (±10% POORLY GRADED SAND W gray, trace fine to medium sh fragments (±5%), moderate F reaction.	few fine to 6). /ITH CLAY, ell ICI	SP-SC	- 10.1		 100-	13+13+18 N =31 REC =18"	w=27.4%	
	-						 105	REC =21"	w=23.1% LL=24 PL=18 *	*Osterberg sampler tube push from 103.5 to 105.3 ft
	-	greenish gray and blueish gra fine to medium shell fragmen very weak HCl reaction.	ay, trace ts (±1%),				 110-	4+8+9 N =17 REC =18"	w=30.8% *	
SCHNABEL.GDT 3/6/08	-						 115 	REC =0"		*Osterberg sampler tube push ftom 113.5 to 113.8 ft *Slight to moderately difficult rotary
G 06120048 PLOG SPT 300 & 400.GPJ	- 0. - - -	SILTY SAND, fine to medium wet, gray and light greenish of fine to coarse shell fragments strong HCI reaction.	grained, gray, mostly s (±70%),	SM	6.9		 120- 	6+16+50/4" N =66/10" REC =18"	w=26.2% LL=NP PL=NP *	advancement from 113.5 to 118.5 ft (slight to moderate rig chatter). **Resumed drilling at 10:30 AM on 6/12/06. *Slight to moderate difficulty in rotary advancement
TEST BORING LC	-	gray and greenish gray, weal continued on next page	k HCl ge				 ¤	4+11+19	w=33.9%	from 118.5 to 120 ft (slight rig chatter).

Γ		the shall be	EST Project:	Calvert Cliff	s Nucle	ar Pow	er Plant		Boring Number:	B-423
ſ	Schn	abel Engineering	RING OG	Calvert Cou	inty, Ma	iryland			Contract Number: Sheet: 5 of 7	06120048
	DEPTH (FT)	STRATA DES	CRIPTION	CLASS.	ELEV. (FT)	WL	бертн		G TESTS	REMARKS
F		reaction.		SM				N =30	8"	
	-	_					125 ^L		0	
		-								
								11+17+	20 w=31.9%	
								N =37 REC =1	8"	
		_								
	132 0				-21.9					
		SANDY SILT, fine to m greenish gray, trace fir	nedium, moist, ne to coarse shell	ML						
		pockets, very weak HC	ains indurated silt CI reaction.					6+12+1	8 w=37.1%	
	-	trace fine to medium s	hell fragments				-135-	REC =1	8"	
	137.0	SILTY SAND, moist, a	reenish grav.	SM	-26.9					
		trace fine to medium s (±5%), very weak HCI	hell fragments reaction.							
		-					1)	8+10+1 N =24	4 w=45.1%	
	-	_					-140-	REC =1	8"	
		-								
		-								
		- dark greenish grav, fev	w fine to coarse					7+9+17	w=38.9%	
		shell fragments (±10% matter (±1%), contains), trace organic clayey sand					N =26 REC =1	8"	
6/08	-	layers (high percentag	e of sand).					-		
3/(_								
ABEL.0		strong HCI reaction								
SCHN		_						7+18+1	5 w=32.8%	
0.GPJ	-	_					-150-	REC =1	8"	
00 & 40		_								
SPT 3	152.0	SANDY LEAN CLAY. 1	fine to medium.	CL	-41.9					
8 PLOG		moist, dark greenish g coarse shell fragments	ray, trace fine to s (±<5%), strong	_			$ \left - \right _{-} $			
312004		_ HCI reaction.					+ -1)	5+9+13 N =22	W=44.9%	
00 00	-	-					-155-	y REC =1	δ	
RING		-								
EST BO		continued on r	next page							

SC	hnabel TEST BORING	Project: C	alvert Cliff	s Nucle nty, Ma	ar Pow ryland	ver Plant	B	oring Number:	B-423
Schnat	pel Engineering LOG						S	heet: 6 of 7	U 120040
DEPTH (FT)	STRATA DESCRIPT	TION	CLASS.	ELEV. (FT)	WL	S. DEPTH	AMPLING	TESTS	REMARKS
- 158.5 -	ORGANIC CLAY, trace fine t shell fragments (±5%) and m contains indurated lean clay weak HCl reaction.	o coarse ica, pockets,	CL OH	-48.4		 	REC =19"	w=44.9% LL=74 PL=18 PP=>4.5 tsf	*Osterberg sampler tube push from 158.5 to 160.0 ft
- 162.0 - - - -	ELASTIC SILT, moist, dark g gray, trace fine to medium sa mica, weak HCI reaction.	reenish and and	MH	51.9		 - 165-	8+10+14 N =24 REC =18"	w=59.7%	
- 167.0 - - - -	SILT, moist, dark greenish gr fine to medium sand, trace fir coarse shell fragments (±5% HCI reaction.	ray, with ne to), moderate	ML	56.9		 - 170-	4+7+11 N =18 REC =18"	w=41.0%	
172.0 -	SILTY SAND, moist, gray		SM	61.9		 175-	8+8+12 N =20 REC =18"	w=49.7%	
	contains indurated elastic silt	pockets.				 - 180- 	REC =16"	w=41.5% LL=64 PL=34 PP=>4.5 tsf	*Osterberg sampler tube push from 178.5 to 179.5 ft *Swiched to 5" O.D. Tri-cone roller bit below 178.5 ft.
- - 185.0 — -	greenish gray, very weak HC ELASTIC SILT, moist, dark g gray, trace fine to medium sa mica, weak HCI reaction.	I reaction. reenish and and	мн	74.9		 	6+8+11 N =19 REC =18"	w=73.3%	**Resumed drilling at 7:00 AM on 6/13/06.
	trace fine sand, mostly indura silt layers.	ated elastic ge				 ™	REC =8"	w=72.4% LL=111 PL=70	*Osterberg sampler tube push from 188.5 to 190.0

-	chnabel	TEST BORING	Project: C	alvert Cliffs alvert Cou	s Nucle nty, Ma	ar Pow ryland	er Plant		Boring	g Number: act Number: 0	B-423
Sch	nabel Engineering	LOG							Sheet	7 of 7	
DEPT (FT)	H STRA	TA DESCRIPT	ION	CLASS.	ELEV. (FT)	WL		SAMPL	ING	TESTS	REMARKS
	- - - - weak HCl read	ated elastic silt ction.	pockets,	MH			 	5+10 N =2 REC	+14 4 =18"	w=71%	π
201.5	LEAN CLAY, dark greenish sand, trace m BOTTOM OF	moist, greenish gray, with fine ca, weak HCl r BORING @ 20	gray and to medium eaction. 1.5 FT.	CL	-88.9		 -200- 	6+9+ N =2 REC	15 4 =18"	w=45.3%	**Resumed grouting at 7:00 AM on 6/14/06.
EST BORING LOG 06120048 PLOG SPT 300 & 400.GPJ SCHNABEL.GDT 3/6/08											

Schnal	TEST Project: C bel Engineering LOG	alvert Cli alvert Co	ffs Nucle ounty, Ma	ar Pow ryland	/er Pla	nt	Boring Contra Sheet:	Number: ct Number 1 of 4	e r: 061200	B-424
Boring (Gro	oundwater Obs	ervations		
	MALAGA, NEW JERSEY					D	ate Time	Depth	Casing	Caved
Boring F	Foreman: J. Blemings		Enco	untere	d	4	/27	23.5'		
Drilling E	Equipment: CME-750	-								
Schnabe	el Representative: B. Bradfield									
Dates 3	Started: 4/27/06 Finished: 4/28/06									
Location	n: Northing: 216263.3 ft Easting: 960818.6 ft									
Ground	Surface Elevation: 118.9 (feet)									
DEPTH (FT)	STRATA DESCRIPTION	CLASS	6. ELEV. (FT)	WL	DEP	S. ТН ∣	AMPLING DATA	TEST	S F	REMARKS
0.3	ROOTMAT AND TOPSOIL.	SM	118.6			Л	1+2+3			
-	SILTY SAND, fine to medium grained, moist, light brown, contains root fragments.	Sivi			-	<u> </u>	N =5 REC =15"			
2.5	SANDY LEAN CLAY fine to medium	CI	116.4				1+2+3			
	moist, orangeish brown.	02			F		N =5			
-	-				F		REC =13"			
					- 5 -					
						M	2+2+4 N =6			
	-				F	-10	REC =2"			
7.0 -			111.9		F	-				
_	medium to coarse grained, moist,	58-210					2+1+3			
	brownish orange, w/ iron staining.				Γ		N =4			
-					F		REC =12"			
	orangeish brown, no iron staining.				-10-	_				
							2+5+4			
-					F		N =9			
-	vellowish brown, trace gravel, w/ slt, iron				-	-14	REC =12"			
_	staining.				L					
							E 1 7 1 0			
-	_				F	HVI	5+7+8 N =15			
					-15-	-14	REC =12"			
-					Γ	1				
17.0 -	SILTY SAND medium to coarse	SM	101.9		F	+				
_	grained, moist, orangeish brown, trace				L					
	tine to medium gravel.						10+10+0			
-	-				F	- \/	N =19			
-					-20-	44	REC =13"			
					L					
-					Γ]				
22.0 -	POORLY GRADED SAND WITH SILT	SP-SM	96.9		F	+				
_	fine and coarse grained, wet, orangeish			_	L					
	☐ brown and gray, trace fine to medium ☐ gravel.			¥			6+13+12			
-	moist, orangeish brown and gray.				F	1	N =25			
	continued on payt page				-25-	- 14	REC =14"			

	TEST P	roject: Calvert Cliff	s Nucle	ar Pow	er Plant	Boring Number:	B-424
Schnal	bel Engineering LOG	Calvert Cou	inty, Ma	aryland		Contract Number: 0 Sheet: 2 of 4	6120048
DEPTH (FT)	STRATA DESCRIPTIO	N CLASS.	ELEV. (FT)	WL	SAMPLI DEPTH D	NG TESTS	REMARKS
_		SP-SM					
_							
_	brownish orange and gray.						
_	fine to medium grained.				6+9+1	5	
_					N =24	=14"	
_							
-		(0 slave					
-	lenses.	/2 clay					
-					9+14+	17	
					-35-0 REC =	=14"	
-							
-	brownish orange and gray.						
-							
-					3+4+5 N =9	5	1///" clay lense
-					40 <u>[]</u> REC =	=15"	
-							
-	brownish orange and mottled gra	ay,					
-					⊢ – ∏ 6+5+4		
44.8			74.1		N =9		
	CLAYEY SAND, fine to medium grained, moist, brownish orange	e and					
- 6/08	gray.						
1 3/							
48.5 -	POORLY GRADED SAND WITH	H SILT, SP-SM	70.4		9+11+	-16	
sch	brown, trace gravel.	orange			0 REC =	=16"	
1 1 1 1 1 1							
52.0 -	I FAN CLAY with sand moist da	ark Cl	66.9				
- 13	gray.						
					1+5+6 N =11	;	
120048					55/	=18"	
- 00 00							
שמים 19 19 19	FAT CLAY with sand, moist, dar	rk gray. CH	61.9				
	continued on next page						
<u> </u>							

Γ		the shall be	ST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant		Boring	Number:	B-424
	Schna	bel Engineering	C	alvert Cou	nty, Ma	ryland			Contra Sheet:	ct Number: 0	6120048	
F	DEPTH					ELEV.			SAMPLIN	IG		
	(FT)	STRATA DES	CRIPT	ION	CLASS.	(FT)	WL	DEPTH	DA	ТА	TESTS	REMARKS
					СН				WOH+	5+7	PP=1.25 tsf	
	-							F 1 X	N =12	10"		
								-60-		10		
	-											
	-											
	-											
	-							L -17	WOH+4	4+5	PP=2.50 tsf	
	64.5	CLAYEY SAND, fine to	mediu	ım	SC	54.4		65-0	REC ='	18"		
	_	grained, moist, dark gra	ay.									
	67.0 -	FAT CLAY with sand, r	noist, g	gray.	СН	51.9						
	-	_									PP=3.00 tef	
	-							$\vdash \dashv X$	N =15		11 - 5.00 (3)	
	_							-70-	REC ='	18"		
	-											
	72.0 -		modiu	Im	<u>sc</u>	46.9						
	-	grained, moist, gray.	meuic	4111	00							
	-								4+6+7			
									N =13 REC ='	18"		
	_											
	77.0					44.0						
	//.0 -	POORLY GRADED SA	ND, fii	ne to	SP	41.9						
	-	gray, trace clay, glauco	onite	cenisii					1 00.504	0"		
8	-							- 18	N =50/3	3 3"		
3/6/0								-80-	REC =	5 "		
L.GD1	-											
NABE	-	_										
SCH	-											
0.GPJ	-	_							³ 50/2"			
0 & 40									REC =2	<u>2</u> "		
PT 30(_											
OG S												
048 PL	-	with fine to medium she	ell frag	ments,								
061200	-								50/4"			
000	-	-						├ ┤	N =50/4	4"		
SING L		•						-90-				
T BOF	-	continued on n	ext pag	е				\vdash \dashv				
TES												

	bachal	Project: (Calvert Cliff	s Nucle	ar Pow	er Plant		Borin	g Number:	B-424	
Schnat	Del Engineering		Calvert Cou	inty, Ma	ryland			Contr Sheet	act Number: 0 : 4 of 4	6120048	
DEPTH (FT)	STRAT	A DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	DEDTL	SAMPL		TESTS	REMARKS
				SP			DEFIR	1 1			
92.0	CLAYEY SAND	, fine and coa	arse	SC	26.9						
-	to coarse shell f	gray and whit ragments, str	e, with fine ong HCI								
-	reaction.						$\left - \right $	0+9+ N =2	17 6		
-							-95-		=18.		
-											
	gray and brown	ish white, trac	ce gravel.								Hard drilling
								7 4+10	+07		
							$ \rangle$	N =4	+27 6 =18"		
100.0 —	BOTTOM OF B	ORING @ 10	0.0 FT.		18.9		-100-4		-10		
8											
5											
04007											
8											
2											

Schnab	hnabel BORI BORI	T Project: NG G	Calvert Cl Calvert Co	iffs Nucle ounty, Ma	ar Pov aryland	ver Pla	nt	Boring Contra Sheet	g Number act Number : 1 of 4	: er: 06120	B-42
Boring C	ontractor: UNI-TECH DR	ILLING					Gr	oundwater Obs	servations	;	
Doning O	MALAGA, NE	N JERSEY	L				D	ate Time	Depth	Casing	Caved
Boring Fo	oreman: J. Evans			Enco	untere	ed	4	/28	Dry		
Drilling N	lethod: Mud Rotary		-								
Drilling E	equipment: FAILING-1500		-								
Schnabe	I Representative: R. Vinza	nt									
Dates S	Started: 4/28/06 Finishe	d: 5/1/06									
Location	: Northing: 216247.5 ft Easting: 961274.7 ft										
Ground S	Surface Elevation: 118.4 (f	eet)									
DEPTH (FT)	STRATA DESCR	RIPTION	CLASS	S. ELEV.	WL		S TU		TEST	s I	REMARKS
. ,	POORLY GRADED SAN	D WITH SILT.	SP-SM	1		DEP	TH	DATA 2+6+8	w=13.7	%	
-	fine to medium grained, r brown, trace organic mat	noist, reddish ter.				-	- X	N =14 REC =18"	*		
-						F	1				
-						-	1_				
-						+	-1	3+3+4 N =7	w=7.3	%	
_						- 5 -	ЦД	REC =13"	W-2 E	%	
_							W	3+4+3 N =7	vv=2.5	/0	
						 	Ш	REC =18"			
-						F	1				
-						\vdash	-				
-	brown.					\vdash	-0	2+2+3 N =5	w=10.8	3%	
_						-10-	ЦД	REC =14"		b0/	
							M	3+3+4 N =7	w=14.2	_ /0	
							U	REC =14"			
-						F	1				
-						\vdash	-				
-						+	-0	6+5+6 N =11	w=16.4	1%	
_	.					-15-	10	REC =14"			
	fine to medium grained, trace fine gravel.	moist, brown,									
1	- 0					Γ]				
-						F	1				
-						\vdash	-				
-						+	-				
						-20-				0/	
							M	8+9+9 N =18	w=11.1	70	
1						Γ	ηŊ	REC =15"			
-						F	1				
-						\vdash	-				
4						F	_				
_											
	continued on nex	t page				-25-					
Comments 1. Boring b	continued on nex s: packfilled with cement/bento	<i>t page</i> nite grout throug	h tremie p	ipe upon	comple	-25-					

	TEST	Project: Calv	ert Cliffs	Nucle	ar Pow	er Plant		Borir	ng Number:	B-425
	BORING	Calv	ert Cour	nty, Ma	ryland			Cont	ract Number: 06	6120048
Schna	bei Engineering LOG							Snee	at: 2 of 4	
DEPTH	STRATA DESCRIPT	ION C	LASS.	ELEV. (FT)	WL	DEDTI	SAMP		TESTS	REMARKS
		S	P-SM	. ,		DEPTE	I / 15+	19+14	w=11.6%	
	-)		33	*	
	orangeish brown.							J =18"		
-	-									
	-									
	-					-30-	7		w-15 2%	
							(13+ (N =	14+15 29	*	
						F 74		C =13"		
	-									
	-									
	-									
						25				
_]					-35-	13+	13+14	w=12%	
	-							27 C =13"		
	-									
	-									
-										
-	-					-40-	7 14+	17+19	w=14.9%	
	-					//		36 . =12"	*	
41.5	WELL GRADED SAND WITH	I SILT, S	W-SM	76.9		Ľ		5 12		
	medium grained, wet, orange	eish brown.								
-										
-	-									
-	-					-45-	7 17+	17+10	w=13.7%	
	-)	(N =	36	*	
80/3	dark brown, with fine gravel.					Ľ		3 =16"		
- <u>-</u>]									
- 60	1									
. ABE	4					\vdash				
	-					-50				
Lap							/ 11+ N =	14+14 28	LL=28	
51.5				66.9		- 74		C =14"	PL=17 *	
- 200 8	grained, wet, orange.	medium	CL							
- SPT										
- EOG	-									
)48 P										
 	1					-55-	3+3	+4	w=28.2%	
0 0	1					⊦ - /	RE(/ C =18"	PL=19	
ے 10 - 57.0	EAT CLAX with cond wat a	ray	CLI	61.4				~ -24"	w=31.2%	
SORIF	TAT CLAT, with sand, wel, g	iay.	СП					5 -24	LL=55	
ESTE	continued on next page	ge								
۳ L										

Γ		hnabal	TEST	Project: Ca	alvert Cliffs	s Nucle	ar Pow	er Plant		Во	ring Number:	B-425
	Sahaal			Ca	alvert Cou	nty, Ma	ryland			Col	ntract Number: 0	6120048
┢	Schnal	bei Engineering	LUG						~ ~			
	DEPTH (FT)	STRATA D	ESCRIPTI	ON	CLASS.	ELEV. (FT)	WL	DEDT	5A		TESTS	REMARKS
┢	. ,				СН	. ,		DEPT	1	DATA	PL=25	
	_				0						*	
								00	NI:	3+3+4 N -7	w=35.1% LL=63	
	-								Δli	REC =18"	PL=21	
	-											
	_											
	_											
								-65-		REC =24"	w=39.5%	
	-										PL=28	
	-											
	_											
	_											
	70.0 —	ELASTIC SILT, gra	у		MH	48.4		-70-	71	6+6+9	w=38.4%	
	-								<u>N</u>	N =15 REC =18"	PL=42	
	-											
	_											
	_											
	75.0 —	CLAYEY SAND, da	irk gray		SC	43.4		-75		REC =24"	w=21.8%	
	-										PL=20	
	-											
	_											
	_											
/08												
T 3/6									71	22+35+50/4	w=31.7%	
GD	81.0 - 81.5	SILTY SAND, fine g	grained, mo	oist, dark	SM	37.4 36.9			Δ¦	N =85/10" REC =18"		
NABE	- 01.5	reddish brown, with	fine to coa	arse shell	SP	50.5						
SCH	_	POORLY GRADED) SAND, fir	ne to								
GPJ	_	medium grained, w	et, dark gra	ay, with								
\$ 400		onen nugmento.										
300 8								-85-	71:	7+10+24	w=19%	
3 SPT	-								M	N =34 REC =16"		
PLOC	-											
0048	_											
0612	_											
LOG												
SING								-90-	\mathbb{Z}	29+19+17	w=20.5%	
1 BQ	_	continued	on next page	e				⊢ ┤	' \ I	N =36		
TES												

Sc	hnabel TEST BORING	Project: Ca	alvert Cliffs alvert Cou	s Nucle nty, Ma	ar Pow ryland	er Plant		Borin	g Number: ract Number: 0	B-425
Schnal	bel Engineering LOG							Shee	t: 4 of 4	
DEPTH (FT)	STRATA DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	DEPTH	SAMI H	PLING DATA	TESTS	REMARKS
			SP					EC =18"		
-										
-										
						95[⊠ 50/ N =	/4" =50/4" 50 = 4"	w=17.9%	
96.5 –	SILTY SAND, fine to medium wet, light gray, with fine grave	grained,	SM	21.9				-4		
-										
						100	50	/0 5"		
_ 101.5				16.9			N =	=50/0.5" EC =0"		
	BOTTOM OF BORING @ 10	1.3 F I.								

Schna	TEST BORING Abel Engineering	Calvert Clif	fs Nucle unty, Ma	ar Pow ryland	ver Pla	nt	Boring Contra Sheet:	Number: ct Number 1 of 4	er: 06120	B-426
Boring	Contractor: CONNELLY AND ASSOCIATES	S. INC.				Grou	Indwater Obs	ervations		
	FREDERICK, MARYLAND	.,				Dat	te Time	Depth	Casing	Caved
Boring	Foreman: W. Wolf		Enco	untere	d	7/2	8	9.0'		
Drilling	Equipment: CME-550X (ATV)		Start	of da	y	7/3	1	11.5'		
Schnab	el Representative: K. Bell / K. Megginson		Start	of da	y	8/1	1	43.5'		
Dates	Started: 7/28/06 Finished: 8/3/06		Start	of da	У	8/2	2	43.5'		
Locatio	n: Northing: 216193.04 ft Easting: 961386.57 ft									
Ground	Surface Elevation: 83.7 (feet)				1					
DEPTH (FT)	STRATA DESCRIPTION	CLASS	ELEV. (FT)	WL	DEP	SAN TH	MPLING DATA	TEST	s i	REMARKS
	POORLY GRADED WITH SILT, fine and coarse grained, moist, brown, trace root fragments.	SP-SM			_	- 3 R R	+3+3 I =6 REC =14"		AW	J rods used
	yellowish brown, trace gravel.				-		+3+4 I =7 REC =16"			
-	-				5 - -		+4+4 I =8 REC =16"			
· · ·	wet, yellowish brown and orangeish brown.			Ţ	-		+2+3 I =5 REC =12"			
12.0	moist, orangeish brown and reddish brown.		- 71.7				+4+5 I =9 REC =12"			
	wet, yellowish brown and orangeish brown.	50			_		+2+3 I =5		*4- Ho Aug froi ft.	1/4" I.D. low Stem gers used n 0 to 13.5
-	-		00.7				EC = 17		*Sv 3-7 Tri- bit	vitched to /8" O.D. cone roller below 13.5
	SILTY SAND, fine to coarse grained, wet, yellowish brown, trace fine grave.	SM	00.7]	+2+1		II.	
_					20-	N R 	l =3 REC =0"			
22 0			61 7		L				*SI	ght to
	FAT CLAY, wet, grayish brown and orangeish brown, trace fine to medium sand.	СН			-		+2+3		mo cha ft.	derate rig itter at 22.5
	gray and dark gray, trace mica, contains clayey sand and silty sand pockets <i>continued on next page</i>				25-		I =5 REC =18"			

ſ	6	TEST P	roject: Ca	Calvert Cliffs Nuclear Power Plant					Boring Number:		B-426
	Schnal	bel Engineering LOG	Ca	alvert Cou	nty, Ma	iryland			Contra Sheet:	ct Number: 00	6120048
F	DEPTH		N	CI 499	ELEV.	\ \ /I	s		G	теете	DEMADKS
	(FT)	STRATA DESCRIPTION	N	CLASS.	(FT)		DEPTH	DA	TA	12313	REWARKS
	_	below 24 ft.		СН							
	27.0				56 7						
	27.0	ELASTIC SILT, moist, gray and gray, trace fine to medium sand.	dark mica.	MH	50.7						
	_	and organic matter (±1%), conta	ins					3+3+3			
	_						F _ 1	N =6	18"		
							-30				
	_										
	_										
	_										
	_	gray.					F 1 X	N =8	10"		
							-35-	REC =	10		
	_										
	37.0 -	SANDY LEAN CLAY, fine to me	dium,	CL	46.7						
	_	gray clayey sand pockets, contains	ins								
	_	indurated sandy lean clay pocke	IS.				X	3+4+5 N =9			
							-40	REC =	18		
	_										
	42.0 -	CLAYEY SAND, fine to medium		SC	41.7						*Slight to
	_	grained, moist, gray, mostly induction clayey sand layers (±100%).	irated								moderate rig chatter at 43 ft
	44.0 -	SILTY SAND, fine to medium gra	ained,	SM	39.7		X	8+13+4 N =56	3		
		yellowish brown and light brown	rk ,				-45	REC =	18		
8	_	layers and pockets, and dark red	ddish								
T 3/6/0	_	ft.	0 44.1								
EL.GD	_										*Lost ~80 gal of mud from 48.5
HNABI	_	wet, gray.					X	7+5+3 N =8			to 53.5 ft. Thickened mud.
J SC							-50-	REC =	15"		160 gal of mud
400.GI	_										(2 Datches).
300 &	_										became
G SPT	_										seized at 47 ft
18 PLO	-	tew tine to coarse shell fragment $(\pm 10\%)$, contains shell bed layer	ts from				F -1 X	19+36+ N =86	·50		by running sands). Ran
312004		54 to 54.3 ft, strong HCI reaction	1.				-55-	REC =	18		4-1/4" I.D. HSA to 53.5 ft to free
000	-										rod. *Switched to
RING L	-										3-7/8" O.D. Tri-cone roller
ST BOF	-	continued on next page									
Ĕ											

	hnabol TEST	Project:	Calvert Cliff	s Nucle	ar Pow	er Plant	Borii	ng Number:	B-426
Schnak	bel Engineering LOG	IG	Calvert Cou	nty, Ma	iryland		Cont Shee	ract Number: 0 et: 3 of 4	6120048
DEPTH (FT)	STRATA DESCRI	PTION	CLASS.	ELEV. (FT)	WL	SA DEPTH	MPLING	TESTS	REMARKS
-	moist, mostly strongly cerr layers (±90%), few fine to fragments (±10%).	ented sand coarse shell	SM			K	50/5" N =50/5" REC =2"		bit below 53.5 ft. *Slight to moderate difficulty in rotary advancement from 53.5 to
62.0 -	CLAYEY SAND, fine to me grained, moist, gray and o contains strongly cemente pockets, trace fine to coars fragments (±5%).	edium liveish gray, d sand se shell	SC	21.7		 65 	ô+50 N =50 REC =14"		57.5 ft (slight rig chatter). *Very to extremely difficult rotary/auger advancement from 57.5 to 58.5 ft. *Lost additional
67.0 -	SILTY SAND, fine to medi wet, gray, little fine to coar fragments (±15%), modera reaction.	um grained, se shell ate HCl	SM	16.7		 	6+7+11 N =18 REC =18"		80 gal of mud between 53.5 to 58.5 ft. With rig off, can hear mud quickly draining into formation. *Ran 4-1/4" I.D. HSA to 58.5 ft. *Sampler refusal at 58.9
72.0 -	CLAYEY SAND, fine to me grained, wet, gray and gre trace fine to coarse shell fi (±5%), contains sandy silt weak HCI reaction.	edium enish gray, 'agments pockets,	SC	11.7		 75	5+5+9 N =14 REC =18"		ft. **Resumed drilling at 7:20 AM on 8/1/06. *Due to significant mud loss, attempted to run augers to 63.5 ft in order to socket
77.0 - - - - - - - - - - - - -	SILTY SAND, fine to medi wet, gray and light greenis fine to medium shell fragm very weak HCI reaction.	um grained, h gray, trace ents (±<5%),	SM	- 6.7		 	1+5+8 N =13 REC =18"		augers in a low permeable strata. However, augers became sand-locked overnight due to running sands. Augers successfully
	CLAYEY SAND, fine to me grained, wet, gray and ligh gray, trace fine to medium fragments (±5%), contains particles (1/16 inch), very reaction.	edium t greenish shell black weak HCl	SC	1.7		 85 	4+4+7 N =11 REC =18"		un-sand-locked with considerable effort. **Resumed drilling at 12:40 PM on 8/2/06. *Moderate to very difficult rotary advancement from 59 to 60.5 ft (moderate to
	light greenish gray and gre mostly fine to coarse shell (±70%), contains moderate sand pockets, strong HCI light greenish gray, some continued on next	eenish gray, fragments ely cemented reaction. fine to coarse page				1 90	18+7+9 N =16 REC =18"		*Moderate to difficult rotary advancement from 60.5 to 62

	hnabel BODING	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant		Boring Num	ıber:	B-426
Schnal	bel Engineering LOG		aivert Cou	nty, ivia	iryiand			Contract Nu Sheet: 4 of	1 mber: 00	3120048
DEPTH (FT)	STRATA DESCRIP	TION	CLASS.	ELEV. (FT)	WL	S DEPTH	SAMPLIN	IG T	ESTS	REMARKS
	shell fragments (±30%) belo	w 89 ft.	SC							ft. *Ran 4-1/4" I.D.
92.0 -	SILTY SAND, fine to mediur wet, gray and greenish gray coarse shell fragments (±10 HCI reaction.	n grained, , few fine to %), weak	SM	8.3		 95	6+8+10 N =18 REC =1) 18"		HSA to 63.5 ft. *More mud loss. *Modrate to difficult rotary advancement from 88 to 88.5 ft (moderate to strong rig chatter)
97.0 -	CLAYEY SAND fine to mer	lium	SC	-13.3						onditor).
-	grained, wet, greenish gray, medium shell fragments (±1 moderate HCI reaction.	trace fine to %),	30			 X	7+11+1 N =29	8		
100.0 —	BOTTOM OF BORING @ 1	00.0 FT.		-16.3		-100-	∬ REC =1	18"		

Schnak	TEST Project: C BORING C C Del Engineering LOG C	alvert Clif alvert Co	fs Nucle unty, Ma	ar Pov Iryland	ver Pla	int	Boring Contra Sheet:	Number: Act Number 1 of 5	er: 06	61200	B-427
Boring C	ontractor: CONNELLY AND ASSOCIATES	, INC.				Gro	oundwater Obs	ervations			
	FREDERICK, MARYLAND	· _				D	ate Time	Depth	Cas	ing	Caved
Boring F	oreman: D. Reese		Enco	untere	ed	5	5/2	44.0'	3.	5'	
Drilling N	Method: Mud Rotary		Start	of da	v	5	5/3	17.0'	5.	0'	
Drilling E	Equipment: CME-75				,					-	
Schnabe	I Representative: M. Arles										
Dates S	Started: 5/2/06 Finished: 5/2/06										
Location	: Northing: 216164.05 ft Easting: 961272.73 ft										
Ground \$	Surface Elevation: 116.3 (feet)										
DEPTH (FT)	STRATA DESCRIPTION	CLASS	ELEV. (FT)	WL	DEP	S. TH	AMPLING DATA	TEST	s	R	EMARKS
0.3	ROOTMAT AND TOPSOIL.	SM	116.0			M	1+5+4 N -0	PP=4.50) tsf	Holle	ow stem er
	SILTY SAND, fine to medium grained, moist, orangeish brown.				Ĺ	1	REC =16"			Jug	
							3+3+3	w=9.4	%		
							N =6	*		Mud	rotary
-					-		REC = 14				,
					- 5 -		1+2+2				
_					L		N =4				
							REC =14"				
7.0 -	POORLY GRADED SAND WITH SILT,	SP-SM	109.3		F			w-7.0	0/		
-	fine to medium grained, moist, orange				-	HM	4+5+7 N =12	w=7.9	70		
-					-	$ \Box $	REC =18"				
					_10-						
							37373				
_					F		N =6				
-					-		REC =18"				
_											
							4+4+4				
_							N =8				
					-15-	- 14	REC =15"				
-					F						
170 -			99.3		L						
	SILTY SAND, fine to medium grained, moist orange	SM	00.0								
-	molet, orange				F				0/_		
_					╞	-	4+4+5 N =9	w=8.2	/0		
					-20-	_ [1]	REC =18"				
					L						
					Ē.						
22.0 -	POORLY GRADED SAND WITH SILT,	SP-SM	94.3		F						
-	fine to coarse grained, moist, orange.				\vdash	-					
					L		9+13+14				
						١Ň	N =27 REC =15"				
	continued on next page				-25-						

		hashal	TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant		E	Boring	Number:	B-427
	Schna	hel Engineering		C	alvert Cou	nty, Ma	ryland				Contra	ct Number: 06	6120048
E	Schha	ber Engineering	200						9		sneet:	2 01 5	
 	(FT)	STRAT	A DESCRIPT	ION	CLASS.	ELEV. (FT)	WL		יכ נ		, ,	TESTS	REMARKS
┢					SP-SM				1	DAI	A		
		-											
	-	-											
	-									7+0+7		w=12.2%	
	-	-						+ +	XII	N =16		*	
		-						-30-1	<u> </u>	REC =10)"		
		-											
		-											
	33.5		ED SAND fi	ne to	SP	82.8				11+12+1	2		
	-	coarse grained,	moist, orange	eish white,	JF				XII	N =24	2		
	_	with fine gravel.						-35-4		REC =14	."		
	-	-											
	-	-											
	-									10+15+1	2	w=13.6%	
	-	orange.						+ +	XII	N =28	3	*	
		-						-40-4		REC =18	3"		
	-	-											
	-	_											
	43.5				CD CM	72.8				10,12,1	~		
	-	fine to medium g	grained, wet,	orange.	5P-5M		<u> </u>		XII	N = 25	3		
		-						-45-		REC =15	5"		
	-	-											
6/08	-	_											
DT 3/													
EL.GI	-	1								10,10,1	<u>_</u>	w=18.6%	
HNAB	-	-						+ +	XII	N =25	3	*	
l sci	_	-						-50-1		REC =15	5"		
0.GP,	-	-						$ \mid $					
0 & 40	-	-											
T 30(
JG SF	53.5		o grained	oiot	<u> </u>	62.8				5+0+15			
8 PLC	-	mottled orange a	and white.	0151,	SIVI				XII	N =24			
12004		1						<u> </u> −55– ^ℓ	<u> </u>	REC =15)"		
00,0	-	-						├ ┤					
GLQ	-	4											
ORIN													
ST B(-	continu	ed on next pag	e				[]					
Ľ∟													

	2	hnahal	TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant		Boring Number: B-427	
Sch	nat		BORING LOG	C	alvert Cou	nty, Ma	ryland			Contract Number: (06120048
DEPT	н	er Engineering				FI FV		s		G	
(FT)		STRAT	A DESCRIPT	ION	CLASS.	(FT)	WL	DEPTH	DAT	TESTS	REMARKS
58.5			nist dark grav	, with	CI	57.8			4+5+7		
	-	sand.	JISI, UAIK YIAY	y, wiui				F 1 X	N =12	0"	
	-							-60-	REC = 1	8	
	-										
	-										
	-										
63.5	-	SANDY, ORGAN	NIC CLAY, m	oist, dark	OH	52.8			REC =2	4" w=32.8% LL=56	
	_	gruy.						-65-		PL=18 PP=2.50 tsf	
	_									*	
	_										
	_										
		trace sand.							5+7+5		
									N =12 REC =1	8"	
73.5	-		fine grained	moiot	80	42.8				6"	
	-	dark gray.	, inte granteu,	, moist,	30				REC - I	5 = 10	
	-							-75-			
	-										
	-										
70 5	-					27.0					
/ / 0.5	-	SILTY SAND, fir moist. dark brow	ne to medium /nish orange.	grained,	SM	57.0		18	44+50/3 N =50/3	w=23.1%	
3/6/08	_	,	5 - 5					-80-	REC =1	0"	
GDT	_										
IABEL	_										
SCH	_										
	_								50/4"	_	
8 400								-85-	REC =4		
1 30C											
00.5											
048 PL											
06120(trace fine to mor	tium shell fro	aments					³ 50/2"		
LOG C		weak HCl reaction	on.	ginenio,					N =50/2	"	
RING	-							-90-			
ST BO	-	continu	ied on next pag	<i>ne</i>							
Ë											

ſ	6	TEST	Project: 0	Calvert Cliff	s Nucle	ar Pow	er Plant	E	Boring Number: B-42		
	Schnal	bel Engineering LOG	6 0	Calvert Cou	nty, Ma	ryland		C S	Contract Number: 0 Sheet: 4 of 5	6120048	
	DEPTH (FT)	STRATA DESCRIP	TION	CLASS.	ELEV. (FT)	WL	S		TESTS	REMARKS	
				SM							
	-										
	_							50/4"	w=12.0%	Rig chatter	
							—95—	N =50/4" REC =3"			
	-										
	-										
	_	<i>.</i>									
	-	green, trace fine to medium fragments, weak HCI reaction	st, grayish shell in.					N =15 REC =18			
	-										
	100 5				10.0						
	103.5	POORLY GRADED SAND V fine to medium grained, moi	VITH SILT, st, grayish	SP-SM	12.8			8+12+13 N =25	w=24.8%		
		green, with fine to coarse sl fragments, weak HCI reaction	nell In.				-105-	REC =16	"		
	-										
	_										
	108.5	SILTY SAND, fine to mediur	n grained,	SM	7.8		17	7+9+11 N =20			
	_	coarse shell fragments, moc reaction.	lerate HCI				-110-	REC =18			
	_										
6/08	-										
GDT 3/	113.5	POORLY GRADED SAND	VITH SILT,	SP-SM	2.8		17	9+9+8			
NABEL		green, trace fine to coarse s fragments, weak HCI reaction	shell n.				-115-	REC =13			
PJ SCF	_										
\$ 400.G	-										
PT 300 8	118.5	SILTY SAND, fine to mediur	n grained,	SM	-2.2			3+3+4	w=29.2%		
PLOG SI	_	moist, grayish green, trace f coarse shell fragments, mod	ine to lerate HCl				<u>120</u>	N =7 REC =18	"		
1200481	_										
0G 06	-										
JRING L	_	areenish white with medium	to coarse					6+11+14			
TEST BC	-	continued on next pa	ge					(0 , 11, 14			

	bashal	TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant		Boring	Number:	B-427
Schna	bel Engineering	C	alvert Cou	nty, Ma	iryland			Contra Sheet:	tet Number: 06	6120048	
DEPTH (FT)	STRAT	A DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	DEDTU	SAMPLI	NG	TESTS	REMARKS
-	shell fragments, sand, moderate	contains cen HCI reaction	nented	SM			-125-	N =25 REC =	18"		
-											
-							 [-130-	9+11+ N =25 REC =	14 18"	w=31.4% *	
-											
-							 135 	N =16 REC =	12"		
-							 [5+4+9 N =13 REC =	18"	w=38.5% *	
-											
	with sand, trace fragments, mod	e fine to medi erate HCl rea	um shell ction.				 145 	7+5+8 N =13 REC =	18"	PP=3.00 tst	
	fine to medium	grained, mois	st, green.		22.7			5+6+9 N =15 REC =	18"	w=44.3% *	
150.0 —	BOTTOM OF B	ORING @ 15	0.0 FT.		1-33./				-		
JG 06120048 PLO											

Schna	TEST Project: C bel Engineering LOG C	alvert Clif	fs Nucle unty, Ma	ar Pow ryland	ver Pla	nt		Boring Contra Sheet:	Number: ct Number 1 of 5	er: 061200	B-428
Boring	Contractor: UNI-TECH DRILLING					Gr	oundwa	ter Obs	ervations		
	MALAGA, NEW JERSEY					D	ate	Time	Depth	Casing	Caved
Boring F	Foreman: J. Evans		Enco	untere	d	Ę	5/2		Dry		
Drilling	Method: Mud Rotary										
Drilling	Equipment: FAILING-1500 (Truck)										
Schnabe	el Representative: R. Vinzant										
Dates	Started: 5/2/06 Finished: 5/3/06										
Location	n: Northing: 216109.19 ft Easting: 961210.06 ft										
Ground	Surface Elevation: 114.1 (feet)				1						
DEPTH (FT)	STRATA DESCRIPTION	CLASS	ELEV. (FT)	WL	DEP	S. TH	AMPLIN DA	IG TA	TEST	S F	REMARKS
0.4	ROOTMAT AND TOPSOIL		113.7			M	3+4+4				
-	LEAN CLAY, fine to medium grained, moist, reddish brown.	CL			L	-Ň	N =8 REC =1	14"			
							2.2.2				
-	-				F	HVI	3+3+3 N =6				
4.0 -			110.1		F	ЦШ	REC =1	16"			
	arained, moist, reddish brown.	SC			_						
					- 5 -	M	2+3+3				
-	-		1.0-0		F	HM	N =6 RFC =1	18"			
6.5	SILTY SAND, fine to medium grained,	SM	107.6		L						
	moist, reddish brown.						1+2+2				
-	-				F	HXI	N =4				
					F	ЦШ	REC =1	16"			
	light reddish brown.				10						
					-10-	٦_					
	-				╞	HM	3+4+4 N =8				
120 -			102 1		L	ЦΔ	REC =1	16"			
12.0	POORLY GRADED SAND, fine to	SP	102.1								
-	trace fine gravel.				F						
-	-				F	-M	5+6+7				
150			00.4		4-	M	REC =1	15"			
15.0 -	CLAYEY SAND, fine to medium	SC	99.1		15 -						
-	grained, moist, reddish brown.				F	-					
-					L						
-	-				F	-					
5 -	-				F	-M	15+15+	·12			
			011			M	N =27 REC =1	18"			
20.0 -	SILTY SAND, fine to medium grained,	SM	94.1		²⁰⁻			-			
- 1	moist, light orangeish brown.				┝	-					
-					L						
-	1				F	-					
- S	4				F	$-\square$	14+14+	·16			
						Ŵ	N =30 REC =1	14"			
	continued on next page				-25-			•			
Ĺ											

Comments:
1. Boring backfilled with cement/bentonite grout through tremie pipe upon completion.
2. * = See Appendix I for additional lab testing data.
3. Ground Water Observation Well OW-428A installed at a nearby location
| | TEST | Project: 0 | Calvert Cliff | s Nucle | ar Pow | er Plant | | Boring Number: B-428 | | |
|--------|--|---------------------|---------------|----------|---------|-----------------------|------------------|---------------------------|--------|---------|
| Schna | bel Engineering | i (| Calvert Cou | inty, Ma | iryland | | | Contract Number: 06120048 | | |
| DEDTU | | | | | | 6 | | | | |
| (FT) | STRATA DESCRIPT | TION | CLASS. | ELEV. | WL | | | | STS | REMARKS |
| | medium to coarse grained. | | SM | | | | | | | |
| - | - | | | | | | | | | |
| - | - | | | | | | | | | |
| - | - | | | | | | | | | |
| _ | | | | | | L JM | 11+13+1 | 16 | | |
| | | | | | | ₂₀ | N =29
REC =13 | 3" | | |
| | | | | | | | | | | |
| - | - | | | | | F 1 | | | | |
| - | - | | | | | | | | | |
| - | - | | | | | | | | | |
| - | fine to medium grained dark | reddish | | | | M | 24+16+1
N =26 | 10 | | |
| | brown, with fine gravel | | | | | | REC =4' | • | | |
| - | brown. | light | | | | | | | | |
| 37.0 - | | | | 77 1 | | | | | | |
| 07.0 | POORLY GRADED SAND W
fine to medium grained, wet. | /ITH SILT,
liaht | SP-SM | 11.1 | | | | | | |
| - | brown. | 5 | | | | | 11+12+1 | 14 | | |
| - | - | | | | | F 1 X | N =24 | | | |
| 40.0 | CLAYEY SAND, fine to medi | um | SC | 74.1 | | -40 | REC = I | D | | |
| - | grained, moist, orangeish bro
black, trace fine rock fragme | own and
nts. | | | | | | | | |
| - | - | | | | | | | | | |
| - | - | | | | | | | | | |
| - | - | | | | | L -M | 16+9+10 |) | | |
| | | | | | | L_45[] | N =19
REC =13 | 3" | | |
| | orange, no rock fragments. | | | | | | | | | |
| 00 | | | | | | | | | | |
| | | | | | | | | | | |
| – פ | - | | | | | $ \mid \mid_{\Box} $ | | | | |
| | | | | | | IX | 6+9+6
N =15 | | | |
| 50.0 | FAT CLAY moist grav | | СН | 64.1 | | -50-L | REC =18 | 8" | | |
| | | | | | | | | | | |
| × - | 1 | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | 4+3+5 | | | |
| | | | | | | | N =8
REC =18 | 8" | | |
| | 1 | | | | | | | - | | |
| - | - | | | | | ├ ┤ | | | | |
| - 19 | - | | | | | ╞╴╶┤ <u></u> | REC =2 | 1" PP=1. | 00 tsf | |
| - | continued on next ney | ae | | | | ╞╴╶╢┻ | | | | |
| | | | | | | | | | | |

	-	TEST	Project: 0	Calvert Cliff	s Nucle	ar Pow	er Plant		Boring Number:	B-428
s	chnal	Del Engineering LOG	Calvert Cou	nty, Ma	ryland			Contract Number: 06120048		
DE (f	EPTH FT)	STRATA DESCRIPT	ΓΙΟΝ	CLASS.	ELEV. (FT)	WL	S		G TEST	S REMARKS
<u> </u>				СН	. ,		DEPTH			
59	9.0 -	FAT CLAY, moist, gray, with	sand.	СН	55.1					
							-60-	REC =2	w=37.1	%
	-								LL=6 PL=1	7
	-							REC =2	PP=2.00) tsf
	-								PP=2.00) tsf
	-							REC -2	.0	
	_						-65			
	-								PP=2.50) tef
	_							REC =2	4" 11-2.50	
	_									
	-									
	_						70	REC =7	/"	
7	10 -				43.1					
'		CLAYEY SAND, fine to medi grained, moist, dark gray.	um	SC	10.1					
	_									
	_							9+10+1	2	
								N =22 REC =1	8"	
		with fine rock fragments.								
								50/4"	PP=1.50) tsf
80/3								N =50/4 REC =4	,n ,n	
DT 3/6							-80			
BEL.G										
CHNA	_									
S L de	-							50/3"		
* 400.C	-							N =50/3)" 1	
8	5.0	SILTY SAND, fine grained, n	noist, gray,	SM	29.1		-85-		,	
JG SP	-	moderate HCl reaction.	nonto,							
48 PL(-						⊢ ┤			
61200	-							50/4"		
00	-							N =50/4		
RING							-90-	KEC =4	,	
NI BOI	-	continued on next pag	ge							

	1	bachal	TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant		Boring	Number:	B-428
	20	maper	BORING	C	Calvert County, Maryland					Contract Number: 06120048		
	Scnna	bei Engineering	LUG							Sneet	4 01 5	
	EPTH (FT)	STRATA	A DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	DEDTU			TESTS	REMARKS
					SM							
	-				_							
	-											
									7+13	+50/2"		
	-							F 72	N =63	3/8" -10"		
								95	REC	-19		
	-											
	-											
									7 7 . 8 . 1	2		
	-							F 1))	N =16	5		
								-100-	REC	=18"		
	-											
	_											
	-											
	-							F -1))	N =34	5+19 I		
10	05.0 —		ED SAND fi	ne to	SD	9.1		-105-	REC	=18"		
	-	medium grained,	, moist, gray.									
	-							[]				
	-								_			
	-							- +	19+24 N =54	4+30 L		
								-110-	REC	=18"		
	_											
ω	-											
3/6/0	-							-				
GDT	-	trace fine to med	lium shell fra	gments.				1	4+5+	10		
	15.0 —					-0.9		-115-	REC	, =18"		
		CLAYEY SAND, moist, areenish a	fine to coars aray, with fine	e grained, e to coarse	SC	0.0						
SIG	-	shell fragments,	strong HCI re	eaction.				[]				
400.G	-											
800	-											
3PT 3	-							L 1	10+1	3+25		
000									N =43 REC	s =18"		
48 PL												
1200	-											
5	-											
lg LC	-							$\mid \mid \mid$				
	_							L Ja	30+4	7+36		
STB	-	continue	ed on next pag	e] [`]				
<u>"</u>												

	hashal	TEST	Project:	Calvert Cliff	s Nucle	ar Pow	er Plant			Boring	Number:	B-428
	maper	BORING		Calvert Cou	nty, Ma	iryland				Contra	ct Number: 0	6120048
Schna	ibel Engineering	LUG						_		Sneet:	5 01 5	
DEPTH (FT)	STRAT	A DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	DEDT	5/ 			TESTS	REMARKS
				SC				M	N =83			
		ana ahall fuar					-125-	Δ	REC =1	7"		
	moderate HCI r	eaction.	ments,									
· ·	_						- 1					
	-											
	_							V	8+I0+17	,		
	_						-130-	Δ	REC =1	8"		
							[]					
· ·	-											
	_											
	_						1	V	11+17+2	22		
_	_						-135-	Δ	REC =1	8"		
							[]					
· ·	-											
	_											
	_						1	V	10+13+ ⁻	18		
_	_						-140-	Δ	REC =1	8"		
· ·	-						- 1					
	-						-					
	_							yI	7+12+17 N =29	7		
							-145-	Δ	REC =1	8"		
20/0	_ with fine to coal moderate HCI r	rse shell fragn eaction.	nents,									
<u>ي</u>												
י פֿן.	-						- 1					
. AB	_						-					
	_							VI	6+8+13 N =21			
150.0 -			0 0 FT		-35.9		-150-	Δ	REC =1	8"		
Ø 40	BOLLOW OF B	ORING @ 15	0.0 F1.									
1 300												
5												
12004												
6												

Groundwater Observations Groundwater Observations Boring Foreman: J. Blemings Drilling Method: Mud Rotary Drilling Representative: B. Bradfield Date Time Depth Gasing Caved Boring Foreman: J. Blemings Contraction: With Rotary Diffing Representative: B. Bradfield Date Started: S/106 Location: Northing: 19807 86 Contraction: Softwart No TOPSOIL. OPTIM STRATA DESCRIPTION CLASS ELEV Wuth Start AD ESCRIPTION CLASS ELEV OPTIM STRATA DESCRIPTION CLASS ELEV with Bart AD ESCRIPTION CLASS ELEV with Point Cases and main organic matter. organish thrown, contains organic matter. ORDITAT AND TOPSOIL. OPTIM STRATA DESCRIPTION CLASS ELEV with Point Cases and main organic matter. organish thrown, contains organic matter. organish thrown, contains organic matter. OPTIM TAND TOPSOIL. OPTIM TAN TOPSOIL. 91.5 POORLY GRADED SAND, fine to coarse grained, most, yellowish brown and orangelsh brown, frace git. 91.6 POORLY	Schna	TEST Project: C bel Engineering LOG C	alvert Cli alvert Co	ffs Nucle unty, Ma	ar Pov ryland	ver Pla	nt	Boring Contra Sheet:	Number: Ict Number 1 of 4	er: 061200	B-429
Date Time Depth Casing Casing Caseng Boring Foreman: J. Blemings Encountered 5/1 17.0 Drilling Method: Mud Rotary Encountered 5/1 17.0 Detring Featback Bradield Encountered 5/1 17.0 Dates Started: S1/06 Finished: S/206 Iocation: Nothing: 21087.85 ft Escarted: S/106 Finished: S/206 Ground Surface Elevation: 103.7 (fred) CLASS ELEV WL SAMPLING TESTS REMARKS 0.3 RCOTINAT AND TOPSOIL CLASS ELEV WL Markack (FT) STRATA DESCRIPTION CLASS ELEV WL SAMPLING TESTS REMARKS 0.3 RCOTINAT AND TOPSOIL SM 103.4 Image: Anter A	Boring	Contractor: UNI-TECH DRILLING					Gro	oundwater Obs	ervations	;	
Boring Foreman: J. Beinings Encountered 5/1 17.0 Drilling Representative: B. Bradfield Dates Stande: 5/106 Cotation: Northing: 21087-8 h Easting: 99119.27 ft Ground Surface Elevation: 103.7 (feet) CLASS. ELEV (FT) WL SAMPLING DEPTH TESTS REMARKS 0.3 SILTY SAND, fine to orangeish brown, trace gravel, trace organic matter. SM 103.4		MALAGA, NEW JERSEY					D	ate Time	Depth	Casing	Caved
Image parameter Image parameter Image parameter Image parameter Dilling Equipment: CM Image parameter Image parameter Dates Stated: 51/06 Finshed: 52/06 Location: Northing: 21007-85 ft Ground Surface Elevation: 103.4 Image parameter 0:3 SITRATA DESCRIPTION (FT) CLASS. ELEV (FT) WL SAMPLING DEPTH TESTS REMARKS 0:3 SITRATA DESCRIPTION (FT) CLASS. ELEV (FT) WL SAMPLING DEPTH DATA TESTS REMARKS 0:3 SITRATA DESCRIPTION (FT) CLASS. ELEV (FT) WL SAMPLING DEPTH DATA TESTS REMARKS 0:3 SITRATA DESCRIPTION (FT) CLASS. ELEV (FT) WL SAMPLING DEPTH DATA TESTS REMARKS 0:4	Boring I	Foreman: J. Blemings		Enco	untere	ed	5	5/1	17.0'		
Description Schnabel Representative: B: Bradield Dates Startaci: B/108 Finished: 5/2/06 Location: Northing: 21607.85 ft Easting: Startaci: S/108 Finished: 5/2/06 Location: Northing: 21607.85 ft Bit Strate Startaci: S/108 Finished: 5/2/06 Deprint Strata DeSCRIPTION CLASS O3 ROOTMAT AND TOPSOIL SM 0.3 ROOTMAT AND TOPSOIL SM 0.3 ROOTMAT and DESCRIPTION CLASS ELEV (FT) WL SAMPLING DEPTIN TESTS REMARKS 0.3 ROOTMAT AND TOPSOIL SM 103.4 Image: Test Strate REC = 6° 0.3 REC regrish brown, trace gravel, trace or ot fragments. SM 103.4 Image: Test Strate REMARKS 9.5 POORLY GRADED SAND, fine to coarse grained, most, yellowish brown, trace gravel, trace silt. 94.2 91.7 91.7 Image: Test Strate Strate Strate 12.0 POORLY GRADED SAND, fine to coarse grained, most, yellowish brown, trace gravel, trace silt. SP-SM 81.7 91.7 12.0 POORLY GRADED SAND WITH SILT, fine to coarse grained, wet, whithe and orangeish brown, trace gravel, trace silt. <td>Drilling</td> <td>Equipment: CME-750</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	Drilling	Equipment: CME-750									
Dates Strate: S/106 Finished: 52/06 Location: Northing: 26087.86 ft	Schnab	al Representative: B. Bradfield									
Location: Northing: 216072 S8 ft Easting: 991119.27 ft Ground Surface Elevation: 103.7 (feet) DEPTH (FT) 0.3 ROOTMAT AND TOPSOLL SIM 0.3 ROOTMAT AND TOPSOLL SIM 0.3 ROOTMAT AND TOPSOLL SIM 0.3 ROOTMAT AND TOPSOLL SIM 0.3 RECE = 6° fine to medium grained, trace root fragments. fine to medium grained, trace root fragments. Fine to medium grained, trace root fragments. Fine to medium grained, valowish brown. 9.5 POORLY GRADED SAND, fine to coarse grained, most, yellowish brown, trace gravel, trace gravel. 12.0 POORLY GRADED SAND, fine to coarse grained, most, yellowish gravel. 17.0 POORLY GRADED SAND, fine to coarse grained, most, yellowish gravel. 22.0 POORLY GRADED SAND WITH SILT, fine to medium grained, well, white and orangeish brown, trace gravel, trace silt. 22.0 POORLY GRADED SAND WITH SILT, fine to medium grained, well, white and orangeish brown, trace gravel, trace silt. COORLY GRADED SAND WITH SILT, fine to medium grained, well, white and orangeish brown, trace gravel, trace silt. COORLY GRADED SAND WITH SILT, fine to medium grained, well, white and orangeish brown, trace gravel, trace silt. COORLY GRADED SAND WITH SILT, fine to medium grained, well, white and orangeish brown, trace gravel, trace silt. COORLY GRADED SAND WITH SILT, fine to medium grained, well, white and orangeish brown, trace gravel, trace silt. COORLY GRADED SAND WITH SILT, fine to medium grained, well, white and orangeish brown, trace gravel, trace silt. COORLY GRADED SAND WITH SILT, fine to medium grained, well, orangeish trown, trace gravel, trace silt. COORLY GRADED SAND WITH SILT, fine to medium grained, well, orangeish trown, trace gravel, trace silt. COORLY GRADED SAND WITH SILT, fine to medium grained, well, orangeish trown, trace gravel, trace silt. COURT SILT SIM	Dates	Started: 5/1/06 Einished: 5/2/06									
Decision Easting: 99111227 It Ground Surface Elevation: 103.7 (feet) DEPTH (FT) STRATA DESCRIPTION (FT) CLASS: ELEV: (FT) WL SAMPLING DEPTH TESTS REMARKS 0.3 ROOTMAT AND TOPSOIL. 		a. Northing: 216087 85 ft									
Orrund Surface Elevation: 103.7 (feet) DEPTH (FT) STRATA DESCRIPTION CLASS. ELEV. (FT) WL DEPTH DEPTH DEPTH REC = 0° DATA 0.3 ROOTMAT AND TOPSOIL. SM 103.4 1414.3 0.3 SLTY SAND, fine to medium grained, matter. SM 103.4 1414.3 0.3 SILTY SAND, fine to medium grained, matter. SM 103.4 1414.3 0.3 Fine to coarse grained, trace root fragments. SM 103.4 WOH+WOH +1 - fine to coarse grained, trace root fragments. SP 94.2 2434 9.5 POORLY GRADED SAND, fine to coarse grained, molt, yellowish brown. SP-SM 91.7 743+11 12.0 POORLY GRADED SAND, fine to coarse grained, molt, yellowish brown and orangeish brown, trace sitt. SP-SM 91.7 17.0 POORLY GRADED SAND, fine to coarse grained, will write sitt. SP-SM 91.7 17.0 POORLY GRADED SAND, fine to coarse grained, well, while and orangeish brown, trace gravel, trace sitt. SP 17.0 POORLY GRADED SAND WITH SILT. fine to medium grained, wel, orangeish brown, trace gravel, trace sitt. SP-SM 17.0 POORLY GRADED SAND WITH SILT. fine to medium grained, wel, orangeish brown, trace gravel, trace sitt. SP-SM 22.0 POORLY GRADED SAND WITH SILT. fine to medium grained, wel, or		Easting: 961119.27 ft									
DEPTH (FT) STRATA DESCRIPTION CLASS ELEV (FT) WL SAMPLING DEPTH TESTS REMARKS 0.3 RCOTMAT AND TOPSOIL. SM 103.4	Ground	Surface Elevation: 103.7 (feet)									
0.3 ROOTMAT AND TOPSOIL. SM 103.4 III1Y SAND, fine to medium grained, matter. 0.3 SILTY SAND, fine to medium grained, matter. SM 103.4 III1Y SAND, fine to medium grained, fine to coarse grained, trace root fragments. 0.4 Fine to coarse grained, trace root fragments. IIIIY SAND, fine to coarse grained, moist, yellowish brown, face sitt. 94.2 IIIIY SAND, fine to coarse grained, moist, yellowish brown, face sitt. 9.5 POORLY GRADED SAND, fine to coarse grained, moist, yellowish brown, face sitt. 94.2 IIIIY SAND, fine to coarse grained, moist, yellowish brown, face sitt. 12.0 POORLY GRADED SAND WITH SILT, fine to coarse grained, moist, yellowish brown, face sitt. SP-SM 17.0 POORLY GRADED SAND, fine to coarse grained, wet, white and orangeish brown, trace gravel, trace sitt. 91.7 17.0 POORLY GRADED SAND, fine to coarse grained, wet, white and orangeish brown, trace gravel, trace sitt. SP-SM 17.0 POORLY GRADED SAND, fine to coarse grained, wet, white and orangeish brown, trace gravel, trace sitt. SP-SM 17.0 POORLY GRADED SAND WITH SILT, fine to medium grained, wet, orangeish brown, trace gravel, trace sitt. SP-SM 17.0 POORLY GRADED SAND WITH SILT, fine to medium grained, wet, orangeish brown, trace gravel, trace sitt. SP-SM 17.0 POORLY GRADE	DEPTH (FT)	STRATA DESCRIPTION	CLASS	ELEV. (FT)	WL	DEP	S/ ′тн ∣	AMPLING DATA	TEST	S F	REMARKS
$\begin{array}{c} \text{SILTY SAND, fine to medium grained, matter.} \\ \text{orangelsh brown, trace gravel, trace organic matter.} \\ \text{orangelsh brown, trace gravel, trace organic matter.} \\ \text{orangelsh brown, trace gravel, trace root fragments.} \\ \text{fine to coarse grained, trace root fragments.} \\ \text{fine to medium grained, yellowish brown, and orangelsh brown, trace sit.} \\ \text{fine to medium grained, wellowish brown, and orangelsh brown, trace sit.} \\ \text{POORLY GRADED SAND, fine to coarse grained, moist, yellowish brown, and orangelsh brown, trace sit.} \\ \text{POORLY GRADED SAND, fine to coarse grained, well, while and orangelsh brown, trace gravel, trace sit.} \\ \text{POORLY GRADED SAND, fine to coarse grained, well, while and orangelsh brown, trace gravel, trace sit.} \\ \text{POORLY GRADED SAND, fine to coarse grained, well, while and orangelsh brown, trace gravel, trace sit.} \\ \text{POORLY GRADED SAND, fine to coarse grained, well, while and orangelsh brown, trace gravel, trace sit.} \\ \text{POORLY GRADED SAND, fine to coarse grained, well, while and orangelsh brown, trace gravel, trace sit.} \\ \text{POORLY GRADED SAND, well, orangelsh brown, trace gravel, trace sit.} \\ \text{POORLY GRADED SAND, fine to coarse grained, well, while and orangelsh brown, trace gravel, trace sit.} \\ \text{POORLY GRADED SAND WITH SILT, fine to medium grained, well, while and orangelsh brown, trace gravel, trace sit.} \\ \text{POORLY GRADED SAND WITH SILT, fine to medium grained, well, while and orangelsh brown, trace gravel, trace sit.} \\ \text{POORLY GRADED SAND WITH SILT, fine to medium grained, well, orangelsh brown, trace gravel, trace sit.} \\ \text{POORLY GRADED SAND WITH SILT, fine to medium grained, well, orangelsh brown, trace gravel, trace sit.} \\ \text{POORLY GRADED SAND WITH SILT, fine to medium grained, well, orangelsh brown, trace gravel, trace sit.} \\ \text{POORLY GRADED SAND WITH SILT, fine to medium grained, well, orangelsh brown, trace gravel, trace sit.} \\ \text{POORLY GRADED SAND WITH SILT, fine to medium grained, well, orangelsh brown, trace gravel, trace sit.} \\ POORLY GRADED SAND$	0.3	ROOTMAT AND TOPSOIL.	em.	103.4			TM	1+1+3			
error orangeish brown, trace gravel, trace organic matter. fine to coarse grained, trace root fragments. fine to medium grained, yellowish brown, and orangeish brown, trace grained, moist, yellowish brown and orangeish brown, trace gravel, trace silt. 12.0 POORLY GRADED SAND, fine to coarse grained, wet, white and orangeish brown, trace gravel, trace silt. 17.0 POORLY GRADED SAND, fine to coarse grained, wet, white and orangeish brown, trace gravel, trace silt. 17.0 POORLY GRADED SAND WITH SILT, fine to medium grained, wet, orangeish brown, trace gravel, trace silt. 18.7 94.2 </td <td></td> <td>SILTY SAND, fine to medium grained, moist, reddish brown, contains organic matter.</td> <td>511</td> <td></td> <td></td> <td> - -</td> <td>10</td> <td>N =4 REC =6"</td> <td></td> <td></td> <td></td>		SILTY SAND, fine to medium grained, moist, reddish brown, contains organic matter.	511			- -	10	N =4 REC =6"			
9.5 Free or an edium grained, yellowish brown. 9.5 POORLY GRADED SAND, fine to coarse grained, moist, yellowish brown and orangeish brown, trace silt. 94.2 12.0 POORLY GRADED SAND WITH SILT, fine to coarse grained, moist, yellowish brown, and orangeish brown, trace silt. 91.7 12.0 POORLY GRADED SAND WITH SILT, fine to coarse grained, moist, yellowish gravel. SP-SM 17.0 POORLY GRADED SAND WITH SILT, fine to coarse grained, wet, white and orangeish brown, trace gravel, trace silt. SP-SM 17.0 POORLY GRADED SAND WITH SILT, fine to coarse grained, wet, white and orangeish brown, trace gravel, trace silt. SP-SM 17.0 POORLY GRADED SAND WITH SILT, fine to coarse grained, wet, write and orangeish brown, trace gravel, trace silt. SP-SM 17.0 POORLY GRADED SAND WITH SILT, fine to coarse grained, wet, orangeish brown, trace gravel, trace silt. SP-SM 17.0 POORLY GRADED SAND WITH SILT, fine to coarse grained, wet, orangeish brown, trace gravel, trace silt. SP-SM 22.0 POORLY GRADED SAND WITH SILT, fine to coarse grained, wet, orangeish brown, trace gravel, trace silt. SP-SM 22.0 Continued on next page SP-SM		orangeish brown, trace gravel, trace organic matter.				-	-	WOH+WOH +1 N =1			
$\begin{array}{c} 1 \text{ logiticities.} \\ 1 logiticiti$	-	fine to coarse grained, trace root						REC =6"			
9.5 Free to medium grained, yellowish brown, increase grained, most, yellowish brown and orangeish brown, trace silt. 94.2 3+3+3 N = 6 REC = 14" 12.0 POORLY GRADED SAND, fine to coarse grained, most, yellowish brown, trace gravel. 91.7 91.7 17.0 POORLY GRADED SAND, fine to coarse grained, wet, white and orangeish brown, trace gravel, trace silt. 91.7 91.7 17.0 POORLY GRADED SAND, fine to coarse grained, wet, white and orangeish brown, trace gravel, trace silt. 96.7 ▼ 17.0 POORLY GRADED SAND, fine to coarse grained, wet, orangeish brown, trace gravel, trace silt. SP 22.0 POORLY GRADED SAND WITH SILT, fine to medium grained, wet, orangeish brown, trace gravel, trace silt. SP-SM 22.0 POORLY GRADED SAND WITH SILT, fine to medium grained, wet, orangeish brown, trace gravel. SP-SM 22.0 POORLY GRADED SAND WITH SILT, fine to medium grained, wet, orangeish brown, trace gravel. SP-SM 22.0 POORLY GRADED SAND WITH SILT, fine to medium grained, wet, orangeish brown, trace gravel. SP-SM 22.0 POORLY GRADED SAND WITH SILT, fine to medium grained, wet, orangeish brown, trace gravel. SP-SM 22.0 POORLY GRADED SAND WITH SILT, fine to medium grained, wet, orangeish brown, trace gravel. SP-SM 22.0 POORLY GRADED SAND WITH SILT, fine to me		-				-	-	N =7 REC =16"			
9.5 POORLY GRADED SAND, fine to coarse grained, moist, yellowish brown and orangeish brown, trace silt. 12.0 POORLY GRADED SAND WITH SILT, fine to coarse grained, moist, yellowish brown and orangeish brown, trace gravel. 17.0 POORLY GRADED SAND, fine to coarse grained, wet, while and orangeish brown, trace gravel, trace silt. 22.0 POORLY GRADED SAND WITH SILT, fine to medium grained, wet, orangeish brown, trace gravel. 22.0 POORLY GRADED SAND WITH SILT, fine to medium grained, wet, orangeish brown, trace gravel. Continued on next page Continued on next page		fine to medium grained, yellowish brown.				-		3+3+3 N =6			
9.5 POORLY GRADED SAND, fine to coarse grained, moist, yellowish brown and orangeish brown, trace silt. 94.2 -10- 12.0 POORLY GRADED SAND WITH SILT, fine to coarse grained, moist, yellowish brown and orangeish brown, trace SP-SM 91.7 91.7 17.0 POORLY GRADED SAND, fine to coarse grained, wet, white and orangeish brown, trace silt. SP-SM 91.7 91.7 17.0 POORLY GRADED SAND, fine to coarse grained, wet, white and orangeish brown, trace gravel, trace silt. SP 86.7 ⊻ - 22.0 POORLY GRADED SAND WITH SILT, fine to medium grained, wet, orangeish brown, trace gravel. SP-SM 81.7 3+7+17 N = 24 REC = 12" 22.0 POORLY GRADED SAND WITH SILT, fine to medium grained, wet, orangeish brown, trace gravel. SP-SM 81.7 - - 22.0 Continued on next page SP-SM 81.7 - - -		-				F	LΔ	REC =14"			
12.0 Coarse grained, moist, yellowish brown and orangeish brown, trace silt. 91.7 7+8+11 N = 19 REC = 12" 12.0 POORLY GRADED SAND WITH SILT, fine to coarse grained, wet, white and orangeish brown, trace gravel, trace silt. 91.7 91.7 99+9+13 N = 22 REC = 12" 17.0 POORLY GRADED SAND, fine to coarse grained, wet, white and orangeish brown, trace gravel, trace silt. 96.7 ▼ 9.7 22.0 POORLY GRADED SAND WITH SILT, fine to medium grained, wet, orangeish brown, trace gravel, trace silt. SP-SM 86.7 ▼ 4 22.0 POORLY GRADED SAND WITH SILT, fine to medium grained, wet, orangeish brown, trace gravel, trace silt. SP-SM 81.7 5+10+9 N = 19 N = 10 N =	9.5	POORLY GRADED SAND, fine to	SP	94.2		_10-					
12.0 POORLY GRADED SAND WITH SILT. fine to coarse grained, moist, yellowish brown and orangeish brown, trace gravel. 17.0 POORLY GRADED SAND, fine to coarse grained, wet, white and orangeish brown, trace gravel, trace silt. 22.0 POORLY GRADED SAND WITH SILT. fine to medium grained, wet, orangeish brown, trace gravel. 22.0 POORLY GRADED SAND WITH SILT. fine to medium grained, wet, orangeish brown, trace gravel. 22.0 POORLY GRADED SAND WITH SILT. fine to medium grained, wet, orangeish brown, trace gravel. 22.0 POORLY GRADED SAND WITH SILT. fine to medium grained, wet, orangeish brown, trace gravel. 22.0 POORLY GRADED SAND WITH SILT. fine to medium grained, wet, orangeish brown, trace gravel. 22.0 POORLY GRADED SAND WITH SILT. fine to medium grained, wet, orangeish brown, trace gravel. 22.0 POORLY GRADED SAND WITH SILT. fine to medium grained, wet, orangeish brown, trace gravel. 22.0 POORLY GRADED SAND WITH SILT. fine to medium grained, wet, orangeish brown, trace gravel. 22.0 POORLY GRADED SAND WITH SILT. 59-SM 81.7 SP-SM 81.7 SP-SM 81.		coarse grained, moist, yellowish brown and orangeish brown trace silt						7+8+11			
12.0 POORLY GRADED SAND WITH SILT, fine to coarse grained, moist, yellowish brown, trace gravel. SP-SM 91.7 -	-					F		N =19			
$ \begin{array}{c} $	12.0 -	POORLY GRADED SAND WITH SILT,	SP-SM	91.7		F		REC =12"			
$\begin{array}{c} 17.0 \\ - \\ 22.0 \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\ $	-	fine to coarse grained, moist, yellowish				F	-				
$17.0 - \frac{POORLY GRADED SAND, fine to}{coarse grained, wet, white and} orangeish brown, trace gravel, trace silt.} = \frac{86.7}{22.0} = \frac{V}{REC} = 12"$ $22.0 - \frac{POORLY GRADED SAND WITH SILT,}{fine to medium grained, wet, orangeish} = \frac{SP-SM}{225} = \frac{81.7}{25} = \frac{SP-SM}{25} = \frac{SP-SM}{REC} = 9"$	-	gravel.				L	-M	9+9+13			
17.0 $\frac{15-1}{120}$ POORLY GRADED SAND, fine to coarse grained, wet, white and orangeish brown, trace gravel, trace silt. 22.0 $\frac{15-1}{120}$ POORLY GRADED SAND, fine to coarse grained, wet, white and orangeish brown, trace gravel, trace silt. 22.0 $\frac{15-1}{120}$ REC =12" $\frac{15-1}{100}$ \frac						45	Ŵ	N =22 REC =12"			
17.0 $\frac{1}{22.0}$ POORLY GRADED SAND, fine to coarse grained, wet, white and orangeish brown, trace gravel, trace silt. 22.0 $\frac{1}{22.0}$ POORLY GRADED SAND WITH SILT, fine to medium grained, wet, orangeish brown, trace gravel. 22.0 $\frac{1}{22.0}$ Continued on next page 86.7 $\frac{1}{22.0}$ 81.7 $\frac{1}{22.0}$						-15-					
17.0 POORLY GRADED SAND, fine to coarse grained, wet, white and orangeish brown, trace gravel, trace silt. 22.0 POORLY GRADED SAND WITH SILT, fine to medium grained, wet, orangeish brown, trace gravel. Continued on next page Continued on next page		-				F	-				
22.0 POORLY GRADED SAND WITH SILT, fine to medium grained, wet, orangeish brown, trace gravel. <i>continued on next page</i>	3 17.0 -		SD.	86.7	$\overline{\Sigma}$	F	-				
22.0 POORLY GRADED SAND WITH SILT, fine to medium grained, wet, orangeish brown, trace gravel. - - - - - - - - - - - - - - - - - - -		coarse grained, wet, white and				L					
22.0 POORLY GRADED SAND WITH SILT, fine to medium grained, wet, orangeish brown, trace gravel. - - - - - - - - - - - - - - - - - - -		orangeish brown, trace gravel, trace silt.						3+7+17			
22.0 POORLY GRADED SAND WITH SILT, fine to medium grained, wet, orangeish brown, trace gravel. <i>continued on next page</i> 81.7 81.7 81.7 81.7 5+10+9 81.7 5+10+9 81.7 81.7 81.7 81.7 81.7 81.7 81.7 81.7						Γ		N =24			
22.0 - POORLY GRADED SAND WITH SILT, fine to medium grained, wet, orangeish brown, trace gravel		1				-20-	-	NEC - 12			
22.0 POORLY GRADED SAND WITH SILT, SP-SM fine to medium grained, wet, orangeish brown, trace gravel.	Ď -	-				╞	+				
POORLY GRADED SAND WITH SIL1, SP-SM fine to medium grained, wet, orangeish brown, trace gravel. <i>continued on next page</i>	22.0 -		0.5.5.	81.7		F					
	-	FOORLY GRADED SAND WITH SILT, fine to medium grained, wet, orangeish brown, trace gravel.	SP-SM			_	-				
continued on next page	- 20	4				F	HM	5+10+9 N =19			
		continued on next page				-25-		REC =9"			

	TEST	Project: Cal	vert Cliffs	s Nucle	ar Pow	er Plant		Boring Numbe	er: B-4	29
Schn	abel Engineering LOG	Cal	vert Cou	nty, Ma	ryland			Contract Number: 06120048 Sheet: 2 of 4		
DEPTH (FT)	STRATA DESCRIPTIO	ON (CLASS.	ELEV. (FT)	WL	S		G TES		ĸs
			SP-SM	. ,		DEPTH	DAI	A		
	-									
	 fine to coarse grained, yellowis	sh brown,								
	_ no gravel.									
	-						7+11+12 N =23	2		
-	-					-30	REC =12	2"		
	_									
32.0	POORLY GRADED SAND, me	edium to	SP	71.7						
	brown and yellowish brown, tra	geisn ace					10.10.1			
							N = 20	1U 2"		
-	-					-35		2		
37.0	POORLY GRADED SAND WIT	TH SILT,	SP-SM	66.7						
	orange and gray.						5+4+6			
							N =10 REC =18	8"		
-]					_40				
12.0				61 7						
42.0	FAT CLAY with sand, moist, gr contains mica.	ray,	СН	01.7						
	_						3+4+5			
						45Å	N =9 REC =18	3"		
	_						REC =24	4"		
/6/08	-							PP=2 (00 tsf	
GDT 3	_							11-2.		
IABEL.	_					17	2+2+3			
19.5 - 49.5 -	SANDY ELASTIC SILT, wet, g	ray.	MH	54.2		<u>50</u>	REC =18	3"		
00.GPJ	-									
[¥] 80 52.0	FAT CLAY moist grav traces	sand	СН	51.7						
SPT 3	_									
3 PLOG	-						REC =0"	,		
120046	-					-55-			50.1.6	
00 0C	-						3+6+8 N =14	PP=3.	50 tst	
วี ยุ่ม พ	CLAYEY SAND, fine to mediur	m	SC	46.7			REC =18	3"		
ST BOF	_ grained, moist, dark greenish g continued on next page	gray.								
μ										

Comments: 1. Boring backfilled with cement/bentonite grout through tremie pipe upon completion. 2. * = See Appendix I for additional lab testing data.

ſ		hpabol TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	Borir	g Number:	B-429	
	Schna	bel Engineering LOG	C	alvert Cou	nty, Ma	ryland		Cont Shee	Contract Number: 06120048 Sheet: 3 of 4		
	DEPTH (FT)	STRATA DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	S/ DEPTH		TESTS	REMARKS	
-	-			SC				REC =18"			
	-						 65-	11+16+28 N =44 REC =18"			
	67.0 - - -	POORLY GRADED SAND W fine to medium grained, wet,	ITH SILT, gray.	SP-SM	36.7		 ⊠ - 70-	50/3" N =50/3" REC =4"		Hard drilling	
	- 72.0 - - -	POORLY GRADED SAND, fi medium grained, wet, gray.	ne to	SP	31.7		 75 -	21+20+19 N =39 REC =18"			
SDT 3/6/08	- 77.0 -	POORLY GRADED SAND W fine to coarse grained, wet, g white, with fine to coarse she fragments, strong HCI reactio	ITH SILT, ray and II n.	SP-SM	26.7		 80	20+19+14 N =33 REC =16"		Resumed drilling on 5/2/06 Augers	
SPT 300 & 400.GPJ SCHNABEL.0	82.0 - - - -	CLAYEY SAND, fine to mediu grained, moist, gray, trace fin medium shell fragments, wea reaction.	um e to k HCl	SC	21.7		 85 -	17+11+15 N =26 REC =18"		grinding/scraping Changed to roller bit	
RING LOG 06120048 PLOG	87.0 - - -	POORLY GRADED SAND, fi medium grained, wet, gray ar trace silt, with fine to coarse s fragments, moderate HCI rea	ne to Id white, shell ction.	SP	16.7		 90	5+8+8 N =16 REC =18"			
TEST BO	-	continued on next pag	e								

Schnabet Engineering BORING LOG Calvert County, Maryland Contract Number: 06120048 Sheet: 4 of 4 DEPTH (FT) STRATA DESCRIPTION CLASS. ELEV. (FT) WL SAMPLING DEPTH TESTS REMARKS 97.0 97.0 POORLY GRADED SAND WITH SILT, fine to medium grained, moist, gray, trace fine to coarse shell fragments, weak HCl reaction. SP-SM 6.7 -<
DEPTH (FT) STRATA DESCRIPTION CLASS. ELEV. (FT) WL SAMPLING DEPTH TESTS REMARKS 97.0
PORLY GRADED SAND WITH SILT, fine to medium grained, moist, gray, weak HCI reaction. SP-SM 6.7 6.7 5+7+9 -100- 5+7+9 N =16 REC = 18" 100.0 BOTTOM OF BORING @ 100.0 FT. 3.7 3.7 -100- 5+7+9 N =16 REC = 18"
$97.0 - \frac{POORLY GRADED SAND WITH SILT, fine to medium grained, moist, gray, trace fine to coarse shell fragments, weak HCI reaction. 100.0 - BOTTOM OF BORING @ 100.0 FT. 3.7 - \frac{1}{100} - \frac{1}{100} = \frac{1}{100} + \frac{1}{100} = 1$
97.0 POORLY GRADED SAND WITH SILT, fine to medium grained, moist, gray, trace fine to coarse shell fragments, weak HCl reaction. 100.0 BOTTOM OF BORING @ 100.0 FT. 3.7 4. 4. 5. 6.7 5. 6.7 5. 6.7 5. 6.7 5. 6.7 5. 6.7 5. 6.7 5. 6.7 5. 6.7 5. 6.7 5. 6.7 5. 6.7 5. 6.7 5. 6.7 5. 6.7 5. 6.7 5. 6.7 5. 6.7 5. 6.7 5. 7. 6.7 5. 7. 6.7 5. 7. 6.7 5. 7. 6.7 5. 7. 6.7 5. 7. 7. 7. 7. 7. 7. 7. 7. 7. 7
97.0 POORLY GRADED SAND WITH SILT, fine to medium grained, moist, gray, trace fine to coarse shell fragments, weak HCl reaction. 100.0 BOTTOM OF BORING @ 100.0 FT. 3.7 3.7 3.7 3.7 3.7 3.7 3.7 3.7 3.7 3.7 3.7 3.7 3.7
97.0 POORLY GRADED SAND WITH SILT, fine to medium grained, moist, gray, trace fine to coarse shell fragments, weak HCl reaction. 100.0 BOTTOM OF BORING @ 100.0 FT. 3.7 - - - - - - - -
97.0 POORLY GRADED SAND WITH SILT, fine to medium grained, moist, gray, trace fine to coarse shell fragments, weak HCl reaction. 100.0 BOTTOM OF BORING @ 100.0 FT. 3.7 -95-U -95-U REC = 17" -95-U
97.0 POORLY GRADED SAND WITH SILT, fine to medium grained, moist, gray, trace fine to coarse shell fragments, weak HCl reaction. 100.0 BOTTOM OF BORING @ 100.0 FT. 3.7 6.7 6.7 6.7 6.7 6.7 6.7 6.7 6
97.0 POORLY GRADED SAND WITH SILT, fine to medium grained, moist, gray, trace fine to coarse shell fragments, weak HCl reaction. 100.0 BOTTOM OF BORING @ 100.0 FT. BOTTOM OF BORING @ 100.0 FT.
100.0 BOTTOM OF BORING @ 100.0 FT. 3.7
100.0 BOTTOM OF BORING @ 100.0 FT. 3.7 - - - 5+7+9 N = 16 REC = 18"
100.0 BOTTOM OF BORING @ 100.0 FT. 3.7 3.7 3.7 100 N =16 REC =18"
BOTTOM OF BORING @ 100.0 FT.

Se	chnak	hnabel BORING bel Engineering	Calvert Cl Calvert Co	ι Cliffs Nuclear Power Plant t County, Maryland						Boring Number: Contract Number: 061200 Sheet: 1 of 4			B-430	
Bar								Gr	oundwa	ater Obs	ervations			
Bor	ing C	FREDERICK, MAR	RYLAND	5, INC.				D	ate	Time	Depth	Casi	ng	Caved
Bor	ing F	oreman: D. Bender			Enco	untere	d	ę	5/1		10.5'			
Dril	ling N	lethod: Mud Rotary			Start	of Da	v		5/2		17.0'			
Dril	ling E nabe	equipment: CME-550X (ATV)	n											
Dat		Started: 5/1/06 Finished: 5	(1/06	_										
Loc	ation	Northing: 216006.88 ft Easting: 961193.12 ft	1700											
Gro	und \$	Surface Elevation: 102.5 (feet)												
DEI (F	PTH T)	STRATA DESCRIPT	ION	CLAS	s. ELEV. (FT)	WL	DEP	S. TH		NG ATA	TEST	s	RI	EMARKS
0	.5	Forest litter, rootmat and tops	soil.		102.0			M	2+3+3		PP=1.00) tsf		
	-	SANDY SILT, fine to medium brown, contains root fragmen	, moist, its.	ML	100.5		-	ŀΔ	N =6 REC =	11"				
2	.0 +	CLAYEY SAND, fine to coars	e grained,	SC	100.5		-							
	-	moist, brown.					-	HM	3+2+2 N =4					
	_						L	ЦШ	REC =	14"				
4	.5	POORLY GRADED SAND W	ITH SILT.	SP-SN	98.0		_							
		trace gravel, fine to coarse gr	ained,				- 5 -	7M	3+5+4					
	-	moist, brown and light brown					-	HM	N =9 REC =	11"				
7	.0 -		· .		95.5		L							
		moist, brown.	se grained,	SC				\Box	3+6+8					
								IX	N =14	10"				
	-						-			12				
						∇	-10-	-						
	_	wet.				<u> </u>	L	Π	6+6+7					
								IŴ	N =13 REC =	11"				
12	.0 +	POORLY GRADED SAND W	ITH SILT,	SP-SN	<u>л</u> 90.5			1					*\$\\\\i	tched to
	-	fine to coarse grained, wet, li and light vellowish brown.	ght brown				-	-					3-7/8	5" O.D.
	_						-	-M	7+6+8				Tri-c bit be	one roller elow 13.5
							15	M	N =14 REC =	10"			ft.	
							- 15-]						
	-						F	-						
3	-						F	-						
5							L							
		light brown							 11+12-	+10				
2000	-	iigni biown.					F	1	N =31	. 13				
5	_						-20-	ЦЦ	REC =	8"				
ß	_						L	_						
							Γ	1						
	-						F							
	_						F	-10	6+8+8					
							25-	\square	REC =	9"				
]	continued on next pag	<i>je</i>				25							
<u>'</u>														

	TEST Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	Boring Number:	B-430	
Schnal	bel Engineering LOG	Calvert Cou	nty, Ma	iryland		Contract Number: 06120048 Sheet: 2 of 4		
DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL		NG TESTS	REMARKS	
		SP-SM						
-								
27.0 -	SANDY SILT, fine to medium, wet, light vellowish brown.	ML	/5.5					
-	,				□ □ □ □ □ □ □ 1+1+2			
					N =3 REC =	16"		
-	gray.				REC =	10" PP=1.50 tsf		
32.0 -			70.5					
-	LEAN CLAY, wet, gray, trace sand, contains mica.	CL						
-					1+2+3			
34.5	CLAYEY SAND, fine to coarse grained, wet, gray, contains mica, and lean clay	SC	68.0			18"		
	pockets.							
-						-" PP=NM tsf		
397			62.8			5		
	LEAN CLAY, wet, dark gray, trace sand, contains clayey sand lenses and mica.	CL	02.0		-40	4.0"		
42.0			60.5		<u> </u> REC =	18"		
-	ELASTIC SILT, moist, gray, trace sand, contains mica.	MH	00.5					
					45 A REC =	18"		
-								
3/6/08								
– GDT								
					REC =	18"		
ਠ ਹਿੰ 50.2	LEAN CLAY, moist, gray and light	CL	52.3		-50-3+3+4			
8 400.0 	greenish gray, trace sand, contains mica.		50.5			18"		
000 52.0 - 100 -	FAT CLAY, moist, light greenish gray, trace sand, contains mica.	СН	50.5					
- 100 8					4+4+7			
					55	18"		
- 0612								
57.0 -	SANDY SILT, fine to medium. moist.	ML	45.5					
- BOR	gray. continued on next page							
TES	· -							

-	hnabel TEST	Project: (Calvert Cliff	s Nucle	ar Pow	/er Plant	E	Boring Number: B-			
Schnat	bel Engineering LOG		Calvert Cou	inty, Ma	iryland		C S	Contract Number: 06120048 Sheet: 3 of 4			
DEPTH (FT)	STRATA DESCRIPT	ΓΙΟΝ	CLASS.	ELEV. (FT)	WL	S DEPTH	AMPLING	TESTS	REMARKS		
_			ML				REC =17	" PP=4.50 tsf			
62.0 - - -	SILTY SAND, fine to coarse moist, dark gray, trace grave to medium shell fragments, n HCI reaction.	grained, I, trace fine noderate	SM	40.5		 65-	24+15+15 N =30 REC =12	5	*Switched to 2-15/16" Tri-cone roller		
- 67.0 - - -	POORLY GRADED SAND, f wet, gray, with silt, with fine t shell fragments, moderate He	ine grained, o medium Cl reaction.	SP-SM	- 35.5		 	45+43+12 N =55/7" REC =10	2/1"	bit below 65 ft.		
- 72.0 - - -	SILTY SAND, fine to coarse wet, gray, with fine to coarse fragments, strong HCI reaction	grained, shell on.	SM	- 30.5		 75-	11+12+14 N =26 REC =11	4			
- 77.0 - - -	CLAYEY SAND, fine to coars wet, light gray, trace fine to n shell fragments, moderate H	se grained, nedium CI reaction.	SC	- 25.5		 80	12+7+6 N =13 REC =14	"			
- - -	oliveish gray and grayish bro fine to medium shell fragmen moderate HCI reaction.	wn, trace its,				 85-	26+9+23 N =32 REC =16	"			
- - - -	fine to medium grained, trace coarse shell fragments, stron reaction.	e fine to lg HCl				 	6+5+9 N =14 REC =0"		**Resumed drilling at 7:00 AM on 5/2/06.		
-	continued on next pag	ge									

	TES	Calvert Cliff	s Nucle	ar Pow	er Plant		Boring Number: B-43			
Schnal	nabel Engineering LOG			inty, Ma	ryland			Contract Number: 06120048		
DEPTH	STRATA DESCR		CLASS.	ELEV.	WL	5	SAMPLIN	G TESTS	REMARKS	
(F1)				(F1)		DEPTH	DA	ТА		
-	for a final to use allows a local		30							
_	strong HCl reaction.	ragments,								
_							15+7+8			
						X	N =15 REC =1	7"		
						90				
-										
-	trace fine to medium shel	l fragments,								
-							7			
-						F -11X	N =20			
100.0 —	BOTTOM OF BORING @) 100.0 FT.		2.5		-100-	∬ REC =1	8"		
0										
0/0/2										
Ida										
5										
0 4 4										
040 71										
00120										
PNIN PNIN										
2										

Schnal	bel Engineering	Calvert Clif Calvert Cou	fs Nucle unty, Ma	ar Pow ryland	ver Pla	nt	Boring Contra Sheet:	Number: act Number: 1 of 4	er: 061200	B-431
Boring	Contractor: UNI-TECH DRILLING					Gr	oundwater Obs	ervations		
	MALAGA, NEW JERSEY					D	ate Time	Depth	Casing	Caved
Boring F	oreman: J. Evans		Enco	untere	d	4	/27	13.5'		
Drilling I	Method: Mud Rotary									
Drilling B	Equipment: FAILING-1500									
Schnabe	el Representative: R. Vinzant									
Dates 3	Started: 4/27/06 Finished: 4/28/06									
Location	n: Northing: 216271.1 ft Easting: 961177.3 ft									
Ground	Surface Elevation: 118.4 (feet)				1					
DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL	DEP	S. TH	AMPLING DATA	TEST	S F	REMARKS
_	CLAYEY SAND, fine to coarse grained, moist, orangeish brown	SC			_		1+4+5 N =9			
1.5	SANDY LEAN CLAY, fine to medium	CL	- 116.9		-		REC =10"			
-					-		2+3+3	PP=1.00) tsf	
-					-	-	N =6 REC =16"			
_					- 5 -	-				
6.0 -			112.4		F					
-	CLAYEY SAND, fine to medium grained, moist, orangeish brown.	SC			-	-	2+2+2 N =4 REC =12"			
-	orangeish brown and brown.				-		3+4+4			
					-10-		N =8 REC =11"			
-	fine to coarse grained orangeish brown				-		5+7+8			
	and yellowish brown.				-	-	N =15 REC =11"			
125	-		104.0	∇	F	-				
- 13.5	POORLY GRADED SAND WITH SILT	SP-SM	104.9	-	-	-M	5+7+11 N =18			
	orangeish brown and white.				-15-	\square	REC =12"			
_					Γ	1				
-					F	-				
-					F	-				
_					F	_				
					-20-					
20.5	SILTY SAND fine to coarse grained	SM	97.9		20	M	10+14+18 N =32			
-	moist, orangeish brown.				F	70	REC =12"			
					F	-				
					\vdash	-				
_					L					
	continued on next page				-25-					

	TEST Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	Boring Number:	B-431	
Schna	bel Engineering	alvert Cou	inty, Ma	ryland		Contract Number: 06120048		
DEDTH					SAMDI IN			
(FT)	STRATA DESCRIPTION	CLASS.	ELEV.	WL		TESTS	REMARKS	
		SM				+19		
	_				N =33	11"		
.								
· · ·								
· ·	_							
-	_				-30-0 11+14	-20		
	-				X N =34	20		
31.5	POORLY GRADED SAND WITH SILT.	SP-SM	86.9			9"		
	fine gravel, fine to medium grained, wet,							
· ·								
· ·								
-					-35-0 18+121	20		
	_					-30		
	vellowish brown.					13"		
· ·								
· ·								
40.0 -		CP	78.4			10		
40.5	medium grained, with sand, trace silt,	SC	77.9		N =20			
	Wet, yellowish brown and white.					12"		
	trace fine gravel, moist, orangeish							
· ·	brown and yellowish brown.							
	-							
-					-45-0 10.11.	45		
	no gravel, wet.				N =29	-15		
/08					REC =	12"		
- 2/0								
-	-							
. NABE	-							
50.0 -		N 41 1	68.4		-50-0.0.0			
	grained, moist, orangeish brown and	MH			N =10			
& 400	gray.				REC =	18"		
- 000								
	-							
55.0 -			63.4		-55-0			
7190	gray.	CH						
LOG						18"		
					- 1			
	continued on next page							

		hpabol T	Project: C	Calvert Cliffs Nuclear Power Plant					В	Boring Number: B-43			31	
	Schna	bel Engineering	RING OG	C	alvert Cou	nty, Ma	ryland			C	Contract Number: 06120048 Sheet: 3 of 4			
Ľ	DEDTH					EI EV			S			5 01 4		
	(FT)	STRATA DES	CRIPTIC	DN	CLASS.	(FT)	WL	DEPT	H	DAT	A	TESTS	REMARK	٨S
					СН									
	-													
								-60-	М	4+3+6				
	-								XI	N =9 REC =18				
	-									INEC - 10				
	_													
	-													
	_	sandy						65	М	4+4+6				
	-								Ň	N =10 REC =18				
	-													
	-													
	_													
	70.0	LEAN CLAY with sand	d, c. mica	, moist,	CL	48.4		70	M	5+7+10				
	-	greenish gray.							М	REC =18				
	-													
	-													
	-													
								75						
		sandy						15	M	4+5+7 N =12				
	-								Ш	REC =18				
	-													
	-													
	-													
6/08	80 0					38.4								
DT 3/	0010	CLAYEY SAND, fine to grained, wet, orangeis	o medium h brown a	n and gray.	SC				X	13+50/5" N =50/5"				
EL.G	-			0,						REC =11				
HNAE	-													
J SC	-	_												
DO.GP	-	_												
0 & 4(85.0 —		.			33.4		85		50/48				
PT 30	-	coarse grained, wet, g	i , mediur Iray.	TI TO	MH			'		50/4" N =50/4"				
OG SI	86.5	SILTY SAND fine to n	nedium a	rained	SM	31.9				REC =4"				
48 PL	-	moist, light gray, with s	shell fragi	ments,										
31200	-													
<u>)</u> G 0(-													
NG LC								-90-		13+11+24	1			
BORIT	-								M	N =42	1			
TEST I		continued on i	next page											

	6	hnabol	TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plan	t		Boring	Number:	B-431
•	Schnat	bel Engineering					iryland				Contract Number: 06120048 Sheet: 4 of 4		
	EPTH (FT)	STRATA		ION	CLASS.	ELEV. (FT)	WL	DEPT	S. тн		G TA	TESTS	REMARKS
					SM				Ø	REC =1	2"		
	_												
		with fine to ease		anto				-95-		17+50/2			
	06.5	strong HCl reacti	on.	ients,		21.0				N =50/2 REC =8			
	90.0	CLAYEY SAND, grained, moist, lig	fine to mediu ght gray, with	um n shell	SC	21.9							
	-	fragments, trace	rock fragmei	nts.									
	-												
		trace fine to med moderate HCI rea	ium shell frag action.	gments,					M	10+32+ N =48	16		
1	01.5	BOTTOM OF BC	RING @ 10	1.5 FT.		16.9				REC =1	8"		
00/0													
ADEL.													
400.01													
200 Q													
-00 ol													
0040 LI													
10012													
DING LC													
2													

Schna	hnabel TEST BORING LOG	Project: C	alvert C alvert C	liffs Nucle county, Ma	ar Pow ryland	/er Pla	nt		Boring Contra Sheet:	Number: Inct Number 1 of 4	er: 06120	B-432
Device							Gr	oundw	ater Obs	ervations		
Boring	FREDERICK, MAF	RYLAND	, INC.				D	ate	Time	Depth	Casing	Caved
Boring F	oreman: D. Reese			Enco	untere	d	4	/27		29.0'		
Drilling	wethod: Mud Rotary			Start	of day	v	4	/28		12.7'		
Drilling I Schnabe	Equipment: CME-75		F			-						
Dates	Started: 4/27/06 Finished: 4	4/28/06	F									
Location	: Northing: 216399 ft Easting: 961139.1 ft											
Ground	Surface Elevation: 118.6 (feet)					1						
DEPTH (FT)	STRATA DESCRIPT	ION	CLAS	s. ELEV. (FT)	WL	DEP	S. TH	AMPLI D	NG ATA	TEST	s	REMARKS
0.3	TOPSOIL.		FILI	118.3			M	WOH	+2+2			
-	Poorly graded sand FILL, mo with clay.	ist, brown,					Ň	N =4 REC =	=14"			
2.5	SILTY SAND, fine and coarse moist. brownish orange.	e grained,	SM	- 116.1		_	-0	5+3+4 N =7				
-						-		REC =	=18"			
5.0 -	POORLY GRADED SAND W fine to medium grained, mois orange.	/ITH SILT, t, grayish	SP-SI	113.6 M		5 - -		2+3+4 N =7 REC =	-18"			
-	white.							3+4+5 N =9 REC =	=14"			
-	orange.					10-		4+5+7				
-						_	_Ň	N =12 REC =	-18"		Sv	vitch to mud
	orangeish white layering 1/4"	thick.				_	-	4+5+7 N =12 REC =	=16"		rot us bit	ary at 15' ing 2 15/16"
						L						
-						-	-	9+9+1 N =19	0			
						-20-		REC =	=10"			
						Ī						
	fine to coarse grained, grange	e lavering				F		12+12	+13			
		ε, ιαγ€ιπιÿ.						N =26 REC =	=12"			
	continued on next pag											

	1	TEST P	Project: Ca	lvert Cliffs	s Nucle	ar Pow	er Plant	Boring	Number:	B-432	
	20	hnabel Engineering LOG			nty, Ma	ryland		Contra	Contract Number: 06120048		
	Schna	abei Engineering LOG					CAMD	Sneet:	2 01 4		
	JEPTH (FT)	STRATA DESCRIPTIO	N	CLASS.	ELEV. (FT)	WL			TESTS	REMARKS	
				SP-SM							
		_									
		_									
		wet				∇	<u>∏</u> 10+ [.]	12+12			
						<u> </u>	N =2	24			
	-	-						, = 10			
		-									
		-									
		_									
		vellow trace gravel					19+^	18+21			
							N =3	89 ; =13"			
	-						-35-1-1				
		-									
		-									
		-									
	38.5	SILTY SAND, fine to medium gr	rained,	SM	80.1		7+8-	+8			
	_	wet, light brownish orange.						6 ; =13"			
		-									
		-									
		_ orange.					5+7-	+7 /4			
	_	_						; =13"			
/08											
T 3/6											
EL.GD	48.5	-			70.1						
INABE	49.3	SILT, moist, dark orange, with s	sand.	ML	69.3			+1 }			
SCF	-	LEAN CLAY, moist, dark gray, v sand.	with	CL				; =18"			
0.GPJ		_									
& 40											
T 300											
G SP								. 4			
8 PLC		-					-				
12004	-	-					55 <u>[]</u> REC	; =18"			
.90 D		-									
G LO		-									
ORIN											
ESTE		continued on next page									
≓∟		1									

	TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant		Boring Number:	B-432		
20	BORING	C C	alvert Cou	inty, Ma	iryland			Contract Number: 06120048			
Schnal	bei Engineering LOG						3	Sneet: 3 of 4			
DEPTH (FT)	STRATA DESCRIP	TION	CLASS.	ELEV. (FT)	WL	DEPTH		TESTS	REMARKS		
			CL				21214				
-	greenish gray.					- 11XI	N =7				
_						-60- 1	REC =18	8"			
-											
-											
-											
63.5	FAT CLAY, wet, dark gray.		СН	55.1			3+3+3				
_						<u>65</u> Ŭ	N =6				
_											
-											
-											
-						X	4+6+4 N =10				
_						-70- 1	REC =5"				
-											
-											
-											
73.5	CLAYEY SAND, fine grained	l, moist,	SC	45.1		M	4+5+5				
_	dark greenish gray.					_ ₇₅ _	REC =18	8"			
_											
78.5	SILTY SAND fine grained r	noist	SM	40.1			34+50/4				
- 9	reddish brown.	noist,	5101			- 10	N =50/4"	" O"			
10/c —						-80-					
– <u>פ</u> ר											
				35 4							
	POORLY GRADED SAND V	VITH SILT, gravish	SP-SM	35.1		∏	6+8+30 N =38				
	green, contains shell fragme	ents, strong				<u>⊢85</u> – ∐	REC =17	7"			
100121	moist, greenish white.						48+27+2	29			
							N =56 REC =18	8"			
						-90-1 ⁻¹		-			
	continued on next pa	ge									
<u>í</u>											

	TES	T Project: (Calvert Cliff	s Nucle	ar Pow	er Plant	t	Borin	g Number:	B-432	
Sahaak	BORI		Calvert Cou	inty, Ma	ryland			Contract Number: 06120048			
Schnat	bei Engineering LOC						~ ~	Snee	: 4 OT 4		
DEPTH (FT)	STRATA DESCR	IPTION	CLASS.	ELEV.	WL	DEDT	5А ⊔ ∣		TESTS	REMARKS	
			SP-SM			DEPT		DATA			
_											
93.5	POORI Y GRADED SANI	O WITH CLAY	SP-SC	25.1				7+12+50/5"			
94.5	fine to coarse grained, we	et, green.		24.1			XI	N =62/11"			
	CLAYEY SAND, fine to m	edium ntains shell	SC			-95		REC - 10			
-	fragments.										
_											
	wet							E0/2"			
-	wei.							N =50/3"			
100.0 -		100.0 FT		18.6		-100-		REC =2"			
		, 100.011.									
0											
0.000											
B											
5.00											
8 7											
б - -											
8											
0											

Schn	TEST Project: C Chnabel BORING C abel Engineering LOG	alvert Clif	ffs Nucle unty, Ma	ar Pow ryland	ver Pla	nt	Boring Contra Sheet:	Number: Ict Number 1 of 4	r: 06120	B-433
Boring						Gr	oundwater Obs	ervations		
Bonng	FREDERICK, MARYLAND	, INC.				D	ate Time	Depth	Casing	Caved
Boring	Foreman: D. Reese		Enco	untere	d	5	/17	33.5'	4.0'	
Drilling	Method: Mud Rotary									
Drilling	Equipment: CME-75 (Truck)									
Schnat	bel Representative: M. Arles									
Dates	Started: 5/16/06 Finished: 5/17/06									
Locatio	n: Northing: 215963.8 ft Easting: 961107.5 ft									
Ground	I Surface Elevation: 97.5 (feet)				1					
DEPTH (FT)	STRATA DESCRIPTION	CLASS	ELEV. (FT)	WL	DEP	S. TH	AMPLING DATA	TEST	S F	REMARKS
0.5	ROOTMAT AND TOPSOIL.		97.0			M	WOH+1+1		0-4	Hollow
	CLAYEY SAND, fine to medium grained, moist, brown, contains root	SC	01.0		-	-M	N =2 REC =15"		ste	n auger
2.0	fragments.	ML	95.5		F	1_				
	SANDY SILT, moist, orangeish brown,				-	ЧM	2+2+3			
					L	\mathbb{N}	REC =18"		4-4	8.5'- 3 7/8"
									rolle	er bit
	-				- 5 -	-177	4+3+2	w=27%	6 Sta	rt of drilling the day
	_				L		N =5	*		
6.3	POORLY GRADED SAND WITH SILT,	SP-SM	91.2			Ľ	REC =18"			
7.0	fine to coarse grained, moist, brown.	ML	90.5		F	1_				
	SANDY SILT, fine to medium, moist,				+	ЧM	2+2+2 N =4			
					L	\mathbb{N}	REC =16"			
9.5		014/014	88.0							
	to coarse grained, moist, brown.	500-510			-10-	1				
	_				L	-M	5+5+5	w=5.89	%	
						IŴ	N =10 REC =15"			
	-				F	1	1120 10			
	_				\vdash	-				
	brownish orange, with gravel.				L	\Box	8+12+10			
						IX	N =22			
-	-				-15-		REC = 10			
	_				L	_				
ŝ	1				F	1				
	-				F	-				
5	orange.				L		6+8+8			
8					Γ	IXI	N =16			
-	-				-20-	44	REC =12"			
2	-				F	1				
	1				F	1				
	-				F	-				
	brownish orange.				L		5+8+5	w=14.4	%	
					⁻		N =13	*		
- 1	continued on next page				-25-	44	KEC =18"			

Schnabel Engineering BORING LOG Calvert County, Maryland Contract Nun Sheet: 2 of 4 DEPTH (FT) STRATA DESCRIPTION CLASS. ELEV. (FT) WL SAMPLING DEPTH TE SW-SM SW-SM SW-SM Image: Contract Nun Sheet: 2 of 4 Image: Contract Nun Sheet: 2 of 4	nber: 06120048
DEPTH (FT) STRATA DESCRIPTION CLASS. ELEV. (FT) WL SAMPLING DEPTH TE SW-SM SW-SM <td< td=""><td>STS REMARKS</td></td<>	STS REMARKS
SW-SM	
27.0 SILTY SAND, fine to medium grained, SM 70.5	
N =4 REC =18"	
SANDY ELASTIC SILT, fine to medium, MH 05.5 Sweet, orange.	
□ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □	3.3%
34.5SILTY SAND, fine to medium grained, SM 63.0SILTY SAND, fine to medium grained, SM 63.0	×
moist, grayish orange	
36.5 SANDY FAT CLAY, moist, dark gray, CH 61.0	
with sand.	
REC =24" W=3	3.5% =61
	=14 .50 tsf
	*
- $ -$	3.5% =59
REC =18" PL	=22 *
	48.5-100' - 2
$ \begin{array}{c} H \\ H $	3.6% 15/16" roller bit =64
	.00 tsf
52.0 SANDY LEAN CLAY, fine to medium CL 45.5	
grained, moist, dark gray.	21%
$ \begin{array}{c} - \\ + \\ + \\ + \\ + \\ + \\ + \\ + \\ + \\ + \\$	=45 =18
	*
SILTY SAND, fine to medium grained, SM 40.5 moist, dark greenish gray.	
continued on next page	

Γ		hnabel TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	Boring Number: B-433		
	Schnal	bel Engineering LOG	C	alvert Cou	nty, Ma	aryland		Contract Number: 06120048 Sheet: 3 of 4		
	DEPTH (FT)	STRATA DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	SAMPLI DEPTH D	NG TESTS	REMARKS	
	-			SM				19 w=29.3% LL=44 =18" PL=35		
	62.0 - - - -	POORLY GRADED SAND W fine to medium grained, moist	ITH SILT, t, gray.	SP-SM	35.5		 [⊠] 50/5" N =50 REC = 	/5" =4"		
	67.0 - - - -	WELL GRADED SAND WITH to medium grained, moist, gre gray, with fine to coarse 20-30 fragments, strong HCI reactio	I SILT, fine eenish 0% shell n.	SW-SM	30.5		 23+19 N =51 - 70 - REC =	9+32 =16"		
	-	50-70% shell fragments.						4 w=23.7% *		
ABEL.GDT 3/6/08	-	25-30% shell fragments.					 N 11+8+ N =16 REC =	-8 =18"		
DG SPT 300 & 400.GPJ SCHNA	- - -	20-25% shell fragments.					6+9+1 06+9+1 N =20 REC =	1 =18"		
0RING LOG 06120048 PL(87.0 - - -	SANDY SILT, fine to medium moist, dark green, with fine to 15-20% shell fragments, stror reaction.	grained, coarse ng HCl	ML	10.5		 90 - 90 - 90 - - 90 - - - 90 - - - 90 - - - - - - - - - - - - - - - - - -	9 =18"		
TEST BC		continued on next pag	e							

Sc	hnabel TEST BORING	Project: Ca	alvert Cliff alvert Cou	s Nucle nty, Ma	ar Pow ryland	er Plant		Boring Contra	Number:	B-433
Schnat	bel Engineering LOG							Sheet:	4 of 4	
DEPTH (FT)	STRATA DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	DEPTH	SAMPLIN	G TA	TESTS	REMARKS
			ML							
-										
-							7		w=31 5%	
-	fragments.)	N =14	0"	*	
_						95		0		
-										
-										
-							7 5.4.5			
-)	N =9	0"		
100.0 —	BOTTOM OF BORING @ 10	0.0 FT.		-2.5		-100-		0		

Schna	bel Engineering TEST BORING LOG	alvert Cl alvert Co	rt Cliffs Nuclear Power Plant rt County, Maryland					Boring Number: B-434 Contract Number: 06120048 Sheet: 1 of 4			B-434	
Boring	Contractor: CONNELLY AND A	SSOCIATES	INC				Gro	oundw	ater Obs	ervations		
	FREDERICK, MAR	YLAND	,				D	ate	Time	Depth	Casing	Caved
Boring I	Foreman: D. Bender			Enco	untere	d	5	5/9		28.5'		
Drilling												
Sahnah												
Deter	Startade 5/0/00 Finishede 5/	0/00	-									
Dates	Starteu: 5/9/06 Finisheu: 5/1	10/06										
Location	Easting: 961244.3 ft											
Ground	Surface Elevation: 105.2 (feet)						S		NG			
(FT)	STRATA DESCRIPTI	ON	CLAS	S. (FT)	WL		тн ∣	ם וווג- עם	ΔΤΔ	TEST	S F	REMARKS
0.5	CLAYEY SAND, fine to mediu	m	sc	104 7								
-	grained, moist, orangeish brow	vn and /	SM			╞	HM	3+4+4 N =8				
	trace wood fragments.					L	$ \Delta $	REC =	=18"			
	SILTY SAND, fine to medium	grained,						3+4+5				
-	fragments.	root					1 X	N =9	10"			
-						-		REC =	=18"			
_	 					- 5 -		0.4.0				
		orown.					IXI	2+4+6 N =10				
							$ \Box $	REC =	=18"			
7.0 -	POORLY SAND SAND WITH	SILT,	SP-SN	<u>98.2</u>		-						
-	trace gravel, fine to coarse gra	ained, Sllowish				-	HMI	3+6+7 N =13		w=11.8	%	
	brown.					L	$ \Delta $	REC =	=15"			
9.5	SILTY SAND fine to coarse o	rained	SM	95.7		10						
_	moist, orangeish brown.	i all'i e a,	0			-10-	7,	4.7.0				
-	-					-	HXII	4+7+8 N =15				
	-					-	-121	REC =	=11"			
						L						
								0+0+0		w=7.0	%	
						-	TIXII	N =18		*		
14.8 _	POORLY GRADED SAND WI	TH SILT,	SP-SN	И 90.4		-15-	- ĽI	REC =	-9"			
-	tine to coarse grained, moist, y brown and orange.	yellowish				F						
						L						
-	-					F	┤│				.0/	
-	-					╞	HM	5+8+1 N =10	1	w=10.6	70	
-						-20-	40	REC =	=10"			
						Γ	7					
22.0 -	SILTY SAND, medium to coar	se	SM	83.2		F	$\left \right $					
-	grained, moist, orangeish brow	vn and				F	+					
	yellowian มเอพท.					L		2+4+3				
								N =7	-12"			
	continued on next page	e				-25-	- 12	NLC =	- 14			

	6	TEST Project:	Calvert Cliff	s Nucle	ar Pow	er Plant	Boring Number:	B-434
	Schnat	BORING	Calvert Cou	inty, Ma	iryland		Contract Number: 0	6120048
	DEPTH	STRATA DESCRIPTION	CLASS.	ELEV.	WL	SAMPLIN	NG TESTS	REMARKS
\vdash	(FI)		SM	(F1)		DEPTH DA	ATA	
	_		5101					
	_							
		wet, orangeish brown and grav.			$\overline{\Sigma}$	3+2+2	w=21.9%	
						N =4	18"	
	_							
	-							
	-							
	-						00.00/	
	-	fine to medium grained, light gray.				2+2+2 N =4	w=26.6%	
	_					35	18"	
	-							
	-							
	-							
	_					2+1+1	w=27.4%	
	_						18" PL=NP	
	_							
	_							
	_							
						REC =	7" PP=1.50 tsf	
						-45-		
80	_							
T 3/6	47.0 -	FAT CLAY, trace sand, moist, gray and	СН	58.2				
EL.GD	-	greensn gray.					w=38.2%	
HNAB	-						LL=73	
J SC						-50-10 REC =	*	
100.GF	-							
300 & 4	-							
SPT	-							
PLOG	-					REC =	18" w=87.8% LL=56	
20048	_						PL=23 PP=2.50 tsf	
3 061;	-					│	*	
GLOC	_							
BORIN	_							
TEST		continued on next page						

6		Project: Ca	alvert Cliffs	s Nucle	ar Pow	er Plant	I	Boring Number: B-434		
Schnat	bel Engineering LOG	Ca	aivert Cou	nty, Ma	ryland			Sheet: 3 of 4		
DEPTH (FT)	STRATA DESCRIPTIO	ON	CLASS.	ELEV. (FT)	WL	S. DEPTH	AMPLING	G TESTS	REMARKS	
-			СН				5+5+8 N =13 REC =18	w=36.6% LL=86 PL=22 PP=2.75 tsf	Resumed drilling on 5/10/06 @ 7:30 am	
62.0 -	SILTY SAND, fine to medium g moist, greenish gray and white fine to medium shell fragments reaction moderate, weakly cer	grained, , trace s, HCI mented.	SM	43.2		 65 	REC =19	9" w=23.7% LL=NP PL=NP PP=2.00 tsf *		
-						 	20+100/5 N =100/5 REC =10	5" w=25% 5" *		
-	HCI reaction weak.						48+50 N =50 REC =13	w=22.6%		
						 	36+29+4 N =78 REC =17	.g w=15.6%		
- 0.28 	SANDY LEAN CLAY, moist, lig trace fine to coarse shell fragm reaction moderate.	ght gray, hents, HCI	CL	23.2		 85 	50 REC =6"	w=19.8% LL=30 PL=22 PP=1.00 tsf		
- 0.78 PLOC	SILTY SAND, fine to medium g moist, gray and greenish gray, to coarse shell fragments, HCI strong.	grained, with fine reaction	SM	18.2		 90	8+28+21 N =49 REC =18	w=15.6% *		
	continued on next page									

Schnat	Schnabel Engineering			Calvert Cliffs Nuclear Power Plant Calvert County, Maryland					Boring Number: B-434 Contract Number: 06120048 Sheet: 4 of 4		
DEPTH (FT)	STRATA		ION	CLASS.	ELEV. (FT)	WL	SA DEPTH	MPLING	TESTS	REMARKS	
92.0	POORLY GRAD wet, gray and wh shell fragments,	ED SAND, tr nite, trace find HCI reaction	race silt, e to coarse moderate.	SM SP	13.2		 	6+6+8 N =14 REC =18"	w=31.2% LL=NP PL=NP *		
97.0 - - - 100.0 -	SILTY SAND, fir wet, greenish gra to coarse shell fr strong.	e to medium ay and white agments, HC	n grained, , trace fine Cl reaction	SM	8.2 5.2		 	11+7+11 N =18 REC =18"	w=25.6%		

Schnat	TEST Project: C bel Engineering LOG C	alvert Cli alvert Co	ι Cliffs Nuclear Power Plant t County, Maryland				Boring Contra Sheet:	Boring Number: B-435 Contract Number: 06120048 Sheet: 1 of 4			
Boring C						Gr	oundwater Obs	ervations			
Bornig C	FREDERICK, MARYLAND	, INC.				D	ate Time	Depth	Casing	Caved	
Boring F	oreman: D. Bender		Enco	untere	ed	Ę	5/2	7.5'			
Drilling N	Method: Mud Rotary		Start	of Da	v	5	5/3	9.7'			
Drilling E	Equipment: CME-550X (ATV)	-									
Schnabe	Representative: K. Megginson										
Dates S	Started: 5/2/06 Finished: 5/3/06										
Location	: Northing: 216020.06 ft Easting: 961404.74 ft										
Ground	Surface Elevation: 107.7 (feet)				1						
DEPTH (FT)	STRATA DESCRIPTION	CLASS	ELEV. (FT)	WL	DEP	S. TH	AMPLING DATA	TEST	S I	REMARKS	
0.4	Forest litter, rootmat and topsoil.		107.3			M	1+1+2				
	CLAYEY SAND, fine to medium grained, moist, brown, contains root		10F 7		t		REC =10"				
2.0 -	tragments.	SM	105.7		Γ		0.0.0				
	moist, brown, contains root fragments.				F	HV	2+2+2 N =4				
					F	ЦШ	REC =13"				
	fine to coarse grained.				_ <u>5</u> _						
	Ū.					M	3+4+4 N -9				
-					F	-10	REC =12"				
7.0 -	CLAVEY SAND find to opprove grained	80	100.7		+	-					
	wet, brown.	50		<u> </u>			3+5+6				
						IŇ	N =11 REC =12"		*U:	sed hollow	
95			98.2		F		1120 - 12		ste	m augers to	
	SILTY SAND, fine to medium grained,	SM	00.2		-10-	-			*3-	7/8" Tri-cone	
					L	\square	6+5+6		roll 9 fl	er bit below	
						IŇ	N =11 RFC =11"				
					F	1					
-					F	-					
_	light yellowish brown.				Ļ	$-\square$	6+6+8				
					45	M	N =14 REC =10"				
					- 15-						
_					F	-					
					F	_					
					L						
							5.7.0				
-	light brown.				F	HXI	5+7+8 N =15				
					-20-	- 121	REC =8"				
					L						
-					F	-					
-					\vdash	-					
	fine to coarse grained, brown and light				L		5+9+10				
	brown.						N =19 REC =10"				
-	continued on next page				-25-						

ſ		TEST Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	Boring Number:	B-435	
	Schna	bel Engineering LOG	alvert Cou	inty, Ma	iryland		Contract Number: 06120048 Sheet: 2 of 4		
	DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL		IG TESTS	REMARKS	
-	- - - - -	brown.	SM			 	12 7"		
	32.0 -	CLAYEY SAND, fine to medium grained, wet, brown.	SC	75.7		 	13"	*Switched to 2-15/16" Tri-cone roller bit below 33.5 ft.	
	37.0 - - - -	SANDY SILT, fine, wet, yellowish brown and light gray, contains mica.	ML	- 70.7		 	18" DH/18" 18"		
	42.0 - - - -	SILTY SAND, fine to medium grained, wet, gray, contains mica.	SM	65.7		 	18"		
00 & 400.GPJ SCHNABEL.GDT 3/6/08	47.0 -	FAT CLAY, moist, gray and dark gray, trace sand, contains mica.	СН	60.7			PP=1.00 tsf	**Resumed drilling at 6:50 AM on 5/3/06.	
LOG 06120048 PLOG SPT 30	- - -	contains mica and organic matter.				 2+5+5 N =10 REC =	PP=1.75 tsf		
TEST BORING	-	gray, trace sand, contains mica. continued on next page						*Switched to 3-7/8" Tri-cone	

	TEST	Project: Ca	lvert Cliff	s Nucle	ar Pow	er Plant	E	Boring Number: B-435		
Schn	abel Engineering LOG	Ca	lvert Cou	inty, Ma	iryland			Contract Number: 06120048 Sheet: 3 of 4		
DEPTH	STRATA DESCRIPT		CLASS	ELEV.	wi	S	AMPLING	TESTS		
(FT)	STRATA DESCRIPT		ULAUU.	(FT)		DEPTH	DAT	A		
-	-		СН			 60	3+4+6 N =10 REC =18	je	58.5 ft because smaller roller bit was clogged with sediment.	
62.0	LEAN CLAY, moist, gray, wit contains mica.	h sand,	CL	45.7		 65	3+6+6 N =12 REC =18	,n	*Switched to 2-15/16" Tri-cone roller bit below 33.5 ft.	
67.0	SANDY SILT, fine to medium orangeish brown and grayish contains fine to coarse silty s pockets gray below 69 ft.	n, moist, brown, and	ML	40.7		 	7+13+33 N =46 REC =18	jn		
72.0	POORLY GRADED SAND W fine to medium grained, wet,	/ITH SILT, gray.	SP-SM	35.7		 75	7+6+7 N =13 REC =12	. ⁿ		
77.0	SILTY SAND, fine to medium wet, gray, with fine to coarse fragments, strong HCI reactio	ı grained, shell m.	SM	30.7		 80 - -	23+25+4 N =65 REC =14	0		
0.06 SPT 300 & 400.6PJ SCHNABEL.	CLAYEY SAND, fine to medi grained, wet, light gray, most coarse shell fragments (±60% HCI reaction	um ly fine to 6), strong	SC	25.7		 85 - 	17+23+2 N =52 REC =18	9		
30RING LOG 061200481	gray and oliveish gray, little f coarse shell fragments.	ne to					6+46+19 N =65 REC =18	ja		
TEST	continued on next page	ge								

SC	hnabel BORING	Project: C	Calvert Cliffs Nuclear Power Plant					Boring Number: B-435		
Schnal	bel Engineering LOG			inty, wa	iryiana			Sheet: 4 of 4		
DEPTH (FT)	STRATA DESCRIP	ΓΙΟΝ	CLASS.	ELEV. (FT)	WL	S DEPTH			TESTS	REMARKS
			SC							
_	gray.									
_							5+4+5			
						Å	N =9 REC =	18"		
-										
97.0 -	SILTY SAND find to modium	arainad	SM	10.7						
-	wet, gray, little fine to coarse fragments, strong HCI reaction	shell	5101							
-						17	7+10+1 N =20	10		
100.0 —	BOTTOM OF BORING @ 10	0.0 FT.		7.7		-100-	REC =	18"		
l										
							1			

BORING Exhance Equipment Exhance Equipment (REE) PROFENCE, MARYLAND Calvert County, Mayland Contract Number: 08120048 Sheet: 1 of 4 Boring Contract: Dende (REE) PROFENCE, MARYLAND Date Time Depth Saing Caved Boring Foreman: D. Bender Date Time Depth Saing Caved Boring Foreman: D. Bender Date Time Depth Saing Caved Drilling Equipment: ME Solo Date Time Depth Saing Caved Dates Stated: 5/500 Finished: 5/300 Location: Dates SameLinko Dates SameLinko Date		hpahol TEST	Project:	Project: Calvert Cliffs Nuclear Power Plant							Boring Number: B-436				
Groundwater Observations Groundwater Observations Contractor: CONNELLY AND ASSICIATES, INC FREDERICK, MARYLAND Date Time Depth Casing Caved Drilling Method: Multicatary Drilling Regiment: CME-680K (ATV) Schnabel Representative: K. Bell Date Started: 5/5/06 Finished: 5/9/06 Location: Northing: 15/92/32 (2) Satisfie: 5/5/06 Finished: 5/9/06 Control Sufface Elevation: 108.3 (feet) DEPTM STRATA DESCRIPTION CLASS CLASS ELEV WL South Colspan="2">Sampling: 19/2/4 OCOTMAT AND TOPSOIL SM 108.0 Carageish brown and reddsh SM 108.0 Carageish brown and predium grained, most, orangeish brown and predium grained, most, orangeish brown and prown. SILTY SAND, fine to coarse grained, most, orangeish brown and orange. SM 90.3 SILTY SAND, fine to coarse grained, most, orangeish brown and orange. SP-SM 100.1 <th colsp<="" th=""><th>Schnal</th><th>bel Engineering LOG</th><th></th><th>Calvert (</th><th colspan="5">County, Maryland</th><th></th><th>Contra Sheet:</th><th colspan="3">Contract Number: 06120048 Sheet: 1 of 4</th></th>	<th>Schnal</th> <th>bel Engineering LOG</th> <th></th> <th>Calvert (</th> <th colspan="5">County, Maryland</th> <th></th> <th>Contra Sheet:</th> <th colspan="3">Contract Number: 06120048 Sheet: 1 of 4</th>	Schnal	bel Engineering LOG		Calvert (County, Maryland						Contra Sheet:	Contract Number: 06120048 Sheet: 1 of 4		
Date Time Depth Casing Casing <thcasing< th=""></thcasing<>	Boring C	Contractor: CONNELLY AND	ASSOCIATE	S. INC.					Gr	ound	water Obs	ervations			
Boring Poreman: D. Bender Encountered 5/9 37.0 Drilling Method: Mud Rotary Drilling Method: Mud Rotary		FREDERICK, MAR	RYLAND	- , -					D	ate	Time	Depth	Casing	Caved	
Umming Memodic: Multiple Equipment: Multit Multiple Equipment: Mu	Boring F	Foreman: D. Bender				Enco	untere	d		5/9		37.0'			
Difference Schnable Representative: IS Bell Dates Started: 5/5/06 Finished: 5/9/06 Location: Northing: 515423.22 ft Ensiting: 961441.55 ft Ground Surface Elevation: 108.3 (feet) DEPTH STRATA DESCRIPTION CLASS. F(FT) STRATA DESCRIPTION CLASS. F(FT) STRATA DESCRIPTION CLASS. F(FT) SILTY SAND, fine to medium grained, moist, orangeish brown and reddish brown. -	Drilling	Method: Mud Rotary													
Dates Statust: 5/000 Location: Northing: 1916/3023 92 ft Easting: 98.8 O'A SILTY SAND, fine to coarse grained, molst, yellowish brown and orange. 0.3 SILTY SAND, fine to coarse grained, molst, yellowish brown and orange. 0.4 SILTY SAND, fine to coarse grained, molst, yellowish brown and orange. 0.5 SILTY SAND, fine to coarse grained, molst, yellowish brown and orange. 0.6 SILTY SAND, fine to coarse grained, molst, yellowish brown and orange. 0.7.0 POORLY GRADED SAND WITH SILT, medium to coarse grained, molst, orangeish brown and orange. 0.4 SILTY SAND, fine to coarse grained, molst, yellowish brown and orange. 0.5 SILTY SAND, fine to coarse grained, molst, brown and orange. 0.6 SILTY SAND, fine to coarse grained, molst, brown and orange. 0.7.0 POORLY GRADED SAND WITH SILT, medium to coarse grained, molst, wellowish brown and orange. 0.7.0 SULTY SAND, fine to coarse grained, molst, wellowish brown and orange. 0.7.0 SULTY SAND, fine to coarse grained, molst, wellowish brown and orange. 0.7.0 SULTY SAND, fine to coarse grained, molst, wellowish brown and orange. 0.7.0 SULTY SAND, fine to coarse grained, molst, wellowish brown, trace grained, molst, orangeish brown and orange. 0.7.0 SULTY SAND, fine to coarse grained, molst, wellowish brown, trace grained, molst, coarse graine	Schnabe														
Location: Northing: 515823 92 ft Easting: 901441.55 ft Ground Surface Elevation: 108.3 (feet) DEPTH (FT) STRATA DESCRIPTION (T) CLASS. (FT) ELEV (FT) WL SAMPLING DEPTH DATA TESTS REMARKS 0.3 ROOTMAT AND TOPSOIL. Sith Y SAND, fine to medium grained. moist, orangeish brown and reddish brown. SM 108.0 11/2:46 N = 4 REC = 13° 11/2:46 N = 4 REC = 13° 11/2:46 N = 4 REC = 13° 7.0 POORLY CRADED SAND WITH SILT, orangeish brown and brown. SP-SM 101.3 2/3:42-3 N = 6 N = 6 3/2:42-3 N = 6 3/3% R = 6 3/3% R = 6 10/3 2/3:44-4 R = 7 R = 7 w=3.3% R = 6 10/3 9.5 SILTY SAND, medium to coarse grained, moist, orangeish brown and yellowish brown and orange. SM 96.8 91.3 4/5/66 N = 14'' R = 6 4/5/66 N = 14'' R = 6 4/5/66 N = 14'' R = 6 10 12.0 POORLY GRADED SAND WITH SILT, wellowish brown and orange. SM 91.3 91.3 5/5/6*68 N = 14'' R = 11'' 5/7*9 N = 16 N = 11'' R = 11'' 11/2'''''''''''''''''''''''''''''''''''	Dates	Started: 5/5/06 Finished: 5/	9/06												
Ground Surface Elevation: 108.3 (feet) Sampling DEPTH (FT) STRATA DESCRIPTION CLASS ELEV. (FT) WL SAMPLING DEPTH TESTS REMARKS 0.3 SULTY SAND, fine to medium grained, moist, orangeish brown and reddish brown. SM 108.0	Location	: Northing: 515923.92 ft Easting: 961441.55 ft		·											
DEPTH (FT) STRATA DESCRIPTION CLASS ELEV. (FT) WL SAMPLING DEPTH TESTS REMARKS 0.3	Ground	Surface Elevation: 108.3 (feet)													
(FT) STRATA DESCRIPTION CLASS (FT) WL DEPTH DATA TESTS REMARKS 0.3 ROOTMAT AND TOPSOIL SM 108.0 - <td>DEPTH</td> <td>, , , , , , , , , , , , , , , , , , ,</td> <td></td> <td></td> <td></td> <td>ELEV.</td> <td></td> <td></td> <td>S</td> <td></td> <td>LING</td> <td></td> <td></td> <td></td>	DEPTH	, , , , , , , , , , , , , , , , , , ,				ELEV.			S		LING				
0.3 ROOTMAT AND TOPSOLL SM 108.0	(FT)	STRATA DESCRIPT	ION	CLAS	55.	(FT)	WL	DEP	тн		DATA	IESI	5	REMARKS	
SILTY SAND, fine to medium grained, brown.	0.3	ROOTMAT AND TOPSOIL.		SM	1	108.0			M	1+2-	⊦4 S				
7.0 POORLY GRADED SAND WITH SILT, orangeish brown and brown. SP-SM 101.3 322+3 N + 5 REC = 15" 322+3 N + 7 REC = 15" 9.5 SILTY SAND, medium to coarse grained, moist, orangeish brown and brown. 98.8 -10 -10 445+6 N + 7 REC = 14" -10 12.0 POORLY GRADED SAND WITH SILT, wellowish brown. SP-SM 96.3 -10 -10 -10 -10 12.0 POORLY GRADED SAND WITH SILT, wellowish brown. SP-SM 96.3 -10	-	SILTY SAND, fine to medium moist, orangeish brown and r brown.	grained, eddish					-		REC	; =13"				
7.0 POORLY GRADED SAND WITH SILT, medium to coarse grained, moist, orangeish brown and brown. SP-SM 101.3 - - 24.344 N = 7 REC = 15" w=3.3% 9.5 SILTY SAND, medium to coarse grained, moist, orangeish brown and yellowish brown. SM 98.8 -	-									3+2- N =4 REC	+2 ; ; =20"				
7.0POORLY GRADED SAND WITH SILT, medium to coarse grained, moist, orangeish brown and brown.SP-SM101.3 $N=5$ REC =15" REC =11" $w=3.3\%$ REC =14"9.5SILTY SAND, medium to coarse grained, moist, orangeish brown and yellowish brown.98.8 $10-4$ REC =14" $2+3+4$ REC =14" $w=3.3\%$ REC =14"12.0POORLY GRADED SAND WITH SILT, yellowish brown and orange.96.396.3 -4 REC =12" $5+6+8$ N =14 REC =14"17.0SILTY SAND, fine to coarse grained, moist, yellowish brown and orange.SM91.3 -4 REC =11" $5+7+9$ N =16 REC =11"17.0SILTY SAND, fine to coarse grained, moist, yellowish brown and orange.SM91.3 -4 REC =11" $5+7+9$ N =16 REC =11"22.0POORLY GRADED SAND WITH SILT, fine to coarse grained, moist, orangeish brown, trace gravel.SP-SM86.3 -4 REC =12" $5+7+9$ N =16 REC =11"22.0POORLY GRADED SAND WITH SILT, fine to coarse grained, moist, orangeish brown, trace gravel.SP-SM86.3 -4 REC =12" $w=11.1\%$ REC =12"		orangeish brown and yellowis	sh brown.					- 5 -	M	3+2-	+3				
7.0 POORLY GRADED SAND WITH SILT, orangeish brown and brown. SP-SM 101.3 2+3+4 w=3.3% 9.5 SILTY SAND, medium to coarse grained, moist, orangeish brown and yellowish brown. 98.8 98.8 96.3 4+5+6 12.0 POORLY GRADED SAND WITH SILT, medium to coarse grained, moist, yellowish brown and orange. 96.3 96.3 4+5+6 10 17.0 SILTY SAND, fine to coarse grained, moist, yellowish brown and orange. 91.3 96.3 5+6+8 10 17.0 SILTY SAND, fine to coarse grained, moist, yellowish brown and orange. 91.3 91.3 5+7+9 5+7+9 22.0 POORLY GRADED SAND WITH SILT, fine to coarse grained, moist, orangeish brown and orange. SM 91.3 91.3 5+7+9 22.0 POORLY GRADED SAND WITH SILT, fine to coarse grained, moist, orangeish brown and orange. SP-SM 86.3 7+7+10 w=11.1% 22.0 POORLY GRADED SAND WITH SILT, fine to coarse grained, moist, orangeish brown, trace gravel. SP-SM 86.3 7+7+10 w=11.1%	_							F	-Ŵ	N =5 REC	; =15"				
9.5 9.5 SILTY SAND, medium to coarse grained, moist, orangeish brown and brown. 9.5 98.8 91.3 91.3 91.3 94.3 94.4 94.4 94.4 94.4 94.4 94.4 94.4 94.4 94.4 94.4 94.4 94.4 94.4 94.4 <p< td=""><td>7.0 -</td><td>POORLY GRADED SAND W</td><td>ITH SILT.</td><td>SP-S</td><td>SM</td><td>101.3</td><td></td><td>F</td><td>-</td><td></td><td></td><td></td><td></td><td></td></p<>	7.0 -	POORLY GRADED SAND W	ITH SILT.	SP-S	SM	101.3		F	-						
9.5 SILTY SAND, medium to coarse grained, moist, orangeish brown and yellowish brown. 98.8 -10 12.0 POORLY GRADED SAND WITH SILT, medium to coarse grained, moist, yellowish brown and orange. 96.3 -10 17.0 SILTY SAND, fine to coarse grained, moist, yellowish brown and orange. 91.3 -15 17.0 SILTY SAND, fine to coarse grained, moist, yellowish brown and orange. 91.3 -16 22.0 POORLY GRADED SAND WITH SILT, fine to coarse grained, moist, orangeish brown, trace gravel. SM 91.3 -16 22.0 POORLY GRADED SAND WITH SILT, fine to coarse grained, moist, orangeish brown, trace gravel. SP-SM 86.3 -16 -17 22.0 Continued on next page SP-SM 86.3 -17 -17 -17	-	medium to coarse grained, m orangeish brown and brown.	oist,							2+3- N =7 REC	+4 ; ; =14"	w=3.3'	%		
grained, moist, orangeish brown and yellowish brown. 96.3 10 4+5+6 12.0 POORLY GRADED SAND WITH SILT, medium to coarse grained, moist, yellowish brown and orange. 96.3 5+6+8 17.0 SILTY SAND, fine to coarse grained, moist, yellowish brown and orange. 91.3 5+7+9 17.0 SILTY SAND, fine to coarse grained, moist, yellowish brown and orange. 91.3 5+7+9 22.0 POORLY GRADED SAND WITH SILT, fine to coarse grained, moist, orangeish brown, trace gravel. SP-SM 86.3 7+7+10 22.0 POORLY GRADED SAND WITH SILT, fine to coarse grained, moist, orangeish brown, trace gravel. SP-SM 86.3 7+7+10 w=11.1% 22.0 Continued on next page SP-SM 86.3 4.5 4.5 4.5	9.5	SILTY SAND. medium to coa	Irse	SM	1	98.8		10							
12.0 POORLY GRADED SAND WITH SILT, medium to coarse grained, moist, yellowish brown and orange. SP-SM 96.3 -	_	grained, moist, orangeish bro yellowish brown.	wn and					-	-0	4+5- N =1	⊦6 1				
$17.0 = \frac{1}{22.0} = \frac{1}{17.0} = \frac{1}{17.0$	12.0 -	POORLY GRADED SAND W	ITH SILT.	SP-S	SM	96.3		F		REC	=12"				
17.0 SILTY SAND, fine to coarse grained, moist, yellowish brown and orange. SM 91.3	-	medium to coarse grained, m	ioist,					F	_						
$17.0 - \frac{15}{1200} = \frac{15}{1200} = \frac{15}{1200} = \frac{14}{1200} = \frac{14}{1$								_	-10	5+6-	+8				
17.0 SILTY SAND, fine to coarse grained, moist, yellowish brown and orange. 22.0 POORLY GRADED SAND WITH SILT, fine to coarse grained, moist, orangeish brown, trace gravel. <i>continued on next page</i> 86.3 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 91.5 9									10	REC	4 ; =14"				
17.0 SILTY SAND, fine to coarse grained, moist, yellowish brown and orange. 22.0 POORLY GRADED SAND WITH SILT, fine to coarse grained, moist, orangeish brown, trace gravel. Continued on next page 86.3 91.3															
SILTY SAND, fine to coarse grained, moist, yellowish brown and orange. SM 91.3 91.3 91.3 91.3 91.3 5+7+9 N=16 REC =11" 90ORLY GRADED SAND WITH SILT, fine to coarse grained, moist, orangeish brown, trace gravel. Continued on next page w=11.1%						01.0									
$22.0 - \frac{1}{22.0} = \frac{1}{22.0} = \frac{1}{22.0} = \frac{1}{20} = \frac{1}{20$	0 17.0 - 2	SILTY SAND, fine to coarse of	grained,	SM	1	91.3		F	1						
22.0 POORLY GRADED SAND WITH SILT, fine to coarse grained, moist, orangeish brown, trace gravel. <i>continued on next page</i> 86.3 87.7710 87.77710 87.7710 87.777710 87.77710 87.77710 87.77710 87	۵.004 –	moist, yellowish brown and o	range.					F							
22.0 POORLY GRADED SAND WITH SILT, fine to coarse grained, moist, orangeish brown, trace gravel. <i>continued on next page</i> 86.3 86.3 86.3 86.3 86.3 86.3 86.3 86.3								F	HM	5+7- N =1	⊦9 6				
22.0 POORLY GRADED SAND WITH SILT, SP-SM fine to coarse grained, moist, orangeish brown, trace gravel. <i>continued on next page</i> 86.3 86.3 86.3 86.3 86.3 86.3 86.3 86.3		_						-20-	ЦЦ	REC	=11"				
22.0 POORLY GRADED SAND WITH SILT, fine to coarse grained, moist, orangeish brown, trace gravel. <i>continued on next page</i> 86.3 6.3 7+7+10 86.3 86.3 86.3 86.3 86.3 86.3 86.3 86.3								_	_						
POORLY GRADED SAND WITH SILT, fine to coarse grained, moist, orangeish brown, trace gravel. <i>continued on next page</i>	220 -					86.3		L							
$\begin{bmatrix} - & - & - & - & - & - & - & - & - & - $		POORLY GRADED SAND W fine to coarse grained, moist, brown, trace gravel.	ITH SILT, orangeish	SP-S	SM			-			10	w-11 1	0/2		
continued on next page								F		7+7- N =1	⊦10 7	*	/0		
		continued on next pag	je					-25-		REC	:=12"				

Schnabel Engineering BORING LOG Calvert County, Maryland Contr Sheet DEPTH (FT) STRATA DESCRIPTION CLASS. ELEV. (FT) WL SAMPLING DEPTH	act Number: 0 :: 2 of 4 TESTS	6120048 REMARKS
DEPTH (FT) STRATA DESCRIPTION CLASS. ELEV. (FT) WL SAMPLING DEPTH	TESTS	REMARKS
SP-5M		
27.0 CLAYEY SAND, fine to coarse grained, SC 81.3		
gravel.		
4 inch orange and white fat clay layer below 29.6 ft.		
32.0 SILTY SAND, fine to medium grained, SM 76.3		
white.	w=25.2%	
$\begin{bmatrix} - & - \\ - & - \end{bmatrix} \times \begin{bmatrix} N & -4 \\ REC & = 17" \end{bmatrix}$	*	
CLAYEY SAND, fine to medium SC Grained, wet, orangeish brown and gray.		
2+2+2		
39.4 SANDY LEAN CLAY, wet, gray. CL 68.9 N =4 REC =20"		
_ moist 1+2+3		
		drilling resumed 5/9/06 @7:00
		am
₩ REC =24"		
52.0 FAT CLAY with sand, moist, gray. CH 56.3 - -		
$\mathcal{O}_{\mathbf{z}}$		
minued on next page minued on next page		

	TEST	Project: Ca	Calvert Cliffs Nuclear Power Plant					Boring Number: B-436		
Schoo	BORING	Ca	alvert Cou	nty, Ma	ryland			Contract Number: 06120048		
DEDTU						9				
(FT)	STRATA DESCRIPTI	ON	CLASS.	(FT)	WL	DEPTH		TESTS	REMARKS	
-			СН							
-						X	3+5+5 N =10			
_						-60- []	REC =2	0"		
-										
-										
_										
	light gray and greenish gray.						5+7+11			
							N =18 RFC =1	9"		
						-65				
-										
67.0 -	SANDY LEAN CLAY, moist, g	ray and	CL	41.3						
-	greenish gray.									
-							5+7+11 N =18			
							REC =2	0"		
-										
720 -				36.3						
72.0	SILTY SAND, fine to medium moist, light gray.	grained,	SM	50.5						
							35+67+	100/4"		
-						- 10	N =167/	10"		
						75		4		
-										
-										
-										
-	wet, light gray and white, with	shell				0	88+100/	/4"		
(6/08	inagments, HCI reaction strong	J.				-80-	REC =1	1"		
5DT 3										
BEL.G										
CHNA										
- S	fine to compare successful successful	allaite					100			
400.6	fine to coarse grained, gray ar	id white.					REC =6	"		
- 300 &						85				
SPT										
87.0 -	CLAYEY SAND fine to coarse	arained	SC	21.3		-				
- 20048	wet, oliveish gray and reddish	white,	50							
0612	reaction strong.	ionio, HOI				L -M	50+10+	11		
9000						L_90_	N =21 REC =2	0"		
ORIN										
ESTB	continued on next page	9								

	TEST Project: (Calvert Cliff	s Nucle	ar Pow	er Plant	Boring Number:	B-436	
Schnat	bel Engineering LOG	Calvert Cou	inty, Ma	iryland		Contract Number: 06120048 Sheet: 4 of 4		
DEPTH		01.400	ELEV.		SAMPLIN		DEMARKO	
(FT)	STRATA DESCRIPTION	CLASS.	(FT)	WL	DEPTH DA	ATA	REMARKS	
		SC						
	olivoish gray and white							
	onversiti gray and writte.				N =12	10"		
_					95121 KEC -			
-								
-								
-								
-	light gray and white.				– – – – – – – – – – – – – – – – – – –	17		
100.0 —	BOTTOM OF BORING @ 100.0 FT.		8.3		-100-100 REC =	18"		
9								
3/0								
פר בר								
11/AB								
400.0								
8								
20048								
BORIT								
Boring Contractor: UNI-TECH DRILLING MALAGA, NEW JERSEY Boring Foreman: J. Evans Drilling Method: Mud Rotary Drilling Equipment: Failing-1500 (Truck) Schnabel Representative: K. Megginson Dates Started: 7/10/06 Finished: 7/11/06	Encounte Start of c	ered day	Groundw Date 7/10 7/11	vater Obso Time 	ervations Depth 18.5'	Casing	Caved	
---	------------------------	-------------	------------------------------------	------------------------	-----------------------------	------------------------------	--	
Boring Contractor: UNI-TECH DRILLING MALAGA, NEW JERSEY Boring Foreman: J. Evans Drilling Method: Mud Rotary Drilling Equipment: Failing-1500 (Truck) Schnabel Representative: K. Megginson Dates Started: 7/10/06 Finished: 7/11/06	Encounte Start of c	ered day	Date 7/10 7/11	Time 	Depth 18.5'	Casing	Caved	
Boring Foreman: J. Evans E Drilling Method: Mud Rotary E Drilling Equipment: Failing-1500 (Truck) E Schnabel Representative: K. Megginson E Dates Started: 7/10/06 Finished: 7/11/06 E	Encounte Start of c	ered day	7/10 7/11		18.5'			
Drilling Method: Mud Rotary Drilling Equipment: Failing-1500 (Truck) Schnabel Representative: K. Megginson Dates Started: 7/10/06 Finished: 7/11/06	Start of c	day	7/11					
Drilling Equipment: Failing-1500 (Truck) Schnabel Representative: K. Megginson Dates Started: 7/10/06 Finished: 7/11/06 Leastion: Nothing: 210521 70 ft			,,,,,		20.0'			
Schnabel Representative: K. Megginson Dates Started: 7/10/06 Finished: 7/11/06 Leastion: Northing: 210521 70 ft					20.0			
Dates Started: 7/10/06 Finished: 7/11/06								
Leasting Northing 040504 70 ft								
Easting: 960968.8 ft								
Ground Surface Elevation: 110.6 (feet)		1				1		
DEPTH (FT) STRATA DESCRIPTION CLASS. EI (ELEV. (FT) W		SAMPLI TH D	NG ATA	TESTS	6 F	REMARKS	
0.2 Rootmat and topsoil FILL 1	110.4		3+3+6	6				
Silty Sand PROBABLE FILL fine to coarse grained, moist, brown, trace 2.0 Coarse gravel, contains root fragments and fine to coarse sandy fat clay layer	108.6	-		=10"				
CLAYEY SAND, fine to coarse grained,		-	N =3 REC =	 =18"				
4.5 LEAN CLAY, moist, brown, trace fine to CL medium sand.	106.1	- 5 -	- M woh	+1+1				
		-	- N =2 REC :	=14"				
_ trace organic matter (±1%).		-		7				
		-		=18"				
9.5 CLAYEY SAND, fine to medium SC 10	101.1	-10-						
12.0 trace organic matter (1776), contains sandy lean clay pockets.	98.6	-	N =15	=18"				
POORLY GRADED SAND, with silt, fine to coarse grained, moist, brown, trace		-	-		7.00	, *Os	terberg pler tube	
- pockets.		-	_ REC =	=23"	W=7.29 LL=NF PL=NF	b pus to 1	h from 13.5 5.5 ft	
		- 15-			PP=NP *	tsf		
- - fine to medium grained, wet, brown	Σ	- - -	- - - 	+12		*5.4 bit 1 18.1 *Sv	" O.D. Drag rom 0 to 5 ft. rtiched to	
fine to coarse grained, moist, yellowish brown and dark reddish brown, contains strongly cemented sand pockets and lenses below 19 ft .		- 20-	N =29 REC =	=12"		4-3 Dra 18.	4" O.D. g bit below 5 ft.	
_ wet, contains clayey sand lenses.		-	- 5+5+8 N =13	3				
continued on next page		-25-		- 10				

		TEST Projec	t: Calvert Cliff	s Nucle	ar Pow	er Plant	Вс	oring Number:	B-437
	Schna	bel Engineering LOG	Calvert Cou	inty, Ma	iryland		Co	ontract Number: 0	6120048
						S			
	(FT)	STRATA DESCRIPTION	CLASS.	(FT)	WL	DEPTH		TESTS	REMARKS
			SP-SM						
	-								
	-								
	-								
	-	fine to medium grained, mottled light				M	2+1+1		
		gray and yellowish brown.				<u>30</u>	REC =18"		
	_								
	-								
	-						7.40.40		
	-	brown, yellowish brown, and light gra	y.			X	7+12+12 N =24		
						35- L]	REC =10"		
	-								
	37.0 -	LEAN CLAX wat vallowish brown an		73.6					
	-	light gray, trace fine to medium sand.							
	_					M	1+3+6		
	39.5	SILTY SAND, fine to medium grained	, SM	71.1		Å	N =9 REC =18"		
		wet, stratified brown and orangeish brown.				40			
	-								
	42.0 -	LEAN CLAY, wet, light grayish brown	CL	68.6					
	-	medium sand, contains cemented sar	nd						
	44.0 -	fragments, contains slity sand layer from 43.8 to 44 ft.	Сн	66.6			4+4+5 N =9		
		FAT CLAY, moist, gray, trace fine to				-45- []	REC =18"		
	-	medium sanu anu mica.							
3/6/08	-								
GDT (-								
VBEL.	_	gray and dark gray, contains silty san	d				2+3+4		
SCHN/		pockets.				- FO	N =7 REC =18"		
GPJ S						-50			
400.0	-								
300 8	-								
C SPT	-								
PLO0	-	gray, contains silty sand layers from 54.1 to 54.2 ft and from 54.8 to 55 ft.				M	2+3+4 N =7		
2004£						— ₅₅ —[/]	REC =18"		
3 061	-								
G LOC	57.0 -			53.6					
30RIN	-	sand and mica.	e MH						
TEST E		continued on next page							

5	chnabel BORIN	G Project: C	Calvert Cliff Calvert Cou	s Nucle inty, Ma	ar Pow	ver Plant	Bo	oring Number:	B-437
Schn	abel Engineering LOG			.,,	,		Sh	eet: 3 of 4	0120040
DEPTH (FT)	STRATA DESCRIF	TION	CLASS.	ELEV. (FT)	WL	S DEPTH	AMPLING	TESTS	REMARKS
	-		MH				4+5+9 N =14 REC =18"		
62.0	CLAYEY SAND, fine to me grained, moist, gray, contai to white clayey sand pocke organic matter (±1%).	dium ns light gray ts, trace	SC	48.6		 65	4+5+7 N =12 REC =18"		
67.0	SANDY SILT, fine to mediu dark gray, contains clayey s and indurated silt pockets.	m, moist, sand pockets	ML	43.6		 - 70 	27+50/5" N =50/5" REC =11"		
72.0	POORLY GRADED SAND fine to medium grained, mo	WITH SILT, ist, gray.	SP-SM	38.6		 75 	22+50/4" N =50/4" REC =10"		
L.GDT 3/6/08	- _ weak HCl reaction. _						50/4" N =50/4" REC =3"		
48 PLOG SPT 300 & 400.GPJ SCHNABE	SILTY SAND, fine to mediu wet, gray, mostly fine to coa fragments (±80%), strong H	m grained, arse shell ICI reaction.	SM	- 28.6		 85 	12+16+18 N =34 REC =14"		*Extremely difficult rotary advancement from 86.5 to 88.5 ft (strong to very strong
IEST BORING LOG 061200	oliveish gray, trace fine to n few fine to coarse shell frag (±10%), contains weakly ce continued on next p	nedium sand ments mented age				 - 90	9+11+25 N =36 REC =18"		rig chatter). *Switched to 5" O.D. Tri-cone roller bit below 87 ft. *Moderate to

	hnabel TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	Boring	Number:	B-437
Schnat	bel Engineering LOG	i C	Calvert Cou	nty, Ma	iryland		Contra Sheet:	act Number: 00 4 of 4	6120048
DEPTH (FT)	STRATA DESCRIP	ΓΙΟΝ	CLASS.	ELEV. (FT)	WL	SAMF DEPTH		TESTS	REMARKS
-	sand pockets, moderate HCl below 89.8 ft. gray, strong HCl reaction.	reaction	SM			 	0+13 22 C =18"		difficult rotary advancement from 88.8 to 93.5 ft (slight to moderate rig chatter).
-	fine to an one of all for					 	0.00"	PP=NP tsf	*Osterberg sampler tube push from 98.5 to 100.5 ft **Resumed
100 5	some fine to coarse shell fra (±30%), moderate HCI reacti	gments on.		10.1		RE	C =22"		grouting at 7:00 AM on 7/11/06.
100.0	BOTTOM OF BORING @ 10	00.5 FT.		10.1					
5									

Schna	bel Engineering	TEST BORING LOG	Project: C C	alvert Cl alvert Co	liffs Nucle ounty, Ma	ar Pow ryland	ver Plar	nt		Boring Contra Sheet:	y Number: act Number 1 of 1	e r: 06	1200	B-438
Boring			NG					Gr	ound	water Obs	ervations			
bonng	MALA	GA, NEW JE	RSEY					D	ate	Time	Depth	Casi	ing	Caved
Boring F	Foreman: J. Evans				Enco	untere	d	(6/7	5:00	Dry			
Drilling	Method: Mud Rota	ry		-										
Drilling	Equipment: Failing	J-1500 (Truck	x)											
Schnabe	el Representative:	K. Megginso	n											
Dates	Started: 7/6/06 F	Finished: 7/	6/06											
Location	n: Northing: 216414 Easting: 96084	4.91 ft 8.9 ft												
Ground	Surface Elevation:	106.6 (feet)												
DEPTH (FT)	STRATA	A DESCRIPT	ION	CLAS	S. ELEV. (FT)	WL	DEP	S TH		LING DATA	TEST	S	R	EMARKS
0.2	Rootmat and top	osoil.	/	FILL	106.4			M	2+2+	2			_	
-	Clayey Sand FIL	L, fine to me	dium prangeish					10	REC	=16"				
2.0 -	brown and grayis	sh brown, co	ntains root	FILL	- 104.6									
-	tragments.						Ļ -	M	2+1+	2				
-	orangeish brown contains root frag	and grayish amount of the second s	brown, brganic					М	REC	=14"				
-	fine to coarse m	nottled vellow	ish brown				- 5 -		1+1+	.12			*Adv	ancing
-	grayish brown, a	and orangeish	n brown.				Ļ .	JXI	N =1	3			defle	ected by a
6.5	contains cement	fragments a	t 6 ft.		100.1			Ш	REC	=14"			cons	iderable e at a
	BOLLOW OF BC	ORING @ 6.5	b⊢l.										dept	h from 6 to
													0.51	ι.

Comments: 1. Boring backfilled with cement/bentonite grout through tremie pipe upon completion. 2. * = See Appendix I for additional lab testing data. 3. Obstruction ecountered at 6.5 feet. Boring offset B-438A

	Schnat	hnabel BORING bel Engineering	Project:	Calvert Cli Calvert Co	ffs Nucle ounty, Ma	ar Pow ryland	ver Pla	nt		Boring Contra Sheet:	Number: Inct Number 1 of 4	er: 0612	B-438A 20048
Б	lorina C	ontractor: UNI-TECH DRILLI	NG					Gr	oundv	vater Obs	ervations		
	•	MALAGA, NEW JE	RSEY					D	ate	Time	Depth	Casin	g Caved
B	oring F	oreman: J. Evans			Enco	untere	d	7	7/7		18.5'		
	rilling N	lethod: Mud Rotary											
	rilling E	quipment: Failing-1500 (Truck	x)	-									
s	chnabe	I Representative: K. Megginson	n										
	ates S	Started: 7/7/06 Finished: 7/	7/06										
	ocation	Northing: 216411.98 ft Easting: 960867.31 ft											
G	Fround S	Surface Elevation: 106.0 (feet)					1						
	DEPTH (FT)	STRATA DESCRIPT	ION	CLASS	ELEV. (FT)	WL	DEP	S. TH	AMPL C	ING DATA	TEST	s	REMARKS
		Rotary probe to 7.5 ft; see B- strata description.	438 alt for										
	-						-						
	-						-	-					
	-						-	-					
	_						- 5 -						
	_							1					
	7.5				08.5		-	-					
	7.5	SILTY SAND, fine to coarse g	grained,	SM	90.5		-	-M	5+8+8	B			
	_	moist, brown.					L	$ \Delta $	REC	, =11"			
							10						
		fine to medium empired strati	field				– ^{10–}		4.7.	0			
	_	yellowish brown and light bro	nea wn,				-	HXI	4+7+8 N =15	5			
	-	contains poorly graded sand lenses	with silt				-	ЦЦ	REC	=12"			
	_						L						
80%		fine to coarse grained, stratife	ed						3+6+	7			
T 3/6	_	yellowish brown, orangeish b	rown, and					TIXI	N =13	3			
L.GD							-15-		REU	-10			
NABE	-						╞	-					
SCH							L					* +	5.4" O.D. Drag
GPJ												t	o 18.5 ft.
400.		wat light aronatish harris				$\overline{\Sigma}$	Γ		E . O · ·	7			4-3/4" O.D. Drag bit below
300 &	-	wet, light orangeish brown.					F	HXI	o+o+ N =13	1 3		1	8.5 ft.
SPT	_						-20-		REC	=8"			
LOG	_						L						
048 P													
6120	-						Γ	1					
000	-						F	1_					
NG LC	_	fine to medium grained, light	orangeish				╞	-117	3+4+4	4			
BORIT	_	STOWN and light grayion blow	1.				-25-	$ \Delta $	REC	=10"			
ESTE		continued on next pag	e										
≝∟							<u> </u>						

	TEST Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	Boring Number:	B-438A
Schnal	bel Engineering LOG	alvert Cou	nty, Ma	aryland		Contract Number: 00 Sheet: 2 of 4	6120048
DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL		NG TESTS	REMARKS
-	yellowish brown and light brownish gray,	SM			 N		
	CLAYEY SAND, fine to medium grained wet light orangeish brown and	SC	74.0		REC =	11"	
33.8 _	SILTY SAND, fine to coarse grained, wet, yellowish brown, contains clayey sand pockets (coarse sand is subangular to subrounded).	SM	72.2			11"	
37.0 -	FAT CLAY, wet, gray, with fine to medium sand, trace mica.	СН	69.0			18"	
EL.GDT 3/6/08	moist, dark oliveish gray and dark gray, trace fine to medium sand.				$ \begin{array}{c} - & - & & \\ - & - & & \\ - & 45 & & \\ - & - & - & \\ - & - & - & \\ - & - &$	18"	
& 400.GPJ_SCHNABI	gray and light greenish gray, trace organic matter (±<1%), contains sandy fat clay pockets and elastic silt lenses (elastic silt lenses based on contrasting texture and appearance).		54.0			18"	
06120048 PLOG SPT 300	ELASTIC SILT, moist, gray and light greenish gray, trace fine to medium sand and mica, (soil may lab classify as CH).	МН	1 54.0		4+6+9 	18"	
	FINE TO MEDIUM SANDY LEAN CLAY, moist, gray, contains light gray to continued on next page	CL	0.0				

SC	hnabel BORING	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	-	Boring Number	B-438A
Schnat	bel Engineering LOG	0		inty, ivia				Sheet: 3 of 4	er: 06120048
DEPTH (FT)	STRATA DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	бертн		G TEST	S REMARKS
-	whiteish clayey sand pockets mica.	, trace	CL				4+6+8 N =14 REC =1	8"	
62.0 - - - - -	SILTY SAND, fine to medium moist, dark gray, trace mica, cementation, (no visible HCI r	grained, weak eaction).	SM	44.0		 [X 65 	24+50 N =50 REC =1	2"	*Slight to moderately difficult rotary advancement from 64 to 66.5 ft (slow rotary advancement).
	gray.					 ⊠ ⊠ 70	³ 50/3" N =50/3 REC =4	и 1	*5" O.D. Tri-cone roller bit below 68.5 ft.
-	wet, few fine to medium shell (±10%), contains greenish gra clay lenses and black particle inch), strong HCl reaction. mostly fine to medium shell fr (±50%) below 74 ft.	fragments ay lean s (1/16 agments				 	33+38+ N =64 REC =1	26 1"	
	mostly fine to coarse shell fra (±70%), contains silt pockets.	gments				 	8+15+1 N =29 REC =1	4 8"	*Moderately
	moist, mostly cemented sand trace fine to medium shell fra (±5%).	(±100%), gments				 ^{E8} - 85 	³ 50/2" N =50/2 REC =1	и 11	difficult rotary advancement from 82.5 to 83.5 ft (slow rotary advancement). *Very to extremely difficult rotary advancement from 83.5 to 87.5 ft (strong
	wet, dark oliveish gray, trace coarse shell fragments (±5%) exhibit low cohesion - used a potential successful tube pus	fine to , (soil fines s basis for h).				 90	7+10+1: N =22 REC =1	2 8"	to very strong rig chatter).
	continued on next pag	e				[]			

	hnabel	TEST	Project:	Calvert Cliff	s Nucle	ar Pow	er Plant	E	Boring Number:	B-438A
Schna	bel Engineering	LOG	(calvert Cou	nty, ivia	ryiand		S	Contract Number: 0 Sheet: 4 of 4	6120048
DEPTH (FT)	STRAT	A DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	DEPTH		TESTS	REMARKS
-	gray, few fine to (±10%), (shell fr inches in diamet	coarse shell agment appro ter and 1/4 ind	fragments oximately 2 ch thick).	SM			 95 	REC =14	" PP=NP tsf	
-	(±1%), very wea	lium shell frag k HCl reactio	gments n.					N =30 REC =18		
	BOTTOM OF B	ORING @ 10	D.0 FT.		6.0		100L			

Schna	bel Engineering LOG	Project: C C	alvert Cli alvert Co	ffs Nuclea ounty, Ma	ar Pow ryland	ver Pla	nt	Boring Contra Sheet:	Number: Inct Number 1 of 4	er: 06120	B-439
Boring C	Contractor: UNI-TECH DRILLI	NG					Groun	dwater Obs	ervations		
	MALAGA, NEW JE	ERSEY					Date	Time	Depth	Casing	Caved
Boring F	Foreman: J. Evans			Enco	untere	d	7/5		18.5'		
Drilling	Method: Mud Rotary			Start	of day	,	7/6		14 0'		
Drilling	Equipment: Failing-1500 (Truck	x)		oturt		,			1.1.0		
Schnabe	el Representative: K. Megginso	n									
Dates	Started: 7/5/06 Finished: 7/	6/06									
Locatior	1: Northing: 216340.49 ft Easting: 960948.68 ft										
Ground	Surface Elevation: 113.8 (feet)					1					
DEPTH (FT)	STRATA DESCRIPT	ION	CLASS	6. ELEV. (FT)	WL	DEP		PLING DATA	TEST	s	REMARKS
0.5	Crushed Stone FILL, moist, c contains root fragments, and pockets.	lark gray, silty gravel	FILL FILL	113.3		_	6+1	6+6 =12 :C =10"			
2.0 -	Lean Clay PROBABLE FILL, brown, trace fine to medium	moist, sand.	SC	- 111.8		-	- 2+	3+4			
-	CLAYEY SAND, fine to medi grained, moist, brown, trace of matter (±1%).	um organic				_		=7 IC =14"			
4.5	SILTY SAND, fine to medium moist, brown.	grained,	SM	— 109.3		- 5 -	2+:	2+3			
-	-							-5 C =11"			
-	fine to coarse grained.					-	3+/	4+6 =10			
-	-					-		C =11"			
-	-					-10-		5+8			
12.0 -	stratified brown and light brow 11.5 ft.	wn below	SP-SM	101.8		-		C =10"			
-	POORLY GRADED SAND W fine to medium grained, mois light brown and orangeish bro	/ITH SILT, t, stratified own.					4+	6+10			
	_					-15-		=16 :C =6"			
-	-					-					
17.0 -	SILTY SAND, fine to medium	grained,	SM	96.8		F					
-					∇	F					
-	-				_	-	- M 5+	8+11 =19		*9	witched to
	-					-20-		C =6"		4-3	3/4" O.D.
_						L				Dr 18	ag bit below .5 ft.
						[
22.0 -	SILTY GRAVEL, fine grained gray and brown, trace fine to	, wet, dark coarse	GM	91.8		Ĺ					
	sand.					L		DH+3+9			
2/ 2				_ 80 0				=12 C =5"			
24.0 _	continued on next page	ne		09.0		-25-		0-0			

	1	hachel	TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant		В	oring	Number:	B-4	39
	Scho	hol Engineering	BORING	C	alvert Cou	nty, Ma	iryland			Co	ontra	ct Number: 0	6120048	
	Schille	iber Engineering	LUU						6		ieet:	2 01 4		
	(FT)	STRATA	DESCRIPT	ION	CLASS.	ELEV. (FT)	WL		ы ⊔⊔			TESTS	REMARK	(S
		POORLY GRADI	ED GRAVEL	. WITH	GP-GM									
		SILT, wet, dark g medium sand.	ray and brow	vn, fine to										
	27.0		fine to ecor	o grainad	CM	86.8								
		wet, dark gray an	nd brown, tra	ce fine to	Givi									
		medium sand.							∇	WOH+2+7	,			
									Ň	N =9 REC =2"				
	-							-30-						
		-						- 1						
		_												
		_												
		trace fine to coar	se sand						V	1+2+6 N =8				
	_	_						_35_	Δ	REC =5"				
		dark grav brawn	and rad bra							21216				
	39.0	SILTY SAND, fin	e to medium	arained.	SM	74.8			XI	N =9				
	-	wet, brown, trace	e coarse grav	vel, om 39 to				-40-		REC = 10				
		- 39.1 ft.												
	42.0	SANDY LEAN C	AY fine to	medium	CI	71.8								
		wet, mottled yello	wish brown	and light										
		_ pockets.		lay lat olay				1	V	1+1+2				
	_							-45-	Δ	REC =18"				
/08	47.0					00.0								
0T 3/6	47.0	FAT CLAY, mois	t, light brown	ish gray	СН	66.8		[]						
EL.G		and mica, contair	ns clayey sa	nd						0.0.1				
HNAB								1	XII	2+3+4 N =7				
l sci	-	-						-50-		REC =18"				
00.GF		-												
00 & 4		4						\mid \mid						
SPT 3(4						$ \downarrow \downarrow$						
LOG		gray and dark gra	ay.						∇	2+3+5				
048 P.		light greenish ara	ay and grav.	trace					\mathbb{N}	N =8 REC =18"				
06120	-	organic matter (±	:1%).											
DOG								[1						
SING		1												
T BOI		continue	ed on next pag	e										
TES			, • 5											

	hnabol T	EST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	E	Boring Number:	B-439
Schnal	bel Engineering	RING .OG	C	Calvert Cou	inty, Ma	ryland			Contract Number: (Sheet: 3 of 4	06120048
DEPTH (FT)	STRATA DES	SCRIPT	ION	CLASS.	ELEV. (FT)	WL	S DEPTH		TESTS	REMARKS
-	gray, contains 2 inch t clayey sand layer fron gray and oliveish gray	thick dai n 59.3 to below s	rk gray 5 59.5 ft. 59.5 ft .	СН			60-	3+3+6 N =9 REC =18	,,	
62.0 -	ELASTIC SILT, moist gray, trace fine to mee mica, contains clayey	, gray ar dium sai sand le	nd dark nd and nses.	MH	51.8		 65	6+8+11 N =19 REC =18	'n	
67.0 -	LEAN CLAY, moist, g light greenish gray, wi sand, contains silty sa light gray to white clay	ray, dari ith fine to and lens /ey sand	k gray and o medium es and d pockets.	CL	46.8		 	5+6+11 N =17 REC =18	р.	
72.0 -	POORLY GRADED S medium grained, mois silt, contains indurated pockets.	AND, fir st, dark (d silty sa	ne to gray, trace and	SP	41.8		 75 	37+50 N =50 REC =12	'n	*Perceptible increase in rotary resistance from 73 to 73.5 ft.
- - - - -	very weak HCI reactio	n.					 	50/5" N =50/5" REC =4"		**Resumed drilling at 10:30 AM on 7/6/05. *Switched to 5 " O.D. Tri-cone roller bit below 78.5 ft. *Moderately difficult rotary
	SILTY SAND, fine to r wet, gray, mostly fine fragments (±70%), str	nedium to coars ong HC	grained, ie shell i reaction.	SM	- 31.8		 85-	16+15+10 N =31 REC =12	6	advancement from 78.5 to 83.5 ft (slow rotary advancement).
88.0 -	SANDY SILT, fine to r gray, moderate HCI re strongly cemented sat to 88.8 ft. <i>continued on</i>	medium eaction. nd layer next pag	, moist, from 88.7 e	ML	- 25.8		 □ 90 	50/4" N =50/4" REC =4"		*Very difficult rotary advancement from 88 to 88.5 ft (strong rig chatter). *Extremely difficult rotary advancement

	hnabel TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant		Boring Number:	B-439
Schnat	bel Engineering LOG	C	alvert Cou	nty, Ma	iryland			Contract Number Sheet: 4 of 4	ər: 06120048
DEPTH (FT)	STRATA DESCRIPT	ΓΙΟΝ	CLASS.	ELEV. (FT)	WL	DEPTH		IG TEST	S REMARKS
			ML						from 88.5 to 93.5 ft (very strong rig chatter).
93.5	SILTY SAND, fine to medium wet, gray and oliveish gray, f coarse shell fragments (±10% black particles .	n grained, ew fine to %), contains	SM	20.3			7+7+12 N =19 REC =	2 18"	
						[]			
97.0 -	CLAYEY SAND, fine to medi grained, wet, gray, trace fine shell fragments (±5%).	um to coarse	SC	16.8			7 4+7+1/	1	
- 100.0 —	BOTTOM OF BORING @ 10	0.0 FT.		13.8			N =21 REC =	18"	

Schnat						Groups	Sneet:	orvations		
oring C	Contractor: UNI-TECH DRILLING					Date		Depth	Casin	a Cave
oring F	Foreman: J. Blemings		Enco	untere	he	6/6		18.5'	0.0'	
rilling N	Method: Mud Rotary		Elico			0/0		10.0	0.0	
rilling E	Equipment: CME-750 (ATV)									
hnabe	I Representative: M. Arles									
ates S	Started: 6/6/06 Finished: 6/7/06									
ocation	: Northing: 216349.47 ft									
	Easting: 961813.66 ft									
ound \$	Surface Elevation: 56.3 (feet)									
ЕРТН		01 499	ELEV.	\ <u>\</u> \\		SAMP	LING	TEST	e	
(FT)	STRATA DESCRIPTION	CLASS	. (FT)	VVL	DEP	тн	DATA	1231	3	
0.5	Crushed Stone.	FILL	55.8			8+8 N =	+4 12)-30' 4-1/4" Irag bit
-	Sandy lean clay FILL, fine to coarse, moist, gravish orange.				F	10	12			-
2.0 -	Clayey Sand FILL with gravel, fine to	FILL	54.3		F					
-	coarse grained, wet, orange.				-	- 5+6	+4 10	w=8.6	%	
4.0 -			52.3		L		C =9"			
	Poorly graded sand FILL with gravel, medium to coarse grained, moist, gray.	FILL			- 5 -					
						3+3 N =	+4 7			
-							C =10"			
-					F					
-					-	2+3	+2 5			
9.0 -			47.3		L		C =0"			
	grained, wet, gray, trace gravel,	FILL								
	contains root fragments, contains wood fragments.					1+1	+1			
_							2			
-					F		0= 0			
-					-	-				
_	with gravel, PROBABLE FILL.				-	5+4	+5	w=16.1	1%	
							C =6"			
]					Γ					
7.0 -	POORLY GRADED SAND WITH SILT,	SP-SM	39.3		F	1				
-	tine to medium grained, moist, gray.			∇	F					
-				_	+		5+35 50			
					-20-		C =18"			
-					F	1				
-					F					
-	dark gray.				\vdash	- 16+	27+30 57	w=22.1	1%	
_					-25-		C =12"			
	continued on next page									

	6	TEST Project: C	alvert Cliff	s Nucle	ar Pow	ver Plant	Boring Number:	B-440
	Schnal	BORING C	alvert Cou	nty, Ma	ryland		Contract Number: 0	6120048
	ЕРТН					SAMPL IN	IG	
	(FT)	STRATA DESCRIPTION	CLASS.	(FT)	WL		TA TESTS	REMARKS
			SP-SM					
	-							
	27.0 -	SANDY SILT, fine to medium, moist.	ML	29.3				
	-	greenish gray, contains cemented sand.						
	-					⊠ 50/5"	c."	
	_					-30		30-100 4-1/4"
								bit
	32.0 -	SILTY SAND, fine to coarse grained,	SM	24.3				
	-	shell fragments, strong HCl reaction,					w=20.1%	
	-	70-80% shell frag.				13+24+ N =60	+36 w=20.1%	
						-35-12 REC =	18"	
	-							
	-							
	_							
	_	moist, green, 35-45% shell frag.				5+3+4		
						N =7	14"	
	-							
	-							
	-							
	-	25-35% shell frag.				7+11+3 N =41	30 w=27.1%	
						45/ REC =	18"	
	-							
(6/08	47.0 -			9.3				
DT 3,	_	CLAYEY SAND, fine to medium grainedt, dark green, trace fine to	SC					
BEL.G		coarse shell fragments, weak HCl reaction, 0-5% shell frag.				4+3+6		
CHNA	_	, C				N =9	18"	
PJ S(
400.G	-	green, no shells.				REC =:	24" w=30.0%	51' tube pushed
300 &	-						PL=21	
SPT				2.0		┝╶╶┤■┛│		
; PLOG	53.5	SILTY SAND, wet, trace fine to medium	SM	2.8				
20048		0-5% shell frag.					18"	
0612	_							
BLOG	_							
ORIN								
EST B	7	continued on next page						
≃ 1						1		

	TEST F	Project: Calvert	Cliffs Nuclea	ar Pow	er Plant	Boring	g Number:	B-440
Schna	bel Engineering LOG	Calvert	County, Ma	ryland		Contra	act Number: 0 : 3 of 4	6120048
DEPTH			ELEV.		SAM	PLING		
(FT)	STRATA DESCRIPTIC	DN CLA	SS. (FT)	WL	DEPTH	DATA	TESTS	REMARKS
_		SM	N		_ RE	C =0"		58.5' pushed tube
_								60-63' rig
_								chatter
-								
-								
-	fine to coarse grained, green ar	nd white,			35-	+20+15	w=19.4%	
-	contains cemented sand, strong	g HCI				-35 C =18"		
-	reaction, 00-75 /osnell hag.							
-								
-								
-	20-30%shell frag.					10+16 :26		
					70	C =18"		1" thick
-								
-								
-								
-					– – – 5+7 N =	10+15 =25		
					75 [] RE	C =18"		
-								
-								
-							w=41.0%	
- ۵	sandy, moderate HCI reaction, shell frag.	10-15%				7+9 •16	w=41.0%	
- 3/6/0					80 <u> </u> RE	C =18"		
- EL.GD								
82.0 -	LEAN CLAY, moist, green, trac	ce fine to Cl	L -25.7					
	shell frag.	Silt, 0-376				0+10		
8 400.0 -						-19 C =18"		
- 200								
			20.7					
- U.10 1	SANDY SILT, fine to medium, green, with fine to coarse shell	moist, M	L -30.7					
06120	fragments, moderate HCl react 10-20% shell frag.	ion,			6+ 7	7+9		
					N =	⊧16 C =18"		
TEST	continued on next page							

	hnahal	TEST	Project: (Calvert Cliff	s Nucle	ar Pow	er Plant	t	Вс	oring Num	ber:	B-440
Schnat	bel Engineering	BORING LOG		Calvert Cou	nty, Ma	iryland			Co	ontract Nu neet: 4 of	mber: 00	6120048
DEPTH (FT)	STRAT	A DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	DEPT	SA н∣		т	ESTS	REMARKS
				ML					DAIA			
92.0 -	SILTY SAND, fi moist, green, wi fragments, stror shell frag.	ne to medium th fine to coa ng HCl reactio	n grained, rse shell on, 20-30%	SM	-35.7		 95		4+5+9 N =14 REC =18"			
_												
-	moderate HCI re frag.	eaction, 10-20	0% shell					\square	7+7+9 N =16 PEC =12"			
100.0 —	BOTTOM OF B	ORING @ 10	0.0 FT.		-43.7		-100		REC - 12			

Schna	bel Engineering LOG	Project: C	alvert Clii alvert Co	ffs Nucle ounty, Ma	ar Pow ryland	ver Plar	nt		Boring Contra Sheet:	I Number: Inct Number 1 of 3	e r: 061	B-70 ²⁰⁰⁴⁸
							Gro	oundv	vater Obs	ervations		
Boring	CONNELLY AND FREDERICK MAR	ASSOCIATES RYLAND	, INC.				D	ate	Time	Depth	Casir	ng Caved
Boring F	Foreman: D. Reese			Enco	untere	d	6	/28		7.5'	7.5	
Drilling I	Method: 3-7/8" OD Tri-cone Rol	ler Bit (Mud R	otary)	Start	of Day		6	/29		7.0'	24.0	
Drilling I	Equipment: CME-75 (Truck)			Start		y	0	23		7.0	24.0	
Schnabe	el Representative: M. Arles											
Dates	Started: 6/28/06 Finished: 6	6/29/06										
Locatior	1: Northing: 219485.54 ft Easting: 960507.6 ft		-									
Ground	Surface Elevation: 8.7 (feet)			1								
DEPTH (FT)	STRATA DESCRIPT	ION	CLASS	ELEV. (FT)	WL	DEP	S⊿ ⊺н ∣	AMPL	ING DATA	TEST	s	REMARKS
0.5	CRUSHED STONE.			82			M	4+6+	7			
-	Poorly graded sand, PROBAI with gravel, fine to coarse gra	BLE FILL, ained,	FILL	6.7			Ň	N =13 REC	3 =16"			
2.0			SP-SC	0.7				4.5.	7			
-	trace gravel, fine to coarse gr moist, orange.	ained,					X	4+5+ N =12 REC	2 =16"			
						- 5 -		6+6+	7			
5.5	SILTY SAND, fine to medium moist, brownish orange.	grained,	SM	- 3.2			-M	N =13 REC	3 =18"			7 5' switched to
-	trace gravel, fine to coarse gr orange.	ained, wet,			Ţ			1+3+0 N =9 REC	6 =12"	w=15.9 *	1%	mud rotary fror nollow stem augers 3'-16' grinding
10.0				-1.3		-10-						
-	WELL GRADED SAND WITH	I SIL I	SW-SM	1				3+6+ N =11 REC	5 =12"	w=12.4 *	%	
-												
13.0 -	SILTY SAND, fine to medium moist, green and white, with f	grained, ine to	SM	4.3		 	M	1+5+ N =14	10			
	reaction, 70-90% shell frag.	grior				-15-		REC	=2"			
	fine to medium grained, mois	t, green,					1					
-	with fine to coarse shell fragm	nents,					HMI	4+10-	+13	w=28.2	.%	
- I	sand, 30-40% shell frag.	Cementeu						REC	, =18"			
						20-						
	-						$\left \right $					
- 1	-					Ļ .						
	fine to medium grained, wet, contains fine to coarse shell f strong HCI reaction.	green, ragments,						19+1 N =28	7+11 3			
	continued on next pag	1e				-25-		REC	=2"			

		TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant		Boring	Number:	B-701
	Schna	bel Engineering LOG	C	alvert Cou	nty, Ma	ryland			Contra	ct Number: 06	6120048
	DEPTH				EI EV		s		G	2 01 3	
	(FT)	STRATA DESCRIP	ΓΙΟΝ	CLASS.	(FT)	WL	DEPTH		TA	TESTS	REMARKS
				SM							
	-	_									
	-	_									
	-										
	-							37+11+	12	w=37.3%	
								N =23 RFC =1	8"	Â	
	_						-30		•		
	-	-									
	-	-									
	-	-									
	-	-					17	5+6+8			
							Å	N =14 REC =1	8"		
							55				
	-										
	37.0 -	ELASTIC SILT, with clay, mo	oist, green,	МН	-28.3						
	-	trace fine to coarse shell frag moderate HCI reaction, 0-5%	ments, shell frag.								
	-		5				17	5+8+7			
	_						<u>40</u>	REC =1	8"		
	-	-									
	-	-								07.00/	
	-	contains fine to medium she fragments.	1					REC =1	7"	w=37.3% LL=54	
		-					-45			PL=33 PP=4.00 tsf	
	-	-								*	
	47.0				20.3						
/08	47.0	SILTY SAND, fine to mediun	n grained, le to coarse	SM	-30.5						
T 3/6	-	shell fragments, strong HCl r	eaction,							w=33.1%	
EL.GD	-	40-60% shell ltag.						5+6+8 N =14		*	
NABE		-					-50-1	REC =1	8"		
SCH	-	-									
CPJ.	520 -				-43 3						
77 70C		SANDY SILT, fine to mediun green, contains fine to coars	n, moist, e shell	ML							
JG SF		fragments, strong HCI reaction	on, 10-20%					5+6+9		w=42.5%	
BPLC	-						$\vdash \parallel X$	N =15	0"	*	
12004		4					-55-	KEC =1	<u>д.</u>		
.90 D	-										
G LO	57.0 -				-48.3						
ORIN	-	green, moderate HCI reactio	dist, oliveish n.	MH							
EST B		continued on next pa	ge								
≓I		1						1			

	TEST Project	t: Calvert Cliff	s Nucle	ar Pow	er Plant	E	Boring Number:	B-701
Schnal	bel Engineering LOG	Calvert Cou	nty, Ma	ryland		C S	Contract Number: 0 Sheet: 3 of 3	6120048
DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL	S/ DEPTH		TESTS	REMARKS
-		MH				6+7+9 N =16 REC =18	w=55.7%	
62.0 -	SANDY SILT, fine to medium grained moist, oliveish green, with fine to coa shell fragments, strong HCl reaction, 20-40% shell frag.	d, ML rse	53.3		 65	4.+5+6 N =11 REC =18	w=40.4%	
67.0 -	ELASTIC SILT, with clay, moist, olive green, with clay, moderate HCI reacti	eish MH on.	58.3		 70 -	5+7+4 N =11 REC =18	w=48% *	
- - 75.0 —	BOTTOM OF BORING @ 75.0 FT.		66.3		 	4+6+8 N =14 REC =18		

Schna	chnabel TEST BORING	Project: Ca Ca	Ivert Clif	fs Nucle unty, Ma	ar Pow ryland	ver Plai	nt		Boring Contra	Number:	er: 06120	B-702
Conna							Gra	undu	ator Obe	orvations		
Boring	Contractor: CONNELLY AND	ASSOCIATES,	INC.			1	GIU D	oto	Time	Donth	Casina	Coved
Boring F	FREDERICK, MAR	KT LAND		Enco	untere	d	6/	/29		10.5'	8.0'	
Drilling	Method: 3-7/8" OD Tri-cone Rol	ler Bit (Mud Ro	otary)									
Drilling	Equipment: CME-75 (Truck)											
Schnabe	el Representative: M Arles											
Dates	Started: 6/29/06 Finished: 6	6/29/06										
Location	n: Northing: 218980.62 ft Easting: 961183.23 ft											
Ground	Surface Elevation: 10.3 (feet)											
DEPTH (FT)	STRATA DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	DEP	S/ ТН ∣	AMPL C	ING DATA	TEST	s	REMARKS
0.5	ROOTMAT AND TOPSOIL.			90			M	1+4+4	4		0-2	24' hollow
- 0.5	POORLY GRADED SAND W fine to coarse grained, moist,	ITH CLAY, orange.	SP-SC	9.0			-Ň	N =8 REC	=14"		ad to	em auger vanced to 24' prevent mud
2.0 -	SILTY SAND, fine to coarse g	grained,	SM	- 8.3		- ·	1_				los	s and hole
	moist, green, with fine to med	lium shell					HMI	5+5+0	6 1		gra	avel and
_	10-20% shell frag.					L.	$ \Delta $	REC	- =14"			ose soils, ud rotary
											dri	lling 24'-50'
55	-			48		- 5 -	M	8+11	+15			
6.0 -	POORLY GRADED SAND W	ITH CLAY,	SP-SC	4.3		- ·	HŇI	N =26	∂ =18"			
_	moist, orange.		SP			Ļ.		I LO	10			
	POORLY GRADED SAND, fi	ne to						6101	10			
-	coarse grained, moist, orange	eish white.					IIXII	N =18	3			
	1/8-1/4" clay lenses, yellowis	h orange.				- ·	-M	REC	=18"			
_		-										
					$\overline{\Delta}$			4.4.0	-			
-	wet.					- ·	HXII	A+4+; N =9	5			
-	-					Ļ .	- LN	REC	=18"			
						L.						
		at a dia a mad				[-	-			
14.0 -	with fine to coarse shell frage	nted sand, nents,	SM	- 3.7			HVI	5+3+ N =8	5			
	\shells are black, no HCl react	tion.				-15-	-M	REC	=18"			
5	SILTY SAND, fine to medium	grained,										
	fragments, strong HCl reaction	on, 20-40%				[7					
17.0 -	shell frag.		SC	-6.7			+					
	CLAYEY SAND, fine to coars	e grained,				L .	4					
5	with fine to coarse shell fragn	nents,						4+9+	5			
-	strong HCl reaction, 70-90%	shell frag.				- ·	IXII	N =14	i i i i i i i i i i i i i i i i i i i			
. –	shell frag.	ι, 30-40%				-20-		REC	=18"			
- 1						Ļ.						
22.0 -	SILTY SAND, fine to medium	grained,	SM	-11.7		F .	1					
-	moist, green, with fine to coal fragments strong HCI reaction	rse shell					+					
	shell frag.	, 20 0070				Ļ.	M	3+3+	6			
						_	$\ \tilde{M}\ $	N =9	=18"			
	continued on next pag	e				-25-		I LO	10			

	TEST	Project:	Calvert Cliff	s Nucle	ar Pow	er Plant	E	Boring Number:	B-702
School	BORING		Calvert Cou	nty, Ma	ryland		C	Contract Number:	06120048
DEDTU	ber Engineering EOO								
(FT)	STRATA DESCRIP	TION	CLASS.	ELEV. (FT)	WL	ПЕРТН		TESTS	REMARKS
			SM					<u>^</u>	
	-								
_	trace fine to coarse shell fra-	gments,					4+6+5		
	weak HCl reaction, 0-5% sh	ell frag.					N =11 REC =18	5"	
-									
-									
-	with fine to coarse shell frag	ments, shell frag				17	5+7+7 N =14		
		onen nug.				<u>35</u> []	REC =18	5"	
_									
-							4.5.7		
						11	N =12		
						-40	REC =18	5"	
42.0 -	SANDY SILT find to modiur	narainad	N/I	-31.7					
	moist, green, trace fine to m	edium shell							
_	shell frag.	on, 0-10%					5+6+7		
							N =13 REC =18	5"	
						-40			
-	•								
- 19						10	5+6+7 N =13		
50.0 —				-39.7		<u> </u>	REC =18	;"	
Eoo		J.U F I.							
5									
-									
S C									

Schna	TEST Project: C bel Engineering LOG C	alvert Clif alvert Cou	fs Nucle unty, Ma	ar Pow ryland	ver Pla	nt	Boring Contra Sheet:	Number: Ict Number 1 of 4	r : 06120	B-703
Boring						Gro	oundwater Obs	ervations		
	FREDERICK, MARYLAND	, INC.			1	D	ate Time	Depth	Casing	Caved
Boring F	Foreman: T. Connelly		Enco	untere	d	7	//7	23.5'		
Drilling	Method: 3-7/8" OD Tri-cone Roller Bit		Start	of day	v	7	/10	Drv		
Drilling	Equipment: CME-550 (ATV)							,		
Schnabe	el Representative: K. Bell									
Dates	Started: 7/7/06 Finished: 7/10/06									
Location	n: Northing: 218171 ft Easting: 960957.01 ft									
Ground	Surface Elevation: 45.4 (feet)				1				1	
DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL	DEP	S/ TH	AMPLING DATA	TEST	6 F	REMARKS
0.7	ROOTMAT AND TOPSOIL.		117							
	CLAYEY SAND, fine to medium grained, moist, brown and yellowish brown.	SC	44.7				WOH+WOH +1 N =1			
2.5	SANDY LEAN CLAY trace roots and	CI	42.9				REC =8"			
-	wood fragments, moist, brown and	02				IXII	N =5			
-	orangeish brown.						REC =10"			
	-				- 5 -					
	iron staining					M	2+3+5 N =8			
-	-				F .	٦Ш	REC =16"			
-	-				-	-				
-	weak cementation				L .	-M	3+4+4			
						Ŵ	N =8 RFC =18"			
-										
10.0 -	ORGANIC CLAY WITH SAND moist	ОН	35.4		-10-	-				
-	gray and orangeish brown.				L .	-M	2+3+4			
						Ŵ	N =7 RFC =18"			
-					-					
-	-				-	-				
-	iron staining				L .	-M	3+2+2			
						Ŵ	N =4 RFC =18"			
_					-15-					
-	4				-	+				
_					Ļ.					
-	1					╡			0/	
-	-						REC =19"	W=45.1	% tsf	
	-				_20-			*		
-	1				-	1				
22.0 -	SILTY SAND fine to coarse grained	SM	23.4		-	-				
-	wet, reddish brown, contains fine to	Sivi			L .				На	der drilling
	coarse shell tragments, 10-20%, weak cementation. HCl reaction strong			ĮŸ			WOH+2+2		i idi	act at initig
-					F .	1	N =4			
-	continued on peyt page				-25-	- 121	REC =10"			

Γ		TEST	Project: Ca	alvert Cliff	s Nucle	ar Pow	er Plant		Boring	y Number:	B-703
	Schna	bel Engineering LOG	Ca	alvert Cou	nty, Ma	aryland			Contra Sheet:	act Number: 00 2 of 4	6120048
	DEPTH (FT)	STRATA DESCRIPTI	ON	CLASS.	ELEV. (FT)	WL	DEPTH	SAMP	LING DATA	TESTS	REMARKS
				SM							total fluid loss in
	27.0 -				18.4						mud tub
		ELASTIC SILT, moist, gray an yellowish brown.	d	MH	10.1						resumed drilling
	-						17		H/18"		on 7/10/06 @ 9:00am
	_						-30-1		\$ =10"		
	-										
	-										
	33.0 -	SILTY SAND, fine to medium wet, gray and white, contains	grained, fine to	SM	12.4			7 4+4	+7		furthest advancement of
		coarse shell fragments, 20-30 reaction strong.	%, HCI					N =	1 ; =16"		hollow stem augers
	-										
	-										Rig chatter
	-							_			
	-	greenish gray, trace fine to me shell fragments, 2-5%, HCI re	edium action				-	4+4·	+6 0 _19"		
		moderale					-40		, – 10		
	-										
	-										
	-							3+3·	+6)		
							-45	REC	; =18"		
	-										
/08	47.0 -	SANDY LEAN CLAY, wet, gre	enish gray	CL	-1.6						
3DT 3/6	-	fragments, 30-40%, HCI react strong.	tion					7 3+5	+7		
IABEL.(50		2 ; =18"		
J SCHN	-										
700.GP	52.0 -	SILTY SAND, fine to medium	grained,	SM	-6.6						
DG SPT	-	wet, gray and white, with fine t shell fragments, 50-60%, stro	o coarse ng ong				 	7 8+1	1+7		
048 PLC	-		ong.					N =1	8 ; =18"		D
06120											Rig chatter
IG LOG	-										
BORIN	-	continued on next page	9				$\left - \right $				
TESI											

	-	TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	Bori	ng Number:	B-703
Sci	Schnabel Engineering LOG			alvert Cou	nty, Ma	ryland		Cont	tract Number: 0	6120048
DEP	тн				EI EV		SA			
(FT)	STRATA DESCRI	PTION	CLASS.	(FT)	WL	DEPTH	DATA	TESTS	REMARKS
	_	greenish gray and white, co to medium shell fragments, HCI reaction moderate	ontains fine 20-30%,	SM				5+7+10 N =17 REC =16"		
62.0	- - 0 -	SANDY SILT, wet, gray an contains fine to coarse she 20-30%, strong cementation reaction strong.	d white, Il fragments, on, HCl	ML	-16.6			11+23+50/4" N =73/10" REC =16"		Pig chatter
67.0	- 0 - -	SILTY SAND, fine to mediu wet, greenish gray and whi fine to coarse shell fragmer	im grained, te, contains nts, 20-30%,	SM	-21.6					Rig Challer
		HCI reaction moderate.					 70 	5+8+12 N =20 REC =18"		
							 75	REC =10"		
77.(- 0 - -	SANDY SILT, moist, green trace fine to medium shell 1 2-5%, HCI reaction modera	ish gray, ragments, ite.	ML	-31.6		 80	6+7+10 N =17 REC =18"		
1.28 CHNABEL.GUI 3/	0	CLAYEY SAND, fine to me grained, wet, greenish gray medium shell fragments, 2- reaction moderate.	dium /, trace fine to .5%, HCI	SC	-36.6		 85-	5+7+9 N =16 REC =18"		
16 LUG 06120048 PLOG SP1	-	contains fine to coarse she 20-30%, HCl reaction stron	ll fragments, g				 	7+15+15 N =30 REC =18"		
IESI BORIN	_	continued on next p	bage							

	bashal	TEST	Project:	Calvert Cliff	s Nucle	ar Pow	er Plant		Boring Number:	B-703	
Schnabel Engineering LOG				Calvert Cou	nty, Ma	iryland			Contract Number: 06120048 Sheet: 4 of 4		
DEPTH (FT)	STRAT	A DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	S		G TESTS	REMARKS	
				SC							
92.0 -	SANDY SILT, fi wet, greenish g shell fragments moderate.	ne to medium ray, trace fine , 2-5%, HCI re	grained, to coarse eaction	ML	-46.6		 M	5+7+12 N -10			
							95 ^ 	REC =1	8"		
-							 M	7+10+12 N =22	2		
100.0 —	BOTTOM OF B	ORING @ 10	0.0 FT.		-54.6		-100-	REC =1	8"		
5											

Schnat	TEST Project: C bel Engineering LOG C	alvert Clif alvert Co	ffs Nucle unty, Ma	ar Pow ryland	ver Pla	nt	Boring Contra Sheet:	Number: Ict Number 1 of 2	e r: 06120	B-704
Boring C	contractor: CONNELLY AND ASSOCIATES					Gro	oundwater Obs	ervations		
	FREDERICK, MARYLAND	,,				D	ate Time	Depth	Casing	Caved
Boring F	oreman: T. Connelly		Enco	untere	d	7	/6	23.5'		
Drilling N	Method: 3-7/8" OD Iri-cone Roller Bit		Start	of Dag	у	7	/7	23.0'		
Schnabo										
Dates S	Started: 7/6/06 Finished: 7/7/06	-								
Location	: Northing: 217991.06 ft									
	Easting: 960926.05 ft									
Ground S	Surface Elevation: 39.6 (feet)									
DEPTH (FT)	STRATA DESCRIPTION	CLASS	ELEV. (FT)	WL	DEP	 ТН		TEST	S I	REMARKS
0.6	ROOTMAT AND TOPSOIL.		39.0							
-	CLAYEY SAND, trace roots and wood fragments, fine to medium grained, moist, reddish brown.	SC	00.0			1	woh+1+2 N =3 REC =7"			
2.5 -	SANDY LEAN CLAY, trace wood fragments, moist, reddish brown and orangeish brown.	CL	- 37.1		-		2+2+3 N =5 REC =6"			
	iron staining, weak cementation.				5 -		2+2+2 N =4 REC =15"			
-					-		2+4+4 N =8 REC =15"			
10.0 — - -	SANDY FAT CLAY, trace root fragments, moist, reddish brown and orangeish brown, iron staining, weak cementation.	СН	- 29.6			-	2+2+2 N =4 REC =16"		sta rota	rt of mud ary drilling
13.0 - - _	SANDY SILT, moist, blueish gray.	ML	- 26.6		- - 15-	-	3+4+5 N =9 REC =18"			
- 17.0 -	SILTY SAND find to modium grained	SM	- 22.6		_	-				
	coarse shell fragments, 30-40%, strong cementation, HCl reaction strong.				_ _ 20-		40+29+16 N =45 REC =18"		Rig	chatter
_					-	$\left \right $				
-				Ţ	- - 25-	-	4+8+6 N =14 REC =18"			
	continued on next page									

	TEST Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	Boring Number: B-70		
Schna	bel Engineering LOG	alvert Cou	nty, Ma	iryland		Contract Number: 0 Sheet: 2 of 2	6120048	
DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL		IG TESTS	REMARKS	
-	contains fine to coarse shell fragments, 20-30%, HCl reaction moderate.	SM				18"	resumed drilling on 7/7/06 @ 7:30am	
32.0 -	CLAYEY SAND, fine to medium grained, wet, blueish gray, trace fine to coarse shell fragments, 2-5%, HCl reaction weak.	SC	7.6		33+3+5 	18"	Rig chatter	
42.0	SANDY FAT CLAY, wet, gray and white,	СН	-2.4		 	18"		
-	contains fine to coarse shell fragments, 20-30%, HCI reaction moderate.				 2+3+6 N =9 REC =	18"	Rig chatter	
- 47.0 - - 3(9/08 - 381 -	SILTY SAND, fine to medium grained, wet, white and gray, contains fine to coarse shell fragments, 20-30%, strong cementation, HCI reaction strong.	SM	-7.4		 N =27 REC =	-11		
TEST BORING LOG 06120048 PLOG SPT 700.GPJ SCHNA 0.0 10	BOTTOM OF BORING @ 50.0 FT.		1-10.4					

Schnal	TEST Project: C bel Engineering LOG C	Calvert Cl Calvert Co	liffs Nuclea ounty, Ma	ar Pow ryland	ver Pla	nt	Boring Contra Sheet:	Number: oct Number 1 of 2	er: 06120	B-705
Boring (Gro	oundwater Obs	ervations		
Bornig C	FREDERICK, MARYLAND	5, INC.				D	ate Time	Depth	Casing	Caved
Boring F	Foreman: W. Wolfe		Enco	untere	d	6/	27	13.5'		
Drilling I	Method: 3-7/8" OD Tri-cone Roller Bit									
Drilling B	Equipment: CME-550X (ATV)	_								
Schnabe	el Representative: K. Bell									
Dates :	Started: 6/26/06 Finished: 6/27/06									
Location	n: Northing: 217581.3 ft Easting: 960917.9 ft									
Ground	Surface Elevation: 46.8 (feet)				I					
DEPTH (FT)	STRATA DESCRIPTION	CLASS	S. ELEV. (FT)	WL	DEP	S# <u>TH</u>	AMPLING DATA	TEST	s	REMARKS
0.6	ROOTMAT AND TOPSOIL.		46.2							
-	CLAYEY SAND, trace wood and root fragments, fine to medium grained, moist, orangeish brown.	SC			-		2+3+2 N =5 REC =5"			
2.5	SANDY FAT CLAY, trace root fragments, moist, orangeish brown and gray.	СН	- 44.3		_		3+3+5 N =8 REC =5"			
4.5	CLAYEY SAND, trace root fragments, fine to medium grained, moist, gray and orangeish brown.	SC	- 42.3		5 -	-	3+3+5 N =8 REC =16"			
7.0 -	SILTY SAND, fine to medium grained, moist, gray and orangeish brown, with yellow sand lenses.	SM	- 39.8		-		4+5+6 N =11 REC =18"			
- -	gray and reddish brown, weak cementation, iron staining						2+5+16 N =21 REC =11"		res on 7:5	sumed drilling 6/27/06 @ 30am
13.0 -	POORLY GRADED SAND WITH CLAY, fine to medium grained, wet, yellowish brown and gray.	SP-SC	33.8	Ţ	- - 15-		5+12+8 N =20 REC =10"			
17.0 -			29.8		_					
- -	SILIY SAND, fine to medium grained, wet, gray and white, contains fine to medium shell fragments, 20-30%, HCI reaction moderate.	SM			20-		15+14+10 N =24 REC =15"			
220 -			24 8							
-	SANDY ELASTIC SILT, moist, gray, trace fine to medium shell fragments, 2-5%, HCI reaction weak.	MH	27.0			- - M	3+3+4 N =7			
	continued on next page				-25-		REC =18"			

Comments:
1. Boring backfilled with cement/bentonite grout through tremie pipe upon completion.
2. * = See Appendix I for additional lab testing data.
3. Ground water observation well OW-705 installed at nearby location.

SC	hnabel TEST Project: C BORING C	er Plant	t Boring Number: B-7 Contract Number: 06120048				
DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL		Sheet: 2 of 2 NG TESTS	REMARKS
-		MH					
27.0 -	SILTY SAND, fine to medium grained, wet, light gray, contains fine to coarse shell fragments, 20-30%, strong cementation, HCl reaction strong.	SM	- 19.8		 ⊠ 50/5" N =50/ REC =	5" 5"	Rig chatter
32.0 -	CLAYEY SAND, fine to medium grained, wet, gray, contains fine to coarse shell fragments, 30-40%, HCI reaction strong.	SC	- 14.8			15"	
			1.8		 	1 18"	softer drilling
42.0 -	SILTY SAND, fine to medium grained, wet, greenish gray, trace fine to coarse shell fragments, 2-5%, HCI reaction weak.	SM	4.0			18"	
- - 50.0 —	BOTTOM OF BORING @ 50.0 FT.		3.3		3+3+4 3+3+4 N =7 REC =	18"	

Comments:
1. Boring backfilled with cement/bentonite grout through tremie pipe upon completion.
2. * = See Appendix I for additional lab testing data.
3. Ground water observation well OW-705 installed at nearby location.

Schna	TEST Project: C BORING C C abel Engineering LOG	alvert Cli alvert Co	ffs Nucle ounty, Ma	ar Pow ryland	ver Pla	nt	Boring Contra Sheet:	Number: act Number 1 of 2	er: 06120	B-706
Boring	Contractor: UNI-TECH DRILLING					Groun	dwater Obs	ervations		
	MALAGA, NEW JERSEY					Date	Time	Depth	Casing	Caved
Boring	Foreman: J. Blemings		Enco	untere	d	5/15		5.0'		
Drilling	Method: 3-7/8" O.D. Drag Bit (Mud Rotary)		Start	of day	у	5/16		0.0'		
Drilling	Equipment: CME-750 (ATV)									
Dates	Started: 5/15/06 Einisbed: 5/16/06	-								
Locatio	n: Northing: 217140.14 ft						_			
	Easting: 961339.74 ft									
Ground	Surface Elevation: 77.4 (feet)				1					
DEPTH (FT)	STRATA DESCRIPTION	CLASS	6. ELEV. (FT)	WL	DEP	SAMI <u>TH</u>	PLING DATA	TEST	s i	REMARKS
0.3	Rootmat and topsoil.	SM	77.1				5+3 -8		*N\	VJ rods
	SILTY SAND, fine to coarse grained, moist, brown, contains root fragments.				_		=o :C =17"		use	: 0.
	_				L	2+4	4+6			
						N =	=10 :C =11"			
4.5	CLAVEY SAND fine to modium	80	72.9		[
-	grained, wet, brown, trace organic	00		<u> </u>	- 5 -	2+2	2+1			
					F		=3 :C =14"			
7.0	SANDY I FAN CLAY, fine to medium	CI	70.4		-	-				
	grained, moist, yellowish brown and	-			F	2+2	2+1			
					L		-3 C =18"			
9.5	FAT CLAY, with fine to medium sand.	СН	67.9		10					
	trace mica, moist, mottled yellowish						2+2			
	trace fine to medium sand, gray.				F		=4			
	-				F		C =18"			
	-				F	-				
	_ trace fine sand.				-	_ 1+4	4+4 -8			
	1				-15-		C =0"			
·										
17.0	ELASTIC SILT, trace fine to medium	MH	60.4		F	1				
	gray and dark gray.				F					
5	-				F	- 2+4 N =	4+4 =8			
_	_				-20-		C =18"			
	1				F	1				
	+				F	-				
	<pre>trace fine sand, light greenish gray and light gray.</pre>				\vdash	- 3+0	6+6 =12			
- 2					-25-		C =18"			
	continued on next page									

	TEST Pr	oject: Calvert C	liffs Nucle	ear Pow	er Plant		Boring Number:	B-706
Schnal	bel Engineering LOG	Calvert C	ounty, Ma	aryland			Contract Number: 0 Sheet: 2 of 2	6120048
DEPTH (FT)	STRATA DESCRIPTION	I CLAS	s. ELEV. (FT)	WL	S DEPTH		TESTS	REMARKS
_		MH						
27.0 -	SANDY LEAN CLAY, trace mica,	, fine to CL	- 50.4					
-	medium grained, moist, gray.					8+9+12		
					Ň	N =21 REC =18	3"	
-								
-								
34.0 -	CLAYEY SAND, trace mica, fine	to SC	43.4			9+9+18 N =27	211	
	brown and light brown, (shell impressions observed in soil sam	ngeisn nple).			-35-4	REC = R	5	
37.0 -	POORLY GRADED SAND WITH	I SILT, SP-SI	40.4					
-	fine to medium grained, moist, lig brown.	int				50		
					-40	REC =6"		
-								
-								
-	light brown and orangeish brown					50 REC =5"		
-								
47.0 -	SANDY LEAN CLAY, trace mica, medium grained, moist, light gree	, fine to CL	- 30.4					
GDT 3/6	gray, trace fine to medium shell fragments (±5%), weak HCI reac	tion.			$\begin{bmatrix} 1 \end{bmatrix}$	WOH+3-	+4 PP=2.00 tsf	**Resumed grouting at 7:10
CHNABEI	BOTTOM OF BORING @ 50.0 F	T.	27.4		-50-	REC =18	3"	AM on 5/16/06.
00.GPJ S								
0G SPT 7								
20048 PL								
LOG 061								
BORING								
TEST								

Schnat	hnabel TEST BORING LOG	Project: Calv Calv	vert Clif vert Cou	ffs Nuclea unty, Mai	ar Pow ryland	er Plar	nt	Boring Contra Sheet	g Number: act Numbe : 1 of 2	er: 061200	B-707
Borina C	ontractor: UNI-TECH DRILLIN	G					Gro	oundwater Obs	servations		
J	MALAGA, NEW JEF	RSEY					D	ate Time	Depth	Casing	Caved
Boring Fo	oreman: J. Blemings <i>l</i> ethod: 3-7/8" OD Drag Bit (Mud	l Rotary)		Encou	untere	d	5	5/2	25.0'		
Drilling E	Equipment: CME-750										
Schnabe	I Representative: B. Bradfield										
Dates S	Started: 5/2/06 Finished: 5/2	/06									
Location	: Northing: 217396.98 ft Easting: 961481.84 ft										
Ground S	Surface Elevation: 67.4 (feet)										
DEPTH (FT)	STRATA DESCRIPTIO	ON C	CLASS.	ELEV. (FT)	WL	DEP	S/ TH	AMPLING DATA	TEST	S F	REMARKS
0.3	TOPSOIL.		CL	67.1			\mathbb{M}	2+3+4 N =7			
	SANDY LEAN CLAY, moist, or brown and gray.	rangeish						REC =18"			
2.5	SANDY FAT CLAY, moist, gra contains mica.	у,	СН	- 64.9		 		4+6+4 N =10 REC =18"	w=27.3	%	
	with sand.					— 5 — - -		4+4+5 N =9 REC =18"			
_	fine to medium sandy, greenisl and dark gray.	h gray					-	3+3+4 N =7	w=32.8 LL=59	9% 9	
						 		REC =18"	PL=2 *	1	
_	with sand, gray.							2+5+5 N =10 REC =18"			
_								4+6+8 N =14 REC =18"	w=32.7 *	%	
						- 15-		2			
						 	- - M	3+7+9 N =16			
						-20-		REC =18"			
22.0				AEA							
	CLAYEY SAND, fine to mediur grained, moist, dark gray, cont mica.	m ains	SC	40.4						.0/	
24.6				42.8	~~~		\mathbb{M}	6+6+9 N =15	w=29.5	9%	
	continued on next page			12.0	¥	-25-		KEC =18"			

	bachal	TEST	Project:	Calvert Cliff	s Nucle	ar Pow	er Plant	Bori	ng Number:	B-707	
Schnat	Schnabel Engineering LOG			Calvert Cou	inty, Ma	aryland		Con	Contract Number: 06120048 Sheet: 2 of 2		
DEPTH (FT)	STRATA	DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	S DEPTH	AMPLING DATA	TESTS	REMARKS	
	CLAYEY SAND, t orangeish brown a limonitic cementa staining.	race gravel and yellowis tion & Fe ox	, wet, sh brown, kide	SC	10.4						
-	ELASTIC SILT wi contains mica.	th sand, mo	ist, gray,	МН	40.4		 - 30	8+8+10 N =18 REC =18"			
-	organic odor.						 35	6+8+8 N =16 REC =18"	w=45.5% LL=59 PL=45 *		
-	brown, contains o	rganic matt	er.				 40	2+4+4 N =8 REC =17"			
42.0 -	POORLY GRADE fine to coarse gra brownish white, w fragments, strong	ED SAND W ined, wet, g vith fine to c HCI reactic	/ITH SILT, ray and parse shell on.	SP-SM	25.4		 45-	30+15+12 N =27 REC =18"		Harder drilling	
	brownish white, w fragments, strong	ith fine to co HCI reactio	oarse shell on.				 	5+7+26 N =33	w=27%		
50.0 —	BOTTOM OF BO	RING @ 50	.0 FT.		17.4		-50				

Schnak	hnabel TEST BORING LOG	Project: C C	alvert Cliff alvert Cou	fs Nucle unty, Ma	ar Pow ryland	er Pla	nt	Bor Con She	ing Nun htract No et: 1 o	nber: umbe f 4	: er: 06120	B-708
Boring C	ontractor: UNI-TECH DRILLIN	G					Gro	oundwater C)bserva	tions	;	
Doning o	MALAGA, NEW JEF	RSEY					D	ate Time	e De	pth	Casing	Caved
Boring F	oreman: J. Blemings			Encountere			5	5/8	5	.0'		
Drilling N	Method: 3-7/8" O.D. Drag Bit (Mu	d Rotary)		Start	ofday	,	F	5/0	0	5'		
Drilling E	Equipment: CME-750 (ATV)			Start	orua	/	,			.5		
Schnabe	I Representative: K. Megginson											
Dates S	Started: 5/8/06 Finished: 5/9	/06										
Location	: Northing: 217585.84 ft Easting: 961810.64 ft											
Ground S	Surface Elevation: 37.4 (feet)			1								
DEPTH (FT)	STRATA DESCRIPTIO	N	CLASS.	ELEV. (FT)	WL	DEP	S/ ТН	AMPLING DATA	1	rest	S I	REMARKS
0.4	Rootmat and topsoil.			37.0			M	1+3+4				
2.0	CLAYEY SAND, fine to coarse moist, brown, contains root frag	grained, gments.	30	35 4		L .	<u>الا</u>	N =/ REC =14"				
2.0 -	SILTY SAND, fine to medium g	rained,	SM	35.4		[01014				
_	grayish brown.	i anu				-	IXII	N =3				
								REC =12"				
4.5	SILT, wet, dark brown, with fine	e to	ML	32.9	$\overline{\nabla}$	- 5 -						
	medium sand, trace mica.						IM	WOH/18" N = WOH/18	3"			
_							12	REC =11"				
7.0 -	CLAYEY SAND, fine to coarse	grained.	SC	30.4		-	-					
_	moist, brown, (coarse sand is a	angular to				L .	-M	1+3+3				
	subangular).						IM	N =6 REC =12"				
9.5		- i	<u> </u>	27.9		[
_	wet, reddish brown and light or	angeish	SIVI			-10-						
-	brown, (coarse sand is subrour	nded to					-M	10+10+13 N =23				
12.0 -				25.4		L.	$ \Delta $	REC =10"				
12.0	SILTY GRAVEL, fine to coarse	grained,	GM	20.4								
-	(maximum dimension of suban	gular to				- ·						
14.0 -	subrounded fine gravel is 3/4 in	nch).	SM	23.4			HMI	20+9+3 N =12				
_	SILTY SAND, fine to medium g wet, dark orangeish brown, cor	irained, ntains					$ \Omega $	REC =9"				
	cemented sand pockets, (no of	oserved										
_	pockets).					F .						
17.0 -	CLAYEY SAND, fine to mediur	n	SC	20.4			+					
_	grained, wet, light brown, few f	ine to				Ļ .						
	silty sand pockets, strong HCI	, contains reaction.						WOH+2+3				
_						[`	1 X	N =5				
_						-20-	-	REC =18"				
-						<u> </u>						
22.0				15 /		L						
22.0	SILTY SAND, fine to medium g	rained,	SM	15.4								
-	fragments (±20%), strong HCL	reaction.				F .	1_					
_	· · · -					<u> </u>	-M	5+19+18 N -27				
	light grove mostly find to opprove	shell					IM	REC = 14"				
	light gray, mostly line to coarse					<u>–</u> 25–						

Comments:
1. Boring backfilled with cement/bentonite grout through tremie pipe upon completion.
2. * = See Appendix I for additional lab testing data.
3. Ground water observation well OW-708A installed at nearby location.

	hnabal	TEST	Project:	Calvert Cliff	s Nucle	ar Pow	er Plant		Boring Number:	B-708
Schna	bel Engineering	BORING LOG	G Calvert County, Maryland Contract N Sheet: 2 c			Contract Number Sheet: 2 of 4	ract Number: 06120048 t: 2 of 4			
DEPTH (FT)	STRAT	A DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	S		G TEST	S REMARKS
-	fragments (±>50 cemented sand 24.9 ft, strong H dimension of sho trace fine to med (±5%), weak HC	%), contains lense (1/4 ind Cl reaction, (ell fragment i dium shell fra cl reaction.	strongly ch thick) at maximum s 1/2 inch). gments	SM			 30	4+4+5 N =9 REC =18	3"	
32.0 - - - - -	CLAYEY SAND grained, wet, gra shell fragments reaction.	, fine to medii ay, trace fine (±5%), weak	um to medium HCl	SC	5.4		 35-	3+2+4 N =6 REC =18	3"	
37.0 -	SILTY SAND, fir wet, gray, little fi fragments (±209	ne to medium ne to coarse 6), strong HC	grained, shell I reaction.	SM	- 0.4			6+9+16 N =25 REC =18	3"	*Very difficult rotary advancement at 41 ft; moderate difficulty in rotary advancement below 42 ft.
	light gray and lig fine to coarse sh contains strongl pockets, (maxim cemented sand inches).	iht oliveish gr nell fragments y cemented s num dimensic pockets is 1-	ay, mostly s (±70%), and n of 1/2					7+14+14 N =28 REC =12	i 2"	
	light greenish gr shell fragments	ay, few fine to (±10%).	o coarse					7+11+26 N =37 REC =16	5"	*Relative difficultly in rotary advancement
	SANDY SILT, fir light greenish gr shell fragments reaction.	ne to medium ay, trace fine (±5%), mode	i, moist, to medium rate HCI	ML	-14.7		 	5+9+14 N =23 REC =10)"	below 51 ft. *Switched to 3-7/8" O.D. Tri-cone roller bit below 53.5 ft.
57.0 -	SILTY SAND, fir wet, gray, few fir continu	ne to medium ne to medium red on next pag	i grained, i shell ge	SM	-19.7					

Comments:
1. Boring backfilled with cement/bentonite grout through tremie pipe upon completion.
2. * = See Appendix I for additional lab testing data.
3. Ground water observation well OW-708A installed at nearby location.
| | TEST Project: C | alvert Cliff | s Nucle | ar Pow | er Plant | Boring Number: | B-708 |
|------------------------------|--|--------------|---------------|---------|--------------------------------------|-------------------------------------|---|
| Schna | bel Engineering LOG | alvert Cou | inty, Ma | iryland | | Contract Number: 0
Sheet: 3 of 4 | 6120048 |
| DEPTH
(FT) | STRATA DESCRIPTION | CLASS. | ELEV.
(FT) | WL | SAMPLI
DEPTH D | NG TESTS | REMARKS |
| - | fragments (±10%), strong HCI reaction. | SM | | | 11+11
60 REC = | +11
=18" | |
| 62.0 | SANDY SILT, fine to medium, moist,
gray, trace fine to coarse shell
fragments (±5%), strong HCI reaction,
(shell fragments easily crumble and roll
with slight finger pressure). | ML | 24.7 | |

 | 2
=18" | |
| _ | trace fine to medium shell fragments (±1%). | | | |
 | =18" | |
| 72.0 | SANDY LEAN CLAY, fine to medium,
moist, light greenish gray, trace fine to
coarse shell fragments (±5%), contains
dark brownish particles (< 1/8 inch),
(dark brownish particles may be fish
scales). | CL | 34.7 | |

N =19
REC = | 3
=18" | **Resumed |
| 77.0 | SILTY SAND, fine to medium grained,
wet, gray, little fine to coarse shell
fragments (±20%), contains subrounded
to rounded black particles (1/16 inch),
strong HCI reaction. | SM | 39.7 | |

 | =12" | AM on 5/9/06.
*Slight to
moderate rig
chatter from 75
to 76 ft. |
| 0.28 201 30 | SILT, moist, greenish gray, with fine to
medium sand, trace mica and fine to
medium shell fragments (±5%), weak
HCl reaction. | ML | 44.7 | |

 | 3
=18" | |
| - 0.78 PLOG 00120048 PLOG St | LEAN CLAY, moist, greenish gray, trace
fine to medium sand and mica, weak
HCl reaction. | CL | - 49.7 | |

N =18
REC = | 1
=18" | |
| | continued on next page | | | | | | |

Comments:
1. Boring backfilled with cement/bentonite grout through tremie pipe upon completion.
2. * = See Appendix I for additional lab testing data.
3. Ground water observation well OW-708A installed at nearby location.

	la sa la sl	TEST	Project:	Calvert Cliff	s Nucle	ar Pow	er Plant		Boring Number:	B-708
C	nnapel	BORING		Calvert Cou	inty, Ma	iryland		-	Contract Number	: 06120048
Schnar	bei Engineering	200								
(FT)	STRAT	A DESCRIPT	ION	CLASS.	ELEV.	WL			TESTS	REMARKS
				CL				DA		
-										
_										
	with fine to med	lium sand, tra	ce fine to					4+5+7		
	medium shell fr	agments (±5%	6),				r 11	N =12	8"	
		caction.					-95		0	
-										
-										
-										
	dark greenish g	ray, weak HC	l reaction.					6+7+9		
								N =16	8"	
100.0 —	BOTTOM OF B	ORING @ 10	0.0 FT.		62.7		-100-1	1,120 1		
0/0/0										
200.4										
1040										
00120										
2										
DNIX										

Comments:
1. Boring backfilled with cement/bentonite grout through tremie pipe upon completion.
2. * = See Appendix I for additional lab testing data.
3. Ground water observation well OW-708A installed at nearby location.

Sabas	hnabel BORING	Project: C	Calvert Clif Calvert Co	fs Nucle unty, Ma	ar Pow ryland	ver Pla	nt	Boring Contra	Number: act Number	: er: 0612	B-709
Senna	Ser Engineering LOG						<u> </u>				
Boring C	Contractor: UNI-TECH DRILLING	G					Gr	oundwater Obs		; 0:	
Boring F	MALAGA, NEW JER	(SEY		Enco		. d				Casin	g Caved
Drilling	Method: 3-7/8" O.D. Drag Bit (Mu	d Rotary)		LIICO		,u	``		7.5		
Drilling	Equipment: CME-750 (ATV)	• •									
Schnabe	el Representative: K. Megginson										
Dates	Started: 5/9/06 Finished: 5/9/	/06									
Locatior	n: Northing: 217642.82 ft Easting: 961978.18 ft										
Ground	Surface Elevation: 31.3 (feet)										
DEPTH (FT)	STRATA DESCRIPTIC	ON	CLASS	ELEV.	WL	DEP	TH TH		TEST	S	REMARKS
0.4	Rootmat and topsoil.		SM	30.9			M	WOH+2+2		*	NWJ rods
2.0 -	SILTY SAND, fine to coarse gra moist, brown, contains root frag and clayey sand pockets	ained, gments	SIVI	- 29 3			10	REC =14"			ISECI.
	LEAN CLAY, moist, orangeish	brown	CL					2+3+2			
	and grayish brown, with fine to sand.	medium				[N =5 REC =8"			
4.5				26.8		F	1				
	SILTY SAND, moist, fine to me grained, dark orangeish brown.	dium	SM	_0.0		- 5 -	M	3+2+3 N =5			
							Ľ	REC =12"			
7.0 -	CLAYEY SAND, fine to coarse wet, mottled dark orangeish bro grayish brown (high percentage fines)	grained, own and e of	SC	- 24.3	Ţ	-	-	WOH/18" N = WOH/18" REC =12"	w=27.3	3%	
9.5	SANDY SILT, fine to medium, v	wet, dark	ML	- 21.8		- 10-	_				
-	orangeisir brown.			10.0		-	-1	2+2+3 N =5			
-	SILTY SAND, fine to medium g moist, dark orangeish brown ar gray. (dark gray color is a 2 inc	rained, nd dark h thick	SM	- 19.0		_		REC =13"			
_	layer from 11.5 to 11.7 ft).							WOH+WOH	w=29.1	1%	
_	(bottom of sample vertically two different colors). gray below 14.5 ft.	Drown D						+1 N =1 REC =12"	*		
-						- -					
-	moist light gray mostly find to	medium				-		10+1+1			
-	strongly cemented sand (±100) strong HCI reaction. wet, gray, trace fine to medium	%), shell				20-	ĪM	N =5 REC =10"			
-	fragments (±5%) below 19.5 ft.					-	-				
22.0 -	CLAYEY SAND, fine to mediun grained, wet, gray, weak HCI re	n eaction.	SC	9.3		-	1				
-						_	-0	3+3+3 N =6	w=30.4	1%	
-	continued on next page					-25-		REC =18"			

	TEST Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	Boring Number:	B-709
Schnal	bel Engineering LOG	alvert Cou	nty, Ma	ryland		Contract Number: 0 Sheet: 2 of 2	6120048
DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL		NG TESTS	REMARKS
	trace fine to medium shell fragments (±5%), contains black particles (1/16 inch).	SC	-0.8		 	18"	
	SANDY SIL1, fine to medium, wet, gray and light gray, mostly fine to coarse shell fragments (±50%), strong HCI reaction.	ML	-5.8		5+5+1 	1 w=33.8% *18"	*Slight to moderate rig
	SILTY SAND, fine to medium grained, wet, gray and light gray, some fine to coarse shell fragments (±40%), contains clayey sand lenses (1/4 inch thick) and black particles (1/16 inch), strong HCI reaction.	SM	-5.0		1 1 N = 32 REC = 	+17 :10"	chatter from 37 to 38.5 ft.
- - 47.0 - 8	light gray, trace fine to coarse shell fragments (±5%), contains strongly cemented sand pockets, moderate HCI reaction.	CL	-15.8		11+28 N =51 REC =	+23 :13"	
BURING LOG 06120048 PLOG SP1 700.GPJ SCHNABEL.GDI 3/6/0 200 201 201 202 202 202 202 202 202 20	moist, gray, few fine to coarse shell fragments (±10%), contains black particles (< 1/8 in), strong HCI reaction, (some shell fragments are orange brown). contains moderately cemented sand lense below 49.8 ft. BOTTOM OF BORING @ 50.0 FT.		-18.8		 	30 w=23% *18"	

Groundwater Observations Groundwater Observations Defining Foreman: J. Blemings Drilling Reubers: 37/8* O.D. Drag Bit (Mud Rotary) Drilling Equipment: CME-750 (ATV) Schnabel Representative: K. Megginson Dates Started: 5/9/06 Encountered 5/10 Constance Representative: K. Megginson Dates Started: 5/9/06 Finabel Representative: K. Megginson Defining Surgers CLASS Ground Surface Elevation: 48.0 (set) Performance: Defining Surgers CLASS Fill Trace Integration Review Clayey and PROBABLE Fill, fine to medium saily and pockets. Fill and lenses. Fail Clay PROBABLE Fill, most, light graysh brown, and pockets. read filling and pockets. Fail Clay PROBABLE Fill, most, light graysh brown, and pockets. read filling and pockets. Fail Clay Probabilities of ragments, most, light graysh brown, with fine to medium sail? and light graysh brown, and light orangelsh brown, rotanis leaf fragments, trace organic matter (±1%). 8.5 LEAN CLAY, molet, brown, with fine to medium candination to fagments, most of spond, or brongelsh brown, contains leaf fragments, trace organic matter (±1%). 8.6 FAT CLAY. molet, brown, trace fine sand and mica.	chnabe	TEST BORING Engineering LOG	Project: C C	alvert Cl alvert Co	liffs Nucle ounty, Ma	ar Pow ryland	ver Pla	nt	Borin Contr Sheet	g Number: act Numbe :: 1 of 3	er: 06120	B-710
Instruction MALACA, NEW JERCEY Boring Foreman: J. Blemings Depth Casing Boring Foreman: J. Blemings Encountered 5/10 23.5 Drilling Method: 37.8° O.D. Drag Bit (Mud Rotary) Encountered 5/10 23.5 Dates Started: 5:006 Finehed: 5/1006 Location: Northing: 217542.51 ft Easting: 982130.88 ft 0.5 Forest litter, rootmat and topsoil. MALACA, Weight Starter 0.5 Forest litter, rootmat and topsoil. FlitL 47.5 MALACA, Weight Starter 0.5 Forest litter, rootmat and topsoil. FlitL 47.5 MALACA, Weight Starter 0.6 Class Regression Regresion Regresion Regression Regression Regression Regression Regresi	ring Cor		IG					Gro	oundwater Ob	servations		
Boring Foreman: J. Blemings Encountered 5/10 23.5 Drilling Method: 3-78*0 D. Drag Bit (Mul Rotary) Drilling Equipment: CME-750 (ATV) Schnabel Representative: K. Megginson Dates Starte: 59/06 Finished: 51/10/06 Location: Northing 2175245 51/10/06 Coround Surface Elevation: 48.0 (feet) 0.5 2.0 2.1 2.1 2.2 2.1 2.2 2.3		MALAGA, NEW JE	RSEY					D	ate Time	Depth	Casing	Caved
Drilling Equipment: CME-750 CD. Drag Bit (Mulk Rotary) Drilling Equipment: CME-750 (ATV) Schabol Representative: K. Megginson Dates Started: 59/00 Finished: 5/1006 Location: Northing: 217542.51 ft Easing: 962136.85 ft Ground Surface Elevation: 48.0 (feet) DEPTH STRATA DESCRIPTION 0.5 Clayey sand PROBABLE FILL, fine to medium gained, most, brown, contains 2.0 Sampenet, race organic matter (4%). 9.5 LEAN CLAY, molst, brown, trace fine sand, NOTAIN trace fine sand and mica. 17.0 FAT CLAY, molst, brown, trace fine sand (NOTE: hydrated behroinin observed in toor 6 spoon). 17.0 FAT CLAY, molst, brown, trace fine sand (NOTE: hydrated behroinin observed in toor 6 spoon). 17.0 SANDY LEAN CLAY, fine to medium, we difficult care organic matter (4%). 22.0 SANDY LEAN CLAY, fine to medium, we difficult care organic matter (4%). 22.0 SANDY LEAN CLAY, fine to medium, we difficult care organic matter (4%). 22.0 SANDY LEAN CLAY, fine to medium, we difficult care organic matter (4%). 22.0 SANDY LEAN CLAY, fine to medium, we difficult care organic matter (4%). 22.0 SANDY LEAN CLAY, fine to medium, we difficult care organic matter (4%). 22.0 SANDY LEAN CLAY, fine to medium, we difficult care organic matter (4%). 22.0 SANDY LEAN CLAY, fine to medium, we difficult care organic matter (4%). 22.0 SANDY LEAN CLAY, fine to medium, we difficult care organic matter (4%). 22.0 SANDY LEAN CLAY, fine to medium, we difficult care organic matter (4%). 22.0 SANDY LEAN CLAY, fine to medium, we difficult care organic matter (4%). 22.0 SANDY LEAN CLAY, fine to medium, we difficult care organic matter (4%). 22.0 SANDY LEAN CLAY, fine to medium, we difficult care organic matter (4%). 22.0 SANDY LEAN CLAY, fine to medium, we difficult care organic matter (4%). 22.0 SANDY LEAN CLAY, fine to medium, we difficult care organic matter (4%). 22.0 SANDY LEAN CLAY, fine to medium, we difficult care organic matter (4%). 22.0 SANDY LEAN CLAY, fine to medium, we difficult care organicare	ring For	reman: J. Blemings			Enco	untere	d	5	/10	23.5'		
Drilling Equipment: CME-750 (ATV) Schnabel Representative: K. Megginson Dates Started: 59/06 Finished: 57/006 Location: Northing: 217542.51 ft Easting: 962136.88 ft Ground Surface Elevation: 48.0 (feet) DEPTH (FT) STRATA DESCRIPTION CLASS. Fill Attack Strate St	lling Me	ethod: 3-7/8" O.D. Drag Bit (M	ud Rotary)									
Schnabel Representative: K. Megginson Dates Stated: 5/9006 Finished: 5/1006 Location: Northing: 21754:251 ft Easting: 962136.88 ft Ground Surface Elevation: 48.0 (feet) DEPTH STRATA DESCRIPTION CLASS. Clayey sand PROBABLE FILL, fine to mobility grained model, throw, nontains root fragments and fine to medium sailly sand enses. FILL 47.5 2.0 Forest litter, rootmat and topsoil. Fill. 46.0 3.1 Fat Clay PROBABLE FILL, fine to mobility gray and orangeish brown, with fine to medium sand, contains leaf fragments, trace organic matter (+1%). Fill. 46.0 9.5 LEAN CLAY, moist, brown, contains leaf fragments, trace organic matter (+1%). CL 38.5	lling Eq	uipment: CME-750 (ATV)		_								
Dates Starte: Starte: 5/10/06 Finished: 5/10/06 Location: Northing: 217542.51 ft Image: Control of the start	hnabel F	Representative: K. Megginsor	1									
Location: Northing: 21754251 ft Easting: 962136.88 ft Ground Surface Elevation: 48.0 (feet) DEPTH STRATA DESCRIPTION CLASS. ELEV. (FT) WL SAMPLING DEPTH DATA (FT) STRATA DESCRIPTION CLASS. ELEV. (FT) WL DEPTH DATA 0.5 Creat litter, rootmat and topsoil. 0.5 Creat litter, rootmat and topsoil. 0.5 Creat litter, rootmat and topsoil. 0.5 Creat litter, rootmat and topsoil. 1.6 Clay PROBABLE FILL, fine to medium grained, moist, brown, contains 1.7 Clay PROBABLE FILL, moist, light Fill fine to medium sand, contains silly sand pockets. 1.7 Clay PROBABLE FILL, moist, light rage and orageish brown, contains leaf fragments, trace organic matter (±1%). 9.5 LEAN CLAY, moist, brown, with fine to medium sand. 1.7 Clay PROBABLE FILL, moist, light region and light orangeish brown (mostly transceling curvilinear laminations), trace fine sand and mica. 1.7 Clay PROBABLE FILL, moist, light region and light orangeish brown (mostly transceling curvilinear laminations), trace fine sand and mica. 1.7 Clay PROBABLE FILL, moist, brown, with fine to contains fine to medium cemented sand pockets below 19.5 ft (mo observed HGI contains fine to medium, trace fine add (NOTE: hydrated bentonite observed in top of spoon), contains fine to medium, cemented sand pockets below 19.5 ft (mo observed HGI contains fine to medium, trace fine suff regions thrown, trace organic matter (±1%). 22.0 SANDY LEAN CLAY, fine to medium, reding brown, trace organic matter (±1%). 22.0 SANDY LEAN CLAY, fine to medium, reding brown, trace organic matter (±1%). 22.0 SANDY LEAN CLAY, fine to medium, reding brown, trace organic matter (±1%). 22.0 SANDY LEAN CLAY, fine to medium, reding brown, trace organic matter (±1%). 23.0 SANDY LEAN CLAY, fine to medium, reding brown, trace organic matter (±1%). 24.0 SANDY LEAN CLAY, fine to medium, reding brown, trace organic matter (±1%). 24.0 SANDY LEAN CLAY, fine to medium, reding brown, trace organic matter (±1%). 25.0 SANDY LEAN CLAY, fine to medium, reding brown, tra	tes Sta	arted: 5/9/06 Finished: 5/	10/06									
Ground Surface Elevation: 48.0 (feet) Value SAMPLING (FT) TESTS RE 0.5 Forest litter, rootmat and topsoil. CLASS. ELEV. (FT) WL SAMPLING DEPTH TESTS RE 0.5 Forest litter, rootmat and topsoil. FILL 47.5 Ar.5 2.443 NRC = 6° 2.0 Forest litter, rootmat and topsoil. FILL 46.0 Ar.5 2.423 NRC = 6° 2.0 Forest litter, rootmat and topsoil. FILL 46.0 Ar.5 NRC = 6° NRC = 6° 2.0 Forest litter, rootmat and topsoil. FILL 46.0 Ar.5 NRC = 6° NRC = 6°	cation:	Northing: 217542.51 ft Easting: 962136.88 ft										
DEPTH (FT) STRATA DESCRIPTION CLASS. ELEV. (FT) WL SAMPLING DEPTH TESTS RI 0.5 Forest litter, rootmat and topsoil. (FT) WL DEPTH DATA TESTS RI 2.0 Clayey sand PROBABLE FILL, fine to root fragments and fine to medium solution, contains root fragments and fine to medium solution with fine to medium sand, contains suity sand lenses. FILL 47.5	ound Su	urface Elevation: 48.0 (feet)					1					
0.5 Forest litter, rootmat and topsoil. Fill. 47.5 24.43 N=7 2.0 Clayey sand PROBABLE FILL, fine to modium saind, contains root fragments and fine to medium saind, contains silty sand pockets. Fill. 46.0 1 34.24.3 N=7 2.0 Fat Clay PROBABLE FILL, most, light thrown, with fine to medium saind, contains silty sand lenses. Fill. 46.0 1 34.24.3 N=6 1.1 Fat Clay PROBABLE FILL, most, light thrown, with fine to medium saind, contains solf ragments, mostly multied light yellowish brown and light graysh brown and light graysh brown and light graysh brown and light graysh brown, contains leaf fragments, trace organic matter (±1%). 24.24.2 N=4 REC =6" 9.5 LEAN CLAY, moist, brown, with fine to medium sand. CL 38.5 10 10.5 10 10.5 10.1 FAT CLAY, moist, brown, trace fine sand and mica. CL 31.0 10.5 10.5 10.5 10.5 17.0 FAT CLAY, moist, brown, trace fine sand and mica. CH 31.0 10.5 10.5 10.5 10.5 12.2.0 SANDY LEAN CLAY, fine to medium, wet, dark orangeish brown and logk registion with fine to medium, reddish brown, trace organic matter (±1%). CL 26.0 10.5 10.5	PTH FT)	STRATA DESCRIPTI	ON	CLAS	S. ELEV. (FT)	WL	DEP	S/ ТН	AMPLING DATA	TEST	s	REMARKS
Clayey sand PROBABLE FILL, fine to medium grained, moist, brown, contains root fragments and fine to medium silty sand pockets.FILLN=7 FILLused2.0Fact Cay PROBABLE FILL, moist, light yellowish brown and light grayish brown with fine to medium sand, contains silty sand length yellowish brown and light grayish brown mostly motited light yellowish brown and light grayish brown, with fine to medium sand.FILL46.0	0.5	Forest litter, rootmat and tops	oil.		47.5			M	2+4+3		*N	WJ rods
2.0 medium grained, moist, brown, contains is motion, sand pockets. 2.0 Fat Clay PROBABLE FILL, moist, light yellowish brown and light grayish brown, with fine to medium sand, contains sitty sand lenses. 9.5 trace fine sand, contains root fragments, mostly motified light yellowish brown, light brownish gray and orangeish brown, contains leaf fragments, trace organic matter (±1%). 9.5 LEAN CLAY, moist, brown, with fine to medium sand. 17.0 FAT CLAY, moist, brown, trace fine sand and mica. 17.0 FAT CLAY, moist, brown, trace fine sand (NOTE: hydrated bentonite observed in shoe of spoon, dry bentonite o	-	Clayey sand PROBABLE FILL	, fine to	FILL				HŇI	N =7 REC =6"		us	ed.
 FILL For the individual state of the undult staty Fill Fat Clay PROBABLE FILL, moist, light, yand pockets. Fat Clay PROBABLE FILL, moist, light provide and light grayish brown, with fine to medium sand, contains sitty sand lenses. trace fine sand, contains root fragments, mostly motted light pellowish brown and light grayish brown, with fine to medium sand. trace fine sand, contains leaf fragments, trace organic matter (±1%). 9.5 LEAN CLAY, moist, brown, with fine to medium sand. tight brown and light orangeish brown (mostly transecting curvilinear laminations), trace fine sand and mica. 17.0 FAT CLAY, moist, brown, trace fine sand and mica. 17.0 FAT CLAY, moist, brown, trace fine sand and mica. 17.0 FAT CLAY, moist, brown, trace fine sand and mica. 17.0 FAT CLAY, moist, brown, trace fine sand and mica. 17.0 CAT CLAY, moist, brown, trace fine sand and mica. 17.0 CAT CLAY, moist, brown, trace fine sand and mica. 17.0 CAT CLAY, moist, brown, trace fine sand and mica. 17.0 CAT CLAY, moist, brown, trace fine sand and mica. 17.0 CAT CLAY, moist, brown, trace fine sand and mica. 17.0 CAT CLAY, moist, brown, trace fine sand and mica. 17.0 CAT CLAY, moist, brown, trace fine sand and mica. 17.0 CAT CLAY, moist, brown, trace fine sand and mica. 17.0 CAT CLAY, moist, brown, trace fine sand and mica. 17.0 CAT CLAY, moist, brown, trace fine sand and mica. 17.0 CAT CLAY, moist, brown, trace fine sand and mica. 17.0 CAT CLAY, moist, brown, trace fine sand and mica. 17.0 CAT CLAY, moist, brown, trace fine sand and mica. 17.0 CAT CLAY, moist, brown, trace fine sand and mica. 17.0 CAT CLAY, most, brown,	20 1	medium grained, moist, brown	n, contains		46.0		L.					
Fat Clay PROBABLE FILL, moist, light yellowish brown and light grayish brown, with fine to medium sand, contains silty sand lenses. trace fine sand, contains root fragments, mostly motified light yellowish brown and light grayish brown. -100 -222		sand pockets.		FILL	-0.0				31013			
yellowish brown and light grayish brown, with fine to medium sand, contains silty sand lenses. trace fine sand, contains root fragments, mostly motiled light yellowish brown and light grayish brown, light brownish gray and orangeish brown, contains leaf fragments, trace organic matter (±1%). 9.5 LEAN CLAY, moist, brown, with fine to medium sand. 17.0 FAT CLAY, moist, brown, trace fine sand (NOTE: hydrated bentonite observed in top of spoon), dry bentonite observed in top of spoon), dry bentonite observed in shoe of spoon), contains fine to medium cemented sand pockets below 19.5 ft (no observed HCI reaction with cemented sand pockets). 22.0 SANDY LEAN CLAY, fine to medium, wet, dark orangeish brown and dark reddish brown, trace organic matter (±1%). 22.0	-	Fat Clay PROBABLE FILL, m	oist, light					HXII	3+2+3 N =5			
Index <th< td=""><td>-</td><td>yellowish brown and light gray with fine to medium sand, con sand lenses.</td><td>vish brown, tains silty</td><td></td><td></td><td></td><td></td><td></td><td>REC =10"</td><td></td><td></td><td></td></th<>	-	yellowish brown and light gray with fine to medium sand, con sand lenses.	vish brown, tains silty						REC =10"			
9.5 Hight grayish brown. ight brownish of the total information of to	_	trace fine sand, contains root	fragments,				- 5 -	M	2+2+2 N =4			
9.5 9.5 $-\frac{1}{12}$ $-\frac{1}{12}$ $-\frac{1}{$		light grayish brown.	brown and						REC =6"			
9.5 HEAN CLAY, moist, brown, with fine to medium sand. Iter and the provided and the pro	_	mottled yellowish brown, light	brownish						2+2+2			
9.5 LEAN CLAY, moist, brown, with fine to medium sand. CL 38.5 -10	_	gray and orangeish brown, co fragments, trace organic matte	ntains leaf er (±1%).					Ň	N =4 REC =8"			
$17.0 = \begin{bmatrix} FAT CLAY, moist, brown, trace fine sand and mica. \\ 17.0 = \begin{bmatrix} FAT CLAY, moist, brown, trace fine sand and mica. \\ 17.0 = \begin{bmatrix} FAT CLAY, moist, brown, trace fine sand and mica. \\ 15 = \begin{bmatrix} TA \\ 10 \\ 10 \\ 10 \\ 10 \\ 10 \\ 10 \\ 10 \\ 1$	9.5	LEAN CLAY, moist, brown, wi	th fine to	CL	38.5		_10_				*C	ontinued
$\frac{1}{22.0} = \frac{1}{22.0} = \frac{1}{2} $		medium sand.							3+3+1		rot	ary
$17.0 = \frac{1}{10000000000000000000000000000000000$	-						-	IXII	N =7		ad	vanced to
17.0FAT CLAY, moist, brown, trace fine sand (NOTE: hydrated bentonite observed in top of spoon, dry bentonite observed in shoe of spoon).31.0 $2+4+5$ -15 $REC = 16"$ *Bori from 15 ft suffac contains fine to medium cemented sand pockets below 19.5 ft (no observed HCI reaction with cemented sand pockets).31.0 -16 $7+5+3$ REC =6" $7+5+3$ REC =6" $7+5+3$ REC =6"22.0SANDY LEAN CLAY, fine to medium, wet, dark orangeish brown and dark reddish brown, trace organic matterCL26.0 ∇ $7+5+3$ REC =7"	-								REC =10"			.5 n.
17.0Iight brown and light orangeish brown (mostly transecting curvilinear laminations), trace fine sand and mica.2+4+5 N=9 REC =16"*Bori from 15 ft surface 0.5 15 ft17.0FAT CLAY, moist, brown, trace fine sand (NOTE: hydrated bentonite observed in top of spoon, lr contains fine to medium cemented sand pockets below 19.5 ft (no observed HCI reaction with cemented sand pockets).CH31.0 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td>L</td><td></td><td></td><td></td><td></td><td></td></t<>							L					
$ \begin{array}{c} In the formation of the product of $		light businessed light supervision							0.4.5		*B	orina arouted
17.0FAT CLAY, moist, brown, trace fine sand (NOTE: hydrated bentonite observed in top of spoon, dry bentonite observed in shoe of spoon).CH31.0 -15 $REC = 16"$ 15 ft surface conti loss 15 ft.22.0SANDY LEAN CLAY, fine to medium, wet, dark orangeish brown and dark reddish brown, trace organic matter (±1%).CL26.0 $\overline{2}$ $7+5+3$ REC =6" $7+5+3$ REC =6"	-	(mostly transecting curvilinear	n brown				-	HXII	2+4+5 N =9		fro	m depth of
17.0FAT CLAY, moist, brown, trace fine sand (NOTE: hydrated bentonite observed in top of spoon, dry bentonite observed in shoe of spoon).CH31.0 $-$ - - - - $-$ - 		laminations), trace fine sand a	ind mica.				-15-	- 121	REC =16"		15 su	ft to ground
17.0 FAT CLAY, moist, brown, trace fine sand (NOTE: hydrated bentonite observed in top of spoon), dry bentonite observed in shoe of spoon). contains fine to medium cemented sand pockets below 19.5 ft (no observed HCl reaction with cemented sand pockets). 22.0 SANDY LEAN CLAY, fine to medium, wet, dark orangeish brown and dark reddish brown, trace organic matter (\pm 1%). CL 26.0 $\sum_{i=1}^{1055} \frac{1}{15 \text{ ft.}}$ 26.0 $\sum_{i=1}^{1056} \frac{1}{15 \text{ ft.}}$ 26.0 $\sum_{i=1}^{1056} \frac{1}{15 \text{ ft.}}$ 7+5+3 REC =6" 7+5+3 REC =6" 7+5+3 REC =6" 7+5+3 REC =6"											со	ntinued mud
17.0FAT CLAY, moist, brown, trace fine sand (NOTE: hydrated bentonite observed in top of spoon, dry bentonite observed in shoe of spoon).31.0 $7+5+3$ N =8 REC =6"22.0SANDY LEAN CLAY, fine to medium, wet, dark orangeish brown and dark reddish brown, trace organic matter (±1%).CL26.0 $7+5+3$ N =8 REC =6"	1						Ē .				105	ft.
$22.0 \qquad \qquad$	7.0 +	FAT CLAY, moist brown trac	e fine	СН	31.0		-					
22.0 SANDY LEAN CLAY, fine to medium, wet, dark orangeish brown and dark reddish brown, trace organic matter $(\pm 1\%)$. $(\pm 1\%)$.	4	sand (NOTE: hydrated bentor	ite				L .					
22.0 SANDY LEAN CLAY, fine to medium, wet, dark orangeish brown and dark reddish brown, trace organic matter $(\pm 1\%)$. CL $(\pm 1\%)$. $(\pm 1\%$		observed in top of spoon, dry observed in shoe of spoon).	Dentonite						7+5+3			
22.0 $\sum_{\substack{n=1\\ n \in \mathbb{C}^{n} \\ n \in $	1							1	N =8			
22.0 SANDY LEAN CLAY, fine to medium, wet, dark orangeish brown and dark reddish brown, trace organic matter $(\pm 1\%)$.	_	contains fine to medium ceme	ented sand				-20-	- 121	REC =6"			
22.0 SANDY LEAN CLAY, fine to medium, wet, dark orangeish brown and dark reddish brown, trace organic matter $(\pm 1\%)$.		reaction with cemented sand	pockets).				L.					
22.0 SANDY LEAN CLAY, fine to medium, wet, dark orangeish brown and dark reddish brown, trace organic matter (±1%).												
wet, dark orangeish brown and dark reddish brown, trace organic matter (\pm 1%).	2.0 +	SANDY LEAN CLAY, fine to r	nedium,	CL	26.0		F .					
$\begin{array}{c} \searrow \\ (\pm 1\%). \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\ $	4	wet, dark orangeish brown an	d dark					-				
-25-		(±1%).	nauci			<u>⊻</u>	L		7+5+3			
- $ -25$ $ -25$ $ -$	1	· ·					「 「		N =8			
continued on next page		continued on next page	9				-25-	- 121	REC =/"			
			-									

50	hnabel TEST BORING	Project: C	alvert Cliff alvert Cou	s Nucle nty, Ma	ar Pow ryland	er Plant	Bor	ing Number:	B-710
Schna	bel Engineering LOG						She	et: 2 of 3	0120040
DEPTH (FT)	STRATA DESCRIPT	ON	CLASS.	ELEV. (FT)	WL	S DEPTH		TESTS	REMARKS
			CL				2,11,1		
-									
27.0 -				21.0					
27.0	SILTY SAND, fine to medium	grained,	SM	21.0					
-	brown.	a grayish							
-						F -IM	WOR/18" N = WOR/18	3"	
_						0/_/	REC =12"		
_									
-						- 1			
-									
-	brown and light gray, trace fin	e to				M	6+7+7 N -14		
_	HCl reaction, (shell fragments	easily				_ ₃₅ 0	REC =12"		
	crumble and roll with slight fin pressure).	ger							
-	gray, few fine to coarse shell f	fragments							
37.0 -	f (±10%), strong HCI reaction b ft (shell fragments are rigid).	elow 34.5	CL	11.0					
-	LEAN CLAY, wet, light brown	and							
39.0 -	orangeish brown, with fine sa	nd, trace		9.0		107	WOH+10+8		
	SILTY SAND, fine to medium	grained,	SM			L 10	N =18 REC =10"		
	moist, gray, mostly fine to me strongly cemented sand (±>50	dium)%), trace				-40			
-	fine to medium shell fragment	s (±5%),							
-	wet trace fine to medium she	11							
-	fragments (±5%), weak HCl re	eaction.							
_						L JM	3+3+5		*No return of
						I IX	N =8 REC =18"		rotary cuttings
-						-45			Hollow stem
-									augers used to 40 ft in order to
47.0 -	LEAN CLAX moist gray with	fino to	N/I	1.0					case borehole
/9/08	medium sand, few fine to coa	rse shell							significant mud
DT 3	fragments (±10%), strong HC	reaction.					3+4+8		IOSS.
5. 						F 1 X	N =12		
HNAB –						-50-0	REC - 10		
9 52.0 -				-4.0		$ \downarrow \downarrow$			
21 20	GLAYEY SAND, fine to mediu grained, moist, gray and light	ım gray,	SC						
DG ST	some fine to coarse shell frag	ments					22+15+7		
- 8 PL(f 1 X	N =22		
- 12004						<u> </u> −55– ^[]	KEC =18"		
.90 _						├ ┤			
ں 1570 -				-90					
	SANDY LEAN CLAY, fine to r moist, light greenish grav and	nedium, arav.	CL						
- ST B(continued on next pag	e				Γ 1			
μ									

	bnabal	TEST	Project:	Calvert Cliff	s Nucle	ar Pow	er Plant		Boring Nur	nber:	B-710
Schnat	bel Engineering	LOG		Calvert Cou	inty, Ma	iryland			Contract N Sheet: 3 o	umber: 0 f 3	6120048
DEPTH (FT)	STRAT	A DESCRIPT	ION	CLASS.	ELEV. (FT)	WL			G 1	FESTS	REMARKS
	trace fine to mee (±5%) and mica	dium shell fra , strong HCl r	gments eaction.	CL				5+5+13			
59.5	CLAYEY SAND grained, moist, I gray, trace fine t fragments (±5% reaction.	, fine to medi ight greenish to medium sh) and mica, s	um gray and ell trong HCl	SC	- 11.5		60 	REC =1	8"		
62.0 -	SANDY SILT, fii light greenish gr shell fragments brownish particle HCI reaction.	ne to medium ray, trace fine (±5%), contai es (1/16 inch)	, moist, to coarse ns dark a, strong	ML	14.0			6+16+30 N =52 REC =1	6 8"		
67.0	LEAN CLAY, m	oist, greenish	gray, with	CL	-19.0						
-	fine to medium s shell fragments reaction, (some dark reddish bro	sand, few fine (±10%), stror shell fragmer own).	to coarse ng HCl nts are				 70	8+7+16 N =23 REC =1	8"		
72.0	SANDY SILT fi	ne to medium	moist	MI	-24.0						
-	greenish gray, ti shell fragments reaction.	race fine to m (±5%), weak	edium HCI					5+7+13 N =20 REC =1	8"		
	BOTTOM OF B	ORING @ 75	.0 FT.		-27.0						

	SC	hnabel BORING	Project: C C	alvert Cl	iffs Nucle ounty, Ma	ar Pow ryland	/er Pla	nt		Boring Contra	Number: Ict Numbe	: ər: 0612	B-711
S	Schnat	bel Engineering LOG								Sheet:	1 of 2		
Во	oring C	ontractor: UNI-TECH DRILLIN	IG					Gr	oundw	ater Obs	ervations	; 1	
		MALAGA, NEW JEI	RSEY					D	ate	Time	Depth	Casing	J Caved
Во	oring F	oreman: J. Blemings			Enco	untere	d	5	/11		28.5'		
Dri	illing N	Method: 3-7/8" O.D. Drag Bit (Mu	ud Rotary)										
Dri	illing E	Equipment: CME-750 (ATV)		-									
Sc	hnabe	I Representative: K. Megginson											
Da	ites S	Started: 5/11/06 Finished: 5/	/11/06										
Lo	cation	: Northing: 216755.7 ft Easting: 961743.5 ft											
Gr	ound	Surface Elevation: 53.0 (feet)											
		. ,											
	FT)	STRATA DESCRIPTI	ON	CLASS	3. ELEV. (FT)	WL	DED	тц		ATA	TEST	s	REMARKS
-	0.3	 Rootmat and topsoil. 			- 52.7		DEP	M	3+2+3	3		*N	WJ rods
	-	CLAYEY SAND, fine to coarse	grained.	SC			<u> </u>	- X	N =5	-10"		us	sed.
	20	moist, light brown and brown,	contains		51.0		L		REC -	=12			
	2.0	FAT CLAY moist light grange	hish brown	СН	51.0				4+5+6	2			
	-	and light gray, trace fine sand.					-	IXI	N =11				
	_						-		REC :	=14"			
	4.5	ELASTIC SILT, moist, mottled		MH	48.5		- 5 -						
		orangeish brown and light gray fine sand, (orangeish brown pa	y, trace articles					IM	4+4+7 N =11	7			
	_	appear to be weathered shell f	fragments					Π	REC :	=18"			
	7.0 -	Dased on snape).	maiat	ML	46.0			-					
	_	orangeish brown and light gray	yish				Ļ .	-M	4+4+5	5			
		brown, trace mica (high percer sand)	ntage of					\square	REC :	=18"			
	9.5	CLAVEN SAND find to modiu	m	80	43.5								
	_	grained, moist, dark gray.		30			-10-						
	_							HM	3+6+5 N =11	5			
1	2.0	light brown and dark reddish b	rown,		41.0		Ļ .	\square	REC	=16"			
	-	contains fine to medium weakl cemented sand pockets, trace	y fine to	SM									
		medium shell fragments (±5%)), below				Γ		00.50				
	-	orangeish brown due to oxidat	ined dark /				-	ΗM	32+50 N =50)			
	_	SILTY SAND, fine to medium	grained,				-15-	$\left \right $	REC :	=12"			
		moist, dark orangeish brown a reddish brown, (oxidized).	nd dark				L.						
		., ,											
1	1.0	LEAN CLAY, moist, gray, trace	e fine to	CL	36.0			1					
3	-	medium sand and mica.					-	-					
5	_						Ļ .	-10	5+3+5	5			
									IN =8 REC :	=14"			
							20-						
í	-						F .	1					
	-						- ·	-					
	_						Ļ.						
		with fine to medium sand						\square	3+3+2	2			
	-						Γ	1	N =5	-40"			
3	-	continued on next page	;				-25-		REC	=18			

Comments:
1. Boring backfilled with cement/bentonite grout through tremie pipe upon completion.
2. * = See Appendix I for additional lab testing data.
3. Ground water observation well OW-711 installed at nearby location.

SC		Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	Bo	oring Number:	B-711
Schnat	bel Engineering LOG			iity, ivia	inyianu		Co Sh	neet: 2 of 2	6120048
DEPTH (FT)	STRATA DESCRIP	ΓΙΟΝ	CLASS.	ELEV. (FT)	WL	DEPTH	SAMPLING	TESTS	REMARKS
_			CL						*Slight to moderate rig
27.0 -	SILTY SAND, fine to mediun wet, gray, few fine to coarse fragments (±10%), strong H0	n grained, shell Cl reaction.	SM	26.0	Ţ	 	5+8+9 N =17 REC =18"		rotary advanced below 27 ft.
						 35 	9+4+6 N =10 REC =16"		*Moderate difficultly in rotary advancement below 33 ft.
-						 [40 	7+8+10 N =18 REC =17"		
-	trace fine to medium shell fra (±5%), weak HCl reaction.	agments				 [45	4+4+7 N =11 REC =18"		
47.0 -	CLAYEY SAND, fine to medi grained, wet, light greenish g gray, trace fine to medium sh fragments (±5%), weak HCI	um Iray and Iell reaction.	SC	6.0			1+3+4 N =7 REC =18"		
	BOTTOM OF BORING @ 50	0.0 FT.		5.0					

Comments:
1. Boring backfilled with cement/bentonite grout through tremie pipe upon completion.
2. * = See Appendix I for additional lab testing data.
3. Ground water observation well OW-711 installed at nearby location.

Sc	hnabel BORIN	F Project: C	alvert Cli alvert Co	iffs Nucle ounty, Ma	ar Pow ryland	ver Pla	nt		Boring Contra	Number: Ict Numbe	er: 06	61200	B-712
Schna	bel Engineering LOG	i							Sheet:	1 of 2			
Boring	Contractor: CONNELLY AN	ID ASSOCIATES	, INC.				Gro	ound	vater Obs	ervations	1		
Boring F	FREDERICK, N	IARYLAND	-	F in e e			D	ate	Time	Depth	Cas	ing	Caved
Drilling	Method: 2-15/16" OD Tri-cor	ne Roller Bit (Muc	l Rotary)	Enco	untere	a	5	122		19.0	9.0	0	
Drilling	Equipment: CME-75 (Truck)												
Schnabe	el Representative: M. Arles												
Dates	Started: 5/22/06 Finished	I: 5/22/06											
Locatior	n: Northing: 216506.16 ft Easting: 961997.56 ft												
Ground	Surface Elevation: 42.4 (fee	t)											
DEPTH (FT)	STRATA DESCR	IPTION	CLASS	3. ELEV. (FT)	WL	DEP	S. /тн ∣	AMPL [ING DATA	TEST	s	R	EMARKS
0.2	ROOTMAT AND TOPSOI	L. /	SM	42.2			M	1+3+	2			0-9' ster	hollow n auger
-	SILTY SAND, fine to medi moist, brown, contains roc	um grained, ot fragments.		40.4		-	-10	N =5 REC	=14"			oter	nuugen
2.0 -	SANDY SILT, fine to medi mottled orangeish brown,	um, moist, contains root	ML	40.4				2+3+	3				
_	fragments.						<u> </u>	N =6 REC	=10"				
_						- 5 -							
-	mottled brownish orange.					-	-	3+3+ N =7	4 =18"				
-						-	-	NLO	-10				
-	orangeish gray.					-	-0	2+3+ N =7	4				
-	_					-		REC	=18"			9-50 muc	0' 2-15/1" 1 rotary
-						-10-							
-	gray.					-		3+3+ N =7	-10"				
-						-		REC	-10				
13.0 -	POORLY GRADED SANE	WITH SILT,	SP-SN	29.4		-		0.0.	_				
_ ع	green, with fine to coarse	oist, grayish shell				-	IXI	2+3+ N =8	5				
- 3/6/(shell frag.	ction, 10-15%				-15-		REC	=18"				
- פר						-	-						
- HANNER -				24.9		-	-						
- Sol	wet, green, with fine to coa	arse shell	SM			-							
- 100.	shell frag.	ction, 25-35%			<u> </u>	-	IXI	4+5+ N =5	50/5" 5/11"				
esh						-20-		REC	=1/"				
						F	$\left \right $						
- 22 5				10 0		F	$\left \right $						
	POORLY GRADED SAND	WITH SILT,	SP-SN	1		-	$\left \right $						
	with fine to coarse shell fra strong HCI reaction, 10-20	agments,)% shell frag				F	-0	2+3+ N =7	4				
	antipued as a f	nogo				-25-	- 14	REC	=18"				
	continuea on next	page											

	bachel	TEST	Project:	Calvert Cliff	s Nucle	ar Pow	er Plant		Boring	Number:	B-712
20	nnabel	BORING	(Calvert Cou	inty, Ma	iryland			Contra	ct Number: 00	6120048
Schna	bel Engineering	LUG							Sheet:	2 of 2	
DEPTH	STRA	TA DESCRIPT	ION	CLASS.	ELEV.	WL	5		G	TESTS	REMARKS
				SP-SM			DEPTH	DA	TA		
-	-										
							Γ				
-	-										
-	15-25% shell fi	rag.					⊢ -10	4+4+4 N =8			
_	-						/	REC =1	8"		
-	-										
-	-										
-	-						10	2+2+3			
_							_35	REC =1	8"		
-							F 1				
-	-										
-	-										
-	-							2+3+4			
								∥ N =7 √ REC =1	8"		
]						-40				
-	-										
-	-										
43.0 -		C		014	-0.6						
	moist, green a	nd white, with f	ine to	5101				28+16+	21		
	coarse shell fra reaction, 60-70	agments, stron)% shell frag.	g HCl				I IŇ	N =37 REC =1	8"		
		0					-45		_		
-	-										
-	-										
80/0/	-										
	30-40% shell fi	raq.						9+7+6			
		0					r ix	N =13	8"		
50.0 —	BOTTOM OF E	BORING @ 50	.0 FT.		-7.6		-50	3	0		
0											
200											
40 7											
1200											
5											
EQ											

Schna	abel Engineering	Calvert Cli Calvert Co	πs Nucle unty, Ma	ar Pow ryland	er Pla	nt	Boring Contra Sheet:	Number act Number 1 of 2	er: 06120	B-/1 048
oring						Ground	water Obs	ervations		
oning	MALAGA, NEW JERSEY					Date	Time	Depth	Casing	Cavec
oring l	Foreman: J. Blemings		Enco	untere	d	5/11		33.5'		
rilling	Method: 3-7/8" O.D. Drag Bit (Mud Rotary)		Start	of day	v	5/12		17.0'		
rilling	Equipment: CME-750 (ATV)									
chnab	el Representative: K. Megginson									
	started: 5/11/06 Finished: 5/11/06									
locatio	Easting: 962283.16 ft									
Ground	Surface Elevation: 58.0 (feet)									
DEPTH			ELEV.	\ \ /I		SAMPL	ING	теет		
(FT)	STRATA DESCRIPTION	CLASS	' (FT)	VVL	DEP	тн і	DATA	1231	3 r	
	silty sand FILL, fine to coarse grained, moist, brown, contains crushed stone.	FILL				2+3+	4		*N\ use	VJ rods ed.
-							=7"			
2.0 -	LEAN CLAY, moist, brown, with fine to	CL	- 56.0		-					
-	_ medium sand, contains root fragments.				-	- / 2+3+ N =7	4			
	-		50 5		F		=10"			
4.5	FAT CLAY, moist, orangeish brown and	СН	- 53.5		- 5 -		.1			
	_ contains fine to coarse sandy fat clay				L	N =7	4			
	layers.						=11"			
	vellowish brown and light gravish brown					∏ 3+3+	4			
-	(dark orangeish brown soil appears to					N =7	=18"			
-	light grayish brown, light orangeish				-		-10			
_	_ brown and gray below 8.5 ft.				-10-					
-	_ fine sandy, gray, trace mica.				-	4+5+	·7 2			
12.0	FLASTIC SILT moist light blueish grav	мн	46.0		-		=18"			
-	and dark gray, trace fine sand.				F	-				
	_				L	5+5+	8			
_					15_		3 =18"			
-	7				Γ]				
17.0	SANDY SILT, fine to medium, moist,	ML	41.0		F	1				
-	_ gray, trace mica.				F					
-	-				╞	- \/ 4+3+ N =8	5			
_	-				-20-		=18"			
-	-				Ļ	$\left \right $				
22.0 -			36 0		L					
	LEAN CLAY, moist, gray, trace fine to medium sand and mica.	CL			L					
-						4+2+	5			
-	1				F	N =8	-19"			
_	continued on next page				-25-		-10			

Γ	6	hnabel TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	Boring	Number:	B-713
	Schnal	bel Engineering LOG	C	alvert Cou	nty, Ma	iryland		Contra Sheet:	ct Number: 00	6120048
D	EPTH (FT)	STRATA DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	SAM DEPTH	PLING DATA	TESTS	REMARKS
	-	light greenish gray and gray, medium sand, weak HCI read wet, gray, trace fine to mediu	with fine to tion. m sand,	CL		Ţ	 	4+5 =9 EC =18" /2" =50/2"		
	 37.0 – 	CLAYEY SAND, fine to medium grained, wet, light gray, some coarse shell fragments (±30% fine to medium strongly ceme	um b), contains ented sand	SC	21.0			-50/2 EC =2" 50/5"		
		pockets, strong HCI reaction. dark gray, trace fine to coarse fragments (±5%), contains bl particles (1/16 inch), moderal reaction.	e shell ack e HCl				RE 	=50/5" EC =11" 5+7 =12 EC =18"		*Moderate difficultly in rotary advancement below 39 ft.
JABEL.GDT 3/6/08	47.0 - - 50.0 —	SILTY SAND, fine to medium wet, dark gray, trace fine to c fragments (±5%), weak HCl r	grained, oarse shell eaction.	SM	8.0		 RE	5+8 =13 EC =18"		**Resumed grouting at 7:00 AM on 5/12/06.
TEST BORING LOG 06120048 PLOG SPT 700.GPJ SCHN		BUTTOM OF BORING @ 50								

Schnak	hnabel TEST BORING Del Engineering LOG	Project: (Calvert C Calvert C	iiffs Nucle ounty, Ma	ar Pow aryland	ver Pla	nt		Boring Contra Sheet:	I Number: Ict Number 1 of 2	er: 06120	B-714
Boring C	contractor: CONNELLY AND	ASSOCIATES					Gro	oundw	ater Obs	ervations		
g -	FREDERICK, MAR	RYLAND					D	ate	Time	Depth	Casing	Caved
Boring F	oreman: T. Connelly			Enco	untere	d	6	/27		Dry		
Drilling N	lethod: 4-1/4" ID Hollow Stem	Auger	-	Wator	Poadi	na	7	/25		44.0'		
Drilling E	Equipment: Diedrich D-50 (ATC	;)	-	water	Reau	ng		25		44.0		
Schnabe	I Representative: R. Vinzant											
Dates S	Started: 6/27/06 Finished: 6	6/27/06										
Location	: Northing: 215705.73 ft Easting: 962034.37 ft											
Ground \$	Surface Elevation: 116.0 (feet)				1	1						
DEPTH (FT)	STRATA DESCRIPT	ION	CLAS	S. ELEV. (FT)	WL	DEP	S/ TH	AMPL D	ING ATA	TEST	s i	REMARKS
0.5	TOPSOIL.		CN4	115.5				2+2+	1			
2.0 -	SILTY SAND, fine to medium moist, yellowish brown, conta fragments.	grained, ins root	SIVI	114.0		- -	10	N =6 REC	+ =18"			
	POORLY GRADED SAND W	ITH SILT,	SP-SI	M				2+3+3	2			
_	fine to medium grained, mois	t,						N =5	-40"			
_	orangeish brown.					F		REC	=18			
	Light orongoigh brown					- 5 -		2+2+	4			
_	Light orangeish brown.					L		N =7	+			
							ĽЦ	REC	=18"			
_						F	1_					
_	Med coarse sand.					╞	HMI	3+4+6 N =10	5)			
_						L	LΜ	REC	=18"			
						10						
	Contains rest freements					[10-	اص[4.0.0	-			
-	Contains root tragments.					-	HXII	4+6+6 N =12				
-						\vdash	-M	REC	=18"			
_						L						
	No root fragments							4+5+6	3			
_	No root nagments.					F	IXII	N =11				
_						-15-	- 14	REC	=18"			
_						F	4					
						L						
]					
_						F	1_					
-	Light orangeish white.					╞	HM	3+4+6 N =10	5			
						-20-	10	REC	, =18"			
						_						
						F	1					
-						╞	-					
						F						
	Fine - med. sand							4+5+	7			
						Γ		N =12	-10"			
_	continued on next page	e				-25-	- 12	REC	=18"			
		-										

Comments:
1. Ground water observation well OW-714 installed in boring upon completion.
2. * = See Appendix I for additional lab testing data.

	TEST	Project: 0	Calvert Cliff	s Nucle	ar Pow	er Plant		Boring N	umber:	B-714
Schnal	bel Engineering LOG		Calvert Cou	inty, Ma	ryland			Contract Sheet: 2	Number: 06 of 2	6120048
DEPTH			CI 499	ELEV.	wi	s	SAMPLIN	G	TESTS	DEMARKS
(FT)	STRATA DESCRIPT			(FT)		DEPTH	DA	ТА	12010	
_			SP-SM							
_	Light grangeish brown Med	- coarse					6+7+10			
-	sand.	000100				F 1 X	N =17	8"		
_						-30		Ŭ		
-										
-										
_							,			
-	Yellowish orange, Fine - med	l. sand.				F -1 X	N =16	.		
_						-35-	REC =1	8"		
-										
-										
-						- $-$				
-	Orangeish brown.					10	12+13+ N =29	16		
_						-40-	REC =1	8"		
_										
42.0 -	CLAVEY SAND find to mod		80	74.0						
-	grained, moist, mottled grayi	sh orange.	30							
_						10	7+1+2			
_						A	REC =1	8"		
_										
_										
00/0										
							REC =2	4" F	P=1.50 IST	
				66.0		50				
	BOTTOM OF BORING @ 50	0.0 FT.		00.0		50				
.00										
200										
40										
DNIN										
<u>i</u>										

Comments:
1. Ground water observation well OW-714 installed in boring upon completion.
2. * = See Appendix I for additional lab testing data.

Schna	test Project: BORING bel Engineering LOG	Calvert Cli Calvert Co	ffs Nucle ounty, Ma	ar Pow ryland	ver Pla	nt	Boring Contra Sheet:	Number: Not Number 1 of 2	er: 06120	B-715
Boring	Contractor: CONNELLY AND ASSOCIATE	S INC				Ground	dwater Obs	ervations		
	FREDERICK, MARYLAND	o,				Date	Time	Depth	Casing	Caved
Boring I	Foreman: T. Connelly		Enco	untere	d	6/1		10.5'		
Drilling										
Drilling	Equipment: Diedrich D-50 (ATC)									
Schnab	el Representative: R. Vinzant									
Dates	Started: 6/1/06 Finished: 6/1/06									
Location	n: Northing: 214951.76 ft Easting: 962639.59 ft									
Ground	Surface Elevation: 86.3 (feet)				1					
DEPTH (FT)	STRATA DESCRIPTION	CLASS	ELEV. (FT)	WL	DEP	SAMF TH	PLING DATA	TEST	s i	REMARKS
0.5	TOPSOIL.	-	85.8				.0			
	SILTY SAND, fine to medium grained, moist, dark brown, with organic matter, and root fragments.	SM					+2 3 C =12"			
	Dark orangeish brown, trace root fragments.				_	- 3+3 N =	6 6			
	-				- 5 -		5 = 17			
6.0			80.3		Ļ	3+3	5 5 			
-	fine to medium grained, moist, light orangeish brown.	3F-3M			-					
	-						6 C =18"			
	-			∇	-10-				Ch	ange from low stem
	Wet, orangeish brown.			-	-	- 6+7 N =	′+10 17 C =11"		aug rota	ger to mud ary drilling
					_					
-	-				-	9+1	0+13 23 2 = 17"			
							5 = 17			
	-				_	$\left \right $				
-	 Reddish brown				-		12+13			
							25 C =16"			
	-					$\left \right $				
-	-				-	+				
	Dark reddish brown, contains organic matter.				-	- 9+6 м =	6+5 11		Bro	own return
	continued on next page				-25-		C =18"			

	bachel	Project: C	Calvert Cliffs Nuclear Power Plant						Boring	Number:	B-715	
Sahaa	maper	BORING	С	alvert Cou	nty, Ma	ryland			C	Contra	ct Number: 0	6120048
Schna	bei Engineering	LUG						~		sneet:	2 07 2	
DEPTH (FT)	STRATA	DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	DEDTI	5≠ ⊔∣		`	TESTS	REMARKS
				SP-SM			DEFT		DAI	~		
26.0 -	LEAN CLAY. moi	st. mottled o	ıravish	CL	60.3							
-	orange, with sand	d.	, - , -									
-												
_								∇	4+3+4			
							20	Ň	N =7 REC =18			
							_30					
-							F 1					
-												
-												
-	Gray.							M	2+3+4 N =7			
_							-35-		REC =18	"		
-												
-												
_												
								∇	2+4+5			
							10	XI	N =9 REC =18			
							-40					
-							- 1					
-												
-												
-								M	4+5+6 N =11			
							-45-4	Δ	REC =18	"		
-												
_												
ة 								∇	5+7+9			
								XI	N =16 RFC =18			
50.0	BOTTOM OF BO	RING @ 50	.0 FT.		36.3		-50-					
б Г												
5.007												
20040												
de l'O												

		TEST	Project:	Calvert	Cliff	s Nucle	ar Pov	/er Pla	nt		Boring	Number:			B-716
	Schna	bel Engineering LOG	i	Calvert	Cou	inty, Ma	ryland				Contra Sheet:	act Number 1 of 2	er: 06'	1200)48
	Borina (Contractor: CONNELLY AND	ASSOCIATI	ES. INC.					Gr	ound	water Obs	ervations			
	J	FREDERICK, MAI	RYLAND	-, -					D	ate	Time	Depth	Casi	ng	Caved
	Boring F	Foreman: T. Chew	allor bit (Mud	(Dotony)		Enco	untere	d	7	/20		13.5'			
	Drillina	Equipment: Diedrich D-50 Turb	o (Track)	r (totary)											
	Schnabe	el Representative: K. Megginso	on												
	Dates	Started: 7/20/06 Finished:	7/20/06												
	Locatior	n: Northing: 215003.21 ft Easting: 961364.57 ft													
	Ground	Surface Elevation: 82.4 (feet)													
	DEPTH (FT)	STRATA DESCRIPT	ΓΙΟΝ	CLA	SS.	ELEV. (FT)	WL	DED	S. TLI	AMPL	.ING	TEST	s	R	EMARKS
ł	0.3	Forest litter, rootmat and top	soil.		1	82.1			M	1+1+	2			*AW	/J rods
	-	SILT, moist, brown, trace fine medium sand, contains root	e to fragments.		_			_	-M	N =3 REC	=18"			use	α.
	-	light brown and brown, trace matter (±1%).	organic					-		2+5+ N =1 REC	6 1 =18"			*4-1	/4" I.D.
	7.0	brown and dark brown.						5 -	-	5+6+ N =1 REC	7 3 =18"			Holl Aug from *Sw	ow Stem ers used n 0 to 5 ft. itched to
	7.0 -	LEAN CLAY, moist, mottled brown and light gray, with fin medium sand.	/, moist, mottled orangeish ight gray, with fine to nd.	CI	-	75.4		-		8+10 N =2 REC	+10+11 =21 EC =18"			Tri-c	cone roller below 5 ft.
	7.0 - - 9.5 _ - -	SILTY SAND, fine to coarse moist, orangeish brown and brown, contains moderately sand pockets, trace fine grav sand and fine gravel is subar subrounded; maximum dmer gravel is 1/4 inch).	grained, grayish cemented /el, (coarse ngular to nsion of fine	SN	Л	72.9				8+11 N =2 REC	+12 3 =14"				
GDT 3/6/08	-	wet, dark yellowish brown, lig and light grayish brown.	ght gray,				Ŷ	- 15-		2+1+ N =3 REC	2 =12"				
INABEL .	17.0 -	FAT CLAY, wet, gray, with fi	ne to	CH		65.4		-	-						
120048 PLOG SPT 700.GPJ SCH	-	medium sand, trace mica.						- - 20- -		3+2+ N =5 REC	3 =18"				
TEST BORING LOG 06	-	moist, gray and dark gray, tra medium sand, contains claye sandy fat clay lenses. continued on next pag	ace fine to ey sand and ^{ge}					- - 25-		3+3+ N =6 REC	3 =18"				

	TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant		Boring N	umber:	B-716
Schna	bel Engineering LOG	C	alvert Cou	inty, Ma	iryland			Contract Sheet: 2	Number: 06 of 2	6120048
DEPTH (FT)	STRATA DESCRIPT	TION	CLASS.	ELEV. (FT)	WL		SAMPLIN		TESTS	REMARKS
- - - -	gray, trace organic matter (± contains light grayish sandy t clayey sand pockets.	1%), fat clay and	СН			 	4+4+5 N =9 REC =	18"		
34.3	ELASTIC SILT, moist, gray, f medium sand and mica.	trace fine to	MH	- 48.1		 35	3+5+6 N =11 REC =	18"		
37.0	SANDY LEAN CLAY, moist, light gray, contains light gray sand pockets.	gray and ish clayey	CL	45.4		 40	5+7+10 N =17 REC =	D 18"		
42.0	SILTY SAND, fine to medium moist, dark gray, trace fine to shell fragments (±5%), mostl sand layers (±95%), (no obso reaction with cemented sand	n grained, o medium y cemented ervable HCI layers).	SM	40.4		 45 	38+50/ N =50/ REC =	'3" 3" 10"		*Moderate to difficult rotary advancement from 44 to 48.5 ft (slow advancement).
ST BORING LOG 06120048 PLOG SPT 700.GPJ SCHNABEL.GDT 3/6/08 66 6 5 0 5 0 5 0	wet, gray, mostly fine to med fragments (±80%), strong HC POORLY GRADED SAND W fine to medium grained, wet, fine to medium shell fragmen moderate HCI reaction. BOTTOM OF BORING @ 49	ium shell Cl reaction. /ITH SILT, gray, few tts (±10%), 0.5 FT.	SP-SM	33.4			12+50 N =50 REC =	12"		

Sahaa	hnabel BORING	oject: Calvert Calvert	Cliff Cou	s Nucle inty, Ma	ar Pow ryland	/er Pla	nt		Boring Contra	<u>I Number:</u> Ict Numbe	er: 06120	B-717
Schha	bei Engineering LOG						0		Sneet:			
Boring C	Contractor: UNI-TECH DRILLING					1	Gr	oundw	ater Obs	ervations		
	MALAGA, NEW JERSI	ΕY						ate	Time	Depth	Casing	Caved
Boring F	F oreman: J. Blemings Method: 4-1/4" O.D. Drag Bit (Mud I	Rotary)		Enco	untere	d	7	/14		13.5'	0.0'	
Drilling	Equipment: CME-750 (ATV)											
Schnabe	el Representative: M. Arles											
Dates	Started: 7/14/06 Finished: 7/14	/06										
Locatior	n: Northing: 214302.45 ft Easting: 962349.27 ft											
Ground	Surface Elevation: 90.7 (feet)					1						
DEPTH (FT)	STRATA DESCRIPTION	CLA	SS.	ELEV. (FT)	WL	DEP	S. TH	AMPLI D	NG ATA	TEST	s i	REMARKS
0.5	TOPSOIL			90.2			M	WOH	+WOH			
-	SILTY SAND, fine to coarse grair moist, brown, contains root fragm	ned, SM ents.	Λ				ŀΔ	+1 N =1 REC :	=18"			
2.0 -	SANDY LEAN CLAY, fine to med	dium, CL	_	88.7		-			10			
-	moist, brown, contains root fragm	ents.					HM	WOH	+2+4			
_						L.	\square	REC :	=14"			
4.5			204	86.2								
	fine to coarse grained, moist, oral	ngeish	SIVI			- 5 -	10	9+10+	-9			
-	brown.	-				- ·	-IXI	N =19	- 4 7 "			
				00.7				REC	=17*			
7.0 -	POORLY GRADED SAND, with g	gravel, SF	2	83.7								
-	fine to coarse grained, moist, ora	nge.					HM	8+13+ N =26	-13			
_						L .	ЦШ	REC :	=18"			
10.0 -	POORLY GRADED SAND WITH	SILT, SP-S	SM	80.7		-10-						
	fine to coarse grained, moist, rede	dish				- ·	HM	4+7+7 N =14	7			
120 -	orange.			78 7		L.	ЦΜ	REC :	=16"			
12.0	SILTY SAND, fine to coarse grain	ned, SM	Λ	10.1								
	wet, orange.				∇	-	1_					
-					-	- ·	ЧM	6+5+6	6			
						15	M	REC :	=16"			
						- 15-						
-							-					
						L .						
- 5						-	1_					
- s	fine to medium grained, wet, moth	led				- ·	-M	WOH	+WOH			
	grayish orange.						IM	+1 N =1				
5						-20-		REC =	=18"			
- 1	-					-	-					
- I						L.	_					
2 -	-					F .	1					
- 1						<u> </u>	-M	WOH	+WOH			
						25	JM	+4 N =4				
	continued on next page					-25-	1					

	bachal	TEST	Project: (Calvert Cliff	s Nucle	ar Pow	er Plant			Boring	Number:	B-717
	maper	BORING	0	Calvert Cou	inty, Ma	iryland				Contra	ct Number: 0	6120048
Schnal	bel Engineering	LUG								Sneet:	2 07 2	
DEPTH	STRAT	A DESCRIPT	ION	CLASS.	ELEV.	WL		SA	AMPLIN	G	TESTS	REMARKS
(SM	()		DEPTH	H	DA	ר A פיי		
_				Sivi					RLC - I	0		
27.0 -	SANDY SILT, fir	ne to medium	, moist,	ML	63.7		- 1					
-	gray.											
_							L 1	∇	1+2+2			
							20	\mathbb{N}	N =4 REC =1	8"		
-												
32.0 -		ne to medium	arained	SM	58.7							
_	moist, gray.		i graineu,									
									1+2+3			
-								XII	N =5	0"		
							-35-1		REC = I	0		
-												
_												
-									0.0.7			
-							`	XII	3+3+7 N =10			
							-40-4		REC =1	8"		
_												
10.0					40.7							
42.0 -	FAT CLAY, mois	st, gray, with	silt.	CH	40.7		[]					
-												
								VI.	2+4+5 N =9			
_							-45-	Δ	REC =1	8"		
-												
- 10							_	M	4+5+6			
500-					40.7		50	\mathbb{N}	N =11 REC =1	8"		
50.0 -	BOTTOM OF BO	ORING @ 50	.0 FT.		40.7							
ň												
					1	I						

Schna	TEST BORING BORING LOG	Calvert Cli Calvert Co	ffs Nucle ounty, Ma	ar Pov aryland	ver Pla	nt	Borir Cont Shee	ng Number: ract Number it: 1 of 2	: er: 0612	B-718
Boring	Contractor: CONNELLY AND ASSOCIATE	S INC				Gr	oundwater Ob	oservations	;	
Bonnig	FREDERICK, MARYLAND					D	ate Time	Depth	Casing	Caved
Boring	Foreman: T. Connelly Method: 3 7/8" OD Tri cone Pollor Pit		Enco	untere	d	6	/19	8.0'		
Drilling										
Drilling	Equipment: CME-750 (ATV)									
Schnab	el Representative: R. Vinzant									
Dates	Started: 6/19/06 Finished: 6/19/06									
Locatio	n: Northing: 214130.52 ft Easting: 961929.05 ft									
Ground	Surface Elevation: 117.5 (feet)									
DEPTH (FT)	STRATA DESCRIPTION	CLASS	ELEV. (FT)	WL	DEP	S. TH	AMPLING DATA	TEST	S	REMARKS
0.5	FL, R AND TOPSOIL.	014	117.0			M	2+3+5			
	SILTY SAND, fine to medium grained, moist, reddish brown, contains mica.	SM				-0	N =8 REC =18"			
							6+13+17			
· ·					F	IXI	N =30			
	-				-	ЦЦ	REC =18"			.
4.5	POORLY GRADED SAND, fine to	SP-SC	113.0		_ <u>5</u> _				rc	nange to mud tary drilling
	medium grained, moist, light orange,					M	6+6+8		fre	om hollow
					F	HM	REC =18"		st	em auger
					L					
	Wet Med - coarse sand						6+9+8			
· ·				<u> </u>	F	IXI	N =17			
	-				-	ЦЦ	REC =18"			
					L_10_					
							0.0.0			
	-				F	HVI	2+2+2 N =4			
					L	ЦШ	REC =10"			
12.5	POORLY GRADED SAND WITH SILT	SP-SM	105.0							
· ·	fine to medium grained, moist, light	01-010			F					
	orangeish brown.				-	HM	8+9+9 N -19			
					15	M	REC =18"			
					- 15-	7				
	-				F	-				
						_				
	-				F					
5	_ Light brown.				-	-M	9+12+16			
						M	N =28 REC =16"			
					-20-					
	4				\vdash	-				
					L					
	-				\vdash	+				
	Med coarse sand.				F	$-\square$	8+12+15			
						Ŵ	N =27 REC =15"			
	continued on next page				-25-					
í										

Comments:
1. Boring backfilled with cement/bentonite grout through tremie pipe upon completion.
2. * = See Appendix I for additional lab testing data.
3. Ground water observation well OW-718 installed at nearby location.

	Schnabel TEST Project: BORING				s Nucle	ar Pow	er Plant		Boring	Number:	B-718
Schnat				Calvert Cou	inty, Ma	iryland			Contra	ct Number: 0	6120048
DEDTU	Ser Engineering	LUU							G	2 01 2	
(FT)	STRAT	A DESCRIPT	ION	CLASS.	(FT)	WL	DEPTH		та	TESTS	REMARKS
				SP-SM							
-											
-											
-											
	Wet.						L -10	11+15+	17		
								N =32 REC =1	6"		
							50				
-											
-											
	Moist, light oran	geish brown.					10	11+13+ N =26	13		
							-35-	REC =1	7"		
	Deuk vedeliek ku							7 - 40.4	<u>_</u>		
-	Dark reddish bro	own, Fine - m	ed. sand.				F -11X	N =22	2		
-							-40-	REC =1	8"		
42.0 -		Constant and the			75.5						
	grained, moist, i	nottled grayis	um sh orange.	SC							
								2+1+2			
								N =3	8"		
							-45	1,50 1	Ŭ		
-											
_											
							10	2+1+2			
500					67.5			REC =1	8"		
	BOTTOM OF B	ORING @ 50	.0 FT.		01.0						
2.007											
0400											
<u>الــــــــــــــــــــــــــــــــــــ</u>											

Comments:
1. Boring backfilled with cement/bentonite grout through tremie pipe upon completion.
2. * = See Appendix I for additional lab testing data.
3. Ground water observation well OW-718 installed at nearby location.

Schnal	bel Engineering LOG	Calvert Clit Calvert Co	ffs Nucle unty, Ma	ar Pow Iryland	ver Pla	int	Boring Contra Sheet	g Number: act Numbe : 1 of 2	e r: 06120	B-719
Boring C	Contractor: CONNELLY AND ASSOCIATES	S, INC.				Gro	oundwater Obs	ervations		
	FREDERICK, MARYLAND	· _				D	ate Time	Depth	Casing	Caved
Boring F	oreman: D. Reese		Enco	untere	d	6	/15	10.5'		
Drilling I	Method: 3-7/8" OD Tri-cone Roller Bit		Start	t of da	v	6	/16	5.0'		
Drilling E	Equipment: Diedrich D-50 (ATC)									
Schnabe	el Representative: B. Bradfield									
Dates	Started: 6/15/06 Finished: 6/16/06									
Location	a: Northing: 213978.69 ft Easting: 961500.2 ft									
Ground	Surface Elevation: 75.2 (feet)			1	1					
DEPTH (FT)	STRATA DESCRIPTION	CLASS	ELEV. (FT)	WL	DEP	S/ דר	AMPLING DATA	TEST	s I	REMARKS
0.2	FL, R AND TOPSOIL.	ML	75.0			М	2+2+2		0-9	'- Advanced /4" HSA
- 2.0	SANDY SILT, fine to medium, moist, brown and light brown, comtains wood fragments, contains root fragments		73.2		-	ĪM	N =4 REC =7"			
	SILTY SAND, fine to medium grained,	SM			L		3+5+6			
_	moist, light orangeish brown and yellowish brown, trace root fragments,][]	N =11 REC =18"			
4.5	SANDY SILT fine to medium moist	ML	70.7		_ <u>5</u> _					
-	light orangeish brown and yellowish brown, slight layering <1/2" thick.				-		4+7+9 N =16 REC =13"			
7.0 -			68.2		L		NEC = 15			
-	CLAYEY SAND, fine to medium grained, moist, grayish white and light yellowish brown.	SC			-		4+5+5 N =10 REC =12"		9'- mu	Changed to d rotary with
10.0 —			65.2		-10-				roll	er bit
	SILTY SAND, fine to medium grained, wet, light orangeish brown and light	SM		Į⊻			3+6+5			
-	gray. 1" layer of moderately cemented sand, dark orangeish brown .				_		N =11 REC =13"			
_					F	-				
-	mottled orangeish brown and light gray.				F	-M	1+2+1			
					-15-		REC =14"			
									17'	- Color
_					Γ	1			cha	ange in mud
-	4				F	1			bro	wn to
-					╞	-			ora	ngeish wn
-					F		2+1+2			
						_W	N =3 REC =16"			
					20-					
-					F	1			201	- mud return
22.0 -	LEAN CLAY with sand, moist, gray, contains mica.	CL	- 53.2		-	-			fro	m orangeish wn to gray
-					Γ		0.0.4			
-					F		∠+3+4 N =7			
	continued on payt page				-25-	- 121	REC =18"			

	hnabel TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	E	Boring Number: B-719		
Schna	bel Engineering LOG	C	alvert Cou	inty, Ma	ryland		C S	Contract Number: 06120048 Sheet: 2 of 2		
DEPTH (FT)	STRATA DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	S DEPTH		TESTS	REMARKS	
	-		CL							
27.0 -	FAT CLAY with sand, moist, contains mica.	gray,	СН	48.2			2+4+5 N =9 REC =18			
	SANDY ELASTIC SILT, fine moist, dark gray, contains mi	to medium, ca.	MH	43.2			3+4+6 N =10			
37.0 -	SANDY LEAN CLAY, fine to with sand, moist, gray and da contains mica.	medium, ırk gray,	CL	38.2		35	5+7+8 N =15		35'- Start of day on 6/16/06	
	CLAYEY SAND, fine to coars moist, dark gray, contains mi moderate cementation.	se grained, ca,	SC	- 33.2		40 ^ 45	REC =18 7+11+21 N =32 REC =18	"	45-48.5'- Harder drilling	
- 47.0 - 47.0	POORLY GRADED SAND W wet, dark gray and brownish 50-60% fine to medium shell contains mica, strong HCI rea BOTTOM OF BORING @ 49	/ITH CLAY, white, fragments, action. .4 FT.	SP-SC	- 28.2		 X	37+50/5" N =50/5"		Harder drilling 47.5'- Rig chatter	

Schnal	bel Engineering LOG	ject: Calvert Calvert	Cliffs Nucle County, M	ear Pov aryland	ver Pla I	nt	Boring Contra Sheet:	Number act Number 1 of 3	B-720		
Borina C						Gro	undwater Obs	ervations	6		
	MALAGA, NEW JERSE	Y				Da	ate Time	Depth	Casing	Caved	
Boring F	oreman: J. Blemings		Ence	ountere	əd	7/*	17	11.0'	0.0'		
Drilling I	Method: 4-1/4" O.D. Drag Bit (Mud R	otary)									
Drilling I	Equipment: CME-750 (ATV)										
Schnabe	el Representative: M. Arles										
Dates	Started: 7/17/06 Finished: 7/18/0	06									
Location	: Northing: 215674.48 ft										
	Easting: 962378.47 ft										
Ground	Surface Elevation: 73.5 (feet)										
DEPTH			FLEV	,		SA	MPLING				
(FT)	STRATA DESCRIPTION	CLA	ASS. (FT)	WL	DEP	тн	DATA	TEST	'S F	REMARKS	
0.3	FL, R AND TOPSOIL.	~	73.2			- M	1+2+1				
_	POORLY GRADED SAND, fine to	3	P		-	-WI	N =3 RFC =18"				
20 -	coarse grained, moist, brown, cont	ains	71.5		L						
	POORLY GRADED SAND WITH (CLAY.	SC				3+3+5				
_	fine to coarse grained, moist, yello	wish					N =8				
-	white.		<u> </u>		-		REC =18"				
4.5	CLAYEY SAND, fine to coarse gra	ined, S	C 69.0		- 5 -		0 - 0 - 4				
_	moist, yellowish orange.						2+2+4 N =6				
_					Γ	יןעך	REC =16"				
7.0 -	SANDY LEAN CLAY, fine to coars	e, C	L 66.5		F						
-	moist, yellowish gray.				+	-Mi	2+2+3 N =5				
_							REC =17"				
10.0 —	FAT CLAY, wet, brownish gray, wi	th C	H 63.5		-10-						
_	sand.			⊻	+		1+1+1 N =2				
_					-	$ \Delta $	REC =18"				
13.0 -			60 5								
10.0	POORLY GRADED SAND, fine to	ite	P				4+3+2				
_					F		N =5				
					-15-		REC =10"				
_					-	-					
170 -			F6 F		L						
17.0 -	FAT CLAY, moist, gray, with sand.	C	H ^{30.5}								
-					F						
-					\vdash	-	WOH+2+3 N =5				
					-20-	_M	REC =18"				
					L						
-											
_	-				F	1					
-	-				\vdash	-					
_					F		2+2+3				
					0.5	M	N =5 REC =18"				
	continued on next page				-25-						
	1			1	1			1			

	Chnabel BORING				Calvert Cliffs Nuclear Power Plant						Boring Number: B-720		
Saha		BORING	C	alvert Cou	nty, Ma	iryland				Contract Number: 06120048			
Schr	abei Engineering	200						•		Sneet:	2 01 3		
(FT)	STRATA	A DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	DEDTI	ы ц		J F A	TESTS	REMARKS	
				СН			DEPT		DA				
	-						-						
	_												
									21417				
	-						1	XII	N =11				
	-						-30-4		REC =1	8"			
	-												
	_												
	fine to modium a	andy							1+7+8				
		anuy					1	XI	N =15	.			
	-						-35-4		REC =1	8"			
	-												
37.0					36.5								
	ELASTIC SILT, I	moist, gray, v	vith sand.	MH									
									1+1+6				
	-							XI	N =10	.			
	-						-40-4		REC =1	8"			
	-												
	_												
	fine to medium s	andv graani	sh arav						1+1+8				
		sandy, greeni	Shi gray.					XI	N =12	. "			
	-						-45-		REC =1	8			
	-												
	_												
6/08													
DT 3/	with sand								5+6+10				
EL.GI								XII	N =16	0"			
INAB	-						-50-4		REC =1	8			
sc	-						-						
a) 52.0					21.5		$ \downarrow \downarrow$						
01 70	SILTY SAND, fin moist, green, wit	he to medium th fine to coai	i grained, rse shell	SM									
DG SF	fragments, stron	g HCI reactio	on, 10-20%						1+7+10				
8 PLO								XI	N =19	.			
12004	-						<u> </u> −55– ^ℓ		REC =1	α			
90 5	-						$\left - \right $						
9 57.0					16.5		\downarrow \downarrow						
ORIN	fine to medium g	9ED SAND W grained, wet,	green, with	SP-SM									
EST B	continu	ed on next pag	<i>je</i>										
≓L													

SC	hnabel BORING	Project: Calvert (Cliffs Nucle	ar Pow	er Plant	Boring	Boring Number: B-720		
Schnal	bel Engineering LOG	Guivert	Sounty, Ma	iryiana		Sheet:	3 of 3	5120048	
DEPTH (FT)	STRATA DESCRIPTIC	DN CLAS	SS. ELEV. (FT)	WL	SAN		TESTS	REMARKS	
-	fine to coarse shell fragments, HCI reaction, 20-40% shell frag	strong SP-S J.	SM		8 	+9+11 I =20 REC =18"			
- - - -	10-30% shell frag.				 65			63-75' grinding	
67.0 - - - -	SILTY SAND, fine to medium g wet, green, with fine to coarse s fragments, strong HCI reaction, shell frag.	grained, SM shell , 5-15%	6.5		 R - 	+8+11 I =19 REC =18"			
- - 75.0 —	0-5% shell frag. BOTTOM OF BORING @ 75.0	FT.	-1.5		 3 N R	+6+8 I =14 REC =18"			

Sc	hnabel BORING	Calvert Cl Calvert Co	ert Cliffs Nuclear Power Plant ert County, Maryland					Boring Number: B-72' Contract Number: 06120048		
Schna	bel Engineering LOG		-	-			Sheet: 1 of 4			
Boring	Contractor: UNI-TECH DRILLING					Ground	water Obs	ervations		
	MALAGA, NEW JERSEY					Date	Time	Depth	Casing	Caved
Boring F	Foreman: J. Blemings		Enco	untere	d	7/18		33.5'	0.0'	
Drilling	Method: 4-1/4" O.D. Drag Bit (Mud Rotary)		Start	of da	v	7/19		8.0'	0.0'	
Drilling I	Equipment: CME-750 (ATV)	-			-					
Datos	Startad: 7/18/06 Einishad: 7/19/06	-								
Dates	Started: 7/18/00 Finished: 7/19/00									
Location	Easting: 962462.1 ft									
Ground	Surface Elevation: 101.3 (feet)									
DEPTH (FT)	STRATA DESCRIPTION	CLAS	s. ELEV. (FT)	WL		SAMPI		TEST	S F	REMARKS
	POORLY GRADED SAND WITH SILT	SP-SN	Л		DEP		DATA +1			
-	fine to medium grained, moist, brown.				-		=6"			
-					F	-				
-	orangeish brown.				F		+5			
							;=14"			
4.5		<u> </u>	96.8							
-	fine to coarse grained, moist, orange.	55			- 5 -	3+3+	⊦4			
-	_				-		, . =1/1"			
70 -			94 3		L		, = 14			
1.0	POORLY GRADED SAND WITH CLAY,	SP-SC				7+11	0+15			
-	trace gravel.				-	$ \rangle N = 2$	27 27			
-	-				-		=16"			
	_				-10-					
							-8			
-					F	X N =1	3			
-	-				-		:=14"			
13.0 -			88.3		F	_				
	POORLY GRADED SAND, fine to coarse grained, moist, vellowish white.	SP				5+8+	+12			
-	trace gravel.					X N =2	20			
					-15-		,=12"			
-	-				F	-				
					L					
					Γ	7				
-					╞					
-	no gravel.				L	5+8-	+12			
2							:u ; =10"			
					2 0-					
	1				F	-				
-					F	4				
					L					
_					Γ		10			
-	1				F	- \ 6+8+ N =1	F10 8			
il					-25-		:=9"			
	continued on next page									
L					-					

	TEST	Calvert Cliff	s Nucle	ar Pow	er Plant	Bor	Boring Number: B-721		
School	bol Engineering	G	Calvert Cou	nty, Ma	ryland		Con	tract Number: 0	6120048
DEDTU						6			
(FT)	STRATA DESCRIP	TION	CLASS.	ELEV. (FT)	WL			TESTS	REMARKS
			SP						
-	-								
-	-								
_	_								
	orange.						6+8+7		
-						r ixi	N =15		
	-					-30-1	NEC -5		
	_								
	-								
	-								
_	wet.				⊥ <u>⊻</u>		4+6+6		
							N =12 RFC =14"		
-									
37.0 -	POORLY GRADED SAND	NITH SILT.	SP-SM	64.3					
	fine to medium grained, wet	, orange.							
-	-					M	2+9+9		
							N =18 REC =16"		
						40			
-	-								
42.0 -	SILT, wet, reddish orange, v	with sand,	ML	59.3					
	with clay.								
-	-					M	5+3+4 N =7		
45.0				56.3		<u>45</u>	REC =12"		
_	moist, gray.	neaium,	СН						
9									
	-								
- e	-					X	2+4+4 N =8		
	-					-50-1	REC =18"		
- 50	-								
	-								
-									
	trace sand with silt						4+5+5		
						F 1 X	N =10		
	-					-55-1	110 - 10		
- E	-								
- 19	-								
	continuea on next pa	iye							

Γ		TEST Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	Boring Number:	B-721	
	Sahaa	BORING C	alvert Cou	nty, Ma	ryland		Contract Number: 06120048 Sheet: 3 of 4		
Н	Scrina					SAMDI IN			
	(FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL		TESTS	REMARKS	
┢			СН						
	-								
							18"		
						00			
	-								
	62.0 -	SILTY SAND fine to medium grained	SM	39.3					
	-	moist, dark grayish green.							
	_					2+4+5			
						N =9	18"		
						-65-1-1-1-20			
	-								
	67.0 -	FLASTIC SILT moiot grow with cond	NALI	34.3					
	-	ELASTIC SILT, Moist, gray, with sand.							
						2+4+5			
	-						10"		
						-70-10 REC -	10		
	-								
	-								
	_								
		fine sandy, greenish gray				3+4+6			
	-	inte sandy, greenisti gray.				X N = 10	4.01		
						75 [] REC =	18"		
	-								
	77.0 -			24.3					
	_	SILTY SAND, fine to medium grained, moist, greenish gray, contains	SM						
		cemented sand, with fine to coarse shell fragments strong HCI reaction				50/1"			
	-	80-100% shell frag.				N =50/1	1"		
						80 REC =	1"		
3/6/08	-								
GDT	-								
BEL									
ANHO	_	wat groop 40 60% shall frag					LO		
J S(-	wet, green, 40-60% shell hag.					-9		
00.GF						85 [] REC =	18"		
SPT 7	-								
) 00	_								
048 PI									
61200	-								
0 90	-	∠u-40% sneli trag.				$ \ \ = 0.5 \times 10^{-1}$	14		
NGL						90 /_ REC =	18"		
BORII	-								
TEST		continued on next page							

	TEST Project:			Calvert Cliff	s Nucle	ar Pow	er Plant	E	Boring Number: B-721		
Schnal		BORING LOG		Calvert Cou	nty, Ma	ryland			Contract Number:	06120048	
DEPTH (FT)	STRAT	A DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	S	SAMPLING	TESTS	REMARKS	
				SM	. ,		DEPTH	DAT	A		
92.0 -	POORLY GRAD fine to medium g with fine to coars strong HCI react	ED SAND W grained, mois se shell fragn ion, 20-30%	TH SILT, t, green, nents, shell frag.	SP-SM	9.3		 - 95 	6+9+15 N =24 REC =16	'n		
- - 100.0 —	BOTTOM OF BO	ORING @ 10	0.0 FT.		1.3		 100-	6+12+19 N =31 REC =12	'n		

Schnal	hnabel Boring	Project: C	Calvert Cl Calvert Co	liffs Nuclea ounty, Ma	ar Pow ryland	ver Plai	nt	Borin Contr Sheet	g Number: act Number	er: 06120	B-722
Conna							Gro	undwater Ob	servations		
Boring C	Contractor: UNI-TECH DRILLIN					1	GIU P	ato Timo	Donth	Casing	Caved
Boring E	IVIALAGA, NEW JE	ROLI	-	_						Casiliy	Caveu
Drilling I	Method: 4-1/4" O.D. Drag Bit (M	ud Rotary)	_	Encol	untere	a	11	18	28.5	0.0	
Drilling E	Equipment: CME-750 (ATV)										
Schnabe	el Representative: M. Arles										
Dates \$	Started: 7/18/06 Finished: 7	7/18/06									
Location	n: Northing: 215386.1 ft Easting: 962467 ft		_								
Ground	Surface Elevation: 99.8 (feet)										
DEPTH (FT)	STRATA DESCRIPT	ION	CLASS	s. ELEV. (FT)	WL	DEP [.]	SА ТН	AMPLING DATA	TEST	S F	REMARKS
_	POORLY GRADED SAND W fine to medium grained, moist gray, contains root fragments	ITH SILT, t, brownish 3.	SP-SN	Λ			M	WOH+1+2 N =3 REC =18"			
-	fine to coarse grained, orange trace gravel.	eish brown,				- ·		3+3+2 N =5 REC =16"			
4.5	POORLY GRADED SAND, fir coarse grained, moist, orange gravel.	ne to e, with	SP	95.3		- 5 -		5+6+10 N =16 REC =15"	w=3.5'	%	
7.0 -	POORLY GRADED SAND W fine to coarse grained, moist, trace gravel, with silt.	ITH SILT, orange,	SP-SN	92.8 M		- ·		5+8+12 N =20 REC =12"			
10.0 — _ _	POORLY GRADED SAND, fir coarse grained, moist, yellowi with gravel.	ne to ish orange,	SP					6+8+11 N =19 REC =12"			
-						- ·		4+9+9 N =18 REC =10"	w=12.4	1%	
						 20 <i>_</i> _		6+12+16 N =28 REC =12"			
22.0 -	SANDY SILT, fine to medium, reddish orange, with clay.	, moist,	ML	77.8							
24.5	POORLY GRADED SAND W	ITH SILT, e	SP-SN	75.3		25-		3+8+9 N =17 REC =16"	w=21.1 *	%	



Comments:

1. Boring backfilled with cement/bentonite grout through tremie pipe upon completion.

2. * = See Appendix I for additional lab testing data.

50	hnabel	TEST BORING	Project: C C	alvert Cliff alvert Cou	s Nucle nty, Ma	ar Pow ryland	er Plant	_	Boring Number: B-722 Contract Number: 06120048		
Schna	bel Engineering	LOG							Sheet: 3 of 3	0120040	
DEPTH (FT)	STRAT	A DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	S DEPTH		G TESTS	REMARKS	
-	fine to medium	sandy		СН				3+5+5 N =10 REC =1	8"		
- - -	-						 65	3+3+4 N =7 REC =7'	w=47.5% *		
	-						 70	3+4+6 N =10 REC =18	8"		
72.0 - - 73.9 -	SILTY SAND, fi wet, greenish gu sand, with fine t fragments, mod 70-90% shell fra BOTTOM OF B	ne to medium ray, contains o o coarse shel erate HCI rea ag/cemented s ORING @ 75	grained, cemented l ction, sand.	SM	27.8		 ×	50/5" N =50/5 REC =5	w=18.8%		

Schna	TEST Project: C bel Engineering LOG C	alvert Cl alvert C	vert Cliffs Nuclear Power Plant vert County, Maryland					Boring Number: B- Contract Number: 06120048 Sheet: 1 of 3		
Boring		INC				Gr	oundwater Obs	ervations		
	FREDERICK, MARYLAND	, 110.				D	ate Time	Depth	Casing	Caved
Boring F	Foreman: T. Connelly		Enco	untere	d	6	5/1	6.0'		
Drilling										
Drilling	Equipment: Diedrich D-50 (ATC)	-								
Schnabe	el Representative: R. Vinzant									
Dates	Started: 6/1/06 Finished: 6/1/06									
Location	n: Northing: 215108 ft Easting: 963000.8 ft									
Ground	Surface Elevation: 90.0 (feet)									
DEPTH (FT)	STRATA DESCRIPTION	CLAS	S. ELEV. (FT)	WL	DEP	S. TH	AMPLING DATA	TEST	s I	REMARKS
0.5	FOREST LITTER, ROOTMAT AND		89.5				1 . 1 . 1			
	POORLY GRADED SAND WITH SILT,	37-31	VI				N =2 REC =16"			
	brown.						3+4+6			
-	Light brown, trace root fragments.					IXI	N =10			
-	-						REC =18"		Ch	ongo from
50-			85.0		- 5 -				hol	low stem
0.0	POORLY GRADED SAND, Wet, light	SP	00.0	∇		M	2+3+5 N =8		aug	ger to mud
-				<u> </u>	- ·	ΗМ	REC =12"		100	ary unining
-	-					-				
7.5	POORLY GRADED SAND WITH SILT,	SP-SN	A 82.5		L.		10+14+20			
	Reddish brown.					IŇ	N =34 REC =18"			
-	-				- ·		REC = 10			
	-				-10-	-				
	Light orange.				L.		10+16+21			
						IXI	N =37			
-	-				- ·		REC = 10			
-	-									
	Moist, orangeish brown, Mottles of gray				L.		9+8+7			
9	clay.				[]	٦XI	N =15			
	-				-15-		REC = 10			
- 19	-					-				
					[.					
			74 5							
18.5 5 -	POORLY GRADED SAND WITH CLAY,	SP-SC	2 /1.5		L .	-M	w.o.h.+1+2			
	fine to medium grained, moist, mottled gravish orange					Ŵ	N =3 RFC =18"			
	grayion orange.				-20-					
	-				- ·	-				
- 10					Ļ.					
	-				F .					
- 19	Contains mica.					HM	2+2+2 N =4			
					25	\square	REC =18"			
	continued on next page				25					
<u>-</u>										
	bachal	TEST	Project:	Calvert Cliff	s Nucle	ar Pow	er Plant		Boring Number:	B-723
--------	----------------------	--------------------	------------	---------------	---------------	--------	---------------------------	----------	------------------	----------
20	Abel Engineering LOG			Calvert Cou	nty, Ma	ryland			Contract Number:	06120048
Schnal	bel Engineering	LUG							Sheet: 2 of 3	
DEPTH	STRAT	A DESCRIPT	ION	CLASS.	ELEV. (FT)	WL			TESTS	REMARKS
				SP-SC			DEPIN	DAI		
-										
27.0 -					63.0					
	FAT CLAY, mois	st, gray		СН						
_									o" w=31.9%	
-									LL=56	
_							-30-		PP=1.50 tsf	
-										
-										
	with sand conta	ine mica. Fin	e - med					w o h +2	0+4	
-	grained sand.	iiiis iiiica, Fiii	e - meu.				F -1 X	N =6		
							-351	REC =18	8"	
-										
-										
_										
								REC =24	w=33.9%	
-									LL=64 PI =19	
							-40		PP=3.00 tsf	
-										
-										
_										
								3+5+6		
-							F 1 X	N =11	0"	
							-45 []	REC = 18	8"	
-										
-										
5 1								4+5+7		
							F 1 X	N =12	0"	
							-50-0	REC = 10	0	
							\vdash \dashv			
							$ \downarrow \downarrow$			
53.5	SILTY SAND fir	ne to medium	arained	SM	36.5			6+6+7		
	moist, gray, con	tains mica.	. granica,				「	N =13	0"	
							−55– ^[_]		0	
- 20							\vdash \dashv			
							$ \downarrow \downarrow$			
	continu	ied on next pag	<i>je</i>							
					1			1		1

	TEST Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	Boring Number:	B-723
Schna	abel Engineering LOG	alvert Cou	nty, Ma	ryland		Contract Number: 06 Sheet: 3 of 3	6120048
DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL		NG TESTS	REMARKS
-	-	SM			 3+3+6 N =9 REC =	:18"	
-	With cemented sand, moderate HCI reaction.				⊠ 50/3" ⊠ 50/3" N =50/ REC =	'3" :4"	Drilling penetration rate slower
-	Greenish gray, strong HCl reaction, 15% med coarse shell fragments.				 	50/5" /11" :17"	
75.0 -	25% shell fragments. BOTTOM OF BORING @ 75.0 FT.		15.0		4+5+11 4+5+11 N =15 REC =	0 :18"	

Schna	bel Engineering LOG	Project: Ca	alvert Cli alvert Co	ffs Nucle ounty, Ma	ar Pow Iryland	ver Pla	nt	Boring Contra Sheet:	Number: Inct Number 1 of 4	er: 06120	B-724
Boring			INC				Gro	undwater Obs	ervations		
	FREDERICK, MAR	RYLAND	,				Da	ate Time	Depth	Casing	Caved
Boring F	Foreman: T. Connelly			Enco	untere	d	6	/2	10.5'		
Drilling	Method: 3-7/8" OD Tri-cone Rol	ller Bit		Start	of day	У	6	/5	23.5'		
Drilling	Equipment: Diedrich D-50 (ATC	;)				-					
Schnabe	el Representative: R. Vinzant										
Dates	Started: 6/2/06 Finished: 6/	/5/06									
Location	1: Northing: 214780 ft Easting: 963106.2 ft										
Ground	Surface Elevation: 97.0 (feet)										
DEPTH (FT)	STRATA DESCRIPT	ION	CLASS	ELEV. (FT)	WL	DEP	SА ⊺н	AMPLING DATA	TEST	s i	REMARKS
0.5	FL, R AND TOPSOIL.			96.5			M	woh+2+1			
-	POORLY GRADED SAND W fine to medium grained, dry, o brown, contains organic matt	/ITH SILT, prangeish ter.	SP-SM			-	-0	N =3 REC =18"			
-	Moist.					_		3+4+4 N =8 REC =18"			
-	Med coarse sand.					5 - -		3+6+7 N =13 REC =18"			
-	Light orangeish brown.					-		5+6+6 N =12 REC =18"			
	. Wet.				Ţ			4+6+6 N =12 REC =16"		Cha holl aug rota	ange from ow stem Jer to mud ary drilling
	Moist, yellowish brown.					- - 15-		5+9+11 N =20 REC =16"			
	Wet, light orangeish brown, F sand.	ine - med.				- - 20-		9+12+13 N =25 REC =14"			
22.0 -	POORLY GRADED SAND W fine to medium grained, mois grayish orange.	/ITH CLAY, t, mottled	SP-SC	75.0		-		7+5+4 N =9 REC =18"			
	continued on next pag	je				-25-					

BORING Calvert County, Maydand Contract Rumber: 08120048 DEPTH STRATA DESCRIPTION CLASS ELEV WL SAMPLING TESTS REMARKS 28.0 POORLY GRADED SAND WTH SLT. for angeish gray. SP-SM 71.0 - - - - 38.0 SILTY SAND, fine to medium grained, moist, gray, contains mica. SM 61.0 - - - - 46.0 LEAN CLAY, moist, gray, with sand, contains mica. CL 51.0 - - - - 46.0 LEAN CLAY, moist, gray, with sand, contains mica. CL 51.0 - - - - 46.0 LEAN CLAY, moist, gray, with sand, contains mica. CL 51.0 - - - - 46.0 LEAN CLAY, moist, gray, with sand, contains mica. CL 51.0 - - - -		TES	T Project:	Calvert Cliff	s Nucle	ar Pow	er Plant	Во	ring Number:	B-724
Depty (PT) STRATA DESCRIPTION CLASS ELEV (PT) WL SAMPLING TESTS REMARKS 28.0 POORLY GRADED SAND WITH SLT. The to medium grained, moist, motified orangetish gray. SP-SC 10 71.0 -	Schnal	BORI	NG	Calvert Cou	nty, Ma	ryland		Co	ntract Number: 0	6120048
28.0 SP-SC PCORLY GRADED SAND WITH SLT. From rangesh gray. 71.0 - - 36.0 SILTY SAND, fine to medium grained, moist, gray, contains mica. SM 61.0 - 36.0 SILTY SAND, fine to medium grained, moist, gray, contains mica. SM 61.0 - 46.0 LEAN CLAY, moist, gray, with sand, contains mica. CL 51.0 - 46.0 LEAN CLAY, moist, gray, with sand, contains mica. CL 51.0 - 46.0 LEAN CLAY, moist, gray, with sand, contains mica. CL 51.0 - 46.0 LEAN CLAY, moist, gray, with sand, contains mica. CL 51.0 -	DEPTH (FT)	STRATA DESCR		CLASS.	ELEV. (FT)	WL	SA		TESTS	REMARKS
28.0 POORLY GRADED SAND WITH SLT. fine to medium grained, most, motified analysis gray. 36.0 SILTY SAND, fine to medium grained, SILTY SAND, fine to medium grained, CL SILTY SAND, fine to medium grained, SILTY SAND, fine to me				SP-SC			DEPTH	DATA		
$46.0 \qquad \qquad$	26.0 -	POORLY GRADED SANI	O WITH SILT.	SP-SM	71.0					
$46.0 \qquad \qquad$	-	fine to medium grained, morangeish gray.	noist, mottled							
36.0 SILTY SAND, fine to medium grained, molit, gray, contains mica. SM 61.0										
36.0 SILTY SAND, fine to medium grained, moist, gray, contains mica. SM 61.0 24242 36.0 SILTY SAND, fine to medium grained, moist, gray, contains mica. SM 61.0 3+4+4 46.0 LEAN CLAY, moist, gray, with sand, contains mica. CL 51.0 3+6+6 46.0 LEAN CLAY, moist, gray, with sand, contains mica. CL 51.0 3+6+6 46.0 LEAN CLAY, moist, gray, with sand, contains mica. CL 51.0 3+6+6 46.0 LEAN CLAY, moist, gray, with sand, contains mica. CL 51.0 3+6+6 46.0 LEAN CLAY, moist, gray, with sand, contains mica. CL 51.0 - 46.0 LEAN CLAY, moist, gray, with sand, contains mica. CL 51.0 - 46.0 LEAN CLAY, moist, gray, with sand, contains mica. CL 51.0 - 46.0 LEAN CLAY, moist, gray, with sand, contains mica. CL 51.0 - 56.0 RC = 18* - - - 60.0 RC = 18* - - - 60.0 RC = 18* - - - 60.0 RC = 18* <td>-</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td> </td> <td>2+6+6</td> <td></td> <td></td>	-							2+6+6		
36.0 SILTY SAND, fine to medium grained, moist, gray, contains mica. SM 61.0 24242							<u>30</u>	REC =17"		
36.0 SILTY SAND, fine to medium grained, moist, gray, contains mica. SM 61.0 222-22 46.0 SILTY SAND, fine to medium grained, moist, gray, contains mica. SM 61.0 3444 46.0 LEAN CLAY, moist, gray, with sand, contains mica. CL 51.0 346+6 46.0 LEAN CLAY, moist, gray, with sand, contains mica. CL 51.0 346+6 46.0 LEAN CLAY, moist, gray, with sand, contains mica. CL 51.0 346+6 46.0 LEAN CLAY, moist, gray, with sand, contains mica. CL 51.0 346+6 46.0 LEAN CLAY, moist, gray, with sand, contains mica. CL 51.0 346+6 46.0 LEAN CLAY, moist, gray, with sand, contains mica. CL 51.0 344+5 46.0 LEAN CLAY, moist, gray, with sand, contains mica. CL 51.0 344+5 46.0 LEAN CLAY, moist, gray, with sand, contains mica. CL 51.0 344+5 50.0 REC = 18" 55.0 REC = 18" 55.0 40.0 Contains mica. CONTAINS CONTAINS 76.0 40.0 CONTAINS CONTAINS 76.0 76.										
36.0 SILTY SAND, fine to medium grained, moist, gray, contains mica. SM 61.0	-									
36.0 SILTY SAND, fine to medium grained, moist, gray, contains mica. SM 61.0	_									
36.0 SILTY SAND, fine to medium grained, moist, gray, contains mica. 46.0 LEAN CLAY, moist, gray, with sand, contains mica. 46.0 contains mica. 46.0 con	_							2+2+2		
36.0 SILTY SAND, fine to medium grained, moist, gray, contains mica. 46.0 LEAN CLAY, moist, gray, with sand, contains mica. 46.0 contains mica. 46.0 con	_						Å	N =4 REC =18"		
46.0 LEAN CLAY, moist, gray, with sand, CL contains mica.	36.0 -				61.0					
46.0 LEAN CLAY, moist, gray, with sand, contains mica. $1 = \frac{1}{2}$ $1 = \frac{1}{2}$ 1 =		SILTY SAND, fine to med moist, gray, contains mica	ium grained, a.	SM	01.0					
46.0 LEAN CLAY, moist, gray, with sand, CL 51.0 $ -$	_									
46.0 LEAN CLAY, moist, gray, with sand, CL contains mica. 1 1 1 1 1 1 1 1 1 1	_							3+4+4		
46.0 LEAN CLAY, moist, gray, with sand, contains mica.								N =8 REC =18"		
46.0 LEAN CLAY, moist, gray, with sand, contains mica.										
46.0 $ \begin{array}{c} $										
$46.0 - \frac{1}{10000000000000000000000000000000000$										
$46.0 - \frac{1}{10000000000000000000000000000000000$								3+6+6		
46.0 LEAN CLAY, moist, gray, with sand, CL 51.0 $ -$								N =12 REC =18"		
40.0 LEAN CLAY, moist, gray, with sand, contains mica. LEAN CLAY, moist, gray, with sand, CL S1.0 woh+3+4 N =7 -50 REC =18" 	16.0				51.0		45			
- -	40.0 -	LEAN CLAY, moist, gray, contains mica.	with sand,	CL	51.0					
- -	00									
$ \begin{array}{c} & & & \\ & & & \\ & & \\ & & \\ & & \\ & & \\ & & & \\ & & \\ & & & \\ & $								woh+3+4		
								N =7 REC =18"		
- -										
- - <td></td>										
- - - - - 3+4+5 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -										
								3+4+5		
continued on next page								N =9 REC =18"		
continued on next page										
continued on next page										
continued on next page							[]			
		continued on next	page							

		TEST Pro	j ect: Ca	alvert Cliffs	s Nucle	ar Pow	er Plant	Boring	Number:	B-724
	Schnal	BORING	Ca	alvert Cou	nty, Ma	ryland		Contra	ct Number: 06	6120048
ł	DEDTU	ber Engineering EOO					641		5014	
	(FT)	STRATA DESCRIPTION		CLASS.	ELEV. (FT)	WL			TESTS	REMARKS
ł				CL				DATA		
	-						3	+5+5 L = 10		
								REC =18"		
	_									
	_									
	_									
	_						4	+6+8		
								l =14 REC =18"		
							-05			
	66.0 -	SILTY SAND, fine to medium grair	ned,	SM	31.0					
	-	moist, dark greenish gray, contains mica.	S							
	-									
	_						4	+5+5		
								N =10 REC =18"		
							-70-0			
	-									
	_									
	_									
	73.5	SANDY ORGANIC CLAY, moist.		OL	23.5			REC =22"	w=31.9%	
	_	geenish gray						-	LL=45 PL=24	
	_						75		PP=4.00 tsf	
	-									
	_									
	_									
	78.5	LEAN CLAY with cemented sand.	weak	CL	18.5			5+45+39		
	_	HCI reaction, 3% med. coarse she	II					N =84		
		nagments.					-80- 4	LC = 10		
3/6/0	-									
GDT	-									
ABEL.	_									
CHN		Light greenish grav, strong HCI						8+50/5"		
PJ S	_	reaction, 40% med coarse fragm	nented				- 101 <u>-</u>	V =50/5"		
700.G		snell.					-85-	EC = II		
SPT :	-									
LOG	-						-			
048 F										
06120	_	Greenish grav						+5+12		
000	-	oreenion ylay.					- X ⁵	V =17		
NGL							90 ^[] F	KEC =18"		
BOR	-	continued on next new-								
TEST		commued on next page								

	hashal	TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant		Boring Nu	mber:	B-724
Schna		C	alvert Cou	inty, Ma	ryland			Contract N	umber: 00	6120048	
DEDTU	ber Engineering								G	<u>"</u> 4	
(FT)	STRAT	A DESCRIPT	ION	CLASS.	(FT)	WL	БЕРТН		та і	TESTS	REMARKS
				CL							
-	_										
-	-										
	Weak HCI read	tion, 5% med.	- coarse					11+8+9			
	shell.							N =17 REC =1	8"		
_	-						-95				
-	-										
-	_										
-	-										
-	-						10	6+9+12			
100.0					3.0			N =21 REC =1	8"		
100.0	BOTTOM OF E	ORING @ 10	0.0 FT.		-3.0		100				
g											
3/0/2											
IABEL											
NHO0											
2004											
	BOTTOM OF E	ORING @ 10	0.0 FT.		3.0			6+9+12 N =21 REC =1	8"		

s	chnak	hnabel BORING bel Engineering LOG	roject: Ca Ca	alvert Cli alvert Co	iffs Nucle ounty, Ma	ar Pow ryland	ver Pla	nt		Boring Contra Sheet:	Number: Ict Number 1 of 3	er: 06120	B-725
Во	rina C	ontractor: CONNELLY AND AS	SOCIATES	. INC.				Gr	oundw	ater Obs	ervations		
		FREDERICK, MARYL	LAND	,				D	ate	Time	Depth	Casing	Caved
Bo	ring F	oreman: T. Connelly			Enco	untere	d	6	6/5		8.0'		
Dri	lling N	Nethod: 3-7/8" OD Tri-cone Roller	Bit		Start	of day	y	6	6/6		9.0'		
Dri	lling E	Equipment: Diedrich D-50 (ATC)		-									
	nnabe	representative: R. vinzant	16	_									
	cation	• Northing: 214664 3 ft	00										
	oution	Easting: 963219.4 ft											
Gro	ound S	Surface Elevation: 59.0 (feet)											
	DTU	, , , , , , , , , , , , , , , , ,								NG			
	FT)	STRATA DESCRIPTION	N	CLASS	3. (FT)	WL	DEP	тн			TEST	s	REMARKS
	0.5	FL, R AND TOPSOIL.			58.5								
	-	SILT, moist, light brown, with sa	nd, and	ML			F	-11	1+2+2 N =4	2			
:	2.0 -		H SII T	SP-SM	57.0		F		REC =	=13"			
	_	medium to coarse grained, mois	st,				F	-10	2+3+2	2			
	_	yellowish brown.					L	\square	REC =	=18"			
							_ 5 _						
								M	3+3+3 N =6	5			
	-						-	70	REC =	=18"			
·	7.0 -	CLAYEY SAND, medium to coa	rse	SC	- 52.0		F						
	-	grained, wet, mottled grayish bro contains gravel.	own,			¥	-	HM	1+2+4 N =6			Ch	ange from
	-	-					F	40	REC =	=18"		ho	llow stem
1	0.0			CM	49.0		-10-	_				rot	ary drilling
	_	wet, reddish brown.	ameu,	5101			L	-10	3+6+5	5		for	the day
								M	N =11 REC =	=13"			
	.				40.0								
¹³	3.0 -	LEAN CLAY, moist, gray, with s	and,	CL	40.0		Γ		2+1+1	L			
	-	The Theu. Sanu.					-		N =8	4.0"			
	_						-15-		REC =	- 10			
	-						F	-					
	-						F	-					
	_						Ļ	_					
	_						L		3+4+6	;			
								M	N =10 REC =	=18"			
	-						F	1					
	-						F	-					
	-						F	-					
	-						F	-0	3+4+6 N =10	5			
	_						-25-	10	REC =	=18"			
		continued on next page											

Comments:
1. Boring backfilled with cement/bentonite grout through tremie pipe upon completion.
2. * = See Appendix I for additional lab testing data.
3. Ground water observation well OW-725 installed in nearby location.

	2	TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant		Boring	Number:	B-725
Sel	-	BORING	i C	alvert Cou	nty, Ma	iryland			Contra	ct Number: 0	6120048
DEDI									G	2013	
(FT)	STRATA DESCRIP	ΓΙΟΝ	CLASS.	ELEV. (FT)	WL			G та	TESTS	REMARKS
				CL							
	-						-				
	_										
		Greenish grav						4+7+8			
							r ix	N =15	8"		
							-30-		0		
	-										
	_										
	_										
							L JV	3+4+6			
								N =10 REC =1	8"		
	_						-35				
	-										
	-										
38.0) -	SANDY SILT fine to medium	n moiet	MI	21.0						
	_	dark greenish gray.	ι, ποισι,					3+6+50	/3"		
								REC =1)" 9"		
	-						F 1				
42.0) 	SILTY SAND, fine to mediun	n grained,	SM	17.0						
	-	moist, dark greenish gray, 28 coarse shell fragments.	5% med								
	_	-					∏	5+9+14 N =23			
	_						<u>45</u>	REC =1	8"		
88											
<u>اي (۵</u>	י ו	POORLY GRADED SAND V	VITH SILT,	SP-SM	11.0			,			
L.GD	-	fine to medium grained, mois gray, 25% medium to coarse	st, greenish shell				N	7+6+6 N =12			
VABE	_	fragments.					-50-1	REC =1	8"		
SCHI	_										
GPJ											
1 700											
G SP	-							7.0.40			
8 PLC	-						F -1 X	N =21			
12004	-						-55-1	REC =1	8"		
G 06	-						├ ┤				
ඉ 57.0	,			014	2.0		$ \downarrow \downarrow$				
BORIN		moist, greenish gray, 5% me	dium to	SM							
EST (continued on next pa	ge								
⊢∟				1	1			1		1	1

Comments:
1. Boring backfilled with cement/bentonite grout through tremie pipe upon completion.
2. * = See Appendix I for additional lab testing data.
3. Ground water observation well OW-725 installed in nearby location.

	hnahol	TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant		Boring Number:	B-725
Schnat	bel Engineering	C	alvert Cou	nty, Ma	ryland			Contract Number: 0 Sheet: 3 of 3	6120048	
DEPTH (FT)	STRAT	A DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	S		G TESTS	REMARKS
-	coarse shell frag reaction.	gments, weak	HCI	SM				5+5+7 N =12 REC =1	8"	
							 65	REC =1	8" PP=2.50 tsf	
- - - -							 70	3+6+5 N =11 REC =11	8"	
- - 75.0 —	strong HCI react	tion. ORING @ 75	.0 FT.		-16.0		 75	8+14+1 N =25 REC =1	1 8"	
80.00										
SPI 700.6PJ SURVABELGUI 3										

Comments:
1. Boring backfilled with cement/bentonite grout through tremie pipe upon completion.
2. * = See Appendix I for additional lab testing data.
3. Ground water observation well OW-725 installed in nearby location.

Schna	TEST Project: C bel Engineering LOG C	alvert Cl alvert Co	liffs Nucle ounty, Ma	ar Pow Iryland	ver Pla	nt	Boring Contra Sheet:	Number: oct Number 1 of 3	er: 06120	B-726
Boring						Gro	oundwater Obs	ervations		
	FREDERICK, MARYLAND	,				D	ate Time	Depth	Casing	Caved
Boring F	Foreman: T. Chew		Enco	untere	ed	8	3/1	4.0'		
Drilling										
	Equipment: Diedrich D-50 (ATC)									
Schnabe	el Representative: B. Bradfield									
Dates	Started: 8/1/06 Finished: 8/1/06									
Locatior	n: Northing: 215564.67 ft Easting: 961709.57 ft									
Ground	Surface Elevation: 78.3 (feet)				1					
DEPTH (FT)	STRATA DESCRIPTION	CLASS	S. ELEV. (FT)	WL	DEP	S/ דו (דו	AMPLING DATA	TEST	s I	REMARKS
0.3	FL, R AND TOPSOIL.	SM	78.0			M	1+2+2 N =4		0'- dril	4 1/4" HSA
-	SILTY SAND, fine to coarse grained, moist, light brown and orangeish brown, some iron staining.				- -	<u>الا</u> ך	REC =15"			
2.5	POORLY GRADED SAND WITH SILT, fine to coarse grained, wet, light brown and orangeish brown, trace gravel.	SP-SN	75.8	 	_		4+5+6 N =11 REC =18"		4'- rota	Begin mud ary with 3
4.5		CM	73.8	_					7/8	" tri-cone
	wet, light brownish orange and brown.	SIVI			5 - -		4+7+4 N =11 RFC =18"		TOIL	
70 -			71.3		L					
-	SANDY SILT,fine to medium, wet, light orangeish brown and dark reddish brown, contains mica, gray lenses <1/16" throughout sample.	ML			_		1+2+1 N =3 REC =14"			
					-10-	-				
-					-		REC =0"			
-					-					
13.0 -	SILTY SAND, fine to medium grained, wet, gray and light oliveish gray, contains mica.	SM	- 65.3		- - 15-	-	1+2+3 N =5 REC =15"			
-										
17.0 -	SANDY ELASTIC SILT moist grav	мн	61.3		F	-				
-	contains mica.				_	-	0.0.0			
-							2+2+3 N =5 REC =15"			
-					-	$\left \right $				
22.0 -	FAT CLAY, moist, gray, trace sand,	СН	56.3		-	$\left \right $				
-	contains mica.				_	- -	REC =19"	w=35.7	7%	
	continued on next page				-25-	┛		PL=22	2	

	TEST	Project:	Calvert Cliff	s Nucle	ar Pow	er Plant	В	oring Numbe	r:	B-726
Schna	bel Engineering		Calvert Cou	inty, Ma	aryland		C	contract Numb	er: 06	6120048
DEDTH						SA				
(FT)	STRATA DESCRIP	ΓΙΟΝ	CLASS.	(FT)	WL			A TES	TS	REMARKS
			СН				2,,	*		
	_									
27.0 -	I FAN CLAY with sand mois	t grav	CI	51.3						
-	contains mica.	, gruy,	02							
-						L -M	3+4+5.			
						N	N =9 REC =18			
-						[]				
-										
						F -IMI	4+6+8 N =14			
						<u>-35</u>	REC =18'	•		
37.0 -				41.3						
	CLAYEY SAND, fine to med grained, wet, dark gray, trace	ium e mica.	SC	-						
							4+5+5			
-						Г., <u>Т</u> ХІ	N =10 REC =18			
							INEO IO			
	Weak cementation, some 1/4	4-1/2"				M	7+20+48 N =68			
						<u> </u>	REC =18	•		
-										
47.0 -				31 3						
	POORLY GRADED SAND, f medium grained, wet, dark g	ine to rav. trace	SP	51.5						
	clay, contains mica.	,					9+10+12			
-						F -1 X	N =22			
						-50-1	REC = 14			
-										
-	-					$\mid \mid \mid \mid$				
-	Gray and brownish white, 30	-40% fine					4+6+8			
_	to medium shell fragments, s reaction.	strong HCI					N =14 REC =14			
						[]				
-	-									
	continued on next pa	ge		-		$\left \begin{array}{c} \\ \\ \end{array} \right $				
Ĺ										

SC	hnabel TEST BORING	Project: C	Calvert Cliff Calvert Cou	s Nucle Inty, Ma	ar Pow	er Plant	-	Boring Number: Contract Number:	B-726
Schnab	el Engineering LOG							Sheet: 3 of 3	00120040
DEPTH (FT)	STRATA DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	S		G TESTS	REMARKS
58.0 -	POORLY GRADED GRAVEL medium grained, wet, gray, tr trace clay, strong HCI reactio cementation, gravel is actual cemented sand fragments.	., fine to race sand, n, strong y	GP	20.3			¹ 50/2" N =50/2 REC =2	и и	
62.0 -	SILTY SAND, fine to medium wet, gray and brownish white fine to coarse shell fragments HCI reaction.	g grained, , 20-30% s, strong	SM	- 16.3		 65-	5+8+9 N =17 REC =1	6"	
67.0 -	CLAYEY SAND, fine to medi grained, wet, gray and brown 20-30% fine to coarse shell fi strong HCI reaction.	um ish white, ragments,	SC	- 11.3		 70	7+7+9 N =16 REC =1	8"	
72.0 -	POORLY GRADED SAND W fine to medium grained, wet, brownish white, 0-10% fine to shell fragments, moderate H0 HCI reaction localized to shell fragments.	/ITH CLAY, gray and coarse Cl reaction, I	SP-SC	6.3			6+7+11 N =18 REC =1	8"	
/5.0	BOTTOM OF BORING @ 75	.0 FT.		3.3					

Schna	TEST BORING BORING LOG	alvert Clif	ffs Nucle unty, Ma	ar Pow ryland	ver Pla	nt	Boring Contra Sheet:	I Number: Ict Number 1 of 4	er: 061200	B-727
Baring						Gr	oundwater Obs	ervations		
Boring	FREDERICK. MARYLAND	, INC.				D	ate Time	Depth	Casing	Caved
Boring I	Foreman: D. Bender		Enco	untere	d	5	/10	23.5'		
Drilling	Method: 3-7/8" OD Tri-cone Roller Bit (Mud R	lotary)	Start	of Da	у	5	/11	36.0'		
Schnab	el Representative: K Bell									
Dates	Started: 5/11/06 Finished: 5/11/06									
Locatio	n: Northing: 215300.85 ft Easting: 961884.98 ft									
Ground	Surface Elevation: 104.9 (feet)									
DEPTH (FT)	STRATA DESCRIPTION	CLASS	· ELEV. (FT)	WL	DEP	S. TH	AMPLING DATA	TEST	S F	EMARKS
0.6	ROOTMAT AND TOPSOIL.		104.3							
	CLAYEY SAND, fine to medium grained, moist, orangeish brown and	SC	102.0				1+2+5 N =7 RFC =18"			
2.0	LEAN CLAY with sand, moist, orangeish	CL	102.9				4+2+3			
-	brown and gray, trace root fragments.					TX	N =5 REC =18"			
4.5			100.4		-					
-	SILTY SAND, fine to coarse grained, moist, orangeish brown and yellowish brown.	SM			- 5 -		1+5+6 N =11			
70-			97.9		L		REC =14"			
-	POORLY GRADED SAND WITH SILT, fine to coarse grained, moist, yellowish brown and orange.	SP-SM	01.0		_		5+7+7 N =14 REC =15"			
9.5	SILTY SAND, fine to medium grained, moist, orangeish brown and reddish brown.	SM	95.4				5+6+6			
-					_	Ň	N =12 REC =11"			
-	fine to coarse grained, orangeish brown and yellowish brown.					$\overline{\mathbb{A}}$	3+6+9 N =15 PEC =15"			
;	-						1120 - 13			
17.0 -	POORLY GRADED SAND WITH SILT	SP-SM	87.9		F	-				
-	fine to medium grained, moist, orangeish brown and yellowish brown.				-	-				
-	-				-	-M	6+9+12 N =21			
	-				-20-	ЦЦ	REC =10"			
-	-				-	-				
-	-				-	-				
-	-			$\overline{\Delta}$	-	-				
-	wet.			-	-	-	6+8+12 N =20			
	continued on next page				-25-		REC =9"			

	TEST Projec	t: Calvert Cliff	s Nucle	ar Pow	er Plant	Boring Number:	B-727
Schna	bel Engineering LOG	Calvert Cou	inty, Ma	iryland		Contract Number: 0 Sheet: 2 of 4	6120048
DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL		NG TESTS	REMARKS
		SP-SM					
-							
27.0 -	SANDY ELASTIC SILT, wet, orangeis	sh MH	77.9				
-	blown and gray.						
-					N =4	=15"	
_							
_							
	reddish brown.				2+2+5	;	
	gray.				N =7 REC =	=18"	
-							
37.0 -		T OD OM	67.9				
-	fine to medium grained, wet, yellowisk	h					
-	biowii.				4+5+8		
					-40-10 REC =	=12"	
-							
42.0 -	FAT CLAY with sand, wet, gray.	СН	62.9				
-							
-					\ 3+3+4 N =7		
					45[1] REC =	=20"	
-							
-							
					 ■ RFC =	=22" PP=2.50 tsf	
-							
-							Resumed
20	moist.				3+5+7		drilling on 5/11/06 at 7:30
54.9	SILTY SAND fine to medium argined		50.0			=18"	am
-	wet, gray.						
57.0 -	FAT CLAY with sand moist grav	СН	47.9				
-	continued on pevt page						
	Continued On next page						

Γ		TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	1	Boring N	umber:	B-727
	Schna	Calvert County, Maryland Imabel Engineering LOG TH STRATA DESCRIPTION CLASS. ELEV. (ET)							Contract	Number: 06	6120048
E							s			01 4	
1	(FT)	STRATA DESCRIPT	ION	CLASS.	(FT)	WL	DEPTH		A	TESTS	REMARKS
				СН							
	-							2+3+5 N =8			
							- <u>60</u>	REC =19	9"		
	_										
	_										
	_										
	-										
	-							REC =20	ר" ר	P=>4.5 ISI	
							65				
	_										
	67.0				27.0						
	67.0 -	SILTY SAND, fine to medium	grained,	SM	37.9						
	-	moist, light gray and oliveish	gray.								
	-						M	28+27+5 N =77/11	50/5" 1"		
							—70— ^[]]	REC =20	O"		
	_										
	70.0				22.0						
	72.0 -	CLAYEY SAND, fine to media	um white	SC	32.9						
	-	grained, moist, light gray and	white.								
	-							50/5" N =50/5"			
		-					75	REC =5"	•		
	_										
	77.0				07.0						
	//.0 -	SILTY SAND, fine to medium	grained,	SM	27.9						
	-	shell fragments, HCl reaction	strong.								
	-						M	4+9+11 N =20			
							<u>80</u>	REC =14	4"		
6/08	_										
DT 3	00.0				22.0						
BEL.G	o2.0 -	CLAYEY SAND, fine to media	um nd white	SC	22.9						
HNAB	-	with fine to coarse shell fragm	nents, HCl								
l SC	-	reaction strong.					M	9+8+6 N =14			
0.GP							85[]]	REC =16	6"		
PT 7(-										
OG S	07.0				170						
48 PL	01.0 -	SILTY SAND, fine to medium	grained,	SM	17.9						
31200	-	to coarse shell fragments, HC	l reaction								
jg Dg	-						M	6+6+7 N =13			
NG LC	_						<u>–₉₀⊣∐</u>	REC =20)"		
BORII	-										
TEST		continued on next pag	e								

	Schnabel Engineering				s Nucle	ar Pow	er Plant		Boring	Number:	B-727
Schna	helEngineering	0	Calvert Cou	inty, Ma	iryland			Contra Shoot:	ct Number: 00	6120048	
DEDTU	STRATA DESCRIPTION								G	4 01 4	
(FT)	STRAT	A DESCRIPT	ION	CLASS.	(FT)	WL	DEPTH		ТА	TESTS	REMARKS
				SM							
-	-										
	-										
-	contains fine to	coarse shell f	ragments.					6+8+9			
								N =17 REC =1	8"		
							35				
-											
-	-										
-	-										
	light gray and g	reenish gray,	trace fine				10	6+8+12			
100.0	weak.	ringinento, r		-	4.9		-100-	REC =2	20"		
	BOTTOM OF B	ORING @ 10	0.0 FT.								
2/0/02											
NHO											
700.6											
LCC.											
20048											
7100											
LOC											
<u>-</u>	1				1			1			

	hnahal	Project: (Calvert	Cliff	s Nucle	ar Pow	er Pla	nt		Boring	Number:		B-728	
Schna	bel Engineering	(Calvert	Cou	inty, Ma	ryland				Contra Sheet:	ct Number 1 of 3	er: 06120	048	
Boring	Contractor: CON			S INC					Gro	oundv	vater Obs	ervations		
	FRED	DERICK, MAF	RYLAND	5, 110.					D	ate	Time	Depth	Casing	Caved
Boring F	Foreman: D. Bende	er) Tri-cone Rol	ler Bit (Mud I	Potany)		Enco	untere	d	5	/11		13.5'		
Drilling	Equipment: CME-			(otal y)										
Schnabe	el Representative:	K. Bell												
Dates	Started: 5/11/06	Finished:	5/12/06											
Location	n: Northing: 21516 Easting: 96191	3.63 ft 0.05 ft												
Ground	Surface Elevation:	: 112.3 (feet)												
DEPTH (FT)	STRAT	A DESCRIPT	ION	CLA	SS.	ELEV. (FT)	WL	DEP	S/ TH	AMPL C	ING DATA	TEST	S I	REMARKS
0.4		TOPSOIL.		CI		111.9				3+3+	3			
-	SANDY LEAN C orangeish browr	CLAY, moist, I n, trace root a	orown and nd wood		-	110.2			M	N =6 REC	=18"			
2.0	CLAYEY SAND	fine to medi		sc	;	110.5				3767	5			
-	grained, moist, r	eddish browr	and					F .	IXI	N =1	-19"			
45			agmento.			107.8		- ·		REG	-10			
	SILTY SAND, fir moist. orangeish	ne to medium n brown and r	grained, eddish	SN	1	107.0		- 5 -		4+3+	4			
-	brown.							Ļ .	-IXII	N =7	-17"			
_								L.		REC	-17			
										3+3+	7			
-								–		N =10) =11"			
-								- ·		NLO	- 1 1			
								-10-	1_					
	fine to coarse gr	ained, orange	eish brown						-M	3+4+ N =9	5			
-								Ļ .	$ \Delta $	REC	=11"			
_								L.						
	fine to medium o	nrained wet	orangeish				$\overline{\Delta}$			5+5+	5			
<u>م</u> -	brown and yello	wish brown.	orangeisn					F .	IXI	N =10)			
3/6/								-15-		REC	=10			
- 19									-					
17.0 -				0.00		95.3		L .	-					
	fine to coarse gr	ained, wet, o	rangeish	SP-S	SIVI			L.						
	brown and yellow	wish brown.								5+6+	10			
- 00/								- ·	TIXII	N =10	5			
								-20-		REC	=12			
									+					
								Ļ .						
- 100								Ļ.						
LOG	fine to medium o	arained.								8+10	+12			
									1 X	N =22	2 =0"			
	continu	ied on next pag	e					-25-		REU	-9			
Ш														

	TEST	Project:	Calvert Cliff	s Nucle	ar Pow	er Plant	E	Boring Number:	B-728
Schnal	bel Engineering LOG	Calvert Cou	nty, Ma	ryland			Contract Number: 0	6120048	
DEPTH		I		FI FV		s			
(FT)	STRATA DESCRIPT	ΓΙΟΝ	CLASS.	(FT)	WL	DEPTH	DAT	A TESTS	REMARKS
			SP-SM						
						\vdash \dashv			
						-			
	orangeish brown and reddisł	n brown.				M	5+7+9 N =16		
						<u>30</u>	REC =9"		
_									
32.0 -				80.3					
52.0	SILTY SAND, fine to mediun wet, orangeish brown and re	n grained, ddish grav.	SM	00.5					
-	(color change at 39.9 feet).	J					5+3+4		
-							N =7		
_						-35-0	REC = 14		
-									
37.0 -	SANDY LEAN CLAY, wet, qu	av and	CL	75.3					
-	greenish gray.								
-						M	3+2+3		
_						<u> </u>	REC =18		
_									
42.0 -				70.3					
42.0	SILTY SAND, fine to mediun wet, orangeish brown and gr	n grained, av.	SM	10.0					
_		,					2+2+10		
-							N =12		
						-45		,	
-									
47.0 -	FAT CLAY with sand, wet, or	rangeish	СН	65.3					
- 100	brown and gray.	0							
- 19						M	2+3+2 N =5		
	gray, trace sand.					<u>50</u>	REC =19	"	
- P									
							RFC =23	PP=2.50 tsf	
						$\begin{bmatrix} 1 \end{bmatrix}$			
						-55-			
						├ ┤			
57.0 -	ELASTIC SILT, moist, green	ish gray,	MH	55.3		\vdash \dashv			
	trace sand.	qe				$\left - \right $			
		• ·							

Sc	hnabel TEST BORING	Project: Ca	alvert Cliff alvert Cou	s Nucle nty, Ma	ar Pow ryland	er Plant	Bo	oring Number:	B-728
Schnal	bel Engineering LOG						Sh	eet: 3 of 3	r
DEPTH (FT)	STRATA DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	S. DEPTH	AMPLING	TESTS	REMARKS
-			MH				2+4+4 N =8 REC =18"		
						 65	REC =23"	PP=>4.5 tsf	
	FAT CLAY with sand, moist, and greenish gray.	light gray	СН	45.3		 	5+7+5 N =12 REC =18"		
	gray and greenish gray, ceme 2/16ths inch silt lense.	ented					8+10+16 N =26		Harder drilling
75.0 —	BOTTOM OF BORING @ 75	.0 FT.		37.3		75[_]	REC =18"		
IGFO OCTIVADEL.GUT 20000									

Schna	bel Engineering LOG	Project: Calver Calver	t Clif t Cou	fs Nuclea unty, Ma	ar Pow ryland	er Plar	nt		Boring Contra Sheet:	I Number: Ict Number 1 of 3	er: 06	1200	B-729
Baring							Gr	oundv	vater Obs	ervations			
Boring C	FREDERICK, MAR	RYLAND					D	ate	Time	Depth	Cas	ing	Caved
Boring F	Foreman: D. Reese			Enco	untere	d	5	/18		Dry		-	
Drilling	Method: 3-7/8" OD Tri-cone Rol	lier Bit (Mud Rotary	"	Start	of day	,	5	/19		15.0'		-	
Drilling Schnabe	Equipment: CME-75 (Truck)				-								
Dates	Started: 5/18/06 Finished: 6	5/19/06	-										
Location	n: Northing: 214861.87 ft Easting: 962454.6 ft	5,15,00											
Ground	Surface Elevation: 117.3 (feet)			1 1									
DEPTH (FT)	STRATA DESCRIPT		ASS.	ELEV. (FT)	WL	DEP	S. TH	AMPL C	ING DATA	TEST	s	R	EMARKS
0.5	Forest litter, rootmat and tops	soil.		116.8			M	1+1+	2			4-1/	4 in. hollow
-	CLAYEY SAND, fine to mediu grained, moist, brown, contain fragments.	um ns root	SC	110.0			Ŵ	N =3 REC	=16"			adva ft.	anced to 4
-	mottled brownish red.						\mathbb{N}	4+7+ N =14 REC	7 1 =18"	w=16%	6	4 ft	-switched to
_	-					- 5 -		2+5+	5			3 7/8 rolle	8" tri-cone r bit
7.0				110.2			W	N =10 REC) =14"				
-	POORLY GRADED SAND W fine to coarse grained, moist, orange.	/ITH SILT, SF reddish	-SM	110.5				5+8+ N =16 REC	8 5 =13"	w=13.5 *	%		
9.5	POORLY GRADED SAND, fil coarse grained, moist, yellow trace silt, with fine gravel.	ne to sish orange,	SP	- 107.8			M	8+14 N -20	+16				
12.0 -	SILTY SAND, fine to coarse of wet, orange, trace gravel.	grained, S	SM	- 105.3			Μ	REC	=13"				
-				102.6				7+5+ N =9	4				
-	SANDY FAT CLAY, fine to m moist, orange.	edium, C	CH	102.0				REC	=10				
17.0 -	POORLY GRADED SAND W fine to coarse grained, moist,	/ITH SILT, SF yellowish	-SM	- 100.3									
	orange.						\mathbb{N}	5+7+ N =1	8	w=14.2	%		
	-					-20-		REC	=12"				
-	continued on next poo	ne				 25		11+14 N =34 REC	4+20 4 =12"				

Comments:
1. Boring backfilled with cement/bentonite grout through tremie pipe upon completion.
2. * = See Appendix I for additional lab testing data.
3. Ground water observation well OW-729 installed at nearby location.

Γ	6	TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	Bori	ng Number:	B-729
•	Schna	bel Engineering LOG	C C	alvert Cou	inty, Ma	aryland		Con	tract Number: 0 et: 2 of 3	6120048
D	EPTH (FT)	STRATA DESCRIP	TION	CLASS.	ELEV. (FT)	WL	S/ DEPTH	AMPLING DATA	TESTS	REMARKS
	-			SP-SM						
	-	with gravel.					 30	12+17+17 N =34 REC =14"	w=12.5%	
	- 32.0 - -	POORLY GRADED SAND, coarse grained, moist, yellow trace silt and gravel.	fine to vish orange,	SP	85.3		 	4+14+15 N =29		
	 37.0 -	SILTY SAND, fine to coarse moist, orange.	grained,	SM	- 80.3		35 [_] 	REC =18"		
	-						 40	2+2+6 N =8 REC =12"	w=18.4% *	
	42.0 - - - -	POORLY GRADED SAND V fine to medium grained, moi orange, with silt.	VITH SILT, st, reddish	SP-SM	75.3		 45	16+21+24 N =45 REC =14"		
T 3/6/08	- 47.0 - -	SANDY SILT, fine to mediur grayish orange.	n, moist,	ML	70.3			WOLLANA	w=28.2%	
J SCHNABEL.GD	-						 50	N =2 REC =18"	*	
3 PLOG SPT 700.G	52.0 - - -	SILTY SAND, fine to mediur wet, orangeish brown and g layering, almost mottled.	n grained, ray, slight	SM	65.3		 	3+1+1 N =2		
NG LOG 06120048							55 [] 	REC =14"		
TEST BORI	-	continued on next pa	ge							

Comments:
1. Boring backfilled with cement/bentonite grout through tremie pipe upon completion.
2. * = See Appendix I for additional lab testing data.
3. Ground water observation well OW-729 installed at nearby location.

School	TEST BORING	Calvert Cliff Calvert Cou	s Nucle inty, Ma	ar Pow Iryland	er Plant	Boring Contra Shoot	g Number: act Number: 0	B-729
DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL	SAI		TESTS	REMARKS
-		SM			60 - 6 N - 60 - 7 R	+5+6 I =11 REC =6"	w=28.8%	
62.0 -	ORGANIC CLAY, fine to medium, mois gray, contains mica.	st, OH	- 55.3		 	+3+4 I =7 REC =18"		
- - - -	with sand.				 - -	REC =24"	w=32.8% LL=56 PL=18 *	
72.0 -	LEAN CLAY with sand, moist, gray, contains mica.	CL	45.3		 2 N F	+4+4 I =8 REC =18"		
	BOTTOM OF BORING @ 75.0 FT.							

Comments:
1. Boring backfilled with cement/bentonite grout through tremie pipe upon completion.
2. * = See Appendix I for additional lab testing data.
3. Ground water observation well OW-729 installed at nearby location.

Sc	hnabel TEST BORING	Project:	Calvert Cl Calvert Co	liffs Nucle ounty, Ma	ar Pow ryland	/er Pla	nt		Boring	<u>I Number:</u> Ict Numbe	er: 06	1200	B-730
⁻ Schna	bel Engineering LUG								Sheet:	1 of 3			
Boring C	Contractor: CONNELLY AND	ASSOCIATE	S, INC.				Gr	oundv	vater Obs	ervations			
_	FREDERICK, MAI	RYLAND					D	ate	Time	Depth	Cas	ing	Caved
Boring F	Foreman: D. Reese	ller Bit (Mud I	Potany	Enco	untere	d	5	/22	1:32	Dry		-	
Dining			(otal y)										
Drilling	Equipment: CME-75 (Truck)		-										
Schnabe	el Representative: M. Arles												
Dates	Started: 5/17/06 Finished:	5/18/06											
Locatior	n: Northing: 214728.5 ft Easting: 962523.84 ft												
Ground	Surface Elevation: 115.4 (feet))				1							
DEPTH (FT)	STRATA DESCRIPT	ΓΙΟΝ	CLASS	s. ELEV. (FT)	WL	DEP	S. TH	AMPL	ING DATA	TEST	s	R	EMARKS
0.5	ROOTMAT AND TOPSOIL.			- 114.9			M	1+2+	3			0-4'	hollow
-	SILTY SAND, fine to coarse moist, brown, contains root fi	grained, ragments.	SM				ľ	N =5 REC	=18"			Sten	rauger
2.5	POORLY GRADED SAND W		SP-SN	112.9				5+7+	5				
-	and gravel, fine to coarse gra	ained,				F	IXI	N =12	2			4 75	. 2 7/0"
-	moist, brown and red.					-	ЦШ	REC	=18"			rolle	r bit, mud
50-				110.4		_ <u>5</u> _						rota	ry drilling
5.0	POORLY GRADED SAND, f	ine to	SP	110.4			M	3+5+	6			5/18	6/06
-	trace silt and gravel.	sn brown,				-	HM	REC	ı =15"				
-						L							
	vellowish orange with grave	I						6+11	+13				
-	yellowish orange, with grave					-	IXI	N =24	1				
-	-					-	ЦШ	REC	=12"				
9.5	SILTY SAND, fine to medium	n grained,	SM	105.9		_10_							
	moist, orange, trace gravel.	0 /				- 10-							
-	-					-	HVI	4+5+ N =1	6 1				
_	_					L	ЦШ	REC	=15"				
13.0 -	POORLY GRADED SAND W	VITH SILT,	SP-SN	Л 102.4		-	1_						
-	fine to coarse grained, moist	, orange				-	ЧM	6+7+	7				
00						45	IM	REC	+ =14"				
						- 15-	1						
- 19	-					-	-						
						L							
	orange, with gravel.												
- n	-					-	-						
-	_					L	ЧM	10+1	3+13				
							IŴ	N =26	5 =14"				
	1					-20-	-						
- 12	-					-	-						
040						L							
	trace gravel.												
5 -	-					F	-						
- 12						L	\square	9+15	+17				
							IXI	N =32	2=15"				
a –	continued on next par	qe				-25-	-1	REC	-15				
		-											

	hnabal	Project:	Calvert Cliff	s Nucle	ar Pow	er Plant		Boring	Number:	B-730	
School	Schnabel Engineering LOG				inty, Ma	iryland			Contra	ct Number: 00	6120048
Schha	bei Engineering	200							Sneet:	2 01 3	
DEPTH (FT)	STRATA	A DESCRIPT	ION	CLASS.	ELEV.	WL			Гл	TESTS	REMARKS
				SP-SM			DEPTH	DAI			
27.0 -					88.4						
	POORLY GRAD coarse grained,	ED SAND, fi moist, yellow	ne to , trace silt,	SP							
	with gravel.							8+11+13	2		
-							F 1 X	N =24	, ,,,		
							-30-1	REC = 1	4		
-											
_											
								9+7+10			
							r ik	N =17	3"		
							-35-1				
							-				
37.0 -				SP-SM	78.4						
	fine to medium g	grained, mois	t, reddish								
_	orange.							9+13+9			
								N =22 REC =14	4"		
							-40				
-											
-											
-											
	fine to coarse gr	ained (small	1/16"				10	5+11+18	3		
44.8	SILTY SAND fir	ne to medium	arained	SM	70.6		<u> </u>	REC =14	4"		
_	moist, reddish or	range.	granica,								
46.5	SANDY SILT. fir	ne to medium	. moist.	ML	68.9						
8	orange.		, ,								
– פר							HX	1+2+2 N =4			
							-50-1	REC =0	"		
- 50											
E E2 0					62.4						
53.U -	SILTY SAND, fir	ne to medium	grained,	SM	02.4						
	inoist, orange.										
							-55-				
- 8							$ \left - \right ^{-}$				
							└				
	continu	ed on next pag	<i>je</i>								
·	1				1	I	i – – – –	1			

	TEST Project:	Calvert Cliff	s Nucle	ar Pow	er Plant	Boring Number:	B-730
Schnal	BORING	Calvert Cou	nty, Ma	ryland		Contract Number: 0	6120048
DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL	SAMPLI	NG TESTS	REMARKS
		SM	52.4		 60 10+9+ N =17 REC =	8 :12"	
62.0 - - - - -	FAT CLAY, moist, dark gray, with sand.	СН	33.4			:18"	
- 	trace sand. LEAN CLAY, moist, dark gray, with sand.	CL	44.4		70	24" PP=2.50 tsf	
- 75.0 —	BOTTOM OF BORING @ 75.0 FT.		40.4		3+4+6 75 REC =	:18"	
NG LOG 06120048 PLOG SP1 700.GPJ SCHNABEL.GD1 3/6/08							
I ESI BORI							

Schna	bel Engineering	t: Calvert C Calvert C	Cliffs Nucle County, Ma	ar Pow Iryland	ver Pla	nt	Boring Contra Sheet:	Number: Inct Number 1 of 4	er: 06120	B-731
Boring	Contractor: CONNELLY AND ASSOCI	ATES, INC.				Gro	oundwater Obs	ervations		
	FREDERICK, MARYLAND					D	ate Time	Depth	Casing	Caved
Boring	Foreman: T. Connelly		Enco	untere	d	5	/31	14.0'		
Drilling	Method: 3-7/8" OD Tri-cone Roller Bit	Ī								
Drilling	Equipment: Diedrich D-50 (ATC)	F								
Schnab	el Representative: R. Vinzant									
Dates	Started: 5/31/06 Finished: 5/31/06									
Locatio	n: Northing: 214546.48 ft Easting: 962547.88 ft									
Ground	Surface Elevation: 115.7 (feet)									
DEPTH (FT)	STRATA DESCRIPTION	CLAS	S. ELEV. (FT)	WL	DEP	S. TH	AMPLING DATA	TEST	S I	REMARKS
0.5	FL, R AND TOPSOIL.	N/I	115.2			M	1+3+3 N =6			
	SANDY SILT, moist, dark oliveish brown, with organic matter, and root fragments, Fine - med. sand.					-0	REC =9"			
2.5	SILTY SAND, fine to medium grained	, SM	113.2		L .	-M	5+9+13			
	moist, light orangeish brown.				L	Ш	N =22 REC =18"			
					Γ				Ch	ange from
-	-				- 5 -	TM	2+4+11		aug	ger to mud
	-				-	HŇ	N =15 REC =18"		rota	ary drilling
	-				L .					
	Reddish brown.						5+7+9			
						IXI	N =16			
	-				-					
-	-		405.0		-10-	-				
10.5	POORLY GRADED SAND WITH SIL	T, SP-S	M 105.2		Ļ .	-M	7+7+7			
	grayish orange.	a				\square	N =14 REC =18"			
	1				F .	1_				
	Wet, light orangeish brown.			ĮΫ	-	HM	8+9+9 N =18			
_	-				-15-	-124	REC =15"			
					L					
	-				-	-				
	-				-	-				
	Moist.				L .	-M	10+12+16			
2						M	N =28 REC =18"			
_]				- 20-		-			
	1				+	+				
	4				-	$\left \right $				
	1				L.					
	Wet Med - coarse sand						4+8+11			
						1	N =19			
-	continued on next page				-25-		REC =14"			

	TEST	Project: Cal	vert Cliffs	s Nucle	ar Pow	er Plant	Во	ring Number:	B-731
Schoo	bol Engineering	Cal	vert Cou	nty, Ma	ryland		Co	ontract Number: (06120048
DEDTU						6			
(FT)	STRATA DESCRIPT		CLASS.	(FT)	WL			TESTS	REMARKS
		;	SP-SM				2,117		
-	_								
-	-								
-									
-	Moist.					M	9+12+15		
						Å	N =27 REC =18"		
-									
-	_								
-									
	Wet, light yellowish brown.					MI	20+20+20 N =40		
	-						REC =18"		
-	_								
-	-								
	Light orangeish brown						17+23+26		
-						- 181	N =49		
	_					-40-1-1	RLC - 18		
-	_								
-	-								
-	-								
43.5	SILTY SAND, fine to medium	grained,	SM	72.2		M	3+5+5		
_	moist, dark gray, contains mi	ca.				_45_0	N =10 REC =18"		
- 20	Oliveish gray.					XII	3+4+4 N =8		
						_50_U	REC =18"		
	-								
-									
-	4								
200							1+3+4		
							N =7 REC =18"		
						-55-1-			
-	4								
-	-								
-	continued on next pa	re.							
		y-							

	chnabel	TEST	Project:	Calvert Cliff	s Nucle	ar Pow	er Plant	E	Boring Number:	B-731
Schr	abel Engineering	LOG		Calvert Cou	nty, Ma	ryiand			Contract Number: 0 Sheet: 3 of 4	6120048
DEPT (FT)	STRAT	A DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	S DEPTH		TESTS	REMARKS
	SILTY SAND, fir moist, oliveish g	ne to medium ray, contains	grained, mica.	SM			 60	REC =24	" PP=1.50 tsf	
63.5	CLAYEY SAND grained, moist, r	, fine to medi mottled grayis	um sh orange.	SC	52.2		 65 -	3+2+10 N =12 REC =18	,n	
68.5	LEAN CLAY, gra fine to medium of mica.	eenish gray, ı grained sand,	moist, with contains	CL	47.2		 	3+3+5 N =8 REC =18	,"	
	-						 75	3+5+6 N =11 REC =18	,	
20 3/9/08	-						 	3+5+7 N =12 REC =18	,	
83.5	- SILTY SAND, fir moist, oliveish g	ne to medium ray, contains	grained, mica.	SM	32.2		 85 -	5+6+8 N =14 REC =18	,"	
	Contains cemen	ited sand.						23+25+5 N =75/11 REC =17	0/5" "	
	continu	ied on next pag	<i>je</i>							

	hashal	TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant		Boring Number:	B-731
PC	nnabel	C	alvert Cou	inty, Ma	ryland			Contract Number	06120048	
Schna	STRATA DESCRIPTION				L				Sheet: 4 of 4	
DEPTH	STRAT	A DESCRIPT	ION	CLASS.	ELEV.	WL	5		G TESTS	REMARKS
				SM	. ,		DEPTH	DA		
-	-									
_										
								11+17+	14	
-							- 11	N =31	0"	
	-						-95-		0	
-	-									
-	-									
-	-									
	Shell fragments	s, weak HCl re	action, 5%					4+50/5"		
99.3	shell.				16.4			N =50/5	1"	
	BOLLOW OF B	ORING @ 99	.3 F I.							
0										
0/0/0										
ADEL										
.00										
2004										

Schna	TEST Project: C bel Engineering LOG C	alvert Cl alvert Co	iffs Nucle ounty, Ma	ar Pow ryland	ver Pla	nt	Boring Contra Sheet:	Number: Ict Number 1 of 3	e r: 061	B-732 20048
Boring	Contractor: CONNELLY AND ASSOCIATES					Ground	dwater Obs	ervations		
	FREDERICK, MARYLAND	,				Date	Time	Depth	Casir	ng Caved
Boring I	Foreman: T. Connelly		Enco	untere	d	6/8		6.0'		
Drilling	Method: 3-7/8" OD Tri-cone Roller Bit	-								
Drilling	Equipment: Diedrich D-50 (ATC)									
Schnab	el Representative: R. Vinzant									
Dates	Started: 6/8/06 Finished: 6/9/06	-								
Locatio	n: Northing: 215034.1 ft Easting: 961594.7 ft									
Ground	Surface Elevation: 90.7 (feet)				1					
DEPTH (FT)	STRATA DESCRIPTION	CLASS	s. ELEV. (FT)	WL	DEP	SAMF	PLING DATA	TEST	s	REMARKS
0.5	FL, R AND TOPSOIL.		90.2							
	POORLY GRADED SAND WITH SILT,	SP-SN	//		F	$\ \ \ _{N} =$	1+2 3			
	brown, with silt, trace organic matter,				F		C =15"			
	and root fragments.				L	5+e	6+7			
	Light brown, no organic.						:13 C =18"			
-	-				F		0 = 10			
-	Wet reddish brown no root fragments				- 5 -		8+3			
.	wei, redust brown, no root tragments.			∇	L	_ X N =	:6			
							C =18"			
-	-				F					
	Orangeish brown, med coarse sand.				F	- 3+5	5+6 11			
90 -			81.7		L		C =18"			
	POORLY GRADED SAND WITH CLAY, medium to coarse grained wet	SP-SC								Change from
-	orangeish brown.				-10-				ł	nollow stem
	-				F	- / 4+6	6:12		a la fa	auger to mud otary drilling
12.0 -			78.7		F		C =13"			g
-	CLAYEY SAND, fine to medium grained, moist, mottled gravish orange.	SC								
-					F					
-	-				F	- / 3+3 N =	3+4 :7			
	-				-15-		C =16"	w-23 1	0/_	
						RE	C =24"	LL=26	5	
-					F			PL=19) tsf	
-	4				F	⊣■		*		
5 -	4				F					
ŝ						1+2	2+2			
	1				Γ	X N =	4			
20.0 -	POORLY GRADED SAND WITH CLAY	SP-SC	70.7		-20-		C =18"			
2	fine to medium grained, wet, orange.				Ļ					
]				Γ	1				
-	4				F	-				
	4				F	1+2	2+5			
					0-		:7 C =18"			
	continued on next page				-25-					
<u>í</u>										

Γ	-	TEST	Project: (Calvert Cliff	s Nucle	ar Pow	er Plant		Boring Numb	er:	B-732
	C	BORING		Calvert Cou	nty, Ma	ryland			Contract Num	iber: 06	6120048
E	Schnab	bei Engineering LOG					-		Sneet: 2 of 3	5	
'	(FT)	STRATA DESCRIP	TION	CLASS.	ELEV. (FT)	WL	о ПЕРТН			STS	REMARKS
┢	25.0	LEAN CLAY, moist, gray, wi	th sand,	CL	65.7						
	-	contains mica.									
	-										
	_										
	_						L -M	2+3+3			
								N =6 REC =18	3"		
							50				
	1										
	-										
	-										
	-						M	2+3+4 N =7			
	_							REC =18	3"		
	-										
	_										
	_										
	_							2+4+4			
								N =8 REC =18	3"		
							-40				
	-										
	-										
	-										
	-						M	4+5+7 N =12			
	_						-45- <u> </u> []	REC =18	3"		
	-										
	_										
0000	_										
								4+6+6			
					10 -			N =12 REC =18	3"		
	50.0	SILTY SAND, fine to medium	n grained,	SM	40.7		-50		-		
5	-	moist, dark gray.									
2.00	-										
	-										
	-							50/4" N =50/4"	,		
74007							-55-	REC =4"	'		
	4										
	_										
	_										
		continued on next pa	ge								

Schnat	hnabel BORING LOG	Project: Calvert Cliff Calvert Cou	s Nucle inty, Ma	ar Pow Iryland	er Plant	Boring Contra Sheet	Number:	B-732
DEPTH (FT)	STRATA DESCRIPTIO	ON CLASS.	ELEV. (FT)	WL	SAM DEPTH	PLING DATA	TESTS	REMARKS
	Gray, moderate HCl reaction, 7 - coarse shell fragments.	SM 15% med.			25 60 	=+50/5" =50/5" EC =11"		
	Light gray, strong HCI reaction med coarse shell fragments.	, 25%			 14 N 65 - RE 	+12+15 =27 EC =18"		Drilling penetration rate slower
-	Greenish gray, trace cemented moderate HCI reaction, 5% me coarse sand.	l sand, d			 35 N 70 RE	+13+10 =23 EC =18"		
71.0 -	LEAN CLAY, dark greenish gra moderate HCI reaction, 15% m coarse shell fragments.	ay, CL led	- 19.7		 	7+7 =14		
75.0 —	BOTTOM OF BORING @ 75.0) FT.	- 15.7		75[_] K			

Schna	TEST Project: C bel Engineering LOG C	alvert Cli alvert Co	iffs Nucle ounty, Ma	ar Pow ryland	ver Pla	nt	Boring Contra Sheet:	Number: Ict Numbe 1 of 4	r: 06120	B-733
Boring C	Contractor: CONNELLY AND ASSOCIATES	, INC.				Gro	oundwater Obs	ervations		1
	FREDERICK, MARYLAND					D	ate Time	Depth	Casing	Caved
Boring F	oreman: I. Connelly		Enco	untere	d	6	6/7	7.5'		
Drilling	Wethod: 3-7/8" OD Tri-cone Roller Bit		Start	of da	у	6	5/8	13.0'		
Drilling	Equipment: Diedrich D-50 (ATC)									
Dates	Startad: 6/7/06 Einishad:									
Location	Northing: 21/866 8 ft									
Location	Easting: 961697.7 ft									
Ground	Surface Elevation: 87.9 (feet)									
DEPTH (FT)	STRATA DESCRIPTION	CLASS	S. ELEV. (FT)	WL	DEP	5/ <u>тн</u>	AMPLING DATA	TEST	S F	REMARKS
0.5	FL, R AND TOPSOIL.	ML	87.4				2+1+2			
-	SANDY SILT, fine to medium, moist, light yellowish brown, trace root fragments, and organic matter.				-		N =3 REC =16"			
- 4.5		80	- 83.4		-	-				
-	grained, moist, mottled grayish orange.				5 - -	$\overline{\mathbb{A}}$	6+9+20 N =29 REC =18"			
7.0 -	POORLY GRADED SAND WITH SILT, medium to coarse grained, wet, reddish brown	SP-SM	80.9	Ţ	-	-	6+9+20 N =29			
8.5 9.0 -	SANDY SILT, fine to medium, moist, light orangeish brown, contains gravel.	ML SC	79.4 78.9		-		REC =12"		Ch	ange from
-	CLAYEY SAND, fine to medium grained, moist, mottled grayish orange.				-		2+3+3 N =6 REC =18"		hol aug mu	low stem ger drilling to d rotary
- - -	Mottled orangeish gray.				- - 15-		2+2+3 N =5 REC =18"			
- 18.0 - -	POORLY GRADED SAND WITH CLAY, fine to medium grained, moist, mottled grayish orange, with clay.	SP-SC	69.9		_ _ 20-		2+1+2 N =3 REC =18"			
22.0 -	FAT CLAY, moist, oliveish gray,	СН	65.9		_					
-	contains mica, and sand, fine to med. grained.				-		REC =24"	w=33.2 LL=51 PI =14	%	
	continued on next page				-25-					

		bashal	TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plan	t		Boring	Number:	B-733
	20	maper	C	alvert Cou	nty, Ma	iryland			Γ	Contra	ict Number: 0	6120048	
┢	Schna	bel Engineering	LUG						_		Sheet:	2 of 4	
	DEPTH (FT)	STRATA	DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	DEDT			G	TESTS	REMARKS
┢	· /				СН			DEPT		DA		PP=2.00 tsf	
	-											*	
	_												
	_												
	_									07073			
	-								XI	N =5	0"		
								-30-		REC =1	8		
	-												
	-												
	_												
	_								\square	2+3+4			
	_								XI	N =7 REC =1	8"		
								-35		1120 1	0		
	-												
	-												
	-												
	-								M	2+4+4			
								40	Ŵ	N =8 REC =1	8"		
	-												
	42.0 -	SILTY SAND, fin	e to medium	grained,	SM	45.9							
	-	moist, dark gray.											
	-								M	5+6+8 N =14			
								-45	Ш	REC =1	8"		
	_												
	_												
/08													
T 3/6	-	T an a same a ta d	a single state also							45.05.	F0/0"		
EL.GD	-	reaction.	sand, weak	HCI					XI	N =85/9	50/3" "		
NABE								-50-		REC =1	6"		
SCH	-												
0.GPJ	-												
7 70	_												
OG SF		Light grav strong	n HCI reactio	n 35-45%					М	24+22+	28		
48 PL	-	med coarse sh	ell fragments	3.				F 1		N =50	8"		
31200-								-55-			0		
<u> 06</u>	-												
NG LC	-												
BORII	-												
TEST		continue	ea on next pag	e									

Γ	6	hnabol	TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant		Boring	g Number:	B-733
	Schnak	bel Engineering	LOG	C	alvert Cou	nty, Ma	ryland			Contra Sheet:	act Number: 06 3 of 4	6120048
	DEPTH					ELEV.			SAMPL	NG		
	(FT)	STRATA	DESCRIPT	ION	CLASS.	(FT)	WL	DEPTH	D	ΑΤΑ	TESTS	REMARKS
	_	Contains cemente reaction, 35-45% r fragments.	d sand, stro med coar	ong HCl se shell	SM			2	50 REC	=6"		Drilling penetration rate
	_											slower
	_											
	_	And cemented sar	nd, weak H	CI reaction,					3 50/4"			
		<5% mea coarse	e snell fragi	nents.				65	REC	-4"		
	_											
	_											
	_	Light greenish gra	y, strong H	Cl					15+23	8+11		
		fragments.	u coarse :	STEI				-70	REC	- =18"		
	_											
	-											
	_	Weak HCI reaction	n, 10-20% r ients	ned					5+6+8	3		
		ocaloo ololi nagili						-75-				
	_											
												Harder drilling
	_	Moderate HCI read coarse shell fragm	ction, 10-20 ients.	9% med				[20+9- N =17	-8		0
08								-80-4	REC	=18"		
3DT 3/6	_											
NABEL.(_											
PJ SCH	_	Dark greenish gra	y, no shell f	ragments.					7+6+6 N =12) 		
7 700.G								-85- ^L	I REC	=18		
PLOG SF	_											
1200481	_							_				
LOG 06	_	strong HCI reactio coarse shell fragm	n, 10-20% i ients.	med					REC	=24"	PP=4.00 tsf	
BORING								-90-				
TESTE		continued	l on next pag	e								

School	hnabel BO	Project: (Calvert Cliff Calvert Cou	s Nucle nty, Ma	ar Pow Iryland	er Plant		Borir Cont	ng Number: ract Number: 0	B-733					
DEPTH	STRATA DES			CLASS.	ELEV.	WL		SA		TESTS	REMARKS				
(F1)			-	CM	(F1)		DEPT	H	DATA						
92.0 -	POORLY GRADED S, fine to medium graine gray, with clay, strong 35-45% med coarse	AND W d, mois HCl rea shell fi	TH CLAY, t, light action, ragments.	SP-SC	-4.1		 95-		17+14+11 N =25 REC =18"						
96.0 -	SILTY SAND, fine to r moist, light greenish g reaction, 20-30% med fragments.	nedium ray, stro l coar	grained, ong HCl se shell	SM	8.1		 		18+32+38						
100.0 —	BOTTOM OF BORING	G @ 10	0.0 FT.		-12.1		1001		N =70 REC =18"						
Schnal	hnabel	TEST BORING LOG	Project:	Calvert (Calvert (Cliff: Cou	s Nucle nty, Ma	ar Pow ryland	/er Plai	nt		Boring Contra Sheet:	Number: Ict Number 1 of 3	er: 061	B- 20048	734
------------	--------------------	-----------------------------	-----------	------------------------	---------------	--------------------	---------------------	----------	--------------	----------------	----------------------------	---------------------------------	---------	--------------------------	-----------
Boring (Contractor: CONN			SINC					Gr	oundw	ater Obs	ervations			
	FRED	ERICK, MAP	RYLAND	.o, inc.					D	ate	Time	Depth	Casir	ng Ca	aved
Boring F	Foreman: T. Conne	elly				Enco	untere	d	6	6/6		8.0'			
Drilling I	Method: 3-7/8" OD	Tri-cone Ro	ler Bit	-		Start	of day	v	6	6/7		15.5'			
Drilling I	Equipment: Diedric	ch D-50 (ATC	C)	-			-	, 							
Schnabe	el Representative:	R. Vinzant	7.000	-											
Dates :	Started: 6/6/06 r	-inisned: 6/	7/06												
Location	Easting: 96181	2.5 ft													
Ground	Surface Elevation:	105.7 (feet)		-											
DEDTU		. ,							6		NG				
(FT)	STRATA	A DESCRIPT	ION	CLAS	SS.	ELEV. (FT)	WL		ы. ТН		ΔΤΔ	TEST	s	REMA	RKS
0.5	FL, R AND TOP	SOIL.				105.2			M	1+1+1					
-	SILTY SAND, fin	e to medium	grained,	SM	1				١Ň	N =2 REC :	=14"				
2.0 -	moist, light brow	n, contains o fragments.	rganic		214	103.7		- ·	-						
-	POORLY GRAD	ED SAND W	ITH SILT,	06-0	JIVI			Ļ .	M	5+5+5	5				
_	brown.	raineu, mois	i, ligni					L.	\mathbb{N}	N =10 REC :	=18"				
								_							
	Light orangeish I	brown.						- 5 -	M	2+3+4	ł				
-								- ·	Π	REC :	=18"				
_															
-	Wet, light reddis	h brown.					$\overline{\Delta}$	- ·	HM	2+2+2 N =4	2				
_								Ļ .	ЦИ	REC :	=18"				
								-10-						Change f	rom
_										2+3+4	ł			hollow ste auger to r	em mud
									IM	N =7 REC :	=13"		1	rotary dril	ling
_								- ·							
-								- ·							
-	Light orangeish I	brown.							HM	2+4+6 N =10	6				
								-15-		REC :	=13"				
-								ļ .	-						
_								Ļ .							
_															
_										4+4+4	5				
-								F .		N =9	-10"				
	•							-20-		REC :	-12				
-								- ·	-						
-									-						
-								Ļ .	4						
_	Med coarse sa	and.						L.		3+4+1	16				
	Moist dark reddi	ish brown						0-	M	N =20 REC :	- =11"				
	continu	ed on next pag	e					-25-							

	TEST	Project:	Calvert Cliff	s Nucle	ar Pow	er Plant	Borin	g Number:	B-734
Schnal	bel Engineering LOG	Ì	Calvert Cou	nty, Ma	ryland		Cont Shee	ract Number: 0 t: 2 of 3	6120048
DEPTH (FT)	STRATA DESCRIPT	ΓΙΟΝ	CLASS.	ELEV. (FT)	WL	SA DEPTH		TESTS	REMARKS
	Wet, light orangeish brown.		SP-SM	73.7		 	7+10+7 N =17 REC =14"		
	SANDY LEAN CLAY, fine to moist, mottled grayish orang	medium, e.	CL	75.7		 	4+3+2 N =5 REC =18" 2+1+3		
39.5	SILTY SAND, fine to mediun moist, gray, contains mica.	n grained,	SM	66.2			N =4 REC =12" 3+4+4 N =8 REC =18"		
	LEAN CLAY, moist, dark gra mica.	y, contains	CL			 50 	REC =24"	PP=3.00 tsf	Start of drilling for the day
	continued on next pa	ge					2+4+4 N =8 REC =18"		

SC	hnabel	TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	-	Boring	Number:	B-734
Schnal	bel Engineering	LOG			inty, wa				Sheet:	3 of 3	5120048
DEPTH (FT)	STRAT	A DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	S DEPTH	SAMPLIN DA	G TA	TESTS	REMARKS
	Dark greenish g	ray.		CL			DEPTH	DA 3+5+5 N =10 REC =1 3+5+6 N =11 REC =1	TA 8" 8"		
	SILTY SAND, fir moist, light gree cemented sand,	sand, Fine - r ne to medium nish gray, cor strong HCI rr	ned. sand.	SM	- 33.7		 	5+7+9 N =16 REC =1	8"		
75.0 —	40% med coa	rse shell fragi	.0 FT.		- 30.7			25+15+: N =45 REC =1	30 8"		

Schnal	hnabel BORING bel Engineering LOG	Project: Calvert Calvert	Cliff Cou	s Nucle inty, Ma	ar Pow ryland	er Pla	nt		Boring Contra Sheet:	Number: ct Numbe 1 of 3	e r: 06120	B-735
Boring (Gro	undwa	ater Obs	ervations		
Bornig C	FREDERICK, MARYI	LAND					Da	ate	Time	Depth	Casing	Caved
Boring F	oreman: T. Connelly	- D'4		Enco	untere	d	6/2	28		Dry		
		BIL		Water	Readi	ng	7/:	27		52.0'		
Schnabe	Equipment: Diedrich D-50 (ATC)											
Dates	Started: 6/28/06 Finished: 6/2	28/06										
Location	: Northing: 214805.48 ft Easting: 961021.83 ft		_									
Ground	Surface Elevation: 91.2 (feet)											
DEPTH (FT)	STRATA DESCRIPTIO	N CLA	SS.	ELEV. (FT)	WL	DEP	SA TH		NG ATA	TEST	S I	REMARKS
0.5	FL, R AND TOPSOIL.		21.4	90.7				4.4.5				
-	POORLY GRADED SAND WITI medium to coarse grained, cont organic matter, moist, orangeish	H SILT, SP-8 tains h brown.	SIM					1+1+3 N =4 REC =	18"			
	Fine - med. sand.							2+2+2 N =4	4.0"	w=7.6°	%	
-						- 5 -		REC =	18"			
-	Yellowish orange, Med coarse no organic matter.	e sand,					-	2+4+7 N =11 REC =	18"			
7.0 -	SILTY SAND, fine to medium gr	rained, SN	Л	84.2		-						
-	moist, yellowish brown, contains matter.	s organic				_ ·		3+5+4 N =9 REC =	18"			
-	No organic matter.							3+4+5		w=13.5	%	
-								N =9 REC =	18"			
	Mottled grayish orange, trace m	iica.				- - 15-		3+5+5 N =10 REC =	18"			
											Ch	ange from
								2+2+1 N =3 REC =	18"	w=28.7 *	% aug rot	ger to mud ary drilling
-												
-	Mottled grayish orange.					-		3+4+2 N =6 REC =	18"			
	continued on next page					-25-						

Comments:
1. Ground water observation well OW-735 installed in boring upon completion.
2. * = See Appendix I for additional lab testing data.

	boobal	TEST	Project:	Calvert Cliff	s Nucle	ar Pow	er Plant		Boring	Number:	B-735
	maper	BORING	(Calvert Cou	nty, Ma	ryland			Contra	ct Number: 06	6120048
Schna	bei Engineering	LUG							Sneet:	2 01 3	
DEPTH	STRAT	TA DESCRIPT	ION	CLASS.	ELEV. (FT)	WL			G	TESTS	REMARKS
				SM			DEPTH		IA		
-											
27.0 -					64.2						
	FAT CLAY, mo contains mica,	ist, gray, with Fine - med. sa	sand, ind.	СН							
								REC =2	4"	w=32.3% LL=51	
-										PL=16 PP=3 00 tsf	
-							-30-			*	
-											
-											
_											
	Dark greenish (orav						3+3+4			
-		9.0.).					F 1X	N =7	8"		
							-35-1		0		
-											
-											
-											
_							L JM	4+3+5			
								N =8 REC =1	8"		
_							-40				
-											
-											
-											
							10	4+7+8		w=39.6%	
							<u>45</u>	REC =1	8"	PL=30	
-							F 7				
el 47.0 -	POORLY GRA	DED SAND W	ITH SILT,	SP-SM	44.2						
- 1/0/2	gray, contains i	grained, mois mica.	t, oliveish				+ +				
- e							M	4+5+7 N =12			
							_ ₅₀ _[]	REC =1	8"		
							[]				
	Wet, mottled re	eddish orange.					X	22+50 N =50			
							-55-	REC =1	2"		
- 19							└				
-											
	contin	nued on next pag	e				[]				
<u> </u>											

Comments:
1. Ground water observation well OW-735 installed in boring upon completion.
2. * = See Appendix I for additional lab testing data.

	TEST Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	Boring Number:	B-735
Schnal	bel Engineering LOG	aivert Cou	nty, Ma	ryiand		Contract Number: 0 Sheet: 3 of 3	6120048
DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL	SAMPLI DEPTH D	NG TESTS	REMARKS
-	Gray.	SP-SM			32+31 N =50 REC =	+19 w=20.9% :18"	
- 63.0 - - - -	SILTY SAND, medium to coarse grained, moist, light gray, 40% medium to coarse shell fragments, strong HCI reaction.	SM	28.2		 	+11 :18"	
	greenish gray, fine - med. grained.				 	+10 :18"	
- - 75.0 —	Moderate HCI reaction, 15% med coarse shell fragments. BOTTOM OF BORING @ 75.0 FT.		16.2		 5+6+1 N =16 REC =	0 w=24.5% *	

Comments:
1. Ground water observation well OW-735 installed in boring upon completion.
2. * = See Appendix I for additional lab testing data.

	TEST Project: C	alvert C	liffs Nucle	ar Pow	er Plar	nt		Boring	Number	:	B-736
Schna	bel Engineering LOG	alvert C	county, Ma	iryland				Contra Sheet:	t Number 1 of 3	er: 061	120048
Boring	Contractor: CONNELLY AND ASSOCIATES	INC				Gro	oundv	vater Obs	ervations	;	
	FREDERICK, MARYLAND	,				D	ate	Time	Depth	Casi	ng Caved
Boring	Foreman: T. Chew		Enco	untere	d	7	/18		23.5'		
Drilling	Equipment: Diedrich D 50 Turbs (Treak)	Rolary									
Drilling	Equipment: Diedrich D-50 Turbo (Track)	-									
Schnab		_									
Dates	Started: 7/18/06 Finished: 7/19/06										
Locatio	n: Northing: 214681.67 ft Easting: 961154.26 ft										
Ground	Surface Elevation: 98.3 (feet)										
DEPTH (FT)	STRATA DESCRIPTION	CLAS	s. ELEV.	WL		S	AMPL	ING	TEST	S	REMARKS
	Forest litter, rootmat and topsoil		07.0		DEP	IH M	1+2+1	2 2			*AWJ rods
1.0	CLAYEY SAND, fine to medium grained, moist, brown, contains root fragments.	SC SM	97.9			\mathbb{Z}	N =4 REC	=18"			used. *4-1/4" I.D. Hollow Stem Augers used
	SILTY SAND, fine to medium grained, moist, brown, contains root fragments. fine to coarse grained.						2+1+2 N =3 REC	2 =18"			from 0 to 23.5 ft.
4.5	POORLY GRADED SAND WITH SILT, fine to coarse grained, moist, stratified light orangeish brown and light brown, with silt, trace fine gravel	SP-SI	93.8 M		- 5		4+3+; N =5 REC	2 =14"			
9.5	light brown and orangeish brown, dark orangeish/reddish brown weakly to moderately cemented sand layer at 8.5 ft.		88.8				3+4+(N =1(REC	6) =16"			
	 POORLY GRADED SAND, fine to coarse grained, moist, stratified light brown and light orangeish brown. 	SP					3+7+ N =17 REC	10 7 =14"			
	stratified yellowish brown, orangeish brown, and light brown.				 15		6+10 [.] N =24 REC	+14 4 =16"			
			81.3								
PT 700.GPJ SCHN	SILTY SAND, fine to medium grained, moist, orangeish brown.	SM					4+8+ N =18 REC	10 3 =14"			
0048 PLOG	-		76.3								
	CLAYEY SAND, fine to medium grained, wet, yellowish gray and light gray.	SC		₽	 	- M	2+4+	4			*Switched to 3-7/8" O.D. Tri-cone roller
TEST BORIN	continued on next page				-25-	M	N =8 REC	=18"			bit below 23.5

	TEST Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	Boring Number:	B-736
School	bol Engineering	alvert Cou	nty, Ma	ryland		Contract Number: 0	6120048
Schha					CAMPLIN	Sheet: 2 of 3	
DEPTH	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL		TESTS	REMARKS
		SC					ft.
	-						
27.0			713				
	SILTY SAND, fine to medium grained, wet, vellowish brown and light gray.	SM					
	-				- $ $		
-	-				-30-10 REC =	18"	
	-						
	-						
-	dark vallewich brown and erangeich						
34.0	brown.	CL	64.3		- $ $		
-	SANDY LEAN CLAY, fine to medium,					18"	
	moist, gray, trace mica.						
37.0			61.3				
	FAT CLAY, moist, gray, trace fine to medium sand and mica.	СН	0.110				
-							
	-				2+3+4 N =7		
-	-				-40- [] REC =	18"	
	-						
42.0			56.3				
	ELASTIC SILT, moist, gray, trace fine to medium sand, mica, and organic matter	MH					
	(±1%).						
-					- $ $		
-	-				-45- <u> </u> REC =	18"	
	-						
	_						
3/08							
0T 3/6	arow and dark grow						
-	gray and dark gray.				= = = = = = =		
- HNABI					-50-10 REC =	18"	
Ś -	-						
. J.GPJ	-						
77 70							
DG st							
- 8 PL(4.01	
- 12004	In tine to medium sandy, gray and light greenish gray below 54.5 ft.				-55- <u> </u> REC =	18"	
90 0	Contains clayey sand and silty sand						
 1057.0			41.3				
ORIN	CLAYEY SAND, fine to medium grained, moist, gray, trace mica,	SC					
STB	continued on next page						
۳L							

	hnabol TEST	Project: 0	Calvert Cliffs	s Nucle	ar Pow	er Plant	B	oring Number:	B-736
Schna	bel Engineering LOG		Calvert Cou	nty, Ma	ryland		C	ontract Number: 0 heet: 3 of 3	6120048
DEPTH (FT)	STRATA DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	S. DEPTH	AMPLING	TESTS	REMARKS
- 61.0 - - - -	contains indurated clayey sa dark gray below 59.5 ft. POORLY GRADED SAND V fine to medium grained, wet, weak HCl reaction.	/ITH SILT, gray, very	SC SP-SM	37.3			4+3+20 N =23 REC =18" 13+26+33 N =59 REC =15"		
	SILTY SAND, fine to medium wet, gray, mostly fine to med fragments (±50%), strong HC CLAYEY SAND, fine to medi grained, moist, gray and light gray, trace fine to coarse she fragments (±5%), weak HCI n SILTY SAND, fine to medium	grained, ium shell I reaction. greenish II eaction.	SM SC SM	28.8 26.3 23.8 23.3			4+3+9 N =12 REC =18" 4+4+12 N =16 REC =18"		*Moderate to difficult rotary advancement from 73 to 73.3 ft (strong rig chatter).
	moist, gray and oliveish gray strongly cemented sand (±70 fine to coarse shell fragments strong HCI reaction. BOTTOM OF BORING @ 75	, mostly %), some s (±30%), .0 FT.		20.0					

	-	hnabol TEST	Project:	Calvert (Cliffs	s Nucle	ar Pow	er Pla	nt		Boring	Number:			<u>B-737</u>
s	chnal	bel Engineering LOG		Calvert (Cou	nty, Ma	ryland				Contra Sheet:	t Number 1 of 4	er: 06	61200	48
Во	rina C	contractor: CONNELLY AND A	SSOCIATI	-S INC					Gr	ound	water Obs	ervations			
		FREDERICK, MAR	YLAND						D	ate	Time	Depth	Cas	ing	Caved
Bo	ring F	oreman: T. Chew	ller Dit (Mu	d Doton (Enco	untere	d	7	/19		7.5'		-	
Dri	llina F	Fauinment: Diedrich D-50 Turbo	(Track)	iu Rolary	,	Start	of da	/	7	/20		13.5'		-	
Sc	hnabe	I Representative: K. Megginson													
Da	tes s	Started: 7/19/06 Finished: 7	/20/06												
Lo	cation	Northing: 214511.91 ft Easting: 961147.4 ft													
Gro	ound	Surface Elevation: 63.5 (feet)													
DE (I	EPTH FT)	STRATA DESCRIPTI	ON	CLAS	SS.	ELEV. (FT)	WL	DED	S. TLI	AMPL		TEST	s	R	EMARKS
	0.3	 Forest litter, rootmat and tops 	oil.			63.2		DEF	<u>ТМ</u>	1+1/	12"			*AW	J rods
	_	SILTY SAND, fine to medium moist, brown, contains root fra	grained, agments.	SM	1				-M	N =1 REC	/12" =17"			use	J.
	_	fine to coarse grained, moist, l	brown.						-0	3+3+ N =6 REC	-3 =18"				
	4.5 	CLAYEY SAND, fine to coarse moist, brown, trace fine gravel	e grained,	SC	;	59.0		- 5 -		2+1+	3				
	_								- X	N =4 REC	=18"				
	-	wet, light grayish brown, orang brown, and yellowish brown.	geish				Ā		-0	5+4+ N =1 REC	6 0 =18"				
	9.5	FAT CLAY, moist, light gray a orangeish brown, trace fine to sand.	nd medium	CH	ł	54.0			-	REC	=24"	w=37.6 PP=1.50 *	6%) tsf		
	-	light brown, grayish brown, an	d						- I - - M	3+4+	5			*4-1 hollo augo from	/4" I.D. ow stem ers used i 0 to 13.5
20/0/02	4.5 	SANDY LEAN CLAY, fine to n moist, gray, trace mica.	nedium,	CL	-	49.0			_	REC	=18"			ft. *Sw 3-7/ Tri-c	itched to 8" O.D. cone roller
	7.0 -		<u> </u>			46.5		L .	_					ft.	elow 13.5
PJ SCHN	_	medium sand and mica.	line to		1										
PT 700.G	_							- 20-	10	3+4+ N =1 REC	6 0 =18"				
18 PLOG	-								-						
2 001200	2.0 -	CLAYEY SAND, fine to mediu grained, moist, gray, trace mic	m ca.	SC	;	41.5									
SING LOC	_							L .	-	3+4+ N =1	9 3				
LESI BOF		continued on next page	9					-25-		REC	=18"				

	hpabol TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	Во	oring Number:	B-737
Schnal	BORING	C	alvert Cou	nty, Ma	ryland		Co	ontract Number: 0	6120048
DEPTH (FT)	STRATA DESCRIPT		CLASS.	ELEV. (FT)	WL	S/ DEPTH	AMPLING DATA	TESTS	REMARKS
			SC						
-									
27.0 -	POORLY GRADED SAND W	/ITH SILT,	SP-SM	36.5					
-	silt.	gray, with					6+15+19		
-							N =33 RFC =18"		
_						-30			
_									
34.0 -				29.5		M	1+6+9		
	SILTY SAND, fine to medium wet, gray, some fine to mediu	n grained, um shell	SM	20.0		Å	N =15 REC =17"		*Moderate to
36.0 -	fragments (±30%), strong HC	Cl reaction.		27.5					difficult rotary advancement
-	CLAYEY SAND, fine to medi grained, wet, oliveish gray, g	um ray and	SC						from 36 to 38.5 ft (slight rig
-	shell fragments.	to coarse							challer).
-							5+19+19 N =38		
						<u>40</u>	REC =18"		
-									
42.0 -	SILTY SAND, fine to medium	n grained,	SM	21.5					
-	wet, gray, little fine to coarse fragments (±25%), strong HC	shell I reaction.							
-							10+8+9 N =17		
						-45	REC =18"		
-									
80/									
	few fine to coarse shell fragm	nents					4+5+9		
	(±10%), weak HCl reaction.						N =14 REC =18"		
- schnz									
- J.GPJ									
- 100	trace fine to medium shell fra	igments				M	4+6+8		
	(±5 /0).					<u>55</u> _	REC =18"		
- 061									
- NG LO									
	continued on next page	ge							
		,-							

	TEST Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	Boring Number:	B-737
Schna	bel Engineering LOG	alvert Cou	inty, Ma	iryland	-	Contract Number: 0 Sheet: 3 of 4	6120048
DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL	SAMPLI	NG TESTS	REMARKS
	trace fine to medium shell fragments	SM					
-	(±1%), very weak HCl reaction.				N =11	=18"	
-							
62.0 -	CLAYEY SAND, fine to medium	SC	1.5				
-	grained, moist, gray, little fine to coarse shell fragments (±20%), strong HCl reaction.				 	0	*Moderate to difficult rotary advancement
64.7	SILTY SAND, fine to medium grained,	SM	-1.2		-65- A REC =	=18"	from 64.7 to 65.5 ft (moderate to
-	fragments (±50%), contains black particles (1/16 inch), strong HCl reaction.						strong rig chatter). *Difficult to very difficult rotary
-	some fine to coarse shell fragments				10+13	+17	from 65.5 to 66 ft (strong rig
-	(±40%). trace fine to medium shell fragments (±5%) below 69 ft.					=18"	chatter). *Moderate to difficult rotary advancement
-	_						from 67.5 to 68 ft (moderate rig chatter).
-	oliveish gray and light greenish gray, contains moderately cemented sand pockets.				 13+20 N =47 REC =	+27 =18"	merinitient moderate to difficult rotary advancement from 71.5 to 73.5 ft.
			10 5				
- 17.0	CLAYEY SAND, fine to medium grained, wet, gray, little fine to coarse	SC	-13.5				
-	silt lenses, strong HCl reaction.				7+11+ N =25	14	
						-18"	
82.0 -			-18.5				
	SILTY SAND, fine to medium grained, wet, gray and greenish gray, with silt, trace fine to coarse shell fragments	SM					
	(±5%), moderate HCl reaction, contains clayey sand pockets.				14+17 N =41	+24	
	-				85 <u>1</u> REC =	-24	
87.0 -	CLAVEY SAND find to modium	80	-23.5				
-	grained, wet, greenish gray, trace fine to medium shell fragments (±1%), very weak HCl reaction.	50			 5+9+1 N =24	5	
						=18"	
-	continued on next page						

	hnahel	TEST	Project:	Calvert Cliff	s Nucle	ar Pow	er Plant		Boring Number	B-737
Schnal	bel Engineering	LOG		Calvert Cou	nty, Ma	ryland			Contract Numb Sheet: 4 of 4	er: 06120048
DEPTH (FT)	STRATA	DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	ہ DEPTH		G TEST	rs remarks
				SC						
92.0 -	SANDY SILT, fine greenish gray, tra shell fragments (± weak HCl reactior	to medium ce fine to m 1%), and m 1.	, moist, edium iica, very	ML	-28.5		 95 	6+8+11 N =19 REC =1	8"	
-										
-	trace fine to coars (±<5%), contains inch), weak HCl re	e shell frag black particl eaction.	ments les (1/16		-36 5			7+12+13 N =25 REC =18	3 8"	
100.0	BOTTOM OF BOI	RING @ 10	0.0 FT.		-30.5		100			
1										

Schna	TEST Project: C bel Engineering LOG	alvert Clif alvert Co	fs Nucle unty, Ma	ar Pow ryland	ver Pla	nt	Boring Contra Sheet:	Number: ct Number 1 of 3	e r : 06120	B-738
Boring		INC				Gro	undwater Obs	ervations		
Borning C	FREDERICK, MARYLAND	, INC.				Da	te Time	Depth	Casing	Caved
Boring F	Foreman: D. Reese		Enco	untere	d	6/1	13	10.5'		
Drilling	Method: 3-7/8" OD Tri-cone Roller Bit									
Drilling	Equipment: Diedrich D-50 (ATC)									
Schnabe	el Representative: B. Bradfield									
Dates	Started: 6/13/06 Finished: 6/13/06									
Location	n: Northing: 213826.3 ft Easting: 961679.62 ft									
Ground	Surface Elevation: 87.3 (feet)				1					
DEPTH (FT)	STRATA DESCRIPTION	CLASS	ELEV. (FT)	WL	DEP	SА ТН	MPLING DATA	TEST	S I	REMARKS
0.2	Forest litter, rootmat and topsoil.	ML	87.1			M	1+2+2		0-9	/- Drilled with /4" HSA
-	SANDY SILT, fine to medium, moist, vellowish brown, contains wood				F	10 ¦	REC =12"			
2.0 -	fragments.	SP-SM	85.3		╞	+				
-	POORLY GRADED SAND WITH SILT,				Ļ		6+7+8			
	orangeish brown and yellowish brown.					M	N =15 RFC =18"			
4.0 -	SILTY SAND, fine to coarse grained,	SM	- 83.3		F					
-	moist, orangeish brown and yellowish				- 5 -		8+13+14	w=9%	, b	
6.0 -			81.3		F		N =27	*		
	POORLY GRADED SAND, fine to coarse grained, moist, gravish white	SP					REC =18"			
-	and yellowish brown, trace gravel, 1				Γ					
-	shoe.				-		6+8+11 N =19		9'-	Switched to
-	-				F	<u> </u>	REC =14"		mu	d rotary with
					10				roll	/8" tri-cone er bit
_				$\overline{\Delta}$	[10-	ᅰ.	7.0.0	w=12.3	%	
-	brown, trace silt.				F	-IIXII i	7+8+9 N =17	*		
12.0 -		014	75.3		F	<u> </u>	REC =14"			
	wet, dark orangeish brown and mottled	SM			L					
	yellowish brown, contains mica.				[
-	_				F	-IIXII î	N =12			
	-				-15-	<u> </u>	REC =13"			
16.0			71 0		L					
10.0 -	SANDY FAT CLAY, fine to medium,	СН	11.3							
-	layering, gray lenses 1/16" thick.				F	+				
-					F					
					L		2+2+2	w=24.2	%	
							N =4	*		
20.0 —	SANDY ELASTIC SILT, fine to medium.	MH	67.3		-20-	┥╩╢╹				
-	wet, light orangeish brown and gray,				F	+				
_	iayereu, yray ierises > 1/0 lilick.				L					
-	-				F					
-					\vdash	-M;	1+2+2			
					25	_M'	REC =18"			
	continued on next page				25					

	hnabol TEST	Project: Ca	alvert Cliff	s Nucle	ar Pow	er Plant	Boring	Number:	B-738
Schnal	bel Engineering LOG	Ca	alvert Cou	nty, Ma	iryland		Contra Sheet:	ct Number: 0	6120048
DEPTH (FT)	STRATA DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	SAM DEPTH	PLING DATA	TESTS	REMARKS
	CLAYEY SILTY SAND, fine t grained, wet, gray, contains r	o medium nica.	MH SC-SM	· 57.3		 	2+4 =6 EC =18"	w=28.4%	
	SANDY LEAN CLAY, fine to moist, gray, contains mica.	medium,	CL	49.3		4+ - 35 - RE RE RE 4+ 4+ 40 RE	4+5 =9 EC =18" EC =24" EC =24" EC =24" =5+5 =10 EC =18"	w=26.4% LL=26 PL=22 *	
- - 46.0 - - - - -	with sand, moist, gray and lig FAT CLAY with sand, moist, contains mica.	ht gray. gray,	СН	41.3			4+7 =11 EC =18" 6+7 =13	w=32.1%	
G 06120048 PLOG SPT 700.GPJ SCHINABE 0.95 0.95 0.95 0.95 0.95 0.95 0.95 0.95	LEAN CLAY with sand, mois and blackish gray, contains n blackish gray pockets <1" co sandy clay.	t, light gray nica, nsist of	CL	- 35.3		RE	EC =18" 7+8 =15 EC =18"		
TEST BORING LO	grained, moist, gray, contains weak HCl reaction, <5% fine fragments.	s mica, shell ge	30						

	hpabol TEST	Project: Ca	alvert Cliff	s Nucle	ar Pow	er Plant		Boring Number:	B-738
Schnal	bel Engineering LOG	Ci	alvert Cou	nty, Ma	ryland			Contract Number: 0 Sheet: 3 of 3	6120048
DEPTH (FT)	STRATA DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	S DEPTH		G TESTS	REMARKS
-			SC				7+11+18 N =29 REC =18	8" w=28.7%	
62.0 -	POORLY GRADED SAND, fi coarse grained, wet, gray and white, 60-70% fine to coarse fragments, trace silt, strong F reaction.	ne to d brownish shell ICI	SP	25.3		 65	29+31+2 N =51 REC =10	20 6"	62'- Harder drilling
67.0 -	SANDY LEAN CLAY, fine to moist, gray, contains mica, w reaction, <5% shell fragment reaction limited to shell fragm	medium, eak HCl s, HCl nents.	CL	20.3		 70 -	4+4+5 N =9 REC =1	w=30.9% *	
71.0 -	CLAYEY SAND, fine to medi grained, wet, gray and brown 20-30% fine to coarse shell fi trace silt, moderate HCI reac	um ish white, ragments, tion.	SC	16.3			25+22+2 N =33	11	71-73.5'- Rig chatter
75.0	BOTTOM OF BORING @ 75	.0 FT.		12.3		75L	NREC =11	8"	

Schna	bel Engineering LOG	oject: Calvert Calvert	Cliffs Coui	s Nucle nty, Ma	ar Pow ryland	ver Plai	nt	B C S	oring ontra heet:	Number: ct Number 1 of 4	e r: 061	B-739 20048
Barling							Gro	oundwater	Obse	ervations		
Boring	FREDERICK, MARYL	AND					D	ate Ti	me	Depth	Casir	ng Caved
Boring I	Foreman: D. Reese			Enco	untere	d	6	/13		23.5'		
Drilling	Method: 3-7/8" OD Tri-cone Roller E	Bit		Start	of day	/	6	/14		16.0'		
Drilling	Equipment: Diedrich D-50 (ATC)					,						
Schnab	el Representative: B. Bradfield											
Dates	Started: 6/13/06 Finished: 6/15	6/06										
Locatio	n: Northing: 23719.6 ft Easting: 961793.32 ft											
Ground	Surface Elevation: 100.4 (feet)											
DEPTH (FT)	STRATA DESCRIPTION		SS.	ELEV. (FT)	WL	DEP [.]	S/ TH	AMPLING DATA		TEST	s	REMARKS
0.4	Forest litter, rootmat, and topsoil.		4	100.0			M	2+1+3			(0-9'- Drilled with
-	SILTY SAND, fine to medium gra moist, light brown, contains root	lined,	/1				ΗŇ	N =4 REC =12"			8	85'- Hard drilling with rig
2.0 -	fragments.	SP-S	SM	98.4			1_				(chatter
.	POORLY GRADED SAND WITH	SILT,					-M	11+12+10 N -22				
.	brown and orangeish brown.					Ļ.	$ \Delta $	REC =18"				
	Moist, orangeish brown and yello	wish				- 5 -	TM	7+5+5				
6.0 -	brown.	SF	>	94.4			HŇ	N =10 REC =18"				
	POORLY GRADED SAND, fine to coarse grained, moist, orangeish	o brown				Ļ .						
	and yellowish brown.							4+4+6				
-	1					- ·	TIXII	N =10			9	9'- Switched to
-	-							REC =18"				using 3 7/8"
_	-					-10-	-					tri-cone roller bit
	Orangeish brown and yellowish w	vhite,				L .		5+6+6				
	stratified into 1/2" to 1" lenses of	,				[IXI	N =12				
-						- ·		KLC - 10				
-	-						-					
_	Yellowish brown and gray, stratifi	ied into				L.		4+5+6				
:	1/2" to 1" lenses of alternating co	lor.					IŇ	N =11 REC =14"				
_	1					-15-		NEC - 14				
-	-						-					
170 -				83 4		L .						
	POORLY GRADED SAND WITH	SILT, SP-S	SM									
-	orangeish brown and yellowish g	ray,				- ·	1_					
-	slight stratification, trace medium grained rounded gravel.						HM	8+10+9 N =19				
						-20-	40	REC =15"				
						_						
-	1					F .	1					
22.0 -	SILTY SAND fine to coarse grain	ned SN	1	78.4		+ ·	+					
-	wet, orangeish brown and dark bi	rown.				Ļ.	\downarrow					
					Ţ			10+15+16				
	1					F .	7 X	N =31				
- 1	continued on next page					-25-	- 14	KEC =18"				

	bachel	TEST	Project:	Calvert Cliff	s Nucle	ar Pow	er Plant		Boring	Number:	B-739
Sahas		BORING		Calvert Cou	nty, Ma	ryland			Contra	ct Number: 0	6120048
Schha	bei Engineering	200							Sneet:	2 01 4	
DEPTH (FT)	STRAT	A DESCRIPT	ION	CLASS.	ELEV. (FT)	WL			J F A	TESTS	REMARKS
				SM			DEPTH	DAI	A		
-											
27.0 -					73.4						
	SANDY SILT, fir mottled orangeis	ne to medium sh brown and	, wet, liaht arav.	ML							
-			5 - 5 - 7								
-							F -1 X	N =5			
	_						-30-1	REC =18	8"		
-											
-											
								2+2+2			
-							F 1 X	N =4	0"		
							-35-4	REC = 10	8		
-											
37.0 -		Guera da una alla			63.4						
_	grained, wet, mo	ottled orangei	sh brown	SC							
	and gray.							2+1+3			
-							F 7 X	N = 4	0"		
							-40		5		
-											
42.0 -		no to modium	arainad	SM	58.4						
-	wet, dark gray.		i graineu,	3101							
							L JM	3+3+5			
							r ix	N =8	7"		
							-45				
-											
-	_										
							$ \downarrow \downarrow$				
	Contains mica.						L JM	4+6+8			
								N =14 REC =1	5"		
50.5		fine to medi			49.9		-50		-		
- 5	grained, wet, da	, fine to medii rk gray, trace	um e mica.	SC				REC =12	2"		
							╞╴╶╢┻				
53.0 -	EAT CLAY with	and maint	light ares		47.4		├ ┤				
-	and dark gray, c	sanu, moist, contains mica	iigni gray				L IM	2+4+4			
								N =8 REC =18	8"		
-							F 1				
	1						├ ┤				
- 12	continu	ied on next nor	10				├ ┤				
		ica on next pay									

		hnabol	TEST	Project: C	alvert Cliffs	s Nucle	ar Pow	er Plant		Boring Numb	er:	B-739
-	Schna	abel Engineering	LOG	C	alvert Cou	nty, Ma	ryland			Contract Nun Sheet: 3 of 4	nber: 0 4	6120048
D)EPTH (FT)	STRATA	A DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	S DEPTH			STS	REMARKS
					СН				3+5+6			
		_							N =11 REC =1	8"		
	-											
	62.0				a	38.4						
		_ moist, dark gray,	CAY, fine to	medium, ca.	CL							
		_						10	5+5+7 N =12			
	-	_						-65-	REC =1	8"		
		_										
		_ With sand.						M	5+9+9			
	_	_						0	REC =1	8"		
		_										
	72.0	CLAYEY SAND,	fine to medi	um	SC	28.4						
		white, 10-20% fir fragments, conta	ne to coarse ains mica, str	shell ong HCl					14+31+	50/4"		
	_	reaction.	,	0					N =81/1 REC =1	0" 6"		
		_										
		_										
		_										
	79.5	Wet, gray and br fine to medium s	ownish white hell fragmen	e, 70-80% ts, action		20.9		10	9+8+9 N =17			
3/08	_	LEAN CLAY with	n sand, moist	, gray,	UL			-80-				
3DT 3/		contains mica, w	eak HCI read	agments, ction.								
NABEL.(_										
J SCH	84.0	fine to medium s	andy, gray a 10-20% fine	nd to coarse /	SP-SC	16.4			REC =5 50/2"			
700.GP	-		ED SAND W	ITH CLAY.				-85-	N =50/2 REC =2			85'- Hard drilling with rig chatter
DG SPT		fine to medium g 10-20% fine to c	rained, mois oarse shell fr	t, gray, agments,								
048 PL(87.0	strong HCl reactic	ion, strong	/	SM	13.4						
06120		SILTY SAND, fin wet, light gray ar	ne to coarse g nd brownish v pedium shell	grained, white, fragments				l Im	7+12+5	0/5"		
NG LOG	_	strong HCI react	ion, weak ce	mentation.				⊢ 90–∭	REC =1	8"		
T BORII		continu	ed on next pag	e								
TES			, , ,									

Schna	hnabel bel Engineering LOG	Project:	Calvert Cliff Calvert Cou	s Nucle nty, Ma	ar Pow Iryland	er Plant	Borii Cont Shee	ng Number: ract Number: 0 it: 4 of 4	B-739
DEPTH (FT)	STRATA DESCRIP	TION	CLASS.	ELEV.	WL	SA		TESTS	REMARKS
91.0	POORLY GRADED SAND V fine to coarse grained, moist and white, 60-70% fine to m fragments, strong HCI reacti moderate cementation. Wet, gray and brownish whit fine to coarse shell fragment reaction limited to shell fragr	VITH SILT, , light gray edium shell on, e, 30-40% s, HCl nents.	SP-SM	9.3		 	11+10+10 N =20 REC =18"		
96.8 _	And, 20-30% fine to coarse s fragments, HCI reaction limit fragments. CLAYEY SAND, fine to med grained, wet, gray and brow	shell ed to shell ium nish white,	SC	3.6		-	REC =10"		
99.6 99.8	30-40% fine to medium shell strong HCI reaction. POORLY GRADED SAND V fine to medium grained, wet, brownish white, 30-40% fine shell fragments, HCI reaction shell fragments. BOTTOM OF BORING @ 99	VITH SILT, gray and to coarse in limited to 0.8 FT.	SP-SM	0.8		M	8+9+50/4" N =59/10" REC =15"		

Schna	TEST Project: C bel Engineering LOG C	alvert Cli alvert Co	iffs Nuclea ounty, Ma	ar Pow ryland	ver Pla	nt	Borin Contr Sheet	g Number: act Numbe : 1 of 3	ər: 06120	B-740
Boring						Gr	oundwater Ob	servations		
Borning	FREDERICK, MARYLAND	, INC.				D	ate Time	Depth	Casing	Caved
Boring F	Foreman: T. Chew		Enco	untere	d	7	//20	13.5'		
Drilling	Method: 3-7/8" O.D. Tri-cone Roller bit (Mud F Equipment: Diedrich D-50 Turbo (Track)	Rotary)	Start	of day	/	7	/21	4.0'		
Schnabe	el Representative: K. Megginson									
Dates	Started: 7/20/06 Finished: 7/21/06									
Location	n: Northing: 213605.13 ft Easting: 961781.13 ft									
Ground	Surface Elevation: 74.3 (feet)									
DEPTH (FT)	STRATA DESCRIPTION	CLASS	S. ELEV. (FT)	WL	DEP	S. TH	AMPLING DATA	TEST	s I	REMARKS
0.5	Forest litter, rootmat and topsoil.		73.8			IM	1+1+2		*A\	VJ rods
-	SILTY SAND, fine to medium grained, moist, brown, trace fine gravel, contains	SM	70.0			10	N =3 REC =18"		430	
2.0 -	root tragments.	CL	72.3							
3.0 -	SANDY LEAN CLAY, fine to medium, moist, brown, contains root fragments.	ML	71.3		-	-M	4+8+12 N =20 REC =18"			
4.5	 SANDY SILI, fine to medium, moist, light grayish brown, yellowish brown, and orangeish brown. 	SM	69.8		5-					
-	SILTY SAND, fine to coarse grained, moist orangeish brown and brown					M	15+13+14 N =27			
7.0 -	trace fine gravel, contains clayey sand layers.	SC	67.3		- ·		REC - 10			
8.0 -	CLAYEY SAND, fine to coarse grained, moist, yellowish brown and light grayish brown, contains root fragments.	SM	- 66.3			M	4+5+5 N =10 REC =18"			
9.5	SILTY SAND, fine grained, moist, stratified orangeish brown and light brown.	SC	- 64.8		-10-					
-	Contains poorly graded sand with silt layer below 8.8 ft.					X	3+3+3 N =6 REC =18"			
-	CLAYEY SAND, fine grained, moist, yellowish brown and light gray.			∇					*4- hol	1/4" I.D. low stem
- 14.5	wet, mottled dark yellowish brown and light gray.	N AL	- 59.8			-	2+2+2 N =4 PEC =18"		froi ft.	n 0 to 13.5
	SANDY SILT, fine to medium, wet, gray, trace organic matter (±1%), and mica.	IVIL							*Sv 3-7 Tri-	/8" O.D. cone roller
17.0 -	SILTY SAND, fine grained, wet, gray.	SM	- 57.3			_			ft.	0elow 13.5
	-									
-	-				- ·	١X	3+3+4 N =7 PEC =18"			
					20-					
	-				 -					
-					L .	-				
-	trace mica.				-	-M	3+3+5 N =8 REC =16"			
	continued on next page				25-					

	TEST Project: (Calvert Cliff	s Nucle	ar Pow	er Plant	Boring Number:	B-740
Schnal	bel Engineering LOG	Jaivert Cou	inty, Ma	iryland		Contract Number: 0 Sheet: 2 of 3	6120048
DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL		NG TESTS	REMARKS
		SM					
-							
27.0 -	FAT CLAY, moist, gray, with fine sand, trace mica	СН	47.3				
-					□ □ □ 3+4+5		
-					N =9 REC =	18"	
_							
-							**Resumed
-	gray and dark gray, trace fine to				4+5+7		drilling at 7:00 AM on 7/21/06.
	medium sand and organic matter (±1%).				-35- A REC =	18"	
-							
-							
-	with fine to medium sand, contains clayey sand lenses.				5+7+1 N =17	0	
-					-40-10 REC =	18"	
-							
42.0 -	ELASTIC SILT, moist, gray, trace fine to medium sand mica, and organic matter	MH	32.3				
	(±1%).				6+10+	12	
_					N =22	18"	
_							
47.0 -	CLAVEY CAND fine to medium		27.3				
-	grained, moist, dark gray and dark	SC					
49.0 -	SILTY SAND fine to medium grained	SM	25.3		30+50	/4" /4"	*Moderate to
	moist, dark gray, trace fine to medium shell fragments (±5%), contains weak to	Civil Civil			-50- REC =	10"	advancement from 49 to 50.5
	moderately cemented sand layers, strong HCI reaction.						ft (strong rig chatter).
52.0 -	SANDY LEAN CLAY, fine to medium,	CL	22.3				
-	frioist, gray, trace fine to medium shell fragments (±5%), moderate HCl reaction						
-					N =11	18"	
							*Moderate difficulty in
							advancement
	continued on next page						

SC	TEST Project: C	Calvert Cliff Calvert Cou	s Nucle inty, Ma	ar Pow ryland	er Plant	Bo	ring Number:	B-740
Schnat	el Engineering LOG	1	-	-	I	Sh	eet: 3 of 3	120040
DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL	SA DEPTH	MPLING DATA	TESTS	REMARKS
-	contains clayey sand pockets, moderate HCl reaction. oliveish gray below 59.8 ft.	CL				11+6+13 N =19 REC =18"		from 56.5 to 58 ft (slight rig chatter). *Intermittent moderate difficultly in rotary advancement
62.0 - - - -	CLAYEY SAND, fine to medium grained, oliveish gray and dark gray, mostly fine to medium shell fragments (±50%), strong HCI reaction.	SC	12.3		 ⊠ - 65 	50/3" N =50/3" REC =2"		from 58.5 to 63.5 ft (slight to moderate rig chatter). *Moderate to difficult rotary advancement from 63.5 to 64 ft (strong rig chatter).
67.0 - - - - -	SILTY SAND, fine to medium grained, wet, gray, few fine to coarse shell fragments (±10%), moderate HCI reaction.	SM	7.3		 	5+6+8 N =14 REC =18"		*Intermittent moderate difficultly in rotary advancement from 68.5 to 73.5 ft (slight to moderate rig chatter).
- 75 0	trace fine to medium shell fragments (±5%), weak HCl reaction.		-07			24+11+12 N =23 REC =18"		
	BOTTOM OF BORING @ 75.0 FT.							

Schnatz	TEST Project: C bel Engineering LOG C	Calvert Clif Calvert Co	fs Nucle unty, Ma	ar Pow Iryland	ver Pla	nt	Bo Co Sh	oring ontra neet:	Number: ct Numbe 1 of 3	er: 061200	B-741
Boring C						Gr	oundwater	Obs	ervations		
Boring C	MALAGA, NEW JERSEY					D	ate Tin	ne	Depth	Casing	Caved
Boring F	oreman: J. Blemings		Enco	untere	d	7	/13	-	53.5'	0.0'	
Drilling E	Equipment: CME-750 (ATV)										
Schnabe	I Representative: M. Arles										
Dates S	Started: 7/13/06 Finished: 7/13/06										
Location	: Northing: 213760.48 ft Easting: 961029.82 ft										
Ground S	Surface Elevation: 81.4 (feet)	_	-								
DEPTH (FT)	STRATA DESCRIPTION	CLASS	ELEV. (FT)	WL	DEP	S. TH	AMPLING DATA		TEST	S F	REMARKS
0.5	FL, R AND TOPSOIL.		80.9			M	WOH/18"				
	SANDY SILT, fine to medium, moist, orangeish brown, contains root	ML	70.4		-	-Ň	N = WOH/ [,] REC =12"	18"			
2.0		SP-SM	/9.4		Γ		0.0.4				
-	and gravel, fine to coarse grained,				F	HVI	2+3+4 N =7				
_	moist, brownish orange.				F	$ \square $	REC =16"				
4.5	POORLY GRADED SAND with gravel.	SP	76.9		_						
	fine to coarse grained, moist, brownish				- 5 -	M	3+5+7				
-	orange.				-	HM	N =12 REC =16"				
					F						
							6+15+1/				
-					F	IXI	N =29				
-					-	ЦΔ	REC =15"				
					L_10_						
							E 1 0 1 0				
-					F	HXI	5+8+8 N =16				
-					F	ЦШ	REC =14"				
12.0			69.4								
13.0	SILTY SAND, fine to medium grained,	SM	00.4		Γ		0.0.4				
-	moist, orange.				F	HV	3+3+4 N =7				
_					-15-	ЦШ	REC =14"				
17.0 -	SANDY SILT fine to medium moist	MI	64.4		+	-					
	orange.				L	_					
							2+2+3				
-					F	HXI	N =6				
_					-20-	$ \square $	REC =14"				
					L						
1					Γ	7					
-					F	-					
					F						
							REC =0"				
-					F						
					-25-						
	continued on next page										
			1		1					1	

	hnahal	TEST	Project:	Calvert Cliff	s Nucle	ar Pow	er Plant		Boring	Number:	B-741
Schnat	Schnabel Engineering LOG				nty, Ma	iryland			Contra Sheet	ct Number: 00	6120048
DEPTH					FI FV		s		G	2 01 0	
(FT)	STRATA D	ESCRIPT	ION	CLASS.	(FT)	WL	DEPTH	DAT	ГА	TESTS	REMARKS
				ML							
-											
27.0 -	FLASTIC SILT moi	ist arav		мн	54.4						
		ist, gray.									
							L JM	1+2+3			
							l an M	N =5 REC =1	8"		
-							F 1				
32.0 -	FAT CLAY, moist, o	arav.		СН	49.4						
-	, , , , , ,	, - <u>,</u>									
-							L -M	3+4+6			
							L_35	N =10 REC =18	8"		
_							F 1				
-											
							M	4+5+6			
_							L_40_	REC =1	8"		
-							F 1				
-							├ ┤_				
-	with sand, contains small pods of sand	cemented	l sand, nted sand				M	5+6+7 N =13			
							<u>45</u>	REC =1	8"		
17.0					04.4						
3 47.0 -	SILTY SAND, fine to	o medium	grained,	SM	34.4		[]				
5 –	cemented sand.	n gray, co	liains								
							F -IM	4+6+14 N =20			
							<u>–_50</u> _∐	REC =1	8"		
							└ ┤				
52.0					20.4						
52.0	POORLY GRADED	SAND W	ITH SILT, dark	SP-SM	23.4						
	green, with fine to a	coarse she				$\overline{\Sigma}$		40.40	24		
-	shell frag.	ICI reactio	11, 70-90%				F -11X1	N =40	21		
							<u> </u> −55– ∐	REC =1	6"		
							$ \downarrow \downarrow$				
570 -					24 4						
	SILTY SAND, fine to moist, green, with fi	o medium ne to coar	grained, se shell	SM							
	continued of	on next pag	e								
۱ <u> </u>											

Sc	hnabel TEST Project: C BORING C	alvert Cliff alvert Cou	s Nucle inty, Ma	ar Pow Iryland	er Plant	Boring Number: Contract Number: 0	B-741
Schnat	bel Engineering LOG	1	1			Sheet: 3 of 3	1
DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL	SAMPLI DEPTH D	NG TESTS	REMARKS
	fragments, moderate HCI reaction, 20-30% shell frag.	SM			4+5+7 	2 =18"	
-					13+21 N =36 REC =	+15 	64' grinding
67.0 - - - -	SANDY SILT, fine to medium, moist, green, with fine to coarse shell fragments, strong HCI reaction, 30-40% shell frag.	ML	- 14.4		 	3")/3" =10"	
-							71' grinding
72.0 -	SILTY SAND, fine to medium grained, moist, green, with fine to coarse shell fragments, strong HCI reaction, 20-30% shell frag.	SM	9.4		 N =15 REC =	9 5 =18"	
75.0 -	BOTTOM OF BORING @ 75.0 FT.		0.4				

Schnatz	hnabel TEST BORING LOG	Project: (Calvert Cli Calvert Co	ffs Nucle ounty, Ma	ar Pow ryland	ver Pla	nt	Boring Contra Sheet:	Number: ct Number 1 of 4	er: 061200	B-742
							Gro	undwater Obs	ervations		
Boring C	MALAGA, NEW JEF	IG RSEY				1	Da	te Time	Depth	Casing	Caved
Boring F	oreman: J. Blemings			Enco	untere	d	7/*	11	23.5'	0.0'	
Drilling N	Method: 4-1/4" O.D. Drag Bit (Mu	ud Rotary)									
Drilling E	Equipment: CME-750 (ATV)		-								
Schnabe	I Representative: M. Arles										
Dates S	Started: 7/11/06 Finished: 7/	/11/06									
Location	: Northing: 213472.84 ft Easting: 961217.19 ft										
Ground S	Surface Elevation: 102.4 (feet)										
DEPTH (FT)	STRATA DESCRIPTIO	ON	CLASS	6. ELEV. (FT)	WL	DEP	SА ТН	MPLING DATA	TEST	S F	EMARKS
0.5	FL, R AND TOPSOIL.			101.9			M	WOH+2+2			
-	SILT, moist, orangeish brown, sand, contains root fragments.	with	ML	100.4			-M'	N =4 REC =14"			
2.0	SILTY SAND, fine to coarse gr	rained,	SM	100.4]_].				
-	fragments.	ins root				-	1 X i	3+2+3 N =5			
4.0 -		th gravel	80	98.4		- ·	- LJ I	REC =15"			
_	fine to coarse grained, moist, o	brange.	5P			- 5 -					
							M	3+3+5 N =8			
-						-	ΠD	REC =12"			
7.0 -			SP-SC	95.4		-	+ $+$				
_	and gravel, fine to coarse grain	ned,	36-30			L .	<u> </u> ;	3+8+10			
	moist, dark orange.						M	N =18 RFC =14"			
_						- ·					
_						-10-	+				
-						Ļ .	-101	4+5.+8			
							M	N =13 RFC =14"			
_						F	1-1				
13.0 -	POORLY GRADED SAND, fin	e to	SP	89.4		- ·	+				
_	coarse grained, moist, orange.					L .	-101 :	5+7+10			
						15	M	N =17 REC =14"			
						-15-					
-						-					
						L.					
	trace clay							5+16+10			
-	แลงะ เเล่ง.					F .	X ‡	N =35			
						-20-	- ĽI I	REC =14"			
						Ļ.					
-							1				
-					∇	-	+				
_	wet.				<u> </u>	L .	-M:	7+16+21			
						0-	M	N =37 REC =10"			
-	continued on next page	•				-25-	'				

	tes	ST Project:	Calvert Cliff	s Nucle	ar Pow	er Plant	E	Boring Number: B-742	
Schna	bel Engineering	Calvert Cou	inty, Ma	iryland			Contract Number:	06120048	
DEDTU						6			
(FT)	STRATA DESC	RIPTION	CLASS.	ELEV.	WL			TESTS	REMARKS
			SP					^	
-	-								
27.0 -				75.4					
	SILTY SAND, fine to me wet, orange.	edium grained,	SM						
	-						2+3+2		
-	-					F 1 X	N =5		
	-					-30-1	REC =14	ł"	
-	-								
_	-								
	moint mottled gravish a	rango					1+1+1		
-		i ange.				F - 1 X	N =2		
-	-					-35-1	REC =18	3"	
-	-								
37.0 -				65.4					
	SANDY SILT, fine to me mottled gravish orange.	edium, wet,	ML						
-	-					F - 1 X	N = WOH	H/18"	
	-					-40-1	REC =18	3"	
-	-								
420 -				60.4					
	SILTY SAND, fine to me wet, grav.	edium grained,	SM						
							1.0.0		
-	-					F - 1 X	N =5		
	-					-45-1	REC =18	3"	
-	-								
_	-								
5							2+2+4		
- 5	-					F - 1 X	N =7		
	-					-50-1	REC =18	3"	
- 5	1								
52.0 -				50.4					
	SANDY LEAN CLAY, fii moist, grav.	ne to medium,	CL						
] ,3-,						1+2+4		
- 1	1					F -1 X	N =6		
—	-					<u> </u> -55- ∐	REC =18	3"	
-	-								
570 -				45.4					
	FAT CLAY, moist, gray,	trace sand.	СН						
	continued on ne	ext page				[]]			

Second Engineering BORING LOG Calvert County, Maryland Contract Number: 08120048 DEPTH STRATA DESCRIPTION CLASS. ELEY (FT) WL SAMPLING DEPTH DATA TESTS REMARKS With silt. OH OH OH OH ATA TESTS REMARKS with silt. OH OH OH OH OH OH OH OH OH Vith silt. OH OH OH OH OH OH OH OH OH Vith silt. OH OH OH OH OH OH OH OH Vith silt. OH OH OH OH OH OH OH Vith silt. OH OH OH OH OH OH OH Vith silt. OH OH OH OH OH OH		-	TEST PI	roject: Ca	Calvert Cliffs Nuclear Power Plant					Boring Number: B-742		
Operation Operation STRATA DESCRIPTION CLASS. ELEV. (FT) WL SAMPLING TESTS REMARKS 0-1 STRATA DESCRIPTION CLASS. ELEV. (FT) WL SAMPLING TESTS REMARKS	Se	chnal	BORING	Ca	lvert Cou	nty, Ma	ryland		C	ontract N	lumber: 0	6120048
CFT) STRATA DESCRIPTION CLASS. CFT WL DEPTH DATA TESTS REMARKS 0	DE	отн						SA				
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	(F	T)	STRATA DESCRIPTION	N	CLASS.	(FT)	WL			A	TESTS	REMARKS
With silt.					СН					•		
72.0 SILTY SAND. fine to medium grained, solutions continued on next page SM 72.0 SILTY SAND. fine to medium grained, solutions continued on next page SM 72.0 SILTY SAND. fine to medium grained, solutions continued fragments, store find to medium, moist, green, with fine to coarse shell fragments, store HCI reaction, 20-30% shell frag. 30.4 72.0 SILTY SAND. fine to medium, moist, green, with fine to coarse shell fragments, store HCI reaction, 20-30% shell frag. 30.4 72.0 SILTY SAND. fine to medium, moist, green, with fine to coarse shell fragments, store HCI reaction, 20-30% shell frag. 30.4		-						X	2+5+7 N =12			
72.0 SILTY SAND, fine to medium grained, most, dark graysh green, contains shell fragments, strong HCI reaction, 0-2% shell frag. SM 30.4		_						-60-M	REC =18	•		
72.0 SiLTY SAND, fine to medium grained, moist, dark graysh green, contains shell fragments, storg HCI reaction, 0-3% shell frag. SM 82.0 30.4 - <td></td> <td>_</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td> </td> <td></td> <td></td> <td></td> <td></td>		_										
72.0 SiLTY SAND, fine to medium grained, moist, dark grayish green, contains commended sand, trace fine to medium grained, 0.5% shell frag. SM 30.4		_										
with silt. With silt. With silt. With silt. With silt. T2.0 SILTY SAND, fine to medium grained, moist, dark grayship green, contains shell fragments, moderate HCI reaction, 0-5% shell frag. 82.0 SANDY SILT, fine to medium, moist, green, with fine to coarse shell fragments, strong HCI reaction, 20-40% shell frag. 87.0 SILTY SAND, fine to medium, grained, shell frag. 87.0 SANDY SILT, fine to medium, moist, green, with fine to coarse shell fragments, strong HCI reaction, 20-40% shell frag. 87.0 SILTY SAND, fine to medium, grained, moist, green, with fine to coarse shell fragments, strong HCI reaction, 20-40% shell frag. 87.0 SILTY SAND, fine to medium, grained, moist, green, with fine to coarse shell fragments, strong HCI reaction, 20-30% shell frag. 87.0 SILTY SAND, fine to medium, grained, moist, green, with fine to coarse shell fragments, strong HCI reaction, 20-30% shell frag. REC = 4* 900- Continued on next page												
$82.0 = \frac{1}{2} = \frac{1}{2}$		_	with silt						1+7+8			
72.0 SILTY SAND, fine to medium grained, moist, dark grayish green, contains cemented sand, trace fine to medium, o-5% shell frag. SM 30.4 - - - 6+18+30 82.0 SANDY SILT, fine to medium, moist, orderate HCI reaction, 0-5% shell frag. SM 20.4 - - - 6+18+30 82.0 SANDY SILT, fine to medium, moist, orderate HCI reaction, 0-5% shell frag. ML 20.4 - - - - 82.0 SANDY SILT, fine to medium, moist, orderate HCI reaction, 20-40% shell frag. ML 20.4 - - - - 87.0 SILTY SAND, fine to medium grained, moist, green, with fine to coarse shell frag. ML - - - - - 87.0 SILTY SAND, fine to medium grained, moist, orderate HCI reaction, 20-40% shell frag. SM 15.4 -		_	with Sit.					X	N =15			
72.0 SILTY SAND, fine to medium grained, remented sand, trace fine to medium, subst, cemented sand, trace fine to medium, subst, cemented sand, trace fine to medium, o-5% shell frag. 30.4								-65-1	REC =18			
72.0 SILTY SAND, fine to medium grained, moist, dark graysh green, contains commeted sand, trace fine to medium shell fragments, moderate HCI reaction, 0-5% shell frag. 30.4		-										
72.0 SILTY SAND, fine to medium grained, molist, dark gravish green, contains commende and, trace fine to medium shell fragments, moderate HCI reaction, 0-5% shell frag. 30.4 Image: SM Fine State		-										
72.0 SILTY SAND, fine to medium grained, moist, dark grayish green, contains cemented sand, trace fine to medium shell fragments, moderate HCI reaction, 0-5% shell frag. SM 30.4		_										
72.0 SILTY SAND, fine to medium grained, moist, cemented sand, trace fine to medium, ashell tragments, moderate HCI reaction, 0-3% shell frag. 30.4 -70-W REC = 18" 82.0 SANDY SILT, fine to medium, moist, green, with fine to coarse shell fragments, strong HCI reaction, 20-40% shell frag. 30.4 -75-W REC = 18" 82.0 SANDY SILT, fine to medium, moist, green, with fine to coarse shell fragments, strong HCI reaction, 20-40% shell frag. ML 20.4 -76-W REC = 18" 87.0 SLTY SAND, fine to medium grained, shell frag. SM 15.4 -78-W REC = 18" 82' Switched to roller bit		_							5+7+7			
72.0 SILTY SAND, fine to medium grained, moist, dark grayish green, contains commercied sand, trace fine to medium, shell fragments, moderate HCI reaction, 0-5% shell frag. 30.4 - <								M	N =14 REC =18			
72.0 SILTY SAND, fine to medium grained, moist, dark grayish green, contains cemented sand, trace fine to medium shell fragments, moderate HCI reaction, 0-5% shell frag. SM 30.4 6+18+30 N=48 REC = 18" 82.0 SANDY SILT, fine to medium, moist, green, with fine to coarse shell fragments, strong HCI reaction, 20-40% shell frag. ML 20.4 - 87.0 SILTY SAND, fine to medium grained, moist, green, with fine to coarse shell fragments, strong HCI reaction, 20-30% shell frag. ML 20.4 - 87.0 SILTY SAND, fine to medium grained, moist, green, with fine to coarse shell fragments, strong HCI reaction, 20-30% shell frag. SM 15.4 -												
72.0 SILTY SAND, fine to medium grained, moist, dark grayish green, contains comented sand, trace fine to medium shell fragments, moderate HCI reaction, 0-5% shell frag. 30.4 - - 6+18+30 N = 48 REC = 18" 82.0 SANDY SILT, fine to medium, moist, green, with fine to coarse shell fragments, strong HCI reaction, 20-40% shell frag. ML 20.4 - - - 82' Switched to roller bit 87.0 SILTY SAND, fine to medium grained, moist, green, with fine to coarse shell fragments, strong HCI reaction, 20-40% shell frag. ML 20.4 - - - - 82' Switched to roller bit		-										
82.0 SANDY SILT, fine to medium, moist, green, with fine to coarse shell fragments, strong HCI reaction, 20-30% shell frag. ML 20.4 -	72	2.0 -	SILTY SAND, fine to medium gra	ained,	SM	30.4						
82.0 SANDY SILT, fine to medium, moist, green, with fine to coarse shell frag. 20.4 		_	moist, dark grayish green, conta cemented sand. trace fine to me	ins dium								
82.0 SANDY SILT, fine to medium, moist, green, with fine to coarse shell fragments, strong HCl reaction, 20-40% shell frag. 87.0 SILTY SAND, fine to medium grained, moist, green, with fine to coarse shell fragments, strong HCl reaction, 20-40% shell frag. 87.0 SILTY SAND, fine to medium grained, shell frag. SILTY SAND, fine		_	shell fragments, moderate HCI re	eaction,				M	6+18+30			
82.0 SANDY SILT, fine to medium, moist, green, with fine to coarse shell fragments, strong HCI reaction, 20-40% shell frag. 87.0 SILTY SAND, fine to medium grained, moist, green, with fine to coarse shell fragments, strong HCI reaction, 20-40% shell frag. 87.0 SILTY SAND, fine to medium grained, moist, green, with fine to coarse shell fragments, strong HCI reaction, 20-30% shell frag. 87.0 SILTY SAND, fine to medium grained, moist, green, with fine to coarse shell fragments, strong HCI reaction, 20-30% shell frag. 87.0 SILTY SAND, fine to medium grained, moist, green, with fine to coarse shell fragments, strong HCI reaction, 20-30% shell frag. Continued on next page			e e // enen nag.						REC =18	•		
82.0 SANDY SILT, fine to medium, moist, green, with fine to coarse shell fragments, strong HCI reaction, 20-40% shell frag. 87.0 SILTY SAND, fine to medium grained, moist, green, with fine to coarse shell fragments, strong HCI reaction, 20-30% shell frag. 87.0 SILTY SAND, fine to medium grained, moist, green, with fine to coarse shell fragments, strong HCI reaction, 20-30% shell frag. 87.0 SILTY SAND, fine to medium grained, moist, green, with fine to coarse shell fragments, strong HCI reaction, 20-30% shell frag. 87.0 SILTY SAND, fine to medium grained, moist, green, with fine to coarse shell fragments, strong HCI reaction, 20-30% shell frag. SM SM SM SM SM SM SM SM SM SM		_										
82.0 SANDY SILT, fine to medium, moist, green, with fine to coarse shell fragments, strong HCI reaction, 20-40% shell frag. 87.0 SILTY SAND, fine to medium grained, moist, green, with fine to coarse shell fragments, strong HCI reaction, 20-30% shell frag. 87.0 SILTY SAND, fine to medium grained, moist, green, with fine to coarse shell fragments, strong HCI reaction, 20-30% shell frag. 87.0 SILTY SAND, fine to medium grained, moist, green, with fine to coarse shell fragments, strong HCI reaction, 20-30% shell frag. 87.0 SILTY SAND, fine to medium grained, moist, green, with fine to coarse shell fragments, strong HCI reaction, 20-30% shell frag. Continued on next page												
82.0 SANDY SILT, fine to medium, moist, green, with fine to coarse shell fragments, strong HCI reaction, 20-40% shell frag. ML 20.4 - - - 82' Switched to roller bit 87.0 SILTY SAND, fine to medium grained, moist, green, with fine to coarse shell fragments, strong HCI reaction, 20-40% shell frag. 15.4 - <td< td=""><td></td><td>_</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td<>		_										
82.0 SANDY SILT, fine to medium, moist, green, with fine to coarse shell fragments, strong HCI reaction, 20-40% shell frag. 87.0 SILTY SAND, fine to medium grained, moist, green, with fine to coarse shell fragments, strong HCI reaction, 20-30% shell frag. 87.0 Continued on next page		_										
82.0 SANDY SILT, fine to medium, moist, green, with fine to coarse shell fragments, strong HCI reaction, 20-40% shell frag. 87.0 SILTY SAND, fine to medium grained, moist, green, with fine to coarse shell fragments, strong HCI reaction, 20-30% shell frag. 87.0 SILTY SAND, fine to medium grained, moist, green, with fine to coarse shell fragments, strong HCI reaction, 20-30% shell frag. 87.0 SILTY SAND, fine to medium grained, moist, green, with fine to coarse shell fragments, strong HCI reaction, 20-30% shell frag. Continued on next page		_							REC =0"			
82.0 SANDY SILT, fine to medium, moist, green, with fine to coarse shell fragments, strong HCI reaction, 20-40% shell frag. ML 20.4 4+4+5 								-80-				
82.0 SANDY SILT, fine to medium, moist, green, with fine to coarse shell fragments, strong HCI reaction, 20-40% shell frag. 20.4 4+4+5 87.0 SILTY SAND, fine to medium grained, moist, green, with fine to coarse shell fragments, strong HCI reaction, 20-30% shell frag. 15.4 - - 87.0 SILTY SAND, fine to medium grained, fragments, strong HCI reaction, 20-30% shell frag. SM 15.4 - - 900- - - - - - - - 6000000000000000000000000000000000000	3/6/08	_										
SANDY SIL 1, inte to medium, moist, green, with fine to coarse shell fragments, strong HCl reaction, 20-40% shell frag. ML -	100 82	2.0 -				20.4						82' Switched to
87.0 SILTY SAND, fine to medium grained, moist, green, with fine to coarse shell fragments, strong HCI reaction, 20-40% SILTY SAND, fine to medium grained, moist, green, with fine to coarse shell fragments, strong HCI reaction, 20-30% shell frag. <i>continued on next page</i>	ABEL.	_	SANDY SILI, fine to medium, m green, with fine to coarse shell	ioist,	ML							roller bit
87.0 SILTY SAND, fine to medium grained, moist, green, with fine to coarse shell fragments, strong HCl reaction, 20-30% shell frag. <i>continued on next page</i>	CHN		fragments, strong HCI reaction, 2 shell frag.	20-40%					4+4+5			
87.0 SILTY SAND, fine to medium grained, moist, green, with fine to coarse shell fragments, strong HCI reaction, 20-30% shell frag. <i>continued on next page</i>	S L de	_	0					- 18	N =9 REC =18			
87.0 SILTY SAND, fine to medium grained, moist, green, with fine to coarse shell fragments, strong HCl reaction, 20-30% shell frag. SM 15.4 - - 90 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -	200.02							-851-	INEC - 10			
87.0 SILTY SAND, fine to medium grained, moist, green, with fine to coarse shell fragments, strong HCI reaction, 20-30% shell frag. 15.4 - - 90 - - - - - 0 - - - - - 0 - - - - - 0 - - - - - 0 - - - - - 0 - - - - - 0 - - - - - 0 - - - - - 0 - - - - - 0 - - - - - 0 - - - - - 0 - - - - - 0 - - - - - 0 - - - - -	SPT	-										
moist, green, with fine to coarse shell fragments, strong HCl reaction, 20-30% shell frag. - - - - - - - - - - - - - - - - - - -	0 1 87	7.0 -	SILTY SAND fine to medium an	ained	SM	15.4						
shell frag. - continued on next page	20048	-	moist, green, with fine to coarse	shell	0.00							
OD - OD <td>061.</td> <td>_</td> <td>shell frag.</td> <td>20-00 /0</td> <td></td> <td></td> <td></td> <td> ■ </td> <td>REC =4"</td> <td></td> <td></td> <td></td>	061.	_	shell frag.	20-00 /0				■	REC =4"			
Zit of the second se	BLOG											
m continued on next page	ORINC											
	EST B	_	continued on next page					- 1				

	Schnabel TEST Project: BORING			alvert Cliff	s Nucle	ar Pow	er Plant		Boring Number: B-742	
Schnal		BORING	C	alvert Cou	inty, Ma	ryland			Contract Number:	06120048
DEDTU	Ser Engineering	200								
(FT)	STRAT	A DESCRIPT	ION	CLASS.	(FT)	WL	DEPTH			REMARKS
				SM						
-										
	wet, 50-70% sh	nell frag.						6+8+10		
		-					I _ IX	N =18	8"	
							-95			
-										
97.0 -	POORLY GRA	DED SAND W		SP-SM	5.4					
-	fine to medium	grained, wet,	green, with							
	HCl reaction, 20	0-30% shell fra	ag.					7+10+1	0	
100.0								N =20	8"	
100.0 —	BOTTOM OF B	ORING @ 10	0.0 FT.		2.4		-100			
00/00										
° 										
10.0										
50										
40 1										
01200										
5										

Schna	TEST Project: C bel Engineering LOG C	alvert Cl alvert Co	iffs Nuclea ounty, Ma	ar Pow ryland	ver Pla	nt	Boring Contra Sheet:	Number: Ict Number 1 of 3	: er: 061200	B-743
Boring						Gr	oundwater Obs	ervations		
	MALAGA, NEW JERSEY					D	ate Time	Depth	Casing	Caved
Boring F	Foreman: J. Blemings		Enco	untere	d	7	/10	28.5'	0.0'	
Drilling	Method: 4-1/4" Drag Bit (Mud Rotary)	-								
Drilling	Equipment: CME-750 (ATV)									
Schnabe	al Representative: M Arles									
Dates	Startad: 7/10/06 Einishad: 7/10/06	-								
Dates	Statted. 7/10/00 Finished. 7/10/00									
Location	Easting: 961232 ft									
Ground	Surface Elevation: 103.6 (feet)				1					
DEPTH (FT)	STRATA DESCRIPTION	CLASS	S. ELEV. (FT)	WL	DEP	S. TH	AMPLING DATA	TEST	S F	REMARKS
0.3	FL, R AND TOPSOIL.	MI	103.3			M	WOH/18"			
-	SILT, moist, orangeish brown, with sand, contains root fragments.		101.0		F	ď	N = WOH/18" REC =12"			
2.0 -	POORLY GRADED SAND WITH CLAY,	SP-SC	101.6		Γ					
-	fine to coarse grained, moist, brown, with clay				F	HM	1+2+3 N =5			
-					L	ЦШ	REC =14"			
4.5		SP	99.1							
	coarse grained, moist, brownish yellow,				- 5 -	TM	3+3+3			
-	with gravel.				F	ЧŇ	N =6			
							REC = 12			
-]						a = 4a			
-	brownish orange, with gravel, trace clay.				F	HVI	6+7+12 N =19			
-	-				L	ЦШ	REC =15"			
					-10-	1_				
-	trace gravel.				F	HM	7+12+17 N =20			
120 -			91.6		L	\square	REC =14"			
12.0	POORLY GRADED GRAVEL, moist,	GP	51.0							
-	brownish orange, with sand.				F	1				
14.0 -			89.6		F	-M	25+17+12			
	POORLY GRADED SAND, with gravel, trace clay fine to coarse grained moist	SP			4.5	IM	N =29 REC =16"			
	dark orangeish brown.				-15-	-				
-	-				╞	-				
-					L					
	1				F	+				
-	brownish orange.				F	-M	4+10+5			
19.6	EAT CLAY with silt moist grange		84.0			M	N =15 REC =12"			
					-20-					
-	-				┝	-				
22 0 -			81.6		L					
22.0	LEAN CLAY, with fine to medium	CL	01.0							
	j graineu sanu, moisi, goldenish orange.				F	-				
-	4				F	╶┤ ╞	REC =19"	w=21.1	8	
					6-			PL=1	3	
	continued on next page				-25-					

<sup>Comments:
1. Boring backfilled with cement/bentonite grout through tremie pipe upon completion.
2. * = See Appendix I for additional lab testing data.
3. Ground water observation well OW-743 installed at nearby location.</sup>

	Schnabel TEST Project:				s Nucle	ar Pow	er Plant	E	Boring Number: B-743	
Schnal	Schnabel Engineering LOG				inty, Ma	iryland		(Contract Number:	06120048
DEDTU	ber Engineering	LUU					6			
(FT)	STRAT	A DESCRIPT	ION	CLASS.	ELEV.	WL			TESTS	REMARKS
				CL				DAT	*	
27.0 -					76.6					
	POORLY GRAI coarse grained.	DED SAND, fi . wet. vellowis	ne to h orange.	SP						
-		,, ,				$\overline{\Sigma}$		10.10.1		
-							F - 1 X	N =29	1	
							-30-1	REC =12	2"	
-										
320 -					716					
52.0	SILTY SAND, fi	ine to medium	grained,	SM	71.0					
-		grayish orange								
							M	2+2+2 N =4		
							<u>35</u> []	REC =18	3"	
-										
-								REC =0"		
							-40-			
	gray.						M	WOH+3+ N =6	+3	
							-45-0	REC =18	3"	
47.0					56.0					
g 47.0 -	POORLY GRA	DED SAND wi	ith silt, fine	SP-SM	50.0					
		neu, moist, gra	ay.							
- 19							M	3+5+4 N =9		
							<u>50</u>	REC =18	3"	
Epo –										
FOO					E1 0					
52.0 -	POORLY GRA	DED SAND, fi	ne to	SP	0.10		[]			
		u, wei, gray.					$ \left - \right _{-} $			
							M	4+8+7 N =15		
							<u>⊢₅</u> _ ∐	REC =12	2"	
-										
					40.0					
57.0 -	FAT CLAY, mo	ist, gray, trace	sand.	СН	46.6		F 1			
	contin	ued on next pag	e							

Comments:
1. Boring backfilled with cement/bentonite grout through tremie pipe upon completion.
2. * = See Appendix I for additional lab testing data.
3. Ground water observation well OW-743 installed at nearby location.

	hnahal	TEST	Project: C	alvert Cliffs	s Nucle	ar Pow	er Plant		Boring	Number:	B-743
	maper	C	alvert Cou	nty, Ma	ryland			Contra	ct Number: 06	6120048	
Schna	bei Engineering	LUG							Sneet:	3 01 3	
DEPTH	STRATA	A DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	5		IG TA	TESTS	REMARKS
				СН	. ,		DEPTH		AIA		
-				011			10	3+5+7			
								N =12 REC =	18"		
-											
-	_										
-											
								3+6+8			
							r ix	N =14	10"		
	_						-65-		10		
-											
-	-										
_											
								6+8+10	,		
-							F 1 X	N =18	10"		
							-70-	REC =	18		
-	_										
-											
74.0 -	CLAYEY SAND,	fine to medi	um	SC	29.6		- 11	N =24	18"		
75.0 -	BOTTOM OF BO	DRING @ 75	.0 FT.		28.6		-75				
8											
3/6/0											
GDT											
ABEL											
20HN											
G											
200.00											
SPT											
LOG											
0048											
0612											
LOG											
SING											
BQF											
TES											

Comments:
1. Boring backfilled with cement/bentonite grout through tremie pipe upon completion.
2. * = See Appendix I for additional lab testing data.
3. Ground water observation well OW-743 installed at nearby location.

Schna	bel Engineering LOG	Calvert Cl Calvert Co	liffs Nucle ounty, Ma	ar Pow ryland	ver Pla	nt	Boring Contra Sheet:	Number: Inct Number 1 of 4	er: 06120	B-744
Devine						Grou	ndwater Obs	ervations		
Boring	FREDERICK, MARYLAND	S, INC.				Date	e Time	Depth	Casing	Caved
Boring F	Foreman: T. Connelly		Enco	untere	d	6/20)	18.5'		
Drilling	Method: 3-7/8" OD Tri-cone Roller Bit		Start	of da	y	6/21	1	20.0'		
Drilling	Equipment: Diedrich D-50 (ATC)	-								
Schnabe	el Representative: R. Vinzant									
Dates	Started: 6/20/06 Finished: 6/21/06									
Location	n: Northing: 216377.3 ft Easting: 959963.38 ft									
Ground	Surface Elevation: 113.3 (feet)				1					
DEPTH (FT)	STRATA DESCRIPTION	CLAS	S. ELEV. (FT)	WL	DEP	SAN TH	IPLING DATA	TEST	s i	REMARKS
0.5	FL, R AND TOPSOIL.		112.8							
-	POORLY GRADED SAND WITH SILT, fine to medium grained, moist, light	SP-SN	Л		-	-	+5+7 =12 FC =18"			
2.0 -	brown.	SP	111.3		F					
-	POORLY GRADED SAND, fine to medium grained, moist, light gravish				F		+8+9 =17			
40 -	white.		109.3		L	_[[]] R	EC =18"			
4.0	POORLY GRADED SAND WITH SILT,	SP-SN	Л 100.0							
	orangeish brown.				- 5 -	4-	+6+6			
-					F		=12 EC =18"			
_					L		20 - 10			
	Mod opprophend						1516			
-					F		+5+6 =11			
	-				-		EC =18"			
_	_				L_10-					
	Light vellowich brown Final mode and						1416			
-	Light yellowish brown, Fine - med. sand.				F		+4+6 =10			
-	-				F	_[[]] R	EC =18"			
	light commists because Mark as an a									
-	sand.				F		+3+3 =6		Chi	ange from
					-15-	_∐ R	EC =10"		hol	low stem
									aug	jer to mud arv drilling
-					Γ	7				j • j
-	-				-	-				
-	-				F					
	Wet vellowish orange			¥		M 4-	+3+4			
-					F	<u> </u>	=7			
; -	4				-20-	⊣Ľ́́́I R	EC =18"			
-	4				F	4				
-	1				F	1				
-	-				F					
-	Orangeish brown, contains gravel.				L	4-	+2+2			
						M R	=4 EC =18"			
	continued on next page				-25-	<u> </u> _ ``	10			

Comments:
1. Boring backfilled with cement/bentonite grout through tremie pipe upon completion.
2. * = See Appendix I for additional lab testing data.
3. Ground water observation well OW-744 installed at nearby location.

3	6	TEST Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	Boring Number:	B-744
	Chanak	BORING C	alvert Cou	inty, Ma	ryland		Contract Number: 0	6120048
	schnat					CAMPLIN		
	FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL		TESTS	REMARKS
			SP-SM					
	_							
2	70 -			86.3				
		CLAYEY SAND, fine to medium grained, moist, dark greenish gray.	SC					
		contains mica.						
	-					-		
	_					-30-10 REC =	18"	
3	1.0 -	CANDY FAN CLAY, find to modium		82.3				
	_	moist, dark greenish gray, contains						
		mica.						
	-					N =6		
	_					-35-10 REC =	18"	
3	6.0	CLANEY CAND fine to medium		77.3				
	_	grained, moist, dark greenish gray,	SC					
		contains mica.						
	-					- $ $		
	_					-40-12 REC =	18"	
	_							
	20 -			71.3				
	2.0	LEAN CLAY, moist, dark greenish gray, with sand contains mica Fine - med	CL	71.0				
		sand.						
	-					- $ N = 16$		
	_					-45-12 REC =	18"	
4	6.0 -	OU TV OAND for to get diver and in a	014	67.3				
	_	moist, dark greenish gray, contains	SIVI					
/08		mica.						
T 3/6	_							
EL.GD	-					- $ N = 15$		
NABE	_					-50-12 REC =	18"	
SCH	_							
GPJ								
T 700								
G SP	-							
3 PLC	-	Contains cemented sand.				⊢ – <u>\</u> 13+30- \ N =60	+30	
2004(_					-55- <u> </u>	18"	
9061	_							
BLOC								
DRINC								
ST BC	-	continued on next page				- 11		
μ								

Comments:
1. Boring backfilled with cement/bentonite grout through tremie pipe upon completion.
2. * = See Appendix I for additional lab testing data.
3. Ground water observation well OW-744 installed at nearby location.

	6	TEST Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	Boring Number:	B-744
	Schnal	Del Engineering LOG	alvert Cou	nty, Ma	ryland		Contract Number: 0 Sheet: 3 of 4	6120048
	DEPTH		01.400	ELEV.	14/1	SAMPLI	NG TESTS	DEMARKS
	(FT)	STRATA DESCRIPTION	CLASS.	(FT)	VVL	DEPTH D	ATA	REMARNS
		Weak HCI reaction.	SM			4+6+7	,	
	_					N =13	=18"	
	-							
	62.0 -	CLAYEY SAND, fine to medium	SC	51.3				
	-	grained, moist, dark greenish gray, weak HCI reaction, <5% med coarse						
	-	shell fragments, no cemented sand.				– – – – – – – 6+6+7 N =13	,	
						65 [] REC =	=18"	
	-							
	-							
	_							
	-	Strong HCI reaction, <10% shell				4+50/4	4" //"	
		inaginenta.				70 REC =	=10"	
	-							
	72.0 -			41.3				
	72.0 +	SILTY SAND, fine to medium grained, moist, greenish gray, moderate HCI	SM	_				
	_	reaction, 10-20% shell fragments.				8+11+	-35	
						N =46	=18"	
						_75		
	_							
	-							
	-	Weak HCI reaction 5 15% shall						
	-	fragments.				N =16	-19"	
88							-10	
T 3/6/	-							
EL.GD	-							
INABE	-							
J SCI	-	Moderate HCI reaction.				10+13	+13	
00.GF						85 / REC =	=18"	
SPT 7	-							
PLOG	-							
20048	-							
G 061	-	Weak HCI reaction.					1	
lG LO(-90- REC =	=18"	
BORIN	_							
TEST		continued on next page						

Comments:
1. Boring backfilled with cement/bentonite grout through tremie pipe upon completion.
2. * = See Appendix I for additional lab testing data.
3. Ground water observation well OW-744 installed at nearby location.
| | TES | T Project: (| Calvert Cliff | s Nucle | ar Pow | er Plant | | Boring Number: | B-744 |
|---------|---------------------------|--------------|---------------|--------------|--------|--------------|-----------------|--------------------|---------|
| Schnat | BORI | NG (| Calvert Cou | inty, Ma | ryland | | | Contract Number: (| 6120048 |
| DEPTH | | • | | FI FV | | s | | 3 | |
| (FT) | STRATA DESCR | IPTION | CLASS. | (FT) | WL | DEPTH | | TESTS | REMARKS |
| | | | SM | | | | | | |
| - | | | | | | | | | |
| - | | | | | | | | | |
| - | No shell fragments. | | | | | 17 | 5+8+11
N =19 | | |
| | | | | | | <u>95</u> [] | REC =18 | 3" | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | Chrone LICI reaction 20.2 | | | | | | 0.44.05 | _ | |
| - | fragments. | | | | | 11 | N =39 | | |
| 100.0 — | BOTTOM OF BORING @ | 100.0 FT. | | 13.3 | | -100- | REC =18 | 3" | |
| | _ | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| 8 | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| 5 | | | | | | | | | |
| 5 | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| 2 | | | | | | | | | |

Comments:
1. Boring backfilled with cement/bentonite grout through tremie pipe upon completion.
2. * = See Appendix I for additional lab testing data.
3. Ground water observation well OW-744 installed at nearby location.

Schna	bel Engineering LOG	Project: Calve Calve	ert Clif ert Cou	fs Nucle unty, Ma	ar Pow ryland	ver Pla	nt		Boring Contra Sheet:	Number: Ict Number 1 of 3	e r: 06	61200	B-745
Baring							Gr	oundv	vater Obs	ervations			
Boring C	FREDERICK, MAR	YLAND	U.				D	ate	Time	Depth	Cas	ing	Caved
Boring F	oreman: D. Reese			Enco	untere	d	5	/23		Dry	-	-	
Drilling	Method: 2-15/16" OD Tri-cone F	Roller Bit (Mud Ro	tary)	Start	of day	v	5	/24		11.0'	4.0	0'	
Drilling	Equipment: CME-75 (Truck)		-			-							
Schnabe	el Representative: M. Arles												
Dates	Started: 5/23/06 Finished: 5	5/24/06											
Location	n: Northing: 215971.2 ft Easting: 960529.02 ft												
Ground	Surface Elevation: 111.7 (feet)												
DEPTH (FT)	STRATA DESCRIPT	ION CI	ASS.	ELEV. (FT)	WL	DEP	S. TH	AMPL C	ING DATA	TEST	s	R	EMARKS
0.4	ROOTMAT AND TOPSOIL.		0	111.3			M	1+2+	4			0-4'	Hollow
-	SANDY LEAN CLAY, fine to o moist, brown, contains root fra	coarse, agments.	CL			-	-M	N =6 REC	=15"			sten	nauger
2.0 -	CLAYEY SAND, fine to mediu	ım	SC	109.7		F	1_						
	grained, moist, brown, contain	ns root				-	ЧM	5+6+	5				
3.5	POORLY GRADED SAND W fine to coarse grained, moist,	ITH CLAY, S brown.	P-SC	- 108.2		-	$ \Delta $	REC	=18"			4-40 tri-co bit)' 2-15/16 one roller
-						- 5 -	M	2+2+	2				
-						F	HΜ	N =4 REC	=11"				
7.0 -				104.7		F	_						
	fine to coarse grained, wet, ye	th gravel, ellowish	SP					3+3+	4				
	brown.						IX	N =7	-10"				
-	-					F		REC	-10				
-						-10-	-						
_						L	M	3+4+	7				
							IX	N =1	1 -11"				
-	-					F		RLC	-11				
13.0 -			280	98.7		F	-						
	and gravel, fine to coarse gra	ined,	30			L	Π	3+8+	5				
3	moist, yellowish orange.						IX	N =1:	3 =10"				
	-					-15-	1	NLO	-10				
-	-					-	-						
						L							
-	-					F	1_						
-	orange.					F	ЧM	4+5+	7				
							M	REC	<u>~</u> =12"				
						20-							
	-					F	-						
-	-					F	_						
22.5	POORLY GRADED SAND wi	th gravel.	SP	89.2		L							
	fine to coarse grained, moist,	orange.				Ī		0.4	7				
-	-					F	- \/	3+4+ N =1	/ 1				
<u> </u>						-25-	ЦЦ	REC	=3"				
5	continued on next pag	e											
						I							

	bachal	Project:	Calvert Cliff	s Nucle	ar Pow	er Plant		Boring	Number:	B-745	
School	Chinabel Engineering BORING Innabel Engineering LOG 'TH STRATA DESCRIPTION			Calvert Cou	nty, Ma	ryland			Contra Shoot	ct Number: 0	6120048
DEDTU	ser Engineering	200					- C		Gineet:	2013	
(FT)	STRAT	A DESCRIPT	ION	CLASS.	ELEV. (FT)	WL			ГЛ	TESTS	REMARKS
				SP							
-											
27.5	POORLY GRAI	DED SAND W	ITH SILT,	SP-SM	84.2						
	fine to coarse g	rained, moist,	orange.					7+0+11			
-							F 1 X	N =20			
							-30-0	REC =8	"		
-											
-								4.0.0			
-	_						F -1 X	N =16			
							-35-1	REC =1	0"		
-											
_											
-								4.4.5			
-							F -1 X	4+4+5 N =9			
							<u> </u> _40_ ∐	REC =1	0"		
_											
-								0.40.4			
	trace gravel.						F -1 X	8+13+14 N =27	4		
	_						-45-0	REC =1	8"		
-											
47.0					647						
9 47.0 -	SILTY GRAVE	L, fine and coa	arse	GM	04.7						
	grained, wet, or	ange, with sa	iu.								
- 19							F -IM	3+8+6 N =14			
							<u>–₅0</u> _[]	REC =1	2"		
							[]				
53.0 -	FAT CLAY, mo	ist, dark gray,	with sand.	СН	58.7		$ \mid \mid $				
- N		2 .					M	3+3+5 N =8			
	ļ						<u>⊢₅</u> _ ∐	REC =1	8"		
560 -					55.7						
0.0 -	LEAN CLAY, m	ioist, dark gray	/, with	CL	55.7						
	Sanu.						F 1				
- 12	contin	ued on next pac	e				├ ┤				

	hashal	TEST	Project: Ca	alvert Cliffs	s Nucle	ar Pow	er Plant		Boring	Number:	B-745
Sahaa	BORING Calvert County, Maryland						Contra	ict Number: 06	6120048		
Schna	bei Engineering	LUG							Sneet:	3 01 3	
DEPTH (FT)	STRATA DE	SCRIPTI	N	CLASS.	ELEV. (FT)	WL			NG	TESTS	REMARKS
				CL	. ,			D#	AIA		
-	-						1	3+3+4			
_	_							REC =	18"		
-	-										
-	-										
-	-										
_	_							5+6+7			
								N =13	18"		
							-65	1			
-	-										
67.0 -	CLAVEY SAND fine	to mediu	n	SC	44.7						
-	grained, moist, gree	nish gray,	with silt.	50							
								3+4+6			
								N =10	18"		
							-70	1			
-	-										
72.0 -	SILTY SAND fine to	medium	rained	SM	39.7						
-	moist, greenish gray		graineu,	SIM							
								7+15+	35		
								N =50	18"		
75.0	BOTTOM OF BORIN	NG @ 75.0) FT.		36.7		-75	1			
80											
3/6/											
GDI											
IABEI											
SCHN											
GPJ											
. 700.											
LdS SP1											
PLO											
20048											
0612											
LOG											
RING											
DI BO											
TES											

	TEST	Project: Ca	alvert Clif	fs Nucle	ar Pow	er Pla	nt		Boring	Number:			B-746
Schna	abel Engineering LOG	i Ca	alvert Cou	unty, Ma	iryland				Contra Sheet:	ct Number 1 of 3	er: 06	12004	8
Boring	Contractor: CONNELLY AND	ASSOCIATES.	INC.				Gr	oundw	ater Obs	ervations			
j	FREDERICK, MAI	RYLAND					D	ate	Time	Depth	Casi	ng	Caved
Boring	Foreman: T. Chew	ollor Bit (Mud B	Poton	Enco	untere	d	7	/18		7.5'			
Drilling	Equipment: Diedrich D-50 Turk	o (Track)	(Otal y)										
Schnab	el Representative: K Megginso	on											
Dates	Started: 7/18/06 Finished:	7/18/06	-										
Locatio	n: Northing: 215743.35 ft Easting: 960721.36 ft												
Ground	Surface Elevation: 82.8 (feet)												
DEPTH	STRATA DESCRIPT	ΓΙΟΝ	CLASS.	ELEV.	WL		S	AMPL	ING	TEST	s	RE	MARKS
	Ecrest litter, rootmat and top	soil		82.5		DEP	TH	D	ATA 2"			*AWJ	rods
0.0	LEAN CLAY, moist, brown, v medium sand, contains root	vith fine to fragments.	CL	02.0			-	N =2 REC	=18"			used. *4-1/4 Hollov	" I.D. v Stem
2.0	SILT, moist, yellowish brown grayish brown, with fine to m sand.	and edium	ML	- 80.8				3+5+9 N =14	9	w=14.4 *	%	Auger from (rs used) to 13.5 ft
	fine sandy below 3.5 ft.					-	ЦЦ	REC	=18"				
4.5	CLAYEY SAND, fine to coars moist, yellowish brown and g brown.	se grained, Irayish	SC	- 78.3		- 5 -	M	5+9+ ⁻ N =20	11				
6.0	SILTY SAND, fine to coarse	grained,	SM	- 76.8			ЧΔ	REC	=18"				
	gravel.				$\overline{\Sigma}$	L .		2+2+2	1	w=25.1	%		
	_						Ŵ	N =3 REC	=18"				
-						-10-							
	_						M	2+2+2	1				
	_					L .	Ň	N =3 REC :	=18"				
13.5	_ CLAYEY SILTY SAND, mois	it,	SC-SM	69.3				REC	=24"	w=27.2	2%		
80/0	orangeish brown					45				LL=2: PL=2	5	*Swite	ched to
- 						- 15-				*		3-7/8" Tri-co	' O.D. ne roller
EL.G	-											bit bel ft.	low 13.5
HNAB	-												
	_					-							
5. 00	 orangeish brown below 19 ft.					-	HM	4+4+3 N =7	3				
	-					-20-	ЦЦ	REC	=18"				
	_					- ·							
22.0		Gara A		60.8		Ļ .							
10017	_ FAT CLAY, moist, gray, with medium sand, contains claye	tine to ey sand	СН			L .							
	pockets and layers.					L.		3+4+4	1	w=30.8	8%		
NINC						0-	\mathbb{W}	N =8 REC :	=18"	LL=52 PL=1	2		
	continued on next pag	ge				-25-							
<u>"</u>													

	TEST Project: C	alvert Cliff	s Nucle	ar Pow	ver Plant	Boring Number:	B-746
Schna	bel Engineering LOG	alvert Cou	inty, Ma	aryland		Contract Number: 0 Sheet: 2 of 3	6120048
DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL		NG TESTS	REMARKS
_		СН				*	
27.0 -	ELASTIC SILT, moist, gray and dark gray, trace fine to medium sand and mica contains clavey sand pockets	МН	55.8				
-					4+4+6 N =10 REC =	-18"	
32.0 -	FAT CLAY, moist, gray and dark gray, trace fine to medium sand and mica.	СН	50.8		 	w=34.8%	
34.5 	contains silty sand layer from 34.2 to 34.5 ft, wet. ELASTIC SILT, moist, gray, trace fine to medium sand and mica.	MH	48.3			=18" LL=64 PL=24	
	light greenish gray, contains sandy elastic silt pockets.				 40 	-18"	
42.0 -	SANDY SILT, fine to medium, moist, gray, trace mica, contains clayey sand pockets and indurated lean clay pockets.	ML	40.8		 	w=29.2% LL=40 PL=34 *	*Perceptible
- 0.77	SILTY SAND, fine to medium grained, wet, dark gray, little fine to coarse shell fragments (±15%), contains black particles (1/16 inch), moderate HCI reaction, contains strongly cemented sand pockets. trace fine shell fragments (±1%) below 49.8 ft.	SM	35.8		 	+35 =18"	increase in rotary resistance from 47 to 48.5 ft.
52.0 -	POORLY GRADED SAND WITH SILT, fine to medium grained, wet, gray, trace fine to medium shell fragments (±1%), contains black particles (1/16 inch), weak HCI reaction.	SP-SM	30.8		42+50 42+50 N =50. REC =	/3" /3" :10"	*Increase in rotary resistance from 53.5 to 58.5 ft (slight
57.0 -	SILTY SAND, fine to medium grained, wet, gray, few fine to medium shell continued on next page	SM	25.8				intermittent rig chatter).

SC	TEST Project: C	alvert Cliff	s Nucle	ar Pow rvland	er Plant	Boring	g Number:	B-746
Schnat	pel Engineering LOG		inty, inte	- yiuiiu		Sheet	act Number: 00	5120048
DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL	SAM DEPTH	PLING DATA	TESTS	REMARKS
	fragments (±10%), contains black particles (1/16 inch) and shell bed layers.	SM			44 60	+40+27 =67 EC =16"	w=17.9%	*Moderate to difficult rotary
62.0 - - - -	CLAYEY SAND, fine to medium grained, moist, light greenish gray, few fine to coarse shell fragments (±10%), contains moderately cemented sand pockets, strong HCI reaction.	SC	20.8		 ⊠ 50 N = -65 RE	/5" =50/5" EC =5"		from 62 to 63.5 ft (slight to moderate rig chatter). *Difficult to very difficult rotary advancement from 63.5 to 65 ft and 66.5 to 67 ft (strong rig
67.0 - - - - -	SILTY SAND, fine to medium grained, wet, gray and greenish gray, few fine to coarse shell fragments (±15%), contains black particles (1/16 inch), strong HCI reaction.	SM	15.8		 	7+9 =16 EC =18"	w=24.8%	chatter).
- - 75 0	gray, little fine to coarse shell fragments (±20%).		7.8		7+ 7+ - 75 - 8	12+15 =27 EC =18"		
	BOTTOM OF BORING @ 75.0 FT.							

Schna	TEST Project: C bel Engineering LOG C	Calvert Clif	fs Nucle unty, Ma	ar Pov ryland	ver Pla	nt	Boring Contra Sheet	g Number: act Numbe : 1 of 3	er: 061200	B-747
Boring	Contractor: CONNELLY AND ASSOCIATES	S. INC.				Gro	undwater Obs	servations		
	FREDERICK, MARYLAND					Da	ate Time	Depth	Casing	Caved
Boring F	oreman: D. Reese		Enco	untere	d	7/	13	14.0'		
Drilling	Equipment: Diedrich D-50 (ATC)									
Schnabe	el Representative: R. Vinzant									
Dates	Started: 7/13/06 Finished: 7/13/06									
Location	i: Northing: 216176.28 ft Easting: 959944.95 ft									
Ground	Surface Elevation: 90.3 (feet)		1		T					
DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL	DEP	SA TH	MPLING DATA	TEST	S F	REMARKS
0.5	FL, R AND TOPSOIL.	014	89.8				4.4.0			
-	SILTY SAND, fine to medium, moist, yellowish brown, contains root	SM			-		1+1+2 N =3 REC =18"			
	hagments, and organic matter.				Γ		0.4.4	w=7.5	2/2	
					F	HVI	2+4+4 N =8	*	/0	
4.0 -			86.3		F	Ш	REC =18"			
	SANDY SILT, few root fragments, dark orangeish brown	ML			_					
-					- 5 -	1M	2+3+5	w=12.7	'%	
					-	HŇI	N =8 REC =18"			
70 -			83.3		L					
1.0	POORLY GRADED SAND WITH SILT,	SP-SM	05.5				E 1 7 1 0			
	orangeish brown.				F	HXII	5+7+8 N =15			
-					F	ЦЦ	REC =18"			
					10					
					-10-			w-20.3	0/_	
-	Few root fragments.				F	HM	1+2+2 N =4	w-20.3	70	
_					L		REC =18"			
12.5		SM	77.8							
-	wet, yellowish orange.	SIM			F					
				$\overline{\Delta}$	F	-MI	3+2+2	w=26.6	5%	
					15	M	N =4 REC =18"			
5					- 15-					
-					F	+				
_					L					
-					F					
-	Orange.				F	-1171	3+2+1	w=23.9	1%	
2						M	N =3 REC =18"			
5					– ^{20–}					
					F	+				
22.0 -	Sandy SILT, fine to medium grained,	ML	68.3		-	$\left \right $				
	moisi, gray, contains mica.				F					
- 13					F	-M	2+2+3	w=28.2	%	
					0-	M	N =5 REC =18"			
	continued on next page				25-					

	TEST	Project:	Calvert Cliff	s Nucle	ar Pow	er Plant	Boring	y Number:	B-747
Sahaa	BORING	j	Calvert Cou	nty, Ma	ryland		Contra	act Number: 00	6120048
Schna	bei Engineering LOG						Sneet:	2 01 3	
DEPTH	STRATA DESCRIPT	ΓΙΟΝ	CLASS.	ELEV. (FT)	WL	SAMI		TESTS	REMARKS
			MI	. ,		DEPTH	DATA		
-	-								
-	-							w=22.60/	
-	-						3+3 =6	w=32.0%	
_	-					RE	EC =18"		
_	4								
32.0 -	FAT CLAY, fine to medium, I	moist, dark	СН	58.3					
-		1.						04.00/	
-	-						4+6 =10	W=34.2%	
						RE	C =18"		
_	_								
-									
-	-							w=22.60/	
-	-					– – – – – – – – – – – – – – – – – – –	7+8 =15	w=32.0%	
_	-					-40-10 RE	EC =18"		
-	-								
-	-							w=27.5%	
-							5+7 =12	*	
_	-					-45-10 RE	C =18"		
-	1								
9									
- 2/0	-							w-30.4%	
- פֿ	-					/ 6+9	5+6 =11	*	
	-					RE	C =18"		
-	1								
2									
53.5				36.8			<u></u>	w=48.6%	
	gray.	greenish	MH				0+0 =12	LL=78	
	-					<u> -55</u> - ∐ RE	C =18"	rL=4/ *	
- 10	-								
- 10									
	continued on next page	ge							
Ľ									

Schnat	hnabel TEST BORING	Project: (Calvert Cliff Calvert Cou	s Nucle inty, Ma	ar Pow ryland	er Plant	B	Boring Number: Contract Number: 0	B-747 6120048
DEPTH (FT)	STRATA DESCRIPT		CLASS.	ELEV. (FT)	WL	S		TESTS	REMARKS
58.0	FAT CLAY, fine to medium, r greenish gray, contains mica	noist, dark	СН	32.3			REC =18	w=35% LL=53	
60.0 -	CLAYEY SAND, greenish gramoderate HCI reaction, mode cementation, 15% med coa fragments.	ay, erate arse shell	SC	30.3		60 		PL=16	
- - 65.0				25.3			6+7+50/3 N =57/9" REC =16	" w=27.6% LL=43 PL=20	Strong cemented sand at bottom 3" of sample
-	SILTY SAND, strong HCI rea strong cementation, 25% me shell fragments.	ction, d coarse	SM						
70.0	POORLY GRADED SAND W	/ITH SILT	SP-SM	20.3			18+14+20 N =34 REC =18) w=30.3% LL=NP PL=NP *	
-	weak HCl reaction, 15% mec shell fragments.	l coarse							
75.0 —	BOTTOM OF BORING @ 75	.0 FT.		15.3			7+9+13 N =22 REC =18	w=28.1% LL=NP PL=NP *	

Schna	bel Engineering	TEST BORING LOG	Project:	Calvert Calvert	Cliffs Coun	Nucle ty, Ma	ar Pov ryland	ver Pla	nt		Boring Contra Sheet:	Number act Number 1 of 4	er: 06120	B-74 8
Boring (Contractor: CONI	NELLY AND	ASSOCIAT	ES, INC.					Gr	ound	water Obs	ervations		
J	FRED	DERICK, MAF	RYLAND	-, -					D	ate	Time	Depth	Casing	Caved
Boring I	Foreman: T. Conne	elly				Enco	untere	ed	7	/17		8.5'		
Drilling	Method: 3-7/8" O.[D. Drag Bit												
Drilling	Equipment: Diedri	ch D-50 (ATC)											
Schnab	el Representative:	R. Vinzant												
Dates	Started: 7/17/06	Finished: 7	7/17/06											
ocatio.	n: Northing: 21603 Easting: 96028	9.74 ft 38.74 ft												
Ground	Surface Elevation:	: 82.4 (feet)												
DEPTH	STRAT		ION	CLA	SS E	ELEV.	wi		S	AMPL	ING	TEST	S F	REMARKS
(FT)	United in the second se				00.	(FT)		DEP	тн	0	DATA			
0.5	FL, R AND TOP	SOIL.		MI		81.9				1_2_	.0			
-	SANDY SILT, fir light brown, cont	ne to medium tains organic	, moist, matter.		-			-		N =4 REC	=16"			
-	_ Mottled grayish	orange, No o	rganic.					-	-	4+5+ N =1- REC	9 4 =18"			
4.5					_	77.9		F		I LO	10			
-	SILTY SAND, fir moist, mottled g fragments.	ne to medium rayish orange	grained, e, few root	SN	/			- 5 -		6+8+ N =2	12 0 -18"			
70 -						75 /				REC	=18			
-	POORLY GRAD medium to coars yellowish brown	DED SAND W se grained, w , with clay.	ITH CLAY et,	, SP-9	SC	75.4	Ţ	-	-	4+8+ N =1:	7 5 =18"			
- 9.5	-			_		72.9		-		NLO	-10			
-	CLAYEY SAND grained, wet, ora	, medium to c ange.	oarse	SC	2			-10-	-					
-	-	-						-		3+3+ N =7 REC	4 =18"			
13.0 -						60 /								
-13.0	SANDY SILT, fir dark gray, conta	ne to medium iins mica.	, moist,	MI	_	09.4		-	-	REC	=24"			
_	-							15-						
17.0 -	SANDY LEAN C	CLAY. fine to	medium.	CI		65.4		-						
-	moist, dark gray	, contains mic	ca.					-						
-	-							F		N =4	3			
-	-							-20-		REC	=18"			
- 22.0						60.4								
-	SANDY SILT, fir dark greenish gr	ne to medium ray, contains	, moist, mica.	M	-			-	-					
-	-							F	-	3+3+ N =8	5			
_	continu	ied on next pag	e					-25-		REC	=18"			

	-	TEST PI	roject: Ca	alvert Cliffs	s Nucle	ar Pow	er Plant		Boring	Number:	B-748
	C	BORING	Ca	alvert Cou	nty, Ma	ryland			Contra	act Number: 0	6120048
Н	Schnat	el Engineering LUG							Sheet:	2 of 4	
	DEPTH	STRATA DESCRIPTION	N	CLASS.	ELEV.	WL		SAMPL	ING	TESTS	REMARKS
╞	,			N / I	(,		DEPTH		ΑΤΑ		
	_			IVIL							
	_										
	-										
	-							/ 3+4+ N =9	5		
	_								=18"		
	-										
	-					·					
	_	Greenish gray, contains no sand	i.					5+7+	8		
	_							REC	=18"		
	-										
	-										
	-	With fine - med. sand.						4+5+	7		
	_						_40_		=18"		
	_										
	-										
	-					·		_			
	-	Moist, dark greenish gray, weak	HCI 3%					12+2	4+5/3" 9/9"		
	_	med coarse shell fragments.	• • •				-45-	REC	=16"		
	_										
8											
3/6/	-							_			
L'GD	-	5% med coarse shell fragment cemented sand.	ts, no					/ 7+6+ N =1	8 1		
IABE	_						-50-	REC	=18"		
SCH	_										
GP											
1 200											
G SP	-						 _		_		
PLO	-	3% med coarse shell fragment	ts.					(4+4+ N =1	6)		
20048	_						-55-	REC	=18"		
061	_										
5 LOG											
SRING	7										
ST BC	-	continued on next page									
۳Г											

Γ	6	bashal	TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant		Boring Number: B-748			
	Schnat		BORING	C	alvert Cou	nty, Ma	iryland			Contract Number:	06120048		
		i Ligineening						ç		G			
	(FT)	STRAT	A DESCRIPT	ION	CLASS.	(FT)	WL	DEPTH		TESTS	REMARKS		
F					ML								
	-							HX	18+13+ N =24	11			
	_							-60-1	REC =1	8"	penetration rate		
	_										slower		
	-	.							1				
	-	Greenish gray, r moderate cemer	noderate HC	l reaction, med					1 50/4" N =50/4				
	_	coarse shell frag	ments.					-65	REC =4	"			
	_												
	_												
	_	Dark maaniah m		nted acred					1 5.0.40				
	-	Dark greenish gi	ray, no ceme	nted sand.				F -1 X	N =19				
	_							-70-	REC =1	8"			
	-												
	_												
									7+7+9				
	-							F 1 X	N =16	0"			
	_							-75-	REC = I	0			
	-												
	-												
	_												
		Greenish gray, v	veak HCl rea	ction, 3%					7+8+9				
		med coarse sh	nell fragments	3.					N =17 RFC =1	8"			
88	_							-80	,				
3/6/	-												
GDT	-												
IABEI	_												
SCHN	_	Dark greenish g	ray.						3+5+6				
GPJ									N =11 REC =1	8"			
T 700.								-85					
G SPI	_												
PLO	-												
20048	-												
061	_	Light greenish g	ray, strong H	CI				L 10	13+26+	17			
1 LOG	_	reaction, strong - coarse shell fra	cementation, agments.	40% med.					N =43 REC =1	8"			
RING			-					-90					
ST BO	-	continu	ied on next pag	ie									
TES													

	TEST	Project:	Calvert Cliff	s Nucle	ar Pow	er Plant	Вс	oring Number:	B-748
C	BORING	i l	Calvert Cou	inty, Ma	iryland		Co	ontract Number: 0	6120048
Schnat	bel Engineering LOG			L			Sn	leet: 4 of 4	
DEPTH (FT)	STRATA DESCRIP	ΓΙΟΝ	CLASS.	ELEV.	WL	5 DEDTU		TESTS	REMARKS
			ML	. ,		DEPTH	DATA		
-									
	Dark greenish grav, weak H	Cl reaction					31+21+17		
	15% med coarse shell frag	ments.				F 1 X	N =38		
						-95-1	REC = 10		
	Weak HCI reaction. 3% med	coarse					7+12+16		
	shell fagments.					אר ד	N =28		
100.0	BOTTOM OF BORING @ 10	0.0 FT.		-17.6		-100-			
80/0/									
5									
048 T									
20									
HOM									

5	chnabel BORING	P roject: Ca	alvert Clif alvert Co	fs Nucle unty, Ma	ar Pow ryland	/er Pla	nt		Boring	Number:	er: 06	61200	B-749
Sch	habel Engineering LOG								Sheet:	1 of 3			
Borine	Contractor: CONNELLY AND AS	SOCIATES.	INC.				Gro	oundv	vater Obs	ervations			
	FREDERICK, MARY	LAND					D	ate	Time	Depth	Cas	sing	Caved
Boring	Foreman: D. Reese			Enco	untere	d	5	/23		23.5'	4.	0'	
Drillin	g Method: 3-7/8" OD Tri-cone Roller	r Bit (Mud Ro	otary)										
Drillin	g Equipment: CME-75 (Truck)												
Schna	bel Representative: M. Arles												
Dates	Started: 5/23/06 Finished: 5/2	23/06											
Locati	on: Northing: 215775.08 ft Easting: 960332.24 ft												
Groun	d Surface Elevation: 102.5 (feet)												
DEPT (FT)	H STRATA DESCRIPTIO	N	CLASS	ELEV. (FT)	WL	DEP	S/ ТН ∣	AMPL C	ING DATA	TEST	s	R	EMARKS
0.2	ROOTMAT AND TOPSOIL.		SC	102.3			TM	1+1+	2			0-4'	hollow
	- CLAYEY SAND, fine to medium	1				F	HŇ	N =3 REC	=14"			SIEI	n auger
2.0	grained, moist, brown, contains	root		100.5		L							
	POORLY GRADED SAND WIT	H CLAY,	SP-SC					3+2+	2				
	fine to coarse grained, moist, br	own.				Γ	TIXII	N =4	4.0"				
	-					F		REC	=16"			4-58 mud	5' 3-7/8" 1 rotarv
	_					- 5 -							,, ,
	_ orangeish brown.					L		N =6	+3+3				
							$ \Box $	REC	=14"				
7.0	POORLY GRADED SAND, fine	to	SP	95.5		F	1_						
	_ coarse grained, moist, yellow, w	vith				-	HMI	3+4+	5				
	_					L	$ \Delta $	REČ	=14"				
						10							
						-10-	7,		•				
	_ orangeish yellow.					F	HVI	4+6+ N =14	8 4				
	_					F	- 121	REC	=18"				
12.0				90 F									
13.0	POORLY GRADED SAND WIT	H SILT	SP-SM	09.5				E 1 0 1	10				
	moist, yellowish orange.	eu,				F	HXII	N =18	10 B				
0/0/0	_					-15-	- 121	REC	=18"				
						L							
	-					F	1						
50	_					F	-						
29.	brownish, orange.					L		6+12	+12				
							IŇ	N =24	4 =12"				
	-					-20-		NLO	-12				
Ď	-					F	-						
040	_					L							
2100													
2	1.				$\overline{\Delta}$	F	ا		•				
	_ wet, orange.					╞	HM	4+5+ N =1	6 1				
	_					-25-	40	REC	=18"				
	continued on next page												

Schnabel Engineering BORING LOG Calvert County, Maryland Contract Number: 06120048 Sheet: 2 of 3 DEPTH (FT) STRATA DESCRIPTION CLASS. ELEY. (FT) WL SAMPLING DEPTH TESTS REMARKS 0 orangeish brown. SANDY SILT, fine to medium, moist, dark gray. NL 70.5 -		TEST	Project: 0	Calvert Cliff	s Nucle	ar Pow	er Plant		Boring N	umber:	B-749
DEPTH (FT) STRATA DESCRIPTION CLASS. SP-SM ELEV. (FT) WL SAMPLING DEPTH TESTS REMARKS 0 orangelish brown. SP-SM - - - - - - 32.0 SANDY SILT, fine to medium, moist, dark gray. ML 70.5 - - - - 37.0 LEAN CLAY, moist, dark gray, with sand. CL 65.5 - - - - 11242 - - - - - - - - 37.0 LEAN CLAY, moist, dark gray, with CL 65.5 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - <td>Schna</td> <td>bel Engineering</td> <td>0</td> <td>Calvert Cou</td> <td>inty, Ma</td> <td>ryland</td> <td></td> <td></td> <td>Contract</td> <td>Number: 06</td> <td>6120048</td>	Schna	bel Engineering	0	Calvert Cou	inty, Ma	ryland			Contract	Number: 06	6120048
(FT) STRATA DESCRIPTION CLASS. (FT) WL DEPTH DATA TESTS REMARKS 32.0	DEPTH			01.400	ELEV.	14/1	s		G	TESTS	DEMARKS
$32.0 \qquad \qquad SP-SM \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\ $	(FT)	STRATA DESCRIPT	ION	CLASS.	(FT)	VVL	DEPTH	DAT	ГА	IESIS	REMARKS
$32.0 \qquad \begin{array}{c} - \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\ - $				SP-SM							
$32.0 \qquad \qquad$	-						F 1				
$32.0 \qquad \begin{array}{c} & & & & \\ & & & \\ & & & \\ & $	-										
$32.0 \begin{array}{c} \text{orange ish brown.} \\ 32.0 \begin{array}{c} \text{SANDY SILT, fine to medium, moist,} \\ \text{dark gray.} \end{array} \\ \begin{array}{c} \text{ML} \\ \text{dark gray.} \end{array} \\ \begin{array}{c} \text{70.5} \\ \text{-} \\ \begin{array}{c} \text{-} \\ \text{-} \\ \text{-} \\ \text{-} \\ \begin{array}{c} \text{-} \\ \text{-} \\ \text{-} \\ \text{-} \\ \begin{array}{c} \text{-} \\ \text{-} \\ \text{-} \\ \text{-} \\ \begin{array}{c} \text{-} \\ \text{-} \\ \text{-} \\ \text{-} \\ \begin{array}{c} \text{-} \\ \{-} \\ \begin{array}{c} \text{-} \\ \begin{array}{c} \text{-} \\ \{-} \\ \begin{array}{c} \text{-} \\ \begin{array}{c} $	-										
$32.0 \begin{array}{c} 32.0 \\ \hline \\ 32.0 \\ \hline \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ $	-	orangeish brown.					10	4+5+11 N =16			
$32.0 \qquad \begin{array}{c} 32.0 \\ \hline \\ SANDY SILT, fine to medium, moist, \\ dark gray. \\ \hline \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ $							<u>_</u>	REC =1	4"		
32.0 32.0 32.0 32.0 32.0 33	-										
$37.0 = \frac{\text{LEAN CLAY, moist, dark gray, with}}{\text{fine to medium sandy}} = \frac{1}{1000} = \frac{1}{10$	32.0 -				70.5						
$37.0 - \frac{1}{2} = \frac{1}{2}$	02.0	SANDY SILT, fine to medium dark gray.	, moist,	ML	10.0						
$37.0 \qquad \qquad$	-							1+2+2			
$37.0 \frac{1}{2}$ LEAN CLAY, moist, dark gray, with CL 65.5 $-35-12$ REC = 18 $-35-21$ REC = 18 $-35-21$ REC = 18 $-40-12$ $-40-1$	-						F 1 X	N =4	0"		
$37.0 - \frac{1}{2}$ $\frac{1}{2}$							-35-1	REC =1	8		
37.0 LEAN CLAY, moist, dark gray, with sand. CL 65.5 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - <td< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td<>											
$\begin{bmatrix} - & - & - & - & - & - & - & - & - & - $	37.0 -	I FAN CLAY moist dark grav	v with	CI	65.5						
$\begin{bmatrix} - & - & - & - & - & - & - & - & - & - $		sand.	,,								
$\begin{bmatrix} -40 \\ -40 \end{bmatrix} = \begin{bmatrix} -40 \\ -45 $							M	1+3+3			
							L_40_	REC =1	8"		
fine to medium sandy											
fine to medium sandy	-						[]				
	-	fine to medium condu							41		
	-	ine to medium sandy						REC =2	4		
							-45				
47.0 SANDY SILT fine to medium moist MI 55.5	47.0 -	SANDY SILT fine to medium	moist	MI	55.5						
		dark gray.	, moiot,	IVIE							
	-						L -M	3+4+5			
							L_50_0	N =9 REC =1	8"		
							Γ				
52.0 LEAN CLAY, moist, dark gray, with shell CL 50.5	52.0 -	LEAN CLAY, moist, dark gra	y, with shell	CL	- 50.5		- 1				
		iragments, sand.									
	-	_					F -IM	3+4+5 N =9			
							<u> </u> −55– ∐	REC =1	8"		2-15/16" mud rotary
							$\left - \right $				· ···· ,
	57.0 -				45.5		$\left - \right $				
SILLY SAND, The to medium grained, SM moist, dark gray.	-	moist, dark gray.	i grained,	SM							
continued on next page		continued on next pag	<i>je</i>								

	TEST Proj	ject: Calvert Cliff	s Nucle	ar Pow	er Plant	Во	ring Number:	B-749
Sahaa	BORING	Calvert Cou	nty, Ma	ryland		Co	ntract Number: 0	6120048
Schna	bei Engineering LOG							
DEPTH	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL			TESTS	REMARKS
		SM	. ,		DEPTH	DATA		
-					M	5+5+6		
						N =11 REC =18"		
_					_00			
-								
	contains cemented sand.					15+50		
						N =50 REC =12"		
					65	NEO - 12		
-								
67.0 -	CANDY CILT find to modium mai	at MI	35.5					
_	dark gray, trace fine to medium sh							
	fragments, weak HCI reaction, 0-5 shell frag.	%				3+3+4		
-					- 10	N =7		
					70 <u>[]</u>	REC - 10		
-								
_								
						4+4+4		
-					X	N =8		
75.0 —	BOTTOM OF BORING @ 75.0 FT		27.5		-75-L	REC = 18		
ω								
3/6/0								
GDT								
ABEL								
CHN								
SIL								
200.002								
SPT								
PLOG								
0048								
0612								
log								
SING								
BOF								
IESI								

Schnal	hnabel Engineering LOG	Project: Calvert Calvert	Cliff Cou	fs Nucle unty, Ma	ar Pow ryland	ver Pla	nt		Boring Contra Sheet:	Number: ct Numbe 1 of 3	e r: 061	12004	B-750
Boring (Gr	oundwate	er Obs	ervations			
	FREDERICK, MAR	YLAND					D	ate T	ime	Depth	Casi	ng	Caved
Boring F	oreman: T. Chew			Enco	untere	d	7	/10		43.5'			
Drilling I	Method: 3-7/8" OD Tri-cone Roll	er Bit											
Drilling E	Equipment: Diedrich D-50 (ATC))	-										
Schnabe	I Representative: B. Bradfield												
Dates 3	Started: 7/10/06 Finished: 7	/10/06											
Location	: Northing: 215849.16 ft Easting: 959930.06 ft												
Ground	Surface Elevation: 72.4 (feet)					1							
DEPTH (FT)	STRATA DESCRIPTI		SS.	ELEV. (FT)	WL	DEP	S TH	AMPLING) A	TEST	s	RE	MARKS
_	SILTY SAND, fine to coarse g moist, yellowish brown.	rained, S	M			_		1+1+2 N =3				Auge 4-1/4 ft.	red with " HSA to 9
_						L							
	Dark orangeish brown							3+3+3					
-	Dark orangeish brown.					-	IXI	N =6					
						-		REC =18	3"				
4.5	SANDY LEAN CLAY, fine to m	nedium, C	L	67.9		- 5 -							
	moist, orangeish brown and lig	ght gray.					IV	2+3+4 N =7					
-						–	ЧU	REC =13	3"				
7.0 -	FAT CLAY with sand, moist, g	aray, C	н	65.4		F	-						
	contains mica.					F	-M	3+3+14					
_						L	\square	REC =18	3"			9- Si rotar	arted mud v with
												3-7/8	" tri-cone
10.0 —	ELASTIC SILT with sand, moi	ist, gray, M	Н	62.4		-10-	1_					TOILET	DIL
	contains mica.					-	HM	1+2+3 N =5					
_						L	$ \Omega $	REC =15	5"				
-						–							
	Gray and dark gray, some poo (<1/2") of sandy clay.	ckets				F	HVI	4+3+4 N =7					
						-15-	ЦШ	REC =18	3"				
5													
17.0 -	FAT CLAY with silt and sand,	moist, C	Н	55.4		F	1						
- 5	gray and dark gray, contains n some pockets ($<1/2$ ") of sandy	mica,				F	-						
-		y ciay.				L	Π	4+4+7					
							١Ň	N =11					
						²⁰⁻							
2 -						F	-						
22.0 -				50.4		L	_						
	LEAN CLAY with silt and sand gray and dark gray. contains n	a, moist, C nica.	L										
8						Γ	7,	7.0.10					
-						F	HV	/+9+10 N =19					
- R	and in the second second					-25-	40	REC =18	3"				
	continuea on next page												

ſ		TEST	Project: Ca	lvert Cliffs	s Nucle	ar Pow	er Plant	В	oring Number:	B-750
	Schna	bel Engineering LOG	Ca	Ivert Cou	nty, Ma	ryland		C	ontract Number: 0 heet: 2 of 3	6120048
	DEPTH (FT)	STRATA DESCRIPTIO	ON	CLASS.	ELEV. (FT)	WL	S. DEPTH		TESTS	REMARKS
ľ				CL					-	
		_								
		-						REC =20"		
		-					—30—			
		-								
		-								
		-								
		sandy					M	3+4+4 N =8		
	_	-					-35-1	REC = 10		
	37.0				35 /					
	57.0	SANDY SILT, fine, moist, gree contains mica.	nish gray,	ML	00.4					
		-					M	4+5+7 N =12		
	-	-					<u>40</u>	REC =18"		
		-								
	42.0	CLAYEY SAND, fine to coarse	grained,	SC	30.4					
		fine to medium shell fragments contains mica, strong HCI read	s, stion,			$\overline{\Delta}$		6+8+15		
		weak cementation.					Å	N =23 REC =18"		
		-								46-52'- Harder
		-								anning
3/6/08		Light gray and brownish white,	50-60%					REC =11"		
EL.GDT		fine to coarse shell fragments, HCl reaction, moderate cemen	strong Itation.							
CHNAB		-					-50-			
.GPJ S	52.0	-			20.4					
SPT 700	52.0	POORLY GRADED SAND WI fine to medium grained, wet, g	TH CLAY, ray and	SP-SC	20.4					
PLOG S		shell fragments, strong HCl rea HCl reaction localized to shell	action,				M	5+6+7 N =13		
120048		fragments.					-55-0	REC =18"		
00 00		-								
IRING L		-								
TEST BC		continued on next page								

	bnabal	TEST	Project: Ca	alvert Cliffs	s Nucle	ar Pow	er Plant		Boring Number:	B-750
Schnat		BORING LOG	Ca	alvert Cou	nty, Ma	ryland			Contract Number	: 06120048
DEPTH (FT)	STRAT	A DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	S		G TESTS	REMARKS
				SP-SC	10.4			7+8+9 N =17 REC =1	18"	
	CLAYEY SAND, grained, wet, gre to medium shell mica, weak HCI localized to shel	fine to media eenish gray, (fragments, cr reaction, HCI I fragments.	um)-10% fine ontains reaction	SC	10.4			4+6+9 N =15 REC =1	8"	
- - - - - -							 	3+5+7 N =12 REC =1	18"	
73.9	BOTTOM OF BO	DRING @ 73	.9 FT.		-1.6			50/5" N =50/5 REC =0	5"	
ESI BORING LOG 06120048 PLOG SPI 700.GPJ SCHNABELGDI										

	hnahal	TEST	Project:	Calvert C	Cliffs	Nucle	ar Pow	er Pla	nt		Boring	Number:			B-751
Schnal	bel Engineering	BORING LOG		Calvert C	Coun	nty, Ma	ryland				Contra Sheet:	t Number 1 of 3	er: 06	61200	948
Boring C	CON			SINC					Gro	ounc	lwater Obs	ervations			
	FRED	DERICK, MAP	RYLAND	0, INC.					D	ate	Time	Depth	Cas	ing	Caved
Boring F	oreman: D. Reese					Enco	untere	d	5	/22		13.5'	4.0	0'	
Drilling	wethod: 3-7/8" OD		lier Bit (Mud I	Rotary)											
Drilling E	Equipment: CME-														
Dates	Started: 5/22/06	Finished	5/22/06	-											
Location	: Northing: 21558	8 86 ft	5/22/00												
	Easting: 96014	6.2 ft													
Ground	Surface Elevation:	92.2 (feet)													
ПЕРТН									S						
(FT)	STRATA	A DESCRIPT	ION	CLAS	SS. '	(FT)	WL	DEP	тн		DATA	TEST	s	R	EMARKS
0.4) TOPSOIL		SM	1	91.8			TM	1+1	+2			0-4' sten	hollow
-	SILTY SAND, fir	ne to medium	grained,	5101	'			-	-10	N =	3 C =9"			3101	li augei
	moist, brown, co	intains root in	ayments.					-	-						
2.5	POORLY GRAD	ED SAND W	ITH SILT,	SP-S	SM	89.7		F	-M	3+4	+3				
_		graineu, mois	l, DIOWII.					L	$ \Delta $	REC	C =18"			4-75	5' mud
5.0						07.0		5						rota	ry
5.0	POORLY GRAD	ED SAND, fi	ne to trace	SP	`	07.2			M	1+2 N =	+3 5				
-	gravel.		,					F	70	REC	C =12"				
-								-	┤_						
-	yellowish orange	e, with gravel						-	HM	5+6 N =	+6 12				
-								F	-121	REC	C =18"				
10.0 —				000		82.2		-10-	-						
_	fine to coarse gr	ained, moist,	yellowish	53				Ļ	-0	5+7	+8				
_	orange.							L	\square	N =	15 C =16"				
12.0						70.0									
13.0 -	POORLY GRAD	ED SAND w	ith gravel,	SP	,	79.2	$\overline{\Delta}$	Γ		7±1	0+10				
20 -	orange.	ameu, moist,	brownish					-	٦XI	N =	20				
3/0/								-15-		REC	J=18"				
								-	-						
17.0 -			arainod	SM		75.2		F	-						
	wet, orange, trac	ce gravel.	graineu,		'			Ļ							
										3+3	+2				
00/ -									Ŵ	N =	5 C =13"				
								-20-							
								F	1						
- 12004								╞	+						
90 _								F	$\left \right $						
	fine to medium g	grained, no gi	ravel.					F	-0	2+1	+1				
								-25-	M	REC	2 C =14"				
	continu	ied on next pag	<i>je</i>												
-															

	hnahal	TEST	Project:	Calvert Cliff	s Nucle	ar Pow	er Plant	E	Boring Number:	B-7	751
	maper	BORING		Calvert Cou	inty, Ma	iryland		C	Contract Numbe	r: 06120048	
Schnal	bei Engineering	LUG							Sneet: 2 of 3		
DEPTH	STRAT	A DESCRIPT	ION	CLASS.	ELEV.	WL			TEST	S REMAR	RKS
				SM	. ,		DEPTH	DAT	A		
26.5	SANDY SILT, fi	ine to medium	, moist,	ML	65.7						
	reddish orange										
-											
29.0 -	SANDY I FAN (CLAY fine to	medium	CI	63.2		MI	1+2+3 N =5			
	moist, gray.		, including				<u>30</u> [/]	REC =16	, -		
-											
								REC =24	."		
_											
-											
-											
_							101	3+3+4			
								N =7 REC =18	, .		
							-40				
-											
								REC =24			
							-45-				
47.0 -					45.2						
	grained, moist,	greenish gray	um	SC							
5								6+6+7			
							F 1 X	N =13			
							-50-1	REC =18	jë -		
5 –											
5 –											
-											
								3T3T1			
							F -1 X	N =7	_		
							<u> </u> -55- ∐	REC =18			
							$\mid \mid \mid \mid$				
570					35.0						
	SANDY SILT, fi	ine to medium	, moist,	ML	00.Z						
	contin	ued on next pag	e								
Ĺ											

	TEST	Project: Ca	lvert Cliffs	s Nucle	ar Pow	er Plant		Boring Number:	B-751
Schnal	bel Engineering LOG	Ca	Ivert Cou	nty, Ma	ryland			Contract Number: (Sheet: 3 of 3	06120048
DEPTH (FT)	STRATA DESCRIPTIO	ло	CLASS.	ELEV. (FT)	WL	S DEPTH		G TESTS	REMARKS
			ML	30.2			3+4+3 N =7 REC =1	8"	
-	SILTY SAND, fine to medium of moist, greenish gray, trace fine coarse shell fragments, strong reaction, 0-10% shell frag.	grained, e to HCI	SM	00.2		 65	5+6+7 N =13 REC =1	8"	
	with fine to coarse shell fragme 15-20% shell frag	ents,				 	11+16+2 N =38 REC =1	22 8"	
6.62 General Boring Log 06120048 PLOG SPT 700.6PJ SCHNABEL.GDT 3/6/08	BOTTOM OF BORING @ 73.9) FT.		18.3			50/5" N =50/5 REC =5		

Orounduration of converting and the problem of the p	Schna	test problem to the second sec	oject: Calvert Calvert	Cliff Cou	s Nuclea Inty, Ma	ar Pow ryland	ver Pla	nt		Boring Contra	Number: Inct Number	er: 0612	B-752
Boring Contractor: CONNELLY AND ASSOCATES, INC. FREDERING, MARYLAND Boring Foreman: T. Connelly Drilling Retrieved: Trice Precision Charge Equipment: District Precision Dering Method: Trice Precision Caston: Trice Precision Classing: Boring Foreman: Tomal Test Precision Classing: Start of day Trice 23.0" Schnabel Representative: Nurant Encountered Trice 23.0" Optiming Method: Trice Precision Trice Precision Trice Precision Trice Start of day Trice Precision Tr								Gr	oundw	ater Obs	ervations		
Boring Foreman: T. ConnellyDrilling Horbox: 3-78" CD Tricone Roller Bit Drilling Equipment: Diedrich D-50 (ATC) Schnabel Representative: R. VinzantDates Started: 7/500 Finished: 7/5006 Location: Northing 2158482 1f Easting: 960257.57 ftOrcund Surface Elevation: 95.8 (feet)DEFTH (FT)STRATA DESCRIPTION CLASS.CLASS.ELEV (FT)0.5 Sill_TY SAND, fine to medium grained, raggenbits.0.6 Ubit in medium grained, raggenbits.0.7 Ubit in medium grained, raggenbits.0.8 Ubit in medium grained, raggenbits.0.0 Ubit in medium grained, raggenbits.0.0 Ubit in medium grained, raggenbits.0.0 Ubit in medium grained, raggenbits.0.0 Ubit in medium grained, raggenbits.0.10.2 Ubit in medium grained, raggenbits.0.3 Ubit in medium grained, raggenbits.0.4 Ubit in medium grained, 	Boring	Contractor: CONNELLY AND ASS FREDERICK MARYL	OCIATES, INC. AND						ate	Time	Depth	Casin	caved
Drilling Equipment: Diedrich D-50 (ATC) Start of day 7/8 23.0° Schabel Representative: R. Vinzant Water Reading 7/27 58.0° Dates Startot: 7/500 Finished: 7/6/06 Location: Northing 215680 (Finished: 7/6/06	Boring I	Foreman: T. Connelly			Enco	untere	d		7/5		23.5'		
Drilling Equipment: Deckin D-50 (ATC) water Reading 7/27 58.0'	Drilling	Method: 3-7/8" OD Tri-cone Roller E	Bit		Start	of day	/	-	7/6		23.0'		
Site Started: 7/5/06 Finished: 7/6/06 Location: Northing: 215489.21 ft Image: Started: 7/6/06 Cound Surface Elevation: 95.8 (feet) Image: Started: 7/6/06 DEPTH STRATA DESCRIPTION CLASS. ELEV. (FT) With Started: 7/6/06 0.5 FL.R AND TOPSOIL: SM 95.3 96.3 96.3 1.5 FL.R AND TOPSOIL: SM 96.3 94.3 Image: Started: Wort1+2: N = 3 0.5 FL.R AND TOPSOIL: SM 95.3 94.3 Image: Started: Wort1+2: N = 4 Wort1+	Drilling	Equipment: Diedrich D-50 (ATC)			Water	Readi	na	7	/27		58.0'		
Location: Notice Tribute: 1980 Location: Notice Tribute: 1980 Control Surface Elevation: 95.8 (feet) DEPTH STRATA DESCRIPTION CLASS ELEV. WL DEPTH DATA TESTS REMARD DEPTH DATA SILTY SAND, fine to medium grained, medium to coarse grained, moist, orange ish brown. Light yellowish orange, contains root fragments. No root fragments. Upt yellowish orange, contains root fragments. No root fragments. SW-SM SULTY SAND, fine to medium grained, morange, trace organic matter. SW-SM SULTY SAND, fine to medium grained, mica. Rec = 18" SW-SM SULTY SAND, fine to medium grained, wet, motied graysh orange, contains mica. Rec = 18" SW-SM SULTY SAND, fine to medium grained, wet, motied graysh orange, contains mica. Rec = 18" SM SM SM SM SM SM SM SM SM SM	Dates	Started: 7/5/06 Finished: 7/6/06	3				5						
Ground Surface Elevation: 95.8 (feet) SAMPLING TESTS REMARK DEPTH (FT) STRATA DESCRIPTION CLASS. ELEV (FT) WL SAMPLING TESTS REMARK 0.5 FL, R AND TOPSOIL. SM 95.3 94.3 - <td>Locatio</td> <td>n: Northing: 215489.21 ft Easting: 960257.57 ft</td> <td>,</td> <td></td>	Locatio	n: Northing: 215489.21 ft Easting: 960257.57 ft	,										
DEFTH (FT) STRATA DESCRIPTION CLASS ELEV. (FT) WL SAMPLING DEPTH TESTS REMARK 0.5 FL, R AND TOPSOIL. SM 95.3 94.3	Ground	Surface Elevation: 95.8 (feet)					1						
0.5 FL, R AND TOPSOIL. 96.3 1.5 SILTY SAND, fine to medium grained, moist, corangeish brown, contains root tragments. SM POORLY GRADED SAND WITH SILT, medium to coarse grained, moist, orangeish brown. SP-SM Light yellowish orange, contains root fragments. SW-SM No root fragments. SW-SM 0.0 WELL GRADED SAND WITH SILT, fine to medium grained, moist, yellowish orange, contains moot fragments. SW-SM 10.0 WELL GRADED SAND WITH SILT, fine to medium grained, moist, yellowish orange, trace organic matter. SW-SM 22.0 SILTY SAND, fine to medium grained, moist, yellowish orange, contains moot fragments. SW-SM 22.0 SILTY SAND, fine to medium grained, moist, yellowish orange, contains mica. SM - 10 22.0 SILTY SAND, fine to medium grained, meta. SM - 18 22.0 SILTY SAND, fine to medium grained, meta. SM - 18 22.0 SILTY SAND, fine to medium grained, meta. SM - 18 22.0 SILTY SAND, fine to medium grained, meta. SM - 18 22.0 SILTY SAND, fine to medium grained, meta. SM - 18 23.5 tr.Change from hollow stem auger SM - 58 24.5 The change from hollow stem auger SM - 58 25	DEPTH (FT)	STRATA DESCRIPTION	CLA	SS.	ELEV. (FT)	WL	DEP	S. TH	AMPLI D	NG ATA	TEST	s	REMARKS
1.5 SILTY SAND, fine to medium grained, moist, contains root tragments. SM 94.3 94.3 SP-SM 94.3 SP-SM SP-SM </td <td>0.5</td> <td>FL, R AND TOPSOIL.</td> <td></td> <td></td> <td>95.3</td> <td></td> <td></td> <td></td> <td></td> <td>. 0</td> <td></td> <td></td> <td></td>	0.5	FL, R AND TOPSOIL.			95.3					. 0			
POORLY GRADED SAND WITH SILT, medium to coarse grained, moist, orangeish brown. $2+2+2$ N = 4 $w=5.9\%$ N = 4Light vellowish orange, contains root fragments.511333 N = 611333 N = 6No root fragments.511333 N = 6124244 N = 6No root fragments.5110024244 N = 6WELL GRADED SAND WITH SILT, fine to medium grained, moist, vellowish orange, trace organic matter.SW-SM85.8100WELL GRADED SAND WITH SILT, fine to medium grained, moist, vellowish orange, trace organic matter.SW-SM10.0WELL GRADED SAND WITH SILT, fine to medium grained, moist, vellowish orange, trace organic matter.SW-SM10.0WELL GRADED SAND, fine to medium grained, wet, motibed grayish orange, contains mica.SM22.0SILTY SAND, fine to medium grained, wet, motibed grayish orange, contains mica.SM73.8 ∇ $2+5+6$ N =7 $w=12.7\%$ N =5 REC =18"22.0SILTY SAND, fine to medium grained, wet, motibed grayish orange, contains mica.SM73.8 ∇ $2+5+6$ N =5 REC =18" $w=12.7\%$ N =5 REC =18"	1.5	SILTY SAND, fine to medium gra moist, orangeish brown, contains fragments.	ined, Sr root SP-	vi SM	94.3		-	1	wor+1 N =3 REC =	+2 =14"			
Light yellowish orange, contains root tragments. No root fragments. No root fragments. 10.0 WELL GRADED SAND WITH SILT, fine to medium grained, moist, yellowish orange, trace organic matter. 10.0 SILTY SAND, fine to medium grained, wet, motied grayish orange, contains mica. Remarks 23.5 ft.Change from hollow stem auger 23.5 ft.Change from hollow stem auger 31.5 ft.Change from hollow stem auger 32.5 ft.Change from hol	-	POORLY GRADED SAND WITH medium to coarse grained, moist, orangeish brown.	SILT,				-		2+2+2 N =4 REC :	2 =18"	w=5.9' *	%	
10.0No root fragments. $2+2+4$ N =6 REC =18" $2+2+4$ N =6 REC =18" $w=6.7\%$ N =7 REC =18"10.0WELL GRADED SAND WITH SILT, fine to medium grained, moist, yellowish orange, trace organic matter.SW-SM85.8 -10 N =7 REC =18" $2+2+5$ N =7 REC =18" $w=6.7\%$ N =7 REC =18"22.0SILTY SAND, fine to medium grained, wet, motiled grayish orange, contains mica.SM73.8 Z P P P $Z+5+6$ N =11 REC =18" $w=12.7\%$ N =5 REC =18"22.0SILTY SAND, fine to medium grained, wet, motiled grayish orange, contains mica.SM73.8 Z P P P Z P<	-	Light yellowish orange, contains r fragments.	root				- 5 -		1+3+3 N =6 REC =	} =18"			
10.0 WELL GRADED SAND WITH SILT, fine to medium grained, moist, yellowish orange, trace organic matter. SW-SM 85.8 -10- 2+2+5 w=6,7% -	-	No root fragments.					_		2+2+4 N =6 REC =	↓ =18"			
$22.0 \qquad \qquad SILTY SAND, fine to medium grained, wet, motiled grayish orange, contains mica. Remarks 23.5 \text{ ft.Change from hollow stem auger} \qquad \qquad$	10.0	WELL GRADED SAND WITH SIL to medium grained, moist, yellowi orange, trace organic matter.	T, fine SW-	SM	85.8		-10-	- -\[\]	2+2+5 N =7	5	w=6.7	%	
$22.0 \qquad \qquad$									REC :	=18"			
22.0 SILTY SAND, fine to medium grained, wet, mottled grayish orange, contains mica. Remarks 23.5 ft: Change from hollow stem auger 22.0 SILTY SAND, fine to medium grained, wet, mottled grayish orange, contains mica. Remarks 23.5 ft: Change from hollow stem auger 25 2+5+6 2+5+6 2+5+6 2+5+6 2+5+6 3+3+2 3+3+	-	-					- 15-		3+5+1 N =18 REC =	3 			
22.0 SILTY SAND, fine to medium grained, wet, mottled grayish orange, contains mica. SM 73.8 - - - - - Change from hollow stem auger to mu rotary drilling 23.5 ft:Change from hollow stem auger - <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>- - </td> <td></td> <td>2+5+6 N =11 REC =</td> <td>) =18"</td> <td>w=12.7</td> <td>7%</td> <td></td>							- - 		2+5+6 N =11 REC =) =18"	w=12.7	7%	
23.5 ft:Change from hollow stem auger	22.0 -	SILTY SAND, fine to medium gra wet, mottled grayish orange, cont mica.	ined, SI ains	M	73.8	¥		-	3+3+3)		C	hange from ollow stem
	_	23.5 ft:Change from hollow stem	auger				25-		N =5 REC =	- =18"		a ro	uger to mud otary drilling

	TEST Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	Boring Number:	B-752
Schna	bel Engineering LOG	alvert Cou	inty, Ma	ryland		Contract Number: 00 Sheet: 2 of 4	6120048
DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL		NG TESTS	REMARKS
	to mud rotary drilling	SM					
-							
-							
-	Moist grav					w=29.0%	
-	Moist, gray.				N = 3	18"	
-							
31.0 -	Sandy FAT CLAY, fine to medium grained moist dark greenish gray	СН	64.8				
-	contains mica.						
-					3+4+5	w=29.1%	
					N =9 REC =	18" LL=52 PL=23	
36.0			50.8			*	
50.0	ELASTIC SILT, moist, dark greenish gray, with sand, fine - med. sand.	MH	55.0				
						w=33.1%	
					N =9 REC =	18" PL=31	
-							
-							
-							
-	Trace sand.					w=37.1%	
45.0		0.1	50.8		-45 $\overrightarrow{N} = 11$ REC =	18" PL=26	
-	FAT CLAY, moist, dark greenish gray	СН					
-							
- 3/6/08							
- 1001					5+6+8	w=40.3% LL=68	
					REC =	18" PL=24	
- sch							
69.00 -	SILTY SAND fine to medium grained	SM	43.8				
- 12	moist, dark greenish gray, contains mica.						
- PLOG					10+8+9 N =17	9 w=27.7% LL=40	
- 120048					REC =	18" PL=29 *	
9 56.0 -	ORGANIC CLAY, moist, dark greenish	ОН	39.8				
	gray, contains mica.						
- BOR	continued on next page						
TES							

Γ		TEST Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	Boring Number:	B-752
	Schna	bel Engineering LOG	alvert Cou	nty, Ma	ryland		Contract Number: 06 Sheet: 3 of 4	6120048
	DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL	SAMPLIN	IG TESTS	REMARKS
╞	. ,		ОН	. ,		REC =	18" w=45.3%	
				25.0			PL=17	
	0.00	ELASTIC SILT, moist, gray	MH	35.0				
						4+5+5 N =10	w=37.0% LL=64 PL=43	
	65.0 -			30.8			*	
		Sandy SILT, fine to medium grained, moist, dark greenish gray, weak HCl	ML					
		fragments.						
						5+6+7 N =13	w=34.6%	
	_					70 <u>/</u> REC =	18"	
		Pomarke						Rig chatter
		73 ft:Rig chatter				25+15+ N =40	-25	
	_	coarse shell.				75 <u>/</u> REC =	18"	
		Contains cemented sand, strong HCl reaction, 25% medium - coarse shell				⊠ 50/5" N =50/5	5"	
88	80.0 -	fragments. POORLY GRADED SAND WITH SILT,	SP-SM	15.8			5"	
DT 3/6/		weak HCI reaction, 5% medium - coarse shell fragments.						
IABEL.G								
J SCHN						8+9+10 N =19) w=28.0%	
700.GP	_					85	18"	
DG SPT								
048 PL(
3 06120		Weak HCI reaction, 3% medium -					3	
ING LOC	_	Coarse shen naginents.				-90-0 REC =	18"	
TEST BOR		continued on next page						

Schnabel Engineering TEST BORING LOG				alvert Cliff	s Nucle	ar Pow	er Plant		Boring Num	ıber:	B-752
Schnat		С	alvert Cou	inty, Ma	ryland			Contract Nu	mber: 0	6120048	
DEPTH	STRATA D	DESCRIPT	ION	CLASS.	ELEV.	WL		SAMPLIN	IG T	ESTS	REMARKS
				SP-SM	(F1)		DEPTH		TA		
-											
-											
-	Weak HCI reaction,	, 3% medii	um -					5+7+9			
95.0 —		eenish ara	w strong	sc	0.8		—95— ¹	REC =	18"		
-	HCI reaction, 25% i	medium - o	coarse	50							
-	shell hagments.										
-											
-								17+20+	⊦16 W=	•31.6% *	
100.0					-4.2		-100-	REC =	18"		
	BOLLOW OF BOR		U.U F I.								

Schnal	TEST Project: C bel Engineering LOG C	Calvert Clif	fs Nucle unty, Ma	ar Pow ryland	ver Pla	nt	Boring Contra Sheet:	Number: Not Number 1 of 2	er: 06120	B-753
Boring C	Contractor: CONNELLY AND ASSOCIATES					Ground	water Obs	ervations		
	FREDERICK, MARYLAND					Date	Time	Depth	Casing	Caved
Boring F	oreman: T. Connelly		Enco	untere	d	7/6		13.5'		
Drilling I	Method: 3-7/8" OD Tri-cone Roller Bit									
Drilling E	Equipment: CME-550 (ATV)									
Schnabe	el Representative: K. Bell									
Dates \$	Started: 7/6/06 Finished: 7/6/06									
Location	: Northing: 217831.2 ft Easting: 960648.86 ft									
Ground	Surface Elevation: 48.8 (feet)				1					
DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL	DEP	SAMPI	LING DATA	TEST	S F	REMARKS
0.6	ROOTMAT AND TOPSOIL.		48.2							
-	CLAYEY SAND, fine to coarse grained, moist, yellowish brown, trace root fragments.	SC			-	2+6+ N =1 REC	-10 6 =15"			
-	yellowish brown and orangeish brown, Iron staining.				_	4+4+ N =1 REC	-6 0 =16"			
	yellowish brown and gray.				5	2+4+ N =9	-5			
							=15"			
7.0 -	Sandy LEAN CLAY, moist, orangeish brown and gray, Iron staining.	CL	- 41.8		-	4+4+ N =1 REC	-6 0 :=18"			
10.0			38.8		-10-				01-	at a familia
-	moist, orangeish brown and gray.	30			_	4+5+ N =1 REC	-6 1 =10"		rota	ary drilling
13.0 - - - -	POORLY GRADED SAND WITH SILT, fine to medium grained, wet, yellowish brown and orangeish brown.	SP-SM	- 35.8	Ţ	- - 15-	9+11 N =2 REC	+9 0 =9"			
-					F	-				
170 -			31.8		L					
-	FAT CLAY, moist, gray, trace sand, trace fine to medium shell fragments, 2-5%, HCl reaction weak.	CH	51.0		-	2+4+ N =8 BEC	-4			
					-20-					
22.0 -	SANDY ELASTIC SUIT maiat arou and	NALI	26.8		Ļ	$\left \right $				
_	blueish gray.	IVIH			-					
_					-	3+3+ N =7	4			
	continued on next page				-25-					

	TEST F	Project: Ca	alvert Cliffs	s Nucle	ar Pow	er Plant		Boring	Number:	B-753
Schnat	bel Engineering LOG	Ca	alvert Cou	nty, Ma	ryland			Contra Sheet	ct Number: 06	6120048
DEPTH (FT)	STRATA DESCRIPTIO	N	CLASS.	ELEV. (FT)	WL		SAN		TESTS	REMARKS
			MH				•			
-										
27.0 -	SILTY SAND, fine to medium g	jrained,	SM	21.8						
-	moist, gray, trace fine to mediu fragments, 2-5%, strong cemer	m shell ntation,					87			
-	HCI reaction strong.						50 N	0/1" =50/1"		Harder drilling
-						-30-	RI	EC =1"		
-										
-										
-							_			Rig chatter
-	wet, blueish gray, contains fine coarse shell fragments, 30-40%	e to %.				[(5+	+5+7 =12		
-						—35— [[]	J RI	EC =18"		
-										
-										
-						 [_ 			
-								=18 =18		
40.0 —	BOTTOM OF BORING @ 40.0	FT.		8.8		-40 ¹		LC - 10		
0/08										
ABEL.C										
SCHN										
19.0										
LOG										
20048 F										
BORI										
ER										

Schna	bel Engineering LOG	alvert Clif	fs Nucle unty, Ma	ar Pow aryland	/er Plar	nt	Boring Contra Sheet:	I Number Act Number 1 of 2	: er: 06120	B-754
Boring						Ground	water Obs	ervations	;	
Soring	MALAGA, NEW JERSEY					Date	Time	Depth	Casing	Caved
Boring	Foreman: J. Blemings		Enco	untere	d	5/16		2.5'		
Drilling	Method: 3-7/8" O.D. Drag Bit (Mud Rotary)		Water	Readi	na	7/26		29 4'		
Drilling	Equipment: CME-750 (ATV)		Water	Reau	''y	1120		20.4		
Schnab	el Representative: K. Megginson									
Dates	Started: 5/16/06 Finished: 5/16/06									
ocatio	n: Northing: 217369.78 ft Easting: 960290.37 ft									
Ground	Surface Elevation: 67.0 (feet)		1	1	1					
DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL	DEP	SAMP TH	LING DATA	TEST	S	REMARKS
0.5	Forest litter, rootmat and topsoil.	CM	66.5			3+5·	+4		*N	WJ rods
	SILTY SAND, fine to coarse grained, moist, brown, contains root fragments.	SIVI					2 =13"		us	ea.
	wet, brown and dark brown.				L.	2+1·	+3			
							↓ 2 =12"			
	-				- ·					
_	fine to medium grained, brown.				- 5 -	4+7	+9			
	-						l6 ; =12"			
	-				Ļ .		=			
					L .	6+6	+4			
							10 :=12"			
9.5	-		57.5				, 12			
_	LEAN CLAY, moist, gray, with fine to medium sand, trace mica.	CL			-10-					
	-						H+2+3			
12.0			55.0		Ļ .		; ; =18"			
	FAT CLAY, moist, gray, trace fine to medium sand and mica.	СН								
					[]		4.010			
	1					N =5	5			
_	-				-15-		2 =18"			
	-				ļ .	-				
					L .					
					- ·					
	-					- / 3+4· 	+6 10			
_	-				-20-		2 =18"			
	_				Ļ.					
22.0			150		L					
22.U ·	ELASTIC SILT, moist, light greenish	MH	45.0		Г [.]]				
	sand.				F .					
	-					5+8·	+10 I8			
					-25-		2 =18"			
	continued on next page									

	TEST Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	Boring Number:	B-754
Schna	bel Engineering LOG	alvert Cou	inty, Ma	iryland		Contract Number: 00 Sheet: 2 of 2	6120048
DEPTH (FT)	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL	SAMPLI	NG TESTS	REMARKS
	gray, with fine to medium sand, trace organic matter (±1%).	MH				0	
32.0 -	SILTY SAND, fine to medium grained, wet, dark gray, little fine to coarse shell fragments (±15%), strong HCI reaction.	SM	35.0		25+43 25+43 N =69 REC = 	+26 16"	*Very slight rig chatter as
41.0 -	 light brown, mostly fine to coarse shell fragments (±80%). brown, some fine to coarse shell fragments (±40%) below 39.5 ft. LEAN CLAY, moist, greenish gray and gray, with fine to medium sand, trace fine to coarse shell fragments (±1%), weak HCl reaction. 	CL	- 26.0			31 :15"	rotary advanced from 38 to 41 ft.
1EL.GDT 3/6/08	greenish gray, trace fine to medium sand and mica.					-18"	
TEST BORING LOG 06120048 PLOG SPT 700.GPJ SCHNAE 0.05	BOTTOM OF BORING @ 50.0 FT.		17.0				

Comments:
1. Ground water observation well OW-754 installed in boring upon completion.
2. * = See Appendix I for additional lab testing data.

Schna	TEST Project: C bel Engineering LOG C	Calvert Clif	fs Nucle unty, Ma	ar Pow ryland	ver Pla	nt	Bo Co Shi	oring I ontrac eet:	Number t Number 1 of 2	: er: 06120	B-755
Boring	Contractor: CONNELLY AND ASSOCIATES					Gro	oundwater (Obse	rvations	;	
	FREDERICK, MARYLAND	,				D	ate Tim	ne	Depth	Casing	Caved
Boring F	Foreman: T. Chew		Enco	untere	d	8	3/2	-	NE		
Drilling	Equipment: Diedrich D-50 (ATC)										
Schnabe	el Representative: B. Bradfield										
Dates	Started: 8/2/06 Finished: 8/2/06										
Location	n: Northing: 215923.66 ft Easting: 961637.86 ft										
Ground	Surface Elevation: 95.0 (feet)				1						
DEPTH (FT)	STRATA DESCRIPTION	CLASS	ELEV. (FT)	WL	DEP	S/ ⊺н	AMPLING DATA		TEST	's I	REMARKS
-	POORLY GRADED SAND, fine to coarse grained, moist, light brown, trace silt.	SP			-	-0	2+1+1 N =2 REC =6"				
-					-		4+2+3				
-	-				-	10	N =5 REC =10"				
					- 5 -	-	2+3+3 N =6				
7.0 -		0.5.014	- 88.0		-	14	REC =12"				
-	fine to coarse grained, moist, orangeish brown.	5P-5M			_		5+5+5 N =10 REC =11"				
	No cemented sand.						3+5+5 N =10 REC =16"				
13.0 -		SD.	82.0		-	$\left \right $					
-	coarse grained, moist, light brown and orangeish brown trace silt				-	-M	4+9+9 N =18				
					-15-		REC =13"				
- 17.0	SILTY SAND find to modium grained	SM	78.0		-						
	moist, light brown and gray, alternating colors form layers <1/8" thick.					-	2+3+5 N =8 REC =12"				
-					-	$\left \right $					
22.0 -	SANDY SILT, fine to medium, moist, light brown and gray, alternating colors form layers 1/16-1/8" thick.	ML	- 73.0		- -						
-					-	-	2+2+1 N =3 REC =18"				
	continued on next page				-25-						

ſ	6	TES	Project: Ca	alvert Cliffs	s Nucle	ar Pow	er Plant	t	Boriı	ng Number:	B-755	
	Schnal	bel Engineering LOC	NG G	Ca	alvert Cou	nty, Ma	ryland			Cont Shee	ract Number: 0 t: 2 of 2	6120048
	DEPTH (FT)	STRATA DESC	RIPTIC	ON	CLASS.	ELEV. (FT)	WL	DEDT	S/	AMPLING	TESTS	REMARKS
ŀ					ML			DEFI		DATA		
	_											
	-											
	_								М	3+1+3		
	29.5	SILTY SAND, fine to mee	dium g	rained,	SM	65.5			Ň	N =4 REC =18"		
	_	moist, dark gray.										
	32.0 -		t dor	(970) (CH	63.0						
	-	contains mica.	st, uarr	k gray,	СП							
	-								M	4+4+11 N =15		
								-35-	Ш	REC =18"		
	-											
	37.0 -	SANDY LEAN CLAY, mo	oist, da	ark gray,	CL	58.0						
	-	contains mica.							М	2+3+6		
	40.0 —					55.0			M	N =9 REC =18"		
	40.0	BOTTOM OF BORING @	0 40.0	FT.		00.0		-10				
08												
DT 3/6/												
BEL.G												
SCHNA												
0.GPJ												
SPT 70												
PLOG												
120048												
.0G 06												
RING L												
EST BC												

ſ	6	hnabel popu	Project:	Calvert	Cliff	fs Nucle	ar Pow	/er Pla	nt		Boring	Number:			B-756
	Schnat	bel Engineering LOG		Calvert	Cou	inty, Ma	iryland				Contra Sheet:	t Number 1 of 2	er: 06	61200)48
	Boring C	ontractor: CONNELLY AN	ID ASSOCIATI	ES, INC.					Gr	ound	water Obs	ervations			
		FREDERICK, M	IARYLAND	-, -					D	ate	Time	Depth	Cas	ing	Caved
	Boring F Drilling M	oreman: I. Connelly //ethod: 3-7/8" OD Tri-cone	Roller Bit (Muc	l Rotarv)		Enco	untere	d	5	/25		7.5'		-	
	Drilling E	auipment: CME-75 (Truck)													
	Schnabe	I Representative: R. Vinzan	ıt												
	Dates S	Started: 5/25/06 Finished	I: 5/25/06												
	Location	: Northing: 215504.6 ft Easting: 961215.1 ft													
	Ground	Surface Elevation: 106.9 (fe	et)												
	ПЕРТН								S						
	(FT)	STRATA DESCR	IPTION	CLA	SS.	(FT)	WL	DEP	тн		DATA	TEST	S	R	REMARKS
	0.5	Forest litter, rootmat and t	opsoil.			106.4			M	1+1-	+2				
	-	SANDY LEAN CLAY, fine moist, dark brown, with ro and organic matter.	to medium, ot fragments,		_			-	10	N =3 REC	; =18"				
	-	orangeish brown.						-	-M	3+2- N =5	+3				
	-							F	ЦЦ	REC	=18"			Cha	ngo from
	4.5	POORLY GRADED SANE fine to coarse grained, mo brown.) WITH SILT, ist, light	SP-\$	SM	- 102.4		5 -	-	6+5- N =1 REC	+5 0 ; =13"			holle aug rota	ow stem er to mud ry drilling
	-							-	-						
	-	wet, light orangeish brown	Ι.				<u> </u>			4+5- N =1 REC	+5 0 ; =15"				
	_							-10-			_				
	-							-	10	6+5- N =1 REC	+5 0 ; =13"				
	_							-	_						
	-	fine to medium grained, m brown.	oist, reddish					-	-0	7+9- N =1	+8 7				
3/6/0								-15-		REC	; =16"				
L.GDT	-							-	-						
NABEI	-							-	-						
SCH	_							L	_						
.GPJ	_	fine to coarse grained, we	t, light grayish					L	M	8+9-	+11				
от 700		orange.							Ň	N =2 REC	20 \$ =13"				
DG SF								20-							
18 PL(-							F							
1200	-							F	-						
90 00	-							F	-						
RING LC	-	fine to medium grained, da brown.	ark orangeish					-	-	3+5- N =1	+6 1 =15"				
TEST BO		continued on next	page					-25-		REU	, - 13				

Comments:
1. Boring backfilled with cement/bentonite grout through tremie pipe upon completion.
2. * = See Appendix I for additional lab testing data.
3. Ground water observation well OW-756 installed at nearby location.

	TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant		Boring N	lumber:	B-756
Schnal	bel Engineering	C	alvert Cou	inty, Ma	ryland			Contract	Number: 06	6120048
DEDTU						9			012	
(FT)	STRATA DESCRIPT	ION	CLASS.	(FT)	WL	DEPTH		Δ	TESTS	REMARKS
			SP-SM							
-										
	fine to coarse grained, deddi	sh brown.					13+17+1	8		
							N =35	` "		
						-30		, 		
	dark reddish orange (3" laye	of white					5+6+12			
	clay).					Å	N =18 REC =17	,		
						55				
36.0 -	CLAYEY SAND, fine to medi	um	SC	70.9						
	grained, wet, mottied grayish	orange.								
	_									
	_					M	1+2+1 N =3			
-						<u>–40–</u> []	REC =18	3"		
_										
	greenish gray, contains mica									
-							1+2+1			
-						F 1X	N =3			
-						-45	REC =18	5		
46.0 -	LEAN CLAY, moist, oliveish	orav, with	CL	60.9						
-	fine to medium sand, contain	s mica.								
-										
							3+3+3			
				56.0			N =6 REC =18	3"		
50.0	BOTTOM OF BORING @ 50	.0 FT.		- 50.9						
2.00										
-										
0100										
5										
-										

Comments:
1. Boring backfilled with cement/bentonite grout through tremie pipe upon completion.
2. * = See Appendix I for additional lab testing data.
3. Ground water observation well OW-756 installed at nearby location.

20	hnabel	Calvert Calvert	Cliffs Cou	s Nucle nty, Ma	ar Pow ryland	/er Pla	nt		Boring	Number:	er: 06	61200	B-757		
Schna	bel Engineering	LOG									Sheet:	1 of 2			
Boring	Contractor: CONN		ASSOCIATI	S INC					Gro	ound	water Obs	ervations			
	FRED	ERICK, MAF	RYLAND						D	ate	Time	Depth	Cas	ing	Caved
Boring F	Foreman: T. Conne	lly Tri cono Dol	lor Dit (Mud	Detervi		Enco	untere	d	5	/25		11.0'			
Drilling				Rolary)											
Schnabe	Equipment: CME-7	R. Vinzant													
Dates	Started: 5/25/06	Finished [.]	5/25/06												
Location	Northing: 21513	5 12 ff	20,00												
Location	Easting: 96076	0.6 ft													
Ground	Surface Elevation:	106.9 (feet)													
DEPTH	STRATA	A DESCRIPT	ION	CLA	SS.	ELEV.	WL		S	AMPL	ING	TEST	s	F	REMARKS
(FI)						(F1)		DEP	тн		DATA				
0.5	Forest litter, root	mat and tops	soil.	SM	1	106.4			IM	1+1+ N =2	·1				
-	SILTY SAND, fin	e to medium	grained,					F	ΠD	REC	=14"				
2.0 -	and organic matt	ter.	ayments,			104.9		F	-						
	POORLY GRAD	ED SAND W	ITH SILT,	5-3	SIVI			L		4+4+	3				
	fine to medium g	rained, mois	t,						IXI	N =7	-10"				
								F		REC	=18				
								- 5 -	-		_				
	fine to medium g	rained.							IV	3+4+ N =9	.5				
-								F	70	REC	=18"				
	-							-	-						
_	light orangeish b	rown.						L		7+8+	8				
									IŇ	N =1	6 =18"				
-	-							F		NLO	-10				
	-							-10-	-					Cha	anged from
	wet, orangeish b	rown.					∇	L		7+11	+13			aug	er to mud
							-		IXI	N =2	4 -15"			rota	ry drilling
-	-							F		REC	-15				
	-							F	-						
										5+8+	8				
χ								Γ	IXII	N =1	6				
- 3/6/(-							-15-		REC	=16"				
	-							L	4						
2EL.0															
								F	1						
	-							F	-						
- -	light orangeish b	rown.						L		6+7+	10				
									IŇ	N =1	7 =14"				
	1							-20-	- 11	NEU	- 14				
- 12	-							F	-						
0481								L							
- 120]							Γ	7						
ד - ט	{							F	-						
- IC	orangeish brown	I.						L		4+6+	7				
										N =1	3 =15"				
	continue	ed on next pag	ie					-25-	- 11	NEC.	-15				
	chnabel BORING Project:				s Nucle	ar Pow	er Plan	t	В	oring Nu	umber:	B-757			
---------------	-------------------------	----------------------------	---------------------	-------------	---------------	---------	---------	---------	------------------	----------	--------------------	---------			
Schnak	bel Engineering	LOG		Calvert Cou	nty, Ma	iryland			Co Sh	ontract	Number: 00 of 2	6120048			
DEPTH (FT)	STRAT	A DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	DEPT	S. H			TESTS	REMARKS			
				SP-SM					27(17)						
26.0 -	POORLY GRAD	ED SAND W grained, wet,	ITH CLAY, orangeish	SP-SC	80.9										
_	brown.														
-								M	3+3+2 N =5						
-							-30-	Δ	REC =18"						
-															
-															
-	mentile de avec de la								0.4.4						
-	mottled grayish	orange.						X	N =2 REC =18"						
							-35		INEO IO						
-								М	2+2+2						
40.0 -			0 FT		66.9		-40	Μ	REC =18"						
			.011.												
00.00															
100															
-00.0D															
012004															

Comments:
1. Boring backfilled with cement/bentonite grout through tremie pipe upon completion.
2. * = See Appendix I for additional lab testing data.

Schnal	TEST Project: BORING BORING bel Engineering LOG	Calvert C Calvert C	Cliffs Nucle County, Ma	ar Pov aryland	ver Pla	int		Boring Contra Sheet:	Number act Number 1 of 2	: er: 0612	B-75
Borina C	Contractor: CONNELLY AND ASSOCIATI	ES, INC.				Gro	oundwa	ater Obs	ervations	5	
	FREDERICK, MARYLAND	-,				D	ate	Time	Depth	Casing	Caveo
Boring F	oreman: T. Connelly		Enco	untere	∋d	5	/24		Dry		
Drilling I	Method: 3-7/8" OD Tri-cone Roller Bit										
Drilling E	Equipment: CME-75	-									
Schnabe	el Representative: R. Vinzant										
Dates \$	Started: 5/24/06 Finished: 5/24/06										
Location	n: Northing: 215133.29 ft Easting: 960332.67 ft	-									
Ground	Surface Elevation: 82.6 (feet)			1	1						
DEPTH (FT)	STRATA DESCRIPTION	CLAS	SS. ELEV. (FT)	WL	DEP	S⊿ אדי	AMPLII D/	NG ATA	TEST	s	REMARKS
	POORLY GRADED SAND WITH SILT, medium to coarse grained, organic	SP-S	M			M	2+2+2 N =4				
_	matter, trace graveľ, moist, light orangeish brown.						REC =	16"			
-	Reddish brown.				-	-	2+1+1 N =2				
_					-		REC =	17"			
	Orangeish brown, trace organic matter.				- 5 -	M	3+2+2 N =4				
_							REC =	18"			
_	Light yellowish brown, trace gravel, and						13+7+	5			
_	mica.					<u> </u>	N =12				
_					-10-						
_	Light orangeish brown, fine - med. sand.				_		3+3+3				
_					_	$ \square $	N =6 REC =	18"			
-					-	_					
_							3+3+3				
						W	N =6 RFC =	18"		9	art of mud
					-15-		I LO	10		rc	tary drilling
-					F	-					
17.0 -	CLAYEY SAND fine to medium	SC	65.6		\vdash	-					
-	grained, wet, light orange.				F	4					
_							2+1+1				
						W	N =2 RFC =	18"			
					-20-	-					
-					╞	-					
-					F	-					
22.5	SANDY LEAN CLAY, fine to medium,	CL	60.1		L						
	moist, greenish gray, with mica.						1+3+3				
-					Γ		N =6	4.0"			
-	continued on next page				-25-	- 11	KEC =	10			

	6	bachal	TEST	Project: C	alvert Cliffs	s Nucle	ar Pow	er Plant	t		Boring	Number:	B-758
	C		BORING	C	alvert Cou	nty, Ma	ryland				Contra	ct Number: 06	6120048
	schnat	bei Engineering	LUG						_		Sneet:	2 01 2	
	EPTH (FT)	STRAT	A DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	DEDT	ы 1		G TA	TESTS	REMARKS
					CL			DEPT		DA			
	-												
	_												
	1									1.2.2			
	-								XI	N =6			
								-30-	Ш	REC =1	8"		
	-												
	_												
	1									2+4+4			
	-								XI	N =8			
								35	Ш	REC =1	8"		
	-												
	_												
										1+5+6			
	-								XI	N =11	0"		
4	0.0	BOTTOM OF BO	ORING @ 40	.0 FT.		42.6		-40-		REC =1	8		
\$/6/08													
DT													
BEL.G													
HNA													
J SC													
00.GF													
SPT 7													
LOG (
048 P													
6120(
000													
NGL													
BORI													
TEST													

Comments:
1. Boring backfilled with cement/bentonite grout through tremie pipe upon completion.
2. * = See Appendix I for additional lab testing data.

Schna	TEST Project: C BORING C abel Engineering LOG	alvert Cl alvert Co	liffs Nucle ounty, Ma	ar Pov aryland	ver Pla	int	Bo Co She	ring N ntract eet: 1	lumber: t Numbe of 4	er: 06120	B-759
Boring						Gro	oundwater (Obser	vations		
Bornig	MALAGA, NEW JERSEY					D	ate Tim	ne	Depth	Casing	Caved
Boring I	Foreman: J. Blemings		Enco	untere	d	6	/20		10.5'		
Drilling	Method: 3-7/8" OD Drag Bit		Water	Readi	ng	7	/26		61.3'		
Drilling	Equipment: CME-750 (ATV)	-			•						
Schnab	el Representative: B. Bradfield										
Dates	Started: 6/20/06 Finished: 6/21/06										
Locatio	n: Northing: 214526.25 ft Easting: 960025.32 ft										
Ground	Surface Elevation: 98.4 (feet)			1							
DEPTH (FT)	STRATA DESCRIPTION	CLASS	S. ELEV. (FT)	WL	DEP	S. TH	AMPLING DATA		TEST	s	REMARKS
0.2	Forest litter, rootmat, and topsoil.	ML	98.2			M	3+3+3				
	SILT with sand, moist, yellowish brown and brown, contains root fragments				-	-Ň	N =6 REC =7"			1.5 mi	5'-Begin ud-rotary with
2.0	CLAYEY SAND, fine to medium	SC	96.4		F					3-7	7/8" drag bit
	grained, moist, orangeish brown, contains root fragments				-	HM	4+6+9 N =15				
					L		REC =14"				
4.5	POORLY GRADED SAND WITH SILT	SP-SN	93.9								
	fine to coarse grained, moist, orangeish				- 5 -	TM	2+3+3				
.	_ brown and brown				F	HŴ	N =6 RFC =14"				
7.0			91.4		L						
	POORLY GRADED SAND, fine to coarse grained trace gravel trace silt	SP					4+7+8				
-	moist, orangeish brown.				F		N =15				
	-				F		REC =10"				
_	-				-10-	_					
	wet, vellowish brown			<u>¥</u>			4+5+8				
-					Γ		N =13				
	-				F		REC = 10				
13.0			85.4		F	-					
	fine to coarse grained, wet, yellowish	5P-5N					4+6+9				
	brown				Γ		N =15				
-	4				-15-		REC =0				
	-				+	-					
170			81 /		L						
	SILTY SAND, fine to coarse grained,	SM	01.4								
-	reddish brown.				F						
	-				F	-M	8+7+5 N -12				
_					20-	\square	REC =6"				
					20-						
-	1				F	1					
22.0	CLAVEY SAND fine to modium	er	76.4		\vdash	-					
	grained, wet, orangeish brown and light	30			L						
	gray						2+2+2				
-	1				F		N =4				
-					-25-	- 14	REC =15"				
	Continued on next page										

	-	hnahal	TEST	Project: (Calvert Cliff	s Nucle	ar Pow	er Plant		Boring	Number:	B-759
S	chnal		BORING	(Calvert Cou	inty, Ma	iryland			Contra Shoot:	ct Number: 0	6120048
	DTU	ber Engineering	LUU					6		Sneet:	2 01 4	
	T)	STRATA	DESCRIPT	ION	CLASS.	ELEV.	WL			ГЛ	TESTS	REMARKS
					SC			DEPIN	DAI	A		
	-											
27	.0 -					71.4						
	_	wet, orangeish b	SILI, fine t rown and mo	o medium, ottled gray	МН							
									1+1+2			
	_							F 1 X	N =3	-"		
								-30-1		5		
	-											
32	2.0 -		and moist	arav		66.4						
	_	contains mica	anu, moist, g	yiay,								
								L Jm	2+3+2			
								I IX	N =5 REC =1	8"		
								-35-1		0		
	-											
37	' .0 –	I FAN CLAY with	sand moist	arav	CI	61.4						
	-	contains mica	,	, 3 , ,								
	_							L IM	2+4+4			
								L 10-M	N =8 REC =18	8"		
								40				
	_							F 1				
42	2.0 -	FAT CLAY with s	and, moist, g	gray,	СН	56.4						
	-	contains mica										
	-							M	2+4+5			
44	.5	POORLY GRAD	ED SAND W	ITH CLAY,	SP-SC	53.9		L_45_0	REC =1	8"		
	_	fine to medium g contains mica.	rained, wet,	dark gray,								
8 47	′.0 –	LEAN CLAY with	sand, moist	, dark	CL	51.4						
3/6/	-	gray, contains m	ica					$ \mid \mid $				
GDI	-							M	4+6+8 N =14			
IABEI	_							<u>–50–</u> []	REC =1	8"		
SCH	_											
						46.4						
002		CLAYEY SAND,	fine to mediu	um Itains mica	SC	40.4						
GSP	-	granica, moist, u	an gray, cor									
3 PLC	-							F -11X1	4+6+8 N =14			
2004	_							<u> </u> −55– ∐	REC =1	8"		
G 061	-							$ \mid $				
010	_							L _∎	REC =0	•		57-62'-Harder
ORIN												drilling
STB	_	continue	ed on next pag	e				[]				
۳ L					1							

	hnabel TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	B	oring Number:	B-759
Schna	bel Engineering LOG	C	alvert Cou	inty, Ma	iryland		C SI	ontract Number: (heet: 3 of 4	06120048
DEPTH (FT)	STRATA DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	S/ DEPTH	AMPLING DATA	TESTS	REMARKS
59.5	fine to coarse grained, wet, g brownish white, 30-40% fine	ray and to coarse	SC	38.9			12+14+21 N =35		
	shell fragments, strong HCl r SANDY LEAN CLAY, fine to wet, gray, 10-20% fine to me fragments, moderate HCl rea moderate cementation	eaction coarse, dium shell liction,	CL			60 L] 	REC =18"		
-	moist, 0-10% fine to medium fragments, weak HCI reactio	shell า					1+3+4 N =7 REC =18"		
65.5	SANDY FAT CLAY, fine to m moist, gray, 0-10% fine to me fragments, contains mica, we reaction	iedium, edium shell eak HCl	СН	32.9			REC =24"		68'-Start of day
68.5	SANDY SILT, fine to coarse, gray, 20-30% fine to coarse s fragments, moderate HCI rea moderate cementation, ceme up to 1" in diameter	moist, shell action, ented sand	ML	29.9		 70	1+3+50/5" N =53/11" REC =8"		6/21/06 70'-Intermittent moderate to hard drilling
72.0 -	SILTY SAND, fine to mediun wet, gray and brownish white fine to medium shell fragmer HCI reaction	n grained, , 30-40% ts, strong	SM	26.4		 75	4+6+10 N =16 REC =18"		
77.0 -	POORLY GRADED SAND, f medium grained, wet, gray a brownish white, trace silt, 10 to medium shell fragments, s reaction, HCI reaction localiz fragments	ine to nd -20% fine trong HCI ed to shell	SP	21.4		 80 -	10+7+5 N =12 REC =15"		
	POORLY GRADED SAND W fine to medium grained, wet, brownish white, 20-30% fine shell fragments, strong HCI r HCI reaction localized to she	/ITH SILT, gray and to coarse eaction, Il fragments	SP-SM	16.4		 	6+7+8 N =15 REC =18"		
- 	CLAYEY SAND, fine to medi	um	SC	11.4					
	gramed, wet, gray, 0-10% fm medium shell fragments, mo reaction, HCI reaction localiz fragments	e to derate HCI ed to shell				 90	3+4+8 N =12 REC =18"		
	continued on next page	ge							

	hashal	TEST	Project: (Calvert Cliff	s Nucle	ar Pow	er Plant		Boring Number:	B-759
20	nnabel	BORING	0	Calvert Cou	inty, Ma	ryland		F	Contract Number:	06120048
Schna	bel Engineering	LUG							Sheet: 4 of 4	
DEPTH	STRAT	A DESCRIPT	ION	CLASS.	ELEV.	WL	S		G TESTS	REMARKS
				SC	,		DEPTH	DA	TA	
-	-			30						
-	-									
-	-						IV	4+5+8 N =13		
	-						<u>95</u>	REC =1	8"	
-										
-	-									
-		50.000/ fine								
	shell fragments	, strong HCl re	eaction					7+11+1	3	
	⁻ 30-40% fine to	medium shell	fragments,				I IX	N =24	2"	
100.0	reaction	sand, strong			-1.7		-100-		2	
	BOTTOM OF B	ORING @ 10	0.0 FT.							
00.00										
5										
10.0										
2007										
200										
2										

Schna	chnabel TEST BORING bel Engineering LOG	Project: (Calvert C Calvert C	Cliffs Cour	Nucle nty, Ma	ar Pow ryland	ver Pla	nt		Boring Contra Sheet:	I Number: Ict Number 1 of 4	er: 06120	B-765
During								Gr	oundw	ater Obs	ervations		
Boring	FREDERICK, MAI	ASSOCIATE: RYLAND	S, INC.					D	ate	Time	Depth	Casing	Caved
Boring F	Foreman: J. Blemings				Enco	untere	d	7	/11		19.5'		
Drilling	Method: 3-7/8" OD Tri-cone Ro	ller Bit			Start	of day	/	7	/12		20.0'		
Drilling Schnabe	Equipment: Diedrich D-50 (ATC el Representative: R. Vinzant	C)	F	,	Water	Readi	ng	7	/27		19.4'		
Dates	Started: 7/11/06 Finished:	7/12/06	F										
Location	n: Northing: 216424.51 ft Easting: 959701.22 ft		-										
Ground	Surface Elevation: 97.4 (feet)												
DEPTH (FT)	STRATA DESCRIPT	ION	CLAS	SS.	ELEV. (FT)	WL	DEP	S. TH	AMPLI D	NG ATA	TEST	s I	REMARKS
0.5	FL, R AND TOPSOIL.			M	96.9				1.1.4				
-	POORLY GRADED SAND W medium to coarse grained, tr organic matter, moist, dark y brown	/ITH SILT, ace ellowish	SP-SI	M			-		1+1+1 N =2 REC =	-18"			
-	Orangeish brown, contains ro fragments.	oot					-	1	2+2+4 N =6 REC =	=18"			
-	No root fragments.						5 -	-	2+4+4 N =8 REC =	=18"			
-	-						-		3+3+8 N =11 REC =	=18"			
-	Light yellowish brown.								3+4+6 N =10 REC =	=18"			
-	Orangeish brown.						- - 15-	-	5+5+5 N =10 REC =	=18"			
	- - - Wet, 4" section of light gray r	naterial .				Ā	- - - 20-		2+2+5 N =7 REC =	=18"			
	2" layer of dark reddish brow	n .					- - -	-	5+6+7 N =13				
	continued on next pag	ge					25-		REC =	=18"			

 Comments:

 1. Ground water observation well OW-765A installed in boring upon completion.

 2. * = See Appendix C for additional lab testing data.

 3. Ground water observation well OW-765B installed at nearby location.

6	hashal TES	ST Project:	Calvert Cliff	s Nucle	ar Pow	er Plant	E	Boring Numbe	r:	B-765
Schnat	bel Engineering LO	ING G	Calvert Cou	nty, Ma	iryland		(Contract Numb	er: 06	6120048
DEPTH				ELEV.	wi	s			те	DEMARKS
(FT)	STRATA DESC		CLASS.	(FT)	VVL	DEPTH	DAT	A	13	REMARKS
			SP-SM							
27.0				70.4						
27.0	SANDY LEAN CLAY, fin moist, gray, contains mic	e to medium, ca.	CL	70.4						
							3+3+3			
							N =6 REC =18			
						-30				
-										
-										
-							0.0.4			
-							N =7			
						-35-1	REC =18	i"		
-										
37.0 -	SILTY SAND, fine to me	dium grained,	SM	60.4						
-	moist, gray, contains mic	ca.								
-						M	6+8+13 N =21			
-						-40	REC =18	,"		
-										
42.0 -	SANDY FAN CLAY fin	e to medium	CI	55.4						
-	moist, gray, contains mic	ca.								
-						M	5+9+10 N =19			
_						<u>45</u>	REC =18	,"		
-										
47.0 -		-lineint		50.4						
	dark greenish gray, cont	dium, moist, ains mica.	ML							
						L IM	4+7+9			
						Ŭ	N =16 REC =18	,"		
520 -				15 1						
	LEAN CLAY, moist, dark with sand, contains mica	greenish gray, , fine - med.	CL							
	sand.						3+4+6			
140 FL							N =10 REC =18	,"		
						F 1				
57.0 -	SILT, moist, dark greenis	sh gray, with	ML	40.4		F 1				
	continued on ne	xt page								
-										

ſ		hnabol	TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant		Boring	Number:	B-765
	Schna	bel Engineering	LOG	C	alvert Cou	nty, Ma	iryland			Contra Sheet	ct Number: 00	6120048
ŀ	DEPTH	STRATA			CLASS.	ELEV.	WL		SA		TESTS	REMARKS
	(FT)					(FT)		DEPTH	1	DATA		
		_			ML				71	5+5+6		
									Ňľ	N =11 REC =18"		
	-											
		-										
		-										
		-						-				
		-						- +		7+8+13 N =21		
	-	-						-65-	<u> </u> I	REC =18"		Harder drilling
		-										
		-										
		_										
		Contains cemen	ted sand, stro	ong HCl					\overline{A}	9+50/5"		
		reaction, weak c	ementation, ments.	15% med					ן <u>ר</u> י	N =50/5" REC =11"		
	-	Strong HCI react	tion, moderat					70	I	REC =8"		
		fragments.	// IIIeu Cua									
		-										
	73.0	SILTY SAND, fin	e to medium	grained,	SM	24.4						
		reaction, modera	gray, strong H ate cementati	HCI on, 25%)	())	14+12+50/5" N =62/11"		
	-	med coarse sh	ell fragments	6.				-75-		REC =17"		
		-										Drilling penetration rate
		-										faster
		-										
		Dark greenish gr	ray, moderate	e HCI					7	6+7+11		
	_	layered med c	ementation, oarse shell fr	15% agments.						N =18 REC =18"		
8/08												
DT 3/												
BLL.GI		-										
CHNAE			ention 50/							0.0.40		
PJ SC		coarse shell frag	ments, no ce	med ementation.)	X	0+8+12 N =20		
700.G	-	-						-85-4		REC =18"		
SPT		_										
PLOG		-										
20048		-										
3 061		3% med coars	e shell fragm	ients.				_	76	4+6+8 N = 14		
GLOG	_	-						_ ₉₀ _/	∆ ¦	REC =18"		
ORIN												
TESTE		continu	ed on next pag	e								

	TEST Project: 0				s Nucle	ar Pow	er Plant		Boring	Number:	B-765
Schnal		BORING LOG	C	Calvert Cou	inty, Ma	ryland			Contra Sheet	ct Number: 00	6120048
DEPTH				0.000	ELEV.			SAMPLIN	IG	- 01 -	
(FT)	STRATA	DESCRIPT	ION	CLASS.	(FT)	WL	DEPTH	DA	TA	TESTS	REMARKS
				SM							
_	Moist							7 4+6+6			
-	WOISt.							N =12	18"		
							95		10		
-											
-											
_								7			
_	strong cementatio	n, 50% me	action, d coarse					8 50 REC =	6"		
_	shell fragments.						-100-	REC =	20"	*	
-											
102.0 -	BOTTOM OF BOF	RING @ 10	2.0 FT.		-4.6						
10.00											
- 10 0											
240071											
8											
3											

Schnabel TEST Project: Cal					Cliff	s Nucle	ar Pow	/er Pla	nt		Boring	Number:		B-766
Schna	bel Engineering	LOG		Calvert (Cou	inty, Ma	ryland				Contra Sheet:	t Number 1 of 2	er: 061	20048
Boring			NG						Gro	ound	vater Obs	ervations		
	MALA	GA, NEW JE	RSEY						D	ate	Time	Depth	Casin	g Caved
Boring F	Foreman: J. Evans	Tri sere Del				Enco	untere	d	5	/23		0.0'		
Drilling		I ri-cone Roi	ier Bit (Mud I	Rotary)		Water	Readi	ng	7.	/26		27.0'		
Schnabe	Equipment: Failing	I-1500 (Truck R. Vinzant	.)											
Dates	Started: 5/23/06	Finished: 4	5/23/06											
Location	n: Northing: 216932 Easting: 95979	2.89 ft 1.5 ft	5/20/00											
Ground	Surface Elevation:	108.9 (feet)												
DEPTH	OTDAT					ELEV.			S	AMPL	.ING	TEOT		
(FT)	SIRAIA	A DESCRIPT	ION	CLA	55.	(FT)	VL	DEP	тн	[ΑΤΑ	IESI	S	REMARKS
-	POORLY GRAD trace root fragme grained, wet, dar	ED SAND W ents, fine to n rk brown.	ITH SILT, nedium	SP-S	SM			_	-	5+8+ N =1 REC	4 2 =18"			
-	-							-						
-	reddish brown.							_		2+1+ N =3 REC	2 =18"			
_	orangeish brown							- 5 -	-0	2+3+	3			
-								-	-	N =6 REC	=16"			
-	moist.							-	- M	3+3+	4			
-	-							-	-M	N =7 REC	=15"			
	wet trace gravel	fine to coar	se grained					-10-		4+8+	9			
-			ee graniea.					-		N =1 REC	7 =18"			
-	-							-		12+1	6+17			
-								- 		N =3 REC	3 =18"			
								_	-					
	-							_						
	-							-	-0	12+1 N =3	3+19 2			
	-							-20-		REC	=18"			
	-							-						
								F	1					
	reddish brown.									10+1	5+20			
								-25-	_Ň	N =3 REC	5 =18"			
	continu	ed on next pag	e											

Comments:
1. Ground water observation well OW-766 installed in boring upon completion.
2. * = See Appendix I for additional lab testing data.

	TEST Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	Boring Number:	B-766
	BORING C	alvert Cou	nty, Ma	ryland		Contract Number: 0	6120048
Schna	bei Engineering LOG					Sheet: 2 of 2	
DEPTH	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL		TESTS	REMARKS
		SP-SM					
-							
-	light orangeish brown mottled of white.						
-					REC =	18"	
_							
32.0 -	CLAYEY SAND, fine to medium	SC	76.9				
-	grained, wet, orangeish brown, contains white clay.						
					2+2+2		
_					-35 REC =	18"	
-							
-							
-	greenish gray, contains mica.				2+1+2 N =3		
					-40-10 REC =	18"	
-							
_							
					₩ 2+2+3		
-					N =5	4.01	
						10	
-							
-							
80/9/ -	-						
					2+3+4		
						18"	
50.0 —	BOTTOM OF BORING @ 50.0 FT.		58.9				
201							
1048 L							
17190							
2							
DNIK							

Comments:
1. Ground water observation well OW-766 installed in boring upon completion.
2. * = See Appendix I for additional lab testing data.

	hnabal	Project:	: Calvert Cliffs Nuclear Power Plant						Boring Number: E			B-768			
Schna	bel Engineering	Calvert	Coui	nty, Ma	ryland				Contra Sheet:	ct Number 1 of 4	er: 06	1200)48		
Boring	Contractor: CONN	NELLY AND	ASSOCIATE	S. INC.					Gro	ound	water Obs	ervations			
	FRED	ERICK, MAF	RYLAND	-,					D	ate	Time	Depth	Casi	ing	Caved
Boring F	Foreman: D. Reese	; Tri₋cone Rol	ler Bit (Mud	Potany)		Enco	untere	d	6	/20		23.5'	0.0)'	
Drilling	Equipment: CME-7	75 (Truck)		i (Otal y)											
Schnabe	Representative	M Arles													
Dates	Started: 6/19/06	Finished: 6	6/20/06												
Location	n: Northing: 21711	6.03 ft													
	Easting: 96224	2.98 ft													
Ground	Surface Elevation:	48.4 (feet)													
DEPTH (FT)	STRAT	A DESCRIPT	ION	CLA	SS.	ELEV. (FT)	WL	DEP	S/ TH	AMPI	LING DATA	TEST	s	R	REMARKS
0.3	FL, R AND TOP	SOIL.		FII	1	48.1			M	1+3+	-3			0-4(D' Hollow
-	Sandy lean clay fragments, fine t	FILL, contair o coarse, mo	is root ist, brown.		-			 	ŀΜ	N =6 REC	=12"			SICI	n auger
2.0 -	SILTY SAND, fir	ne to medium	grained,	SN	1	46.4		F .							
-	moist, brown.							-	IXI	5+64 N =1	2				
-	-									REC	=18"				
	-							- 5 -		5+6+	-7				
-	-							Ļ .	-IXI	N =1	3				
70 -						414		L .		REU	=10				
	LEAN CLAY, mo	oist, brown ar	nd green.	CL	-				М	3+4+	-5				
-										N =9	=12"				
-								-		INE O	-12				
	-							-10-							
-	trace sand.							-	HM	2+2+ N =5	-3				
	-							- ·	ЦШ	REC	=14"				
13.0 -		• •				35.4		L .	-						
_	ELASTIC SILT, I	moist, green	and brown.	MF	1			L.		1+3+	-3				
80/0								45	Ŵ	N =6 REC	=16"				
								- 15-							
								-	1						
- AN	-							-	$\left \right $						
	-								+						
	with ironite layer	S.						Ļ .	-M	1+3+	4				
	-							-20-	\square	REC	=18"				
48 PL															
	1							F .	1						
23.0 -	SILTY SAND, fir	ne to medium	grained,	SM	1	25.4	$\overline{\Delta}$	-							
- NG	wet, brown.							- ·	HM	WOH	H+1+1				
		ad an <u>wt-</u>						-25-	μΔ	REC	=12"				
	continu	ea on next pag	e												

Γ	6	TEST	Project:	Calvert Cliff	s Nucle	ar Pow	er Plant		Boring Number:	B-768
	Sahnah	BORING		Calvert Cou	nty, Ma	iryland			Contract Numbe	r : 06120048
E	Schnab	er Engineering EOO								
'	(FT)	STRATA DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	ПЕРТН			S REMARKS
				SM						
	-									
	_									
	_									
		moist, green, with fine to coa	rse shell					3+4+4		
		fragments, strong HCI reaction	on, 30-40%					N =8	8"	
	_	Shell hug.					-30	1,150 1		
	-									
	-									
	_									
		contains cemented sand, 40-	50% shell					3+5+5		
		frag.					<u>_</u> }	N =10 REC =1	8"	
							-35			
	-									
	-									
	-									
	_	fine grained, trace fine to me	dium shell				10	3+3+4		
	_	0-10% shell frag.	iction,				40	REC =1	8"	40-100' mud
										roller bit
	-									
	-							_		
	-	fine to medium grained, weal reaction	(HCl					REC =2	0"	
	_						-45-			
	_									
/08										
0T 3/6		with fine to secres shall from	nanta					1 0. 01. 1		
EL.GD	-	strong HCl reaction, 60-70%	shell frag.)	N = 40	9	
INABI	_						-50-	ן REC =1	8	
Ś	-									
0.GP,	4						-			
PT 70										53' rig chattor
OG S		wet, green and white, contair	IS					31+11+	18	
48 PL	1	cemented sand, 60-80% she	ll frag, 1/4" shells					N =29	۵"	
61200	-	ayoro or comence sana anu	01010.				55 ^r -	1,50-1		
ð Ö	-									
NGLC	-									
BORI	4	t					-			
TEST		continued on next pag	je							

Schnabel Engineering BORING LOG Calvert County, Maryland Contract Number: 06120048 Sheet: 3 of 4 DEPTH (FT) STRATA DESCRIPTION CLASS. ELEV. (FT) WL SAMPLING DEPTH TESTS REMARKS green, moderate HCI reaction, 10-20% shell frag. SM 5+17+23 N =40 REC =18" 5+17+23 N =40 REC =18"		TEST	Project: 0	Calvert Cliff	s Nucle	ar Pow	er Plant	В	Boring Number: B-768			
DEPTH (FT) STRATA DESCRIPTION CLASS. ELEV. (FT) WL SAMPLING DEPTH TESTS REMARKS	Schna	bel Engineering LOG	i (Calvert Cou	nty, Ma	ryland		Co	ontract Number: (6120048		
DEPTH (FT) STRATA DESCRIPTION CLASS. LEEV. (FT) WL DEPTH DATA	DEDTU						s					
green, moderate HCI reaction, 10-20% SM - - 5+17+23 N =40 REC =18" - - - - - <	(FT)	STRATA DESCRIPT	TION	CLASS.	(FT)	WL	DEPTH		TESTS	REMARKS		
green, moderate HCI reaction, 10-20% shell frag. 			(0.000)	SM					-			
$\begin{bmatrix} -60 \\ -60 \\ -60 \end{bmatrix} \begin{bmatrix} -60 \\ $		shell frag.	n, 10-20%				F - HXI	5+17+23 N =40				
$\begin{bmatrix} - & - & - & - & - & - & - & - & - & - $		-					-60-1	REC =18"				
		-										
$\begin{bmatrix} - & - & - & - & - & - & - & - & - & - $		_										
5+7+12 5=18"		-										
N =19 REC =18"							L JM	5+7+12				
								N =19 REC =18"				
	· ·											
67.0 POORLY GRADED SAND WITH SILT, SP-SM -18.6	67.0	POORLY GRADED SAND W	/ITH SILT,	SP-SM	-18.6							
trace fine to medium shell fragments,		trace fine to medium shell fra	igments,									
frag. $ -$		frag.	% snell					5+8+10 N =18				
	-	-					-70- 1	REC =18"				
		-										
72.0 SILTX SAND fine to medium grained SM -23.6	72.0	SILTY SAND fine to medium	arained	SM	-23.6							
moist, green.		moist, green.	r grainea,	Civi								
REC =13"		-						REC =13"				
	_	-					— 75—					
		_										
	77.0				28.6							
SANDY SILT, fine to medium, moist, ML -20.0	11.0	SANDY SILT, fine to medium green, trace fine to medium s	n, moist, shell	ML	-20.0							
fragments, moderate HCl reaction,		fragments, moderate HCI rea 0-10% shell frag.	action,					5+5+5				
	· ·							N =10 REC =18"				
		-					-80-1					
	-	-										
82.0 SILTY SAND, fine to medium grained, SM -33.6	82.0	SILTY SAND, fine to medium	n grained,	SM	-33.6							
moist, green, with fine to coarse shell fragments, strong HCI reaction, 40-60%	-	moist, green, with fine to coa fragments, strong HCI reaction	rse shell on, 40-60%									
shell frag.	-	shell frag.					M	4+13+9 N =22				
REC =18"	-	-					85- U	REC =18"				
	-	-										
		-										
		-										
							L JM	5+12+12				
N =24 REC =18"								N =24 REC =18"				
							50					
continued on next page		continued on next pag	ge									

6	hnahol	TEST Project: Calvert Cliffs Nuclear Power Plant BORING Calvert County, Maryland								Boring Number: B-7			
Schnat	bel Engineering		Calvert Cou	inty, Ma	iryland			Contr Sheet	act Number: 06 : 4 of 4	6120048			
DEPTH (FT)	STRAT	A DESCRIPT	ION	CLASS.	ELEV. (FT)	WL	DEPT	SAN H	IPLING DATA	TESTS	REMARKS		
				SM									
92.0 -	SANDY SILT, fi oliveish green, v fragments, mod 10-15% shell fra	ne to medium with fine to me erate HCI rea ag.	ı, moist, edium shell iction,	ML	43.6		 95		+6+7 =13 EC =18"				
07.0					40.0								
97.0 -	ELASTIC SILT, with sand, trace fragments, mod 0-5% shell frag.	moist, oliveis fine to mediu erate HCI rea	h green, ım shell ıction,	MH	48.6				+7+8 =15				
100.0 —	BOTTOM OF B	ORING @ 10	0.0 FT.		-51.6		-100-		EC =18"				

Schnal	TEST Project: C BORING C bel Engineering LOG	alvert Cli alvert Cc	iffs Nucle ounty, Ma	ar Pow ryland	ver Pla	nt	Boring Contra Sheet:	Number: ct Number 1 of 2	er: 061200	B-769
Boring C	contractor: UNI-TECH DRILLING					Gro	oundwater Obs	ervations		
g -	MALAGA, NEW JERSEY					D	ate Time	Depth	Casing	Caved
Boring F	oreman: J. Blemings		Enco	untere	d	5/	/11	24.5'		
Drilling I	Method: 3-7/8" O.D. Drag Bit (Mud Rotary)		Water	Readi	na	7	/25	24 3'		
Drilling E	Equipment: CME-750 (ATV)	-	Water	Reau	ing		20	24.0		
Schnabe	el Representative: K. Megginson									
Dates \$	Started: 5/11/06 Finished: 5/11/06									
Location	: Northing: 216589.75 ft Easting: 962559.47 ft									
Ground	Surface Elevation: 54.2 (feet)				1					
DEPTH (FT)	STRATA DESCRIPTION	CLASS	6. ELEV. (FT)	WL	DEP	S/ ТН	AMPLING DATA	TEST	S F	EMARKS
0.7	Forest litter, rootmat and topsoil.		53 5			M	1+1/12"		*NV	VJ rods d.
	SILTY SAND, fine to medium grained, moist, brown and dark brown, contains root fragments.	SM			-	10	REC =7"			.
_	fine to coarse grained, light brown.				L		3+5+5			
						Ŵ	N =10 REC =15"			
4.5			49.7		Γ					
	CLAYEY SAND, fine to coarse grained, moist, brown, (coarse sand is	SC			- 5 -	M	3+4+6			
_	subangular to subrounded).				_		REC =12"			
	orangeish brown and brown.		45 7		_	-0	5+4+5 N =9			
0.0 -	LEAN CLAY, moist, light orangeish brown and gravish brown, trace fine to	CL	45.7		-	ЦЦ	REC =16"			
	medium sand.				-10-	-				
-	fine to medium sandy, light orangeish brown and light grayish brown, trace mica, contains clayey sand lenses, (bedding thickness 1/8 inch).				_		6+6+8 N =14 REC =16"			
_					F					
_	grayish brown and light orangeish brown				F	HM	3+2+4 N =6			
					-15-	40	REC =18"			
_						7				
_					F	1				
-					-	-				
-	orangeish brown and grayish brown,				F	-M	WOH+3+3			
	structure exhibits vertical laminations -						REC =18"			
	laminations no greater than 1/16 inch thick)				20					
-					F	1				
-					F	-				
-					Ļ					
	orangeish brown and light brown, trace						WOH+2+2			
-	fine to medium sand.			$\overline{\Delta}$	Γ		N =4			
	continued on next page				-25-	-				

Comments:
1. Ground water observation wel OW-769 installed in boring upon completion.
2. * = See Appendix I for additional lab testing data.

	TEST	Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	I	Boring Number:	B-769
Schnat	bel Engineering LOG	c C	alvert Cou	inty, Ma	ryland			Contract Number: (Sheet: 2 of 2	06120048
DEPTH (FT)	STRATA DESCRIPT	ΓΙΟΝ	CLASS.	ELEV. (FT)	WL	S. DEPTH		TESTS	REMARKS
_	wet, light brown and dark ora brown, with fine to medium s	angeish and.	CL						
27.0 -	CLAYEY SAND, fine to medi grained, wet, brown and orar brown, (high percentage of fi	ium ngeish nes).	SC	27.2			4+1+4 N =5		
	light gray and gray below 29.	.7 ft.		22.2		<u>30</u> []	REC =18	3"	
-	SILTY SAND, fine to mediun wet, gray, trace fine to coars fragments (±5%), weak HCI	n grained, e shell reaction.	SM			 35	4+4+4 N =8 REC =18	3"	
37.0 -	CLAYEY SAND, fine to medi grained, wet, gray, few fine tr shell fragments (±10%), stroi reaction, contains fine to mea strongly cement sand layer fi 39 ft.	ium o coarse ng HCl dium rom 38.5 to	SC	17.2		 	17+9+6 N =15 REC =16	5"	
 	dark gray, weak HCI reactior	1.				 45 	3+3+5 N =8 REC =18	3"	
							3+4+3 N =7 RFC =18	3"	
	BOTTOM OF BORING @ 50).0 FT.		4.2					

Comments:
1. Ground water observation wel OW-769 installed in boring upon completion.
2. * = See Appendix I for additional lab testing data.

Schna	TEST Project: C bel Engineering LOG C	Calvert Clit Calvert Co	ffs Nucle unty, Ma	ar Pow ryland	ver Pla	nt	Boring Contra Sheet:	Number: ct Number 1 of 2	e r: 06120	B-770
Boring	Contractor: CONNELLY AND ASSOCIATES					Gro	undwater Obs	ervations		
	FREDERICK, MARYLAND	,				Da	te Time	Depth	Casing	Caved
Boring F	Foreman: T. Connelly		Enco	untere	d	6/2	22	11.0'		
Drilling	Method: 3-7/8" OD Tri-cone Roller Bit		Wator	Roadi	na	7/2	25	DRY		
Drilling	Equipment: Diedrich D-50 (ATC)		Waler	Reau	ng	112		DRT		
Schnabe	el Representative: R. Vinzant									
Dates	Started: 6/22/06 Finished: 6/22/06									
Location	n: Northing: 215466.6 ft Easting: 962826.95 ft									
Ground	Surface Elevation: 121.6 (feet)				I					
DEPTH (FT)	STRATA DESCRIPTION	CLASS	ELEV. (FT)	WL	DEP	5A <u>TH</u>	MPLING DATA	TEST	s I	REMARKS
0.5	FL, R AND TOPSOIL.		121.1			M	2+1+2			
-	POORLY GRADED SAND WITH SILT, fine to medium grained, moist, yellowish brown.	37-310			-		REC =18"			
-	Moist, yellowish orange, trace root fragments.				-		6+8+6 N =14 REC =18"			
4.5			117.1		F					
-	moist, yellowish orange, trace root fragments.	МН			5 - -		3+4+5 N =9 REC =18"			
7.0 -	POORLY GRADED SAND WITH SILT, fine to medium grained, moist, reddish brown.	SP-SM	- 114.6		-		7+10+12 N =22 REC =18"			
- -	Wet.			Ţ	10- - -		5+7+10 N =17 REC =18"		Ch hol aug	ange from low stem ger to mud
- - -	Yellowish orange, Med coarse sand.				- - 15-		5+5+8 N =13 REC =18"		rota	ary aniling
	Moist, reddish brown.				- - 20- -		9+10+9 N =19 REC =18"			
-	Orangeish brown.						9+13+12 N =25 REC =18"			
	continued on next page				20-					

Comments: 1. Ground water observation well OW-770 installed in boring upon completion. 2. * = See Appendix I for additional lab testing data.

	TEST Project: C	alvert Cliff	s Nucle	ar Pow	er Plant	Boring Number:	B-770
Sahaa	BORING C	alvert Cou	nty, Ma	ryland		Contract Number: 0	6120048
Schna	bei Engineering LOG				CAMPLIN	Sneet: 2 of 2	
DEPTH	STRATA DESCRIPTION	CLASS.	ELEV. (FT)	WL		TESTS	REMARKS
		SP-SM					
-							
-							
-						10	
-	vvet, light yellowish brown.					+13	
						15"	
-							
-	_						
						14	
-					$ = \frac{1}{N} = \frac{1}{N} = \frac{1}{26} $	14	
					-35-10 REC =	18"	
-							
37.0 -			84.6				
	POORLY GRADED SAND WITH CLAY, fine to medium grained, moist, mottled	SP-SC					
	grayish orange.						
-					$ = \frac{1}{N} = \frac$		
-					-40-10 REC =	14"	
-	-						
-	-						
	Gray contains organic matter						
44.0 -	I FAN CLAY moist mottled orangeish	CL	77.6		N =2	0"	
	gray, with sand, Fine - med. sand.				-45-10 REC =	6	
46.0 -	EAT CLAX moist mottled orangeish	СН	75.6				
-	gray, with sand, Fine - med. sand.						
6/08							
DT 3/					2+8+8		
· · · · · · · · · · · · · · · · · · ·		0.5.014	72.1		N =16	4.01	
90.0 –	fine to medium grained, moist, reddish	SP-SM	71.6		-50-10 REC =	12"	
sc _	brown.						
0.GPJ	BOTTOM OF BORING @ 50.0 FT.						
of 70							
DG SI							
B PL(
12004							
G 06							
GLO							
ORIN							
EST B							
FL							

Comments:
1. Ground water observation well OW-770 installed in boring upon completion.
2. * = See Appendix I for additional lab testing data.

Schnabel Project No. 06120048 **Appendix C:** Borings and Test Pits

TEST PIT LOGS

	SC	hnabel	TEST PIT	Project: C	alvert Cli alvert Cc	iffs Nucle ounty, Ma	ar Pow	ver Plar	nt		Test P	it Number	: 		P-B307
1	Schnal	bel Engineering	LOG	-		··· · ,	,				Sheet:	1 of 1	i. 001	1200	140
	Rorina (Contractor:		•					Gr	ound	water Obs	ervations			
	, onling C	onu actor.							C	Date	Time	Depth	Casi	ng	Caved
E	Boring F	oreman: Paul Sch	affer												
E	xcavati	on Equipment: Jol	hn Deere 41	0D (Rubber Ti	red)										
s	chnabe	I Representative:	K Megginsor	1											
)ates	Started: 7/29/06	Finished:	7/29/06											
1															
L	ocation	: Northing: 216957 Fasting: 96069	7.53 ft 0 62 ft		-										
	Found	Surface Elevation:	119.4 (feet)												
H															
1	(FT)	STRATA	DESCRIPT	ION	CLASS	3. ELEV.	WL				ING	TEST	s	R	EMARKS
⊢	03	Rootmat and ton	soil			110 1		DEPI	Н						
	0.5		fina ta madi	um cond	ML	119.1		L _							
		⊂ contains root frag	gments, mois	st, brown.											
	-	[└] Fine to medium s	sandy below	1.5 ft.					1						
	3.0 -		(1) find to m	o dium	CM.	116.4									
	40 -	contains poorly g	graded sand	with silt	SIVI	115 /		L _							
	4.0	lenses, moist, br	own and ligh	it brown.	SP-SN	1					Comple	w=2.3	%	Tes	t Pit
		POORLY GRAD	ED SAND W	/ITH SILT				- 5 -		Buik	Sample	*		cons	ed-in at
	-	sand pockets, m	oist, light bro	own and										abo	ut 5.0 ft.
	6.7	yellowish brown.				112.7									
		BOTTOM OF BC	DRING @ 6.7	7 FT.											
/10/0															
51															
E.G															
NABE															
E SC															
<u> </u>															
048.G															
3120(
IS 00															
TPI															
TES															
N															
Zβ															
Ĩ															
ESTF															

Schnat	hnabel PIT LOG	Project: C C	alvert Clif alvert Co	ffs Nucle unty, Ma	ar Pow ryland	er Plan	nt		Test P Contra	it Number	r: er: 06	TF 1200	P-B314
Boring C	contractor:						Gr	ound	water Obs	ervations			
Doring o							D	ate	Time	Depth	Cas	ing	Caved
Boring F	oreman: Paul Schaffer	0D (Dubbor Ti	rad)	Enco	untere	d	8	3/2		4.0'		-	
Schnabe	I Representative: K Megginso	n nand (Rubbel III	red)	Enco	untere	d	8	3/2		6.5'		-	
Dates S	Started: 8/2/06 Finished: 8	/2/06											
Location	: Northing: 217320.35 ft Easting: 960658.25 ft												
Ground S	Surface Elevation: 52.8 (feet)												
DEPTH (FT)	STRATA DESCRIPT	ΓΙΟΝ	CLASS	ELEV. (FT)	WL	DEPT	S TH	AMPL	.ING DATA	TEST	s	R	EMARKS
0.8	Forest litter, rootmat and top	soil		52.0									
-	 SILTY SAND (SM), fine to medium, trace fine gravel, contains root fragments, moist, brown light brown below 1.5 ft. 		SM	52.0			-						
4.0 -	FAT CLAY (CH), trace fine to	СН	48.8	$\overline{\Delta}$			Bulk	Sample	w=37.0)%	Pero	ched ground	
	sand, moist, light gray, orang and yellow-brown.				- 5 -				PL=2	4	4.5	ft.	
-					$\overline{\nabla}$							Wat infilt	er ration from
-					-							bacl 6.5 t	k sidewall at ft.
8.0 -	ELASTIC SILT (MH) trace fi	ne sand	мн	44.8									
9.0 -	and mica, moist, gray.			43.8									
	BUTTOM OF BURING @ 9.	UF1.											

20	chnabel TEST	Project: Ca Ca	Ivert Clif Ivert Co	fs Nucle unty, Ma	ar Pow ryland	er Plan	ıt		Test P Contra	it Number ct Numbe	: T	P-B315
Schna	abel Engineering LOG						_		Sheet:	1 of 1		
Boring	Contractor:					I.	Gro	oundwa	ater Obs	ervations	Casima	Courd
Boring	Ecromon: Doul Schoffor						0	ate	Time	Depth	Casing	Caved
Execute	tion Equipment: John Dooro 41	0D (Bubbor Tire	ad)									
Excava	al Berrecentetive, K Magginee		eu)									
Schnab	Otartada 0/0/00 Einiakada 0											
Dates	Started: 8/2/06 Finished: 8	/2/06										
Locatio	n: Northing: 217182.5 ft Easting: 960563.12 ft											
Ground	Surface Elevation: 65.8 (feet)											
DEDTU							6		NG			
(FT)	STRATA DESCRIPT	ΓΙΟΝ	CLASS	· (FT)	WL	DEDT	ы. ц		NG ATA	TEST	s	REMARKS
	Forest litter, rootmat and top	soil				DEFI		10				
1.0				64.8								
20	contains root fragments, moi	st, light	SM	63.8								
2.0	brown.		SC	05.0								
3.0	CLAYEY SAND (SC), fine to contains silty sand pockets, i orange-brown.	medium, moist,	SM	- 62.8								
5.0 -	SILTY SAND (SM), fine to m moist, stratified brown and vellow-brown.	iedium,	SP-SM	60.8		- 5						
	POORLY GRADED SAND V (SP-SM), fine to coarse, con sand lenses, moist, light brow brown.	VITH SILT tains silty wn and						Bulk S	Sample	w=5.4' *	%	
8.5	BOTTOM OF BORING @ 8.	5 FT.		- 57.3								
2007												
OCHINABEL												
048.6PJ												
110101												
L LUG NE												

	Schnat	hnabel TEST PIT	Project: Ca	alvert Cli alvert Co	ffs Nucle unty, Ma	ar Pow ryland	er Plar	ıt		Test P Contra	it Number	: er: 061	TF 1200	P-B334
	Boring C	ontractor:						Gr	ound	vater Obs	ervations			
	Bornig O							D	ate	Time	Depth	Casiı	ng	Caved
	Boring F	oreman: Paul Schaffer			Enco	untere	d	8	8/2	12:00	8.0'			
	Excavatio	on Equipment: John Deere 410	DD (Rubber Tir	ed)										
	Dates S	Started: 8/2/06 Finished: 8/	2/06											
	Location	Northing: 216515.64 ft Easting: 960560.94 ft												
	Ground S	Surface Elevation: 87.0 (feet)												
	DEPTH (FT)	STRATA DESCRIPT	ION	CLASS	ELEV. (FT)	WL	DEPI	่ร ร			TEST	s	R	EMARKS
	0.7	Forest litter, rootmat and tops	oil		-		DEFI		L					
	0.7	SILTY SAND (SM), fine to me contains root fragments, mois	edium, st, brown	SM	- 86.3									
	_	light brown below 2.5 ft.										N/		
	_								Bulk	Sample	w=7.4*	70		
							- 5							
	_									o .	w=14.5	%		
	_								Bulk	Sample	*	, ,	Wat	er
	7.5	LEAN CLAY (CL), trace fine t	o medium	CL	- 79.5	$\overline{\Delta}$							infilt	ration as ket
		wet below 8.0 ft.	rown.										adva belo	anced w 8 ft.
	9.3	POORLY GRADED SAND W	ITH SILT	SP-SM	77.0		-10-							
		and orangish-brown	0 ET											
		BOTTOM OF BORING @ 10	.0 F1.											
80														
T 3/10														
EL.GD														
HNABE														
PJ SC														
048.G														
s 06120														
ST PITS														
W TES														
JG NE/														
PITLC														
rest														

	6	hnahal	TEST	Project: C	alvert	Cliff	s Nucle	ar Pow	er Plar	nt		Test P	it Numbeı	: Т	P-B3	35
	Schnat	Del Engineering	PIT LOG	C	alvert	Cou	nty, Ma	ryland				Contra Sheet:	ct Number 1 of 1	er: 0612	0048	
	oring C	ontractor								Gr	ound	water Obs	ervations			
	ning C	ontractor.								D	ate	Time	Depth	Casin	g Cav	ed
Bo	oring F	oreman: Paul Scha	affer													
Ex	cavati	on Equipment: Joh	nn Deere 410	DD (Rubber Ti	red)											
Sc	hnabe	I Representative:	K Megginsor	ı												
Da	ates S	Started: 7/29/06	Finished:	7/29/06												
Lo	ocation	: Northing: 216730 Fasting: 960706).79 ft 5 97 ft													
Gr	ound S	Surface Elevation:	99.6 (feet)													
D	EPTH	STRATA	DESCRIPT	ION		ss	ELEV.	wi		S	AMPL	ING	TEST	s	RFMARI	ks
	(FT)						(FT)		DEPT	ГН	I	DATA		–		
	0.4	Forest litter, root	mat and tops	soil.	SN	Λ	99.2									
	-	SILTY SAND (SI contains clayey s	M), fine to me and pockets	edium, and root						1						
	2.0 -	fragments, moist	, brown.	/	CI	-	97.6			1						
	-	SANDY LEAN Cl medium. contains	LAY (CL), fir s root fragme	ie to ents. moist.							Bulk	Sample	w=19.0)%		
	_	brown.	0	, ,							Dan	campio	LL=30 PL =20	0		
	50-						94.6		- 5				*	o /		
	0.0	SILTY SAND (SM moist, brown,	M), fine to me	edium,	SN	Λ	01.0		Ū		Bulk	Sample	w=8.9	%		
	1	······, ····								1						
	-									1						
	8.0 -	BOTTOM OF BC	RING @ 8 () FT			91.6			+						
				,												
		3.0 BOTTOM OF BORING @ 8.0 FT.														
80																
3/10/																
GDT																
ABEL																
CHN																
SPJ S																
048.0																
06120																
PITS (
EST																
Τ																
JG NE																
EST																

	Schna	bel Engineering	TEST PIT LOG	Project:	Calvert (Calvert (Cliff Cou	s Nucle inty, Ma	ar Pow ryland	er Plan	nt		Test P Contra Sheet	it Number	: T er: 06120	P-B407
┟	During									Gr	oundv	vater Obs	ervations		
	Boring	Sontractor:								D	ate	Time	Depth	Casing	Caved
	Boring I	Foreman: Paul Sch	affer												
	Excavat	ion Equipment: Jol	hn Deere 41	0D (Rubber 1	Tired)										
	Schnab	el Representative:	K Megginsor	ı											
	Dates	Started: 8/2/06 F	inished: 8/	/2/06											
	Locatio	n: Northing: 21639	1.76 ft												
		Lasting. 90140.	5.02 ft												
	Ground	Surface Elevation:	81.3 (feet)												
	DEPTH	STRATA				20	ELEV.	\A/I		S	AMPL	.ING	TEST	e	
	(FT)	SIRAIA			ULA	55.	(FT)	VVL	DEPT	н		DATA	1231	5	REWIARRS
	0.4	SILTY SAND (SI	M), fine to co	arse, st. brown	SW-9	SM	80.9								
	-	WELL GRADED	SAND WITH							1					
	-	(SW-SM), fine to	coarse, trac	e fine and											
	-	cobble at 5 ft. Co	ontains fine to	o medium											
	-	 silty sand lenses Light brown below 	from 5.5 to 9 w 6.0 ft.	5.7 ft.											
									5		Bulk	Sample	w=7.1	%	
									- 5 -				*		
	-	-													
	7.0 -	BOTTOM OF BO	DRING @ 7.0) FT.			74.3								
8															
3/10/0															
EDT															
BEL.(
ANHO															
5 SC															
48.GI															
31200															
ITS 0(
ST PI															
₽ ≥															
O NE															
ΤLO															
EST P															

20	chnabel TEST	F Project: C	alvert C	liffs Nucle	ar Pow	ver Plan	nt		Test P	it Number	r: T	P-B414
Schna	bel Engineering LOG	i 0		ounty, ivia	iryiariu				Contra Sheet:	1 of 1	er: 0612	0048
Boring	Contractor:						Gr	oundv	vater Obs	ervations	;	
							D	ate	Time	Depth	Casing	Caved
Boring F	Foreman: Paul Schaffer											
Excavat	ion Equipment: John Deere	410D (Rubber Ti	red)									
Schnabe	el Representative: K Meggin	son	_									
Dates	Started: 7/28/06 Finished	I: 7/28/06										
Location	n: Northing: 216631.18 ft Easting: 961530.95 ft		-									
Ground	Surface Elevation: 120.8 (fe	et)	F									
DEDTU	×	,					S	ΔΜΡΙ	ING			
(FT)	STRATA DESCR	IPTION	CLAS	S. (FT)	WL	DEPT	гн	~лл <u>–</u> г		TEST	S	REMARKS
0.3	Rootmat and topsoil	/	SM	120.5			Ϊ					
0.7	SILTY SAND (SM), fine to	medium,	SP-SN	/120.1 M								
-	yellowish brown and light	orangish					-					
-	brown.											
	(SP-SM), fine to medium,	contains silty				L _						
	sand lenses and layers, m brown and light orangish b	ioist, stratified prown.				–						
-						- 5 -	1					
-	-							Bulk	Sample	w=6.0	%	
7.0		6.5 FT		113.8						Â		
		0.011.										
æ												
3/10/(
GDT												
BEL.												
CHN												
S G												
048.G												
06120												
ESTF												
00 NE												
ESTF												

20	hnabel	TEST PIT	Project: (Calvert Cli Calvert Co	ffs Nucle unty, Ma	ar Pow ryland	er Plan	nt		Test P Contra	it Number	r: T	P-B415
Schna	bel Engineering	LOG								Sheet:	1 of 1		
Boring C	Contractor:						1	Gro	oundv	vater Obs	ervations		1
Boring F	Foreman: Paul Scha	affer		_				Da	ate	Time	Depth	Casing	Caved
Excavat	ion Equipment: Joh	n Deere 410	DD (Rubber T	ired)									
Schnabe	el Representative:	< Megainsor)	,									
Dates	Started: 7/28/06	Finished: 7	7/28/06										
Location	n: Northing: 216490 Easting: 961298).91 ft 3.37 ft											
Ground	Surface Elevation:	118.9 (feet)											
DEPTH	STRATA	DESCRIPT	ION	CLASS	ELEV.	WL		S/	AMPL	ING	TEST	s	REMARKS
	Pootmat and tan	acil			(11)		DEPT	ГН	D	ΑΤΑ			
0.4	Clavey sand Ell I	fine to me	dium	FILL	- 118.5 - 117.9								
	contains root frag	gments, mois	st, brown.	/ SP									
		ED SAND fi	<u>ne to</u>										
-	medium, trace sil	t, contains s	ilty sand						Bulk	Sample	w=10.2	2%	
-	brown and orang	ish-brown.	linea light										
	-						- 5 -						
-	-												
6.5	BOTTOM OF BO	RING @ 6.5	5 FT.		112.4								
90/01													
ō 													
D.0													
0071													

	6	hnabel	TEST	Project: 0	Calvert (Cliff	s Nucle	ar Pow	er Plan	nt		Test P	it Number	:	TF	P-B423
s	Schna	bel Engineering	LOG			000	inty, wa	ryiana				Sheet:	1 of 1	er: 06	1200)48
										Gr	ound	water Obs	ervations			
Во	oring C	contractor:								D	Date	Time	Depth	Casi	ng	Caved
Во	oring F	oreman: Paul Sch	affer													
Ex	cavat	ion Equipment: Jo	hn Deere 41	0D (Rubber T	ired)											
Sc	hnabe	el Representative:	K Megginsor	ı												
Da	tes	Started: 8/2/06	Finished: 8/	/2/06												
Lo	catior	n: Northing: 21641	4.95 ft													
		Easting: 96084	9.03 ft													
Gr	ound	Surface Elevation:	105.9 (feet)													
										6						
	EPTH FT)	STRATA	A DESCRIPT	ION	CLAS	SS.	ELEV.	WL	DEDT				TEST	s	R	EMARKS
-	0.3	 Rootmat and top 	soil				105.6		DEPI							
	1.0 -	Silty sand FILL,	fine to mediu	 m,	FIL	L	104.9								Тор	of cinder
	_	contains root fra	gments, mois	st, brown		L			L _						mar	rk wall and name
		Clayey sand FIL	L, fine to me	dium, ent block	FIL	L									deb	ris at 1.5 ft.
	-	diamond-plated	steel and asp	phalt						1					cind	ler block
	-	fine to coarse. co	ontains root f	ragments.	FIL	L									ft wi	ide (in an
	5.0 —	Contains rebar, I	bed frame ar	nd metal			100.9		- 5 -			Comula	w=16º	%	east	t-west ction) and 6
	_	fine to coarse sa	and, trace coa	arse gravel,		L			L _		Buik	Sample	LL=24	4	ft. d	eep.
		contains root frag	gments, brow	vn, /									PL=10	0	app	icture ears to
	-	contains sandy s	silt pockets b	elow 5 ft.						1					have	e been used
	8.0 -	sandy lean clay	FILL, fine to	coarse,	<u> </u>		97.9								dep	ository.
		Contains cemen	t fragments a	at 6 ft.												
		BOTTOM OF BO	ORING @ 8.0) FT.												
10/08																
01 3/																
EL.GI																
NABE																
SCH																
.GPJ																
0048																
0612																
PITS																
IEST																
N N M																
N DG																
at L																
ESTI																

ſ	SC	hnabel	TEST	Project: C	alvert		s Nucle	ar Pow	er Plar	nt		Test P	it Number	: T	P-B434
	Schnal	bel Engineering	LOG		aivert	COu	fity, ivia	lyianu				Contra	t Number 1 of 1	er: 06120	048
ľ	Boring (contractor:		1						Gr	ound	water Obs	ervations		
	Bornig C	ontractor.								D	ate	Time	Depth	Casing	Caved
	Boring F	oreman: Paul Sch	affer												
	Excavati	on Equipment: Jol	nn Deere 410	DD (Rubber Ti	red)										
	Schnabe	Representative:	K Megginsor	ı											
	Dates 3	Started: 7/29/06	Finished:	7/29/06											
	Location	 Northing: 215825 Easting: 96124 	5.9 ft 4.18 ft												
		_acag. 001_1													
	Ground	Surface Elevation:	105.2 (feet)												
	DEPTH	STRATA		ION	CLA	SS.	ELEV.	WL		S	AMPL	ING	TEST	s	REMARKS
	(FT)						(FT)		DEPT	ГН		DATA			
	0.5	Forest litter, root	mat and tops	soil	CL		104.7								
	_	contains root frag	ce fine to me gments, mois	dium sand, st, brown.		_				1					
	_		-								Bulk	Sample	w=219	%	
	-												PL=1	5 8	
	_									-			*		
									- 5						
									Ū						
	-									1					
	7.0 -	SILTY SAND, fin	e to medium	, moist,	SM	Λ	98.2			1					
	8.0 -	brown.			SP-9	SM	97.2			-					
	8.5	POORLY GRAD fine to coarse, tra	ED SAND W ace fine grav	'ITH SILT, el, /			96.7								
		contains weakly	cemented sa	and											
		BOTTOM OF BC	0RING @ 8.5	5 FT.											
8															
3/10/															
GDT															
BEL															
ANHO															
PJ SC															
48.GI															
31200															
ITS 0															
STP															
₹															
G NE															
ΪĽΟ															
ESTP															

Schnal	hnabel bel Engineering	TEST PIT LOG	Project: C	alvert C alvert C	liffs Nucle ounty, Ma	ear Pow aryland	ver Plar	nt		Test P Contra Sheet:	it Number oct Number 1 of 1	r: T er: 06120	P-B435
Boring	ontractor:							Gr	oundv	vater Obs	ervations		
								D	ate	Time	Depth	Casing	Caved
Boring F	oreman: Paul Schaft	fer											
Excavati	on Equipment: John	Deere 410	DD (Rubber Ti	red)									
Schnabe	el Representative: K	Megginsor	1	-									
Dates	Started: 7/29/06 F	inished: 7	7/29/06										
Location	: Northing: 216020.0 Easting: 961404.7	06 ft 74 ft											
Ground	Surface Elevation: 1	07.7 (feet)											
DEDTH								6		ING			
(FT)	STRATA I	DESCRIPT	ION	CLAS	S. ELEV	WL	DEDI	гц			TEST	s	REMARKS
	Forest litter, rootma	at and tops	oil.										
0.7	CLAYEY SAND, fi	ne to mediu	um,	SC	107.0			-					
- L	contains root fragn	nents, mois	st, brown.				L _						
2.5	SILTY SAND fine	to medium	contains	SM	- 105.2								
-	root fragments, mo	bist, orangis	sh brown.					1					
4.0 -	SILTY SAND, fine	to coarse,	moist, light	SM	103.7			1					
	brown and brown.						- 5 -		Bulk	Sampla	w=6.0	%	
60 -					101 7		L _		Duik	Sample	*		
-	POORLY GRADEI fine to coarse, trac sand and poorly-gr lenses, moist, brow trace cobbles (+/-1	D SAND W e silt, conta raded sand vn and ligh %) below {	ITH SILT, ains silty with silt t brown 3 ft	SP-SI	M				Bulk	Sample	w=4.6	%	
90 -			,		98 7		L -					0/	
10.0 -	CLAYEY SAND, fil fine gravel, contain pockets, moist, bro	ne to coars is clayey sa wn.	e, trace and	SC	97.7		-10-		Bulk	Sample	W=6.7 LL=34 PL=1	% 4 7	
	BOTTOM OF BOR	RING @ 10	.0 FT.								*		
80/01													
REL													
ANH													
2.0													
17000													
90 S													

Schnat	hnabel Pi	ST Project: (T (Calvert (Calvert (Cliffs Nucle County, Ma	ear Pov aryland	ver Plar	nt		Test P Contra	it Number	r: T er: 06120	P-B715
Schnat	Del Engineering LO	6					Gr	oundv	sneet: vater Obs	ervations		
Boring C	ontractor:						D	ate	Time	Depth	Casing	Caved
Boring F	oreman: Paul Schaffer											
Excavati	on Equipment: John Deer	re 410D (Rubber T	ired)									
Schnabe	I Representative: K Megg	inson	-									
Dates S	Started: 7/28/06 Finish	ed: 7/28/06										
Location	: Northing: 214964.18 ft Easting: 962637.77 ft		-									
Ground	Surface Elevation: 88.2 (for	eet)	-									
DEPTH	STRATA DESC		CLAS		WL		S	AMPL	.ING	TEST	s	
(F1)	E	-		(FI)		DEP1	ГН	0	DATA			
0.9	Forest litter, rootmat and			87.3		L _						
	root fragments, moist, b	coarse, contains rown	SC									
	-					F -						
-							1					
4.0 -	POORLY GRADED SAM	ND WITH SILT,	SP-S	M 84.2			1					
	fine to coarse, trace fine gravel (+/- 5%) and cobl	to coarse bles (+/- 1%)				- 5 -	-					
	contains root fragments,	, moist, brown						Bulk	Sample	w=4.8	%	
	Contians weakly cemen	ted sand				L _						
	pockets at 6 ft.											
8.5		@ 8 5 FT		- 79.7		[-	1					
		<u>w</u> 0.011.										
~												
0/01/												
48.61												
21200												
ST P												
≝ ≫												
00 NE												
ESTF												

ſ		TEST Project: C	alvert C	liffs Nuc	ear Po	wer Plar	nt		Test P	it Numbeı	r: -	TP-B	716
	Schna	bel Engineering LOG	alvert C	ounty, N	laryland	1			Contra Sheet:	ct Number 1 of 1	er: 0612	20048	
Ī	Boring (Contractor:					Gr	ound	water Obs	ervations	;		
	Doning						0	ate	Time	Depth	Casin	g Ca	aved
	Boring F	oreman: Paul Schaffer											
	Excavat	on Equipment: John Deere 410D (Rubber Ti	red)										
	Schnabe	el Representative: K Megginson	-										
	Dates	Started: 7/28/06 Finished: 7/28/06											
	Locatior	i: Northing: 214983.83 ft Easting: 961289.79 ft											
	<u> </u>		-										
	Ground	Surface Elevation: 97.1 (feet)											
		STRATA DESCRIPTION	CLAS	S. ELE	/. wL		S		ING	TEST	s	REMA	RKS
	(ГТ)			(Г)		DEP	ГН		DATA				
	0.8	Forest litter, rootmat and topsoll.	014	96.3									
		root fragments, moist, brown, contains	SM										
	-	weakly bonded silty sand pockets.											
	-												
	-												
						- 5							
	5.5	POORLY GRADED SAND WITH SILT,	SP-SI	91.6									
		fine to coarse, trace fine gravel, moist,						Bulk	Sample	w=3.8	%		
	-	Light grayish brown and yellowish											
	8.0 -	brown below 6.5 ft.	SM	- 89.1									
	8.8	Chert fragments, moist, yellowish brown.	-	88.3									
		BOTTOM OF BORING @ 8.8 FT.											
8													
3/10/(
GDT													
BEL													
ANHO													
J S(
48.GI													
31200													
TS 0(
ST PI													
₽́ ≥													
NEV S													
1LO													
ST PI													
Ш			1										

Sch		TEST PIT LOG	Project: C	alvert alvert	Cliffs Cou	s Nucle nty, Ma	ar Pow ryland	er Plar	nt		Test P Contra Sheet	it Number	r: 7 er: 0612	P-B71	7			
Deri	. O								Gr	oundv	vater Obs	ervations	;					
Boring	g Contractor:								D	ate	Time	Depth	Casing	g Caved	1			
Boring	g Foreman: Paul Sch	affer																
Excav	ation Equipment: Jo	hn Deere 410	D (Rubber Ti	red)														
Schna	bel Representative:	K Megginsor	ı															
Dates	Started: 7/28/06	Finished:	7/28/06															
Locati	on: Northing: 21429	7.68 ft																
	Easting. 96234	0.30 II																
Groun	d Surface Elevation:	90.5 (feet)																
DEPT					66	ELEV.	\A/I		S		ING	TEST	•					
(FT)	JIRAIA		CLA	33.	(FT)	VVL	DEPT	ГН	C	ΔΑΤΑ	1231	3	KEWIARNO					
	Forest litter, root	mat and tops	soil.															
1.0	SANDY SILT, fir	ne to medium	, contains	ML	-	89.5												
	_ root fragments, r	moist, brown.																
	_																	
	_							L -										
						0F F		_										
5.0	SILTY SAND, fir	ne to coarse,	contains	SN	Λ	85.5		- 5 -	1									
		kets, moist, ii	gni brown.						1									
7.0	POORLY GRAD	FD SAND W	ITH SILT	SP-S	SM	83.5				Bulk	Sample	w=3.4	%					
8.0	fine to coarse, tr	ace fine to co	arse			82.5					Campio	*						
	contains iron oxi	de cemented	I sand															
	POCKETS at 7.5 ft.		/															
			, , , ,															
/10/0																		
E LO																		
BEL.G																		
HNAE																		
8.GP																		
12004																		
TS 06																		
LEC LEC																		
S I I I I I I I I I I I I I I I I I I I																		
S I																		
Schnabel Engineering TEST Project: Calvert Calvert							s Nucle inty, Ma	ar Pow ryland	ver Plar	nt		Test P Contra	Test Pit Number: TP-B719 Contract Number: 06120048					
--	--	---	--------------------	--------------	-------	------	---------------------	------------------	----------	----	------	------------------	---	--------	---------	--	--	--
┟	Schnal	bei Engineering	LUG							Gr	ound	Sneet:	1 Of 1					
	Boring C	ontractor:								D	ate	Time	Depth	Casino	Caved			
	Boring F	oreman: Paul Scha	affer															
	Excavati	on Equipment: Joh	nn Deere 41	0D (Rubber T	ired)													
	Schnabe	I Representative:	K Megginsor	1														
	Dates \$	Started: 7/28/06	Finished:	7/28/06														
	Location	: Northing: 213966 Easting: 261493	6.93 ft 3.94 ft															
	Ground	Surface Elevation:	72.3 (feet)															
ł	DEPTH						FI FV			S	AMPL	ING						
	(FT)	STRATA		ION	CLA	SS.	(FT)	WL			[DATA	TESTS		REMARKS			
ł	Schnabel Engineering The L Boring Contractor: Boring Foreman: Paul Schaffer Excavation Equipment: John Determinity Schnabel Representative: K Meg Dates Started: 7/28/06 Finis Location: Northing: 213966.93 ft Easting: 261493.94 ft Ground Surface Elevation: 72.3 DEPTH (FT) STRATA DES 0.3 Forest litter, rootmat a LEAN CLAY, with fine to medic contains root fragment and light brown SILTY SAND, fine to c 3.2 SILT, with fine to medic contains clayer and porly graded sar moist, light brown and brown 8.0 Wet, light gray and yet below 7 ft. BOTTOM OF BORING BOTTOM OF BORING	mat and tops	soil		1	72.0						<u>-</u>	0/					
	-	LEAN CLAY, with	h fine to med	lium sand,		-					Bulk	Sample	w=23.9 LL=3	5				
	-	and light brown	gments, mois	st, brown						-			PL=2:	2				
	_	-							L .									
	3.2	 3.2 SILT, with fine to medium sand, contians root fragments, moist, grayish brown. SILTY SAND, fine to coarse, trace fine gravel, contains clayey sand pockets and poorly graded sand with silt lenses, 		M	L	69.1												
	-																	
	4.8			SN	N	67.5		- 5 -										
	-																	
	_	moist, light brown	n and light gi	rayish					Ļ .				w-26 7	·0/				
		Wet, light gray ar	nd yellowish	brown			64.2				Bulk	Sample	w=20.7	70				
	8.0 -	below 7 ft.					64.3		F -	1								
		BOLLOW OF BC	ORING @ 8.0	JFI.														
/08																		
3/10																		
GDT																		
ABEL																		
SCHN																		
PJ S																		
048.G																		
6120																		
ITS 0																		
STP																		
₽ ×																		
G NE																		
ΪLO																		
EST P																		

	SC	hnabel	alvert C	Cliffs	Nucle	ar Pow	er Plar	nt		Test Pit Number: TP-B727						
	Schnat	el Engineering	LOG	0		Journ	ty, ivia	ryiana				Contra Sheet:	1 of 1	er: 0612	20048	
Γ	Boring C	ontractor:								Gr	ound	water Obs	ervations	i	1	
					-					D	ate	Time	Depth	Casin	g	Caved
	Boring F	oreman: Paul Scha	affer													
	Excavati	on Equipment: Jor	In Deere 410D	(Rubber II	red)											
	Schnabe	representative: r	Cinegginson	00/06	F											
	Dates	Started: 7/20/00		20/00	-											
	Location	: Northing: 215299 Easting: 961883	0.14 ft 3.13 ft		-											
	Ground	Surface Elevation:	104 2 (foot)		ŀ											
╞	Ground		104.3 (leel)													
	DEPTH (FT)	STRATA	DESCRIPTIO	N	CLAS	ss. ^E	ELEV. (FT)	WL	DEPT	SAMPLING PTH DAT		.ING DATA	TEST	S REMARK		ARKS
	07	Forest litter, rootr	nat and topsoi	l		1	103 6									
	-	CLAYEY SAND,	fine to coarse,	contains	SC	; '	.00.0			1						
	-	brown, and light g	grayish brown	langion						1						
	-									-						
	_															
	5.0						00.2		-							
	5.0 -	SILT, with fine to	medium sand	moist, ML			99.3		- 5 -							
	6.0 -	SILTY SAND find	e to medium o	ontains	SM	1	98.3				Bulk	Sample	w=10.3	%		
	7.0 -	clayey sand pock	ets, moist, bro	wn.			97.3									
		BOTTOM OF BO	RING @ 7.0 F	T.												
3/10/0																
TO																
BEL.																
ANH																
2 SC																
48.GF																
31200																
TS 0(
ST PI																
₽ ×																
(J NE)																
ΤLO																
EST P																

50	Calvert C	Cliffs Nucle	ar Pow	/er Plan	t	_	Test Pit Number: TP-B744							
Schna	bel Engineering	LOG			Journy, Me	iryiana				Sheet:	1 of 1	er: 0612	0048	
Boring	Contractor:							Gro	oundwat	er Obs	ervations			
								D	ate -	Time	Depth	Casing	Caved	
Boring I	Foreman: Paul Sch	haffer												
Excavat	ion Equipment: Jo	hn Deere 41												
Schnab	el Representative:	K Megginsor	ı	-										
Dates	Started: 7/29/06	Finished:	7/29/06											
Locatio	-													
Ground	Surface Elevation:	: 113.3 (feet)												
DEPTH					ELEV.	wi		S	AMPLIN	G	Э теете		DEMARKS	
(FT)	onan				(FT)		DEPT	н	DAT	ГА	TESTS REMARKS			
0.5	Forest litter, root	tmat and tops	soil.	MI	112.8									
1.0	SILT, trace fine contains root fra	to medium sa aments, mois	and, st. brown. 🗸		112.3						w-190	0/		
	SANDY LEAN C	CLAY (CL), fir	ne to						Bulk Sa	Imple	LL=2	5		
	medium, contair	ns root fragme	ents, moist,								PL=1	1		
3.5	SILTY SAND (S	M), fine to me	edium,	SM	109.8		L _							
50-	moist, brown.				108.3		- 5							
0.0	POORLY GRAD	ED SAND W	/ITH SILT	SP-S	м 100.0									
6.5	gravel, moist, lig	ht brown.			106.8									
	BOTTOM OF BO	ORING @ 6.5	5 FT.											
0														
5														
Ĕ														
ŭ														

	tes	T Project: C	alvert C	liffs Nucle	ar Pow	er Plan	nt		Test P	it Number		TF	P-B758
Schna	bel Engineering LO	G C	Calvert C	ounty, Ma	ryland				Contra Sheet:	ct Number 1 of 1	er: 06	1200	48
Boring C	Contractor:						Gr	oundv	vater Obs	ervations			
			-				D)ate	Time	Depth	Cas	ing	Caved
Boring F	oreman: Paul Schaffer	e 110D (Rubber Ti											
Schnabe	al Representative: K Megg	inson	ileu)										
Dates	Started: 7/28/06 Finishe	ed: 7/28/06											
Location	1: Northing: 215133.29 ft	F											
			_										
Ground	Surface Elevation: 82.6 (fe	eet)											
DEPTH	STRATA DESC	RIPTION	CLAS	S. ELEV.	WL		S		ING	TEST	ESTS		EMARKS
	Forest litter, rootmat and	topsoil.		(,		DEPT			ΟΑΤΑ				
0.6	CLAYEY SAND, fine to r	nedium,	SC	82.0			-						
2.0 -	Contains root fragments,	moist, brown.	SP-SN	80.6				Bulk Sample		w=6.0	%		
	fine to coarse, trace fine		vi					oumpic	*				
3.9 _	sand pockets, moist, bro	wn, contains	SM	- 78.7									
	pockets.		5101			- 5 -							
	SILTY SAND, fine to coa	arse, trace fine				L _						Test cons	t Pit sistently
_	Contains silty sand layer	s, stratified light				L _						cave 6 ft.	ed-in below
								Bulk	Sample	w=11.8%			
				70.0					·	*			
9.0 -	BOTTOM OF BORING (@ 9.0 FT.		/ 3.0									
0000													
5													
2													
2													

Schna	chnabel TEST PIT	Project: C C	alvert C alvert C	liffs Nucle ounty, Ma	ar Pow Iryland	ver Plar	nt		Test Pi Contra	it Number	r: er: 06′	TF 1200	P-C309
Dening							Gr	oundv	vater Obs	ervations			
Boring	Contractor:						D	ate	Time	Depth	Casi	ng	Caved
Boring	Foreman: Paul Schaffer												
Excavat	tion Equipment: John Deere 41	0D (Rubber Ti	red)										
Schnab	el Representative: K Megginso	n	-										
Dates	Started: 8/2/06 Finished: 8	/2/06											
Locatio	Test Project: Project: ring Contractor: ring Foreman: Paul Schaffer cavation Equipment: John Deere 410D (Rubber nnabel Representative: K Megginson ites Started: 8/2/06 stated: 8/2/06 Finished: 8/2/06 cation: Northing: 217020.05 ft cation: Northing: 217020.05 ft cation: Northing: 217020.05 ft cation: PTH STRATA DESCRIPTION 0.5 Forest litter, rootmat and topsoil. POORLY GRADED SAND, fine to coarse, trace fine gravel, contains root fragments, moist, brown and orange-brown. 6.0 POORLY GRADED SAND WITH SILT, fine to medium, trace silt, contains silfy grayish brown. blackish gray, and orangish brown. 8.0												
			-										
Ground	First LOG Project Soring Contractor: Boring Contractor: Boring Foreman: Paul Schaffer Excavation Equipment: John Deere 410D (Rubbitschnabel Representative: K Megginson Dates Started: 8/2/06 Finished: 8/2/06 Boround Surface Elevation: 108.5 (feet) Streat Description 0.5 Forest litter, rootmat and topsoil. POORLY GRADED SAND, fine to coarse, trace fine gravel, contains roo fragments, moist, brown and orange-brown. POORLY GRADED SAND WITH SILT fine to medium, trace silt, contains silt sand pockets and lenses moist, light grayish brown, blackish gray, and orangish brown. BOTTOM OF BORING @ 8.0 FT.												
DEPTH	DEPTH (FT) STRATA DESCRIPTION				WL		S	SAMPLING		TESTS		REMARKS	
(F1)				(F1)		DEP	гн		ΔΤΑ				
0.5	Forest litter, rootmat and top	soll.	SP	108.0		L _							
	coarse, trace fine gravel, cor	ntains root											
	 fragments, moist, brown and orange-brown. 							Bulk	Sample	w=4.3	%		
	-						-					Test	Pit
-	_					- 5 -	-					cons	sistently es-in
60				102 5		L _						betw	veen 5 and
0.0	POORLY GRADED SAND V	VITH SILT, ntains silty	SP-SN	M								0 11.	
	sand pockets and lenses mo	ioist, light iy, and						Bulk Sample		w=8.7%			
8.0	orangish brown.			100.5			-						
	BOTTOM OF BORING @ 8.	0 FT.											
8													
5													
5													
4													

Schr		Calvert Calvert	Cliff Cou	s Nucle nty, Ma	ar Pow ryland	er Plar	nt		Test Pit Number: TP-C723 Contract Number: 06120048 Sheet: 1						
Dering	Comtra atom								Gr	ound	water Obs	ervations			
Boring	Contractor:								C	ate	Time	Depth	Casing	Caved	
Boring	Foreman: Paul Sch	affer													
Excava	ation Equipment: Jo	hn Deere 410	DD (Rubber Ti	ired)	<u> </u>										
Schna	bel Representative:	K Megginsor	ı												
Dates	Started: 7/29/06	Finished:	7/29/06												
Locatio	on: Northing: 21598 Fasting: 95975	9.07 ft 4 78 ft													
Groun	d Surface Elevation:	96.8 (feet)			-										
		00.0 (1001)							_						
DEPTH	STRATA	A DESCRIPT	ION	CLA	SS.	ELEV. (FT)	WL	SAMP				TEST	s	REMARKS	
	Forest litter, root	mat and tops	soil.					DEP		L	JATA				
0.5	- SANDY SILT, fin	ne to medium	, contains	M	L	96.3									
20	root fragments, r	noist, brown.				04.8		L .							
2.0	CLAYEY SAND,	fine to media	um, st brown	SC	C	04.0				Bulk	Sample	w=129	%		
		ge.,e.									campio	LL=30 PL =1	0 5		
4.0	SILTY SAND, fin	ne to coarse,	moist,	SN	Л	92.8						*			
5.0	brown.	brown.		SP-9	SM	91.8		- 5 -							
	POORLY GRADED SAND WITH SILT,									Comula	w=4.6	%			
70	brown and light t	brown. graded sand	trace silt			89.8		L -		Buik	Sample	*	/0		
	lenses below 6.0) ft.				00.0									
	BOTTOM OF BO	ORING @ 7.0) FT.												
80/0															
3/10															
LOD.															
IABEI															
SCH															
GPJ															
0048.0															
0612(
PITS															
EST															
N DC															
EST															

APPENDIX D GROUND WATER OBSERVATION WELLS

- Well Construction Logs
- Field Permeability Test Data
- Well Sampling Records

Schnabel Project No. 06120048 Appendix D: Ground Water Observation Wells

WELL CONSTRUCTION LOGS

































[©] Schnabel Engineering 2006 All Rights Reserved


























[©] Schnabel Engineering 2006 All Rights Reserved





[©] Schnabel Engineering 2006 All Rights Reserved













[©] Schnabel Engineering 2006 All Rights Reserved



© Schnabel Engineering 2006 All Rights Reserved



© Schnabel Engineering 2006 All Rights Reserved



© Schnabel Engineering 2006 All Rights Reserved

Schnabel Project No. 06120048 Appendix D: Ground Water Observation Wells

FIELD PERMEABILITY TEST DATA



1

PERMEABILITY (SLUG) TEST FIELD FORM

PROJECT: Calvert Cliffs NPP COLA Project LOCATION: Lusby, MD DATE: July 27, 2005 WEATHER/ TEMP: 90 Journal	PROJECT NO.: 06120048 CLIENT: Bechtel Power Corporation
TEST INFORMATION	WELL INFORMATION
Type of Test: (Falling Bead / Rising Head) Slug Type: Mechanical / Water) Approximate Volume of Slug: 0.625 GH	WELL ID: <u>UW-30</u> Screen Inside Diameter: <u>Z⁽¹⁾</u> Casing Inside Diameter: <u>Z⁽¹⁾</u>
Manual Water Level Meter S/N: <u>WLP-00</u> Transducer S/N: <u>104759</u> Slug S/N: SLUG-007	Total Well Depth (ft, TOC): 79,1 Screen Interval Depth (ft, TOC): 65-75 Riser Height (ft): 21
1Pre-Test Water Level (ft, TOC)/ Time : $$8.75/(15:35)$ 2Water Level after Probe Insertion (ft, TOC)/ Time: $$8.75/(15:35)$ 3Transducer Depth: $700f+$ 4Calc. Pre-Test Head over Transducer: $700f+$ 5Measured Pre-Test Head over Transducer: $11.26f+$ 6Time Test Started:Pre-test / Sling-test7Time Test Ended: $3:39pm/3:54pm$ 8Percent Factories at End of Test: $11.492 + f+$ 9Datalogger File Name: $0612.0048- PTD - 0W-301-9$	

<u>Comments:</u> TOC = Bottom of the V-notch at top of casing

7006 **Performed By:** Date: 106 q 121 Date: Approved By:

Note: All water level measurements obtained from well measurement point at top of casing. Reference: ASTM D4044

OW-301 Permeability Test



Chnabel Schnabel Engineering



HIPUT (WARANITCINE Minis Water Land ~ 21.48 % Lingth to Hollen of Applier = 62.00 % Length of Gamers = 71.58 % Hellen of Gamers = 62.00 % Realment Jage (Gallegier, Jage Kar Realment Jage (Gallegier, Jage Kar

· 7

1

-----¥...--¥

×

* * *



Schnabel Engineering

PERMEABILITY (SLUG) TEST FIELD FORM

PROJECT: Calvert Cliffs NPP COLA Project LOCATION: Lusby, MD DATE: July 27, 2006 WEATHER/ TEMP! 90, hum. d	PROJECT NO.: 06120048 CLIENT: Bechtel Power Corporation
TEST INFORMATION	WELL INFORMATION
Type of Test: Ealling Head / Rising Head)	WELL ID: OW -313 A
Slug Type: (Mechanical / Water)	Screen Inside Diameter: Z
Approximate Volume of Slug: 032 CAL 0,625 GAL	Casing Inside Diameter: 21
Manual Water Level Meter S/N: WLP-001	Total Well Depth (ft, TOC): 52,4
Transducer S/N: 104213	Screen Interval Depth (ft, TOC): 40-50
slug s/N: $S(1) \alpha = 003$	Riser Height (ft):
1Pre-Test Water Level (ft, TOC)/Time :2Water Level after Probe Insertion (ft, TOC)/Time:3Transducer Depth:4Calc. Pre-Test Head over Transducer:5Measured Pre-Test Head over Transducer:6Time Test Started:7Time Test Ended:8Percent Recovery at End of Test:9Datalogger File Name:	SLUG
Comments:	

TOC = Bottom of the V-notch at top of casing

Performed By:	Jodd White	Date:	July 27,2005
Approved By:	Maile S	Date:	9/21/04

Note: All water level measurements obtained from well measurement point at top of casing. Reference: ASTM D4044

OW-313A Permeability Test







Hydrautic conductivity [ft/s]: 7.50 x 10-6

INPUT PARAMETERS Static Water Level = 10.60 ft Depth to Bottom of Aquifer = 62.00 ft Length of Screen = 10.00 ft Radius of Casing = 0.08 ft Radius of Influence = 0.25 ft Evaluated by: Permeta Patrick Reviewed by: Christopher Krangis

ichnabol Bettentind Englishmenting

٩

PERMEABILITY (SLUG) TEST FIELD FORM

Ĩ

The Land

ts NPP COLA Project 1, ND The second s DATE: DA PROJECT:

CATZONE Lacted Power Corp PROJECT NO.: SLEVN: NO.:

Type of Test (pdf/sg jund / Neter) Rey Type (Jest 2014) Neter) Approximate Volume of Ruy (Jest 2015 CAL Menuel Weier Land Neter SNL J. 2001 Transheer SNL J. 2001 Start SNL J. 2002
--

Cia

1001 **1**1 100

inel Dept. (1) (100)

Ì

(United Ę

COV THES
5
Ì
stater]
i pert

- ier Level after Protes insertion (A. 700) The
- Timmaken Depth
- its. Pro-Tent Hund over Theorem Ē
- d over Transien
- terrer Bushet Time Tax distant
 - Time thet Exted:

-212-212-me-qu- 2128-2700

<u>Generaties</u> TCO: = Bettens of the V-ordels of top of society



tattap af a ates statetned from well 1 Nicht: Al withir band mean Reference: AGTH DAD44

麁

1.

OW-313B Permeability Test







×

.

<u> Hohmetheri) Englishmething</u> chnabal

PERNEABILITY (SLUG) TEST FIELD FORM

×

Buckted Power Co PROJECTION CLEAN B

	1	*
	1	ł
	3	1
		ŧ
	1	F
	1	1
-	1	T
	1	1
11 C	Ľ	
Æ		
2	Ť 4	÷.
3	1	η.
	1.	
8	1	٩.
È.	1	
£ 6		
~ 2	- 14	
2 3	- K	
e.s.	8 J	
81.	4	T
엄금~	2-	
	NO. Ng	1
48 7		1
Ø ~	ſ	1
~~		1
		Ľ
	- 42	
	-14	8
首复		3
Q X	1.	
백종군	# 1	3
년 월 🛙	38	E.
2 Q)	5	
		-

	VPIZ-MO SULLAN	Second Instant Discretise. 2."	Casing Inside Dismater. 24 "	14年14年19年1月 100% 前上。12	Bonne internet Depth (9, 100); FLIS - (1, 1)			Stal a - Dair O & M	75 0 45			~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	and within they adverted	
	pas of Theats ((Challing Hase) / Rissing Hased)	Nug Type: (Sectorized) Water)	matter Value A. 625 GAL	Hairen Jilg . dol	tur in lotas	WW SAL - CO	M Shirl 18	C) Three 24.941 / 11: 42.474	22. 52	Carden S. A.		-tub und Ard		19°4
NEWTHEN TENPS 4444		-	Approximation Vision	Minuted Within Land			the track the set of the track	Whiter Lavel offer Picke Insertion (\$, 10)	Transducter Depth:	Onlin. Pre-Trast Hand over Transdomer.	Manual Post Task Head over Transland		Three Just Ended	Parally Manage at East of Task

1

Ŧ

1

<u>Geranneder</u> 100 = Bottom af fine V-notek at top af oaeking

COLORE RD-ON-SIA-SUG

135

Star Pla Nunc



act point at top of control fred from well not Neix: Al whe long man Reference Alt N 24044

COMPANY (SECONDARY)

Jar Tar

OW-319A Permeability Test



Schnabel Engineering

and Colores Cont Stationarity, 199 (a Colored by 199 (a) (200) 417 June	(noming Altern), and Rovel, Suite X Mi			anna taon arang Canas Ann Sala				Project: Clave Exclusion by:			
Reg Test No. 10	•	· · · · · · · · · · · · · · · · · · ·					an 72154			<u> </u>	
CEPORA	****			·				****			*
1	· ** **					······································	<u> </u>	······································			·····
*		• • • • • • • • • • • • • • • • • • •					<u></u>	<u></u>		<u></u>	
l							-				
	<u>a 1</u>	1 20		. 4	8	*)4) 20	.	70	0	a (80
	**										
		<u> </u> -		*****	 		+				-
		╆╍╍╍┝	<u> </u>		<u> </u>				┼──		-
									╉╼╼╼		-
	.				 	·			<u> </u>		_
	ħ]		1	1			
		1				+	1			-+	1
1	j						1	ł	[1
¥ 4			· · · ·		1.	- With the second	1			•	
				l.	1	1		1	ľ	ļ	I
	<u> </u>		*		<u> </u>						╡.
	1				1	1			e E	ł	
				ł		1	ţ.	,		-	ł
						}	1		1	ł	
1	w ¹		Į	• • • •	[<u></u>	<u></u>			3
	* CHICKER							•			
	Hydenills and	indiaity jithiy. 218	ix 10 ⁸						•		
											*
	•		*	×							
										я	1
											1
	Alain White Lo Clarify in Helius	101×6511 101×6511		•							*
	Largen of Roma Hadious of Constru	n = 10001 = - 0021									
*	Hardian of Julian Rendering has 1	inpute Pairit -	ہے ہو یا					*		*	
	Realizand by: C	Canala.	<u>'alco'i</u> 5	L	×						1
	-4										
		*	*	×							1
					tion of the			· · · · · ·			
								NARA A .		9	



PERMEABILITY (SLUQ) TEST FIELD FORM

PARLIEUT NO. OPANNOS CLIBITT: Disciple Parent Con



Column CRIII: NITP COLA Project Lundy, ND HOLING HOLING

1

COL # Page In

when the h

C

*

ï
N



- network Depth
- Calls. Pro-Nant Hand mer Thursdan
- Measured Pro-Toot Head over Transd
- よ 時 門
- ₹
- Service No Name



ZITCONS-PTD-OW-ZHB-SLON-2.99

Communities 1000 = Rothom of Nav V-notech at top of auritop



ct point at top of costs ols oktobed fight week on Note: Ad water hered mean Reference: ASTIC D4044

OW-319B Permeability Test









l

PERMEABILITY (SLUG) TEST FIELD FORM

Ļ

TAL AL

tiet 20049 Backteil Power Corporation

Project No. Guerra No.

tainet GRIN HIPP COLA Project Linds, HD 24, 26, 26, 26, 26, 26, 26, 26, 26, 26, 26	
PROJECT LOCATION: DATE: VEMTREW TEMP	

F	
There if There is the second in the second is the second in the second is the second in the second is the second is the second is second in the second in the second is second in the second in the second is second in the second is second in the second in the second in the second is second in the second in th	Transfer BN 104255 Big BN: 5/1/5-001

Ŵ

tio Cien

Ser Field R

Hannel Dapth (p. 100): A VIE DATE OF TOOL ing hette Dian



COLOR THE Name

酒酒 100

Generating TOC = Bottom of the V-induki at hips of casing



stat at top of config e Tuno Nets: Al webs lovel mean Reference: ASTM D4044

OW-323 Permeability Test







*

.

×

.

.

Hydroids used a they give: 1.26 at 10⁻¹⁰

*

۲

×

*

INTERPOLATION AMERICAN Rindle Vision Long - 120,00 % Stephine Wildow and Appline - 42,000 % Longine of Steeley - 20,00 % Realise of Steeley - 20,00 % Realise of Linearon - 20,00 % Realise of Linearon - 20,00 % Realise of Linearon - 20,00 %

.

PERMEABLITY (SLUG) TEST FIELD FORM



f.

net citife MPP 201.A. Project 'Lanity, MD **Library**

×

6AU 01626 SLVA - 00 DESS Manual Water Land Mater Site Approximate Volume of Blug. Threadene BAL The Cha



钀

<u>Commentus</u> TCC = Solom of the V-notet of top of casing



للألمانية بليانية فترسيني Notes: All under Jereil anne Vietnenses: ASTNI D-1244

Z

WELL INCOMMANN WELL ID: Old - 5 Bareen inside Disamber 24 Contra Inside Disamber 24		20		
		22-MO M TEM	Bonne hette Dinneter 24	Cantho hubble Diamater. Z ^{III}

Ô

m intervel Dayth (R. 1702). AND TO BE AND THE REAL

Ciectra Int

OW-328 Permeability Test





201 Galany Christell Rosel, Raits Yell Saiteaday, 2012017			MER-MOLT	nihai				den tident			
oj artic	<u> </u>			· · · · · · · · · · · · · · · · · · ·			<u> </u>	[a	nindai iyi pi		
by Tint He. 199				and the Constant of		714	t president of	a Terbinda			as then in the state
			*****				*****	- Mi - 201	1		
	<u> </u>		~~~~ ~~	R			****	*****	<u>, - 100 - 1</u>		*************************************
T IN A REAL PARTY OF THE PARTY	7 ** *** ****************				 !	198 <u>1</u>	. 	~ ~ ~~ ~	4		
	**			****	······			- <u></u>		<u></u>	`````````````````````````````````````
							M				
	8 <u>1</u>			<u> </u>	•			1		<u> </u>	
104		+	· ····································	}	<u> </u>			[<u></u>	. <u> </u>	<u> </u>	
	F			£	<u> </u>			<u> </u>	<u> </u>	<u> </u>	
	<u>}</u>	+		<u></u>	<u> </u>			<u> </u>	<u></u>	<u> </u>	
	l				I			Į		<u> </u>	
	P			1					1		1
							<u></u>	<u> </u>	+	}	<u> </u>
	1	1 1		1			No. of Concession, Name			ł	1
	} -₩	╋╼╌┉╢	*, *, *, *,	<u> </u>	<u> </u>						
	{	1		ł	1			}	{		
ł	<u> </u>	<u></u>		<u>Ľ</u>	[-			<u> </u>	
]	1 1		1	ł			f	Ì	1	1
	ŧ	1 (l i	ſ				1	l	
	1	1. 1			ł			ļ .	1		1
									1	1	
	1	{ {		1	1				{	1]
*				1	ļ .				[Į	1
	ŧ	1 1	1						1		
	ł					1			1	*	
								<u> </u>			
30											
									*		
	Hydranija cem	inang kang a									
		*									
		X *									
	RIPLIT MARKAL	(12210) 1227 - 727 - 7									
1	hydr is faile	nd/ /gilir =ii									
	naga al Cari Indias y Cari	er= 김김희군 Ig=입리학을									
i				*							
		Sure la	Qdei/	<u>k.</u>							
1		177	2								
				* 1 * 1							
	•										

*

Schnabel	

×

PERMEABILITY (SLUG) TEST FIELD FORM

l I T	
Ma i	
Ä	
M	



Netis: Al voter lavel mensurmanis abteined from well index mensurment print at tap af cushy. Reference: AETH DKDVA

May J. W. L.

OW-336 Permeability Test






¥

.

8



I

i

OW-401 Permeability Test





Sciented Cosines	ing Martin, i	10		init lead gord ye	1			<u> </u>	Cinta	1011200		Page 1		1045
All Colors Caline Reed, John 781			l mū	Half Half a		Project: Calvest Cillins					A DAMA NO TO			
			<u> </u>		•					adad by: ye				
Ring Test. No. 497						Test	maintind m	17 7 7 7 7 1 1 1 1 1 1 1 1 1 1 1 1 1 1						
019401		···· · · · · · · · · · · · · · · · · ·	*********							· · · · · · · · · · · ·	-			
×	¥	 10 - 70 - 180		,				*				<u> </u>		
	<u></u>	<u></u>	<u>*.**</u>	<u> </u>	. <u>.</u>	<u> </u>			<u> </u>		<u>,</u>	<u> </u>		<u> </u>
									30					
***	tayuan					<u> </u>		<u> </u>	1		<u>L_</u>		<u></u>	
	i jedanski sana	katikiy jikij: 11	YT A TO ^M	•						•				
• .														

×

.

*

John LY PARAMETERS Statis Water Long = 74.77 % Capits in Nations of April 19 * 752.05 % Long & Classes * 20.00 % Restance of Contens * 20.05 % Restance of Contens * 20.05 % Capital of Contens * 20.05 % Capital



*

OW-413A Permeability Test







FIELD FORM	rscaleCT NO.: Del20048 CLIENT: Beehtel Power Corporation	WELL INCOMMATION WELL INCOMMATION Screen Inside Character: 21 Could Depth of Well (R, TCC); 21 Contented Intervel (R, TCC); 200 Screened Intervel (R, TCC); 200 Rear Height (R); 27	RE-TEST &LSS 9:41 AM	M. ND
PERMEABILITY (BLUG) TEST	cot A Project	ET INFORMATION (Test (Total June) / History Hasel) action: (Mathemical Silar) Water Informitientrovell) action: (Mathemical Silar) (Mathemical Silar) Mathemical) action: (Mathemical Silar) (Mathemical Silar) (Mathemical) action: (Mathemical) (Mathemical) action: (Mathemical) (Mathemical) (Mathemical) action: (Mathemi	2 2 2 4 2 2 4 4 4 4 4 4 4 4 4 4 4 4 4 4	tadicael finam sadili maawaanaanaa paaladi adi faqa afi samilarg
Schmabel Manuale	HOLEST: Calment CITIN MPT LOCATION: Calment CITIN DATE: July 21, 72005	Type o Type of Weder Willinbeaut hij Mater Level Mater Mains Math Mater Level Mater Mains Math	 Pre-Treat Static Depth to Water (R. 1) Thereducer Depth: Thereducer Depth: Cala. Pre-Treat Head over Thereducer Cala. Pre-Treat Head over Thereducer Measured Pre-Treat Head over Thereducer Measured Pre-Treat Head over Thereducer Threa Treat Explore: Debiogon File Nummer 	Notice: All worker lawed concentration of a Reducement: AETIK D4044

ł

OW-413B Permeability Test







**

*.

8 **X**

....

Mattendered Strightweet ling chundbe

l

PERMEABILITY (SLUG) TEST FIELD FORM

i

DLA Project	
LOUNDING DATE	

rhailter No.: an 20040 al 1911: Bhaitel Paver Carp

Type of Type of Aspendimite Volume of Marcal Wister Land Weter Trenstone		Types of Teat: ((1)) (1) (1) (1) (1)	Statistics (Statistics)	Approximate Volume of Story ACC/SCAL Dig 155 GM.	Mercal White Level Meter SNE JULP-OD (Transform Str. 104255	Answ Sulf-601	
--	--	--------------------------------------	-------------------------	--	--	-----------------------	---------------	--

n himmi Dayit (n. 100): 25-35

1

Control tradic ()

30

HELL ID:

2.2

the height (2):





- Transmission Depths
- Chain, Pre-Teat Hand over Transducer
- t Manimust Pro-Tant House man Transd
 - terter (Sty) Time Test Started:

学

ł

A

n N

- Time Test Ender
- Patricent Till Without State

08000-5-70-00-48-500

Communits 100 = Builtion of the V-ratioh st top of control



mark point at two of control sticted from and more Note: Al wein: had man Reference: ASTU 24244

TH M

OW-418A Permeability Test







Schnabel Terment Reported

ŧ

PERMEABILITY (SLUG) TEST FIELD FORM

l

PROJECT: Colorat Citro HTP COLA Project LOCATION: July 11, 2006

PROJECT HO.: DEPENDEN CLEERT: Reddal Power Corp.


Neiss. All weiter breek orean and an and the second from and a summary and at the of conduct. Neisenses: ABTM DADM

Tertument

Approved 1

8

S.

m let

OW-418B Permeability Test





							- 194 - 194	ind: Calmet A		
10	1000	MIKI MIKI				ija 1. Baut				
10										
10 ⁴										
									*	
70 ⁴	- 1991-49100					<u> </u>				
	Eigelandin ann d	oaniy (M); I	L 19 = 10 ⁴	*				•		
		•	•		•			•	÷	
	NGCUT PARAMA Öletler Vision Lu Dagile Da Station	17/348 mi=17/21 X kd/Apdia=1	6.00%						* a u *	
	angen at Anton Redice of Confy Redice of Inter Redice of Inter Sectored Sys Reciment Sys (n = 12:012 g=(2:022) gunla Paija (2:052, 2:02) hyperic Paija hyperic Paija	gilii	k.						
	1	<i>L[]</i>		***						

• • •

Schmabol Sichmankel Engineering

ł

PERMEABILITY (SLUG) TEST FIELD FORM

I

35 4

1





R

\$

Court Haddhe (77);





Comments; TCC = Retists of the V-achien at top of sources



oktebeni itan itali manatanan palai si tap si sasih Niste: Al weber level man Nationarus: ASTUA Indiada

OW-423 Permeability Test







* *

8 X

ļ

н .

Paulticedeel Paultimenting ichmaike/

ł

PERMEABLITY (SLUG) TEST FIELD FORM

X

Pro Sul

Min Net COLA Project deg. MD Krai
2 Contraction
PROJECT LOCATION

UNIXIONS Method Power Corp 64

30 *



Generaties TOO = Buttom of the V-roteh at top of coning



and putty of two of control a state of the second s t Nete: Al veter lovel mur-Reference: ASTM D4D44 N NEW YORK AND A REAL AND A REAL

OW-428 Permeability Test







* * *

Schmithed Roghnauering chinabe

ł

PERMEABLITY (SLUG) TEST FIELD FORM

1

Total



PHCJECT NO.4 NATABAS GLEST NO.4 NATABAS GLEST NO.4 Neutritica

Z

百業

na nanc Contra la 世界

et (9, 100),

in Internet Depth (n. 100).

* [14]

-			- 1		-		l r	1
	C Taning (topic) / Nucley Heavel)		BREAM O. 625 GR	LUP-001	562 W	Sup ODI	3.62 Pt /8:07 M	100 + 1 6 5 11
	Type of Task	anciel (1) (1) (1)	Approximate Vehane of Mug.	Material Wither Lawer Methor 2004.	Transdome SAL	Blue BW	ta-Tant Wister Land (\$, "COC)" Time :	נטופג רפאפ פונפו ג-נונופ ועשונים לני וראלא וועצו

**
2
E
F
-
87
×
22
r.,
÷.
~
T
2
л.
Ξ.
38
10.0
Ξ.
12
폰
E.
문
E.
_

- Weter Loval after Pinche Insutton (R. TOCY Time:
- Freedores Deptity
- Calls. Pre-Part, "Land, over "Service"
- Hanned Pro-Tast H
- Relies Kigher Time Twee Starbad

×

- The Text Baded

K-SLUE

Chinest Ph - Du -

<u>Geometrik</u> 700 - Rober af the V-udeh et top af **oming**



annank parkat, at hop at somito Notes: All varier Jama mun Reference: ASTIN (20204 F

OW-436 Permeability Test







.

×

Mahana Baghamahan <u>Shnabel</u>

ţ

PERMEABILITY (SLUG) TEST FIELD FORM

Ŧ

Contractor Societal Ponner Ci

Ŵ

Ë

THE A

mel Dapti (A, TOC).

Solution (sublide (2)

BL DE OU

周急

HU) Citerius

TT REDENKATOR

Contract COREN HIPP COLA Project	
PROJECT: LOCATION: DATE:	

Tigen of Tool Annual Type of Tool Approximation Approximation Within of Study Approximation Within of Study

- Pro-Tost Wider Lovel (1, TOC) Time :
- Water Layed other Protes Innerthen (1), TOCP/Thrac
- Transducer Dopth:
- Carlo. Pro-That Hand over Transland
- Measured Pro-Tiset Hand to

r

S: 8 302

- TEAL Time Test distant
- oger Pile Name ł

Secon-Ard-Word-Arge-Sug

C.

2.59

<u>Commentes</u> TOC = Boltom of the V-notich of top of surfag



stic citizined from well m Nicks: All works havel aroun Riedergroek Alistiki D4044

MALAL.

OW-703A Permeability Test







* *

× .

Pres / A.L.



٤

PERMEABILITY (BLUG) TEST FIELD FORM

I

1	
PCOLAPH	
ALCORE IN LINK, MA	1 × 4
8 ¥	/ SARAL:
PROJECTS LOCATION DATE: DATE:	

PROJECT ND.: CHENDAR CLEDIT: Backed Power Carport



Nois: All weiser isoni Eropeansendis siddiked from vail someannent point of top of sacing. Reference: ARTH' (MCV4

its preside

Performed By:

1. 14. 76. 700

Ś

OW-703B Permeability Test



Chnabel Schnabel Engineering



hipitanila enalotibily juich 1.100 x 10⁴⁶

HIPLE VANAARTENS Halle VIew Least - 10307 Steph to Mitaness - 10307 Longh of Manusco - 10308 Halles of Cashy - 2008 A Halles of Interess - 0300 B Hallow of Interess - 0300 B Hallow in International State Hallow International State Hallow

æ

.

*

* *

.

.

*

* ×

×

×

.

*



Ę

<u>PERMEABILITY (SLUG) TEST FIELD FORM</u>

Ĩ

total

allis ALPF COLA Project	the second se	Type of Tests Cruited Park
HOLEON Calmat Calls APP COL	NUMBER OF ALL PROPERTY	



20

÷

	ä	
Type of Twee (Twee (Parling Fiber / Riving Hand) Ring Types (Parling / Weater) Approximate Visions of Sug. 75, 52, 55, 75, 50, 50, 50, 50	Menual Materianel Meter BNL - 104255 Transform BNL 104255 Buy BNL 51216 - 007	Pro-Teac Within Teach Tree: 20.25 P.4 /2:49 P.M.

an interval Darth (A, 100)

Class Hady Child

A 0 TOC:





- Transducer Daptic
- Childs. Pre-Hand Hand over Threadonts.
- nd over Titter and the line has
- たち/たち

 - The Total T
- tager File Name ł

212-201-100-019-2-024

2

9°5



<u>Chercherther</u> 7000 = Redison of the V-robolt at top of conduct



start point at the of contra and them and the Note: All water lovel muse Reference: ABTH (24044 MANAGE MANUTANA MANANA MANA Manana

*

OW-705 Permeability Test





Seleminal Megionaring Heatin, 11.6 UN Colour Crobert Russi, Ibdia 708 Millenber, 201207				alogical test scalps: HILANASH WEEP another					Linia: 11200000 Page 1 Project: Colored Cliffs Technolog Descenden			
Ring Type No. 1926				Theil can			htini a	e 708/1900				
				1			<u> </u>	<u>. 1997. 79</u>		- ******************		
		* 11 11 1	***	*******	-1	~ **** ** *		<u> </u>	<u></u>			
	****** ***	•••••••••••••••	** <u>*</u> **	******	— <u> </u>	<u>***</u> ***	- 2000 - 20	***** *** *	*****	**************************************	<u> </u>	
12 ⁴ 12 ⁴												
68 ⁶												
		*****					<u> </u>		<u>,</u> .	1		
	[]	···· · · · · · · ·	***					· · · · · · · · · · · · · · · · · · ·	·····	1	1	
										L		
	i iyilayalla cayal	indity (ittig: :	unaur ^a .									
	noPLIS (Piletan) Spalis Victor I.a Spalis et Norm Applier of Camb Spalier of Camb Spalier of Camb Spalier of Camb	ETENG md = 11.67 11 m = 71.67 11 m = 71.67 1 m = 7	Quetz	4		*						

Richmetricki Terrythmentage chmabe)

*

PERMEABILITY (SLUG) TEST FIELD FORM

Calvant Citrite MPP 1101.A Project
Maleon Locatoria Date Viennev

a ust zupus Beahdal Phones Chapterdites

14 S

			âde.			
	The state of the s		0-1- 0.625	201	V	MARCO
WWWWWWW		Types (Instantial)		FENE LATE P	FOR 1047 S	2/ 12:51
			Approximate Velocus d	studi Water Land Met	Therefore	1007 Thm:
						Pra-Task Waler Land

State Well Dept of 1001 a htered Date (p. 100)

Cuting its

Êi

Star 11



Greenwets: TOC = Rottern of the V-indeli at top of coning



anect point at top of casis sticking firm well in Nets: Al'vater Innel mese Reference: All'IN DADAA NAMES AND ADDRESS OF ADDRESS ADDRESS OF ADDR

NUMBER OF R

OW-708 Permeability Test






.....



l

NOUVED I **MOLECT**

PERMEABILITY (SLUG) TEST FIELD FORM

ž

T WEAL

*



]

Total Well Dept. (T. TOC), 724

en Internet Dayth (9, 100).

Canting Ladde Dismeter

PROJECT ND.2 CHERONE CLEDITI: Developi Honer Chep



<u>Stantentieten</u> 1700 - Bettern of the V-natuti at top of seeing



also about no them well associate party when at device Note: All water Javai capa Rivferense: ABTH D4044 N NO. X BUILDING N.

M NAME ADDRESS OF MARKED

NAME AND ADDRESS OF AD

OW-711 Permeability Test







.

* *

2	個
2	
Ē	
<u></u> 2_	
Nŝ	
- M	g

Į

PERMEABILITY (SLUG) TEST FIELD FORM

I

total

set CBIDs IRPF OOLA Projust Lundy, MD **LOCATION HOULDON**

Types of Tast: (Yealing Head / History Head /	Approximate Values of Blug. 02/20/20 A. 0.62.5 (ML	Name Network Network ALCP-001	Terretory PALS	

- TO ATE

rached No.: setten Clean beite have day

<u>n 2</u>

Ë

Pro-Turk Water Lawal (9, 1000/Thms:

J

North Line

- Mister Land wher Protes townton (tt. 70X2) Trac
- Transform (Depth:

20.5

- wited Pre-Tast Nami aver Tastada
- a la la la
 - Thus Text Enrich
- ger 7% Name:

CLIMON PID-OU- 74-SLUG

SO ra J C 1:341

<u>Secondan</u> 100 - Buttom of the V-natch at top of coning



Hota: Ali wake loval man Reference: ARTH DADA

XXXXX

OW-714 Permeability Test







Schnabel Reconstruction Employmental

l

PERMEABILITY (SLUG) TEST FIELD FORM

ţ



a waa a

07-15-15-01-18-5002170

Datelogger File Namu

<u>Chammadas</u> TCXC:== Botham of the V-rototh at hep of cambry



Notes: All vector layed means Reducement ASTM D4D44

Partat

OW-718 Permeability Test







* * *

* *

R X XAN

Schmebel Engineering adan da a

٩.

PERMEABILITY (SLUG) TEST FIELD FORM

ł

PHOLISCY NO.: Deficient Power Corporation

ma La

2

1	
	F
N N	
1	
PROM LOCK DATE VENT	

	Type of Test: C Testing Haved Rinking Haved	Bar The Line Line of Star 1	Approximate Values of Stag. (250 MAL 0.625 GKL	Menual Whiter Lavel Meter BNI: LVL P no)	Transians BNC A265	Sustan Suke - Chi
Aleman - Ale			Approxim	Menual White		

N 2 1

> ti oppositi una Andry (mitte)

1

1.21.4 Ĉ

-

Time:
O P
6
I
Sector.
The second secon
£

þ

- idiar Laured atter Persian Innerther (ft. 7005) Three
 - Trusted over Depths
- Ciefla, Pro-Tout Hanel court Transactures
- Ę Memburned Pre-Theat Ho
- 101 × 101 × 101

 - tet Brd of Test Time Test Erded
- ADDA THE NUMBER -

Altradieno-on-b-sux

.12.

122

21.30

<u>Communics</u> TCC = Bultom of the V-rickth at top of **caring**



OW-725 Permeability Test







	12
9	E
and the second	
	1 A C A C
	E
S.	툂
N.	L
-	٩ð

ł

PERMEABILITY (BLUG) TEST FIELD FORM

ĩ

띛.



Note. Al successfund measurements stational from well measurement publication of control. Notecome: ASTAI (1904)

OW-729 Permeability Test



Chnabel Schnabel Engineering

3	Ĩ
2	
	旧
2	巡
<u>.</u> £.	
٩ų	

J

Ť



PERMEABILITY (SLUG) TEST FIELD FORM





20 hOI I

1

御御,1002,

百名 西北

ų,



Commentant TOC = Beitners of the V-noteth at hep of condrug



in the point of the of one Notes: Altrender Innel meeu Nedermee: Alt IN 194944 ¥ ۳

OW-735 Permeability Test







=

**

1

September Maginum kag **Johnabel**

ť

PERMEABILITY (SLUG) TEST FIELD FORM

ţ

total





Central Construction			
Martine (Martine) (Martine (Ma	ent <u>Liff-col</u> ent <u>Dizi5</u> ent Siute-col5	5221 5:01 A	12814 827.542 M
Type uf T (T guis (T guis Approximate Volume af S	Nierzei Wicker Level Michae i Transchause i Sitra i	Nicher Lanei (G., TCC)/ Then : ni ather Probe teneditor (A., TCC)/ The	The Hand one Thermotone The Hand one Thermotone Fre-The Hand one Thermotone Started

×

5-0

N

ELL INFOR

2



0015-202-00-01-202-5000

Ŋ

statilized of Task

These Trans Endance

ger Filo Neme



utitatived item well preparaments pulls at top of carding Netic Al setter Janeil man Reference: All 74 D4044 A K MANANANA K KANANANA K MANANANA KANANANA KANANA KANANA KANANA KANANA KANANA KANANA KANANA KANANA KANANA KANA

ž

an United at a

OW-743 Permeability Test







×.

Schnabel

ť

×

PERMEABILITY (SLUG) TEST FIELD FORM

4

A Project	A Second S	
	and the second of the second o	CONTRACTOR AND A CONTRACTOR OF
PROJECTI LOCATION: 11	Second v v v	





<u>Communics</u> TOC = Boltom of the V-robbh of top of saving

١



Netse. All water joned momentum to the head from well communicated public of top all works. Nationalized ASTIN DADA: NAMES AND A DESCRIPTION OF A DESCRIPTION

Not have a fight a state of a substance of a substa

* ******

NAME AND ADDRESS OF A DRESS OF ADDRESS ADDRESS OF ADDRE

M Nilsanin x

K

E STRA REPORT BY A BARREN KARA

*

OW-744 Permeability Test







-

Schnabel Manana Russian

ž

PERMEABILITY (SLUG) TEST FIELD FORM

ŧ

MICT



N NAMES OF A DESCRIPTION OF A DESCRIPTIO

OW-752A Permeability Test









ł

PERMEABILITY (SLUG) TEST FIELD FORM





ĸ

3 11

NATE REPORT

ľ







Date of the Name

<u>Generatories</u> 700 = Auflans of the V-rabbin et top of conting



and point at the of leading armete obteined from such the Noise. Al' verter level mon Nationance: ASTIN D4044 N 2000-Xattik XX X 200 M 2000-20 Aptendity X20 X

M MX

* ***

melet

OW-752B Permeability Test







×



l

PERMEABLITY (SLUG) TEST FIELD FORM

į

PICLECT NO. 0112048 CLENT: Decidal Perneri

TUTIN

¥

ä

٩.

28501

Bund / Filshing Menul)	(Water)	PLASS GAL			6	
Type of Texts	thus Type: Chevrone	die Volume of Nug.	er Level Noter BNK CULP - OO	Transient SN: 10426.5	C-SUS Hank	
Notes - Yes and		Mahandah	Ministration Without			We have been as the second sec

102 H 4

tietad Dietad

5
ß
a'la
Ē

- Meter Level after Prote Inection (6, 1003) Time:
- Thermiteer Depths
- Codta. Pro-Mark Hand sear Thursdianar.
- - Partial 15/ Three These districts
 - THE PARTY
- ļ ١ř
- Der Plie Nene

1.5.46

OLIZON - MD-04- MA

1

R

z Ē

8

Community 700 = Rottom of the Vankin at top of smilty



court point at top of gooing Niche All weiter Innel mann Reference: ABTM D4D44 *

. .

* * *

N N NA KR. N MA NA ^Kamananangan na kang menungkan k

XXXX X XXX

1

OW-754 Permeability Test







.

Statistical Engineering **Chinabel**

*

ŧ

PERMEABLITY (SLUG) TEST FIELD FORM

ŝ

×.

PHOJECT NO. CONTROL

위 (위 =

A.S.

42.8

in the well began on the second

行身

Outrest Cittle NPP COLA Proj Linety, ND 24. Jacks PROJECT: LOOMORE

	Hand Type: Constrained Hand	Approximate Values of Sing ONDR. 0.6255 SAL	Manual Weder Lovel Mater SNL // 2- 00 /	Transforme BAK D-42555	8708-50J

202 406 m	6.4V	100 M	K:2//0:3	Ardio Pan	Sciente PTD. Du - 56-52 US	
Pre-Test Wister Lowal (G., TOCS/ Time : White Lowal after Protes Insection (G., TOCS/ Tho	Transform Dapt:	vanis. Pro-vani, mana over "Lanavages. Mersimud Pro-Task Hendi over Transdayes.	The further and the further	Three Tests Findert	ficatori Makavay & 244 of 1940. Datakagar 1710 Manac	

<u>Commune,</u> 100 - Ballion of Yas V-solati, at top of coning



urrenest point at top of multip skinked for well post Ā Note: Al veder level men Reference: ASTM 12404 A NY MANAGERY

The second second

Predict 1

٦.

OW-756 Permeability Test







ж
Cahmabel Antrontesi Pagimentag

Ĩ

PERMEABLEY (SLUG) TEST FIELD FORM

I

121-42







5

Some the physical state

2

300

(*) I. j

<u>Genomoties</u> TDC = Bellions of the V-notabilat top of controg



وللمعالية المراجع معليها teteterik tékitését iten vedi resserv Notes: Al weater leaved doesn The Australia ASTNI (2020) A REAL PARTY AND A REAL PARTY IN THE PARTY NAME

3

**

No. of Designation of the

OW-759A Permeability Test







ж н

.

×

* ********

* *

***** *

.

жх

*

*

.

×

.

Rehnsteel Brighneering **Technabel**

PERMEABILITY (SLUG) TEST FIELD FORM

+ w + way

CT: Calvert CERts NFT COLA Project CM: Landy, ID: ENTERP / 92 - Year /	Types of Task	and Type (helented) when)	Approximate Volume of Blue. CARD. A.M. O.G.S. GM.	Name Write Land Mater art - LLP - 00 /
PROJECT: LOCATION: DATE: DATE: WEATHEN TH				

30

a Tak

<u></u>

Buchtel Power's

PROJECT IND.

ÎN N

> The Well Days (2, 100) an Interval Depth (R, TOC):

Could held here att statut ment

Contribution:

	1				27 13-986/-
N 01259	6309 Ar / 38	262 H	1 30 / 7 38 M	5374 Cr	
Transform &	nd (R, TOC)/Thon: Inde insection (R, TOC)/Tho	d tree Transdom:	11 hand over Transference	d Brain That	
	Pro-Track Wildow Lon Witcher Lanvel allow P	Theresiser Depti- Calic Pro-Tark Han	Messared Pre-Twi Time Text Blacked:		

<u>Completies</u> TOC - Bettern of the V-notch at tup of **secting**



a part from work but and the state Nets: A vefectant mus Reference: A67H D40M -----

and the second se

Ĭ

₩ ¥

N NAMES AND ADDRESS OF A DESCRIPTION OF

No.

ſ

ĩ

OW-759B Permeability Test







ł

×



.

Į

PERMEABILITY (SLUG) TEST FIELD FORM

ţ

1





×

12-H

A

smen inside (1)

N



Detection 716 Name

ă

<u>Generative</u> 100 - Retion of the Varbeit of top of coming



annait point at the stands Noise Af water loved mean Telements ASTAL D4044 -----

ž

9 36

OW-765A Permeability Test







.

*

* *

ж

A. - COMP. 2443

.

×

×

..

. .

• •

ě



f

PERMEABILITY (SLUG) TEST FIELD FORM

t

×.

*

170

deficience Setter Power Co

26-23

N

Ľ

7 LOGATION





æ

Debioger Ho Name

Time Text States

Kilook Ahow 258-Xue

<u>Chronomiter</u> TOC = Bottom of the V-octobect top of condry.



obieksed frant weil street worket print at top of costing Nation Al'under Javal mans Nationarce ASTM DADA XILLER FOR

....

14.1000-1000 M × 34

OW-765B Permeability Test







*



Į

<u>PERMEABILITY (SLUG) TEST FIELD FORM</u>

Ï.



*

1



Natur. All weder tevel memonyments obtidenet from vedi menonismut point at top al austry Reference: ABTM (24044

Approved by

Parformed By:

* * ***

**

#

.

OW-766 Permeability Test



Schnabel Engineering





ţ

PERMEABILITY (SILUG) TEST FIELD FORM

ţ

No lal





30

and Depth (1, 100)

温泉

The Well Depth (0, TOC):

Contract Intellector

*

() When I have / Wains head)		DELVER DATE	July-001	54260	Nu6-001	Z40 Pt/11:45	CI:: 1 / 14 / 12.22
· Type of Test.	T webby the second	Approximates Violance of Stings	Naruel Waler Lovel Meter Sht		Nr Sk	Pra-Tiert Whiter Loved (\$, TOCH Time ;	Vidor Land after Prote Insertion (A, TOC) Time:





boost File Name

CARDAR-PLO-03 - W

Commentary 700 - Bettern of the V-robek of top of cosing



at point at the of control sticked from well an Nicks: Al water Innel John Pediannes: ARTIN 19494 .

OW-768 Permeability Test







Schnahel Engineering led an mabel

Ĺ

PERMEABLITY (SLUG) TEST FIELD FORM

Jul-a-



Ø

7

Commute. 100 = Beltom d'fin V-ndeh eftep e**l** coning



sectors projected at the sector artis skiningi flaan vagil ma Noise All varies level trans References ASTNI 154244

OW-769 Permeability Test







ж

×

ŀ

- İ

.

*



ţ

PERMEABLUTY (BLUG) TEST FIELD FORM

Į





Note: Al syster bank suscence of the source of the source of a suscence of the state of a state. Note: Decker

OW-770 Permeability Test





Schnabel Project No. 06120048 Appendix D: Ground Water Observation Wells

WELL SAMPLING RECORDS

WELL NO. PROJECT 0W-301 chnabel CLNPP india North LLC JOB NO. Sur ciffs PLING RECORD 06629049 WELL SAMPLING RECORD ABreak METHOD METHOD Volume of Stately 2nto PURGING DATE: 12-120/PL WEATHER: Surgary Cold TEMPERATURE: 044 INITIAL WATER LEVEL: 54-18 DATE OF SAMPLING: 12/20/04 TIME OF SAMPLING: 12/55 SAMPLE MATRIX: GROUND WATER: PUMP TYPE 2" Grun 105 PUMPING VOLUME CALCULATION 1 ft^s = 7.48 gal Xiw - well diameter (in) /-weil depths (ft) V_=I(dw)2h* = (36×23) = 10.9 94 n-porosity リョ= (3.14)(ボ)ぞうしの V_a = I <u>[db-dw]</u>²*7.48 * n - 42 Handle - Boring diameter =3.7(3)=11.1 VT=220 Checked by PURGING DATA FIELD PARAMETERS COMMENTS Comments Concludivity Turbidity DO Time Begin Time Water Temp ORP (mV) рН (mg/L) (± 10%) (NTU) (± 10%) (u mínce) Finish (Ins) Removal fost 1.07 (723) (07) ± t0mV3 住 3%) 135 0.3 1424 1423 124 B.460 189 £0 LS ٦, 10 01 bģ 14.3 19 0.490 2.7 29 4**4**力 25 453 4.12 DA 79Rewell 5gel 155 sa Equipment Calibration Performed By:

Number of Sample Containers Collected:

60sec

PROJECT WELL NO. chnabel CLNPP and maning North, LLP. SITE Calvert Cly JOB NO. Dial 2004 8 Sen B ABresko WELL SAMPLING RECORD PURGING CRITERIA PURGE SAMPLING Volument Stabilization K. Powell METHOD METHOD trab PURGING DATE: 1777-179 WEATHER: 1610-9 1201 TEMPERATURE: 040 INITIAL WATER LEVEL: 35,92 DATE OF SAMPLING: 1217-100 PLIMP TYPE TIME OF SAMPLING: DOI S SAMPLE MATRIX: GROUND WATER: 1 ft⁵ = 7.48 gai PUMPING VOLUME CALCULATION dw - well diameter (in) Va=3.4(勤2(3.49) 17.43 h-well depths (ft) V_{*}=ĭ(<u>dw</u>)2h*; = 0.2ad (3) = 0,600 50L n-porosity V,=1 <u>[db-dw]</u>²*7.48 * n リシニュル(気)をったいう ? d_b - Boring diameter = 14(3) = 34.2 gal Checked by: VT = 34.89 COMMENTS FIELD PARAMETERS Ble below Tas ر لا صوله 43.Lo L Conductivity DO Turbidity Time Begin Time Weter Tomp рН ORP (mV) (mg/L.) . (± 10%) (a mhos) (NTU) (a 10%) 54 (hes) Finish (hm) [Removal (gal) (0) (4.01) ± 10mV) (1 3%) 57 0735 1433 24 ł¶-M.39 1ZÅ 1.44 0150 0.079 12.5 0755 19 0,169 à, 0400 19 }# 123 95 D.S 2.03 4 D.9 1805 Nolë 2.1 Ø 侶 0.2 791D э, 085 DBIS 1Z D.D Dar 3<u>90</u> Equipment Calibration Performed By: 1:3min Number of Sample Containers Collected: 3.8 somin #

		*	and a supervision of the supervi		*	*	A CONTRACTOR OF THE OWNER		
	Chne	hal	PROJECT	000			WELL NO.	, OUS	-33le
	mini Engineering	Notity LLD	CCA	UPP		* *		1-705	
WELL SA	MPING	RECORD	JOB NO.	49	ST That	a.k	PREPARE	D BY	an <u>an an a</u>
	PURGE	SAMPLING	PURGING	CRITERIA:	11	1	100		
	Bond	GATAD	Valum	e + 5	top lizel	21	CMA		
PUMP TYP		*	PURGING	DATE 7	20/04	DATE OF	SAMPLING	1440	10 1'50
1 "	77		TEMPERA	TURE; 4	, ,	SAMPLE	MATRIX: GI	HOUND WA	ik o
		A COLORED THEOREM		60.36	- 19-53-			*	
PUMPING		E CALCULA	NON	hdw - well	diameter (in)		1 # ³ =7/	48 gel	
100=3	2 2 3 7 / 1	(1).07) N=1.7.	(T)	/h-well de n-corosity	pthis (ft) 👘	*	V.,=1 (<u>da</u> 2	M)2h* 4	
14-7	W#	123(02)	YAN	de - Borin	g diameter		V,=1⊡	<u>>dw]²*7.4</u>	5 ⁺ 7
· · · · · ·	11.241	17.24	- 421	,				* 6	
12-14		12. 7					Checked	by:	t l
PURGING	DATA	ager a galactive acree and the Provi	FIELD PA	RAMETER	19	1999 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 -	COMMEN	TS	HR
Į	•						Tas	1 Jan	1 st
Time Begin (firs)	Time Finish (bra)	Water Removal (gel)	Tamp (°C)	pH (±.01)	Conductivity (III mitos) (a. 392)	ORP (mW) ± 10mV)	DO (mg/L)	Turbidity (NTU)	Comente
1708	20-	- 36						in the start	
1723		120	13,78	7.26	0427	R5	1,89	1780	19.8
1728		120	1408	729	0.421	12.5	1.00	14,6	
1737		120	1442	7.30	0422	12.5	0.97	12.4	· · · · · · · · · · · · · · · · · · ·
1738		12.0	1343	1.30	0421	12,5	1.05	133	
<i>17-</i> 45	HITC		14:05	1.30	0,420	145	1.00	Id.A	<
			× ;		1		1 <u>,</u>		*
							K		
×		<u></u>							*
Čardena -	Callbard	n Dasharad	Dan	VI	2.0.1	*	A DECEMBER OF A	*	x x x x
Mumber of			Dy:	<u> </u>	3				
General States	Demphero Dia -				/	<u></u>	*	* *	
54	120	PA						x	
	1.444	1 here				* _ ^			
	~ • ~ U •	~/ #/V [~] *							

* * _ *

÷.,

2	chna	North, LLC	PROJECT	NPI	0		WELL NO.	w-3	<i>07 401</i>
Well SA	MPLING FURGE METHOD	RECORD SAMPLING METHOD	PURGING Volution	no48 Criteria No 4-5	tabiliza	Chiff tion	A Bri L Po	oby sko well	-
UMP TYP	fes	2"	PURGING I WEATHER TEMPERAJ INITIAL WA	URE: 40	-33.60	DATE OF TIME OF SAMPLE	SAMPLING SAMPLING: MATRO: GI		i Ter:
UMPING 1234 5=34 5=34 5=34	1000000000000000000000000000000000000	E CALQUILAT 2057 (13-1 1.1.6 Jul 1.205 (0.5) 12.0 12.0	之子	dw - wali h-weli dej n-porosilj d _k - Borin	diemeter (in) aths (it) 7 g diemeter	- <u>Rosen - 186</u>	1 ft ² = 7.4 V ₂ =1 (<u>d</u>) V ₂ = 1 <u>[d]</u> Checked	48 gel 4) 2 h * * <u>>-chvi</u> ² * 7.48 24 by:	ı*n P
URGING	DATA		FIELD PA	AMETER -	8	*	COMMEN	TS	
Ime Begin (lus)	Time Finish (hrs)	Removal (gal)	Temp ("C)	pH (±.01)	Conductivity (u mhos) (± 3%)	ORP (mV) ± 10mV)	00 (mg/L) (± 10%)	Turbidity (NTU) (±10%)	Commente
2924	0ÅF	4Dad	*		*				dry
949	0948	20gd	*******						<u> </u>
747		141	14.04	7.43	0.394	12.9	3.13	2.2	
727 214-9		1.1	1701	740	0.380	12,5	1.70	11.7	
104	1004	11-	14.52	7/10	0.362	12.5	1.66	4.0	òry
			×		*				
	×				*				
quipment	Calibratio	n Performed	By:	K	Powell	1	R R R R R R R R R R R R R R R R R R R	*	
umber of	Sample C	ontainers Co			- 1 - 1			×	· · · ·
	56AL=1.	35 min =	047	י ר	35min	- 3.	Tg allast) *	

* * * *

Г×.

*: * * *

> , , , , ,

			PROJECT			· ·	WELL NO.	· · · · · · · · · · · · · · · · · · ·	* * * * * * * * * * * *	
. 2	<i>chne</i> Malagnada	bel Mark, LLC	CC	NPP			OW.	42	3	
WELL SA	AMPLING	RECORD	Job No. Dr. Jul	48	Calcut	calls	PREPAREI	BY,		
	PURGE METHOD SUP DIMP	SAMPLING METHOD	Valcm	e+51	abilizari	hen	KPE	pell		
PUMPTY P ^{IN} C	arunf	ő.	PURGING I WEATHER TEMPERAT	DATE: 12/ Clear/ TURE: 49 TER LEVE	20/06 1950nny 29.55	DATE OF TIME OF SAMPLE	SAMPLING SAMPLING: MATRIX: GF	1777 201 Kound Wat	TER:	×
PUMPINO Vec 3 = 7,	SUHE	E CALCULAT	1011	dw - well h-well dej h-gorosity	clemeter (in) pihs (it) /	······	1 ft ^a = 7,4 V _w =1 (<u>dw</u>	8 gai)2 h *		
15=3.1 = 1,	14(数) 25×3=	2 (200)(0 3.75	习错	o _b - Borin	g diamater		V _e ≑T <u>idb</u> ;	<u>:dw</u>] ² *7.48 M	איז גר - גר	
VT=	27.4 91	L .					Checked	by: <u>(</u> []	WP	
PURGING	3 DATA		FIELD PAI	AMETER	8	*	COMMEN Samp 39.7	2 cal	edd at	
Time Begin (bre)	Time Finish (hrs)	Watur Romoval (gal)	Tiemp (°C)	pH (4.01)	Conductivity (u mhos) (± 3%)	OR₽ (mV) ± 10mV)	DQ (mg/L) (± 10%)	Turbitility (NTU) (± 10%)	Commente	
1228		19.784						* *		•
1254	, , , , , , , , , , , , , , , , , , ,	19.2	14.53	5-10	0.153	12,4	16.71	1.7	* *	
1257	· · · · · · · · · · · · · · · · · · ·	<u>M·X</u>	5.09	5/15	0.156	12.7	18.101	41.2	×	
1209	× .	17.0	1211	D+13 E17	21154	14.7	18401	2.4	х х	
34		192-	15.22	5.18	0.153	12.4	Bolel	6.8	pumped dry	
			x 	×	×					;
				×			· · · ·	*		
Equipment	t Celibratic	n Pericimed	By;	K	Powell				1:18= 5 get	ļ
Number of	Semple C	Containers Co	lected: _ + @	1.74	29 =	31.7	t , [*] ,	× ×	2	.1 * *
к К К	×	70		*	**************************************	*, * *	•	* * *		*
				* *				*	* **	i

Ъ.

•]

××

.

PROJECT WELL NO. CONPP chnabel 00-488 a Serie, LLC JOB NO. Calvert Cliffs ABreste PURGING CRITERIA WELL SAMPLING RECORD PURGE SAMPLING K. Powell Volome + Stablization ETHOD METHOD Grab I M.F mas PUMP TYP DATE OF SAMPLING: / 7/2004 PURGING DATE: 12/20/10 WEATHER Clear / Sunn 2" Grunfos. TIME OF SAMPLING: TEMPERATURE: 45 INITIAL WATER LEVEL: 37,97 SAMPLE MATRIX: GROUND WATER: PUMPING VOLUME CALCULATION 1 ft⁵ ≈ 7.48 gal dw - well diameter (in) h-well depths (ft) V"=I(dw)2h* = 1.94(3) = 5.99a n-poroaity Soring diameter V,=I(db-dw/²*7.48*n ち= 3·14に当)2(202)(0·3)(2日 = 3·9にか=1に男gal Checked by: 17= 17.69.08. PURGING DATA FIELD PARAMETERS COMMENTS sapple collected at 48,3' bolow \$ **Compani**s Conductivity DO Turblety Time Becin Time Water Temp øĦ ORF (mV) (u mhoe) (mg/L) ONTLD Finish (nos) Removal (gal) rci ± 10m/v3 (has) (土,01) (+ 10%) (2 3%) ė 10%) 20.25 1054 104 Die da in 24 9.7 12.5 14.54 6.40 4.1 432 D. 111 ow d 23,36 25 14.29 541 liz O, KS 12.1 5.28 0.107 2.0 山のマ 12 リスレ 041 14 5014 0.109 3,8 hz.(19d = 205 6.75 min lave Equipment Calibration Performed By: Simple collected @ 48.3' due to static water level Number of Sample Containers Collected: 1 6.75 min 603

PROJECT WELL-NO. CCNPP nabel 04-705 . a Mein LLE DUIDOUS SITE Calvert Cliffs A.Bres WELL SAMPLING RECORD PURGE SAMPLING PURGING CRITERIA: K. Burd METHOD METHOD Volume Shiphitzation Sielo 6.30 PURGING DATE: 14/1/14 DATE OF SAMPLING: 4 /2/2/20/ PUMP TYPE WEATHER: C.Lear TIME OF SAMPLING: 1435 Gruntes 2" TEMPERATURE: 40 SAMPLE MATRIX: GROUND WATER: INITIAL WATER LEVEL: 18 53 (19-52 Uno-well volume 1 ft³ ≈7.48 gal PUMPING VOLUME CALCULATION dw - weil diameter (in) Vis= 3.14(2)2.32.48.7.4 V_,⊨ĭ(<u>dw</u>)2h* h-well depths (ft) Vs-sendpack n-porosity -0.30 = 5.3 gel + 3 = 15.9 d. - Boring diameter -64 V, = I (db-dw)²*7.48*n い= ろ州(当)2.17532 =0.445#3, 3= 3.3 VT= 19.2 gal. Checked by: PURGING DATA FIELD PARAMETERS COMMENTS Commert Conductivity Turbidity nä Time Weter ORP (miV) Time Beuin Temp 渊 (u mhos). img/L) ONTUS Finish (hrs) Removal (gail) ന്ത് ± 10m/V) (ins) (£.01) (+ 10%) (± 3%) (+ 10%) 6.5 4.1 28.10 0.512 ロル 0.12 69 1D 4 125 241 0,515 llað 0.11 IL 152 カヤる 124 422 Borde п. IJ. 13. 17.1 hard Equipment Calibration Performed By:

Number of Sample Containers Collected:

*			· · · · · · ·		*				
· 🦼	2.		PROJECT	DD		**************************************	WELL NO.		
· 2	<u>ichna</u>	bel	CON	TP			0w	-708A	
- 34	anted Englementeg	North, 11.0	JOB NO.		ISITE -		PREPARE	DBY	2 20 UR R. 171
VELL SA	MPLING	RECORD	06170	2048	Calver	als	ABre	sto	×
	METHOD	METHOD	Volum	CRITERIA: Le. d- 57	habiliz-	A ion	X Pom	sell	•
	Sil	grad							
UMP TYP		24	PURGING	DATE	hbb	DATE OF	SAMPLING	121716	0
r ar	mpz	· 2.	TEMPERAT	TURE;	ゆよ	SAMPLE	Matrix: Gi	ROUND WAT	ER:
×		*	INITIAL WA	TER LEVE	15:00			*	
UMPING	3 VOLUM	E CALCULA	TION	dw - weil	diameter (in)		1 ft ⁸ = 7∕	48 cel	A A A A A A A A A A A A A A A A A A A
)	叫劲行	21.39/24	23	h-well de	pins (fi)		V,,=ī (₫	w)2h*	
~/S.:	5705=	1.5 sd	· .	n-porosity	/		2	4	
ست الانت سعال	い 出こ	12.15	7.40	d _e - Borin	g diameter		V,=1 [d]	<u>5-dw</u> ² *7.48	* n
">> H	化到(12/032	フ					" At	ŝ
シスピート	763=9	it gd				×	Chacked	two D	Ð
VT= 1% VRGING	B DATA		FIELD PA	RAMETER	8		COMMEN	ns	
'1									×
	r	· · · · · · · · · · · · · · · · · · ·		T	Angineikiter	T		Traddellar	Warmania
lime Begin (ius)	Time Finish (hrs)	Weter Remöval (gal)	Temp (°C)	pH (生.01)	(u misee) (u misee)	ORP (mV) ± 10mV)	(mg/L) (± 1085)	(NTU)	
we wanted we approximate the	5 W Y Y			The second second		w www.www.w			
945		Ig.d.	16.34	6.79	0.386	17.5	1.56	337.7	dry
945	*	19.d.	16.34	6.79	0.386	12,5	1.56	337.7	dry Ideal Domte
945	1059	19. al. 2.5 3.5	16.34 14.34	6.79	0.386	12.5	2.31	337.7	dry Ideal Domte Other
945 15 15	1059 1129	19. d. 25 2.5 2.6.d	16.34 16.34 16.34	6.79 7.07 208	D.386 D.749 D.744	12.5	2.31 1.74	337.7 126.8 1231.4	dry Id cal Domite Ory dry
145	1059 1129 1133	19 d. 25 25 25 25 26 4	16.34 4-34 14.9D 16.35	6.79 7.07 208 239	D. 386 D. 749 D. 741 D. 741	17.5 12.5 12.5 12.5	2.31 1.74 6.01	3.37.7 126.8 1231.4 482.5	dry Edical Domete Ory dry The flow
445 15 15 15 15 15 15 15 15 15 15 15 15 15	1059 1129 1133 1138	19 d. 25 2.5 d 2.5 d 5 d	16.34 16.34 16.30 16.35 16.73	6.79 7.07 7.08 7.29 7.21	D. 386 D. 749 D. 741 D. 741 D. 73	17.5 12.5 12.5 12.5 12.5 12.5 12.5	2.31 1.74 6.01 b.N	3.37.7 124.8 1231.4 482.5 477.1	dry Id cal Do mto Ory dry Jaw flow
145 15 15 15 15 15 15 15 15 15 15 15 15 15 1	1059 1129 133 1138	19 d. 25 25 25 25 26 26 26 26 26 26 26 26 26 26 26 26 26	16.34 16.34 16.30 16.35 16.73 16.73 16.83	6.79 7.07 7.08 7.29 7.21 7.18	D. 380 D. 749 D. 741 D. 741 D. 731 470-730	17.5 12.5 12.5 12.5 12.5 12.5 12.5	2.31 1.74 6.01 6.11 6.12	3.37.7 124.8 1231.4 482.5 477.1 481.1	dry Id cal Do mto Oty dry Jaw flow
145 15 15 15 15 14 14 14 14 14 14 14 14 14 14 14 14 14	1059 1129 133 1138	19 d. 35 35 35 35 35 4 3 5 4 4 5 4 4 5 4 4 5 4 4 5 4 4 5 4 5	16.34 16.34 16.35 16.35 16.73 16.73 16.83	6.79 7.07 7.08 7.29 7.21 7.21 7.21 7.18	D. 380 D. 74 D. 74 D. 74 D. 73 HTD. 73 HTD. 73	17.5 12.5 12.5 12.5 12.5 12.5	2.31 1.74 6.01 6.11 6.12	3.37.7 126.8 1231.4 482,5 477.1 481.1	dry Id cal Do mto Dry dry Jaw flow
A45 55 15 131 143	1059 1129 1138 1138	19 d. 35 3.5 3.5 3.5 4 5 4 4 5 4 4 5 4 4 5 4 4 5 4 4 5 4 4 5 4 5 4 5 4 5	16.34 16.34 16.35 16.73 16.73 14.83	6.79 7.07 7.08 7.08 7.39 7.21 7.21 7.18	D. 386 D. 749 D. 741 D. 741 D. 731 470-730	12.5 12.5 12.5 12.5 12.5	2.31 1.74 6.01 6.11 6.12	3.37.7 126.8 1231.4 482,5 477.1 481.1	dry Id cal Domite dry dry Jai flow
A45 IS IS IS IS IS IS IS IS IS IS IS IS IS	1059 1129 1138 1138	19 d. 25 25 25 25 25 25 26 25 26 25 26 25 26 25 26 25 26 25 26 26 26 26 26 26 26 26 26 26 26 26 26	16.34 16.34 16.35 16.35 16.73 16.73 16.73	6.79 7.07 7.08 7.39 7.21 7.18	D. 380 D. 74 D. 74 D. 74 D. 73 470-73	12.5 12.5 12.5 12.5 12.5	2.31 1.74 6.01 6.11 6.12	3.37.7 1,26.9 1,231.4 4,82.5 4,77.1 4,91.1	dry Id cal Do mto dry dry Jai flow
A45 AF 18 131 143 143	1059 1129 1138 	19 d. 15 15 15 15 15 16 15 16 15 16 16 16 16 16 16 16 16 16 16	16.34 16.34 16.35 16.73 16.73 16.73	6.79 7.07 208 239 7.21 7.21 7.18	D. 380 D. 74 D. 74 D. 73 2. 74 2. 74	12.5 12.5 12.5 12.5 12.5	2.31 1.74 6.01 6.11 6.12	3.37.7 1,26.9 1,23.4 1,23.4 4,82.5 4,77.1 4,91.1	dry Id cal Do mto Ory dry Jai flow
945 95 15 15 17 17 17 17 17 17 17 17 17 17 17 17 17	1059 1129 1138 	19. dl. 3.5 3.5 3.5 3.5 3.5 5.6 4 5.6 4 1.5 4 1.5 4 1.5 4 1.5 4 1.5 4 1.5 4 1.5 4 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5	16.34 14.34 14.30 16.35 16.73 16.73 16.73 16.83	6.79 7.07 7.08 239 7.21 7.21 7.21 7.21 7.21 7.21 7.21 7.21	D. 380 D. 749 D. 741 D. 731 A. 7310 A. 7311 A. 731 A. 731 A. 731 A. 731	12.5 12.5 12.5 12.5 12.5 12.5	2.31 1.74 6.01 6.11 6.12	3.37.7 124.8 1231.4 482.5 477.1 481.1	dry Id cal Do mto Ory dry Jaw flow
945 15 15 17 17 17 17 17 17 17 17 17 17 17 17 17	1059 1129 133 138 	I g al. 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.	16.34 16.34 16.35 16.35 16.73 16.73 16.73 16.73 16.73 16.73 16.73	6.79 7.07 7.08 239 7.21 7.21 7.21 7.21 7.21 7.21 7.21 7.21	D. 386 D. 749 D. 741 D. 73 2.741 D. 73 2.741 D. 73 2.741 D. 73 2.04 J. 04 J. 0	12.5 12.5 12.5 12.5 12.5 12.5 12.5 12.5	2.31 1.74 6.01 6.11 6.12	3.37.7 124.8 1231.4 482.5 477.1 481.1	dry Id cal Do mite dry dry Jai flow
9 45 15 15 13 13 14 14 14 14 14 14 14 14 14 14	1059 1129 1138 1138 	1 g. el. 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.	16.34 16.34 16.36 16.35 16.73 16.74 17.75 16.74 17.75 16.75 17.75	6.79 7.07 7.07 7.08 7.39 7.21 7.21 7.21 7.21 7.21 7.21 7.21 7.21	D. 380 D. 749 D. 749 D. 741 D. 731 270-730 270-730 V P. U 310m 7080-	12.5 12.5 12.5 12.5 12.5 12.5 12.5 12.5	2.31 1.74 6.01 6.11 6.12	3.37.7 124.9 1231.4 482.5 477.1 491.1	dry Ed cal Do mite Ory Coy Jai flow
945 15 13 13 14 14 14 14 14 14 14 14 14 14 14 14 14	1059 1129 1136 1136 	1 g. dl. 3.5 3.5 3.5 3.5 3.5 3.5 3.5 3.	16.34 16.34 16.35 16.35 16.73 16.74 17.75 17.75 17.75 17.75 17.75 17.75 17.75 17.75 17.75 17.75 17.75 17.75 17.75 17.75	6.79 7.07 7.07 7.08 7.21 7.21 7.21 7.21 7.21 7.21 7.21 7.21	D. 380 D. 74 D. 74 D. 74 D. 73 ETD. 74 ETD. 74	12.5 12.5 12.5 12.5 12.5 12.5 12.5	2.31 1.74 6.01 6.11 6.12	3.37.7 1,24.9 1,231.4 4,82.5 4,77.1 491.1	dry Ed cal Do mite Ory dry Jai flow
945 15 15 13 14 14 14 14 14 14 14 14 14 14 14 14 14	1059 1129 1136 136 	In Performed	16.34 16.34 16.35 16.35 16.73 17.73 17.74 17.75	6.79 7.07 7.07 7.08 7.39 7.21 7.21 7.21 7.21 7.21 7.21 7.21 7.21	D. 380 D. 749 D. 741 D. 741 D. 731 420-730 420-730 1080- 1080- 1080-	12.5 12.5 12.5 12.5 12.5 12.5 12.5	2.31 1.74 6.01 6.01 6.01 6.01 6.01 6.01 6.01 6.01	3.37.7 124.9 1231.4 482.5 477.1 481.1	dry <u>Fd cal Do mite</u> dry <u>dry</u> <u>her</u> flow

-]

-17:

. 0750.

			PROJECT				WELL NO		· · · · · · · · · · · · · · · · · · ·
	Chas	hal	PLA	(PP			T Description of Reading	·	
	alai Safaala	North LLC					0~-711		
			JOB NO.			-1 /	PREPARE	D-BY.	A CONTRACT OF A
WELL SA	MPLING	RECORD	OLIZOL	248	falvert l	445	H-Br	esto	
	PURGE	SAMPLING	PURGING	CRITERIA:			1 Pm	nell	
į .	Sub	66-60	Volume :	74-2912	MIGN		1 - Tan	~7	
PUMP TYP	2년		FURGING	DATE: 124	10/14	DATE OF	SAMPLING	12/201	4
l c	. 2		WEATHER	Clear 1	çid	TIME OF	SAMPLING:	0850	****==_
1	2[4176	2	I EMPERAT	TER LEVE	10 71	BAMPLE	MATHOC G	KUUND WAT	
1.7					A.50		· · · · · · · · · · · · · · · · · · ·		
PUMPING	S VOLUM	E CALCULA	TION A	dw - weli	diamater (in)		1 ft ^a =7.4	18 gai	
Vo= 3.	MAR	31.5X 2		h-well dep	oths (ft)		V _w ≓I (<u>dv</u>	y)2h*	
= 6	M)3	- 150 m	r'/	n-porosity	1		2	•	
1. 2		H mx N	2.48 al	y - Borin	g diamater		V, = T <u>kit</u>	<u>hdw</u>] ² *7.48	i*n
4=3	171.54	UPP L	-TPS/				,	24	4.0
= 3	903)=	i i fa f			*			\mathcal{D}	MD
VT=	71.14	K					Checked	by: <u>Y44</u>	1
PURGING	DATA		FIELD PAP	RAMETER	8	analik antoin konse sange	COMMEN	F dru	then ,
							Ga	a dola	allest saude
		11			Conductivity		DO	Turbidity	Commenta
(ime Hagin (ime)	Finish (hrs)	water Removal (gal)	(°C)	(ro. 4)	(u mhos)	± 10mV)	(mg/1-)	(NTU)	
MARE	Mary	11.5			2- w/m/			100	da
25:22	nee 1	275			x				1.
00.00	1764	3.10	12.64	1.75	1	捷乐	1	100	- Burge
12.20	093	0.7	1.00	4112	D.437	72.0	6.11	12.7	dry/Slass
0831	2737	0.5	12112	7.12	0,454	12.5	6.08	140	
0937	0442	0-5	14.73	7.33	0.452	125	7.07	4,8	
5942		-	1503	7/39	0452	125	5,96	512	<u>1</u>
					*				
							*		x x
					* *				
		x					*		
				11 -	(1	· · · · ·	*	×	L
Equipment	t Calibratic	n Performed	By:	LHoo	2011				
		AND THE REAL PROPERTY AND ADDRESS OF A DREAM AND ADDRESS OF ADDRESS OF A DREAM AND ADDRESS OF ADDRESS OF A DREAM AND ADDRESS OF ADDRESS OF ADDRESS OF A DREAM AND ADDRESS OF ADDRE			The second se	and a first second s			

Number of Sample Containers Collected: 30858

			Contract Voter				Tenner	*	
4	lan-	Lal	PHOJECT				WELL NO.		7000
	GIII)2		a	NPP	>		.04		125
WELL SA	MPLING	RECORD	Job No. Duijo	048	SITE Calvort	alls	PREPAREL	SBY SKO	
	PURGE	SAMPLING METHOD	PURGING	CRITERIA	11.		V Z.	sell	
	ON MP	grab	VOIDM	et st	DUIZAZ	() PN	f ton		х
PUMP TYP	E	•	PURGING I	DATE: 12	4/12	DATE OF	SAMPLING SAMPLING:	12/2/10 11/2 5	n le
of gr	myes				67.	SAMPLE	MATRIX; GR	OUND WAT	TER:
	10				-22.1	<u> </u>	·····		
PUMPING	VOLUM		22	dw - well	diameter (in)		1 ft ³ = 7.4	lê gal	
VW = 3	17154) 5.4712	L#197][\\$17.0.	\mathcal{D}	h-well dej	ptins (ft) /		V _# ≓ĭ (<u>dv</u> %)2h* 	-
1600	14/4	21.3.1	N7.40	d _b - Borin	g diameter		V, = 1 <u>(db</u>	-dw ² *7.40	3*n
175 24	TOM)	C 1 V (P) 74	ET				1	24 (7)	19
	1763	1 812		ĸ			Churchesel		ų –
PURGING	DATA	- <u>``</u>	FIELD PAL	RAMETER	3		COMMEN	^{DK} 444 18	· · · · · · · · · · · · · · · · · · ·
1					-	* .			
		<u> </u>		1	Provinte		50	Trebbille	10 romania
Time Begin (hrs)	Time Finish (hrs)	Water Removal (gal)	Temp (*C)	pH (±.01)	(u mhos) (± 3%)	ORP (mV) ± 10mV)	(mg/L) (± 10%)	(NTU) (± 10%)	a a
1320	1324	9.5							dry
							1		
1326	1358	30,5	1						
1326 1358	1358	30,5 9.5	1 14,59	6.64	0.39/	23.2	252	31.5	
1326 1358 1408	1358	30,5	1 14.59 14.67	6.61e 6.67	0.31/ 1.31/	23.2 62.8 ²	252	34.5 8.0	
1326 1358 1408 1408	1358	30.5 9.5 9.5 9.5	1 14.59 14.67 14.67 14.61	6.66 6.67 6.68	0.38/ 0.386 0.385	13.2 62.8° 67.3	2.52	31.5 8.0 8.4	
1326 1358 1408 1418 1418 1428	1358	30.5	1 14.59 14.67 14.67 14.61 14.58	6.66 6.67 6.68 6.68	0.38/ 1.386 0,385 0.385	23.2 62.8 67.3 67.1	2,52 42,4 2,62 2,52	31.5 3.0 8.4 8.2	
1326 1358 1408 1418 1418	1358	30.5 9.5 9.5 9.5 1	1 14,59 14,67 14,67 14,61 14,58	6.66 6.67 6.68 6.68	0.38/ 0.386 0.385 0.385	23.2 62.8 ² 67.3 67.1	2.52 2.62 2.62 2.52	31.5 3.0 8.4 8.2	
1326 1358 1408 1418 1418	1358	30 5 5 5 9 5 9 5 9 5 9 5 1	1 14,59 14,59 14,57 14,58	6.66 6.67 6.68 6.68	0.38/ 0.386 0.385 0.386	13.2 6.2.8 ² 67.3 67.1	252 262 252 252	31.5 3.D 8.4 8.2	
1326 1358 1408 1418 1418	1358	305	1 14,59 14,59 14,57 14,58	6.66 6.67 6.68 6.68	0.31/ 9.384 0.385 0.385	13.2 62.8 67.3 67.1	252 262 252	31.5 3.D 8.4 8.2	
1326 1358 1408 1408 1418	1358	30,5 9.5 9.5 7	1 14,59 14,59 14,57 14,58	6.66 6.67 6.68 6.68	0.31/ 0.31/ 0.385 0.385	23.2 62.8 ² 67.3 67.1	252	3.5 3.D 8.4 8.2	
1326 1358 1428 1428 1428	1358 1428	30,5 9.5 9.5 9.5 	1 14,59 14,67 14,67 14,61 14,58	6.66 6.67 6.68 6.68	0.38/ 0.386 0.385 0.385	23.2 62.8 ² 67.3 67.1	252	31.5 3.D 8.4 8.2	5) al 1
1326 1358 1428 1428 1418 1428 1428	1358 1428 Calibratic Sample C	30,5 9.5 9.5 9.5 7.5 7.5 7.5 7.5 7.5 7.5 7.5 7.5 7.5 7	1 14,59 14,67 14,61 14,58 14,58 By:	6.66 6.67 6.68 6.68 6.68 6.68	0.38/ 0.386 0.385 0.385	23.2 62.8 ² 67.3 67.1	252	31.5 3.D 8.4 8.2	541/5.25
1326 1358 1428 1428 1428 1428 1428 1428 1428	1358 1428 Calibratic Sample C	30,5 9.5 9.5 9.5 7.5 7.5 7.5 7.5 7.5 7.5 7.5 7.5 7.5 7	1 14.59 14.67 14.61 14.58 By:	6.66 6.67 6.68 6.68 6.68 6.68	0.31 0.31 0.385 0.385 0.38	23.2 62.8 ² 67.3 67.1	252	31.5 3.D 8.4 8.2	541/5.25
1326 1358 1428 1428 1428 1428 1428 1428 1428	1358 1428 Calibratic Sample C	30,5 9.5 9.5 9.5 7.5 7.5 7.5 7.5 7.5 7.5 7.5 7.5 7.5 7	1 14,59 14,67 14,61 14,58 By:	6.66 6.67 6.68 6.68 6.68 7	0.38/ 0.386 0.385 0.385	23.2 62.8 ² 67.3 67.1	252	34.5 8.4 8.2	541/5.25 C195adhera

ţ

			PROJECT	··· ··· ···	and the second		WELL NO.		
2		bel Matula	100	NPF	>		00	-7	15
WELL SA	MPLING	RECORD	Job No. <i>661,201</i>	48	arre Calvert	aiffs	PREPARE	resko	
-	METHOD	METHOD	Volur	ne+5	tabliz	atim	KP	well	
2ªC	Srunf	05	PURGING I WEATHER TEMPERAT	DATE: 72 Clandy TURE: 46 TER LEVE	12/106 [cool 153.39	DATE OF TIME OF SAMPLE	SAMPLING SAMPLING: MATRIX: GP	1123 NOUND WAT	ier:
NUMPING Vius ≈ 3	volum いり こり つい い	CALCULAT	TION (74)	dw - well h-well dep n-perosity	diamater (in) oths (it) /		1 ft ² = 7.4 V _= I (<u>ch</u>	18 gel 1)2 h* 1	Gudi ⊿8866-aba dan ar i er e — — — — — — — — — — — — — — — — —
Vs = 3 = 2	1415	i) ² (14)(0) = 4.2	30X24) - Borin	g diamater		V,=T <u>(dt</u>	<u>⊶dw</u> f**7.44 ≫	s*n
VT - URGING	17:39 DATA		FIELD PAI	RAMETER	8		COMMEN Sample	18 e col	Vectal popuit of the
fime Begin (ms)	Ticoe Ficial: (hrs)	Water Removel (gal)	Temp (°C)	рН (±.21)	Conductivity (u mhos) (± 3%)	CIRP (mV) ± 10mV)	DC . (mgil.) (± 10%)	Turbidity (NTU) (± 10%)	Commandia
125	1105	155					*		
125	1110	2.3	13,36	6.2	0.217	22.3	4.97	0.7	
10	1115	23	13.71	6.35	0.215	17.9	30	2.7	×
115	1120	2.3	13,72	6.37	0.212	20.4	3.19	23	
120	1178	-	13.79	6.37	0.214	27.6	3.14	2,8	·
×			×						
			*						
quipment	Calibratio	n Performed	By:	K	Powell		· · · · · · · · · · · · · · · · · · ·	54	
umber of	Sample C	Containers Co M	llected;			· · · · · · · · · · · · · · · · · · ·	×		
7	1.	forming.	×	×		. `		× ×	
*	,					• •		*	x x

÷.;

PROJECT WELL NO. CONPP chnabel 010-744 ai Enginaaring North, LLC SITE 108 NO. 06120048 Well Sampling Record SAMPLING PURGE PURGING CRITERIA volume + stabilization (ETHOD METHOD rab URGING DATE CALIDO DATE OF SAMPLING. 1212404 TIME OF SAMPLING: 0945 WEATHER: Cloudy (Con) TEMPERATURE: 43 SAMPLE MATRIX: GROUND WATER: INITIAL WATER LEVEL 40.75 PUMPING YOLUME CALCULA 1 ft⁸ = 7.48 gal dw - well diameter (in) h-well depths (ft) V_w=ĭ(<u>dw</u>)2.h* こうゆうさうみ n-porosity V3=3.14(3)2(14)(の.3) d_b - Boring diameter V_a≈ĭ<u>idb-dw</u>²*7.48*n -=274(3)=9.2 V7=11.5ad Checked by: PURGING DAT FIELD PARAMETERS COMMENTS (deted 47.2 bolow V'notch Tistidity Conductivity Commente DØ Temp (°C) ORP (mM) Time Beold Time Water pН (u mhoe) (mg/L.) (± 10%) (NTU) (hrs) Taish (ha) (4.01) ± 10mV) linave (cal) (± 3%) (± 10%) D85 dſ 0900 Ø11 2421 5.79 illa.9 NP 14. L29. 8 693 P7 39 6 d4 de 1429 477.6 091 **MZD** 16,00 <u>09</u>#3 495.4 608 ID Q . 9 3 094 V Ø. K Powell Equipment Calibration Performed By: Smin Number of Sample Containers Collected: sot below screen

۰.
WELL NO. PROJECT CONPP chnabel 0w-752 ing Name. 11. OW 2004B tvarta. AR Well Sampling Record PURGING CRITERIA: PURGE SAMPLING K Rowell METHOD METHOD Valume + Stabilization met PURGING DATE: 12/24/04 PUMP T DATE OF SAMPLING: 12/2/1/14 WEATHER: Cloudy (99) TEMPERATURE: 48 INITIAL WATER LEVEL: 24.10 TIME OF SAMPLING; 1225 SAMPLE MATRIX: GROUND WATER: 1 ft^a = 7.48 gal UMPING VOLUME CALCULATION .dw - well diemeter (in) V2=3.14(新)=1日 h-well depths (it) V,,=1(dw)2h* = 2.11(3)=2.3 p-porosity Vs= 314(数)~(18)(0.30)子 6. - Boring diameter V,=1[db-dw]²*7.48*n = 3,52 (3) = 1020 gd VT= 16.9 sal Checked by FIELD PARAMETERS COMMENTS Sample collected 33.7" below"V" Conductivity DŐ Turbidity Comments Time Begin Time Water ORP (mV) Temp pHq (mp/L) (± 10%) (u mhos) NTU Finish (hre) Removel (set) (CC) (1.01) ± 10mV) (brs) (土 3%) ± 10%) Z.1 dr .4 49 s low 1 25 1200 8.03 1257.2 - LS 15.94 6.2D9 37.3 12,10 12K RIS 6.62 20.210 .25 10.10 1220 790.9 1123 4.29 1220 ND 5.28 207 Rowell Equipment Calibration Performed By:

Number of Sample Containers Collected:

Sample collected & 33.7 ft below "V" notch.

	*		DOGIERT		· · · · · · · · · · · · · · · · · · ·				· · · · · · · · · · · · · · · · · · ·	
· 🦻	chna	bel	CLN	PP		* *	INCL NU.			
- Can	nabel Englanesiza	Renth, LLC .					0 hr	-76KH	anna ann ann an an an an an an an an an	
WELL SA	MPLING	RECORD	Job No. Duizco	48	STE wart	alle	PREPARE	DBY		
	PURGE	SAMPLING	PURGING O	CRITERIA:			KDI	75100		
	Phone Phone	Grab	Volum	12+5	tobliza	iety	KR	well .		
FUMPTY	Έ.		PURGING I	DATE DA	M/Ob	DATE OF	SAMPLING			
J - C	a cont	Ø	TEMPERAT	URE; LY		SAMPLE	MATRIX: G	ROUND WAT	ER	
			UNITER WA		23.63		×	×		*
PUMPING	AOLAM	CALQULA	TON	dw - well	; diameter (in)	*	1 ft ³ = 7,	48 gel	A ROUGE BOOKS IN	
V=3.	州西门	18/37)(22	微)	h-well der	othe (fl)		V,≓ĭ (₫	<u>v)</u> 2h*		*
14=3	a Las	21 1 10 103	γ <u>7.12</u>	n-porosity			2 V 11 M	9 h. alaat ² 8 7 40	**	
-2	74.21	1 = 8.2		ap - thuild	A meninghal		4 ⁶ - 1 [0	24 24	л х 2А	
10 1	1.1			×				$\overline{\mathcal{M}}$		
	<i>r170</i>		w w ma		*		Checked	by Al		
PURGING	DATA		FIELD PAP	RAMETER	5	*	COMMEN M 247	ns Pury	L	
			×		×		PVW	al dry	*	
Time Begin (hts)	Time Finish (hus)	Water Removal (gal)	Tamp (*C)	pH (±.01)	Conductivity (U minus)	ORP (mV) ± 10mV)	DO (mp/L) (4. 1094)	Turisidity (NTLI) (A. 1056)	Commente	
12:30	12:33	15.8		*			Las Jacking		Pinal	De.
12:25	出影	\$7.7					×		Low FI	
Stor D		0.5	12.88	7.47	0.610	12,5	9.14	42.0	bul	hias kir
225		0.5	11.9%	750	0.418	12.4	9A4	12.10	din	
2:30	2.50	15-	13.27	7.52	0.324	12.5	11.81	4653	dry	**********
	MAD	*								
	x									
×				, 			L		*	* *
		*						<u> </u>	and a	*
*					*			<u> </u>	к -	
Equipment	Calibratic	n Performed	By:	1 Poa	sell .	•		*	×	*
Number of	Samole C	ontainers Co	· · · · · · · · · · · · · · · · · · ·	3						
 ×		n anna maranna a fair a ann a fair ann	*	*	x	**************************************	2 <u>-11-11-11</u>			
, #×	* *	¥ба(L-219			*			*	
×		łCa	**************************************			-	x *			
		· · · · · · · · · · · · · · · · · · ·	• - • • • • • • • • • • • • • • • • • •	(Sec 23	MA 37.	E ·		•		

•	2		PROJECT			10 10 10 10 10 10 10 10 10 10 10 10 10 1	WELL NO.	<u> </u>	an a
<u> </u>) <i>GMN8</i> abi Eghaniy	108/ Reik,115	CCN	IPP	*		an-,	769	
Well SA	MPLING	RECORD	JOB NO.	19.15	SITE	41	A Br	eske-	8 800 800 800 80 80 80 80 80 80 80 80 80
ł	METHOD	METHOD	Volom	e + 51	heb)1200	lin	KB	well	
2"G	rund	los	PURGING WEATHER TEMPERA INITIAL WA	DATE: 14 INRE: 45 ITER LEVE	19/24 17:24	DATE OF TIME OF SAMPLE	SAMPLING: SAMPLING: MATRIX: GR	1271974 IV34 IOUNDWAT	er:
PUMPING Viji = 3 H	volum 州子	E CALCULAT 7) ² (14.24) ×3 = 7.94		dw - well h-well de; n-porosity	diemster (in) oths (it) /	1 You 2	1 ft ² = 7.4 V _w ≂ĩ (<u>dw</u> 24	8 gai)2 h*	
·V5 = 3	11(封)	2(24)[a,3) 0-14_1	2.带	d _b - Borin	g diamatar		V _s =T <u>idb</u>	<u>-dw</u>] ² *7.48 4	
V7= 2	1. mal	9-174 .					Checked	by: (11)	P
PURGING	DATA	* * . *	FIELD PAI	RAMETER	S .		COMMEN	19	ana a shahada a
Time Begin (frz)	Time Finish (hrs)	Water Removal (gal)	Temp (°C)	pH (±.01)	Conclustivity (u mixes) (± 3%)	ORP (mV) ± 10mV)	DO (mg/L) (± 10%)	Turbkilly (NTU) (± 19%)	Comments
1525	1531	. 2							dry.
535	1610	13.8		*					bullow.
FIMD	lletz	D.8	11.73	7.89	1250.4	\$12.5	12.40	1490	ary low
415		0,4	1431	7.23	0,444	1245	12,23	152.5	
122	123	0.6	13.25	7.16	0.193	12.5	4.05	140,9 277.6	
×				,					
			*			* *			*

545 13.8 gal 135min = 0.4 20/min

[[7] [[min

<u>APPENDIX E</u> FIELD ELECTRICAL RESISTIVITY

• Field Electrical Resistivity Test Data

Schnabel Project No. 06120048 Appendix E: Field Electrical Resistivity

FIELD ELECTRICAL RESISTIVITY TEST DATA



RESISTIVITY SOUNDING DATA SHEET

Page 1 of 3

Date:	June 19, 2006	Project:	Calvert Clif	fs COLA	Representative	Todd White
Weather:	Sunny, 92 Degrees	Project N	umber:	06120048	Array type: W	enner Array
Surficial S	oil: Forest litter				Meter: Sting	g R1 Earth Resistivity Meter S

/N 990324

300.0	0.08322	157	48	4,800	
200.0	0.09787	123	37	3,700	
100.0	0.2375	149	45	4,500	
50.0	3.274	1,030	314	31,400	
40.0	9.643	2,424	739	73,900	
30.0	22.87	4,310	1,310	131,000	
20.0	40.87	5,140	1,570	157,000	
15.0	65.16	6,141	1,870	187,000	
10.0	129.9	8,162	2,490	249,000	
7.5	216.5	10,200	3,110	311,000	
5.0	336.3	10,570	3,220	322,000	
3.0	431.4	8,130	2,480	248,000	
1.5	419.800	3,960	1,210	121,000	
set)	R	(ohm-ft)	(ohm-m)	(ohm-cm)	
cing (fe		σ	٩	ρ	
"a" spa	R-1 (EW)				

0.000	023 0.1331	80 250	16 76	600 7,600	
100.0 20	2.541 0.3	1,600 3.	487 1	48,700 11,	
50.0	11.3	3,550	1,080	108,000	
40.0	20.71	5,205	1,590	159,000	
30.0	35.83	6,750	2,060	206,000	
20.0	51.12	6,420	1,960	196,000	
15.0	96.71	9,115	2,780	278,000	
10.0	140.9	8,853	2,700	270,000	
7.5	201.4	9,491	2,890	289,000	
5.0	290.7	9,133	2,780	278,000	
3.0	419.3	7,904	2,410	241,000	
1.5	529.800	4,993	1,520	152,000	
eet)	R	(ohm-ft)	(m-mho)	(ohm-cm)	
"a" spacing (f	R-2 (NS)	σ	d	ρ	

Notes: Resistivity calculated using the standard equation for the Wenner array as shown: Electrodes were hammered into the subsurface at various depths depending on the "a" spacing.

 $\rho = 2\pi aR$





RESISTIVITY SOUNDING DATA SHEET Page 2 of 3

Date:	June 19, 2006	Project:	Calvert Cl	iffs COLA	Representa	tive:	Todd White
Weather:	P-Cloudy, 80 Degrees	Project N	umber:	06120048	Array type:	Wenner F	NITay
Surficial Sa	<i>pil:</i> Forest litter				Meter:	Sting R1 E	arth Resistivity Meter S/N 990324

) 375,000 455,000 544,000 624,000 537,000 410,000 196,000 101,000 41,500 6,900 3,800



$$\rho = 2\pi aR$$

г-3



■ R-3



RESISTIVITY SOUNDING DATA SHEET Page 3 of 3

Calvert Cliffs COLA Representative: Todd White	umber: 06120048 Array type: Wenner Array	Meter: Sting R1 Earth Resistivity Meter S/N 9903
Project:	Project N	
June 20, 2006	P-Cloudy,80 Degrees	U: Forest litter
•.	uther:	ficial Soi

(.1] 59.21 46.53 46.73 28.51 16.73 10.18 2.418 0.1 (40) $3,720$ $4,390$ $5,870$ $5,370$ $4,200$ $3,200$ $1,520$ 16 (40) $3,720$ $1,340$ $1,790$ $1,640$ $1,280$ 975 46.30 5.7 560 113.000 $134,000$ $179,000$ $164,000$ $128,000$ $97,500$ $46,300$ 5.7		
40 3,720 4,390 5,870 5,370 4,200 3,200 1,520 15 06 1,130 1,340 1,790 1,640 1,280 975 46.30 5 500 113,000 134,000 179,000 164,000 128,000 97,500 46,300 5.7	56.1	8.86
06 1,130 1,340 1,790 1,640 1,280 975 463 5 500 113,000 134,000 179,000 164,000 128,000 97,500 46,300 5.7	2,640	160
500 113,000 134,000 179,000 164,000 128,000 97,500 46,300 5,7	806	990
	80,600 1	,950 3



$$\rho = 2\pi aR$$





B R-4