PNL-6581 Vol. 8
UC-41,11

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# Ground-Water Monitoring Compliance Projects for Hanford Site Facilities: Progress Report for the Period January 1 to March 31, 1988

## Volume 8 — Appendix B (contd)

May 1988

Prepared for the U.S. Department of Energy
under Contract DE-AC06-76RLO 1830

Pacific Northwest Laboratory
Operated for the U.S. Department of Energy
by Battelle Memorial Institute

Battelle

PNL-6581 Vol. 8

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PNL-6581 Vol. 8
UC-41, 11

# GROUND-WATER MONITORING COMPLIANCE PROJECTS FOR HANFORD SITE FACILITIES: PROGRESS REPORT FOR THE PERIOD JANUARY 1 TO MARCH 31, 1988

Volume 8 -- Appendix B (contd)

May 1988

Prepared for
the U.S. Department of Energy
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Pacific Northwest Laboratory
Richland, Washington 99352

APPENDIX B (contd)

## PREFACE

This appendix is one of nine volumes, and presents data describing wells completed at the Hanford Site during the fourth quarter of calendar year 1987 (October through December).

The data in this volume of Appendix B cover the following wells:

- 299-W18-21
- 299-W18-22
- 299-W18-23
- 299-W18-24

The data are presented in the following order: Well Completion Report/ Title III Inspection List, Inspection Plan, As-Built Diagram, Logging Charts, and Drill Logs.

WELL 299-W18-21

Battelle
Pacific Northwest Laboratories

# Well Completion Report/Title III Inspection List

Project 200 West Area RCRA Well Drilling
Location Hanford Site 200 West Area
Driller Darrel Ludlek
Drilling Co. Onwego Drilling
Geologist K Aster, SP Airhart, T Gilmore, SS Teel, JS Wilbur, GV Last

Well Number 299-W18-21
Temporary Well Number none
Coordinates N. 37,794 W. 78,080
Casing Elevation 668.62
Ground Elevation 666.50

## DRILLING METHOD

Rotary Air ____ Mud ____
Cable Tool D 0'-40' H 40'-227'
Drilling Fluid Water
Other ____

## COMPLETION DATA

Drilled Depth 227'
Completion Depth 226.3'
Date Started 6/2/87 Completed 7/29/87
Static Water Level/Date 197'6" 7/7/87

## CASING DATA

| Type | Size | |
|---|---|---|
| Type 304 Stainless Steel Casing | 4" diameter | to 195.5' |
| | | to |
| | | to |

Approved By SPA Date 1/5/88

## PERFORATIONS

Type —

| Depth: | | Schedule |
|---|---|---|
| ____ | ____ | ____ |
| ____ | ____ | ____ |
| ____ | ____ | ____ |

App. By ____ Date ____

## SCREEN

| | Telescoping 8" dia type 304SS | 4" dia type 304 SS |
|---|---|---|
| Type | Continuous Wrap | Continuous Wrap |
| Length | 10' | 30' |
| Slot Size | 30 | 20 |
| Depths | 215.5'-225.5' | 195.5'-225.5' |

App. By SPA Date 1/5/88

## ANNULAR SEAL

| Type | Interval | Volume |
|---|---|---|
| Sand | 187'4"-227'6" | 11.86 ft³ |
| Volclay pellets | 185'8"-187'4" | 1.44 ft³ |
| Volclay grout | 3'-185'9" | 153.74 ft³ |
| Concrete | 0'-3' | 4.08 ft³ |

App. By SPA Date 1/5/88

## GEOPHYSICAL LOGGING

| Sondes | Interval | Date |
|---|---|---|
| Neutron | 0'-227' | 7/8/87 |
| Density | 0'-227' | 7/8/87 |
| Natural Gamma | 0'-227' | 7/8/87 |
| | ____-____ | |
| | ____-____ | |
| | ____-____ | |
| | ____-____ | |

Approved By JS Wil Date 7/8/87

## AQUIFER TESTING

Type of Test Constant Discharge Test
Length of Test 8 hrs
Volume Pumped 27,000 gals
Drawdown ~~455~~ 17.89

Approved By JS Wil Date 7/14/87

## OTHER APPLICABLE ITEMS

- (NA) Steam Cleaning
- (NA) Storage of Const. Material
- (NA) Tool Lubricants
- (NA) Concrete Pad
- (NA) Protective Steel Posts
- (NA) Safety Paint
- (NA) Straightness Test
- (NA) Well Development
- (NA) Downhole TV Inspection
- (NA) Well Abandonment
- (NA) Complete As-Built Diagram, Driller's and Geologist's Logs

Approved By JS Wil Date ____

Reviewed By D.K. McMillan Date 1-8-88

A-1800-187 (3/87)

INSPECTION PLAN
CONSTRUCTION PROJECT KEH-1914 (B-677)

Prepared by
U.S. Department of Energy
Pacific Northwest Laboratory
Operated by
Battelle Memorial Institute

PNL

Project Manager — 5/18/87 Date

Facilities Engineering — 5/18/87 Date

PNL Cognizant QA Engineer — 5/18/87 Date

RHO Concurrence:

Construction Engineer — 5/28/87 Date

Quality Assurance — 5-22-87 Date

DOE-RL Concurrence

Project Engineer — 6-1-87 Date

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| WELL DRILLING ACTIVITIES | 3 |
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## PREFACE

This Inspection Plan identifies the inspections required and the responsible people to perform the inspections of the monitoring wells to be constructed under contract KEH-1914 (B-677).

The inspection of well construction activities is intended to provide assurance that the work performed by construction forces is in accordance with the approved contract documents. The degree of inspection is commensurate with the significance of the monitoring wells with regard to function and safety.

### Inspectors

Listed below are the names of the individuals whose initials appear within this inspection plan.

| Name | Initial | Organization | Job Title |
|---|---|---|---|
| Mel Colby | | KEH | Contract Administrator |
| Tom Nemzek | | KEH | Contract Engineer |
| Jim Mortimer | | KEH | Contract Administrator |
| Steve Airhart | | PNL | Field Geologist |
| Tyler Gilmore | | PNL | Field Geologist |
| Scott Wilbur | | PNL | Field Geologist |

The PNL project manager has reviewed the conceptual inspection plan and is satisfied that all the applicable inspections of the work were made during the construction of the wells.

PNL Project Manager — Date: 1-8-88

## CONSTRUCTION INSPECTION SERVICES

Described herein are the inspection services to be provided and documented by PNL.

Pre-Award Submittal Review

| | Item | Contract Reference | Initial | Date |
|---|---|---|---|---|
| 1. | Verify contractor and drillers are licensed for well drilling in the State of Washington. | 01100-1.2<br>01300-1.2.1A | [illegible] | 5-7-87 |
| 2. | Verify cable tool drilling experience is five years or more with drive barrel and hard tool. | 01100-1.2 | [illegible] | 5-7-87 |
| 3. | Verify documentation of ground-water monitoring wells drilled by contractor. | 01100-1.2 | [illegible] | 5-7-87 |
| 4. | Verify contractor submitted description of drilling method and equipment. | 01300-1.2.1B | [illegible] | 5-7-87 |
| 5. | Verify contractor submitted resumes of personnel. | 01300-1.2.1C | [illegible] | 5-7-87 |

Procurements

Verify materials to be furnished to the contractor are as described in the construction specification.

| | Item | Contract Reference | Initial | Date |
|---|---|---|---|---|
| 1. | Stainless steel screen (8 inch telescope size). | 01100-1.5A | [illegible] | 5-15-87 |
| 2. | Stainless steel screen (4 inch). | 01100-1.5B | TN | 5-15-87 |
| 3. | Centralizers. | 01100-1.5C | TN | 5-15-87 |
| 4. | Stainless steel casing (4 inch). | 01100-1.5D | TN | 5-15-87 |

| | Item | | Contract Reference | Initial | Date |
|---|---|---|---|---|---|
| 5. | Artificial sand packs. | | 01100-1.5E | TN | 5-15-87 |
| 6. | Bentonite pellets. | | 01100-1.5F | TN | 5-15-87 |
| 7. | Bentonite grout. | | 01100-1.5G | TN | 5-15-87 |
| 8. | Granular bentonite. | | 01100-1.5H | TN | 5-15-87 |
| 9. | Sack crete. | | 01100-1.5I | TN | 5-15-87 |
| 10. | Portland cement. | | 01100-1.5J | TN | 5-15-87 |
| 11. | Well cap. | | 01100-1.5K | TN | 5-15-87 |
| 12. | Brass survey marker. | | 01100-1.5L | TN | 5-15-87 |
| 13. | Sample jars. | | 01100-1.5M | TN | 5-15-87 |
| 14. | Hydrologic sampling equipment. | | 01100-1.5O | TN | 5-15-87 |
| 15. | Drive shoes. | | 01100-1.5P | TN | 5-15-87 |
| 16. | Carbon steel casing. | a. 16 inch | 01100-1.5Q | TN | 5-15-87 |
| | | b. 12 inch | 01100-1.5Q | TN | 5-15-87 |
| | | c. 10 inch | 01100-1.5Q | TN | 5-15-87 |
| | | d. 8 inch | 01100-1.5Q | TN | 5-15-87 |
| 17. | Guard posts. | | 01100-1.5R | TN | 5-15-87 |
| 18. | Paint: primer | | 01100-1.5S | TN | 5-15-87 |
| | finish enamel | | 02011-3.5I | TN | 5-15-87 |

Performance Submittals

| | Item | Contract Reference | Initial | Date |
|---|---|---|---|---|
| 1. | Verify submission and approval of construction schedule. | 01300-1.2.2A | JM | 10/29/87 |
| 2. | Verify drilling logs are submitted daily. | 01300-1.2.2B | JM | 10/29/87 |
| 3. | Verify submission and acceptability of flow meter certification. | 01300-1.2.2C | JM | 10/29/87 |

Well Number 299-W18-21

The remaining sections of this inspection plan shall be completed for each well.

Well Drilling Activities

| | Item | Contract Reference | Initial | Date |
|---|---|---|---|---|
| 1. | Verify wells are constructed in continuous operation. | 01100-1.3 | ASH | 12/30 |
| 2. | Verify contractor uses approved water source. | 01600-2.0 | ASH | 12/30 |
| 3. | Verify beveled edge is cut on temporary casing by contractor. | 01600-2.1A | ASH | 12/30 |
| 4. | Verify suitability of split spoon sampling equipment. | 01600-2.2 | ASH | 12/30 |
| 5. | Steam cleaning equipment. | 01600-2.3 | ASH | 12/30 |
| 6. | Aquifer testing equipment. | 01600-2.4 | ASH | 12/30 |
| 7. | Verify contractor has copy of WAC Chapter 173-160 "Minimum Standards for Construction and Maintenance of Water Wells" and the construction specification at the jobsite. | 02011-1.2 | ASH | 12/30 |
| 8. | Verify contractor has a copy of all addendums and change orders at the jobsite. | 02011-1.2 | ASH | 12/30 |

Monitoring Well Construction

| | Item | Contract Reference | Initial | Date |
|---|---|---|---|---|
| 1. | Verify proper technique of cable tool drilling. | 02011-3.1.1 | ASH | 12/30 |
| 2. | Verify proper technique of air rotary drilling. | 02011-3.1.2 | ASH | 12/30 |

Well Number 299-W18-21

| | Item | Contract Reference | Initial | Date |
|---|---|---|---|---|
| 3. | Verify steam cleaning is being done properly. | 02011-3.1.3 | QSH | 12/30 |
| 4. | Verify contractor is handling and storing construction materials properly. | 02011-3.1.4 | QSH | 12/30 |
| 5. | Verify the contractor uses proper tool lubricants. | 02011-3.1.6 | QSH | 12/30 |
| 6. | Verify only approved drilling additives are used. | 02011-3.1.7 | QSH | 12/30 |
| 7. | Verify the proper disposal of drill cuttings and water. | 02011-3.1.8 | QSH | 12/30 |

Well Testing

| | Item | Contract Reference | Initial | Date |
|---|---|---|---|---|
| 1. | Verify water-level measurements are taken. Note in log. | 02011-3.2.1 | QSH | 12/30 |
| 2. | Verify the bottom of temporary casing is free of plugging material at end of each day. Note in log. | 02011-3.2.1 | QSH | 12/30 |
| 3. | Verify ground-water samples are taken when needed. | 02011-3.2.2 | QSH | 12/30 |
| 4. | Verify aquifer testing is done at each well. | 02011-3.2.3 | QSH | 12/30 |
| 5. | Verify formation samples are taken as required. | 02011-3.3 | QSH | 12/30 |

Well Number 299-N-18-21

Borehole Construction

| | Item | Contract Reference | Initial | Date |
|---|---|---|---|---|
| 1. | Verify temporary casing is telescoped at no more than 100 feet intevals. | 02011-3.4A | A.S.H | 12/30 |
| 2. | Verify depth of well. | 02011-3.4B | ASH | 12/30 |
| 3. | Verify proper action is taken if overdrilling occurs. | 02011-3.4C | ASH | 12/30 |
| 4. | Verify acceptable passing of alignment test. | 02011-3.4D | ASH | 12/30 |
| 5. | Verify all temporary casing is removed from the well. | 02011-3.4E | ASH | 12/30 |

Well Construction

| | Item | Contract Reference | Initial | Date |
|---|---|---|---|---|
| 1. | Verify position of 8 inch screen and pullback of casing to expose screen. | 02011-3.5A | ASH | 12/30 |
| 2. | Verify adequate well development. | 02011-3.5B | ASH | 12/30 |
| 3. | Witness aquifer test. | 02011-3.5B | ASH | 12/30 |
| 4. | Verify proper setting of 4 inch screen, casing, and centralizer. | 02011-3.5C | ASH | 12/30 |
| 5. | Verify proper placement of sand pack. | 02011-3.5D | ASH | 12/30 |
| 6. | Verify proper location and thickness of bentonite pellet seal. | 02011-3.5E | ASH | 12/30 |
| 7. | Verify proper mixing, placement, and location of Volclay bentonite-based grout. | 02011-3.5F | ASH | 12/30 |

Well Number 299-W24-21

| | Item | Contract Reference | Initial | Date |
|---|---|---|---|---|
| 8. | Verify proper concrete seal at top of well. | 02011-3.5G | JSW | 12/30 |
| 9. | Verify proper construction of concrete pad and placement of brass survey marker. | 02011-3.5H | JSW | 12/30 |
| 10. | Verify proper placement, construction, and painting of guard posts. | 02011-3.5I | JSW | 12/30 |
| 11. | Verify contractor cleans up site and properly stores excess materials. | 02011-3.5J | JSW | 12/30 |
| 12. | If abandonment of well occurs, verify proper abandonment. | 02011-3.6 | — | — |
| 13. | Verify contractor maintains the drill log daily. | 02011-3.7 | JSW | 12/30 |
| 14. | Prepare punchlist at construction completion for exceptions. | | — | — |

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# AS-BUILT DIAGRAM

Well Number 299-W18-21 Geologist OSTER; AIRHART; GILMORE; TEEL; WILBUR; LAST Page 1 of 2

Reviewed by W.L. Mathes Date 1-8-88

| Construction Data | | Depth in Feet | Geologic/Hydrologic Data | |
|---|---|---|---|---|
| Description | Diagram | | Diagram Litho. | Lithologic Description |
| 16" Temporary Carbon Steel Casing (19.5') | | 5 | | SAND |
| 12" Temporary Carbon Steel Casing | | 10 | | SANDY SILT AND CLAY LENS @ 9' |
| 10" Temporary Carbon Steel Casing | | 15 | | SAND (Wood sample taken @ 15.5') |
| 8" Temporary Carbon Steel Casing | | 20 | | GRAVELLY SAND (Silty sand lense @ 22') |
| 4" Stainless Steel Casing (85') | | 25 | C.S. F.S. | SAND (contact between c.s. and f.s.) |
| | | 30 | | |
| | | 35 | | GRAVELLY SAND |
| | | 40 | | SLIGHTLY GRAVELLY SAND (contact @ 42') |
| | | 45 | | SANDY GRAVEL |
| | | 50 | | SILTY SANDY GRAVEL |
| | | 55 | | GRAVEL |
| | | 60 | | SILTY SANDY GRAVEL |
| | | 65 | | (contact @ 68') |
| | | 70 | | SILTY SAND |
| | | 75 | | |
| | | 80 | | |
| | | 85 | | |
| | | 90 | | |
| | | 95 | | |
| | | 100 | | |
| | | 105 | | CLAYEY SILTY SAND |
| | | 110 | | |
| | | 115 | | SILTY SAND |
| | | 120 | | SLIGHTLY SILTY SAND |
| | | 125 | | CLAYEY SILTY SAND |
| | | 130 | | |

A-1900-186 (3/87)

□ - caliche
● - gravel w/ weathering rind

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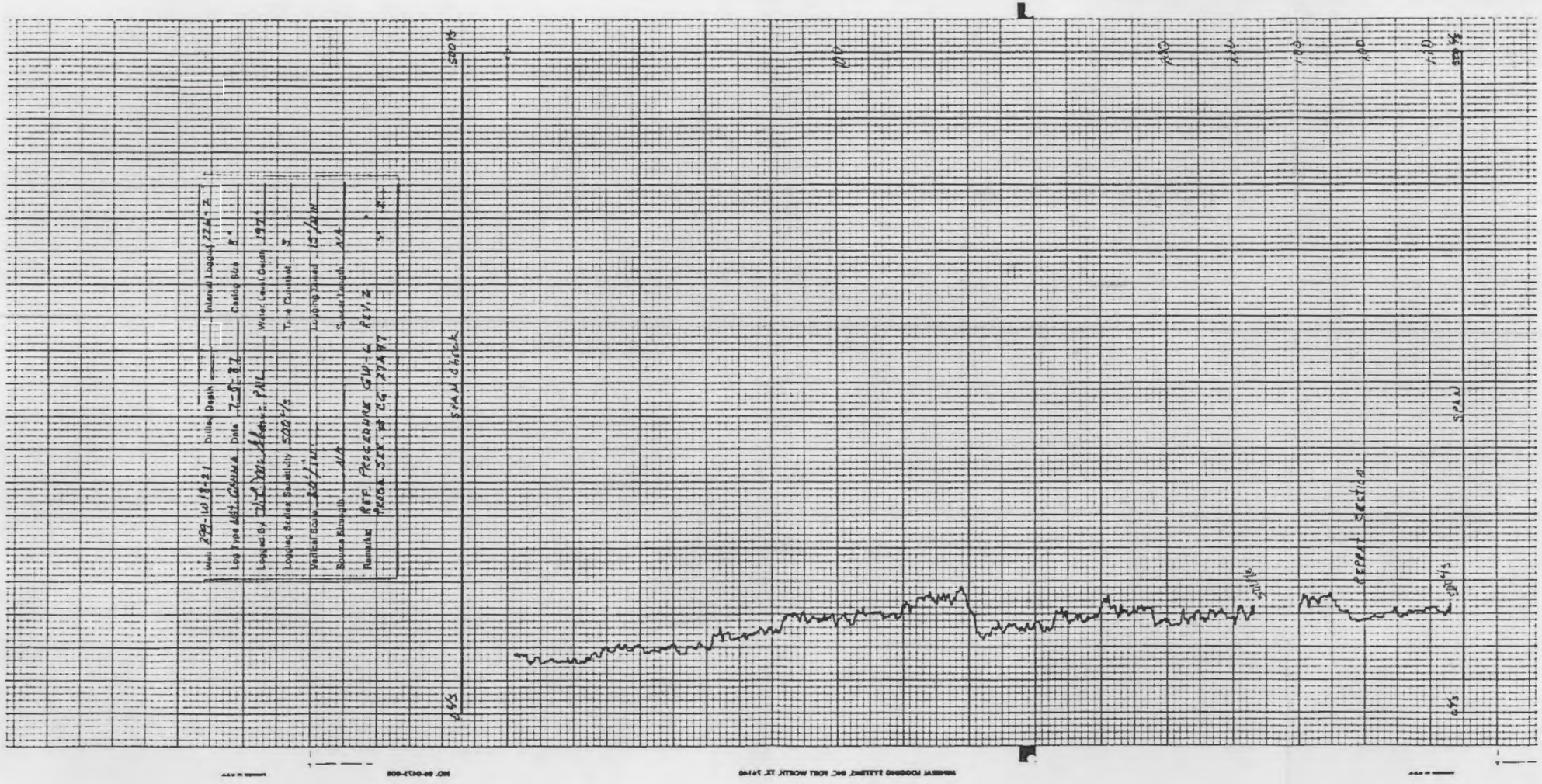
# AS-BUILT DIAGRAM

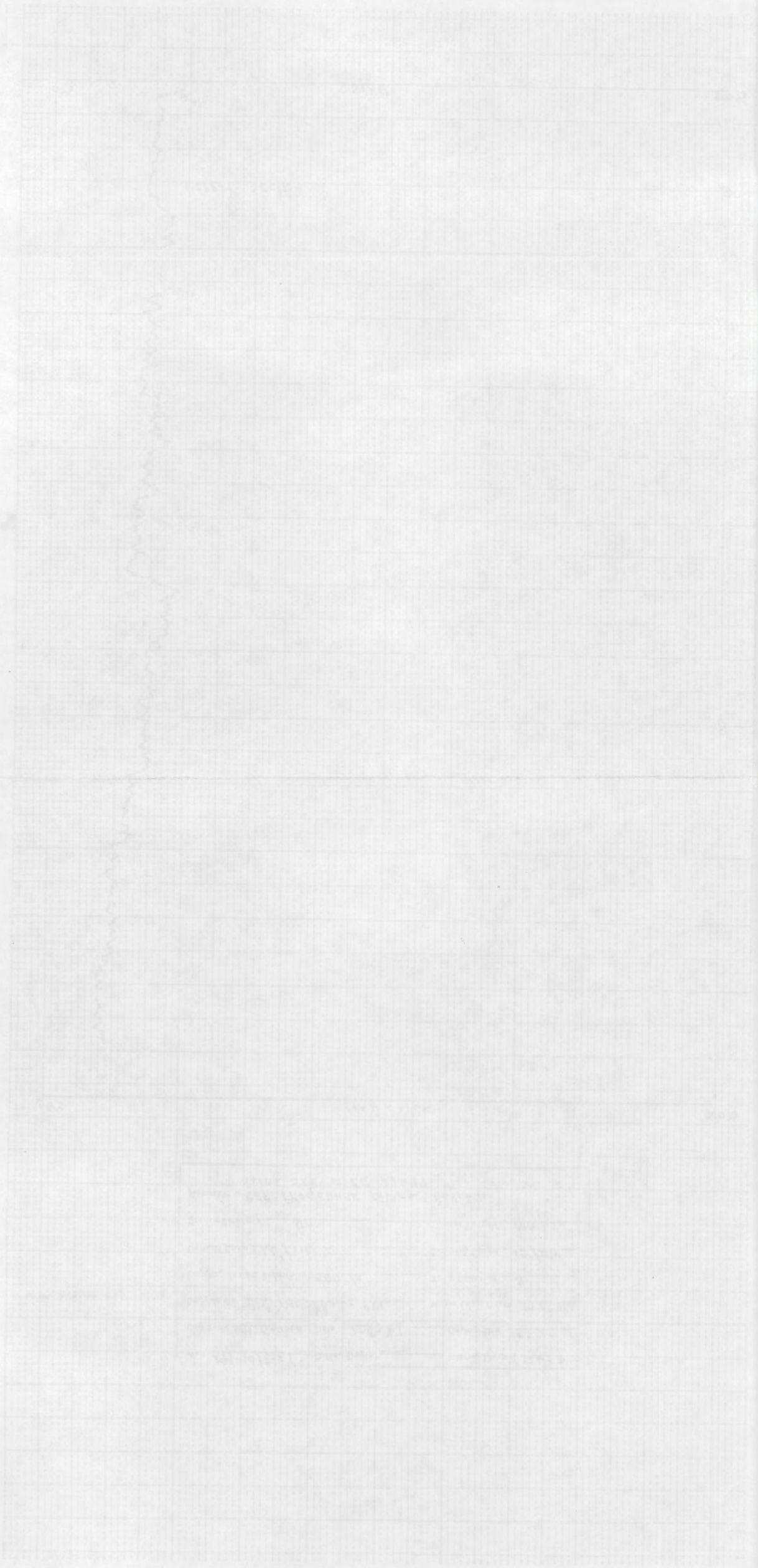
Well Number 299-W18-21 Geologist OSTER; AIRHART; GILMORE TEEL; WILBUR; LAST Page 2 of 2

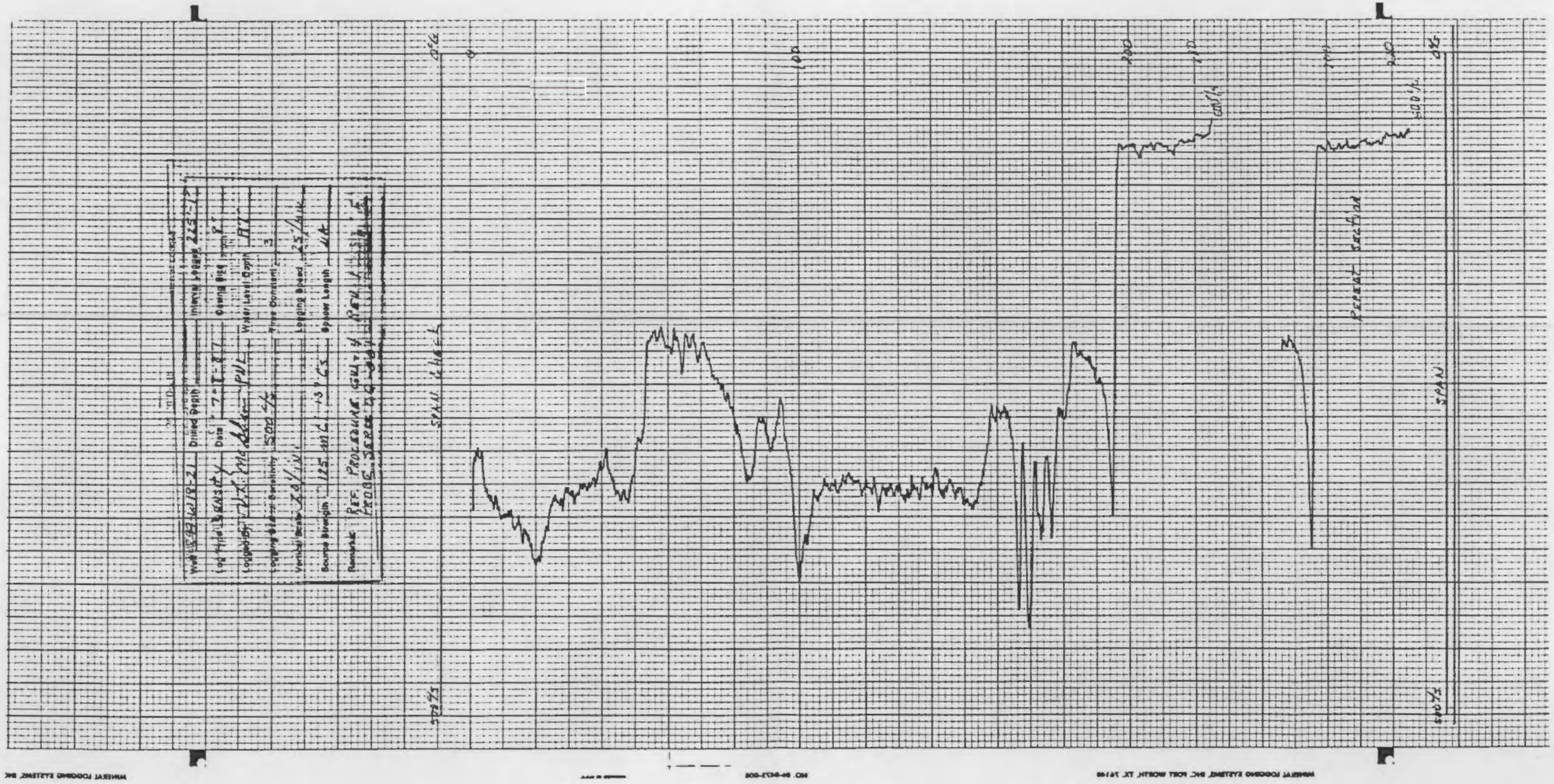
Reviewed by V.L. McGhan Date 1-8-88

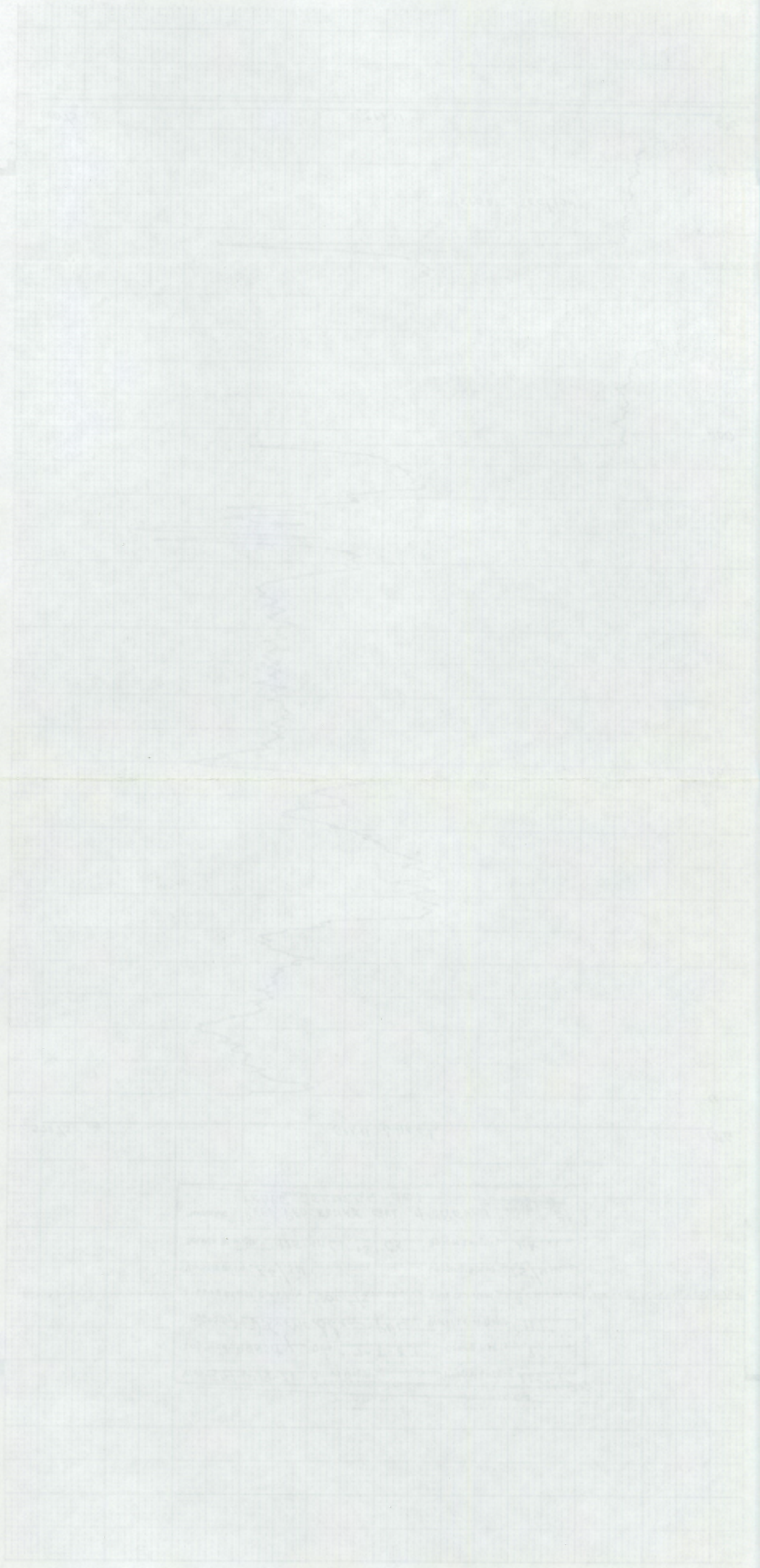
| Construction Data | | Depth in Feet | Geologic/Hydrologic Data | |
|---|---|---|---|---|
| Description | Diagram | | Diagram Litho. | Lithologic Description |
| | | 135 | | CLAYEY SILTY SAND |
| | | 140 | | |
| | | 145 | | SILTY SANDY GRAVEL |
| | | 150 | | |
| | | 155 | | |
| | | 160 | | |
| | 164'10" | 165 | | SANDY GRAVEL |
| | | 170 | | SILTY SANDY GRAVEL |
| Top of volclay pellets 185'9" | | 175 | | SANDY GRAVEL |
| | | 180 | | |
| Top of 20/30 sand pack 187'4" | | 185 | | |
| | | 190 | | |
| | 194'5" 7/18/87 | 195 | | GRAVELLY SILTY SAND |
| | | 200 | | |
| 30' of 4" 20-slot S.S. | | 205 | | SANDY GRAVEL |
| screen (195.5'-225.5') | | 210 | | GRAVELLY SAND |
| | | 215 | | SILTY GRAVELLY SAND |
| | | 220 | | |
| 10' of 8" telescoping screen | 227'3" | 225 | | |
| | | 230 | | |

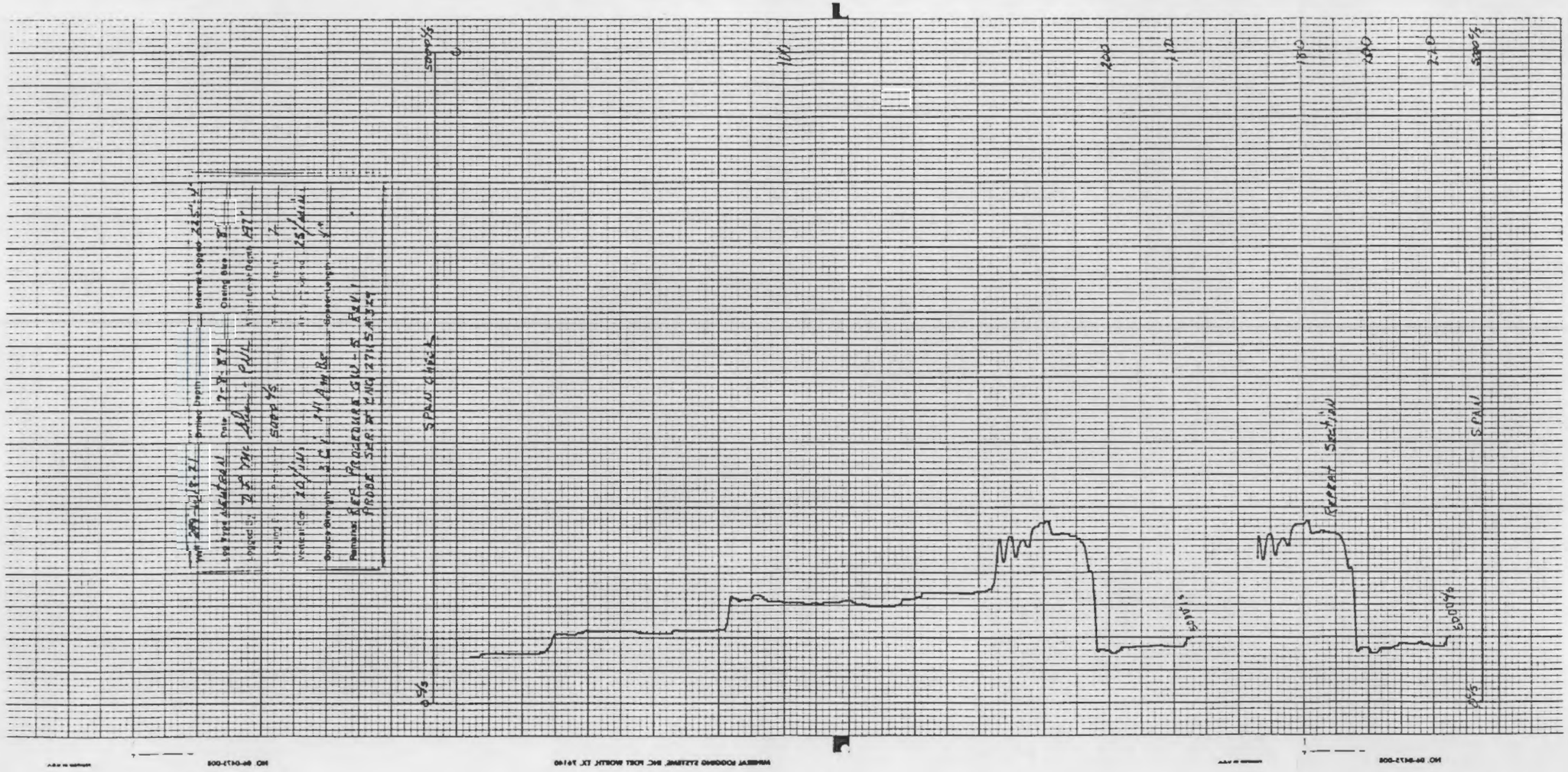
A-1800-186 (3/87)


Drilled Depth
Date 7-5-82
Logged Int. 2241-2
Casing Size 8-5/8
Water Level Depth 197'
Type Fluid
Weight/Gallon N/A
Viscosity N/A
Source of Data
Remarks
Logged Interval 2241'-2
Logged Bottom 2241'
Logged Top 1891'
Logged Bottom 2241'





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Depth Log
Date
Run No.
Type Log
Driller's Depth
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Remarks
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INTERMEDIATE
PRODUCTION
Recent Section
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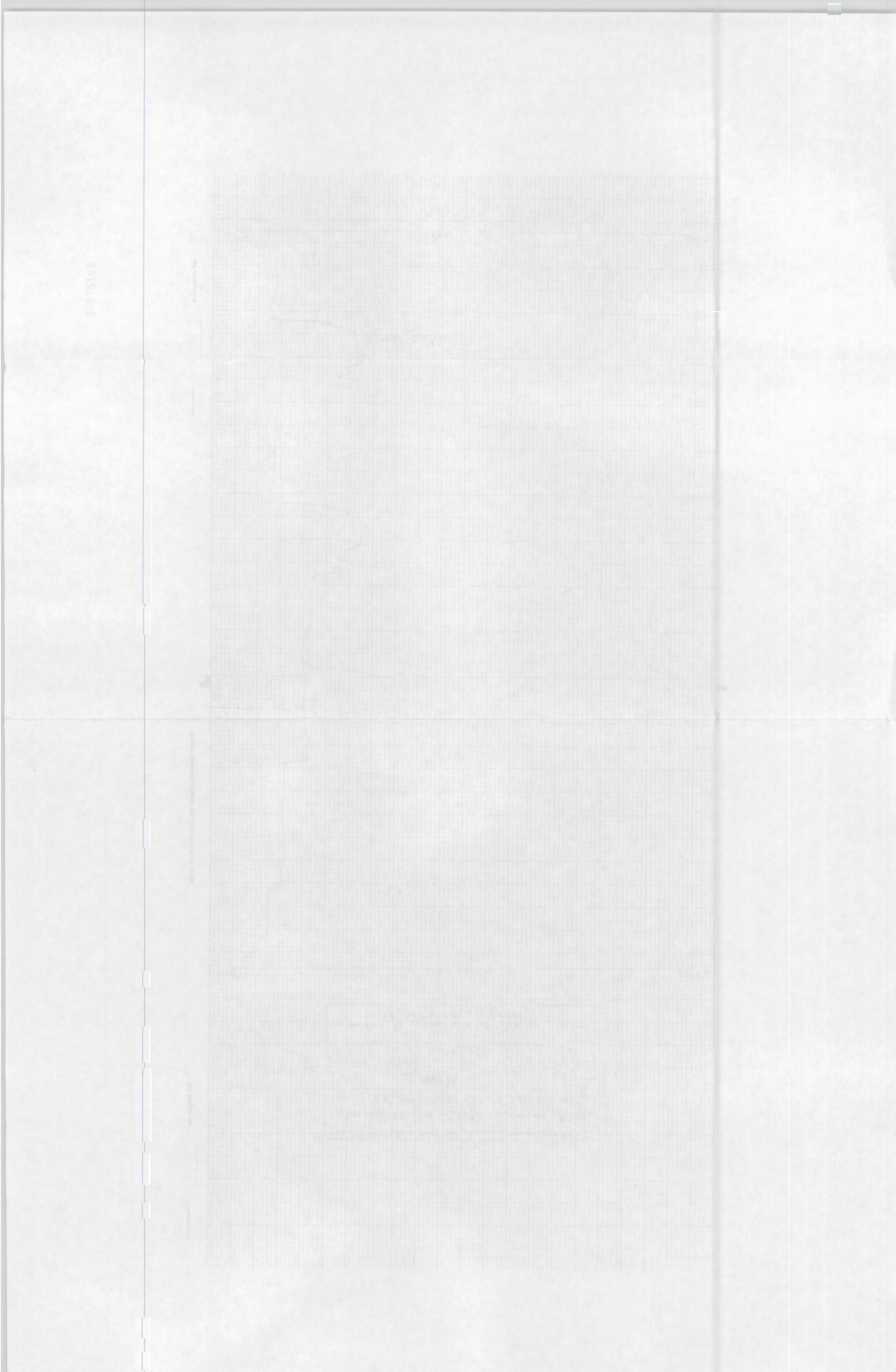

Darrel

| DRILL LOG | By K.R. Oster | Rig Bucyrus Erie 22-W Driver Rig #5 | Well Number 299-W018-21 | Computer Number N/A | Project or Work Order No. KEH-1914 (PNL) |
|---|---|---|---|---|---|
| | Date 6/2/87 | | Depth 0' To 9' | | Subcontract No. N/A |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Driller is Darrel Ludtke. | | Tool Lubricant used |
| | | | | 19'10" section of 10" carbon steel casing was cleaned on Tuesday, June 29, 1987 | | is Chevron Poly EM Grease 2 |
| | | | | Put on drive barrel and started drilling | 0950 | Drill rate = 9' in |
| Op. Hole | 4'-5' | D | Moist | FINE TO MEDIUM SAND, 2% vcs, 3% cs, 30% ms, 35% fs vfs 25%, silt 5%, Sample is well sorted fine to medium sand and contains one very coarse basalt pebble (60% quartz, 30% basalt, 10% other) sands are very angular to subangular. Wet color is dark brown (10YR 3/3) and dry color is light brownish gray (2.5Y 6/2). Sample has very slight reaction in 10% HCl. Sample is lightly consolidated and both geologic and moisture samples are representative but do not include the pebble. | 1000 | 1/2 hour. |
| Open Hole | 9' | D | Very Moist | SANDY SILT AND CLAY LENS, 2% cs, 3% ms, 15% fs, 25% vfs, 35% silt, 20% clay, Sample is well sorted silt with vfs, and clay. Sands and silts are 40% quartz, 30% basalt, 20% clay minerals, 10% other sands, and are very angular to subangular. Wet color is dark grayish brown (2.5Y 4/2) and dry color is | 1015 | |

REMARKS:

Karen R. Oster
6/2/87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2147

| DRILL LOG | By K.R. Oster | Rig Bucyrus Erie 22WS Ingersoll Rig #5 (Darrel) | Well Number 299-W18-21 | Computer Number N/A | Project or Work Order No. KEH-1914 (PNL) |
|---|---|---|---|---|---|
| | Date 6/2/87 | | Depth 9' To 10' | | Subcontract No. N/A |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | light brownish gray (2.5Y 6/2). Dry sample reacts very strongly in 10% HCl. This sample is a slightly consolidated silt lens and overall grain size is finer than previous sample. Geologic and moisture samples are representative. | | |
| | | | | Stopped drilling. | 1020 | |
| | | | | Started drilling | 1115 | Drill rate = 6.5' |
| open hole | 10' | D | slightly Moist | MEDIUM TO VERY COARSE SAND, 2% very fine pebbles, 30% cs, 35% cs, 25% ms, 3% fs, 3% vfs, 2% silt. Sample is well sorted medium to very coarse sand which is composed of 50% basalt sands, 40% quartz sands and 10% other sands, which are very angular to subangular in shape. Wet color is dark grayish brown (2.5Y 4/2), Dry color is dark gray (5Y 4/1), Sands have no reaction in 10% HCl but small clumps of sandy silt react strongly in 10% HCl. This sample is unconsolidated sands and the grain size and basalt content has increased from previous samples. Geologic and moisture samples are representative. | 1120 | in 1/2 hour. |
| | | | | | | |

REMARKS:

Karen P. Oster
6/2/87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-8.2148

Darrel

| DRILL LOG | By K.R. Oster | Rig Bucyrus Erie 22W Onwego Rig #5 | Well Number 299-W18-21 | Computer Number N/A | Project or Work Order No. KEH-1914 (PNL) |
|---|---|---|---|---|---|
| | Date 6/2/87 | | Depth 10' To 15.5' | | Subcontract No. N/A |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| open hole | 15' | D | Slightly Moist | MEDIUM TO VERY COARSE SAND, 1% medium pebbles, 5% fine pebbles, 4% very fine pebbles, 25% vcs, 30% cs, 25% m.s, 4% fs, 3% vfs, 3% silt, Sample is well sorted medium to v.coarse sand which is composed of 50% basalt sands 40% quartz sandsand 10% other sands and are very angular to subangular in shape. The fine pebbles are 90% basalt, 5% quartz rich and 5% othersand they are subangular to subrounded in shape Wet color is very dark grayish brown (2.5Y 3/2), Dry color is dark gray (2.5Y 4/0). Sands have no reaction in 10% HCl but small clumps of sandysilt have strong reaction in 10% HCl. This sample is unconsolidated sands with a few pebbles and although well sorted it is slightly less sorted than the previous sample. Geologic and moisture samples are representative | 1125 | |
| open hole | 15.5' | D | Moist | Wood sample found at 15.5' is Moist and very rotten put in glass jar to transport to Sigma 5. | 1135 | |

REMARKS:

Karen P. Oster
6/2/87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-8-2149

Darrel

| DRILL LOG | By K.R. Oster | Rig Buyrus Erie 22HD Owner's Rig #5 | Well Number 299-W18-21 | Computer Number N/A | Project or Work Order No. KEH-1914 (PNL) |
|---|---|---|---|---|---|
| | Date 6/2/87 | | Depth 15.5' To 20' | | Subcontract No. N/A |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Stopped drilling and unloaded casing. | 11:45 | |
| | | | | Welded metal plates to side of casing to keep it from | 1230 | |
| | | | | slipping down the hole. | | |
| 19'10" of 16" | | | | Set 19'10" of 16" carbon steel casing in hole and | 1300 | |
| | | | | began to drive it in. | | |
| | | | | Started drilling | 1405 | Drill rate = 4.5' |
| | 20' | D | Very Moist. | GRAVELLY VERY COARSE SAND, 2% coarse pebbles, 3% | 1435 | in 1/2 hour. |
| | | | | medium pebbles, 5% fine pebbles, 9% v. fine pebbles, 35% vcs, | | |
| | | | | 20% cs, 15% ms, 5% fs, 3% vfs, 3% silt. Sample is moderately | | |
| | | | | well sorted mostly vcs. sand. The gravels are 90% basalt | | |
| | | | | 5% quartz-rich and 5% others and are subangular to | | |
| | | | | subrounded. The sands are 60% basalt, 30% quartz and | | |
| | | | | 10% other sands and are angular to subangular in shape. | | |
| | | | | Wet Color is dark grayish brown (2.5Y 5/2) and Dry color | | |
| | | | | is light brownish gray (2.5Y 6/2). Sands have slight reaction | | |
| | | | | in 10% HCl and small clumps of sandy silt have a moderate | | |
| | | | | reaction in 10% HCl. Sample is unconsolidated and more poorly sorted | | |
| | | | | than last sample. Overall grain size and basalt content increased also. | 1435 | Stopped Drilling |

REMARKS:
Moisture and Geologic samples are representative.
Delivered 4.5', 9', 10', 15', and 20' moisture samples to lab.
Delivered Wood Sample to Lab.

Karen P. Oster
6/2/87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2150

Darrel

| DRILL LOG | By K R Oster | Rig Bucyrus Erie 2510 Universal Rig #5 | Well Number 299-W18-21 | Computer Number N/A | Project or Work Order No. KEH-1914 (PNL) |
|---|---|---|---|---|---|
| | Date 6/3/87 | | Depth 20' To 25' | | Subcontract No. N/A |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 19'10" of 16" +9'10" | | | | Welded on 9'10" of 16" carbon steel casing. Total | 0730 | |
| 29'8" of 16" | | | | 16" casing = 29'8" | | |
| | | | | Started drilling. | 0930 | Drill rate = 10' in |
| | 22' | D | Very Moist | SILTY VERY FINE SAND LENS (No Sample taken) | 0945 | 1.5 hours. |
| | 25 | D | Moist | Bottom of VERY COARSE SAND from above and top of | 1005 | Change from c. to f. sands |
| | | | | FINE SAND, This Sample contains some of both lithologies | | |
| | | | | so it is combined in description 5% vf pebbles, 25% vcs, 20% cs, | | |
| | | | | 10% ms, 25% fs, 10% vfs, 5% silt. Sample is poorly sorted, | | |
| | | | | The pebbles are 90% basalt 5% quartz rich and 5% others | | |
| | | | | and are subangular. The sands are 50% basalt, 40% quartz, | | |
| | | | | and 10% other sands and are angular to subangular. | | |
| | | | | Wet color is very dark grayish brown (2.5Y 3/2) Dry | | |
| | | | | Color is grayish brown (2.5Y 5/2). Sands have strong | | |
| | | | | reaction in 10% HCl. Moisture and geologic samples are | | |
| | | | | representative, This Sample represents the boundary | | |
| | | | | of change between the coarse and fine sands the | | |
| | | | | Inspection of the fines contains a few thin silt layers | | |
| | | | | and is semiconsolidated with the rest of sample unconsolidated. | | |

REMARKS:

Karen R. Oster
6/3/87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2151

Drill 1

| DRILL LOG | By K.R. Oster | Rig Bucyrus Erie 22W Onwego Rig #5 | Well Number 299-W18-21 | Computer Number N/A | Project or Work Order No. KEH-1914 (PNL) |
|---|---|---|---|---|---|
| | Date 6/3/87 | | Depth 25' To 30' | | Subcontract No. N/A |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | 30' | D | Hoist | VERY FINE SAND, 1% cs, 1% ms, 40% fs, 45% vfs, 5% silt, | 1040 | |
| | | | | Sample is well sorted fine & v. fine sands, which are 50% | | |
| | | | | quartz, 40% basalt and 10% other sand sand they are | | |
| | | | | very angular to subangular. Wet color is very dark | | |
| | | | | grayish brown (2.5Y 3/2), Dry color is grayish brown | | |
| | | | | (2.5Y 5/2). Sample has moderate reaction to 10% HCl. | | |
| | | | | Sample is unconsolidated and geologic and moisture | | |
| | | | | samples are representative. Since last sample was | | |
| | | | | right at the lithology change boundary this sample | | |
| | | | | is much finer in overall grain size than the previous | | |
| | | | | sample. | | |
| | | | | stopped drilling and driving casing. | 1100 | |
| | | | | Steam cleaned 4 sections of 12" casing. lengths are | | |
| | | | | 2@ 21', 1@ 20'10", and 1 with drive shoe @ 21'5" | | |
| | | | | Weld drive shoe on end of 12" casing. | 1400 | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

REMARKS: Delivered 25' and 30' moisture samples to Lab.

Karen R. Oster
6/3/87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2152

Darrel

| DRILL LOG | By K.R Oster | Rig Bucyrus Erie 22W Owned by Rig #5 | Well Number 299-W18-21 | Computer Number N/A | Project or Work Order No. KEH-1914 (PNL) |
|---|---|---|---|---|---|
| | Date 6/4/87 | | Depth 30' To 35' | | Subcontract No. N/A |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 42'3" of 12" | | | | Set 42'3" of 12" carbon steel casing in hole | 0830 | |
| | 35' | D | Moist | GRAVELLY SAND, 3% v.f. pebbles, 1% c. pebbles, 1% f. pebbles, 5% v.f. pebbles, 5% vcs, 20% cs, 20% ms, 25% fs, 15% vfs, 5% silt. Sample is poorly sorted. Gravels are 90% basalt, 5% granite, 5% others and are angular to subrounded. Sands are 50% quartz, 40% basalt, and 10% other sands and are very angular to subangular. Wet color is brown (10YR 5/3), dry color is light brownish gray (10YR 6/2). Sands have strong reaction in 10% HCl. Clumps of vfs and silt have very strong reaction. Sample is unconsolidated, geologic and moisture samples are representative. A few pebbles have $CaCO_3$ weathering rinds on them and some chips of caliche are also found within the sands, these have a very strong reaction in 10% HCl. This sample is more poorly sorted and has an increase in overall grain size from previous sample. | 0930 | |

REMARKS:

Karen R. Oster
6/4/87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2153

Darrel

| DRILL LOG | By K.R. Oster | Rig Bucyrus Erie 22W Onuezo Rig #5 | Well Number 299-W18-21 | Computer Number N/A | Project or Work Order No. KEH-1714 (PNL) |
|---|---|---|---|---|---|
| | Date 4/4/87 | | Depth 35' To 40 | | Subcontract No. N/A |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | 40' | D | Hoist | SLIGHTLY GRAVELLY SAND, 1%c. pebbles, 1%m. pebbles, | 1000 | |
| | | | | 2% f. pebbles, 4% v.f pebbles, 5% v.c.s, 15% c.s, 25% m.s, 25% f.s, | | |
| | | | | 15% v.f.s, 5% silt, 2% clay. Sample is poorly sorted. Gravels are | | |
| | | | | angular to subangular and are 90% basalt, 10% others and also | | |
| | | | | contain 1 small cobble. Sands are 50% quartz, 40% basalt and | | |
| | | | | 10% other sands and are very angular to subangular. Wet color | | |
| | | | | is brown (10YR 5/3), Dry Color is light brownish gray (10YR 6/2), | | |
| | | | | Sands, silts and clays have very strong reaction in 10% HCl. Sample | | |
| | | | | as a whole is unconsolidated but it contains some lumps of | | |
| | | | | slightly consolidated silt and sand and some lumps of | | |
| | | | | moderately consolidated clay layers. Geologic and | | |
| | | | | moisture samples are representative but do not include | | |
| | | | | the small cobble. Sample is very similar to the previous | | |
| | | | | sample except it contains more silt and sand lumps, and | | |
| | | | | it has clay layers which stay intact and are hard to | | |
| | | | | break when dry. The overall grain size decreases slightly. | | |
| | | | | | | |
| | | | | | | |

REMARKS:

Karen P. Oster
6/4/87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-86)

8-B.2154

Darrel

| DRILL LOG | By K.R. Oster | Rig Bucyrus Erie 2300 Driller Jon Big #5 | Well Number U19-1018-21 | Computer Number N/A | Project or Work Order No. KEH-1914 (PNL) |
|---|---|---|---|---|---|
| | Date 6/4/87 | | Depth 40' To 42' | | Subcontract No. N/A |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | 42' | D | Very moist. | SANDY GRAVEL, 1% v.c. pebbles, 3% c. pebbles, 5% m pebbles, | 1120 | Contact between sands |
| | | | | 15% f. pebbles, 20% vf pebbles, 20% v.c.s., 20% c.s., 10% m.s., | | and gravels. |
| | | | | 3% f.s., 2% v.f.s., 1% silt. Sample is poorly sorted. | | |
| | | | | Gravels are subangular to subrounded, and are 10% basalt, | | |
| | | | | 5% granite, 5% others. Sands are subangular, and are | | |
| | | | | 50% basalt, 40% quartz, 10% other sands. Wet color is | | |
| | | | | brown (10YR 5/3), Dry Color is light gray (10YR 7/2). | | |
| | | | | Sands have strong reaction in 10% HCl. Sample is | | |
| | | | | moderately consolidated and contains some clasts of | | |
| | | | | caliche in the fine to v. fine pebble size range. Geologic | | |
| | | | | and moisture samples are representative. This | | |
| | | | | sample is the top of a sandy gravel and all the | | |
| | | | | previous samples have been sands. There is also an | | |
| | | | | increase in basalt content from previous sample | | |
| | | | | Switch to hard tools | 1130 | |
| | | | | Add 10' 6" of 12" carbon steel casing to hole. Total | 1245 | |
| 42' 3" + 10' 6" = 52' 9" | +12" of 12" | | | 12" casing = 52' 9" | | |

REMARKS: Delivered 35', 40', and 42' moisture samples to lab.

Kevin R. Oster
6/4/87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000-021 (5-85)

8-B.2155

Darrel

| DRILL LOG | By C.W. Bishop | Rig Bucyrus Erie 22W | Well Number 299 C 19-21 | Computer Number N/A | Project or Work Order No. KEH-1914 (DVL) |
|---|---|---|---|---|---|
| | Date 6-5-87 | | Depth 42' To 50' | | Subcontract No. N/A |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 42' 3" | | | | Added 30 gal water | 0855 | |
| | | | | [illegible] | [illegible] | |
| | | | | | | |
| | | | | [illegible] 5 gal [illegible] | 10 40 | |
| | 45' | H | W | SANDY GRAVEL [illegible] | | |
| | | | | [illegible] | | |
| | | | | [illegible] | | |
| | | | | [illegible] | | |
| | | | | [illegible] | | |
| | | | | [illegible] | | |
| | | | | [illegible] | | |
| | | | | [illegible] | | |
| | | | | [illegible] | | |
| | | | | [illegible] | | |
| | 50' | H | W | SILTY SANDY GRAVEL <5% S. cobbles, <5% C. pebbles 20% | 1250 | |
| | | | | m. pebbles, 10% f. pebbles, 25% V.f. pebbles, <5% VC. Sand, 10% | | |
| | | | | C. Sand, 10% M. Sand, 10% f. Sand, 5% Silt; poorly sorted; 60% | | |
| | | | | gravel, 45% Sand, 5% silt, [illegible] angular to rounded, few | | |

REMARKS:

[signature] 6-8-87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-8.2156

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| P.W. Bishop | Bucyrus Erie 22W Orango Rig # 5 | 299-N18-21 | N/A | KEH-1914 (PNL) |
| Date: 6-5-87 | | Depth: 50' To 51' | | Subcontract No.: N/A |

Darrel

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 42'3" | | | | preserved Clasts, 80% basalt, 20% gr. rock (Sand) angular to subangular | | |
| | | | | 85% basalt, 15% gr. rock. Overall wet color 5Y4/2, olive gray | | |
| | | | | (dry) light olive gray, 5Y6/2. unconsolidated; NONREACTANT WITH | | |
| | | | | 10% HCL; THIS SAMPLE very Similar to previous ONLY ONLY | | |
| | | | | change are the Cobbles. SAMPLE MAY NOT BE TOO REPRESENTING | | |
| | | | | PLEASE MANY OF THE PEBBLES APPEAR TO BE BIOTICEN. | | |
| 79'9" | | | | Attached 10'6" Casing. | 1430 | |
| + 10'6" | | | | | | |
| 63'3" | | | | | | |

REMARKS:

JW Hoot 6-8-87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2157

| DRILL LOG | By: G V LAST | Rig: CABLE TOOL | Well Number: 299-W18-21 | Computer Number: NA | Project or Work Order No.: KEH-1914 |
|---|---|---|---|---|---|
| | Date: 6-8-87 | # 5 | Depth: 52 To 60' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Driller arived. Worked on Welder. | 0730 | |
| | | | | Finished welding on pipe. (10'6"). TOTAL CASING | 0830 | |
| 63'3" | of 12" | | | 63'3" | | |
| | | | | | 0943 | Added 10 gal. $H_2O$. |
| | | | | | | Started drilling. |
| | 55' | H | Wet | GRAVEL; 5% VC Pebble, 25% M. Pebble, 30% F. Pebble, 20% VF Pebble. | 1041 | stopped drilling. |
| | | | | 5% VCS, 5% CS, 5% MS, 5% FS, Trace of silt. Gravels are broken up. | 1049 | Resumed drilling. Added |
| | | | | Largest chert pebbles (DMS) probably cobble size. Poorly sorted. Gravels | | 5 gal. $H_2O$. |
| | | | | are 70% basaltic, 25% yellow & white quartzites, 5% other. Sand | | |
| | | | | is 65% basalt, 35% other (quartz rich). Gravels are angular. | | |
| | | | | Sand is subround. Wet color is olive gray (5Y 4/2). Reaction | | |
| | | | | to 10% HCl is —. Sampled with flat bottom baiver. | | |
| | | | | | 1205 | Added 5 gal. $H_2O$ |
| | | | | | 1330 | Added 5 gal. $H_2O$. |
| | 59-60' | H | Wet | SILTY SANDY GRAVEL; 5% VC Pebble, 15% C Pebble, 25% M.P., 10% FP, 10% VFP, | 1350 | |
| | | | | 10% VCS, 10% CS, 10% MS, 5% F-VF Sand, 5% Silt, V Poorly Sorted. | | |
| | | | | Gravels are 65% basalt, 35% granites & others. Sand is 60% basalt | | |
| | | | | 40% quartz & other. Gravels are subrounded when not broken. Sand | 1405 | Added 10 gal $H_2O$ |
| REMARKS: | | | | | | Resumed drilling. |

SV Last 6-8-87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2158

| DRILL LOG | By GV LAST | Rig Cable Tool #5 | Well Number 299-W18-21 | Computer Number NA | Project or Work Order No. KEH-1914 |
|---|---|---|---|---|---|
| | Date 6-8-87 | | Depth 60' To 63' | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | (continued) is subround to subangular. Wet color is dark olive grey. Reaction to 10% HCl is ~~~. Formation is poorly consolidated; won't stay open, but can't drive casing ahead either. Sampled with flat bottom bailer. Bailed prior to drilling sampled interval; Good sample. Sample is sandier than previous sample. | | |
| | | | | | 1500 | QUIT FOR THE DAY |
| | | | | | | @ 63'. |

REMARKS:

G V Last 6-8-87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000 021 (5-85)

8-8.2159

Darrel

| DRILL LOG | By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|---|
| | G V LAST | CABLE TOOL #5 | 299-W13-21 | NA | KEH-1914 |
| | Date 6-9-87 | | Depth 63' To 65' | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 63'3" of 12" | | | | | 0710 | STARTED DRILLING. |
| | 64-65' | H | WET | SILTY SANDY GRAVEL, 15% fpebbles, 20% vfg., 10% vcs, | 0735 | ADDED 20 GAL. $H_2O$. |
| | | | | 10% cs, 25% ms, 10% fs, 5% vfs, 5% silt. Poorly sorted, | | |
| | | | | Gravels are 85% basalt, 15% granites and others, and they | | |
| | | | | are very angular and broken. Sands are 60% basalt, | | |
| | | | | 40% quartz and others, and are subangular to subrounded. | | |
| | | | | Wet color is dark olive gray (5Y 3/2), Dry color is light | | |
| | | | | olive gray (5Y 6/2). Reaction in 10% HCl is strong. | | |
| | | | | Formation is unconsolidated sands and gravels. Bailed | | |
| | | | | prior to drilling sampled interval, Geologic samples | | |
| | | | | are representative. Overall decrease in grain size | | |
| | | | | from previous sample. Sampled with flat bottomed bailer | | |
| | | | | | 0810 | stopped drilling. |
| 63'3" +10'6" 73'9" | of 12" | | | Added 10'6" of 12" carbon steel casing to hole. | 0820 | |
| | | | | | 1015 | Pound casing |
| | | | | | 10.30 | Added 15 gal. $H_2O$ |
| | | | | | | started drilling. |
| | | | | | 1208 | Pound casing. |

REMARKS:

Karen P. Oster
6/9/87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000-021 (5.85)

8-B.2160

Darrel.

| DRILL LOG | By K.R.Oster | Rig Cable Tool Rig #5 | Well Number 299-W18-21 | Computer Number N/A | Project or Work Order No. KEH-1914 (PNL) |
|---|---|---|---|---|---|
| | Date 6/9/87 | | Depth 65' To 70' | | Subcontract No. N/A |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 73'9" | of 12" | | | | 1219 | Resumed drilling |
| | 68' | H | Wet | SILTY SAND, 5% f. pebbles, 5% vf pebbles, 10% vcs, | 1220 | Contact between |
| | | | | 10% cs, 15% ms, 15% fs, 20% vfs, 20% silt. Poorly | | gravels and sands |
| | | | | sorted. Gravels are 80% basalt, 20% granites and others. | | |
| | | | | Sands are 50% basalt, 50% qtz and other sands. Gravels | | |
| | | | | are subrounded when not broken, angular when broken. | | |
| | | | | Sands are angular to subangular. Wet color is | | |
| | | | | olive gray (5Y 4/2), Dry color is light olive gray (5Y 6/2) | | |
| | | | | very strong reaction in 10% HCl Unconsolidated | | |
| | | | | sand with some gravel. Sampled with flat bottom bailer | | |
| | | | | Sample is from contact zone and contains some gravels | | |
| | | | | from above and sands from below. Geologic samples | | |
| | | | | are fairly representative. decrease in basalt, decrease in grain size, | | |
| | 70' | H | Wet | SILTY SAND, 5% v.f. pebbles, 5% v.c. sand, 5% cs, 10% ms, | 1230 | |
| | | | | 20% fs, 25% vfs, 30% silt. Poorly sorted. Gravels are 80% | | |
| | | | | basalt, 20% granites and others. Sands are 50% basalt, (Gravels are angular, Sands are subangular) | | |
| | | | | 50% qtz and other sands. Wet color is olive gray (5Y 4/2) | | |
| | | | | Dry color is lt. olive gray (5Y 6/2), Strong reaction in 10% HCl. | | |

REMARKS:

Karen P. Oster
6/9/87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-8000-021 (5-85)

8-B.2161

Darrel

| DRILL LOG | By K.R.Oster | Rig Cable Tool Rig #5 | Well Number 21 W18 21 | Computer Number N/A | Project or Work Order No. KEH-1714.(PNL) |
|---|---|---|---|---|---|
| | Date 6/9/87 | | Depth 70' To 75' | | Subcontract No. N/A |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 73'9" of 12" | | | | Unconsolidated sand with some gravels. Sampled with | | |
| | | | | flat bottomed bailer, geologic samples are representative. | | |
| | | | | Decrease in grain size from previous sample. | | |
| | 75' | H | Wet | SILTY SAND, 2% vf pebbles, 3% vcs, 5% cs, 5% ms, 15% [illegible] | 1300 | |
| | | | | 30% vfs, 10% silt. Moderately sorted. Gravels are 70% | | |
| | | | | basalt, 30% granite and others, sands are 40% basalt, | | |
| | | | | 40% quartz and others. Grains are angular to subangular, | | |
| | | | | and are [illegible] broken. Sands are | | |
| | | | | angular to subangular. Wet color is olive, (5Y 4/3). | | |
| | | | | Dry color is light brownish gray, (2.5Y 6/2), Strong reaction | | |
| | | | | in 10% HCl, Unconsolidated sands, Sampled with flat | | |
| | | | | bottom bailer, geologic samples are representative. Decrease in | | |
| | | | | grain size from previous sample. hole caved in while bailing. | | |
| | | | | | 1315 | Added 20 gal. $H_2O$ |
| 73'9" +10'6" 84'3" | of 12" | | | Welded 10'6" of 12" carbon steel casing to hole, total | 1330 | |
| | | | | 12" casing = 84'3" | | |
| | | | | | 1415 | Pound casing |
| | | | | | [illegible] | Resume drilling |

REMARKS:

Karen R. Oster
6/9/87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-8.2162

Darrel

| DRILL LOG | By K.R.Oster | Rig Cable Tool Rig #5 | Well Number 299-W18-21 | Computer Number N/A | Project or Work Order No. KEH - 1914 (PNL) |
|---|---|---|---|---|---|
| | Date 6/9/87 | | Depth 75' To 75' | | Subcontract No. N/A |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 84'3" | of 12" | | | | 1440 | Pound casing |
| | | | | | 1450 | Stopped pounding casing |
| | | | | | | |
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REMARKS:

Karen R. Oster
6/9/87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2163

Darrel

| DRILL LOG | By T.R.Oster | Rig Cable Tool #5 | Well Number 299-1018-21 | Computer Number N/A | Project or Work Order No. KEH-1914 (PNL) |
|---|---|---|---|---|---|
| | Date 6/10/87 | | Depth 75' To 80' | | Subcontract No. N/A |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 84'3" | of 12" | | | | 0700 | Started drilling |
| | | | | | 0715 | Driving Casing |
| | | | | | 0720 | Bailed Well. |
| | | | | | 0725 | Stopped Bailing |
| | | | | | 0810 | Started drilling |
| | | | | | 0845 | Driving casing |
| | | | | | 0848 | Bailed well |
| | | | | | 0855 | Added 20 gal. $H_2O$ |
| | | | | | 0900 | started drilling |
| | 79'-80' | H | Wet | SILTY SAND, 1% vf pebbles, 1% vcs, 3% cs, 5% ms, 25% fs, | 0920 | Added 20 gal $H_2O$ |
| | | | | 35% vfs, 30% silt. Unevenly-well sorted. The few | | |
| | | | | gravels are 70% basalt, 30% granites and others, Sands | | |
| | | | | are 40% basalt, 40% quartz and others. Gravels are | | |
| | | | | angular and broken. Sands are very angular to sub- | | |
| | | | | angular. Wet color is olive (5Y 4/3) dry color is light | | |
| | | | | olive gray (5Y 6/2). Strong reaction in 10% HCl. Well bailed | | |
| | | | | before drilling sampled interval, Sampled using flat bottom | | |
| | | | | bailer, geologic samples are representative. Decrease in | | |

REMARKS:

Karen R. Oster
6/10/87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2164

Darrel

| DRILL LOG | By K.R. Oster | Rig Cable Tool #5 | Well Number 299-W18 21 | Computer Number N/A | Project or Work Order No. KEH-1919 (CNL) |
|---|---|---|---|---|---|
| | Date 6/10/87 | | Depth 80' To 89' | | Subcontract No. N/A |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | amount of gravel sand silt from previous sample. | | |
| | | | | Unconsolidated sands | | |
| | | | | | 0955 | stopped drillings |
| | | | | | 1000 | started drilling |
| | 84-85 | H | Wet | SILTY SAND, 1% v.f. pebbles, 3% vcs, 6% cs, 10% ms, 20% fs, | 1020 | Added 20 gal $H_2O$ |
| | | | | 25% vfs, 35% silt. Moderately sorted. The few gravels | | |
| | | | | are 70% basalt, 30% granite and others, Sands are | | |
| | | | | 30% basalt, 70% quartz and other sands, Gravels are | | |
| | | | | angular and broken, Sands are angular to sub angular. | | |
| | | | | Wet Color is olive (5Y 4/3), Dry color is pale olive | | |
| | | | | (5Y 6/3). Strong reaction in HCl. Unconsolidated | | |
| | | | | sands. Sampled with flat bottom bailer, geologic samples | | |
| | | | | are representative. Similar to previous sample except | | |
| | | | | that silt content and overall gravel size decreased. | | |
| | | | | | 1030 | Stopped Drilling |
| | | | | | 1040 | Bailed well. |
| | | | | | 1050 | Added 50 gal. $H_2O$ |
| | | | | | 1055 | started drilling |

REMARKS:

Karen R. Oster
6/10/87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000-021 (5-85)

8-B.2165

Drill

| DRILL LOG | By K.R. Oster | Rig Calte Tool #5 | Well Number 299-W18-21 | Computer Number N/A | Project or Work Order No. K-H-1714 (PNL) |
|---|---|---|---|---|---|
| | Date 6/10/87 | | Depth 89' To 95' | | Subcontract No. N/A |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | 89'-90' | H | Wet | SILTY SAND, 1% vfp, 1% vcs, 3% cs, 10% ms, 40% fs, 35% vfs, | 1110 | |
| | | | | 30% silt. Moderately sorted. The few gravels are 15% basalt, 35% granite and others, Sands are 30% basalt, 70% quartz and other sands, Gravels are angular and broken. Sands are angular to subangular. Wet color is olive (5Y 4/4), Dry color is light olive gray (5Y 6/2) Strong reaction in 10% HCl. Unconsolidated sands, sampled with flat bottom bailer, geologic samples are representative, Similar to previous sample except overall decrease in grain size and a decrease in silt content. | | |
| | | | | | 1115 | Add 10 gals $H_2O$ |
| | 94'-95' | H | Wet. | SILTY SAND, trace vf pebbles, trace vcs, 5% cs, 10% ms, | 1140 | Add 10 gals $H_2O$ |
| | | | | 20% fs, 25% vfs, 40% silt. Moderately sorted. the few gravels are 15% basalt, 35% granite and others. Sands are 30% basalt, 70% quartz and other sands, Gravels are angular and broken, Sands are angular to subangular, Wet Color is olive (5Y 4/4), Dry Color is light olive gray, (5Y 6/2), Moderate reaction to 10% HCl. Unconsolidated | | |

REMARKS:

Kevin Poste. 6/10/87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000-021 (6-85)

8-B.2166

Barrel

| DRILL LOG | By K.R. Oster | Rig Cable Tool #5 | Well Number 299-W18-21 | Computer Number N/A | Project or Work Order No. KEH-1914 (PNL) |
|---|---|---|---|---|---|
| | Date 6/10/87 | | Depth 95' To 95' | | Subcontract No. N/A |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | sands, Sampled with flat bottom baiter, geologic | | |
| | | | | samples are representative. Very similar to previous | | |
| | | | | sample except overall decrease in grain size and | | |
| | | | | increase in silt content. | | |
| | | | | Steam cleaned 6-20' sections of 10" pipe. | 1150 | Stopped drilling |
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REMARKS: Total of 130 gallons drilling supply water added today.

Karen R. Oster
6/10/87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000 021 (5-85)

8-B.2167

Darrel

| DRILL LOG | By T. R. Oster | Rig Cable Tool #5 | Well Number 299-W18-21 | Computer Number N/A | Project or Work Order No. KEH-1914 (PNL) |
|---|---|---|---|---|---|
| | Date 6/11/87 | | Depth '15' To 95' | | Subcontract No. N/A |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | | 0915 | Welding shoe on 10" |
| | | | | | | casing. |
| 42' of | 10" | | | Set 42' of 10" carbon steel casing in hole. | 1415 | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000-021 (5-85)

8-B-2168

8-B.2169

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| K P Oster | Cable Tool #5 (Darrel) | 299-W18-21 | N/A | KEH-1914 (PNL) |
| Date: 6/12/87 | | Depth: 95' To 45' | | Subcontract No.: N/A |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 42' of 20'10" | 10" | | | Welded on 20'10" of 10" carbon steel casing, Total | 0810 | |
| 62'10" | " of 10" | | | 10" casing = 62'10". | | |
| 20'5" | | | | Welded on 20'5" of 10" carbon steel casing, Total | 0945 | |
| 83'3" | " of 10" | | | 10" casing = 83'3". | | |
| +10'3" | | | | Welded on 10'3" of 10" carbon steel casing. | 1300 | Added 20gal. $H_2O$ |
| 93'6" | " of 10" | | | Total 10" casing = 93'6" | | |
| | | | | Hole has caved in to 88'. | H20 | Started drilling |
| | | | | | 1415 | Stopped drilling |
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REMARKS:

Karen P. Oster
6/12/87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5 85)

Level

| DRILL LOG | By R.R.Oster | Rig Cable Tool 115 | Well Number 22A-SNB-21 | Computer Number N/A | Project or Work Order No. E-11 1711 (ENE) |
|---|---|---|---|---|---|
| | Date 6/15/87 | | Depth 15' To 100 | | Subcontract No. N/A |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 93'6" | of 10" | | | | 0750 | Started drilling |
| | | | | | 0751 | Added 20 gal H2O |
| | 11 1/2 | H | Wet | SILTY SAND Tr vf pbls; Tr vcs; 23 CS; 20% MS; | 0915 | |
| | | | | 25% fs; 15% vfs; Silt 40%; Moderately-well sorted; | | |
| | | | | vf pbls are predom basalt (75%), small percentage silica-rich | | |
| | | | | (50%); Sands are predom silica-rich rocks (90%) with | | |
| | | | | approx 10% basalt grains; Quartz grains are subrounded | | |
| | | | | to subangular; basalt grains are subangular to angular; | | |
| | | | | Wet color olive 5Y 4/3; Dry color pale olive 5Y 6/3; | | |
| | | | | Moderately calcareous (2 HCl); Unconsolidated; | | |
| | | | | Sands sluffing off into hole; sampled w/ 6" ½ gallon | | |
| | | | | bailer; Sample is slightly better sorted than previous | | |
| | | | | sample with more sands in the medium-fine range | | |
| 103'9" | of 10" | | | | 9:00 | welding 10" Casing |
| | | | | | | added 10'3" Total 103'9" |
| | | | | | | of 10" casing |
| | | | | | 10:01 | added 5gal H2O |
| | | | | | | Drilling |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2170

Driving

| DRILL LOG | By TJ Gilmore | Rig Cable tool #5 | Well Number 877 WIB 21 | Computer Number N/A | Project or Work Order No. KTH 114 (PNL) |
|---|---|---|---|---|---|
| | Date 6/15/87 | | Depth 105' To 110' | | Subcontract No. |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | | 10:30 | 30 gal $H_2O$ added |
| | 104-105' | H | W | CLAYEY SILTY SAND: Trace Very fine Pebbles; Trace VCS; | 10:50 | |
| | | | | Trace CS; 5% MS; 58% FS; 40% VFS; 30% Silt; 5% Clay | | |
| | | | | well sorted; vf pebbles contain 70% Basalt; 30% Siliceous grains | | |
| | | | | Sands contain 35% Basalt and 65% Silic-eous grains | | |
| | | | | Gravel roundness: Basalts; Subangular Siliceous; Subangular | | |
| | | | | Sand roundness: Basalts; Subrounded Siliceous; Subrounded to rounded | | |
| | | | | Dry color light gray 2.5Y 7/2 Wet color grayish brown | | |
| | | | | 2.5Y 5/2; Moderate to vigorous in 10% HCl; Consolidation-none | | |
| | | | | Clay appeared in sample and sorting increased from | | |
| | | | | Previous sample, Very easy drilling, Sampled with a | | |
| | | | | flat Bottom bailer | | |
| | | | | | 10:55 | 5 gal $H_2O$ |
| | 109-110' | H | | | 11:00 | |
| | | | | | | |
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REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-8.2171

Barrel

**DRILL LOG**

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| TJ Gilmore | Cable Tool #5 | 299 W18 21 | N/A | KEH 19/4 (PVL) |
| Date: 6/15/87 | | Depth: 110' To 115' | | Subcontract No.: N/A |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | 109-110 | H | W | SILTY SAND: 5% vf-fine Pebbles; No CS; No MS; | 11:00 | |
| | | | | 18% FS; 27% VFS; 50% Silt; No Clay; Very well sorted; | | |
| | | | | Gravels: 70% Basalts, 30% Silica-rich vf pebbles | | |
| | | | | Sands: 30% Basalts, 70% Silica-rich Sands | | |
| | | | | Roundness gravels: Subangular; Roundness Sands; rounded | | |
| | | | | Wet color: olive, 5Y 5/3 dry color: pale olive 6/3 | | |
| | | | | Very active in 10% HCl No Consolidation; | | |
| | | | | No clays as in Previous sample, an increase in fine | | |
| | | | | to vf sand; Sand [illegible] | | |
| | | | | | | |
| | 114-115' | H | W | SILTY SAND 5% vf fine Pebbles; Tr VCS; Tr CS; | 11:20 | |
| | | | | 5% MS; 40% FS; 20% VFS; 30% Silt; 5% Clay; Tr caliche | | |
| | | | | Well sorted; Gravels: 70% Basalt, 30% Silica-rich | | |
| | | | | Sands: 25% Basalts; 75% Silica-rich; Wet Color | | |
| | | | | light olive brown 2.5Y 5/4, Dry Color pale yellow 2.5Y 7/4 | | |
| | | | | Moderate to very active in 10% HCl, slight to no consolidation; | | |
| | | | | Some clay in sample and a decrease in sorting from Previous | | |
| | | | | Sample; Sample By: Hot Pebble Grinder + Trace Caliche | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2172

Darrell

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| TJ Gilmore | Cable Tool #5 | 22S 31E 21 | N/A | KEH 12½, 12½ |
| Date 6/15/87 | | Depth 120' to 122' | | Subcontract No. N/A |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | | 11:25 | 15 gal $H_2O$ |
| | 119-120 | H | W | SLIGHTLY SILTY SAND: Tr vf pebbles; No vcs, No cs; Tr MS; 30% FS; 66% VFS; 7% Silt; Tr Clay; Very well Sorted; Gravels: 80% Basalt, 20% Silica-rich grains; Sands: 30% Basalt, 70% Silica-rich grains; Gravels are Subangular; Sands are rounded; Wet color olive 5Y 4/4; Dry color pale yellow 5Y 7/3; very active in 10% HCl Slight Cementation No Caliche, less silt, and less Clay than in Previous Sample; Flat Bottom Bailer | 11:45 | |
| 114 3" | Total 16" | | | | 12:45 | Welding casing 10'6" (10") |
| 124'9" | Total 16" | | | | 14:00 | Welding Casing 10'6" (10") |
| | | | | | 15:20 | 30 gal $H_2O$ |
| | | | | | 15:40 | 10 gal $H_2O$ |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2173

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| T.J. Gilmore | Cable Tool | 299 W/S 21 | N/A | RFH 1714.01L |
| Date: 6/15/87 | | Depth: 124' To 124' | | Subcontract No.: N/A |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | 24-125' | H | W | CLAYEY/SILTY SAND Tr v fine pebble; Tr VCS; Tr CS; 15% MS; 34% FS; 20% VFS; 20% Silt; 8% Clay; Well sorted; Gravels contain all Basalt fragments; Sands contain 25% Basalt and 75% Siliceous grains Gravels are subrounded; Sands are subrounded; Wet Color olive brown 2.5Y 4/4; Dry Color light yellowish brown 2.5Y 6/4; slightly to moderately active in 10% HCl Slight consolidation from clay matrix; Increase in Clay content from previous sample | 16:10 | |

REMARKS:

TD 127'
Footage 23'

124'9" Total Casing
Drilled 90 gal $H_2O$ 6/15/87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5-85)

8-B.2174

| DRILL LOG | By TY DiJuane | Rig Cable Tool #5 | Well Number 299 1118 21 | Computer Number N/A | Project or Work Order No. KEH 1[illegible] (TYL) |
|---|---|---|---|---|---|
| | Date 6/16/87 | | Depth 130' To 135' | | Subcontract No. N/A |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | | 7:35 | Drilling |
| | 127'-130' | H | W | CLAYEY SILTY SAND: Tr vf pebbles, Tr VCS, | 8:24 | |
| | | | | 5% CS, 15% MS, 27% FS, 20% VFS, 20% Silt, 10% Clay; | | |
| | | | | well sorted; Gravels contain 70% Basalts, 30% silica-rich | | |
| | | | | grains; Sands contain 85% silica-rich grains and 15% | | |
| | | | | Basalt grains; Gravels are Sub-angular; Sands are | | |
| | | | | Subrounded; Wet color olive 5Y 4/3 Dry color pale | | |
| | | | | olive 5Y 6/3; Slightly to moderately active in 10% HCl | | |
| | | | | Slightly consolidated w/ clay matrix, some clay balls; | | |
| | | | | Increase in clay content and decrease in $CaCO_3$ from | | |
| | | | | previous sample | | 55gal $H_2O$ added |
| | 130-135' | H | W | CLAYEY SILTY SAND Tr vf pebbles, No VCS, Tr CS, | 9:45 | |
| | | | | 5% MS, 25% FS, 30% VFS, 30% Silt, 10% Clay; Well sorted; | | |
| | | | | Gravels contain 70% Basalt, 30% Silica-rich grains; | | |
| | | | | Sands contain 15% Basalt and 85% silica rich grains; | | |
| | | | | Gravels are Sub angular, Sands are Subrounded; | | |
| | | | | Wet color is olive 5Y 4/3, dry color is pale olive 5Y 6/3; | | |
| | | | | moderately active in 10% HCl; Slightly consolidated w/ clay matrix | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000 021 (6-85)

8-B.2175

| DRILL LOG | By TS Gilmore | Rig cable tool | Well Number 209 1018 21 | Computer Number N/A | Project or Work Order No. [illegible] |
|---|---|---|---|---|---|
| | Date 6/16/87 | | Depth 135 To 140' | | Subcontract No. N/A |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | 134-135 | H | W | Cont. Some Clay balls. Slight increase in Silt and clay content from previous sample. Sample taken by flat bottom bailer. | | |
| | 139-140 | H | W | SILTY SAND 10% VFgravels, 5% VCS, 5% CS, 15% MS, 20% FS, 10% VFS, 35% Silt, Tr Clay, Tr Caliche, Moderately Sorted, Gravels contain 70% basalt and 30% silica-rich minerals, Sands contain 25% Basalt and 75% silica-rich grains; Gravels are Subangular and Sands are subrounded, Wet color olive 5Y 4/3 Dry color 5Y 6/3; Moderately active in HCl; slight to no consolidation, Increase in CS & gravel sizes decrease in Sand & silt content from 1 above sample. Sample by flat bottom bailer | 10:15 | |
| 145'10" | total 10" | | | | 10:34 | welding casing |
| | | | | | | 21' 1" added |
| | | | | | | 145'10" total |
| | | | | | | |
| | | | | | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2176

| DRILL LOG | By: S P AIRHART | Rig: CABLE TOOL #5 | Well Number: 299-W18-21 | Computer Number: NA | Project or Work Order No.: KEH-1-1914 |
|---|---|---|---|---|---|
| | Date: 6-16-87 | | Depth: 140' To 150' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | 144-145' | H | WET | SILTY SANDY GRAVEL: 40% gravel, 35% sand, 25% silt, | 1300 | Driller noted |
| 145'10" | total | | | overall → 20% MP, 10% FP, 10% VFP, 5% VCS, 5% CS, | | change at 144-145' |
| | | | | 10% MS, 10% FS, 5% VFS, 25% silt, (GRAVEL) Subrounded to- (poorly sorted) | | to gravel. |
| | | | | rounded clasts composed of 65% basalt 35% | | |
| | | | | qtzite, granite, other metam. - caliche on clast | | |
| | | | | surfaces (SAND) angular-to-subrounded grains | | |
| | | | | composed of 60% qtz-rich 35% basalt 5% caliche | | |
| | | | | frags; overall color (wet) olive 5Y 4/3 (dry) | | |
| | | | | pale olive 5Y 6/3; strong rxn. w/ 10% HCl; | | |
| | | | | slightly consolidated; NOTE: presence of gravel; | | |
| | | | | overall increase in ave. grain size. | | |
| | | | | | | |
| | 149-150 | H | WET | SILTY SANDY GRAVEL 65% gravel, 25% sand, 10% silt | 1550 | |
| | | | | overall - 10% MP, 30% FP, 25% VFP, 2% VCS, 7% CS, | | |
| | | | | 7% MS, 5% FS, 4% VFS, 10% silt, Very poorly sorted | | |
| | | | | (Gravel) 65% basalt, 20% metamorphics, 15% qtz | | |
| | | | | (sand) 60% basalt, 20% metamorphics, 20% qtz. Sample | | |
| 145'10" | total | | | is pretty broken up - hard to tell original roundness of pebbles - | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-8.2177

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| S. Teel | Cable Tool #5 | 299-W18-21 | NA | KEH-1914 |
| Date: 6-16-87 | | Depth: 150' To 150' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | 149-150 | (continued) | | appears to be subangular to subrounded. Sands are also | | |
| 145' 10" | total | | | subangular to subrounded. Wet color: 5Y 4/3 (olive) | | |
| | | | | Dry color: 2.5Y 7/2 (light gray). Strong reaction to 10% HCl, | | |
| | | | | Slightly consolidated. Caliche on pebble surfaces. | | |
| | | | | | | |
| | | | | | 1645 | Stopped drilling |
| | | | | | | |
| | | | | | | |
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| | | | | | | |
| | | | | | | |
| | | | | Steve Teel | | |
| | | | | 6-16-87 | | |
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REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2178

| DRILL LOG | By J.S. Wilbur | Rig Cable Tool Rig #5 | Well Number 299-W18 21 | Computer Number NA | Project or Work Order No. RRH-1914 |
|---|---|---|---|---|---|
| | Date 6/17/87 | Darrel Ludtke | Depth 150' To 150' | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| ~~unknown~~ | | | | Driller arrives @ 7:00 starts drilling @ 7:15 | | driller notes he is |
| 145' | 10" of | 10" carbon | | Driller adds 5 gals $H_2O$ | 7:15 | ~12'-14' ahead of the |
| steel | casing | in the ground- | | Driller adds 5 gals $H_2O$ | 8:15 | casing w/ the hole. |
| | | | | | | |
| | | | | | | |
| | 149'-150' | Hard Tool | Wet | SILTY SANDY GRAVEL - Sample contains 50% gravels, | | Sample left over |
| | | | | 35% sands, and 15% silts. (Gravels) 10% medium | | from last nite! |
| | | | | pebbles, 20% fine pebbles, and 20% very fine pebble sized | | |
| | | | | clasts. These clasts are subangular to subrounded in | | |
| | | | | shape and are composed of 90% mafics (basalts) and | | |
| | | | | 10% qtz & qtz rich materials. (Sands) are made up | | |
| | | | | of 5% very coarse sands, 15% coarse sands, 5% | | |
| | | | | medium sands, ~~and~~ 5% fine sands, 5% very | | |
| | | | | fine sand sized grains. These grains are angular to | | |
| | | | | subangular in shape and are composed of 60% mafics | | |
| | | | | (basalts) and 40% qtz & qtz rich material w/ some | | |
| | | | | micas. (Silts) make up 15% of the sample volume. | | |
| | | | | Dry sample color is 2.5Y 7/2 (light gray) and wet color | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2179

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| T.S. Wilbur/Hess | Cable Tool Rig #5 | 299-W18-21 | NA | KEH-1914 |
| Date: 6/17/87 | Driver: Loitke | Depth: 150' To 155' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | 149-150' | Hard Tool | Wet | Cont. 2.5Y 4/4 olive(olive), Sample has a strong reaction w/ 10% HCl solution. | | |
| 152' 1" | | | | Driller adds a 10' 3" section of 10" casing | | 145' 10" |
| | | | | | | 10' 3" |
| | | | | | | 152' 1" total |
| | | | | | | length of 10" casing |
| | 154-155' | H | W | SILTY SANDY GRAVEL. 45% gravel, 45% sand, 10% silt. Sample is 5% CS, 15% MS, 20% FS, 5% VFS, 30% CS, 10% MS, 5% FS. Sample is very poorly sorted. Gravel is composed of 60% basalt, 20% qtz-rich, 20% other rock frags. Sand is composed of 35% qtz, 55% bas-lith, 10% Rock frags. Gravel clasts are rounded to subrounded (unbroken faces), sand grains are rounded to angular. Wet color is 5Y 4/2, olive gray; dry color is 5Y 6/2 (light olive gray). Strong HCl rxn on semi-dry sample. Sample is unconsolidated, though caliche coats some gravel clasts. Little change from previous sample. | 1300 | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-8-2180

8-B.2181

| DRILL LOG | By HAGE-J | Rig Cable Tool #5 | Well Number 299-W18-21 | Computer Number N/A | Project or Work Order No. HEH-1914 |
|---|---|---|---|---|---|
| | Date 6/17/87 | Driller Luttke | Depth 155' To 163' | | Subcontract No. N/A |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 156'1" | of 10" casing | | | | 1340 | Stopped drilling - |
| 166'4" | of 10" casing | | | | | added 10' 3" of |
| | | | | | | 10" casing - |
| | | | | | 1451 | began drilling |
| | 157'80' | H | W | SILTY SANDY GRAVEL, 45% gravel, 45% sand, 10% | 1520 | Stopped drilling |
| | | | | silt. Sample is 5% CP, 20% MP, 20% F&VFP, | | |
| | | | | 30% CS, 10% MS, 5% FS. Sample is poorly | | |
| | | | | sorted. Gravel is composed of 80% basalt, 15% | | |
| | | | | metamorphics, 5% other. Sand is composed of 35% | | |
| | | | | basalt, 55% qtz, 10% RF. Gravel clasts are | | |
| | | | | rounded to subangular; sand grains are mostly | | |
| | | | | subangular to subrounded. Wet color is 5Y 4/2 | | |
| | | | | (olive gray); dry color is 5Y 6/2 (light olive gray). | | |
| | | | | Weak HCl rxn on wet sample. Sample is | | |
| | | | | unconsolidated. Sample is very similar to previous sample (155') | | |
| | | | | | 1558 | resumed drilling |
| | | | | End of work day @ 163' | 1700 | |
| | | | | 6/17/87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| TJ Gilmore | Cable Tool #5 (Barrel) | 299 W18 21 | N/A | KEH 19141911 |
| Date: 6/18/87 | | Depth: 160' To 161' | | Subcontract No.: N/A |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | | 7:30 | 166'4" to [illegible] 163' TD |
| | | | | Casing added: | | Drilling, hauling Supplies |
| | | | | ①21'5", ②20'10", ③21'0", ④20'11", ⑤20'9", ⑥20'10", ⑦20'11" | 9:15 | welding 8" casing |
| 167'5" to | 8" | | | ⑧20'9" total = 167' 5" 8" casing | | |
| | | | | | 14:20 | Drilling |
| | | | | | | |
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REMARKS:

TJ Gilmore 6/18/87

Total Casing 167'5" of 8" casing
TD 164' Total footage 1' under added Sept

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2182

| DRILL LOG | By SP AIRHART | Rig CABLE TOOL # 5 | Well Number 299-W18-21 | Computer Number NA | Project or Work Order No. KEH-1911 |
|---|---|---|---|---|---|
| | Date 6-19-87 | | Depth 161' To 170' | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Driller arrived, began drilling | 0700 | |
| | 161-165' | H | Wet | SANDY GRAVEL: 40% gravel 55% sand 5% silt; | 1105 | Drill rate slow - between 1.0-1.5 ft/hr |
| | | | | highly crushed sample - 10% MP, 25% FP, 5% | | |
| | | | | FP, 20% VCS, 15% CS, 15% MS, 5% FS-VFS, 5% silt; | | |
| | | | | poorly sorted; (GRAVEL) clast fragments | | |
| | | | | angular w/ a few preserved subrounded-to- | | |
| | | | | rounded, composition includes 75% basalt, 25% | | |
| | | | | glass, granite, other (SAND) dominantly angular | | |
| | | | | grains composed of 60% basalt, 40% gls-rich; | | |
| | | | | overall color (wet) dark olive gray 5Y 3/2 | | |
| | | | | (dry) gray 5Y 6/1; weak-to-mod rxn w/ | | |
| | | | | 10% HCl; well consolidated | | |
| | | | | NOTE: Darker color, otherwise similar to | | |
| | | | | previous sample | 1135 | Added 15 gals |
| | | | | | | $H_2O$ |
| | 169-170' | H | Wet | SILTY SANDY GRAVEL: 35% gravel, 45% sand, 10% silt; | 1345 | |
| | | | | 20% MP, 10% FP, 5% VFP, 15% VCS, 10% CS, 15% MS, | | |
| | | | | 5% FS-VFS, 10% silt; poorly sorted, (GRAVEL) highly | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-8.2183

8-B.2184

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| SP AIRHART | CABLE TOOL #5 | 299-W18-21 | NA | KEH-194 |
| Date: 6-19-87 | | Depth: 170' To 173' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | (continued) crushed ; clasts fragments are angular | | |
| | | | | a few subangular clasts evident ; composition | | |
| | | | | includes 70% basalt , 30% qtzites, granite, | | |
| | | | | metam. (SAND) angular-to-subrounded grains | | |
| | | | | composed of 50% basalt 50% qtz-rich ; overall | | |
| | | | | color (wet) dark olive gray 5Y 3/2 (dry) | | |
| | | | | gray 5Y 6/1 ; slight rxn w/ 10% HCl ; well | | |
| | | | | consolidated ; Generally same as previous sample. | | |
| 177'5" of 8" casing | | | | | 1430 | Added 10' of 8" |
| changed 7/1/87 sph | | | | ' | | casing. Total 8" |
| | | | | | | casing 167'5" + 10' = |
| | | | | | | 176'4" 177'5" |
| | | | | | | |
| | | | | Shut Down | 1640 | |
| | | | | | | |
| | | | | | | |
| | | | | S.P. Airhart 6-19-87 | | |
| | | | | | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000-021 (5-85)

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| T.S. Wilbur | Cable Tool Rig #5 | 299-W18-21 | NA | KEH-19A |
| Date: 6/22/89 | Darrel Luttke | Depth: 179 To 179-180' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | 25% v fine pebble, Tr VCS, 5% CS, 5% MS, 5% FS, 5% VFSand; 20% Silt; poor sorting; Gravels contain 75% Basalts, 25% Silica-rich ? metamorphics; Sands contain 60% Basalts + 40% other grains; Subangular to occasionally Subrounded; Wet color very dk grish brn 2.5Y 3/2 Dry color grish brn 2.5Y 5/2; slight rxn in HCl; | | |
| | | | | | 12:15 | welding hard tool |
| | | | | | | |
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REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000 021 (5-85)

8-B.2185

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| J.S. Wilbur | Cable Tool Rig #5 | 299-W18-21 | NA | KEH-1914 |
| Date: 6/23/89 | Darrel Lultek | Depth: 185' To 185' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| ~~188'~~ of 8" casing | | | | | | |
| NO CASING ADDED | | | | Driller arrives @ the drill site @ | 7:00 | |
| 177' 4" | | | | | | |
| SVA 7/1/89 | | | | Driller is to replace main clucth, chuck packs on the drill rig. | | |
| | | | | | | |
| | | | | Sample collected yesterday @ 4:50pm left until today is described below — | | |
| | | | | | | |
| | 184'-186' | Hard Tool | Wet | SANDY GRAVEL - Sample contains 70% gravels, 20% sands, 10% silts. (Gravels) are made up of 10% medium pebbles, 30% fine pebbles, and 30% very fine pebble sized clasts. The clasts have been highly altered by the hammer during drilling. Size and shapes of the gravels is based on unaltered surfaces of clasts. These clasts are subrounded to rounded in shape and are composed of 60% granitic materials & m/m materials, & 40% mafics (basalts). (Sands) are | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5 89)

8-B.2186

8-B.2187

| DRILL LOG | By J.S. Wilbur | Rig Cable Tool Rig #5 | Well Number 299-W18-21 | Computer Number W/A | Project or Work Order No. KEH-1914 |
|---|---|---|---|---|---|
| | Date 6/23/87 | | Depth 185' To | | Subcontract No. W/A |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | 184'-185' | Hard Tool | Wet | Cont. — made up of 5% coarse sands, 5% medium sands, 5% fine sands, and 5% very fine sand sized grains. These grains are subangular in shape and are composed of 75% mafics (basalt) materials & 25% qtz rich materials. (S.Lt) make up 10% of the sample volume. Wet sample color is 2.5Y 3/2 (very dark brown) and the dry sample color is 2.5Y 5/2 (grayish brown). Sample has a weak reaction w/ 10% HCl solution. | | |
| | | | | | | |
| ~~188' of 8" casing~~ | | | | Driller has a major problem w/ the drill rig — a part | 8:40 | |
| 110 CASING ADDED | | | | of the clutch has become stripped, and will need to | | |
| 177'5" | | | | be worked on in portland, Or.. Driller can not remove | | |
| SOA 7/1/87 | | | | tools from the hole @ this time because of clutch problem. | | |
| | | | | | | |
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| | | | | | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5 85)

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| J.S. Kilbur | Cable Tool Rig # | 29-N18-21 | NA | KEH-1914 |
| **Date** 6/25/87 | Davel | **Depth** To | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | Drill rig is broke down – repair work is being done | — | |
| | | | | | | |
| | | | | | | |
| | | | | J.S. Will 6/25/87 | | |
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REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____Standing Water

A 6000 021 (5 85)

8-8.2188

| DRILL LOG | By: S P AIRHART | Rig: CABLE TOOL #5 | Well Number: 299-N 18-21 | Computer Number: NA | Project or Work Order No.: ICEH-1914 |
|---|---|---|---|---|---|
| | Date: 6-26-87 | | Depth: NO DRILLING To | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | Driller returned from Portland w/ | | |
| | | | | re-built clutch. Began putting rig | | |
| | | | | back together | | |
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| | | | | | | |
| | | | | S.P Aubert | | |
| | | | | 6-26-87 | | |
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REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____Standing Water

A 6000 021 (5-85)

8-B.2189

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| S.P. AIRHART | CABLE TOOL | 299-W18-21 | NA | LEH-1910 |
| Date: 6-29-87 | #5 | Depth: 185' To 188' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| ~~188'~~ 177'5" | | | | Driller arrived | 0700 | |
| | | | | Finished fixing rig | 1250 | |
| | | | | Began drilling | 1330 | |
| ~~198'9½"~~ of 8" casing 188'2½" | | | | | 1330 | Added 10'9½" of 8" casing. Total casing = 177'5" + 10'9½" = ~~198'9½"~~ 188'2½" |
| SOA 7/1/87 | | | | | | |
| | | | | Shut Down | 1500 | |
| | | | | S.P. Airhart 6-29-87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (6 85)

8-8.2190

10'6"

| DRILL LOG | By S.P. AIRHART | Rig CABLE TOOL | Well Number 299-W18-21 | Computer Number | Project or Work Order No. KEH-1914 |
|---|---|---|---|---|---|
| | Date 6-30-87 | #5 | Depth 188 To 194' | NA | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| ~~198'9½"~~ | | | | Driller arrived | 0900 | |
| 188'2½" | | | | | 0912 | Added 10 gals $H_2O$ |
| | | | | | | Drilling very slow |
| | 189-190' | H | W | SANDY GRAVEL: 35% gravel, 60% sand, 5% silt — | 1130 | |
| | | | | 10% FP, 25% VFP, 20% VCS, 5% CS, 15% MS, 10% FS, 10% VFS, | | |
| | | | | 5% silt; poorly sorted; (GRAVEL) dominantly crushed, | | |
| | | | | some rounded surfaces, comp includes 70% qtz-rich | | |
| | | | | rx. granite, qtzites 30% basalt (SAND) 20% basalt, | | |
| | | | | 80% qtz-rich, dominantly angular grains; overall | | |
| | | | | color (wet) dark olive gray 5Y 3/2 (dry) | | |
| | | | | ; No rxn w/ 10% HCl; well consolidated | | |
| | | | | | | |
| ~~209'3½"~~ of 8" casing | | | | | 1300 | Added 10'6" of 8" |
| 198'8½" | | | | | | casing. Total casing: |
| SPA 7/1/87 | | | | | | 188'2½" |
| | | | | | | ~~198'9½"~~ + 10'6" = |
| | | | | | | 198'8½" |
| | | | | | | ~~209'3½"~~ |
| | | | | Shut Down | 1500 | + ½" |
| | | | | | | |

REMARKS:

S.P. Airhart 6-30-87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000.021 (5 85)

8-B.2191

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| S.P. AIRHART | CABLE-TOOL #5 | 299-W18-21 | NA | KEH-1914 |
| Date: 7-1-87 | | Depth: 194' To 204' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 198'8½" | | | | Driller arrived | 0700 | |
| | 194-195' | H | W | GRAVELLY SILTY SAND : 15% gravel, 60% sand, 25% silt | 1000 | Drill rate ≈ 1 ft./hr. |
| | | | | - 5% FP, 10% VFP, 10% VCS, 10% CS, 15% MS, 25% FS-VFS, | | |
| | | | | 25% silt ; poorly sorted (GRAVEL) 30% basalt, 50% qtz-rich, | | |
| | | | | 20% granitic, all clasts crushed (SAND) angular-to- | | |
| | | | | subangular grains composed of 20% basalt 80% qtz-rich; | | |
| | | | | overall color (wet) olive gray 5Y 4/2 (dry) light olive | | |
| | | | | gray 5Y 6/2 ; NO rxn w/ 10% HCl ; mod consolidated | | |
| | | | | - heaves when driving casing. | | |
| | | | | NOTE: INCREASE IN SAND & SILT FRACTION. | | |
| 209'2½" of 8" casing | | | | | 1200 | Added 10'6" of 8" casing |
| | | | | | | 198'8½" + 10'6" = 209'2½" |
| | 199-200' | H | W | GRAVELLY SILTY SAND : 15% gravel, 60% sand, 25% silt | 1320 | |
| | | | | 3% MP, 7% FP, 5% VFP, 10% VCS, 5% CS, 20% MS, 25% FS-VFS; | | |
| | | | | 25% silt ; poorly sorted (GRAVEL) 15% basalt, 65% qtz-rich, | | |
| | | | | 20% granitic ; all clasts broken (SAND) angular-to-subangular | | |
| | | | | grains composed of 15% basalt 85% qtz-rich ; overall color | | |
| | | | | (wet) olive gray 5Y 4/2 (dry) light olive gray 5Y 6/2 ; NO | | Necessary to drive |
| REMARKS: | | | | rxn w/ 10% HCl ; mod consolidated | | casing ahead - |
| | | | | Shut Down S.P. Airhart 9/1/87 | 1500 | |

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5 85)

8-B.2192

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| J Gilmore / Jswilbur | [illegible] #5 | [illegible] 21 | [illegible] | [illegible] |
| Date: 7/2 | | Depth: 204 To 214 | | Subcontract No. |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 219 7½" | | | | Casing 10' 5" welded on 7/6/82 (incl universal) | | [illegible] |
| | 205 | H | Wet | SANDY GRAVEL 20% gravel, 30% Sand, 10% Silt, 10% clay | | |
| | | | | 10% VFP, 10% VCS, 20% CS, 15% MS, 15% FS, 10% VFS, | | |
| | | | | 10% Silt, poor - mod srt, Tr Cly bnds. Gravels: | | |
| | | | | 70% qtz-rich, 30% Basalt; Sands 70% qtz-rich, | | |
| | | | | 30% Basalt, 5Y 5/4 (olv), 5Y 6/4 (pl olv), no rxn HCl | | |
| | | | | | | |
| | 210 | H | Wet | GRAVELLY SAND, 30% gravel 80% Sand Tr Silt; | | |
| | | | | 10% FP, 10% VFP, 20% VC, 10% CS, 30% MS, 15% FS, 5% VFS, | | |
| | | | | Tr Silt (½ Cly); Gravels, avg - subang, 60% qtz-rich | | |
| | | | | 40% Basalts; Sands 60% qtz-rich, 40% Basalts, | | |
| | | | | 5Y 7/2 (lt gry) wet 5Y 5/3 (olv gry) no rxn | | |
| | | | | Sample lost clays and Silts over previous sample | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

REMARKS:

7/5/82 J Gilmore / Wilbur

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5 85)

8-B.2193

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| C.W. Bishop | Cable Tool # 5 | 299-W18-21 | | XLH-1114 |
| Date: 1-7-87 | Darrel | Depth: 215 To 220' | NA | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Driller arrived cont. started drilling | 0100 | |
| | 214-215' | H | W | SILTY GRAVELLY SAND - (70% Sand, 20% gravel, 10% SILT) 5% f.p., 15% | 0930 | |
| | | | | V.f.p., 20% V.C.S., 10% C.S., 20% m.s., 20% f. and V.f. Sand, 10% Silt | | |
| | | | | Tr. clay balls; Gravels 50% mafic, 50% qtz rich; Sands 80% qtz rich, | | |
| | | | | 20% OSLT., poorly sorted; Gravels balls broken - mostly angular, | | |
| | | | | appears to have been rounded prior to being broken during | | |
| | | | | drilling. Larger grains of sands angular; smaller subrounded. | | |
| | | | | WET color 5Y4/2 - olive gry; Dry color 5Y 6/2 Lt. olive gry. | | |
| | | | | NO FXN to 10% HCL. Drilling fast, slow probably due to sluffing | | |
| | | | | hole; fairly poorly consolidated. Similar to previous; clay balls. | | |
| | | | | Some MICA in SANDS | | |
| | 219-220' | H | W | SILTY GRAVELLY SAND (70% Sand, 20% gravel, 10% SILT) 5% f.p., | 1030 | |
| | | | | 15% V.f.p., 20% V.C.S., 10% C.S., 15% m.s., 25% f. and V.f.s., | | |
| | | | | 10% SILT; Gravels 50% qtz rich, 50% mafic; Sands 75% Qtz rich, | | |
| | | | | 25% poly; Gravels broken - angular, Sands angular to subrounded. | | |
| | | | | Sand sizes have more mica than previous. Wet color 5Y4/3 olive, | | |
| | | | | Dry 5Y7/3 PALE YELLOW. NO FXN to 10% HCL. CONSOLIDATION SIMILAR | | |
| | | | | TO PREVIOUS. NO Clay balls in sample. Sample probably more | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5-85)

8-B.2194

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| C. Bishop | Cable Tool #5 | 299 W18-21 | NA | KEH 1914 |
| Date: 7-7-87 | Diesel and Kelly | Depth: 220' To 227' | | Subcontract No.: 11A |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | 220 | Cont'd | | SORTED THAN Formation [illegible] | | |
| 209 2½" | | | | OTHERWISE SIMILAR TO PREVIOUS. | | |
| 219' 6½" | | | | DRILLER WELDING ON 10'4 and 10'5" 8" Carbon Steel Casing | 1100 | |
| 229' 11½" | | | | TOTAL 229' 11½" | | |
| | 224-225' | B | W | SILTY GRAVELLY SAND - (10% SILT, 20% Gravel, 10% Sand) Tr f.p., | 1415 | |
| | | | | 20% V.f.p, 20% V.C.S., 10% f.c., 25% m.s., 20% f.m.s. v.f.s., 10% SILT, | | |
| | | | | fr. Clay balls. Gravels [illegible] 30% matrix, | | |
| | | | | Tr rhz, V.C.S. nearly all bslt at [illegible] nearly | | |
| | | | | all and angular to [illegible] | | |
| | | | | Poorly sorted, WET color 5Y5/2 [illegible] Dry color 5Y6/1 | | |
| | | | | lt. olive gry, No rxn to HCl. SEDIMENTS SOLUBLE IN KETONE. | | |
| | | | | Gravel appears to be all [illegible] clay balls, all [illegible] | | |
| | | | | similar to before. Probably pebbles [illegible] | | |
| | | | | to all that appear to be out [illegible] | | |
| | | | | STATIC WATER TABLE at ~197' 6" E-Tape # 12021 | 1350 | |
| | | | | Depth to bottom ~227' | 1420 | |
| | | | | Approx 2' Sand came into hole while drilling backed. | | |
| | | | | Let stand overnight for [illegible] | 1410 | END OF DAY |

REMARKS:

Carolyn Bishop
7-7-87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5-85)

8-8.2195

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| S.P. AIRHART | CABLE TOOL #5 | 299-W18-21 | NA | KEH-1814 |
| Date: 7-8-87 | | Depth: 227 To 227 | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 229' 11½" | | | | Driller arrived | 0700 | |
| | | | | D/W = 196.5' from ground surface (E-tape # 12021) | 0725 | |
| | | | | Scott Wilbur collected water sample for analysis | 0735 | |
| | | | | Driller waiting for results of analysis | | |
| | | | | Geophysical logger arrived (V.L. McGhan) | 1010 – | 1125 |
| | | | | Performed Natural gamma, neutron, and density measurements | | |
| | | | | SP Airhart 7-8-87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5-85)

8-B.2196

| DRILL LOG | By S.P. AIRHART | Rig CABLE TOOL | Well Number 29S-W18-21 | Computer Number | Project or Work Order No. KEH-1914 |
|---|---|---|---|---|---|
| | Date 7-9-87 | #5 | Depth NO DRILLING To | NA | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | D/W from ground surface = 196' | 06:52 | |
| | | | | Driller waiting on water analysis results | | |
| | | | | S.P. Airhart 7-9-87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2197

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| S.P. AIRHART | CABLE TOOL #5 | 299-W18-21 | NA | KEH-1914 |
| Date: 7-10-87 | | Depth: NO DRILLING To | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | D/W from ground surface = 196' (E-tape @ 1202) | | |
| | | | | D/B From ground surface = 226.3' | 11:30 | |
| | | | | | | |
| | | | | Performed straightness test - passed 20' | 11:55 | |
| | | | | section of 6" casing through entire length | | |
| | | | | of well. | | |
| | | | | | | |
| | | | | Added 3/4 bag of 20-30 mesh Colorado Silica | 1345 | |
| | | | | Sand. D/B = 223.9' | | |
| | | | | Pulled 8" casing to 225'5" | 1410 | |
| | | | | Added 1/2 bag of 20-30 Colorado Silica Sand | 1420 | |
| | | | | D/B = 224 | | |
| | | | | Set 10'3" section of 8" 30-slot Telescoping Screen | 1445 | |
| | | | | D/B = 225 ; Top of screen @ 214'9" | | |
| | | | | Pulled 8" casing to 219'1" - Letting clutch cool | 1520 | |
| | | | | | | |
| | | | | Shut Down. | | |
| | | | | | | |

REMARKS:

S.P. Airhart
7-10-87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5-85)

8-B.2198

| DRILL LOG | By: SP AIRHART | Rig: CABLE TOOL #5 | Well Number: 299-W18-21 | Computer Number: NA | Project or Work Order No.: KEH-1914 |
|---|---|---|---|---|---|
| | Date: 7-13-87 | | Depth: NO DRILLING To | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Pulled 8" casing to 216'9" - 2" of overlap | 0715 | |
| | | | | between top of 8' telescoping screen & bottom | | |
| | | | | of 8' casing | | |
| | | | | D/W = 195.5' below land surface - may not be | 07:30 | |
| | | | | accurate due to disturbance of pulling back | | |
| | | | | casing. | | |
| | | | | Started bailing w/ 4½" dart bailer | 10:45 | |
| | | | | Essentially no drawdown after ~ 6-7 bails | | |
| | | | | After 1 hr. of bailing no change in D/W | 11:50 | |
| | | | | D/B = 225.8' | 12:30 | |
| | | | | Concluded bailing | 13:00 | |
| | | | | Set 5" 15 h.p. submersible pump. Depth to intake | 14:30 | |
| | | | | = 216.9' from ground surface. Set 217' of | | |
| | | | | ½" stilling pipe | | |
| | | | | Turned pump on for ~ 1 min | | |
| | | | | Will set up discharge line tomorrow | | |
| | | | | | | |
| | | | | Shut Down | 1700 | |

REMARKS:

SP Airhart 7-13-87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-8.2199

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| S.P AIRHART | CABLE TOOL #5 | 299-W18-21 | NA | REH-1914 |
| **Date** 7-14-87 | **Depth** NO DRILLING To | | | **Subcontract No.** NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | D/W from ground surface = 195.75' | 0650 | |
| | | | | Driller set up discharge line for aquifer test | | |
| | | | | Began step-drawdown test | 1230 | |
| | | | | End of test | 1400 | |
| | | | | Measured recovery for 60 min. | | |
| | | | | Began constant discharge test | 1500 | |
| | | | | Steve Teel | | |
| | | | | 7-14-87 | | |

REMARKS: Step-drawdown – total drawdown = 15.79 ft
recovery to static in 25 min.

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000 021 (5-85)

8-B-2200

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| S.P. AIRHART | Cable Tool #5 | 299-W18-21 | NA | KEH-1914 |
| Date: 7-15-87 | | Depth: NO DRILLING To | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | E-tape water level measurement - 195.47 | 0709 | |
| | | | | Disassembling aquifer testing equipment | | |
| | | | | Testing equipment was surveyed w/ PAM & GM | 0950 | |
| | | | | Nothing detected | | |
| | | | | Moving equipment to lay-down yard for steam | 0955 | |
| | | | | cleaning | | |
| | | | | Helping set pump & discharge line @ well | | |
| | | | | 299-W18-24 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2201

| DRILL LOG | By: S.P. AIRHART | Rig: CABLE TOOL #5 | Well Number: 299-W18-21 | Computer Number: NA | Project or Work Order No.: KEH-191V |
|---|---|---|---|---|---|
| | Date: 7-16-87 | | Depth: NO DRILLING To | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | D/W from land surface = 195'9" (E-tape # 10998 | 0709 | |
| | | | | Driller helped on well 299-W18-24 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B-2202

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| S.P. AIRHART | Cable Tool #5 | 899 W18 21 | NA | KE4 10,4-1 |
| Date: 7/17/87 | Barrel | Depth: No Drilling To | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Depth to water 195.95' | 650 | |
| | | | | D/B of stainless steel = 225.5' | | |
| | | | | Added 5 bags of 20-30 mesh Col. silica sand | | |
| | | | | D/B = 202' | | |
| | | | | Driller left for Seattle | | |
| | | | | S.P. Airhart 7/17/87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5 85)

8-B.2203

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| J.S. Wilbur | Cable Tool Rig #5 | 199-N18-21 | NA | KFH-1914 |
| Date: 7/20/89 | Darrel Ludlke | Depth: 70 Backpulling | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Depth to H2O @ 195' 11.3" @ 7:10 | | |
| | | | | Driller arrives @ 7:00, back pulling 8" casing | | |
| | | | | 10' of casing back pulled @ 8:15; driller goes to get pipe cutting tourch, casing is coming out of the hole very easy. | | |
| | | | | D/B measured @ 208' for sand in the annulus between the 4"SS & 8" carbon steel. | 9:20 | |
| | | | | + 3 bags of 20/30 sand added D/T @ 197' 8½" for sand pack | 9:25 | 197' 3" |
| | | | | + 1 bag of 20/30 sand added D/T @ 195' ½" for sand pack | 9:30 | |
| | | | | Driller is welding on pulling head on casing in the ground after cutting it off 10' section removed from the hole. | 9:35 | |
| | | | | 10" section of 8" casing removed @ | 9:50 | |
| | | | | D/T of sand pack @ 197' a loss of ~ 4' during back-pulling. Pulling head welded back onto 8" in the hole | 10:15 | 5 bag of 20/30 sand |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5 85)

8-B.2204

| DRILL LOG | By J.S. Wilbur | Rig Cable Tool Rig #5 | Well Number 299-N18-21 | Computer Number NA | Project or Work Order No. KEH-1915 |
|---|---|---|---|---|---|
| | Date 7/20/87 | | Depth TD (BACKFILLING) | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | + 1 bag of 20/30 sand added D/T of sand pack 191' ½" | | |
| | | | | Driller adds 3 bags of 20/30 sand D/T of the sand pack @ 180' ½" | 10:40 | |
| | | | | Driller back pulls 10' length of 8" casing – cut section off | | |
| | | | | D/T of sand pack @ 189' 6", + 1 bag of 20/30 sand | D/T of | sand pack @ 187' 4" |
| | | | | 2 buckets of pellets added D/T of pellets @ 185' 9" | | |
| | | | | Driller goes to get trimme pipe to place grout into the well. Pipe has to be steam cleaned. | | |
| | | | | Trimme pipe in the well and ready to grout @ 13:40 | | |
| | | | | 16 bags of volclay grout 2x (200 gal batches) are added to the well. D/T of the volclay is 37' | 15:07 | |
| | | | | Driller has removed a 10' section of 8" j welding the pulling head to the well. | 16:35 | |
| | | | | Driller has removed a 10" section of 8" from the well a 170' of 8" casing remains to be pulled. | 16:55 | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5 85)

8-B.2205

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| J.S. Wilbur | Cable Tool Rig & Barrel | 299-W18-21 | NA | KEH-1914 |
| Date: 7/21/89 | | Depth: Back pulling — | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Driller arrives @ the well @ | 7:05 | |
| | | | | Driller cuts 10' section of 8" casing | 7:10 | |
| | | | | Driller pulls 160' of 8" casing (20' lengths) | 7:15 — | 10:30 |
| | | | | Driller attaches 10" pulling head to 10" casing — | 11:40 | |
| | | | | 10" pulling head broke, driller heads to the yard | | |
| | | | | make up a new one. | 12:10 | |
| | | | | Driller back pulled 33' 10" of 10" casing from the | | |
| | | | | hole. Hard pulling Started | 14:00 | |
| | | | | Driller heads home @ | 17:00 | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000-021 (5-85)

8-B.2206

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| J.S. Wilbur | Cable Tool Rig #5 | 299-W18-21 | NO | REH-1914 |
| Date: 7/23/91 | | Depth: BACK PULLING to | | Subcontract No.: NO |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Driller arrives @ the drill site @. | 7:00 | |
| | | | | Grout is ~ 4' from the bottom of the casing, waiting for the grout truck to arrive. | 7:15 | |
| | | | | Driller makes a 16" pulling head while waiting | 7:40 - 9:15 | |
| | | | | Grout truck arrives @ the well @ | 13:15 | |
| | | | | 15 sacks of Volclay grout add – 350 gal. | | |
| | | | | Grouting completed @ | 14:35 | |
| | | | | Driller pulls 84' of 10" casing | 15:00 | |
| | | | | Driller pulls 32' of 12" casing | 17:00 | |
| | | | | Driller head home @ | 17:35 | |
| | | | | J.S. Wilbur PWC 7/23/91 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5 85)

8-B.2207

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| S.P. AIRHART | CABLE TOOL | 299-W18-21 | NA | RFH-1914 |
| Date: 7-24-87 | #5 | Depth: NO DRILLING To | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Driller arrived | before | 0700 |
| | | | | Pulling 12" casing | 0830 | |
| | | | | Pulled remaining 12" casing out of hole | 1020 | |
| | | | | Grout truck arrived | 1040 | |
| | | | | D/B = 33.5' | 1105 | |
| | | | | Mixed 8¼ bags of Volclay grout & 8¼ bags initiator | 1140 | |
| | | | | w/ 200 gallons $H_2O$. D/B = 8' | | |
| | | | | Pulled 16" starter casing to 7' | 1145 | |
| | | | | MIXED 8¾ bags of Volclay grout & 8¾ bags initiator | 1240 | |
| | | | | Density 9.9 lbs/gal ; put in hole | 1245 | |
| | | | | Pulled all 16" Casing D/B = 1.5' (TOP OF GROUT) | | |
| | | | | Shut Down - | 1500 | |
| | | | | S.P. Airhart 7/24/87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5 85)

8-B.2208

| DRILL LOG | By: S.P. AIRHART | Rig: CABLE TOOL #5 | Well Number: 299-W18-21 | Computer Number: NA | Project or Work Order No.: KEH-1914 |
|---|---|---|---|---|---|
| | Date: 7-27-87 | | Depth: NO DRILLING To | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Using backhoe to clean up well site | 1000 | |
| | | | | Bailed ~ ½ hr. | | |
| | | | | Mixed 6 bags of pre-mix concrete w/ ~ ½ of | 1300 | |
| | | | | a bag of Portland cement. Filled remaining (5') | | |
| | | | | portion of annulus w/ slurry to form surface | | |
| | | | | seal. | | |
| | | | | Cut off 2.3' of 4" stainless steel casing | 1330 | |
| | | | | Started bailing w/ 3" dart bailer | 1440 | |
| | | | | stopped bailing - lots of sand in hole. | 1540 | |
| | | | | Resumed bailing | 1600 | |
| | | | | Stopped bailing | 1625 | Total bailing today |
| | | | | Check D/B = 222.5'; ∴ ~ 2.5' of sand on bottom. | | 2 hrs. |
| | | | | Apparently screen is not straight ∴ 20' bailer | | |
| | | | | will not penetrate to bottom. Need shorter bailer. | | |
| | | | | Shut Down | 1650 | |
| | | | | S.P. Airhart 7/27/87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000.021 (5 85)

8-B.2209

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| S.P. AIRHART | CABLE TOOL #5 | 209-W18-21 | NA | KEH-1014 |
| Date: 7/28/87 | | Depth: NO DRILLING To | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Bailed w/ 3" flat-bottom bailer | 0715-0745 | |
| | | | | D/B = 225.3' | 0800 | |
| | | | | Resumed bailing | 0855 | Total bailing today = |
| | | | | Quit bailing | 1030 | 2.5 hrs |
| | | | | Began tearing down rig. | 1045 | |
| | | | | Moved rig off site to steamclean | 1150 | |
| | | | | S.P. Airhart 7/28/87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5 85)

8-B.2210

| DRILL LOG | By: S.P. AIRHART | Rig: NO RIG | Well Number: 299-W18-21 | Computer Number: NA | Project or Work Order No.: KEH-1914 |
|---|---|---|---|---|---|
| | Date: 7/29/87 | | Depth: NO DRILLING To | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Set 4, 4" guard posts w/ ~ 4' of stickup on each. 2½' deep, packed w/ sediment. | 1300 | |
| | | | | Mixed & poured 9 sacks of pre-mix concrete & ½ bag Portland cement to make surface pad. | 1530 | |
| | | | | Set brass marker in pad | 1600 | |
| | | | | S.P. Airhart 7/29/87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5 85)

8-8-2211

| DRILL LOG | By DANIEL C. ORR / DARREL LUDTKE | Rig #5 BE 22 W | Well Number 299-W18-27 DV | Computer Number | Project or Work Order No. |
|---|---|---|---|---|---|
| | Date 5-29-87 | | Depth To | | Subcontract No. KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | WASHED RIG, MOVED ON SITE, RIGGED UP, | | |
| | | | | MOVED EQUIPMENT TO NEW YARD | | |
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| | | | | | 8 HRS | D. LUDTKE |

REMARKS:

Karen R. Oster
6/3/87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-8.2212

# DRILL LOG

By Daniel C. Stoke / BARREL LUDTKE | Rig #5 BE22W | Well Number 299-W18-23 | Computer Number | Project or Work Order No.

Date 6-2-87 | Depth 0 To 20' | Subcontract No. KEH-1914

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time ETCH | Drilling Comments |
|---|---|---|---|---|---|---|
| 20' | 0-1' | D.B. | D | 0'-1' DRILL PAD, COBBLES, GRAVEL, SAND, | 2 | 20' |
| | | | | 1'-5' SAND, BROWN | 7 | 20' |
| | | | | 5-10' SILT, SAND | | |
| | | | | 10'-20' BLACK SAND GRAVEL SOME SILT | | |
| | | | | | 8 HRS | D LUDTKE |

REMARKS:

Karen R. Oste
4/3/87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2213

# DRILL LOG

By Darrel Kuotke | Rig # 5 Bezz W | Well Number 299-W18-2 D.H | Computer Number | Project or Work Order No.

Date 6-3-87 | Depth 20' To 30' | Subcontract No. KEH-1914

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time ETEA | Drilling Comments |
|---|---|---|---|---|---|---|
| 20' | 30' | DB | D | 20'-25' BLACK SAND, SOME GRAVEL | 2 | 10' |
| 9'8" | | | | 25'-30' SILT BROWN SAND | 7 | 10' |
| 29'8" | | | | | | |
| | | | | WASHED 12" PIPE, WELDED ON DRIVE | | |
| | | | | SHOE, HELPED KELLY | | |
| | | | | | 9 HRS | D LUOTKE |

REMARKS:

Karen R. Oste
4/13/87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000 021 (5-85)

8-B.2214

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| Chris Ruddle / DARREL LUDTKE | BE22W | C99-WIS-21 | | |
| Date: 6-4-87 | | Depth: 30' To 42' | | Subcontract No.: KKH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time KTEN | Drilling Comments |
|---|---|---|---|---|---|---|
| 42' 3" | | | | 30'-42' SILT, BROWN AND BLACK SAND, | 3 | 10' |
| | | | | HIT ROCK AT 42' COULD NOT | 8 | 42' 3" |
| | | | | DRIVE BARREL IT SWITCHED TO HARD | | |
| | | | | TOOLS | | |
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| | | | | | 8 HRS | D. LUDTKE |

REMARKS:

6-8-87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2215

# DRILL LOG

| By | Bio | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| DARREL LUDTKE | 8E 22W | 299-W18-21 | | |
| Date: 6-5-87 | | Depth: 42' To 52' | | Subcontract No.: KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time Item | Drilling Comments |
|---|---|---|---|---|---|---|
| 42'3" | | | | 42' - 52' COBBLES, GRAVELS, SAND, | 3 | 10' |
| 10'6" | | | | | 8 | 10' |
| 52'9" | | | | | | |
| 10'6" | | | | | | |
| 63'3" | | | | DRILLING WITH HARD TOOLS, COULDN'T | | |
| | | | | KEEP MATERIAL IN DRIVE BARREL | | |
| | | | | DRILLED FROM 42' TO 52', STARTED WELDING | | |
| | | | | ON 10'6" OF 12", RADIATOR WENT BAD ON | | |
| | | | | WELDER | | |
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| | | | | | 9 HRS | D. LUDTKE |
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REMARKS:

6-8-87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8:8.2216

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| DARREL LUDTKE | BE22W | 299-W18-27 | | |
| Date: 6-8-87 | | Depth: 52' To 62' | | Subcontract No.: KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time ~~Feet~~ | Drilling Comments |
|---|---|---|---|---|---|---|
| 63'3" | | | | 52'-62' COBBLES, FINE TO COURSE GRAVEL & SAND | 8' | 10' |
| | | | | CAN'T DRILL OUT IN FRONT OF CASING, HAD TO DRILL A LITTLE THEN DRIVE PIPE | | |
| | | | | | 9 MCS | D. LUDTKE |

REMARKS:

J.W. Lott 6-8-87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2217

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| DARREL LUDIKE<br>David Eaton | BEZZ W | 299-W18-22 | | |
| Date: 6-9-87 | | Depth: 63' To 77' | | Subcontract No.: KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION<br>% Each Grain Size, Color, Roundness, Caliche, Etc. | Time/Item | Drilling Comments |
|---|---|---|---|---|---|---|
| 63' 3" | | | | 63'-67' COBBLES, GRAVELS, SAND | 3 | 14' |
| 10' 6" | | | | 67'-77' SILT, SAND FINE GRAVEL | 8 | 21' |
| 73' 9" | | | | | | |
| 10' 6" | | | | | | |
| 84' 3" | | | | | | |
| 12" PIPE | | | | | | |
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| | | | | | 8 HRS | D. LUDIKE |
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REMARKS:

Karen P. Oste
4/10/87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2218

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| DARRELL LOOKE | BEZZW | 209-WB-21 | | |
| Date: 6-10-87 | | Depth: 77' To 95' | | Subcontract No.: KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time ~~EVEN~~ | Drilling Comments |
|---|---|---|---|---|---|---|
| 84'3" | | | | 77'-95' SILT, SAND | 3 | 18' |
| 12" PIPE | | | | | | |
| | | | | CASED WELL TO 84', TRIED TO DRILL | | |
| | | | | OPEN HOLE, WAS ABLE TO GO TO 95', HAD | | |
| | | | | TO STOP HOLE WOULDNT STAY OPEN, WENT | | |
| | | | | AND HAULED WATER, LOADED UP 6 JOINTS OF | | |
| | | | | 10" PIPE, STARTED WASHING PIPE AND DRIVE | | |
| | | | | SHOE | | |
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| | | | | | 8 HRS | DARRELL LOOKE |
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REMARKS:

Karen P. Oster
4/12/87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000-021 (5-85)

8-8.2219

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| Daniel L Dorke<br>Darrel Lundke | Bezen | 299-W18-21 | | |
| Date: 6-11-87 | | Depth: 915' To | | Subcontract No.: KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION<br>% Each Grain Size, Color, Roundness, Caliche, Etc. | Time ~~STEM~~ | Drilling Comments |
|---|---|---|---|---|---|---|
| 21' 2" | | | | FINISHED WASHING PIPE, HAULED TO DRILL | 9 | 420' 11" |
| 20' 10" | | | | SITE, UNLOADED PIPE, WELDED ON DRIVE SHOE | | |
| 42' of 10" PIPE | | | | BROUGHT IN PUMP RIG, PICKED UP 3-10" BITS | | |
| | | | | SO THEY COULD BE SAND BLASTED, HELPED KELLY | | |
| | | | | HAUL 16" PIPE, PUT 1 JOINT OF 10" PIPE WITH | | |
| | | | | SHOE IN WELL, PICKED UP PIECE 10" x 20' 10" AND STARTED | | |
| | | | | WELDING IT ON, TOOK WATER TRUCK TO HOMER | | |
| | | | | HELPED KELLY WITH WASHING PIPE | | |
| | | | | | 8 HRS | D L Dorke |

REMARKS:

Karen P. Osta
4/12/87

D - Drive Barrel  H - Hard Tool  L - Large  M - Medium  S - Small  VC - Very Coarse  C - Coarse  F - Fine  VF - Very Fine  ____ Standing Water

A-6000 021 (5-85)

8-B.2220

| DRILL LOG | By Darrel Ludtke / Darrel Ludtke | BLZZW | Well Number 299-W-18-21 | Computer Number | Project or Work Order No. |
|---|---|---|---|---|---|
| | Date 6-12-87 | | Depth 95' To | | Subcontract No. KCH-19844 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 42'-0" | | | | RAN IN 51' 6" OF 10" CASING, DRILL WELL | 3 | 51-6" |
| 51'-6" | | | | BACK OUT TO 95' | | |
| 93' 6" | | | | | | |
| | | | | MOVED WATER TRUCK FROM LAY DOWN | | |
| | | | | YARD | | |
| | | | | HELPED KELLY AND RUSS | | |
| | | | | | 8 HRS | DARREL LUDTKE |

REMARKS:

Karen R. Oster
6/15/87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2221

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| DARRELL LUDTKE | BL 22W | 299-W18-21 | | |
| Date: 6-15-87 | | Depth: 94' To 125' | | Subcontract No. |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 94'6" | | | | 95'-125' SILT, SAND, | 4 | 31' |
| 10'6" | | | | | 9 | 31' 3" |
| 105'0" | | | | | | |
| 10'6" | 10' CASING | | | A.S.Hill 6/22/87 | | |
| 115'6" | | | | | | |
| 10'3" | | | | | | |
| 125'9" | | | | | | |
| | | | | | 10 HRS | D. LUDTKE |

REMARKS:

H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B-2222

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| Daniel Stone<br>DARRELL LUDIKE | B-22W | 299-W18-21 | | Subcontract No.<br>KEH-1914 |
| Date<br>6-16-87 | | Depth<br>125' To 155' | | |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION<br>% Each Grain Size, Color, Roundness, Caliche, Etc. | Time /Ft. | Drilling Comments |
|---|---|---|---|---|---|---|
| 125'9" | | | | 125'-144' SILT, SAND | 4 | 30' |
| 20'1" | 10' CASING | | | 144-155' SILT, SAND, GRAVELS | 9 | 20',1" |
| 145'10" | | | | | | |
| | | | | DRILLED OUT IN FRONT OF CASING 10' TO | | |
| | | | | KEEP CASING LOOSE | | |
| | | | | A.S. Hill 6/22/87 | | |
| | | | | | 10 MPI | D. LUDIKE |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5 85)

8-8-2223

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| DARRELL LUDTKE | BE22W | 299-W16-21 | | |
| **Date** | | **Depth** | | **Subcontract No.** |
| 6-17-97 | | 145' To 165' | | KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time-ITEM | Drilling Comments |
|---|---|---|---|---|---|---|
| 145'10" | | | | 145'-160' SILT SAND GRAVEL | 4 | 20' |
| 10'3" | 11 | | | 160'-165' CEMENTED SAND GRAVEL SOME SILT | 9 | 20' |
| 155'10" | 10 CASING | | | | | |
| 10'3" | | | | 1.5 Wilbur — 6/22/97 | | |
| 165' | | | | | | |
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| | | | | | 10 HES | D. LUDTKE |
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REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B-2224

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| DARREL LUDTKE | BT22W | 279-WIS-21 | | |
| Date: 6-[illegible]-87 | | Depth: 165' To | | Subcontract No.: KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time ETEN | Drilling Comments |
|---|---|---|---|---|---|---|
| 21'5" | | | | | 10' | 167'5" |
| 20'10" | | | | CHANGED OUT TOOLS FROM 10" TO 8" | | |
| 42'3" | 8" CASING | | | RAN IN 9 JOINTS OF 8" PLUS SHOE | | |
| 21'0" | | | | | | |
| 63'3" | | | | A.S. Will 6/22/87 | | |
| 20'11" | | | | | | |
| 84'2" | | | | | | |
| 20'9" | | | | | | |
| 104'11" | | | | | | |
| 20'10" | | | | | | |
| 25'9" | | | | | | |
| 20'11" | | | | | | |
| 146'8" | | | | | | |
| 20'9" | | | | | | |
| 167'5" | | | | | | |
| -1'[illegible] | | | | | | |
| [illegible] | | | | | | |
| | | | | | | |
| | | | | | 10 HRS | DLUDTKE |
| | | | | | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-8-2225

# DRILL LOG

By DARREL LUDTKE | Rig B222W | Date 6-19-87

Well Number 299-W18-21 | Depth 165' To 175'

Computer Number

Project or Work Order No.

Subcontract No. KEH-1914

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time 1 FT | Drilling Comments |
|---|---|---|---|---|---|---|
| 167'9" | | | | 165'-175', CEMENTED SAND AND GRAVEL | 5 | 10' |
| 10' 0" | | | | | 10 | 10' |
| 177'5" | 8" CASING | | | | | |
| | | | | DRILLING @ 1-1½ FEET PER HR | | |
| | | | | | | |
| | | | | A.S. Will 6/22/87 | | |
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| | | | | | 10 HRS | D LUDTKE |
| | | | | | | |

REMARKS:

D Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B-2225

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| D. LUOTKE | B22W | 299-W18-21 | | |
| Date: 6-22-87 | | Depth: 175' To 185' | | Subcontract No.: SEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 177' 5" | 185' | | | 175'-185' CEMENTED SAND AND GRAVEL | 5' | 10' |
| | | | | DRILLING SLOW | | |
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| | | | | | 10 HRS | D. LUOTKE |
| | | | | S.P. Arnhart 6-30-87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000-021 (5-85)

8-B-2227

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| D. LUDTKE | BE22W | RGG-W18-21 | | |
| **Date** 6-23-87 | | **Depth** 185' To | | Subcontract No. KEH 1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time ITEM | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | TRIED TO ADJUST HOISTING CLUTCH, THREADS | | |
| | | | | ARE STRIPED, TOOK SHAFT OUT OF RIG TO | | |
| | | | | GET REPAIRED, CLEANED ON RIG | | |
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| | | | | | 10 HRS | D. LUDTKE |
| | | | | | | |
| | | | | SP. Ambrose 6-30-87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B-2228

8-B-2229

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| D. LUDTKE | Bezzw | 299-W18-21 | | |
| Date: 6-24-87 | | Depth: 185' To | | Subcontract No.: KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | SERVICED RIG, HELPED WASH AND | | |
| | | | | HAUL PIPE HELPED AT OTHER RIGS | | |
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| | | | | | 10 HRS | D LUDTKE |
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| | | | | S.P. Aubert 6-25-87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| D LUDTKE | BE 22W | 299-W18-21 | | |
| Date: 6-26-87 | | Depth: 185' To | | Subcontract No.: KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | PICKED UP SHAFT IN PORTLAND HAULED | | |
| | | | | OUT TO HANFORD, STARTED INSTALLING SHAFT | | |
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| | | | | | 11 HRS | D. LUDTKE |
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| | | | | S.P. Ambrust 6-30-87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B-2230

8-B.2231

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| D LUDIKE | BE22W | 299-W18-21 | | |
| **Date** 6-29-97 | | **Depth** 195' To 188' | | **Subcontract No.** KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Calliche, Etc. | Time-Item | Drilling Comments |
|---|---|---|---|---|---|---|
| 177'5" | | | | 185'-188' CEMENTED SAND AND GRAVEL | 5 | 3' |
| 10'9½" | | | | | 10' | 10'9½" |
| 168'2½" | | | | | | |
| | | | | FINISHED INSTALLING RIG, STARTED DRILLING | | |
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| | | | | SP Ludike 6-30-97 | 8 HRS | D LUDIKE |
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REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000-021 (5-85)

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| D. LYDICK | BE22W | 299-W18-21 | | |
| Date: 6-30-87 | | Depth: 188' To 194' | | Subcontract No.: KEH 1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time — IRR. | Drilling Comments |
|---|---|---|---|---|---|---|
| 188' 2½" | | | | 188' TO 194' CEMENTED SAND AND GRAVEL | 5 | 6' |
| 10' 6" | | | | | 10 | 10' 6" |
| 198' 8½" | | | | | | |
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| | | | | S.P. Aitken 6-30-87 | 8 HRS | D. LYDICK |
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REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B-2232

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| D LUDTKE | RIG #2 | 299-W18-21 | | |
| Date: 8-30-87 | Bezzu | Depth: 188' To 194' | | Subcontract No.: KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time-ITEM | Drilling Comments |
|---|---|---|---|---|---|---|
| 188' 2½" | | | | 188' - 194' SILT, SAND, GRAVEL | 5 | 6' |
| 10' 6" | | | | | 10 | 10' 6" |
| 198' 8½" | | | | | | |
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| | | | | Caved to 188' 7-2-87 | | |
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| | | | | | 8 HRS | D LUDTKE |
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REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-8-2233

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| D LUDTKE | BE 22W | 299-W18-21 | | |
| **Date** 7-1-87 | | **Depth** 194' To 204' | | Subcontract No. RCH - 1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time ETGA | Drilling Comments |
|---|---|---|---|---|---|---|
| 199' 8½" | | | | 194' - 204' SILT, SAND, GRAVEL, SOME COBBLES | 5 | 10' |
| 10' 6" | | | | | 10 | 10' 6" |
| ~~209' 2½"~~ | | | | | | |
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| | | | | Carolyn Kelly 7-6-87 | | |
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| | | | | | 8 HRS | D LUDTKE |
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REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B-2234

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| D LUDTKE | # 2 | 299-W18-21 | | |
| **Date** | Brazo | **Depth** | | Subcontract No. |
| 7-2-87 | | 204' – To 214' | | KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time — ETEN | Drilling Comments |
|---|---|---|---|---|---|---|
| 209 2 8" | | | | 204' - 210' SILT SAND GRAVEL | 5 | 10' |
| 10'5" | | | | 210' -214' SAND GRAVEL | 10 | 10'5" |
| 219 7 2 | | | | | | |
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| | | | | Carolyn Ivey | | |
| | | | | 7-8-87 | | |
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| | | | | | 8 HRS | D LUDTKE |
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**REMARKS:**

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____Standing Water

A-6000-021 (5-

8-B-2235

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| D Ludeke | #2 Bezzw | 299-W18-21 | | |
| Date: 7-7-87 | | Depth: 214' To 228' | | Subcontract No.: REH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 219' 1/2" | | | | 214-228' SAND GRAVEL SOME SILT | 5 | 14' |
| 10' 5" | | | | | 10 | 10' 5" |
| 230' 1/2" | | | | | | |
| | | | | Cavity, Pull up 7-8-87 | | |
| | | | | | 10 MES | D. Ludeke |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

B-B-2236

# DRILL LOG

| By | Rig # | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| D LUDTKE | 2 | 299-W18-21 | | |
| Date: 7-8-87 | BE22W | Depth: To | | Subcontract No.: 5511-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time ITEM | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | TOOK WATER SAMPLE IN MORNING, | 30 | 4 HRS |
| | | | | | 31 | 4 HRS |
| | | | | HELPED FISH TOOLS, HELPED LEAKY | 28 | 1 HR |
| | | | | 299-W18-1 | | |
| | | | | MEETING WITH KAISER AND BATTELLE 3:00-3:30PM | | |
| | | | | Carolyn Bolz | | |
| | | | | 7-8-87 | | 1 |
| | | | | | 10 HRS | D LUDTKE. |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B-2237

# DRILL LOG

| By | Rig # | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| D LUDTKE | 2 | 299-W18-21 | | |
| Date: 7-9-87 | Blazo | Depth: To | | Subcontract No.: KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time ITEM | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | STOOD BY WAITING TO FIND OUT IF I COULD | 30 | 4 HRS |
| | | | | SET SCREEN AND PUMP | 31 | 4 HRS |
| | | | | | | |
| | | | | | | |
| | | | | HELPED LENNY | 6 HRS | |
| | | | | | | |
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| | | | | Carolyn Lady 7-10-87 | | |
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| | | | | | 10 HRS | D LUDTKE |
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REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B-2238

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| D. LUOTKE | #2 BEZZW | 299-W18-21 | | Subcontract No. KEH-1914 |
| Date 7-10-87 | | Depth To | | |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time ELAP. | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | SET SCREEN 299-W18-21 - PULLED BACK 6½' | 16 | 20' x 8" |
| | | | | 8" CASING PUT 1¼ SACKS SILICA SAND IN | 15 | 14'-6" |
| | | | | BOTTOM UNDER SCREEN | 20 | 1¼ SACKS |
| | | | | | 30 | 4 HRS |
| | | | | HELPED LENNY SET SCREEN AND GET | 31 | 4 HRS |
| | | | | RIGGED UP FOR PUMP TEST 299-W8-1 | | |
| | | | | | | |
| | | | | SET 8" SCREEN ROMERS WELL PULLED | | |
| | | | | 6' x 8" CASING | | |
| | | | | | | |
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| | | | | | 12 MIN | D LUOTKE |
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REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-86)

8-B.2239

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| D. LUDTKE | | 299-W19-21 | | |
| Date: 7-13-87 | | Depth: 226' To | | Subcontract No.: HEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time - TEAL | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | PULLED 2' PIPE | 28 | 2 ½ HRS |
| | | | | BOILED WELL 2½ HRS | 29 | 4 HRS |
| | | | | SET 15 HORSE SUB. | 30 | 3½ HRS |
| | | | | SET ¾" TRIMY PIPE | 31 | 3½ HRS |
| | | | | HELPED BILL AT HIS | | |
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| | | | | | 10 HRS | D. LUDTKE |
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REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-8000-021 (5 86)

8-B.2240

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| D. LUDTKE | # 2 | 299-W15-21 | | |
| Date: 7-14-87 | BE 22W | Depth: To 225' | | Subcontract No. KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time (TEM) | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | FINISHED LAYING OUT DISCHARGE LINE | 29 | 15 HRS |
| | | | | WAITED 2 HRS FOR RAMPS TO BE PUT OVER DISCHARGE LINE | 30 | 2 HRS |
| | | | | STARTED PUMP TEST | | |
| | | | | SP. Ann Lud 7-14-87 | | |
| | | | | | 17 HRS | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B-2241

| DRILL LOG | By D. L. WOTHE | Rig # 2 Bexar | Well Number 299-WIS-21 | Computer Number | Project or Work Order No. |
|---|---|---|---|---|---|
| | Date 7-15-87 | | Depth To | | Subcontract No. KEH 1514 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time LEAS | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | REMOVED PUMP FROM WIS-21, TOOK IT | 29 | 9 HRS |
| | | | | TO LAY DOWN YARD AND WASHED IT | 30 | 1 HR |
| | | | | STOOD BY FOR 1 HR, SECURITY HAD PRACTICE | | |
| | | | | AT Z PLANT, INSTALLED PUMP IN RUSS'S | | |
| | | | | WELL STARTED LAYING OUT DISCHARGE | | |
| | | | | LINE | | |
| | | | | NOTE: 1 hour standby for military exercise | | |
| | | | | SP Dillard 7-15-87 | | |
| | | | | | 10 HRS | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B-2242

# DRILL LOG

| By | Rig # | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| D. LUDTKE | BE 22W | 299-W18-21 | | |
| Date: 7-16-87 | | Depth: — To — | | Subcontract No.: KEH 1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | MOVED DISCHARGE PIPE AND LAYED OUT | 29 | 7½ HRS |
| | | | | FOR RUSS'S TEST. | | |
| | | | | HELPED LENNY | 30 | |
| | | | | STOOD BY FOR RADIATION MONITOR | 30 | 2 HRS |
| | | | | HAD TO GO GET PENCIL DOSIMETER | 30 | 30 MIN. |
| | | | | J.S. Hill THC 7/16/87 | | |
| | | | | | 10 HRS | D LUDTKE |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000 021 (5-85)

B-B-2243

# DRILL LOG

| By | Rig # | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| D. LUDTKE | BE22W | 299-W18-21 | | |
| Date: 7-17-87 | | Depth: To 226 | | Subcontract No.: KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time Item | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | LOADED UP 30' OF 4" STAINLESS SCREEN | 17 | 30' |
| | | | | AND 200' OF 4" STAINLESS COLUMN PIPE AND | 18 | 200' |
| | | | ! | HAULED TO WELL SIGHT, INSTALLED | 20 | 5 SACKS |
| | | | | STAINLESS IN WELL | | |
| | | | | PUT 5 SACKS OF SAND IN WELL WHICH | | |
| | | | | BROUGHT IT UP TO 20Z' | | |
| | | | | D. Ludtke PHE 7/17/87 | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | 8 HRS | D. LUDTKE |
| | | | | | | |
| | | | | | | |
| | | | | | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000 021 (5-85)

8-B-2244

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| D. LUDTKE | 42 | 24-W18-21 | | |
| Date | BEZZW | Depth | | Subcontract No. |
| 7-30-87 | | To 225' | | KEH. 1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time ITEM | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | PULLED 50' OF 8" CASING | 15 | 56'x8" CASING |
| | | | | MIXED UP 400 GALLONS OF VOLCLAY GROUT | 22 | 16 SACKS |
| | | | | USED 16 SACKS OF VOLCLAY | 20 | 6 SACKS |
| | | | | " 16 SACKS OF INKIATOR | 21 | 2 BUCKETS PELLETS |
| | | | | PLACED 6 SACKS OF SILICA SAND BETWEEN | | |
| | | | | 8" CASING AND 4" STAINLESS | | |
| | | | | PAUL 7/28/87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-88)

8-8.2245

# DRILL LOG

| By | Rig # | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| D LUDIKE | 2 | 299-1018-S1 | | |
| Date | Bazo | Depth To | | Subcontract No. |
| 7-21-87 | | | | KEH-1414 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time 1 TEAM | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | PULLED 160' OF 8" CASING AND LAYED | | 160' OF 8" |
| | | | | IT DOWN | | |
| | | | | PULLED 33' OF 10" CASING AND LAYED | | 33 OF 10" |
| | | | | IT DOWN | | |
| | | | | PAL 7/21/87 | | |
| | | | | | 10 HRS | D LUDIKE |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5 85)

8-8.2246

# DRILL LOG

| By | Rig | Well Number | Project or Work Order No |
|---|---|---|---|
| D. LUDTKE | # 2 | 299-W19-21 | |
| Date | | Depth | Subcontract No. |
| 7-22-87 | BEZZU | To 225' | KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | PULLED 50' OF 10" CASING | | 50' x 10" |
| | | | | add 200 gal ~ (8 sacks of Volclay grout to hole | | |
| | | | | CASING PULLED HARD | | |
| | | | | S. W. Pike 7/22/87 | | |
| | | | | | 10 HRS | D. LUDTKE |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ... Standing Water

A 6000 021 15 85)

8-B-2247

WELL 299-W18-22

Battelle
Pacific Northwest Laboratories

# Well Completion Report/Title III Inspection List

Project: 200 West RCRA Well Drilling
Location: Hanford Site 200 West
Driller: Kelly Olsen
Drilling Co.: Onsago Drilling
Geologist: K Oster SP Airhart SS Teel, K Bishop, T Gilmore, JS Wilbur

Well Number: 299-W18-22
Temporary Well Number: none
Coordinates: N.38, N.37,837 W. 78,109
Casing Elevation: 668.49
Ground Elevation: 666.49

## DRILLING METHOD

Rotary Air ____ Mud ____
Cable Tool D ____ H 0'-455'
Drilling Fluid Water
Other ____

## COMPLETION DATA

Drilled Depth: 455'
Completion Depth: 447'
Date Started: 6/12/87 Completed: 9/25/87
Static Water Level/Date: 198.99 8/27/87

## CASING DATA

| Type | Size | | |
|---|---|---|---|
| Type 304 Stainless Steel Casing | 4" diameter | +2.01' to | 416.5' |
| | | to | |
| | | to | |

Approved By: S.P.A. Date: 10/1/87

## PERFORATIONS

Type: ____

| Depth | | Schedule |
|---|---|---|
| ____ | ____ | ____ |
| ____ | ____ | ____ |
| ____ | ____ | ____ |

App. By ____ Date ____

## SCREEN

Telescoping 6" diameter type 304SS / 4" dia type 304SS

| Type | Continuous Wrap | Continuous Wrap |
|---|---|---|
| Length | 10' | 31' |
| Slot Size | 30 | 20 |
| Depths | 437.5'- 447.5' | 416.5'- 447.5' |

App. By S.P.A. Date 10/1/87

## ANNULAR SEAL

| Type | Interval | Volume |
|---|---|---|
| COLORADO SILICA SAND | 410'-455' | 15.24 ft³ |
| VOLCLAY PELLETS | 404'-410' | 2.05 ft³ |
| VOLCLAY GROUT | 199'-404' | 294.11 ft³ |
| BENTONITE DRY | 3'-189' | 878.47 |
| BENTONITE SLURRY | | ~~878.47~~ ft³ |
| CONCRETE | 0'-3' | |

S PA

App. By S.P.A. Date 10/1/87

## GEOPHYSICAL LOGGING

| Sondes | Interval | Date |
|---|---|---|
| Neutron | 0'-455' | 8/12/87 |
| Density | 0'-455' | " |
| Natural Gamma | 0'-455' | " |
| | -' | |
| | -' | |
| | -' | |
| | -' | |

Approved By: JS Wilbur Date: 8/12/87

## AQUIFER TESTING

Type of Test: Constant Discharge Test
Length of Test: 8 hrs.
Volume Pumped: 24,500 gal
Drawdown: 74.62

Approved By: JS Wilbur Date: 8/26/87

## OTHER APPLICABLE ITEMS

- NA Steam Cleaning
- NA Storage of Const. Material
- NA Tool Lubricants
- NA Concrete Pad
- NA Protective Steel Posts
- NA Safety Paint
- NA Straightness Test
- NA Well Development
- NA Downhole TV Inspection
- NA Well Abandonment
- NA Complete As-Built Diagram, Driller's and Geologist's Logs

Approved By: JS Wilbur Date: 9/5/87

Reviewed By: D.L. McMillan Date: 1-8-88

A-1800-187 (3/87)

8-B.2249

INSPECTION PLAN
CONSTRUCTION PROJECT KEH-1914 (B-677)

Prepared by
U.S. Department of Energy
Pacific Northwest Laboratory
Operated by
Battelle Memorial Institute

PNL

Project Manager — 5/18/87 Date

Facilities Engineering — 5/18/87 Date

PNL Cognizant QA Engineer — 5/18/87 Date

RHO Concurrence:

Construction Engineer — 5/28/87 Date

Quality Assurance — 5-22-87 Date

DOE-RL Concurrence

Project Engineer — 6-1-87 Date

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| MONITORING WELL CONSTRUCTION | 3 |
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## PREFACE

This Inspection Plan identifies the inspections required and the responsible people to perform the inspections of the monitoring wells to be constructed under contract KEH-1914 (8-677).

The inspection of well construction activities is intended to provide assurance that the work performed by construction forces is in accordance with the approved contract documents. The degree of inspection is commensurate with the significance of the monitoring wells with regard to function and safety.

### Inspectors

Listed below are the names of the individuals whose initials appear within this inspection plan.

| Name | Initial | Organization | Job Title |
|---|---|---|---|
| Mel Colby | | KEH | Contract Administrator |
| Tom Nemzek | | KEH | Contract Engineer |
| Jim Mortimer | | KEH | Contract Administrator |
| Steve Airhart | | PNL | Field Geologist |
| Tyler Gilmore | | PNL | Field Geologist |
| Scott Wilbur | | PNL | Field Geologist |

The PNL project manager has reviewed the conceptual inspection plan and is satisfied that all the applicable inspections of the work were made during the construction of the wells.

PNL Project Manager — Date: 1-8-88

## CONSTRUCTION INSPECTION SERVICES

Described herein are the inspection services to be provided and documented by PNL.

### Pre-Award Submittal Review

| | Item | Contract Reference | Initial | Date |
|---|---|---|---|---|
| 1. | Verify contractor and drillers are licensed for well drilling in the State of Washington. | 01100-1.2<br>01300-1.2.1A | [illegible] | 5-7-87 |
| 2. | Verify cable tool drilling experience is five years or more with drive barrel and hard tool. | 01100-1.2 | [illegible] | 5-7-87 |
| 3. | Verify documentation of ground-water monitoring wells drilled by contractor. | 01100-1.2 | [illegible] | 5-7-87 |
| 4. | Verify contractor submitted description of drilling method and equipment. | 01300-1.2.1B | [illegible] | 5-7-87 |
| 5. | Verify contractor submitted resumes of personnel. | 01300-1.2.1C | [illegible] | 5-7-87 |

### Procurements

Verify materials to be furnished to the contractor are as described in the construction specification.

| | Item | Contract Reference | Initial | Date* |
|---|---|---|---|---|
| 1. | Stainless steel screen (8 inch telescope size). | 01100-1.5A | [illegible] | 5-15-87 |
| 2. | Stainless steel screen (4 inch). | 01100-1.5B | TN | 5-15-87 |
| 3. | Centralizers. | 01100-1.5C | TN | 5-15-87 |
| 4. | Stainless steel casing (4 inch). | 01100-1.5D | TN | 5-15-87 |

| | Item | | Contract Reference | Initial | Date |
|---|---|---|---|---|---|
| 5. | Artificial sand packs. | | 01100-1.5E | TN | 5-15-87 |
| 6. | Bentonite pellets. | | 01100-1.5F | TN | 5-15-87 |
| 7. | Bentonite grout. | | 01100-1.5G | TN | 5-15-87 |
| 8. | Granular bentonite. | | 01100-1.5H | TN | 5-15-87 |
| 9. | Sack crete. | | 01100-1.5I | TN | 5-15-87 |
| 10. | Portland cement. | | 01100-1.5J | TN | 5-15-87 |
| 11. | Well cap. | | 01100-1.5K | TN | 5-15-87 |
| 12. | Brass survey marker. | | 01100-1.5L | TN | 5-15-87 |
| 13. | Sample jars. | | 01100-1.5M | TN | 5-15-87 |
| 14. | Hydrologic sampling equipment. | | 01100-1.5O | TN | 5-15-87 |
| 15. | Drive shoes. | | 01100-1.5P | TN | 5-15-87 |
| 16. | Carbon steel casing. | a. 16 inch | 01100-1.5Q | TN | 5-15-87 |
| | | b. 12 inch | 01100-1.5Q | TN | 5-15-87 |
| | | c. 10 inch | 01100-1.5Q | TN | 5-15-87 |
| | | d. 8 inch | 01100-1.5Q | TN | 5-15-87 |
| 17. | Guard posts. | | 01100-1.5R | TN | 5-15-87 |
| 18. | Paint: primer | | 01100-1.5S | TN | 5-15-87 |
| | finish enamel | | 02011-3.5I | TN | 5-15-87 |

Performance Submittals

| | Item | Contract Reference | Initial | Date |
|---|---|---|---|---|
| 1. | Verify submission and approval of construction schedule. | 01300-1.2.2A | JM | 10/29/87 |
| 2. | Verify drilling logs are submitted daily. | 01300-1.2.2B | JM | 10/29/87 |
| 3. | Verify submission and acceptability of flow meter certification. | 01300-1.2.2C | JM | 10/29/87 |

Well Number 299-W18-22

The remaining sections of this inspection plan shall be completed for each well.

Well Drilling Activities

| | Item | Contract Reference | Initial | Date |
|---|---|---|---|---|
| 1. | Verify wells are constructed in continuous operation. | 01100-1.3 | JSH | 10/1 |
| 2. | Verify contractor uses approved water source. | 01600-2.0 | JSH | 10/1 |
| 3. | Verify beveled edge is cut on temporary casing by contractor. | 01600-2.1A | JSH | 10/1 |
| 4. | Verify suitability of split spoon sampling equipment. | 01600-2.2 | JSH | 10/1 |
| 5. | Steam cleaning equipment. | 01600-2.3 | JSH | 10/1 |
| 6. | Aquifer testing equipment. | 01600-2.4 | JSH | 10/1 |
| 7. | Verify contractor has copy of WAC Chapter 173-160 "Minimum Standards for Construction and Maintenance of Water Wells" and the construction specification at the jobsite. | 02011-1.2 | JSH | 10/1 |
| 8. | Verify contractor has a copy of all addendums and change orders at the jobsite. | 02011-1.2 | JSH | 10/1 |

Monitoring Well Construction

| | Item | Contract Reference | Initial | Date |
|---|---|---|---|---|
| 1. | Verify proper technique of cable tool drilling. | 02011-3.1.1 | JSH | 10/1 |
| 2. | Verify proper technique of air rotary drilling. | 02011-3.1.2 | NA | NA |

Well Number 299-W18-22

| | Item | Contract Reference | Initial | Date |
|---|---|---|---|---|
| 3. | Verify steam cleaning is being done properly. | 02011-3.1.3 | J.S.W | 10/1 |
| 4. | Verify contractor is handling and storing construction materials properly. | 02011-3.1.4 | J.S.W | 10/1 |
| 5. | Verify the contractor uses proper tool lubricants. | 02011-3.1.6 | J.S.W | 10/1 |
| 6. | Verify only approved drilling additives are used. | 02011-3.1.7 | J.S.W | 10/1 |
| 7. | Verify the proper disposal of drill cuttings and water. | 02011-3.1.8 | J.S.W | 10/1 |

Well Testing

| | Item | Contract Reference | Initial | Date |
|---|---|---|---|---|
| 1. | Verify water-level measurements are taken. Note in log. | 02011-3.2.1 | J.S.W | 10/1 |
| 2. | Verify the bottom of temporary casing is free of plugging material at end of each day. Note in log. | 02011-3.2.1 | J.S.W | 10/1 |
| 3. | Verify ground-water samples are taken when needed. | 02011-3.2.2 | J.S.W | 10/1 |
| 4. | Verify aquifer testing was done at ~~each~~ well 299-W18-22 | 02011-3.2.3 | J.S.W | 10/1 |
| 5. | Verify formation samples are taken as required. | 02011-3.3 | J.S.W | 10/1 |

Well Number 299-[redacted]W/8-22

Borehole Construction

| | Item | Contract Reference | Initial | Date |
|---|---|---|---|---|
| 1. | Verify temporary casing is telescoped at no more than 100 feet intevals. | 02011-3.4A | ASH | 10/1 |
| 2. | Verify depth of well. | 02011-3.4B | ASH | 10/1 |
| 3. | Verify proper action is taken if overdrilling occurs. | 02011-3.4C | ASH | 10/1 |
| 4. | Verify acceptable passing of alignment test. | 02011-3.4D | ASH | 10/1 |
| 5. | Verify all temporary casing is removed from the well. | 02011-3.4E | ASH | 10/1 |

Well Construction

| | Item | Contract Reference | Initial | Date |
|---|---|---|---|---|
| 1. | Verify position of 8 inch screen and pullback of casing to expose screen. | 02011-3.5A | ASH | 10/1 |
| 2. | Verify adequate well development. | 02011-3.5B | ASH | 10/1 |
| 3. | Witness aquifer test. | 02011-3.5B | ASH | 10/1 |
| 4. | Verify proper setting of 4 inch screen, casing, and centralizer. | 02011-3.5C | ASH | 10/1 |
| 5. | Verify proper placement of sand pack. | 02011-3.5D | ASH | 10/1 |
| 6. | Verify proper location and thickness of bentonite pellet seal. | 02011-3.5E | ASH | 10/1 |
| 7. | Verify proper mixing, placement, and location of Volclay bentonite-based grout. | 02011-3.5F | ASH | 10/1 |

Well Number 299-W18-2

| | Item | Contract Reference | Initial | Date |
|---|---|---|---|---|
| 8. | Verify proper concrete seal at top of well. | 02011-3.5G | ASW | 10/1 |
| 9. | Verify proper construction of concrete pad and placement of brass survey marker. | 02011-3.5H | ASW | 10/1 |
| 10. | Verify proper placement, construction, and painting of guard posts. | 02011-3.5I | ASW | 10/1 |
| 11. | Verify contractor cleans up site and properly stores excess materials. | 02011-3.5J | ASW | 10/1 |
| 12. | If abandonment of well occurs, verify proper abandonment. | 02011-3.6 | ASW | 10/1 |
| 13. | Verify contractor maintains the drill log daily. | 02011-3.7 | ASW | 10/1 |
| 14. | Prepare punchlist at construction completion for exceptions. | | NA | NA |

Battelle
Pacific Northwest Laboratories

# AS-BUILT DIAGRAM

Well Number 299-N18-22 Geologist K. Oster, S. Arnart, T. Gilmore, S. Teel, S. Wilbur Page 1 of 4

Reviewed by T.L. McKlem Date 1-8-88

| Construction Data | | Depth in Feet | Geologic/Hydrologic Data | |
|---|---|---|---|---|
| Description | Diagram | | Diagram Litho. | Lithologic Description |
| concrete surface seal (0'-3') | | 5' | | Sand |
| Dry bentonite (3'-15') | | 10' | | Sand |
| (0'-50'6") 20" dia. Carbon Steel Casing | | 15' | | Sand |
| (0'-150'1") 16" dia. Carbon Steel Casing | | 20' | | |
| (0'-250'11") 12" dia. Carbon Steel Casing | | 25' | | Sand, Gravel |
| (0'-342'6") 10" dia. Carbon Steel Casing | | 30' | | Slightly Silty Sand |
| (0'-458'1½") 8" dia. Carbon Steel Casing | | 35' | | |
| NOTE: All carbon Steel | | 40' | | Slightly Gravelly Sand |
| casing removed. | | 45' | | Sandy Gravel |
| | | 50' | | Silty Sandy Gravel |
| 4" dia. Stainless Steel Casing | | 55' | | Sandy Gravel |
| | | 60' | | Gravel |
| | | 65' | | Sandy Gravel |
| | | 70' | | Slightly Silty Gravel |
| | | 75' | | |
| | | 80' | | Silty Sand |
| Bentonite Slurry (15'-105') | | 85 | | |
| | | 90' | | |
| | | 95' | | Sandy Silt |
| | | 100' | | Sandy Silty Clay |
| | | 105' | | |
| | | 110' | | |
| | | 115' | | Silty/Clayey Sand |
| | | 120' | | Sandy Silt |
| | | 125' | | |
| | | 130 | | |

A-1800-186 (3/87)

Battelle
Pacific Northwest Laboratories

# AS-BUILT DIAGRAM

Well Number 299-W18-22 Geologist K. Oster, S. Airhart, T. Gilmore, S. Teel, S. Wilbur Page 2 of 4

Reviewed by W. K. McGhan Date 1-8-88

| Construction Data | | Depth in Feet | Geologic/Hydrologic Data | |
|---|---|---|---|---|
| Description | Diagram | | Diagram Litho. | Lithologic Description |
| | | 135' | | Silt |
| | | 140' | | Gravelly Sandy Silt/Clay |
| | | 145' | | |
| | | 150' | | Silty Sandy Gravel |
| | | 155' | | Sandy Gravel |
| | | 160' | | Silty Sandy Gravel |
| | | 165' | | |
| | | 170' | | |
| | | 175' | | |
| | | 180' | | Sandy Gravel |
| | | 185' | | |
| | | 190' | | |
| | | 195' | | Gravelly Silty Sand |
| Volclay Grout (189'-404') | | 200' | | Silty Sandy Gravel |
| | 198.98' 4/21/87 | 205' | | Silty Clayey Sandy Gravel |
| | | 210' | | Silty Sandy Gravel |
| | | 215' | | |
| | | 220' | | |
| | | 225' | | |
| | | 230' | | |
| | | 235' | | |
| | | 240' | | silty Gravelly Sand |
| | | 245' | | |
| | | 250' | | Gravelly Sand |
| | | 255' | | Slightly Silty Gravelly Sand |
| | | 260' | | slightly Gravelly Silty Sand |

A-1800-186 (3/87)

Battelle
Pacific Northwest Laboratories

# AS-BUILT DIAGRAM

Well Number 299-W18-22 Geologist K. Oster, S. Airhart, T. Gilmore, S. Teel, J.S. Wilbur Page 3 of 4

Reviewed by V.K. McGlaun Date 1-8-88

| Construction Data | | Depth in Feet | Geologic/Hydrologic Data | |
|---|---|---|---|---|
| Description | Diagram | | Diagram Litho. | Lithologic Description |
| | | 265' | | Slightly Gravelly Silty Sand |
| | | 270 | | slightly gravelly slightly silty sand |
| | | 275' | | |
| | | 280' | | Slightly Gravelly Sand |
| | | 285' | | Gravelly Sand |
| | | 290' | | Slightly Gravelly Silty Sand |
| | | 295' | | Gravelly Silty/Clayey Sand |
| | | 300' | | Silty Gravelly Sand |
| | | 305' | | |
| | | 310' | | Silty/Clayey Gravelly Sand |
| | | 315' | | |
| | | 320' | | |
| | | 325' | | |
| | | 330' | | |
| | | 335' | | Gravelly Silty Sand |
| | | 340' | | Gravelly Sand |
| | | 345' | | Silty Gravelly Sand |
| | | 350' | | |
| | | 355' | | |
| | | 360' | | Gravelly Silty Sand |
| | | 365' | | |
| | | 370' | | |
| | | 375' | | |
| | | 380' | | |
| | | 385' | | |
| | | 390' | | Silty Sand |

A-1800-186 (3/87)

Battelle
Pacific Northwest Laboratories

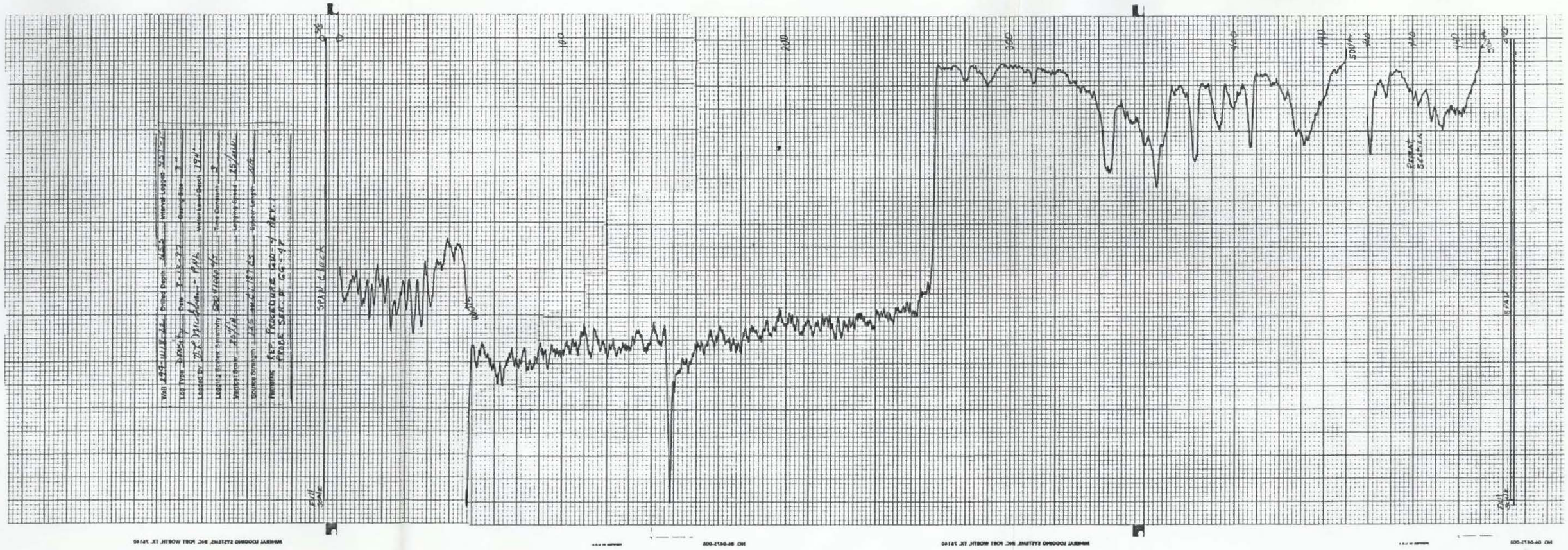
# AS-BUILT DIAGRAM

Well Number 299-W18-22 Geologist K. Oster, S. Airhart, T. Gilmore, S. Teel, J.S. Wilbur Page 4 of 4

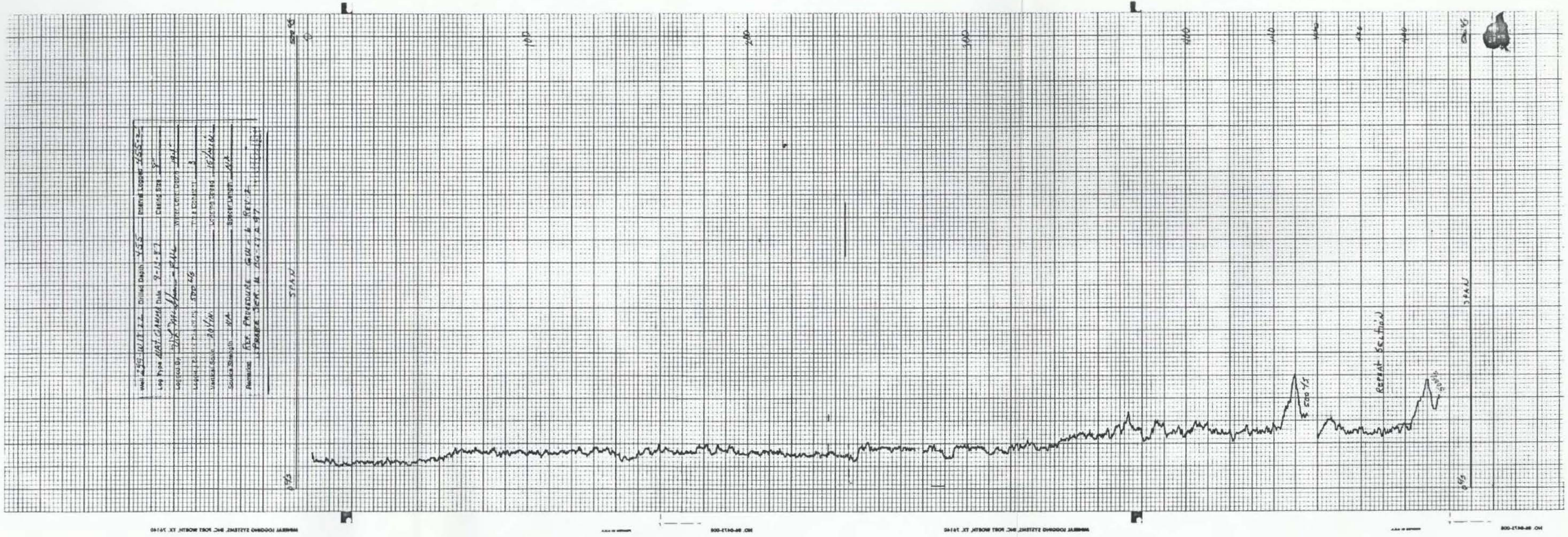
Reviewed by V.L. McGhan Date 1-8-88

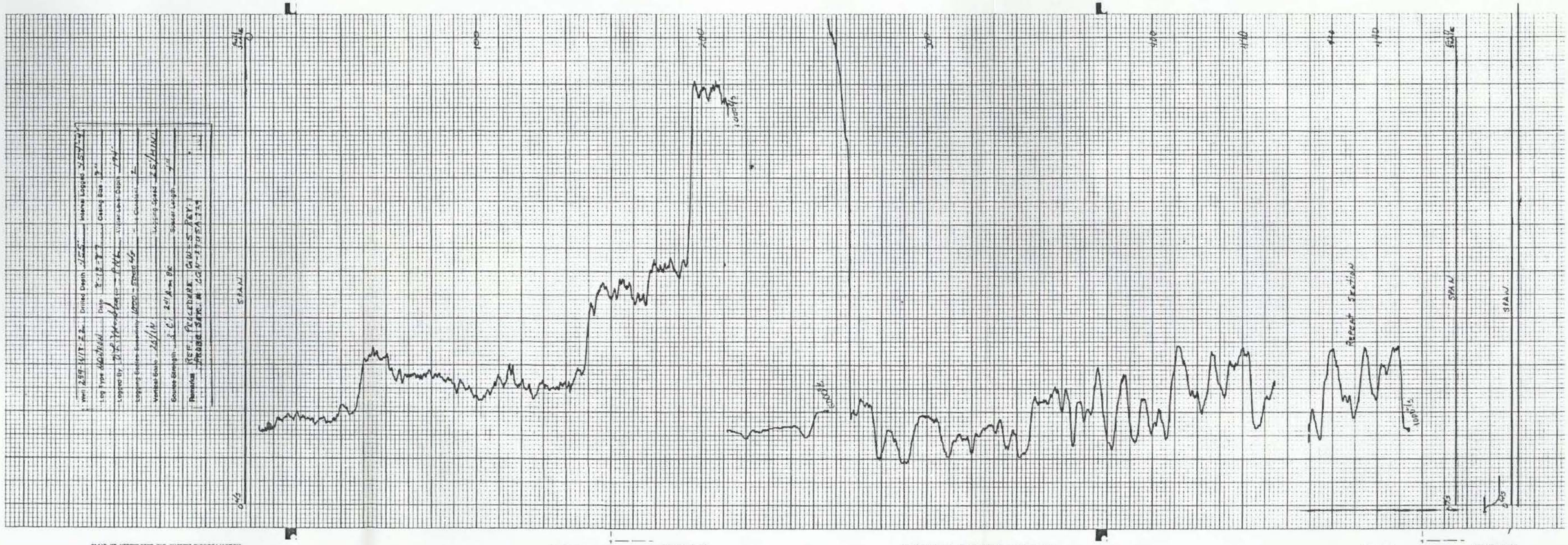
| Construction Data | | Depth in Feet | Geologic/Hydrologic Data | |
|---|---|---|---|---|
| Description | Diagram | | Diagram Litho. | Lithologic Description |
| | | 395' | | Silty Sand |
| | | 400' | | |
| | | 405' | | |
| Volclay Pellets (404'-410') | | 410' | | |
| | | 415' | | |
| 10-20 mesh Colorado Silica Sand (410'-455') | | 420' | | Slightly Gravelly, Silty Sand |
| | | 425' | | |
| 4" 20 slot S.S. screen (446.5-447.5) | | 430' | | |
| | | 435' | | Silty Gravelly Sand |
| | | 440' | | |
| 6" S.S. telescoping screen (437.5-447.5') | | 445' | | Silty Gravelly Sand |
| | | 447' | | Brownish/Gray Clay |
| | | 450' | | Slightly Gravelly, Sandy Clay |
| Back filled w/ sand | | 455' | | Clay |
| Depth to bottom of hole @ 455' | | | | |

A-1800-186 (3/87)


Well
Drilled Depth
Interval Logged
Log Type
Date
Casing Size
Logged By
Written Lower Depth
Logging System Serial No.
Time Constant
Logging Speed
Viscosity
Sonde Length
Remarks
STARTING
FINAL

8-B.2263


Repeat Section


Well 259-5X/T-22
Logged by
Remarks
SPAN
SPAN
SPAN
Recent station

Kelly

| DRILL LOG | By K.R.Oster | Rig Bucyrus Erie 22W Onwa 3.0 Rig #6 | Well Number 299-W18-22 | Computer Number N/A | Project or Work Order No. KEH-1914 (PNL) |
|---|---|---|---|---|---|
| | Date 6/2/87 | | Depth 0' To 4' | | Subcontract No. N/A |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Driller is Kelly Olson. | | Tool Lubricant used is |
| | | | | Set up guide wires for rig stabilization | | Chevron Poly FM |
| | | | | Put on hard tool bit. 20' 5.5" section of 20" casing steam cleaned | 11:10 | Grease - 2 |
| | | | | Welding drive shoe on 20" carbon steel casing | 11:20 | |
| | | | | Welding metal plates to side of casing to keep it from | 13:10 | |
| | | | | slipping down the hole. | | |
| 20' 5.5" of 20" | | | | Set 20' 5.5" section of 20' carbon steel casing in hole | 1330 | |
| | | | | that was hand dug to 1'. | | |
| | | | | Welded more passes on drive shoe. | 1335 | |
| | | | | Added 70 gallons of drilling supply water to hole | 1420 | |
| | 1' | | | Started drilling | 1425 | Drill Rate = 3' in |
| | 4' | | | Stopped drilling due to loose bearing cap | 1440 | 1/4 hour |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

REMARKS: Total of 70 gallons of drilling supply water added today.

Karen P. Oster
6/2/87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000 021 (5-85)

8-B.2269

Kelly

| DRILL LOG | By K.R Oster | Rig Bucyrus Erie 22W Onveso #16 | Well Number 299-W18-22 | Computer Number N/A | Project or Work Order No. KEH-1914 (PNL) |
|---|---|---|---|---|---|
| | Date 6/3/87 | | Depth 4' To 10' | | Subcontract No. N/A |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Went to get water truck | 0730 | |
| | | | | Pulled out 20" casing because it was crooked | 0930 | |
| Open Hole | 5' | shovel | Wet | VERY FINE SAND, 1% v.c. pebbles, 2% c. pebbles, 2% f. and v.f. pebbles, 1% v.c.s, 2% c.s, 2% m.s, 40% f.s, 45% v.f.s, 5% silt. Sample is well sorted fine to v. fine sand with a few pebbles and 1 small cobble, Gravels are 100% basalt and are subrounded. Sands are very angular to subangular, and are 60% quartz, 30% basalt, and 10% other sands. Wet color is olive brown (2.5Y 4/4), Dry color is light brownish gray (10YR 6/2), Sands have a strong reaction in 10% HCl. Sample is unconsolidated and geologic sample is representative but does not include the small cobble. | 0950 | |
| 20'5.5" | | | | Reset 20'5.5" of 20" casing in hole and started drilling | 1000 | Drill rate = 5' in 1.5 hours. |
| | | | | Added 50 gallons drilling supply water. | | |
| | 10' | H | Wet | MEDIUM SAND, 3% v.f. pebbles, 15% vcs, 20% cs, 25% m.s, 20% fs, 15% vfs, 2% silt Sample is poorly sorted sands, the few v.f. pebbles are 95% basalt and 5% other lithologies and are angular to subangular. Sands are 50% basalt, | 1100 | |

REMARKS:

Karen R. Oster
6/3/87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (6-85)

8-B.2270

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| K.R. Oster | Bucyrus Erie 22W Onuego Rig #6 | 299-W18-22 | N/A | KEH-1914 (PNL) |
| Date: 6/3/87 | | Depth: 10' To 10' | | Subcontract No.: N/A |

Kelly

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | 40% quartz and 10% other sands and are v. angular to subangular, | | |
| | | | | Wet Color is brown (10YR 5/3), Dry Color is light | | |
| | | | | brownish gray (2.5Y 6/2). Sands have very strong reaction | | |
| | | | | in 10% HCl. Sample is unconsolidated and geologic sample | | |
| | | | | is representative. Increase in basalt content and grain | | |
| | | | | size from previous sample. | | |
| | | | | Added 30 gallons drilling supply water to hole | 1120 | |
| | | | | Stopped drilling - cable is frayed at rope socket. | 1130 | |
| | | | | Fix rope socket cable. | 1135 | |
| | | | | Started drilling | 1445 | |
| | | | | stopped drilling | 1500 | |

REMARKS: Total of 80 gallons drilling supply water added today.

Karen R. Oster
6/3/87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B-2271

| DRILL LOG | By K.R. Oster | Rig Bucyrus Erie 22W Kelly Onwego Rig #6 | Well Number 299-W18-22 | Computer Number N/A | Project or Work Order No. KEH-1914 (PNL) |
|---|---|---|---|---|---|
| | Date 6/4/87 | | Depth 10' To 15' | | Subcontract No. N/A |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Pound Casing, Added 50 gallons drilling supply water and started drilling. | 0830 | |
| | 15' | H | Wet | MEDIUM TO VERY COARSE SAND, 3% f. pebbles, 5% v.f. pebbles, 25% v.c.s, 30% cs, 25% ms, 5% fs, 4% vfs, 3% silt. Sample is well sorted, Gravels are 90% basalt, 5% quartz-rich, and 5% others and are subangular to subrounded when not broken by hard tool. Sands are 50% basalt sands, 40% quartz sands and 10% other sands, and are very angular to subangular in shape. Wet color is dark grayish brown (2.5Y 4/2), Dry color is light brownish gray (2.5Y 6/2), Sands have a strong reaction in 10% HCl. Sample is unconsolidated and similar to previous sample except grain size increases. | 1130 | |
| | | | | Steam clean 20' section of 20" carbon steel casing. | 1200 | |
| | | | | Cut 20' section of 20" casing in half | 1400 | |
| | | | | | | |
| | | | | | | |

REMARKS: Added 50 gallons of drilling supply water to hole today

Karen P Oster
6/4/87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2272

Kelly

| DRILL LOG | By TJ Gilmore | Rig Bucyrus Erie 22W Onuego Rig 6 | Well Number 299-W18-22 | Computer Number N/A | Project or Work Order No. KEH-1914 (PNL) |
|---|---|---|---|---|---|
| | Date 6/5/87 | | Depth 15' To 20' | | Subcontract No. N/A |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 20' 5⅛" | | | | | 08:30 | |
| 30' 5½" | | | | Add 10' of 20" Casing Total = 30' 5½" | | |
| | 20' | H | W | SANDY GRAVEL | 13:15 | ~30 gal H2O |
| | | | | Gravel 62% medium Pebble, 8% very fine Pebble; Sand 70% Coarse Sand | | |
| | | | | 15% Medium Sand 15% Fine Sand 5% V Fine Sand 5% Silt; | | |
| | | | | Moderate - Poor Sort; 70% Basalts 30% Silica-Rich Gravels; | | |
| | | | | 50% Basalt 50% Silica-rich Sands; Few preserved clasts, | | |
| | | | | predom. fragmented - Subangular to angular; | | |
| | | | | olive, 5Y 4/4 (wet), 5Y 6/4 pale olive (dry); | | |
| | | | | moderate to very active in 10% HCl; No consolidation; | | |
| | | | | Increase in Gravel content from previous sample | | |

REMARKS:

6-8-87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2273

| DRILL LOG | By G.V. LAST | Rig CABLE TOOL | Well Number 299-W18-22 | Computer Number NA | Project or Work Order No. KEH-1914 |
|---|---|---|---|---|---|
| | Date 6-8-87 | #6 | Depth 24' To 36' | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | DRILLER ARRIVED | 0700 | Added 30 gals. |
| | 24-25' | H | WET | SLIGHTLY SILTY SAND; 5% VFP, 25% VCS, 25% CS, 15% MS, | 0825 | |
| | | | | 10% FS, 10% VFS, 10% SILT. Poorly sorted. Gravels are 80% | 0830 | RESUMED DRILLING |
| | | | | basalt, 20% quartzite & others. Sand is 50% basalt, | | Added 30 gals |
| | | | | 50% quartz & others. Gravels are angular (all broken up). | | |
| | | | | Sand is subrounded. Wet color is 5Y 4/2 olive gray; | | |
| | | | | Dry color is lt. olive gray (5Y 6/2). Moderate reaction to 10% HCl. | | |
| | | | | POORLY CONSOLIDATED. This sample at contact between | | |
| | | | | coarse sand and fine sand below. Contains both. | | |
| | 30-31' | H | WET | SLIGHTLY SILTY SAND; 10% CS, 30% MS, 25% FS, 25% VFS, 10% SILT. | 0914 | RESUMED DRILLING |
| | | | | Well sorted. Sand is 50% basalt, 50% other. Sand is subangular | | |
| | | | | to subrounded. Wet color is 5Y 4/2, olive gray; Dry color is | | |
| | | | | lt. olive gray (5Y 6/2). Reaction w/ 10% HCl is moderate. Formation is poorly | | |
| | | | | consolidated but stays open. Sample taken from top of flat | | |
| | | | | bottom bailer. Well not bailed between samples. Samples | | |
| | | | | represent formation between 25'-31'. | | |
| | 35'-36' | H | WET | SLIGHTLY SILTY SAND; trace of very small pebble. Includes some | 0930 | STOPPED DRILLING. |
| | | | | clay clasts; 10% VCS, 25% CS, 30% MS, 10% FS, 10% VFS, 15% SILT. | | |

REMARKS:

G.V. Last 6-8-87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (6-85)

8-B.2274

| DRILL LOG | By GV LAST | Rig Cable Tool #6 | Well Number 299-WRD-22 | Computer Number NA | Project or Work Order No. KEH - 5914 |
|---|---|---|---|---|---|
| | Date 6-8-87 | | Depth 36' To 40' | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | (CONTINUE). MODERATELY SORTED. GRAVELS ARE 50% basalt, 50% other, including clay/rip up clasts?). Sand is 50% basalt, 50% quartz and others. Sand is subangular. Wet color is 5Y 4/2, olive gray. Reaction to 10% HCl, is slight. Well was not bailed between 31' and 36', and borehole was open, so sample is probably a mixture with some slough. Sample is coarser than previous. Dry color is lt. gray (5Y 7/1). | | |
| 40' 6" | | | | | 11:24 | Welded on 6' ½" & 20" casing. Total 20" = 40' 6" |
| | | | | | 12:00 | Added 20 gal. $H_2O$. Resumed drilling. |
| | 39-40' | H | WET | SLIGHTLY GRAVELLY SILTY SAND; Trace of M Pebble, 5% FP, 5% VFP, 10% VCS, 25% CS, 25% MS, 10% FS, 10% VFS, 10% silt, Poorly sorted. Gravels are 70% basalt, 30% other; Sand is 40% basalt, 40% quartz & feldspar (white) & 20% other. Gravel is subrounded when not broken. Sand is subangular. Wet color olive gray. Reaction to 10% HCl is moderate-slight. Driller noted change in drilling conditions at 40' (gravels). Sample probably contains some. | 13:00 | |
| | | | | | 13:09 | Resumed drilling. |

REMARKS:

GV Last 6-8-87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-8.2275

| DRILL LOG | By GV LAST | Rig Cable Tool #6 | Well Number 299-W18-22 | Computer Number NA | Project or Work Order No. KEH-1914 |
|---|---|---|---|---|---|
| | Date 6-8-87 | | Depth 40' To 43' | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | (continuation) of this material. Sampled with flat bottom bailer. Not bailed since 36'. Sample is finer than previous one. | | |
| | | | | | 1500 | QUIT FOR THE DAY @ 43' |

REMARKS:

GV Last 6-8-87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2276

| DRILL LOG | By GV LAST | Rig CABLE TOOL #6 | Well Number 279-W18-22 | Computer Number NA | Project or Work Order No. KEH-1914 |
|---|---|---|---|---|---|
| | Date 6-9-87 | | Depth 43' To 44' | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 40'6" of 20" casing. | | | | | 0700 | STARTED DRILLING. |
| | | | | | | ADDED 40 GALS. $H_2O$. |
| | | | | Steam cleaned 20' section of 20" casing. | 0810 | Stopped drilling |
| | | | | Cut pipe in half. | 1115 | |
| 40'6" +10' 50'6" of 20" | | | | Welded 10'. of 20" carbon steel casing on. Total | 1140 | |
| | | | | 20" casing = 50'6" | | |
| | | | | | 1300 | Pound Casing. |
| | | | | | 1330 | Resumed drilling |
| | | | | | 1445 | Stopped drilling. |
| | | | | | | Pounded casing. |

REMARKS:

Karen P. Oster

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2277

8-B.2278

**DRILL LOG**

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| K.R.Oster | Kelly Cable Tool #6 | 299-W18-22 | N/A | KEH-1914 (PNL) |
| **Date** 4/10/87 | **Depth** 44' To 45' | | | **Subcontract No.** N/A |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | | 0700 | started drilling |
| | | | | | 0730 | stopped drilling |
| | | | | | 0810 | started drilling |
| | | | | | 0900 | Bailed Well |
| | | | | | 0910 | started drilling Added 25 gal. $H_2O$ |
| | | | | | 0930 | Drive Casing |
| | | | | | 1010 | started drilling |
| | | | | Drive head broke - welding back together. | 1115 | stopped drilling |
| | 44'-45' | H | Wet | SANDY GRAVEL, 2% vc pebble, 3% c. pebble, 10% m. pebble, | 1135 | |
| | | | | 10% f pebble, 15% v.f. pebble, 5% vcs, 10% cs, 10% ms, 15% fs, | | |
| | | | | 15% vfs, 5% silt. Very Poorly sorted. Gravels are 70% basalt, | | |
| | | | | 30% others, Sand is 50% basalt, 50% quartz and other sands. | | |
| | | | | Gravel is subrounded when not broken, sands are angular | | |
| | | | | to subangular. Wet color is olive gray (5Y 4/2) Dry | | |
| | | | | Color is light olive gray (5Y 6/2) Moderate reaction to | | |
| | | | | 10% HCl. Unconsolidated. Bailed prior to drilling | | |
| | | | | sample interval. Sampled with flat bottom bailer. | | |
| | | | | Geologic samples are representative. Change from | | |

REMARKS:

Karen R. Oster
4/10/87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

Kelly

| DRILL LOG | By K.R.Oster | Rig Cable Tool #6 | Well Number 299-W18-22 | Computer Number N/A | Project or Work Order No. KEH - 1914 (PNL) |
|---|---|---|---|---|---|
| | Date 6/10/87 | | Depth 45' To 49' | | Subcontract No. N/A |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | sands to gravels - Overall increase in grain size | | |
| | | | | from previous sample. | | |
| | | | | | 1140 | started drilling |
| | | | | | 1255 | Drive casing |
| | | | | help Darrel load casing | 1300 | stop driving casing |
| | | | | | 1400 | Started bailing |
| | | | | | 1410 | started drilling |
| | | | | | 1450 | Drive casing. |
| | | | | | 1455 | Stopped at 49' |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

REMARKS: Added 25 gallons Drilling Supply water to well today.

Karen R. Oster
6/10/87.

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2279

| DRILL LOG | By K.R. Oster | Rig Kelly Cable Tool #6 | Well Number 299-W18-22 | Computer Number N/A | Project or Work Order No. KEH-1914 (PNL) |
|---|---|---|---|---|---|
| | Date 6/11/87 | | Depth 49' To 50' | | Subcontract No. N/A |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 50'6" of 20" | | | | | 0750 | started drilling |
| | 49'-50' | H | Wet | SILTY SANDY GRAVEL, trace vcpebbles, 5% c pebbles, | 0800 | stopped drilling |
| | | | | 10% m. pebbles, 5% f. pebbles, 20% vf. pebbles, 5% vcs, | | |
| | | | | 5% cs, 10% ms, 5% fs, 10% vfs, 25% silt. Very poorly | | |
| | | | | sorted. Gravels are 70% basalt, 30% others, Sands are | | |
| | | | | 70% basalt, 30% other sands. Gravels are subrounded | | |
| | | | | when not broken. Sands are very angular to | | |
| | | | | subangular. Wet color is olive gray (5Y 4/2), Dry color | | |
| | | | | is light olive gray (5Y 6/2), Moderate reaction in 10% HCl. | | |
| | | | | Unconsolidated. Bailed prior to drilling sample interval. Sampled | | |
| | | | | with flat bottom bailer.. Geologic samples are representative. | | |
| | | | | Similar to previous sample except decrease in grain | | |
| | | | | size and increase in basalt content. | | |
| | | | | Steam cleaning 1 section of 16" carbon steel casing. | 0805 | |
| | | | | | 1130 | Added 50gal. H2O |
| | | | | | 1330 | started drilling |
| | | | | | 1430 | stopped drilling. |
| | | | | | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000 021 (5-85)

8-8.2280

Kelly

| DRILL LOG | By K.R. Oster | Rig Cable Tool #6 | Well Number 299-W18-22 | Computer Number N/A | Project or Work Order No. KEH-1914 (PNL) |
|---|---|---|---|---|---|
| | Date 6/12/87 | | Depth 50' To 50' | | Subcontract No. N/A |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 20'4" of 16" | | | | Set 20'4" of 16" carbon steel casing in hole | 0840 | |
| | | | | Welding round stock on bit. | 1005 | |
| 20'4" | | | | Weld on 19'11.5" of 16" carbon steel casing | 1130 | |
| 19'11.5" | | | | Total 16" casing = 110' 3.5". | | |
| 110' 3.5" of 16" | | | | | | |

REMARKS:

Karen R. Oster
6/12/87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2281

Kelly

| DRILL LOG | By L.R Oster | Rig Cable Tool #6 | Well Number 299-W18-22 | Computer Number N/A | Project or Work Order No. KEH-1914 (PNL) |
|---|---|---|---|---|---|
| | Date 6/15/87 | | Depth 50' to 52' | | Subcontract No. N/A |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 40' 3.5" of 16" | | | | Added 19' 11" of 16" carbon steel casing. Total | 0840 | |
| 19' 11" | | | | 16" casing = 60' 2.5". | | |
| 60' 2.5" | | | | Welding on new drive head during drilling | 1020 | Started drilling. |
| | | | | | 1225 | Add 40 gals $H_2O$ |
| | | | | | 1305 | Bailed well |
| | | | | | 1320 | Started drilling. |
| | | | | | 1325 | Add 20 gals $H_2O$ |
| | | | | | 1400 | Drive Casing |
| | | | | | 1405 | Resumed Drilling |
| | | | | | 1700 | Stopped Drilling |

REMARKS: Added a total of 60 gallons drilling supply water to well today

Karen R. Oster
6/15/87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-86)

8-B.2282

Kelly

70 3,010

| DRILL LOG | By: Teel/Hagen | Rig: cable tool #6 | Well Number: 299 W18 22 | Computer Number: N/A | Project or Work Order No.: KEH 1714 (PNL) |
|---|---|---|---|---|---|
| | Date: 6/16/87 | | Depth: 52' To 60' | | Subcontract No.: N/A |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 60' 2½" of | | 16" casing | | | 7:30 | Drilling |
| | | | | | | 100 gal of $H_2O$ added |
| | | | | | | 17 " |
| | 55 | H | W | SANDY GRAVEL. 10% MP, 20% FP, | 1500 | |
| | | | | 45% VFP, 2% VCS, 5% CS, 8% MS, 5% FS, | | |
| | | | | 5% VFS and silt. Gravels and sands are sub-angular to | | |
| | | | | subrounded. (Gravels) 80% basalt, 10% qtz, 10% met. and | | |
| | | | | other rock fragments. (sand) 85% basalt, 10% qtz, | | |
| | | | | 5% other rock fragments. Wet color: very dark gray | | |
| | | | | 5Y 3/1, Dry color: gray 5Y 6/1. Moderate reaction | | |
| | | | | to 10% HCL. unconsolidated. Sample seems to be | | |
| | | | | fairly representative. Sample is poorly sorted | | |
| | 60 | H | W | | 1602 | Stopped drilling |
| | | | | | | after sample taken. |
| 70' 2½" | of 16" | casing | | GRAVEL. 15% sand, 85% gravel. Sample is 3% | VCP, | Added 10'0" of |
| | | | | 20% CP, 37% MP, 15% FP, 10% VFP, 4% VCS, 4% CS, | | 16" diam. casing. |
| | | | | 6% MS, 1% FS, trace of VFS. Sample is very poorly | | |
| | | | | sorted. Gravel is 80% basalt, 15% meta, 5% granitics | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2283

| DRILL LOG | By HAGW | Rig ONWEGO #3 | Well Number 299-W18-22 | Computer Number N/A | Project or Work Order No. KEH-1914 |
|---|---|---|---|---|---|
| | Date 6/16/87 | CABLE TOOL | Depth 60' To 60' | | Subcontract No. N/A |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 70'2½" of 16" diam | | | | Sand is 30% qtz, 60% basalt, 10% rock flour. Gravel clasts are rounded to subangular; mostly rounded to subrounded; sand grains are predominantly subrounded. Wet color is olive gray (5Y 4/2). Dry color is 5Y 6/1 (gray to light gray). Moderate HCl rxn on dry material. Material is unconsolidated. Little change from previous sample | | |
| | | | | End of day | 1650 | Well not completed; will finish tomorrow. |
| | | | | RJ AA 6/16/87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 5000 021 (5 85)

8-B.2284

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| T.S. Wilbur/Hagg | Cable Tool Rig #6 | 299-N18-22 | NA | KEH-1914 |
| Date: 6/17/87 | Kelly, Olsen | Depth: 60' To 65' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 70'2½" of 16" Casing | | | | Driller arrives @ 7:00 to drill site — | | |
| | | | | ~~Driller adds a 10' section of 16" carbon steel casing to the bott.~~ Casing added yesterday, started @ | 7:20 | #2 |
| | | | | (6/16) and completed today completed @ | 8:10 | total 16" = 70'2½" |
| | 64-65' | H | W | SANDY GRAVEL. 40% gravel, 55% sand, 5% s.H. | 1200 | |
| | | | | Sample is 2% CP, 13% MP, 15% FP, 10% VFP, 10% | | |
| | | | | VCS, 25% CS, 10% MS, 10% FS. Sample is very | | |
| | | | | poorly sorted. Gravel is composed of 70% basalt, | | |
| | | | | 20% metamorphics, 10% granitics + alkr. Sand is | | |
| | | | | composed of 30% qtz, 60% basalt, 10% RF. Gravel | | |
| | | | | clasts are rounded to subangular, mostly subrounded. Sand | | |
| | | | | grains are subrounded. Wet color is 5Y 4/2 (olive | | |
| | | | | gray). Dry color is 5Y 6/1 (gray to light gray). | | |
| | | | | Strong HCl rxn on dried sample. Material is | | |
| | | | | unconsolidated. Contains much more sand than 60' sample. | | Driller hit sand/s.H |
| | | | | | | @ ~67'. Driller |
| | | | | | | added ~70 gal H2O |
| | | | | | | today so far. |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2285

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| HKEM | Cable Tool Rig #6 | 299-U18-22 | N/A | KEH-1914 |
| Date: 6/17/87 | Kelly Olsen | Depth: 65' To 75' | | Subcontract No.: N/A |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 70'2½" | of 16" | casing | | | | |
| | 69-70' | H | W | SLIGHTLY SILTY GRAVELLY SAND. 20% gravel, | 1300 | ~1' of open hole |
| | | | | 65% sand, 15% silt. Sample is 3% MP, | | |
| | | | | 7% FP, 10% VFP, 5% VCS, 40% CS, 10% MS, 10% | | |
| | | | | FMFS. Sample is very poorly sorted. Gravel is | | |
| | | | | composed of 80% basalt, 10% metamorphic, 10% | | |
| | | | | other. Sand is composed of 35% basalt, 45% qtz, | | |
| | | | | 20% RF. Gravel clasts are subrounded to | | |
| | | | | subangular. Sand grains are subrounded. Wet color | | |
| | | | | is 5Y 4/2 (olive gray); dry color is 5Y 6/1 | | |
| | | | | (light gray). Strong HCl rxn. Unconsolidated. | | |
| | | | | Sharp decr. in overall grain size compared to | | |
| | | | | 65' sample - driller noted Sands started | | |
| | | | | @ ~67'. | | |
| | 74-75 | H | W | SLIGHTLY SILTY SLIGHTLY GRAVELLY SAND. 5% | 1330 | ~6' of open hole |
| | | | | gravel, 10% silt, 85% sand. Sample is | 1400 | Driller added ~160 |
| | | | | 2% FP, 3% VFP, 5% VCS, 30% CS, 20% MS, | | gal. of water. |
| | | | | 20% FS, 10% VFS. Sample is poorly sorted. Gravel | 1430 | 40 gal added |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2286

| DRILL LOG | By HAGER | Rig Cable Tool Rig #6 Kelly Olsen | Well Number 299-W18-22 | Computer Number N/A | Project or Work Order No. HEH-1914 |
|---|---|---|---|---|---|
| | Date 6/17/87 | | Depth 75' To 80' | | Subcontract No. N/A |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 70' 2½" of 16" casing | | | | is composed of 80% basalt, 10% qtz-rich, 10% other, including caliche fragments. Sand is composed of 20% basalt, 65% qtz & qtz-rich frags, 15% other rock frags. Gravel clasts are subrounded to subangular; sand grains are angular to subrounded. Wet color is 5Y 4/2 (olive gray); dry color is 5Y 6/1 (light gray) Moderate HCl rxn on partly dry sample. Unconsolidated. Slightly finer overall compared to previous sample. | | |
| | 79.80' | H | W | SILTY SAND 80% sand, 20% silt, trace of fine pebbles. Sample is 10% CS, 20% MS, 35% FS, 15% VFS. Sample is moderately well sorted. Sand is composed of 25% basalt, 65% qtz, 10% RF. Sand grains are angular to subrounded. Wet color is 5Y 4/3 (olive); dry color is 5Y 6/2 (light olive gray). Strong HCl rxn on dried sample. Unconsolidated. Decrease in overall grain size compared to previous sample | 1415 | ~11' of open hole |

REMARKS:

D - Drive Barrel H - Herd Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2287

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| HAGEN | Cable Tool Rig #6 | 299-W18-22 | N/A | KEH-1914 |
| Date: 6/17/87 | Kelly Olson | Depth: 80' To 85' | | Subcontract No.: N/A |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 79'2½" of 16" casing | | | | | | |
| | 84-85 | H | W | SAND. <5% gravel, 95% sand, 5% silt. | 1447 | ~16' of open hole |
| | | | | Sample is <1% MP, 2% FP, 2% VFP, 5% VCS, | | when sampled. |
| | | | | 30% CS, 20% MS, 25% FS, 15% VFS. Sample is | | |
| | | | | moderately sorted. Gravel is composed of 60% basalt, | | |
| | | | | 20% metamorphics, 20% other. Sand is composed of | | |
| | | | | 20% basalt, 60% qtz, 20% FF. Gravel clasts are | | |
| | | | | subrounded to subangular, sand grains are angular | | |
| | | | | to subrounded. Wet color is 5Y 4/3 (olive); | | |
| | | | | dry color is 5Y 6/2 (light olive gray). Strong HCl | | |
| | | | | rxn on dried material. Unconsolidated. Slightly | | |
| | | | | coarser than previous sample - less silt, more gravel. | | |
| 90'2" of 16" casing | | | | | 1450 | Stopped drilling - added |
| | | | | | | 19'11½" of 16" |
| | | | | | | diam. casing. |
| | | | | Completed weld + set casing on bottom. | | |
| | | | | End of work day | 1700 | |
| | | | | 6/17/87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2288

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| SP AIRHART | CABLE TOOL | 299-W18-22 | NA | KEH-1914 |
| Date: 6-18-87 | # 6 | Depth: 85' To 95' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Driller arrived | 0700 | |
| | | | | Filled hole completely w/ $H_2O$ ~1500 gals. | 0800 | |
| | 89-90' | H | WET | SILTY SAND ; Trace of VFP , 75% sand 25% silt | 1100 | |
| | | | | - overall → 25% VCS , 30% CS , 10% MS , 10% FS-VFS ; | | |
| | | | | mod. sorted ; (SAND) angular-to subrounded | | |
| | | | | grains composed of 30% basalt 70% qtz-rich , trace | | |
| | | | | of mica ; overall color (wet) olive brown | | |
| | | | | 2.5Y 4/4 (dry) light gray 2.5Y 7/2 ; moderate | | |
| | | | | rxn. w/ 10% HCl ; mod consolidated ; | | |
| | | | | slightly coarser than previous sample . | | |
| | 94-95' | H | WET | SANDY SILT ; 70% silt , 30% sand ; 5% ms , | 1300 | |
| | | | | 10% FS, 15% VFS, 70% silt , well sorted ; (SAND) | | |
| | | | | dominantly angular grains composed of 5% basalt | | |
| | | | | 95% qtz-rich , mica ; overall color grayish brown | | |
| | | | | 2.5Y 5/2 (dry) light gray 2.5Y 7/2 ; mod-to- | | |
| | | | | strong rxn. w/ 10% HCl ; mod. consolidated | | |
| | | | | NOTE: Decrease in grain size, decrease in | | |
| | | | | basalt content ; color change | | |

REMARKS:

D - Drive Barrel · H - Hard Tool · L - Large · M - Medium · S - Small · VC - Very Coarse · C - Coarse · F - Fine · VF - Very Fine · ____ Standing Water

A-6000-021 (5-85)

8-B.2289

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| SP AIRHART | CABLE TOOL | 299-W18-22 | NA | KEH - 1911 |
| Date: 6-18-87 | # 6 | Depth: 95' To 102' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | 99-100' | H | WET | SANDY SILT/CLAY ; NOTE: Very little sediment | 1540 | |
| | | | | in bailer - mostly fines suspended in $H_2O$ - | | |
| | | | | 25% MS, 15% FS, 10% VFS, 50% silt/clay - moderately | | |
| | | | | to well sorted ; (SAND) composed of 5% basalt | | |
| | | | | 95% quartzic material, grains are angular-to- | | |
| | | | | subrounded (SILT/CLAY) highly suspended in $H_2O$ | | |
| | | | | also evident as clumps. ; overall color (wet) | | |
| | | | | olive brown 2.5Y 4/4 (dry) light gray 2.5Y 7/2 ; | | |
| | | | | moderate-to-well rxn. w/ 10% HCl ; well consolidated, | | |
| | | | | Driller indicated although material is fine | | |
| | | | | appears to be hard (consolidated) | | |
| | | | | | | |
| | | | | Shut Down | 1645 | |
| | | | | | | |
| | | | | S.P. Airhart 6-18-87 | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B-2290

| DRILL LOG | By S. Teel | Rig Cable Tool #6 | Well Number 299-W18-22 | Computer Number | Project or Work Order No. KEH-1914 |
|---|---|---|---|---|---|
| | Date 6-19-87 | Kelly Olson | Depth 102' To 110' | NA | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 90'2" of 16" casing | | | | | 0700 | Driller arrives |
| | | | | | | - begin drilling |
| | 104-105' | H | wet | SANDY SILT/CLAY, 1% VCS, 4% CS, 15% MS, 10% FS, | 1020 | Added 200gal |
| | | | | 70% VFS, silt, and clay. Well sorted. (sand) 85% qtz, | | water so far today |
| | | | | 15% basalt and other rock fragments. Generally sub- | | Drill rate ≈ 1 ft/hr. |
| | | | | angular to rounded. Dry color: 2.5Y 7/2 (light gray); | | |
| | | | | Wet color: 5Y 4/2 (olive gray) Moderate to strong | | |
| | | | | reaction to 10% HCl, Well consolidated. Similar to | | |
| | | | | last sample but slightly more clay. | | |
| | | | | | | |
| 110'3" of 16" casing | | | | Added 20' 1" of 16" casing | 1430 | |
| | | | | | | |
| | 109-110' | H | wet | SANDY SILT/CLAY: ≤5% VCS-CS, 5% MS, 10% FS, | 1530 | |
| | | | | 15% VFS, 70% silt/clay, well sorted; (sand) | | |
| | | | | 5% basalt 90% qtz-rich, grains are subangular-to- | | |
| | | | | rounded; silt/clay evident as yellowish-brown | | |
| | | | | clumps (greasy); overall color (wet) olive brown | | |
| | | | | 2.5Y 4/4 (dry) light brownish gray 2.5Y 6/2; strong | | |

REMARKS: rxn- w/ 10% HCl; well consolidated

D - Drive Barrel · H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2291

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| SP AIRHART | CABLE TOOL | 299-W18-22 | NA | KEH-1914 |
| Date: 6-19-87 | # 6 | Depth: 110' To 118' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | 114-115' | H | wet | SILTY/CLAYEY SAND: 45% VCS-CS, 25% MS, 20% FS, | 1615 | Drilling rate increased |
| | | | | 15% VFS, 40% CLAY/SILT; well sorted; (sand) angular- | 1620 | |
| | | | | to-subrounded grains composed of 10% basalt, 90% glass-rich; | | Added ~300 gals |
| | | | | overall color (wet) olive brown 2.5Y 4/4 (dry) | | $H_2O$ |
| | | | | light brownish gray 2.5Y 6/2; mod rxn. w/ 10% | | |
| | | | | HCl; well consolidated | | |
| | | | | NOTE: slight increase in sand | | |
| | | | | | | |
| | | | | | | |
| | | | | Shut Down | 1700 | |
| | | | | | | |
| | | | | S.P. Airhart 6-19-87 | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-8000-021 (5-85)

8-B.2292

| DRILL LOG | By J.S. Hilbur | Rig Cable Tool Rig #6 Kelly Olsen | Well Number 299-N18-2[illegible] | Computer Number NA | Project or Work Order No. KEH-1914 |
|---|---|---|---|---|---|
| | Date 6/22/87 | | Depth 120' To 125' | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 110' 3" 16" Casing | | | | Driller arrives @ well site @ 7:05 | | |
| | 120' | Hard Tool | Wet | SANDY SILT - Sample contains 25% sands and 75% silts w/ some clays. (Sands) are made up of ~2% medium sands, 8% fine sands, and 15% very fine sand sized grains. These grains are subangular to rounded in shape and are composed of 85% qtz & qtz rich materials & 15% mafics (basalt) material. (Silts) are make up of 75% of sample volume, clays make up ~ 10% of the silt fraction. The dry sample color is 5Y 7/3 (pale yellow), and the wet sample color is 5Y 4/3 (olive). The sample has a moderate reaction w/ 10% HCl solution. | | |
| | 124'-125' | Hard Tool | Wet | SANDY SILT - Sample is the same as the 120' sample, no change in the lithology. | | 110' 3" |
| | | | | | | 19' 10" |
| 130' 1" of 16" casing | | | | Driller adds a 19' 10" section of 12" casing to the well. | | 130' 1' |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000 021 (5 85)

8-B.2293

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| J.S. Wilbur | Cable Tool Rig #6 | 299-W18-22 | NA | KEH-1914 |
| Date 6/22/89 | Kelly Olsen driller | Depth 130' To 135' | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 130' | 1" of 16" Casing | | | | | |
| | 130' | Hard Tool | Wet | SANDY SILT - Sample is the same as the 120', 125' samples no change in lithology. | | |
| | 134'-136' | Hard Tool | Wet | SILT - Sample is made up of <3% Sand, and 97% silts & clays. (Sands) are made up of 3% very fine sand sized grains. These grains are subrounded to rounded in shape and are composed of 80% qtz & qtz rich materials & 20% mafics (basalt). (Silts) make up 97% of sample volume, of this 35% is clay sized materials. The dry sample color is 5Y 7/3 (pale yellow), the wet sample color is 5Y 4/3 (olive). The sample has a moderate reaction w/ 10% HCl solution. | 16:50 | |
| | | | | Driller shuts down @ 17:00 — J.S. Wilbur 6/22/89 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5 85)

8-B.2294

| DRILL LOG | By T.S. Kilbur | Rig Cable Tool Rig #6 Kelly Olson, driller | Well Number 299-W18-22 | Computer Number NA | Project or Work Order No. KEH-1914 |
|---|---|---|---|---|---|
| | Date 6/23/87 | | Depth 135' To 141' | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 130' 4" of 16" casing | | | | Driller arrives @ well site @ | 7:20 | |
| | | | | Driller fills ~140' hole w/ water @ - only 200 gallons of H2O added to the well. | 7:52 | |
| | | | | Drill starts drilling @ | 7:56 | |
| | 139-140' | H | WET | GRAVELLY SANDY SILT/CLAY : 10% gravel, 40% sand, 50% silt/clay overall; 5% MP, 3% FP, 2% VFP, <5% CS, 5% MS, 20% FS, 15° VCS, 50% silt/clay ; mod. sorted; (GRAVEL) subrounded-to-rounded clasts composed of 80% basalt 20% caliche (SAND) angular-to-subrounded grains composed of 5% basalt 95% qtz-rich; overall color (wet) olive 5Y 5/3 (dry) pale yellow 5Y 7/3; strong rxn. w/ 10% HCl; mod. consolidated | 9:10 | |
| | | | | NOTE: Driller indicated change into more gravels @ 141' | 9:20 | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B-2295

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| SP AIRHART | CABLE TOOL | 299-W18-22 | NA | LEH-1914 |
| Date: 6-23-87 | #6 | Depth: 141' To 149' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 130' 1" | 144-145 | H | W | GRAVELLY SANDY SILT/CLAY : 30% gravel, 25% sand, 45% silt/clay – overall – 15% MP, 10% FP, 5% VFP, 5% VCS, 5% CS, 10% MS, 5% FS VFS, 45% silt/clay; poorly sorted; (GRAVEL) angular-to-subangular clasts composed of 70% basalt 20% glzite, 10% caliche; (SAND) 40% basalt, 45% glz-rich, 15% caliche grains are dominantly angular; overall color (wet) olive 5Y 5/4 (dry) pale yellow 5Y 7/3, strong rxn w/ 10% HCl, mod.-consol. dated, NOTE: presence of caliche, more gravel. | 12:30 | |
| 150' 1" | of 16" | Casing | | | | Added 20' of 16" casing |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-8000-021 (5-85)

8-B.2296

| DRILL LOG | By R A Hargen | Rig Cable tool #6 Kelly Olsen | Well Number 299-J 18-22 | Computer Number N/A | Project or Work Order No. KEH-1914 |
|---|---|---|---|---|---|
| | Date 6/24/87 | | Depth 149' To 155' | | Subcontract No. N/A |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 150'1" | of 16" | casing | | | 0830 | Began drilling |
| | 149-150' | H | W | SILTY SANDY GRAVEL. 30% gravel, 55% sand, 15% silt. Sample is 5% VCP, 7% CP, 16% MP, 8% FP, 5% VCS, 25% CS, 5% MS, 10% FS, 10% VFS. Sample is poorly sorted. Gravels composed of 70% basalt, 20% meta., 10% granites. Sand is composed of 35% basalt, 40% qtz, 25% RF. Gravel clasts are rounded to subrounded; sand grains are angular to subrounded, mostly subrounded to subangular. Wet color is 5Y 4/2 (olive gray); dry color is 5Y 7/2 (light gray). Strong HCl rxn. Slight to moderate consolidation. Less silt than previous sample ? | 0930 | |
| | 154-155' | H | W | SANDY GRAVEL. 60% gravel, 40% sand. Sample is 2% CP, 15% MP, 25% FP, 18% VFP, 7% VCS, 15% CS, 10% MS, 8% FS. Sample is poorly sorted. Gravel is composed of 60% basalt, 20% qtz-sil, 20% RF. Sand is composed of | 1123 | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5-85)

8-B.2297

| DRILL LOG | By HALEN | Rig Cable Tool Rig #6 | Well Number 299-W18-22 | Computer Number N/A | Project or Work Order No. KEH-1914 |
|---|---|---|---|---|---|
| | Date 6/24/87 | | Depth 155' To 160' | | Subcontract No. N/A |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 150' 1" | at 16' | casing | | 50% basalt, 35% qtz, 15% rock frags. Gravel clasts are rounded to subrounded; sand grains are angular to rounded - mostly subangular. Wet color is 5Y 4/2 (olive gray); dry color is 5Y 7/1 (light gray). Strong HCl rxn on dried sample. Unconsolidated to slightly consolidated. Finer gravel than previous sample - much less silt (≤ 5%). | | |
| | 159-160' | H | W | SILTY SANDY GRAVEL. 60% gravel, 20% sand, 10% silt. Sample is 1% CF, 15% MF, 20% FP, 24% VFP, 5% VCS, 15% CS, 10% MS. Sample is poorly sorted. Gravel is composed of 70% basalt, 10% granitics, 20% metamorphics. Sand is 50% basalt, 30% qtz, 20% rock frags. Gravel clasts are rounded to subrounded. Sand grains are angular (basalt) to subrounded (qtz). Wet color is 5Y 4/1 (olive gray); dry color is 5Y 7/1 (light gray). Strong HCl rxn. Unconsolidated. Little change from previous sample. | 1545 | ~10' of open hole when sampled |

REMARKS:

O - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5 85)

8-B.2298

| DRILL LOG | By HACED | Rig Cable Tool #5 | Well Number 299-W18-22 | Computer Number N/A | Project or Work Order No. KEH-1914 |
|---|---|---|---|---|---|
| | Date 6/24/87 | | Depth 160' To 165' | | Subcontract No. N/A |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 150' 1" | 164-165 | H | D | SILTY SANDY GRAVEL. 60% gravel, 30% sand, 10% silt. Sample is 1% CP, 19% MP, 20% FP, 20% UFP, 5% VCS, 15% CS, 10% MS, trace of FS. Sample is poorly sorted. Gravel is 80% basalt, 10% granities, 10% quartz. Sand is 60% basalt, 30% qtz, 10% RF. Gravel clasts are rounded to subrounded. Sand grains are angular to subrounded. Wet color is olive gray (5Y 4/2); dry color is 5Y 7/1 (light gray). Strong HCl rxn on dried sample. No consolidation. No change from previous sample. | 1630 | ~11' of open hole Wtr sampled. |
| | | | | End of day - stopped drilling @ 165' | 1645 | |
| | | | | RJ A.K 6/24/87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5 85)

8-B.2299

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| J.S. Miller | Cable Tool Rig # | 299-W1822 | NA | KEH-1914 |
| Date 6/25/87 | Kelly Olsen | Depth 165 To | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 150' | 1" of | 16" casing | — | | | |
| | | | | Driller arrives @ 7:10 to drill site | | |
| | | | | | | |
| | | | | Driller is changing over from 16" casing to 12" casing | | |
| | | | | Driller adds a 21'3" section of 12" w/ drive shoe | | |
| | | | | Driller adds a 20' 9.5" section of 12" casing | | turn drill logs over to |
| | | | | Driller adds a 20' 9.5" section of 12" casing | | Steve Airhart @ ~~1300~~ |
| | | | | Driller add a 20' 11' section of 12" casing | | 13:50 — |
| | | | | | | J.S. Miller 13:50 6/25/87 |
| | | | | | | |
| | | | | Driller added 20' 10½' of 12" casing | | |
| | | | | Driller added 21' ½" of 12" casing | | |
| | | | | Shut Down | 1700 | |
| | | | | | | |
| | | | | SP Ambient 6-25-87 | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5 85)

8-B.2300

| DRILL LOG | By: SP AIRHART | Rig: CABLE TOOL | Well Number: 299-W18-22 | Computer Number: NA | Project or Work Order No.: KEH-1914 |
|---|---|---|---|---|---|
| | Date: 6-26-87 | #6 | Depth: 165' To ~~177~~ 166' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | Added 20' 11½" of 12" casing | | |
| | | | | Added 20' 9" of 12" casing | | Total 12" casing = |
| 167'4½" | of 12" | casing | | | | 167'4½" |
| | | | | Resumed drilling | 14:30 | |
| | | | | | | |
| | 164-165' | H | Wet | SILTY SANDY GRAVEL; 60% gravel, 30% sand, 10% | 1550 | |
| NOTE: | Actually sampled | | | silt - 10% CP, 20% MP, 20% FP, 10% VFP, 10% VCS, | | |
| | this interval | | twice. | 10% CS, 10% MS <5% FS, 10% silt; poorly sorted; | | |
| | The previous day's | | | (GRAVEL) highly fractured, preserved clasts are | | |
| | sample (6/29/87) is | | | subrounded, comp. includes 70% basalt 30% qtz-rich | | |
| | more representative. | | | frags (SAND) angular-to-subangular grains composed | | |
| | This sample is | | | of 60% basalt 40% qtz-rich; overall color | | |
| | probably slough | | | 2.5Y 3/2 Dark grayish brown (dry) 2.5Y 6/2 light | | |
| | from driving 12" | | | brownish gray, mod-to-strong rxn. w/ 10% HCl, | | |
| | casing | | | mod consolidated. | | |
| | | 6/29/87 | SPA | | | |
| | | | | SP Airhart 6-26-87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ..... Standing Water

A-6000 021 (5 85)

8-B.2301

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| S.P. AIRHART | CABLE TOOL | 299-W18-22 | NA | KEM-1914 |
| Date: 6-29-87 | #6 | Depth: 166' To 174' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 167'4½" | | | | Driller arrived | 0700 | |
| 177'4½" | of 12" | casing | | @ | 1045 | Added 10' of 12" |
| | | | | | | casing. Total 12" |
| | | | | | | casing = 167'4½" + 10' |
| | | | | | | = 177'4½" |
| | 170-171' | H | Wet | SILTY SANDY GRAVEL: 45% sand, 50% gravel, 5% silt | 1305 | |
| | | | | -overall → 15% MP, 20% FP, 15% VFP, 10% VCS, 10% CS, 15% MS, | | |
| | | | | 5% FS, 5% VFS, 5% silt, poorly sorted, (GRAVEL) highly | | |
| | | | | fractured, crushed – few subrounded surfaces, comp. | | |
| | | | | includes 50% basalt 50% qtz-rich (SAND) angular-to- | | |
| | | | | subangular grains composed of ≈ 40% basalt 60% | | |
| | | | | qtz-rich; overall color (wet) dark olive gray 5Y3/2 | | |
| | | | | (dry) light gray 5Y 7/2; mod. rxn. w/ 10% HCl; | | |
| | | | | well consolidated | | |
| | | | | Shut Down | 1500 | |
| | | | | S.P. Airhart 6-29-87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5 85)

8-B.2302

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| S.P. AIRHART | CABLE TOOL #6 | 299-W18-22 | NA | KEH-1914 |
| Date: 6-30-87 | | Depth: 174' To 179' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 177'4½" | | | | Driller arrived | 0700 | |
| | | | | | | Drilling very |
| | | | | | | slow. |
| | | | | | | Has added 30 |
| | | | | | | gals $H_2O$ |
| | 175-176' | H | W | SILTY SANDY GRAVEL: 60% gravel, 35% sand, 5% silt; | 10 10 | |
| | | | | 5% VCP, 10% CP, 10% MP, 20% FP, 15% VFP, 15% VCS, 10% CS, 5% MS | | |
| | | | | 5% FS-VFS; poorly sorted; subangular-to-rounded clasts | | |
| | | | | composed of 60% basalt, 40% granite, gneiss, metam. | | |
| | | | | (SAND) 50% basalt 50% qtz-rich grains which are | | |
| | | | | dominantly angular; overall color (wet) olive | | |
| | | | | gray 5Y 4/2; (dry) light gray 5Y 6/1; No rxn. | | |
| | | | | w/ 10% HCl; well consolidated. | | |
| | | | | NOTE: More gravels; No rxn. w/ 10% HCl. | | |
| 188'2½" of 12" | | casing | | | 1300 | Added 10'10" of 12" |
| | | | | | | casing. 177'4½" + |
| | | | | Unable to drill open hole. | | 10'10" = 188'2½" |
| | | | | Shut Down. | 1500 | |

REMARKS:

S.P. Airhart 6-30-87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine _ ___ Standing Water

A 6000 021 (5 85)

8-B.2303

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| S.P. AIRHART | CABLE TOOL #6 | 299-W18-22 | NA | LEH-1914 |
| Date: 7-1-87 | | Depth: 179' To 188' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Driller arrived | 0700 | |
| | | | | Began drilling | 0800 | |
| | 180' | H | W | SANDY GRAVEL: 55% gravel, 45% sand, 5% silt — | 0925 | |
| | | | | 10% CP, 15% MP, 15% FP, 15% VFP, 15% VCS, 10% MS, 10% MS, | | |
| | | | | 10% VFS-FS; poorly sorted; (GRAVEL) subrounded-to- | | |
| | | | | rounded clasts composed of 20% basalt, 20% qtzites | | |
| | | | | & other metam., 60% granite (SAND) angular-to-subrounded | | |
| | | | | grains composed of 80% qtz-rich 20% basalt; | | |
| | | | | overall color (wet) olive gray 5Y 4/2 (dry) light | | |
| | | | | olive gray 5Y 6/2; NO rxn w/ 10% HCl; well | | |
| | | | | consolidated | | |
| | 184-185' | H | W | SANDY GRAVEL: 45% gravel, 55% sand, 5% silt — | 1325 | |
| | | | | 15% MP, 20% FP, 15% VFP, 10% VCS, 5% CS, 25% MS, 10% FS, | | |
| | | | | 5% VFS, 5% silt; poorly sorted; (GRAVEL) 90% basalt, | | |
| | | | | 60% granitic, qtzites, other metam. — subrounded-to- | | |
| | | | | rounded (SAND) angular-to-subrounded grains composed of | | |
| | | | | 30% basalt 70% qtz-rich; overall color (wet) olive | | |
| | | | | gray 5Y 4/2 (dry) light olive gray 5Y 6/2; NO rxn w/ | | |

REMARKS:

10% HCl; well consolidated

Shut Down

S.P. Airhart 7/1/87 1500

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2304

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| T Gilmore / JS Wilbur | Cable tool #6 | 27N W18 22 | N/A | EE-15.0 |
| Date: 7/2 | Kelly | Depth: 190 To 195 | | Subcontract No.: N/A |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 178 8⅝ of 12" | | Hole/casing | | Welded on 10' 6" | | |
| | 190' | H | Wet | SANDY GRAVEL 60% Gravel, 35% Sand, 5% Silt; 1% C pebble, 10% M pebble, 25% F pebble, 24% VF pebble, 10% VCS 10% CS, 10% MS, 5% F-VF Sand, 5% Silt, poor Sorting, Many Engraved & Intercalybit, Subang to Subrounded, Gravels contain 40% silica-rich, 60% Basalt; Sands contain 70% Silica-rich, 30% Basalts; Wet color 5Y 5/3 (olv) Dry color 5Y 6/3 (Hologx); No rxn in HCl Slightly consolidated | | |
| | 175 | H | Wet | GRAVELY SILTY SAND 15% Gravel, 70% Sand, 15% Silt; 5% MP, 5% FP, 5% VFP, 10% VCS, 15% CS, 30% MS, 15% FS 10% VFS, 15% Silt; Tr clay balls; Moderately - Mod poor Sorting; Gravels contain, angular to Subangular, 70% Silica-rich (abt cherts), 30% basalts; Sands contain 65% Silica-rich, 35% Basalts, Wet color 5Y 3/4 (olv) 5Y 6/4 (olde) Dry rxn. Sample contains more silica-rich gravels incl more chert. | | |

REMARKS:

7/2/87 T Gilmore / Wilbur

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2305

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| S.D. AIRHART | CABLE TOOL | 299-W18-22 | NA | KEH-1914 |
| Date: 7-7-87 | #6 | Depth: 195' To 205' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 198'8½" | | | | Driller arrived | 0715 | |
| 209'1½" | of 12" casing | | | | 0800 | Added 10'5" of 12" |
| | | | | | | casing → 198'8½" + 10'5" |
| | | | | | | = 209'1½" |
| | 199-200' | H | W | SILTY SANDY GRAVEL: 40% gravel, 45% sand, 15% silt → | 0830 | |
| | | | | 2% VCP, 12% CP, 10% MP, 12% FP, 5% VFP, 5% VCS, 3% CS, | | |
| | | | | 30% MS, 7% FS-VFS, 15% silt — poorly sorted — | | |
| | | | | (GRAVEL) subangular-to-rounded clasts composed of | | |
| | | | | 15% basalt, 20% granitic, 65% qtzites, chert | | |
| | | | | (SAND) predominantly angular grains composed of | | |
| | | | | 5% basalt 95% qtz-rich; overall color (wet) | | |
| | | | | olive 5Y 5/3 (dry) pale olive 5Y 6/3; NO rxn. | | |
| | | | | w/ 10% HCl; unconsolidated-to-mod consolidated- | | |
| | | | | (necessary for driller to drive casing ahead | | |
| | | | | of hole - won't stay open) | | Added ~ 30 gals |
| | | | | | | $H_2O$. |
| | 204-205' | H | W | SILTY/CLAYEY SANDY GRAVEL: 40% Gravel, 40% sand, 20% | 1230 | |
| | | | | silt/clay → 5% MP, 25% FP, 10% VFP, 5% VCS, 5% CS, 15% MS | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-8.2306

| DRILL LOG | By S.P. AIRHART | Rig CABLE TOOL #6 | Well Number 199-W18-22 | Computer Number NA | Project or Work Order No. KEH-1914 |
|---|---|---|---|---|---|
| | Date 7-7-87 | | Depth 205' To 212' | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | (cont'd) 10% FS, 5% VFS, 20% silt/clay (clay balls | 1500 | Added 10'6" of 12" |
| 210'7½" of 12" casing | | | | evident); poorly sorted; (GRAVEL) highly crushed | | casing. 209'1½" + 10'6" |
| | | | | - poorly representative - most all clasts fractured - | | = 210'7½" |
| | | | | comp. includes 20% basalt, 15% granitic, 65% qtzitic | | |
| | | | | (SAND) 5% basalt, 95% qtz-rich, predominantly angular | | |
| | | | | grains, overall color (wet) 5Y 5/4 olive (dry) | | |
| | | | | pale olive 5Y 6/3; No rxn w/ 10% HCl; mod. | | |
| | | | | consolidated. | | |
| | 209-210' | H | W | SILTY SANDY GRAVEL: 45% gravel, 40% sand, 15% silt | 1610 | |
| | | | | - Trace CP, 15% MP, 20% FP, 10% VFP, 5% VCS, 5% CS, 10% | | |
| | | | | MS, 15% FS, 5% VFS - poorly sorted - (GRAVEL) a few | | |
| | | | | subrounded clasts otherwise highly fractured, comp. | | |
| | | | | includes 20% basalt, 20% granitic, 60% qtzitic (SAND) | | |
| | | | | angular-to-subangular grains composed of 5% basalt | | |
| | | | | 95% qtz-rich; overall color (wet) olive gray 5Y 4/2 | | |
| | | | | (dry) lt. olive gray 5Y 6/2, No rxn. w/ 10% HCl, | | |
| | | | | mod. consolidated. | | |
| | | | | S.P. Airhart 7-7-87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2307

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| S.P. AIRHART | CABLE TOOL | 299-W18-22 | NA | KEH-1914 |
| Date: 7-8-87 | #6 | Depth: 212' To 215' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 219'7½" | | | | Driller arrived | 0715 | |
| | 214-215 | H | W | SILTY SANDY GRAVEL: (40% gravel, 45% sand, 15% silt) | 0905 | |
| | | | | 10% MP, 15% FP, 15% VFP, 5% VCS, 5% CS, 20% MS, 10% FS, | | |
| | | | | 5% VFS, 15% silt - poorly sorted - (GRAVEL) poorly | | |
| | | | | representative (crushed) ; composition includes 25% | | |
| | | | | basalt, 5% granitic, 70% qtzitic, chert (SAND) angular- | | |
| | | | | to-subrounded grains composed of 15% basalt, 85% | | |
| | | | | qtz-rich ; overall color (wet) olive gray 5Y 4/2 | | |
| | | | | (dry) lt. olive gray 5Y 6/2 ; No rxn. w/ 10% | | |
| | | | | HCl ; Driller indicated fm. is loose - easy to | | |
| | | | | drive casing - hard to drill open hole - ∴ | | |
| | | | | unconsolidated - to - mod. consolidated - generally | | |
| | | | | same as previous sample. | | |
| 230'1" of 12" casing | | | | | 1115 | Added 10'5½" of 12" |
| | | | | | | casing. 219'7½" + 10'5½" = |
| | | | | | | 230'1" |
| | | | | | | |
| | | | | | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B-2308

| DRILL LOG | By S P. AIRHART | Rig CABLE TOOL #6 | Well Number 299-W18-22 | Computer Number NA | Project or Work Order No. KEH-1914 |
|---|---|---|---|---|---|
| | Date 7-8-87 | | Depth 215' To 225' | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | 219-220' | H | W | SILTY SANDY GRAVEL : (35% gravel, 55% sand, 10% silt) | 1315 | |
| | | | | 5% MP, 20% FP, 10% VFP, 5% VCS, 5% CS, 15% MS, 15% FS, | | |
| | | | | 15% VFS, 10% silt - poorly sorted - (GRAVEL) highly | | |
| | | | | crushed sample - drilling inside casing - a few | | |
| | | | | rounded surfaces - comp. includes 20% basalt, 10% | | |
| | | | | granitic, 70% qfeldic, chert (SAND) 5% basalt 95% | | |
| | | | | qtz-rich, grains angular-to-rounded ; overall color | | |
| | | | | (wet) olive 5Y 4/3 (dry) pale olive 5Y 6/3 ; No rxn. w/ | | |
| | | | | 10% HCl ; unconsolidated-to-mod. consolidated. | | |
| | | | | - generally same as previous sample. | | |
| | 221-225' | H | W | SILTY SANDY GRAVEL ; (30% gravel, 60% sand, 10% silt) | 1445 | |
| | | | | 5% MP, 20% FP, 10% VFP, 10% VCS, 20% CS, 15% MS, 10% FS, | | |
| | | | | 5% VFS, 10% silt - poorly sorted - (GRAVEL) highly crushed - all | | |
| | | | | angular frags, 20% basalt, 5% granitic, 65% qfeldic | | |
| | | | | (SAND) predominantly angular grains composed of | | |
| | | | | 10% basalt, 90% qtz-rich ; overall color (wet) olive 5Y 4/3 | | |
| | | | | (dry) pale olive 5Y 6/3 ; No rxn w/ 10% HCl ; unconsolidated-to- | | |
| | | | | mod. consolidated. | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2309

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| S.P. AIRHART | CABLE TOOL #6 | 299-W18-27 | NA | KEH-1914 |
| Date: 7-8-87 | | Depth: 225' To 227' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Geologist / Driller meeting | 1500 - 1530 | |
| | | | | Driller drilled out of hole - $H_2O$ in hole - | | |
| | | | | Scott Wilbur collected $H_2O$ sample for analysis | 1610 | |
| | | | | Driller instructed to stop drilling @ 227' | | |
| | | | | (same as adjacent well 299-W18-21) for | | |
| | | | | pump test. | | |
| | | | | Checked D/W @ 197.32' from ground surface (E-tape # 10178) | 1617 | |
| | | | | Checked D/B @ 225.5' From ground surface | 1640 | |
| | | | | S.P. Airhart 7-8-87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2310

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| S.P. AIRHART | CABLE TOOL | 299-W18-22 | NA | KEH-1914 |
| Date: 7-9-87 | #6 | Depth: 227' To | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | D/W from ground surface = 196.5' | 06:55 | |
| | | | | Driller waiting on water analysis results | | |
| | | | | from well 299-W18-21. | | |
| | | | | S.P. Airhart 7-9-87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2311

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| S.P AIRHART | CABLE TOOL #6 | 299-W18-22 | NA | KEH-1914 |
| Date: 7-10-87 | | Depth: 225' To 225' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | D/W from ground surface = (E-tape #10178) | | |
| | | | | Driller waiting for pump test on well | | |
| | | | | 299-W18-21 | | |
| | | | | Changed drill line - added new 850' line. | | |
| | | | | - drill line is lubricated and marked w/ | | |
| | | | | paint | | |
| | | | | Shut Down | | |
| | | | | S.P. Airhart 7-10-87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2312

| DRILL LOG | By S.P. AIRHART | Rig CABLE TOOL #6 | Well Number 299-W18-22 | Computer Number NA | Project or Work Order No. KEH-1914 |
|---|---|---|---|---|---|
| | Date 7-13-87 | | Depth 217 To 217 | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Helped move discharge line & general assistance to other drillers | | |
| | | | | Still on standby waiting for aquifer test on well 299-W18-21 | | |
| | | | | S.P. Airhart 7-13-87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2313

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| S Teel | Cable Tool #6 | 299-W18-32 | NA | KEH-1914 |
| Date: 7-14-87 | | Depth: No drilling To | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | D/w from ground surface = 196.15' | 0655 | |
| | | | | Began step drawdown test | 1230 | |
| | | | | End of test | 1400 | |
| | | | | - No drawdown measured | | |
| | | | | Began constant discharge test | 1500 | |
| | | | | Steve Teel | | |
| | | | | 7-14-87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2314

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| S.P. AIRHART | Cable Tool #6 | 299-W18-22 | NA | KRH-1914 |
| Date: 7-15-87 | Kelly | Depth: 225' To 235' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 230'1" | of 12" | casing | | E-tape water level measurement - 199.18 from 12" | 0709 | |
| | | | | (tape # 12021) casing - 196.08' from land surface. | | |
| 240'7" | of 12" | casing | | | 0915 | Added 10'6" of 12" |
| | | | | NOTE: Driller indicates he wants to drive casing | | casing - 230'1" + 10'6" |
| | | | | ahead of hole. Says formation is very loose - | | = 240'7" |
| | | | | not able to drill open hole | | |
| | | | | | | |
| | | | | Resumed drilling | 0955 | |
| | 231-232' | H | Wet | SILTY SANDY GRAVEL: (65% gravel, 20% sand, 15% silt) | 1300 | |
| | | | | 10% VCP, 15% CP, 20% MP, 15% FP, 5% VFP, 5% VCS, 5% MS, 10% FS-VFS | | |
| | | | | 15% silt; poorly sorted; (GRAVEL) 5% basalt, 60% qtzitic, | | |
| | | | | 35% granitic, subrounded-to-rounded (SAND) angular-to- | | |
| | | | | subrounded grains composed of 95% qtz-rich 5% basalt; | | |
| | | | | overall color (wet) olive 5Y 5/4 (dry) light gray 5Y 7/2; | | |
| | | | | No rxn w/ 10% HCl; semi-consolidated - fm. | | |
| | | | | appears loose - sample well preserved | | |
| | 234-235' | H | Wet | SILTY SANDY GRAVEL: (70% gravel 15% sand 15% silt) | 1400 | |
| | | | | 5% CP, 25% MP, 20% FP, 20% VFP, <5% VCS-CS, 10% MS, 5% FS-VFS | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2315

| DRILL LOG | By S.P AIRHART | Rig CABLE TOOL | Well Number 299-W18-22 | Computer Number | Project or Work Order No. KEH-1914 |
|---|---|---|---|---|---|
| | Date 7-15-07 | #6 | Depth 235' To 241' | NA | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | (cont'd) ; poorly sorted ; (GRAVEL) 10% basalt, 15% granitic, 75% qtzitic & chert - preserved clasts subrounded-to-rounded ; (SAND) 5% basaltic, 95% qtz-rich - angular-to-subangular ; color (wet) olive 5Y 5/4 (dry) light gray 5Y 7/2 ; No rxn. w/ 10% HCl ; mod. consolidated | | |
| | | | | NOTE: Decrease in ave grain size | | |
| | 239-240 | H | WET | SILTY GRAVELLY SAND : (25% gravel, 60% sand, 15% silt) Trace of MP, 20% FP, 5% VFP, 10% VCS, 5% CS, 25% MS, 15% FS, 5% VFS, 15% silt , poorly sorted , (GRAVEL) highly fractured NOTE: Driller indicates more cemented ; preserved clast is subrounded , 15% basalt , 85% qtzites, granitic, (SAND) angular-to-subrounded grains composed of 90% qtz-rich 10% basalt ; overall color (wet) olive 5Y 4/4 (dry) light gray 5Y 7/2 ; No rxn w/ 10% HCl ; mod.-to-well consolidated. | 1545 | |
| | | | | NOTE: Drilling ahead of casing Now. | | |
| | | | | Shut Down | 1655 | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2316

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| S.P. AIRHART | CABLE TOOL | 299-W-18-22 | NA | KEH-1914 |
| Date: 7-16-87 | #6 | Depth: 241' To 250' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 240'7" of 12" casing | | | | Driller arrived | 0705 | |
| | | | | D/W = 206' - not true static 0709 | 1200 | Added 10'4" of 12" |
| | | | | | | casing - 240'7" + 10'4" |
| 250'11" of 12" casing | | | | | | = 250'11" |
| | 244-245' | H | W | SILTY GRAVELLY SAND : (30% gravel, 60% sand, 10% silt) | 1420 | |
| | | | | 5% MP, 10% FP, 15% VFP, 10% VCS, 5% CS, 20% MS, 15% FS, 10% VFS, | | |
| | | | | 10% silt, poorly sorted, (Gravel) highly fractured - no | | |
| | | | | preserved clasts, composition includes 25% basalt, 75% | | |
| | | | | qtzites, granite (sand) angular-to-subangular grains composed | | |
| | | | | of 15% basalt 85% qtzite; overall color (wet) olive | | |
| | | | | 5Y 5/4 (dry) pale yellow 5Y 7/3; No rxn w/ 10% | | |
| | | | | HCl; well consolidated | | |
| | | | | | | |
| | | | | Shut Down | 1700 | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2317

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| J.S. Wilbur<br>T.F. Gilmore | Cable Tool Rig #4<br>Kelly Olsen<br>Driller | 299-W18-22 | NA | KEH-1914 |
| Date: 7/17/87 | | Depth: 250' To | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION<br>% Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | No depth to $H_2O$ measurement, Well sealed off w/ plug after driving casing yesterday. | 6:52 | |
| | 249-251 | Hard Tool | Wet | GRAVELLY SAND – 30% gravel, 50% sand, 5' 20% sandy silt, trace mg, 5% fg, 15% vfg, 5% vcs, 5% cs, 15% ms, 20% fs, 10% vfs, 20% silt, Poor to moderate sorting. Gravel contain 60% qtz rich w/ feldics, chert & clear qtz remainder mafics (basalt). Sands contain 50% mafics (basalt) and 50% qtz & qtz rich materials. Sand grain are subrounded in shape, grains are to altered to determine shape. Wet color 5Y 4/3 (olive), dry color 5Y 6/3 (light olive). Weak reaction w/ 10% HCl solution. | | |
| 166' 4½" of 10" Total | | | | Casing added 10" Carbon steel 21' 4"; 20' 10"; 20' 11"; 21' 8"; 20' 8"; 20' 11"; 20' 11"; 20' 9½" Total 166' 4½" | | |

REMARKS:

D - Drive Barrel  H - Hard Tool  L - Large  M - Medium  S - Small  VC - Very Coarse  C - Coarse  F - Fine  VF - Very Fine  ____ Standing Water

A 6000 021 (5-85)

8-B.2318

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| T.S. Wilbur | Cable Tool Rig #2 | 299-W18-22 | NA | KEH-1914 PAL |
| Date: 7/20/89 | Kelly Olsen driller | Depth: 250' To | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 166' | 4.5" of | 10" carbon steel | | Driller arrives @ 9:03 to drill site, needs more | | |
| | | | | 10" casing to steam cleaned and transported to the | 1 | |
| | | | | well. | | |
| | | | | Starts welding a 20' 9.5' section of 10" @ 8:18, this | | |
| | | | | section has one pass on it from friday 7/17. | | |
| | | | | | | |
| 166' | 4.5" | | | A second 20' 9" section of 10" casing has been added | 9:25 | |
| 1.20" | 9.0" | | | to the well. Driller heads to the pipe yard to | | |
| 187 | 1.5 total | of 10" | | steam clean and transport more 10" carbon steel casing | | |
| | | | | | | |
| | | | | Driller returns w/ 7 lengths of 10" casing, while he | 10:10 | |
| | | | | is welding on the ears for these lengths his drilling | | |
| 187 | 1.5" | | Should be | 20' 10" section SPA 7/22/89 | | |
| (21) | 10.0" | | | | | |
| ~~208~~ | ~~11.5~~ | total | | Driller adds a 21' 10" section of 10" casing | 10:38 | |
| 20' | 7.0 | | | | | |
| ~~228~~ | ~~6.5~~ | 228' 6½" | SPA 7/22/89 | Driller adds a 20' 7' section of 10" casing | 12:43 | |
| | 234.25' | Hard Tool | Wet | SLIGHTLY SILTY GRAVELLY SAND - Sample contains | 13:08 | |
| | | | | 25% gravels, 65% sand, and 20% silts. Gravels | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5 85)

8-B.2319

| DRILL LOG | By J.S. Wilbur | Rig Cable Tool Rig #2 Kelly Olsen / driller | Well Number 299-N18-22 | Computer Number NA | Project or Work Order No. KEH-1914 |
|---|---|---|---|---|---|
| | Date 7/20/89 | | Depth 254 To 257 | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | 254-257 Cont | | | are made up of 5% medium pebbles, 10% fine pebbles, and 10% very fine pebble sized clasts. These clasts are subrounded to rounded in shape, based on unaltered surfaces. Gravels are composed of 60% qtz & qtz rich materials w/ m/m materials, and 40% mafics (basalt) Sands are made up of 5% very coarse sands, 10% coarse sands, 10% medium sands, 25% fine sands, & 15% very fine sand sized grains. These grains are subrounded in shape and are composed of 50% qtz & qtz rich materials w/ 50% being mafic. Sand & gravels are moderate to poorly sorted. Silts w/ some clays make up 20% of the samples volume. Wet sample color is 5Y 4/3 (olive), dry color is 5Y 6/3 (light olive). | | |
| | ~~228'6½"~~ ~~229'~~ 20 ~~250~~ 249'5" | | 7/20/89 | ~~6.5'~~ of 10" 10.5 ~~5.0"~~ | | |
| | | | | Driller adds a 20' 10.5" section of 10" carbon steel casing. | 14:30 | |
| | | | | Driller stops drilling @ 17:00 drill depth @ 257' | | |

REMARKS:

J.S. Wilbur PNL 7/20/89

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5 85)

8-B.2320

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| J.S. Wilbur | Cable Tool Rig #2 | 299-N1B-22 | N/A | REH-1914 |
| Date: 7/21/87 | Kelly Olsen | Depth: 265 To 265 | | Subcontract No.: N/A |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 280' 20' 260' | 5" 2 7" to 260' | Cable Tool 10" casing | | Driller added a 20' 2" section of 10" casing to the hole | 12:40 | |
| | 260'-265' | Cable Tool | Wet | SLIGHTLY GRAVELLY SILTY SAND - SAMPLE IS THE SAME AS THE 260' Sample | 1:30 | |

J.S. Wilbur 7/21/87

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5 85)

8-B.2321

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| J.S. Wilbur | Cable Tool Rig | 299-W13-21 | N/A | RRH-1914 |
| Date 7/22/87 | Kelly Olsen | Depth ~ 269' To 270 | | Subcontract No. N/A |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 270' 7" of 10" Casing | | | | Driller arrives @ well site @ | 7:00 | |
| | | | | Starts drilling | 7:05 | |
| | | | | | | |
| | 269'-270' | Hard Tool | Wet | SLIGHTLY GRAVELL SLIGHTLY SILTY SAND - Sample | 10:00 | |
| | | | | contains 7% gravels, 86% sand, 7% silts. Gravels | | |
| | | | | are made up of 2% medium pebbels, 2% fine | | |
| | | | | pebbles, & 3% very fine pebble sized clasts. These | | |
| | | | | clasts are highly altered by the hammer tool during | | |
| | | | | drilling. Based on unaltered surfaces these clasts | | |
| | | | | were coarse to medium sized pebbles w/ subrounded | | |
| | | | | to rounded shapes. Gravels are composed of 90% | | |
| | | | | qtz & qtz rich materials w/ m/m's & 10% mafics (basalt). | | |
| | | | | This is an increase in the qtz rich fraction of the | | |
| | | | | sample over the 265' sample. Sands are made up | | |
| | | | | 2% coarse sands, 4% medium sands, 40% fine sands, | | |
| | | | | & 40% very fine sand sized grains. These grains | | |
| | | | | are subrounded in shape and are composed of | | |
| | | | | 90% qtz w/ some qtz rich materials & 10% mafic | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5 85)

8-B.2322

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| J.S. Wilbur | Cable Tool Rig | 299-W18-22 | N/A | |
| Date: 7/22/87 | Kelly Olsen | Depth: 270' To 275' | | Subcontract No.: N/A |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 270' | 7" of 10" | Casing | | (basalt). Qtz rich grains are subround to rounded in shape, while mafic sand are subangular to angular in shape. Silts make up ~7% of the sample volume, there is a trace of clay in the silt fraction. Wet sample color is 5Y 5/3 (olive) and Dry color is 5Y 6/3 (light olive). Sample has no reaction w/ 10% HCl solution. | | |
| 270' 7" 10' 6" 280' 1" total of 10" Casing | | | | Driller adds a 10' 6" section 10" carbon steel. | | |
| | 274-276' | Hard Tool | Wet | SLIGHTLY GRAVELLY SLIGHTLY SILTY SANDS - No change in lithology of this sample compared to last sample. | 1:05 | |
| | | | | Driller heads home @ | 17:00 | |

REMARKS:

JS Wil — PWC 7/22/87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5 85)

8-B.2323

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| J.S. Wilbur | Cable Tool Rig #6 | 299-W18-22 | NA | REH-1914 |
| Date: 7/23/87 | Kelly Olsen | Depth: ~276' To | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| ~~281'~~ 4" of 10" casing | | | | Driller arrives at the site at 7:00 starts drille | 7:05 | |
| 280' 6" | | | | | | |
| | 279'-281' | Hard Tool | Wet | SLIGHTLY GRAVELLY SAND- Sample contains 9% | 9:22 | |
| | | | | gravels, 90% sands, and a trace ~% silt. Gravels | | |
| | | | | are made up of 3% fine pebbles, & 6% very fine | | |
| | | | | pebble sized clasts. These clasts are angular to | | |
| | | | | very angular in shape, they are highly altered | | |
| | | | | during drilling. Gravels are composed 80% qtz & | | |
| | | | | qtz rich materials, including m/ms's & felsic | | |
| | | | | igenous fragments, and 20% mafics (basalts). | | |
| | | | | Sands are made up of 5% very coarse sands, | | |
| | | | | 10% coarse sands, 20% medium sands, 40% fine | | |
| | | | | sands, and 15% very fine sand sized grains. These | | |
| | | | | grains are subangular to subrounded in shape and | | |
| | | | | are composed of 85% qtz & qtz rich materials. | | |
| | | | | Silts make up ~1% of the sample volume. The | | |
| | | | | sample is moderatly sorted, there is an increase | | |
| | | | | gravel fraction & a decrease in the silt content | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5 85)

8-B.2324

| DRILL LOG | By J.S. Wilbur | Rig Cable Tool Rig #2 | Well Number 299-N18-22 | Computer Number NA | Project or Work Order No. KEH-1914 |
|---|---|---|---|---|---|
| | Date 7/23/87 | Kelly Olsen | Depth 280' To 285' | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | 279'-281' | Hard Tool | Wet | cont. The sample is moderatly sorted, there is a decrease in the silt content & the gravel fraction is smaller in size also. Wet color is 5y 4/3 (olive), Dry is 5y 6/3 (light olive). No reaction w/ 10% HCl solution. | | |
| | 284'-286' | Hard Tool | Wet | GRAVELLY SAND - Sample contains 25% gravels, and 75% sands. Gravels are made up 5% medium pebbles, 10% fine pebbles, and 10% very fine pebble sized clasts. These clasts are angular in shape, highly altered by the hammer. Gravels are composed of 70% qtz & qtz rich materials & 30% mafics. Sands are made up of 5% very coarse sands, 10% coarse sands, 20% medium sands, 30% fine sands, & 10% very fine sand sized grains. These grains are subrounded in shape & are composed of 75% qtz & qtz rich materials and 25% mafics (basalt). Sample is moderatly sorted, there is a larger gravel fraction in this sample compared | 1:15 | |

REMARKS: 10' gl

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2325

| DRILL LOG | By J.S. Hilbur | Rig Cable Tool Rig #6 | Well Number 299-k118-22 | Computer Number | Project or Work Order No. |
|---|---|---|---|---|---|
| | Date 7/23/87 | Kelly Olsen | Depth 285' To 288' | | Subcontract No. |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | 284'-285' | Hard Tool | Wet | cont. Wet sample color is 5Y 4/3 (olive), Dry color | | |
| | | | | is 5Y 6/3 (light olive). No reaction w/ 10% HCl | | |
| | | | | solution. | | |
| 290'1" | | | | | | |
| ~~290'11"~~ SAA 7/27/87 | | | | | | |
| ~~291'11"~~ of 10" | | | | Driller adds a 10' 3" length of 10" casing | 1120 | |
| + 10' 3" | | | | | | |
| ~~299'2"~~ Total | | | | Driller heads home @ | 5:00 | |
| SAA 7/27/87 | | | | | | |
| 290'4" | | | | | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2326

| DRILL LOG | By S.P. AIRHART | Rig CABLE TOOL #6 | Well Number 129-W18-22 | Computer Number NA | Project or Work Order No. KEH-1914 |
|---|---|---|---|---|---|
| | Date 7-24-87 | | Depth 288' To 295' | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| ~~292'~~ 290'4" SPA 7/22/87 | | | | Driller arrived | 0700 | |
| | | | | Building up bit | 0745-0825 | |
| | | | | Began drilling | 0825 | |
| | 288-290' | H | W | SLIGHTLY GRAVELLY SILTY SAND: (10% gravel, 80% sand, 10% silt) - 3% FP, 7% VFP, 10% VCS, 10% CS, 40% MS, 10% FS, 10% VFS, 10% silt - (GRAVEL) highly crushed, a few subrounded-to-rounded surfaces, comp. includes 30% basalt, 10% granitic, 60% qtzite (SAND) angular-to-subrounded grains composed of 30% basalt, 70% qtz-rich; overall color (wet) olive 5Y 5/3; (dry) pale yellow 5Y 7/3; slight-to-moderate rxn w/ 10% HCl; well consolidated; NOTE: Rxn. w/ 10% HCl; | 0900 | |
| | 294-295' | H | W | GRAVELLY SILTY/CLAYEY SAND: (15% gravel, 10% silt, 75% sand) - 5% FP, 10% VFP, 5% VCS, 5% CS, 50% MS, 10% FS, 5% VFS 10% silt/clay - trace of clay clumps; poorly sorted; (GRAVEL) highly crushed, all angular, composition- includes 25% basalt, 75% qtzite, granite, sandstone | 1130 | Drill rate = 2'/hr. |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5-85)

8-B.2327

| DRILL LOG | By: S.P. AIRHART | Rig: CABLE TOOL #6 | Well Number: 299-W18-22 | Computer Number: NA | Project or Work Order No.: KEH-1914 |
|---|---|---|---|---|---|
| | Date: 7-24-87 | | Depth: 295' To 305' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | (continued) (SAND) subangular-to-subrounded grains composed of 10% basalt, 90% qtz, qtz-rich, trace of mica; overall color (wet) olive 5Y/5s (dry) pale yellow 5Y 7/3; very weak rxn. w/ 10% HCl; well consolidated | | |
| | | | | NOTE: less $CaCO_3$, higher qtz-content, | | |
| | 299-300' | H | Wet | SILTY GRAVELLY SAND: (20% gravel, 70% sand, 10% sill/clay - trace of clay clumps) - 5% FP, 15% VFP, 10% VCS, 5% CS, 30% MS, 15% FS, 10% VFS, 10% sill/clay - poorly sorted - (GRAVEL) crushed, few subrounded clasts, comp. of 35% basalt 65% qtz-rich (sand) subangular-to-subrounded grains composed of 15% basalt 85% quartz-rich; overall color (wet) olive gray 5Y 4/2 (dry) 5Y 7/2 light gray; slight rxn. w/ 10% HCl; well consolidated. | 1230 | |
| | 304-305' | H | W | SILTY GRAVELLY SAND: (25% gravel, 60% sand, 15% silt) - 5% FP, 20% VFP, 10% VCS, 10% CS, 15% MS, 15% FS, 10% VFS, 15% silt - poorly sorted - (Gravel) highly crushed | 1620 | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5 85)

8-B.2328

| DRILL LOG | By: SP AIRHART | Rig: CABLE TOOL #6 | Well Number: 289-W18-22 | Computer Number: NA | Project or Work Order No.: LEH-1914 |
|---|---|---|---|---|---|
| | Date: 7-24-87 | | Depth: 305' To 305' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | (cont.) few subrounded-to-rounded clasts, composition includes 35% basalt, 65% qtz-vcl (sand) angular-to-subrounded grains composed of 35% basalt, 65% qtz-vcl - overall color (wet) olive 5Y 5/3 (dry) light gray 5Y 7/2 ; NO rxn w/ 10% HCl ; well consolidated | | |
| | | | | NOTE: More gravel, No $CaCO_3$ | | |
| | | | | Shut Down | 1700 | |
| | | | | S.P. Airhart 7/24/87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5 85)

8-B.2329

| DRILL LOG | By: S.P. AIRHART | Rig: CABLE TOOL #6 | Well Number: 299-W18-22 | Computer Number: NA | Project or Work Order No.: KEH-1914 |
|---|---|---|---|---|---|
| | Date: 7-27-87 | | Depth: 305' To 315' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 290'4" of 10" casing | | | | | | |
| | 309-310' | H | W | SILTY/CLAYEY GRAVELLY SAND: (20% gravel, 70% sand, 10% silt/clay - evident as clumps mixed w/ sand) — 5% FP, 15% VFP, 10% VCS, 5% CS, 30% MS, 15% FS, 5% VFS, 10% silt/clay - poorly sorted; (GRAVEL) highly crushed (all angular) composition includes 10% basalt, 10% granitic, 80% qtzitic (SAND) angular-to-subrounded grains composed of 15% basaltic (mafic) 85% qtz & qtz-rich; overall color (wet) olive 5Y 5/3 (dry) light gray 5Y 7/2; NO rxn. w/ 10% HCl; well consolidated | 1040 | |
| 311'3" of 10" casing | | | | | 1105 | Adding 20'11" of 10" casing. Total = 290'4" + 20'11" = 311'3" |
| | | | | Building up hard tool | 1245 | |
| | 314-315' | H | W | SILTY/CLAYEY GRAVELLY SAND: (30% gravel, 60% sand, 10% silt/clay - evident as clumps mixed w/ sand) — 5% FP, 25% VFP, 10% VCS, 10% CS, 20% MS, 15% FS, 10% VFS, 10% silt/clay - poorly sorted - (GRAVEL) highly crushed | 1545 | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5 85)

8-B.2330

| DRILL LOG | By: S.P. AIRHART | Rig: CABLE TOOL #6 | Well Number: 299-W18-22 | Computer Number: NA | Project or Work Order No.: KEH-1914 |
|---|---|---|---|---|---|
| | Date: 7/27/87 | | Depth: 315' To 317' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | (cont.) all angular - composition includes 20% basalt, 5% granitic, 35% qtzitic (SAND) subangular-to subrounded grains composed of 15% basalt 85% qtz-rich; overall color (wet) olive 5Y 4/3 (dry) light gray 5Y 7/2; moderate rxn. w/ 10% HCl; well consolidated - NOTE: rxn. w/ 10% HCl, more gravel | | |
| | | | | S.P. Airhart 7/27/87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5-85)

8-B.2331

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| S.P. AIRHART | CABLE TOOL | 299-W18-22 | NA. | KEH-1914 |
| Date: 7/28/87 | #6 | Depth: 317' To 324' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 311'3" | | | | Driller Arrived | 0700 | |
| | 319-320' | H | W | SILTY/CLAYEY GRAVELLY SAND: (25% gravel, 55% sand, | 0910 | |
| | | | | 20% silt/clay) – 5% FP, 20% VFP, 10% VCS, 5% CS, 15% MS, | | |
| | | | | 15% FS, 10% VFS, 20% silt/clay – suspect this formation | | |
| | | | | to be matrix supported pebble conglomerate w/ silt/ | | |
| | | | | clay stringers – (GRAVEL) highly crushed – all fragmented. | | |
| | | | | composition includes 20% basalt, 10% granitic, 70% | | |
| | | | | qtzitic (SAND) angular-to-subrounded grains composed | | |
| | | | | of 10% basalt 90% qtz-rich; overall color (wet) | | |
| | | | | dark grayish brown 2.5Y 4/2 (dry) light gray | | |
| | | | | 2.5Y 7/2; moderate-to-strong rxn w/ 10% HCl.; | | |
| | | | | well consolidated – driller frequently builds up bit. | | |
| | | | | Building-up bit | 1100 | |
| 321'9" | of 10" casing | | | | 1330 | Added 10'6" of 10" |
| | | | | | | casing. Total: |
| | | | | VERY SLOW DRILLING! | | 311'3" + 10'6" = 321'9" |
| | | | | | | |
| | | | | Shut Down | 1700 | |

REMARKS:

S.P. Airhart 7/28/87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5 85)

8-B.2332

| DRILL LOG | By S.P. AIRHART | Rig CABLE TOOL #6 | Well Number 299-W18-22 | Computer Number NA | Project or Work Order No. ICEH-1914 |
|---|---|---|---|---|---|
| | Date 7/29/87 | | Depth 324' To 330' | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 321'9" | | | | Driller arrived | 0700 | |
| | 324-325' | H | W | SILTY/CLAYEY GRAVELLY SAND; (25% gravel, 60% sand, 15% silt/ | 0800 | |
| | | | | clay) - 25% VFP, 15% VCS, 5% CS, 20% MS, 15% FS, 5% VFS, | | |
| | | | | 15% silt/clay - poorly sorted - (GRAVEL) highly crushed - | | |
| | | | | all angular fragments - composition includes 30% basalt | | |
| | | | | 70% qtzite, some granitic (SAND) (NOTE: VCS-CS probably | | |
| | | | | represents crushed gravel) - subangular - to - subrounded, | | |
| | | | | composition 15% basalt, 85% qtz-rich; overall color | | |
| | | | | (wet) olive 5Y 4/3 (dry) pale yellow 5Y 7/3; very weak | | |
| | | | | RXN w/ 10% HCl; well consolidated. | | |
| | | | | | | |
| | | | | Built up bit | 0900 | |
| | | | | Change in lithology @ ~328' - faster drill rate | 1200 | |
| | 329-330' | H | W | GRAVELLY SILTY SAND: (5% gravel, 70% sand, 25% silt) | 1208 | |
| | | | | - 1% FP, 4% VFP, 5% VCS, 3% CS, 30% MS, 20% FS, 12% VFS, | | |
| | | | | 25% silt - poorly sorted - (GRAVEL) highly crushed, | | |
| | | | | 20% basalt 80% qtz-rich material (SAND) subangular - to | | |
| | | | | subrounded - composition is 10% basalt 90% qtz-rich | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5 85)

8-B.2333

| DRILL LOG | By S.P. AIRHART | Rig CABLE TOOL #6 | Well Number 299-W15-22 | Computer Number NA | Project or Work Order No. ICEH-1814 |
|---|---|---|---|---|---|
| | Date 7/29/87 | | Depth 330' To 336' | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 321'9" | | | | (cont.) overall color olive 5Y5/3 - (dry) | | |
| | | | | pale yellow 5Y7/3, very slight rxn. w/ 10% HCl; | | |
| | | | | well consolidated. | | |
| | | | | NOTE: finer grain, less gravels, | | |
| | 334-335 | H | W | GRAVELLY SILTY SAND: (10% gravel, 70% sand, 20% silt) | 1510 | |
| | | | | - 2% FP, 8% VFP, 10% VCS, 2% CS, 35% MS, 15% ES, 8% VFS, | | |
| | | | | 20% silt/clay - poorly sorted - (GRAVEL) highly crushed | | |
| | | | | angular frags composed of 10% basalt, 90% qtzite, granitic | | |
| | | | | (SAND) subangular-to-angular grains composed of 5% | | |
| | | | | basalt, 10% muscovite, flakes 85% qtz-rich - overall color (wet) | | |
| | | | | olive 5Y 5/3 (dry) pale yellow, Moderate rxn w/ 10% | | |
| | | | | HCl; well consolidated | | |
| | | | | NOTE: presence of mica, rxn. w/ 10% HCl (more CaCO3) | | |
| 332' of 10" casing | | | | | 1530 | Added 10'3" of 10" casing |
| | | | | | | 321'9" + 10'3" = 332' |
| | | | | Shut Down | 1700 | |

REMARKS:

S.P. Airhart 7/29/87

O - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5 85)

8-B.2334

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| J.S. Wilbur | Rig # 6 | [illegible] | NA | AEA-1014 |
| Date 9/30/89 | Kelly Olsen | Depth 337' To 342' | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 332 | of 10' | Casing | | | | |
| | 329-331' 339-341' SPM 7/31/89 | Hard Tool | Wet | GRAVELLY SAND - Sample contains 25% gravels, 70% sands, & 5% silts. 10% fine pebbles, 15% very fine pebbles, 3% very coarse sands, 7% coarse sands, 40% medium sands, 15% fine sands, 10% very fine sands, & 5% silts. Gravels are subrounded in shape and are composed of 85% qtz, qtz rich materials and 15% mafics (basalts). Sands are subangular to subrounded in shape and are composed of 90% qtz & qtz rich materials w/ 10% mafics. Sample is moderately well sorted. Wet color is 5Y 4/2 (Olive Gray), dry color 5Y 6/2 (light olive gray). Moderate reaction w/ 10% HCl solution. | 12:00 | |
| 332 | of 10" | | | | | |
| 10'6" | | | | Driller adds 10'6" of 10" carbon steel casing | | |
| 342'6" of 10" total | | | | | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2335

| DRILL LOG | By: S.P. AIRHART | Rig: CABLE TOOL #6 | Well Number: 299-W18-22 | Computer Number: NA | Project or Work Order No.: EEH-1914 |
|---|---|---|---|---|---|
| | Date: 7/31/87 | | Depth: 342' To 350' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 3[illegible]" | 344-345' | H | W | SILTY GRAVELLY SAND ; (25% gravel, 55% sand, 20% silt) - Trace of CP, 10% FP, 15% VFP, 7% VCS, 3% CS, 30% MS, 10% FS, 5% VFS, 20% silt - poorly sorted - (GRAVEL) highly crushed - a few clasts preserved - these are subrounded w/ weathered surfaces, composition includes 20% basalt, 80% quartzitic, granitic (SAND) mostly subangular grains composed of 10% basalt, 90% quartz-rich ; overall color (wet) olive brown 2.5Y 4/4 (dry) light brownish gray 2.5Y 6/2 ; slight rxn w/ 10% HCl ; well consolidated | 1000 | |
| | 345-350' | H | W | SILTY GRAVELLY SAND ; (25% gravel, 55% sand, 20% silt) - 5% FP, 20% VFP, 7% VCS, 3% CS, 30% MS, 10% FS, 5% VFS, 20% silt - poorly sorted - (GRAVEL) highly crushed - no preserved clasts - composition 25% basalt 75% quartzitic, granitic (SAND) subangular grains composed of 10% basalt 90% quartz-rich ; overall color (wet) olive brown 2.5Y 4/4 (dry) light brownish gray 2.5Y 6/2 ; very slight rxn w/ 10% HCl ; well consolidated | 1300 | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2336

| DRILL LOG | By S.P. AIRHART | Rig CABLE TOOL #6 | Well Number 200-W18-22 | Computer Number NA | Project or Work Order No. KEH-1914 |
|---|---|---|---|---|---|
| | Date 7/31/87 | | Depth 350' To 359' | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | 354-355 | H | W | SILTY GRAVELLY SAND; (20% gravel, 60% sand, 20% silt); | 1500 | |
| | | | | 5% FP, 15% VFP, 7% VCS, 3% CS, 35% MS, 10% FS, 5% VFS, | | |
| | | | | 20% silt; poorly sorted; (GRAVEL) highly crushed, | | |
| | | | | a few subrounded-to-rounded surfaces - composition | | |
| | | | | includes 20% basalt, 80% quartzite, granitic, metam. | | |
| | | | | (SAND) subangular-to-subrounded grains composed of | | |
| | | | | 10% basalt 90% quartz-rich; overall color (wet) | | |
| | | | | olive brown 2.5Y 4/4 (dry) light gray | | |
| | | | | 2.5Y 7/2; very slight rxn. w/ 10% HCl; well | | |
| | | | | consolidated | | |
| | | | | S.P. Airhart 7/31/87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-8000-021 (5-85)

8-B.2337

| DRILL LOG | By S.P. AIRHART | Rig CABLE TOOL #L | Well Number 299-W18-22 | Computer Number NA | Project or Work Order No. KEH-1914 |
|---|---|---|---|---|---|
| | Date 8-3-87 | | Depth 359' To 365' | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Driller began work | 0745 | |
| | 359-360' | H | W | GRAVELLY SILTY SAND: (15% gravel, 70% sand, 15% silt) | 0815 | |
| | | | | - 15% VFP, 7% VCS, 3% CS, 40% MS, 15% FS, 5% VFS, 15% | | |
| | | | | silt; mod. sorted; (GRAVEL) all crushed - 15% basalt, | | |
| | | | | 85% quartzite, granitic, (SAND) subangular-to-subrounded | | |
| | | | | grains composed of 5% basalt, 95% qtz-rich; | | |
| | | | | overall color (wet) olive brown 2.5Y 4/4 (dry) | | |
| | | | | light gray 2.5Y 7/2; very slight rxn w/ 10% | | |
| | | | | HCl; well consolidated. | | |
| | | | | | | |
| | 364-365 | H | W | GRAVELLY SILTY SAND: (10% gravel, 75% sand, 15% silt) | 1045 | |
| | | | | - 10% VFP, 10% VCS, 5% CS, 25% MS, 25% FS, 10% VFS, 15% | | |
| | | | | silt - poorly-to-mod.-sorted; (GRAVEL) 20% basalt | | |
| | | | | 80% quartzite, granitic - highly crushed & angular | | |
| | | | | (SAND) subangular-to-subrounded grains composed of | | |
| | | | | 5% basalt 95% qtz-rich; overall color (wet) dark grayish | | |
| | | | | brown 2.5Y 4/2 (dry) light gray 2.5Y 7/2; slight | | |
| | | | | rxn- w/ 10% HCl; well consolidated. | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2338

| DRILL LOG | By S.P. LEHART | Rig CABLE TOOL | Well Number 299-W18-2 | Computer Number NA | Project or Work Order No. KEH-1914 |
|---|---|---|---|---|---|
| | Date 8-3-87 | #6 | Depth 365' To 376' | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | 365-370' | H | W | GRAVELLY SILTY SAND: (10% gravel, 80% sand, 10% silt) | 1210 | |
| | | | | - 10% VFP, 10% VCS, 3% CS, 30% MS, 25% FS, 12% VFS, | | |
| | | | | 10% silt; mod-to-poorly sorted - (GRAVEL) one preserved | | |
| | | | | clast is subangular - sample crushed - comp. 25% basalt | | |
| | | | | 75% qtzite, granitic (SAND) subangular-to-subrounded grains | | |
| | | | | composed of 5% basalt 95% qtz-rich; overall color (wet) | | |
| | | | | olive brown 2.5Y 4/4 (dry) light gray 2.5Y 7/2; slight rxn. | | |
| | | | | w/ 10% HCl; well consolidated | | |
| | | | | Cut of 6" of 10" casing | 1245 | |
| | | | | Ready to begin welding 8" | | |
| | | | | pre-measured 19 sections — | 1305 | |
| | | | | 1. 21'1" w/ driveshoe 6. 21'½" 11. 21'½" 16. 20'11½" | | |
| | | | | 2. 20'10½" 7. 20'8" 12. 20'7" 17. 20'11" | | |
| | | | | 3. 20'10½" 8. 20'10" 13. 20'8½" 18. 20'11" | | |
| | | | | 4. 20'10" 9. 21'½" 14. 20'9" 19. 21' | | |
| | | | | 5. 20'8½" 10 20'7½" 15. 20'11½" | | |
| | | | | Each section is numbered as above. — | | |
| | | | | Started welding 8" casing | 13:30 | |

REMARKS:

Welded 5 sections (1-5) today = 104'4½"

S.P. Lehart 8/3/87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2339

| DRILL LOG | By: SP AIRHART | Rig: CABLE TOOL #6 | Well Number: 299-W18-22 | Computer Number: NA | Project or Work Order No.: KEH-1914 |
|---|---|---|---|---|---|
| | Date: 8-4-87 | | Depth: 370' To 370' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Driller arrived | 0600 | |
| | | | | Welded sections 6 - 17 (see previous days logs) | | |
| | | | | Total today = 250' 1½" | | |
| | | | | Total 8" = 354' 6" | | |
| | | | | SP Airhart 8/4/87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2340

| DRILL LOG | By J.S. Wilbur | Rig CABLE TOOL #6 | Well Number 299-W18-22 | Computer Number NA | Project or Work Order No. KEH-1914 |
|---|---|---|---|---|---|
| | Date 8-5-87 | | Depth 370' To 380 | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 354 | 6" of 8" casing | | | Driller arrives @ 7:00, adding casing to the well. | | |
| 320 | 11" | | | | | |
| 375 | 5" total of 8" | | | | | |
| | | | | Driller adding material to the 8" bit | | |
| | | | | | | |
| | 375 | H | Wet | GRAVELLY SILTY SAND (15% Gravel, 60% Sand, 25% Silt) | 1200 | |
| | | | | 5% FP, 10% UFP, 5% FS, 10% CS, 40% MS, 5% FS 25% Silt/clay | | |
| | | | | Some "clayballs" Grains have been fragmented, pos Subrounded | | |
| | | | | 70% qtz rich, 30% Mafics Sands contain 95% qtz rich | | |
| | | | | 5% Basalts Subangular - Subrounded, Moderately Sorted | | |
| | | | | Strong rxn in HCl, Wet color 2.5Y 2/2 (dk gray brn) | | |
| | | | | Dry color 2.5Y 7/2 (lt gry) | | |
| | 380 | H | Wet | GRAVELLY SILTY SAND (15% Gravel, 60% Sand, 25% Silt/clay) | 1330 | Coarse Sands |
| | | | | 5% FP, 10% UFP, 10% UFS, 20% CS, 35% MS, 2.5% FS, 2.5% UFS, | | |
| | | | | 25% Silts/Clays "Clayballs" present, Grains fragmented | | |
| | | | | Subangular 70% qtz-rich, 30% Basalt, Sands angular - | | |
| | | | | Subangular 70% Qtz-rich, 10% Mafics, Moderately Sorted | | |
| | | | | Strong HCl rxn, Wet color 2.5Y 4/2 dk brn Dry 2.5Y 7/2 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2341

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| J Willer | CableTool #6 | 299 WB 22 | NA | EGH 1914 |
| Date: 8/5/87 | Kelly | Depth: 380 To 389 | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | 385 | H | wet | GRAVELY SILTY SAND Same as above | 1430 | |
| | | | | | | |
| | | | | | | |
| | | | | Quit for Day | 1650 | |
| | | | | | | |
| | | | | Depth to Bottom 389' | | |
| | | | | | | |
| | | | | | | |
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| | | | | | | |
| | | | | | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2342

| DRILL LOG | By J.S. Hilbur S.P. Airhart | Rig Rig #6 Kelly | Well Number 299-W18-22 | Computer Number NA | Project or Work Order No. KEH-1914 |
|---|---|---|---|---|---|
| | Date 8/6/87 | | Depth 389' To 395' | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 375' 5" of 8" | | casing | | Driller arrives @ well s.t.c @ | 7:10 | |
| | 389'-390' | Hard Tool | Wet | SILTY SAND - Sample is made up of 3% gravels, 77% sands, & 20% silts; 3% fp-vfp, 8% vcs, 2% cs, 35% ms, 20% fs, 15% vfs, 20% silt. Sample is moderately sorted. Gravels are highly altered by the hammer and are angular in shape, no unaltered surfaces. These clasts are composed of 70% qtz rich materials & 30% mafics (basalts). Sands are angular to subrounded in shape and are composed of 10% basalt & 90% qtz rich material. Wet sample color is 5Y 4/4 (olive), dry sample color is 5Y 7/4 (pale yellow). Sample has slight rxn w/ 10% HCl. Driller believes material is well consolidated. | 8:00 | ~15' ahead of casing w/ open hole |
| | 394'-396' | Hard Tool | Wet | SILTY SAND - Sample is made up of 5% gravels 70% sands, & 25% silts: 2% fp, 3% vfp, 10% vcs, 10% cs, 40% ms, 5% fs, 5% vfs, & 25 silts, | 10:15 | ~20' ahead of casing w/ open hole |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (6-85)

8-B.2343

| DRILL LOG | By J.S. Wilbur | Rig Rig #6 | Well Number 299-W18-22 | Computer Number NA | Project or Work Order No. KEH-191 |
|---|---|---|---|---|---|
| | Date 8/6/87 | Kell, Olsen | Depth 395 To 400' | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | 394'-396 | Hard Tool | Wet | cont. Sample is moderately sorted, the driller | | |
| | | | | beleaves the materates sampled are consolidated. | | |
| | | | | Gravels are highly altered by the hammer and are | | |
| | | | | angular in shape, no unaltered surfaces on these clasts. | | |
| | | | | These clasts are composed of 70% qtz rich materials | | |
| | | | | & 30% mafic (basalts). Sands are angular to | | |
| | | | | subrounded in shape and are composed 90% qtz | | |
| | | | | rich materials & 10% mafics (basalts). Wet sample | | |
| | | | | color is 5Y 4/3 (olive), dry sample color is 5Y 6/3 | | |
| | | | | (pale olive). Sample has a slight rxn w/ 10% HCl. | | |
| 375' | 5" | | | | | |
| + 21' | | | | Driller adds a 21' section of 8" casing to the well | 10:20 | |
| 396' | 5" total of 8" | | | completes welding. | 11:15 | |
| | casing | | | | | |
| | | | | | | |
| | 399-400 | Hard Tool | Wet | SILTY SAND - Sample is made up of ~1% gravels, | 15:37 | |
| | | | | 79% sands, 19% silts; 1% vfp, 9% vcs, 20% | | |
| | | | | cs, 30% ms, 10% fs, 10% vfs, & 19% silts. | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (6-85)

8-B.2344

| DRILL LOG | By J.S. Wilbur | Rig Rig #6 Kelly | Well Number 299-N18-22 | Computer Number NA | Project or Work Order No. KE11-1914 |
|---|---|---|---|---|---|
| | Date 8/6/89 | | Depth 400' To 400' | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | 399-400' | Hard Tool | Wet | cont. Gravels are angular in shape (highly altered) and composed of 95% qtz rich materials & 5% mafics. Sands are angular to subrounded in shape and are composed of 80% qtz rich materials & 20% mafics (basalt). Silts make up 19% of the sample volume. Sample is moderately well sorted, there is a decrease in the gravel fraction of this sample compared to the 395' sample. Wet sample color is 5Y 4/4 (olive), dry sample color is 5Y 7/4 (pale yellow). Sample has a slight rxn w/ 10% HCl. | | |
| | | | | total depth 404' | | |
| | | | | J.S. Wilbur 8/6/89 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-8000-021 (5-85)

8-B.2345

| DRILL LOG | By J.S. Wilbur | Rig # 6 Kelly Olsen | Well Number 299-N18-22 | Computer Number NA | Project or Work Order No. KEH-1914 |
|---|---|---|---|---|---|
| | Date 8/7/87 | | Depth 400' To 410' | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 396'5" of 8" casing | | | | Driller arrives @ 7:00 to well site | | |
| 10'3" | | | | Driller adds 10' 3" section of 8" casing to the well | 7:15 | |
| 406'8" | | | | and builds up the drill bit. | 8:30 | |
| | | | | | | |
| | 404'-406' | Hard Tool | Wet | SILTY SAND - Sample is made up of <1% gravels | 8:40 | |
| | | | | 70% sands & 29% silts & clays, ~% vfp, 2% vcs, | | note: silts & clays |
| | | | | 3% cs, 15% ms, 20% fs, 20% vfs, & 29% silts w/ | | build up around the |
| | | | | clay. Sample is moderately sorted. Gravels are | | bit - these fines are |
| | | | | angular in shape and are highly altered by the hammer. | | removed from the |
| | | | | The compos. har of the gravels are 90% qtz & qtz rich | | bit w/ screw driver. |
| | | | | materials & 10% mafics (basalts). Sands are angular | | appears to be a clay |
| | | | | to subrounded in shape and composed of 80% qtz & | | lens @ ~406'-408' |
| | | | | qtz rich materials & 20% mafics (basalts). Wet sample | | depth. |
| | | | | color is 5Y 4/4 (olive), dry sample color is 5Y 7/4 | | |
| | | | | (pale yellow). Sample has slight rxn w/ 10% HCl. | | |
| | | | | | | |
| | 409'-411' | Hard Tool | Wet | SILTY SAND - Sample is the same as the 405' sample | 10:30 | |
| | | | | no change in lithology. | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (6-85)

8-B.2346

page 2 of 2

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| J.S. Wilbur | Rig #6 | 299-W18-22 | N/A | KEH-1914 |
| **Date** 8/7/87 | Kelly Olsen | **Depth** 405' To 420' | | Subcontract No. N/A |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | 414'-416 | Hard Tool | Wet | SILTY SAND - No change in the lithology - driller thinks | 12:20 | @ 412' depth drilling |
| | | | | that his in a consolidated sands. | | has slowed down, |
| 406' 8" | | | | | | driller think his in th |
| 10' 3" | | | | Driller adds a 10' 3" section of 8" carbon steel casing | 12:30 | gravels — |
| 416' 11" of 8" casing | | | | | 13:10 | |
| | | | | | | |
| | | | | | | |
| | 419-420' | H | W | SLIGHTLY GRAVELLY SILTY SAND: (5% gravel, 80% sand, 15% | 1630 | |
| | | | | silt) - 1% FP, 4% VFP, 5% VCS, 8% CS, 50% MS, 15% FS, 7% | | |
| | | | | VFS, 15% silt - moderately sorted - (GRAVEL) crushed | | |
| | | | | angular clasts composed of 10% basalt 90% qtzites, | | |
| | | | | meta-ss, granite (SAND) angular-to-subangular grains | | |
| | | | | composed of 5% basalt, 95% qtz. rich; overall | | |
| | | | | color (wet) olive 5Y 5/3 (dry) light gray 5Y 7/2; | | |
| | | | | moderate rxn w/ 10% HCl; well consolidated | | |
| | | | | | | |
| | | | | Shut Down | 1650 | |
| | | | | | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-8-2347

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| T.S. Wilbur | Rig #6 | 299-N13-22 | NA | KEH-1914 |
| Date 8/15/89 | Kelly Olsen | Depth 425' To 431' | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 416' | 11" of 8" Casing | | | Driller arrives @ 7:00 to the drill site. | 7:00 | |
| | | | | Driller replaces points & spark plugs on the drill rig. | | |
| | 429'-426' | Hard Tool | Wet | SLIGHTLY GRAVELLY SILTY SAND - Sample is made up of 5% gravels, 85% sands, & 10% silts; 1% mp, 2% vp, 2% vfp, 5% vcs, 10% cs, 45% ms, 40% fs, 10% vfs, & 10% silts. Gravels are highly altered by the hammer - angular in shape and are composed of 90% qtz rich materials & 10% mafics (basalt). Sands are subangular to rounded in shape and are composed of 80% qtz & qtz rich materials & 20% mafics (basalt). Sample is moderately sorted. Wet sample color is 5Y 5/4 (olive), dry color is 5Y 7/4 (light gray). Sample has a strong rxn w/ 10% HCl. | B:55 | |
| | 429-431 | Hard Tool | Wet | SLIGHTLY GRAVELLY SILTY SAND - No change in lithology. | | |
| 416' 11" 10' 4" 427' 3" | total of | 8" | | Driller adds 10' 4" of 8" | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2348

| DRILL LOG | By AIRHART | Rig CABLE TOOL | Well Number 299-W18-22 | Computer Number NA | [redacted] Work Order No. REH-1914 |
|---|---|---|---|---|---|
| | Date 8-10-87 | #6 | Depth 431' To 432' | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Building up bit | 1325 | |
| 437'7½" of 8" casing | | | | | 1600 | Added 10'4½" of 8" casing. |
| | | | | Shut Down | 1645 | |
| | | | | S.P. Ambrust 8/10/87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2349

| DRILL LOG | By AIRHART | Rig CABLE TOOL #6 | Well Number 299-W18-22 | Computer Number NA | Project or Work Order No. KEH-1914 |
|---|---|---|---|---|---|
| | Date 8-11-87 | | Depth 432' To 440' | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Began Drilling | 0700 | |
| | 434-435 | H | W | SILTY GRAVELLY SAND: (20% gravel, 60% sand, 15% silt) - Trace MF, 5% FP, 15% VFP, 10% VCS, 10% CS, 25% MS 10% FS, 5% VFS, 15% silt/clay - poorly sorted - (GRAVEL) highly crushed, preserved clasts are subangular-to-subrounded, composition includes 15% basalt 85% quartzite, granitic (SAND) angular-to-subangular grains composed of 15% basalt 85% qtz-rich; overall color (wet) olive 5Y 5/3 (dry) light gray 5Y 7/2; slight-to-mod rxn. w/ 10% HCl; well consolidated. | 1105 | |
| | 446' | H | W | SILTY GRAVELLY SAND: (10% gravel, 80% sand, 10% silt) 2% FP, 8% VFP, 7% VCS, 3% CS, 30% MS, 25% FS, 15% VFS, 10% silt - (GRAVEL) highly crushed - not representative - subrounded VCP-to-CP found in bailer @ 442' - probably represents actual gravel fraction - composition includes 15% basalt, 85% quartzite, granitic (SAND) angular-to-subangular grains composed of | 1240 | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2350

| DRILL LOG | By AIRHART | Rig CABLE TOOL #6 | Well Number 299-W18-22 | Computer Number NA | Project or Work Order No. KEH-1914 |
|---|---|---|---|---|---|
| | Date 8-11-87 | | Depth 440' To 450 | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | (CONT...) | | 5% basalt 95% qtz-rich, mica ; overall color (wet) olive 5Y5/3 (dry) light gray 5Y7/2 ; slight rxn w/ 10% HCl ; well consolidated | | |
| | 445' | H | W | SILTY/CLAYEY GRAVELLY SAND : (20% gravel, 60% sand, 20% silt/clay - NOTE: clay clumps (tan color) evident in sample - 5% FP, 15% VFP (NOTE: Highly crushed - a few preserved VCP to CP also were collected from below - probably represents true formation), 10% VCS, 5% CS, 30% MS, 10% FS, 5% VFS, 20% silt/clay - poorly sorted - (GRAVEL) Preserved clasts subrounded-to-rounded - composition includes 20% basalt, 75% qtzite, 5% granitic (SAND) angular-to-subangular grains composed of 5% basalt 95% qtz-rich ; overall color (wet) olive 5Y5/3 (dry) light gray 5Y7/2 ; very slight rxn w/ 10% HCl ; well consolidated. | 1455 | |
| | 447 | H | W | Brownish/gray clay @ ~ 447' - will drill 5' more to see if this represents lower/middle Ringold contact. At this depth quite a lot of gravel associated w/ clay. | 1600 | |

REMARKS:

Will describe 450' sample tomorrow 1700

Shut Down 1700

S.P. Airhart 8/11/87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ___ Standing Water

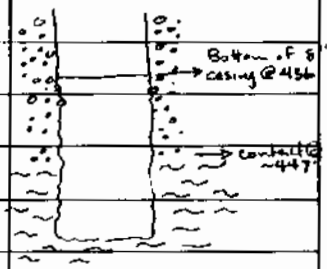
A 6000-021 (5-86)

8-B.2351

| DRILL LOG | By AIRHART | Rig CABLE TOOL | Well Number 299-W18-22 | Computer Number NA | Project or Work Order No. KEH-1914 |
|---|---|---|---|---|---|
| | Date 8-12-87 | # 6 | Depth 450' To 455' | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | D/W from ground surface : 222' (E-tape #0178) | 0805 | |
| 447'10½" | of 8" casing | | | | 0845 | Added 10'3" of 8" casing. |
| | | | | Hole caved while driving casing. Drilling back out | 0930 | 437'7½" + 10'3" = 447'10½" |
| | | | | Driller mis-measured top mark on drill line. | 1100 | |
| | | | | Thought mark was 450', but actually was 455'. Therefore drilled 5' past intended 450' depth. Intended to collect 450' "split-tube" sample and "5' jar" sample. Yesterday collected ~ half of a pint jar of sediment from 450' interval. Will save this for analyses and storage. Following is a descriptor of this sample taken yesterday : | | |
| | 450' | H | W | SLIGHTLY GRAVELLY SANDY CLAY : (NOTE: @ time of sample there was ~ 14' of open hole. Therefore it is probable that most of the sand and gravel came from above gravel / clay contact.) (20% gravel, 30% sand, 50% clay) - 20% MP-VFP | | |

SEE DIAGRAM →




REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-8000-021 (5-85)

8-B.2352

| DRILL LOG | By AIRHART | Rig CABLE TOOL | Well Number 299-W18-22 | Computer Number | Project or Work Order No. KEH-1914 |
|---|---|---|---|---|---|
| | Date 8-12-87 | # 6 | Depth 455' To 455' | NA | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | (CONTINUED...) 5% VCS-CS, 15% MS, 10% FS-VFS, 50% clay/silt - clasts are primarily round - sand grains are subangular-to-subrounded and composed of 5% basalt 95% qtz-rich. - color of clay is between gray 5Y5/1 and olive gray 5Y 5/2. NO rxn. w/ 10% HCl - except for a few caliche sand grains - overall color of fines is (wet) light olive gray 5Y 6/2 (dry) white 5Y 8/2. - mod.-to-well consolidated | | |
| 458'1½" | | | | | 1150 | Added 10'3" of |
| | | | | Drove 8" casing to 455', Drilled out slough | 1225 | 8" casing. |
| | | | | | | 447'10½" + 10'3" = 458'1½" |
| | | | | Cleaning out hole | | |
| | | | | D/B = 453.6' ∴ core sample should be between | 1400 | |
| | | | | 453.6' - 451.9' (actual sampling depth) | | |
| | | | | Took split-tube sample 455'-456.7' | 1505 | |
| | | | | | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2353

| DRILL LOG | By AIRHART | Rig CABLE TOOL | Well Number 299-W18-22 | Computer Number NA | Project or Work Order No. KEH-1914 |
|---|---|---|---|---|---|
| | Date 8-12-87 | # 6 | Depth 455' To 455' | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | 455' | SPLIT-TUBE | Dry | CLAY: clay w/ trace of fine sands and silt. | 1505 | |
| | | | | clay color (dry) ranges from dark greenish gray 5G4/1 to light olive brown 2.5Y 5/6 - brown | | |
| | | | | color appears to be altered clay (oxidation?) | | |
| | | | | No rxn. w/ 10% HCl | | |
| | | | | Driller on stand-by waiting for geophysical logger | 1530 - | 1700 |
| | | | | S.P. Airhart 8/12/87 | | |
| | | | | NOTE: TOOK SPLIT-TUBE SAMPLE TO SIGMA V FOR ANALYSIS | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2354

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| AIRHART | CABLE TOOL #6 | 299-W18-22 | NA | KEH-1914 |
| Date: 8-14-87 | | Depth: 455' ~~365'~~ To ~~455'~~ SPA | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Kelly not here | | |
| | | | | Retrieved broken steel tape out of hole | 1030 | |
| | | | | Tried to take $H_2O$ sample - too muddy | | |
| | | | | Bailed | | |
| | | | | S.P. Airhart 8/14/87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____Standing Water

A-6000-021 (5-85)

8-B.2355

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| J.S. Wilbur | Rig #6 | 299-W18-22 | NA | KEH-1914 |
| Date: 8/17/87 | Kelly Olsen | Depth completion work To | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Depth to the bottom 422' 7", the hole has back filled ~ 20' over the weekend | | |
| | | | | Helpers are steam cleaning the sand pump to remove material from the hole. The sand pump broke off down the hole & had to be fished. A new sand pump is being used. | 1:30 | |
| | | | | Bailed sand | | |
| | | | | No D/B taken !!!!!!!!!! SDA Lund 8/17/87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2356

| DRILL LOG | By AIRHART | Rig CABLE TOOL #6 | Well Number 299-W18-22 | Computer Number NA | Project or Work Order No. KEH-1914 |
|---|---|---|---|---|---|
| | Date 8-18-87 | | Depth COMPLETION To | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | D/B = 242' | 0710 | |
| | | | | Bailed out more silica sand. D/B ~ 447' | 0800 | |
| | | | | Set 8" telescoping screen @ 447.5' | 0840 | |
| | | | | Pulled 8" casing to 439'5" - Exposed telescoping screen | 0900 | |
| | | | | Started bailing | 0930 | |
| | | | | Took $H_2O$ sample for analysis - | | |
| | | | | | | |
| | | | | Driller went to help out @ well 299-W15-16 | | |
| | | | | | | |
| | | | | SP Am Lent 8/18/87 | | |
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REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2357

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| AIRHART | CABLE TOOL | 29-W15-15 | NA | KEH-1914 |
| Date: 8-19-87 | #6 | Depth: COMPLETION To | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Started bailing w/ 4" dart bailer | 1030 | |
| | | | | D/W before bailing = 197' | 1030 | |
| | | | | After bailing 20 min @ ~ 10 gpm. D/W ~ 202' | 1055 | |
| | | | | ∴ ~ 5' of drawdown. | | |
| | | | | Stopped bailing | 1130 | |
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REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2358

| DRILL LOG | By J.S. Kilbur | Rig #6 | Well Number 299-N118-22 | Computer Number NA | Project or Work Order No. RFH 1914 |
|---|---|---|---|---|---|
| | Date 8/24/87 | | Depth Set Pump for Aquifer Test To | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Set pump @ 442'11" from the ground surface, 444'11" from the top of the casing. Stilling well was also implaced. | | |
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REMARKS:

D - Drive Barrel H - Hand Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2359

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| T.S. Wilbur | Rig # 6 | 299-K18-22 | NA | K611-1914 |
| **Date** 8/25/87 | Kelly Olsen | **Depth** To | | **Subcontract No.** NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Finished setting Stillpipe down the hole — | | |
| | | | | set discharge pipe out | | |
| | | | | Ran step drawdown test — 0:00 to 3:00 | | |
| | | | | Well development: | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2360

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| J.S. Wilbur | Rig #6 | 299-N1A-22 | NA | KF11-F11A |
| Date 8/26/87 | Kelly Olsen | Depth To | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Aquifer Test - all day - | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | J.S. Wilbur - 8/26/87 | | |
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REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____Standing Water

A-6000-021 (5-85)

8-B.2361

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| T Gilmore | Cable Tool # 6 | 299 W18 22 | N/A | KEH A/K |
| **Date** 8/27/87 | Kelly Olsen | **Depth** Completion To | | Subcontract No. N/A |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 447' | 10½" | of 8" | | Rig repair replace belt on rig | 700 | |
| | | | | Preparing to pull aquifer testing equipment out of hole. | | |
| | | | | (Note screen set @ 447.5, casing pulled back to 439'5") | | |
| | | | | 198.99' Depth to water from Top of Tremmy pipe | 742 | |
| | | | | Pulling Tremmy pipe | 910 | |
| | | | | Pulling Pump | 1000 | |
| | | | | Depth to Bottom 446.5 (from ground level) | 1530 | |
| | | | | Clean up Site, preparing to run Stainless in Morning | 1545 | |
| | | | | Quit | 1650 | |

REMARKS:

8/27/87 J Gilmore DB 446.5'

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-8000-021 (5-85)

8-B.2362

1 of 1 8/28

| DRILL LOG | By T Gilmore | Rig CobeTm/#6 Kelly Olsen | Well Number 299 W18 22 | Computer Number NA | Project or Work Order No. KEH 9A1 |
|---|---|---|---|---|---|
| | Date 8/28/87 | | Depth Completion To | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Running Stainless steel in hole | 730 | |
| | | | | have on site 21 X 20' sections | | |
| | | | | 1 X 20' 6" Screen | | |
| | | | | 1 X 10' 5" Screen | | |
| | | | | = 450' 9" of casing & screen | | |
| | | | | Added 30' 9" of Screen | 730 | |
| | | | | Added 1X20' Section casing | 755 | |
| | | | | Added 1X20' Section casing w/ centralizer | 835 | |
| | | | | Adding rest of 20' sections | 840 | |
| | | | | Casing settled to 448' - considered depth to bottom | 1240 | |
| | | | | (36" of casing exposed out of ground) | | |
| | | | | Driller helps move irrigation pipe ect. | | |

REMARKS:

8/28/87 T Gilmore

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2363

page 1071

| DRILL LOG | By J.S. Hillow | Rig # 6 | Well Number 299-W18-22 | Computer Number | Project or Work Order No. RFH-1979 |
|---|---|---|---|---|---|
| | Date 8/31/87 | Kelly Assn | Depth Completion TD work | NA | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | No drilling today driller doing repair work on rig | | |
| | | | | J.S Hill 8/31/87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2364

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| J.S. Hilbur | Rig #6 | 299-W18-22 | NA | KEH-1919 |
| Date 9/1/87 | Kelly Olsen | Depth completion work To | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Repair work to drilling rig all day. | | |
| | | | | J.S. Hilb 9/1/87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____Standing Water

A-6000-021 (5-85)

8-B.2365

| DRILL LOG | By AIRHART | Rig CABLE TOOL #6 KELLY | Well Number 299-WIB-22 | Computer Number NA | Project or Work Order No. 14EH-1914 |
|---|---|---|---|---|---|
| | Date 9-2-87 | | Depth COMPLETION To | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Repairing rig | — 1430 | |
| | | | | Added 5 100 lb. bags of 10-20 mesh Colorado | 1445 | |
| | | | | silica sand. D/sand = 422.4' | | |
| | | | | Pulled 8" casing to 432.5' below land surface | 1545 | |
| | | | | D/sand = 431.6' | 1550 | |
| | | | | Added 5 bags 10-20 Colorado silica sand | 1600 | |
| | | | | D/sand = 411' | 1620 | |
| | | | | Added 1 more bag 10-20 Col. silica sand before | 1625 | |
| | | | | pulling 8" | | |
| | | | | Pulled 8" casing to 422'9" below land surface | 1645 | |
| | | | | | 1655 | Shut Down |
| | | | | S.P Arhart 9-2-87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-8000-0

8-B.2366

| DRILL LOG | By AIRHART | Rig CABLE TOOL #6 | Well Number 299-W18-22 | Computer Number | Project or Work Order No. KEH-1914 |
|---|---|---|---|---|---|
| | Date 9-3-87 | KELLY | Depth COMPLETION To | NA | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | D/sand @ 414' | 0730 | |
| | | | | Added 5 bags 10-20 silica sand to 406' | 0750 | |
| | | | | Added 1 more bag 10-20 silica sand before | 0820 | |
| | | | | pulling. | | |
| | | | | Pulled 8" casing to 412'8" below land surface | 0900 | Top of sandpack |
| | | | | D/sand = 410' - | 0915 | 410' (448'-410') |
| | | | | Added 6 buckets of Volclay pellets | 1045 | |
| | | | | Pulled 6" casing to 402'6" below land surface | 1115 | |
| | | | | checked D/B - appears to be a plug @ | 1135 | |
| | | | | ~ 195' - will try and knock plug out w/ | | |
| | | | | a piece of tremie pipe on the sand line - | | |
| | | | | Decided to pour water on pellets to loosen them. | | |
| | | | | Driller poured 5 gallons of $H_2O$ from drilling $H_2O$ | | |
| | | | | supply barrel. Noticed $H_2O$ was sudsy. He stated | | |
| | | | | that he had washed hands w/ cleaning soap. | | |
| | | | | Found new water supply. Dumped ~ 30 gallons | | |
| | | | | down hole. | | |
| | | | | Filled hole w/ water to create more head | 1300 | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2367

| DRILL LOG | By AIRHART | Rig CABLE TOOL #6 | Well Number 299-W18-22 | Computer Number NA. | Project or Work Order No. KEH-191V |
|---|---|---|---|---|---|
| | Date 9-3-87 | | Depth COMPLETION To | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Able to penetrate tremie pipe to ~240' | 1645 | |
| | | | | while jetting water @ same time | | |
| | | | | Shut Down | 1700 | |
| | | | | S.P. Airhart | | |
| | | | | 9-3-87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2368

| DRILL LOG | By AIRHART | Rig CABLE TOOL #L | Well Number 299-W18-22 | Computer Number | Project or Work Order No. KEH-1914 |
|---|---|---|---|---|---|
| | Date 9-4-87 | KELLY O. | Depth COMPLETION TO | NA | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Tried measuring D/B inside tremie - too much | 0700 - | 0800 |
| | | | | bentonite 'goop' inside tremie - tape sticks | | |
| | | | | Will try to run tremie to ~ 380'. | | |
| | | | | Ran tremie to ~ 404' below land surface - | 1100 | |
| | | | | it appears this is top of volclay pellets. | | |
| | | | | Will pull tremie to 384' & pump grout | | |
| | | | | Mixed 9½ bags Volclay grout & 9 bags | 1200 | |
| | | | | initiator w/ ~ 250 gallons $H_2O$. Measured | | |
| | | | | slurry twice - 9.4-9.5 lbs/gal - had to | | |
| | | | | add more $H_2O$ to pump - 9.3 lbs/gal. - | | |
| | | | | Pulled 1½" tremie to ~ 320' | | |
| | | | | Mixed 9 bags Volclay grout & 9 bags | 1430 | |
| | | | | initiator w/ ~ 250 gallons $H_2O$. Again | | |
| | | | | measured slurry twice - 9.4-9.5 lbs/gal - pump | | |
| | | | | wouldn't pump - added $H_2O$ - 9.3 lbs/gal - | | |
| | | | | Pull all of tremie out of hole - had | | |
| | | | | total of 404' 7" originally (to tag bottom) | | |
| | | | | D/grout on tremie ~ 248' | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2369

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| AIRHART | CABLE TOOL #6 | 299-W18-22 | NA | KEH-1914 |
| Date: 9-4-87 | | Depth: COMPLETION To | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Instructed driller to pull remaining 8" | 1600 | |
| | | | | casing out of hole. | | |
| | | | | Pulled 8" casing to 381'10" from land surface | 1645 | |
| | | | | | | |
| | | | | Shut Down | 1650 | |
| | | | | | | |
| | | | | S.P. Ambert | | |
| | | | | 9-4-87 | | |
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REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____Standing Water

A-6000-021 (5-85)

8-B.2370

| DRILL LOG | By AIRHART | Rig CABLE TOOL #6 | Well Number 299-W18-22 | Computer Number NA | Project or Work Order No. KEH-1914 |
|---|---|---|---|---|---|
| | Date 9-8-87 | KELLY O. | Depth COMPLETION To | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Pulled remaining 8" casing out of hole | 0700 - 1500 | |
| | | | | D/grout ~ 345'-350' | 1530 | |
| | | | | Preparing to pull 10" casing & pump grout | 1600 | |
| | | | | S.P. Airhart #9-8-87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2371

| DRILL LOG | By AIRHART | Rig CABLE TOOL #6 | Well Number 299-W18-22 | Computer Number NA | Project or Work Order No. KEH-1914 |
|---|---|---|---|---|---|
| | Date 9-9-87 | | Depth COMPLETION To | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Drillers added 42 50lb sacks of Volclay grout - | | |
| | | | | D/T of Volclay @ 120' from ground surface, this measurement | | |
| | | | | is based on grout coating on the tremie pipe. | 14:20 | |
| | | | | | | |
| | | | | Driller back pulled 20' of 10" casing | | |
| | | | | | | |
| | | | | A. S. Dill PNL 9/9/87 | | |
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REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-8000-021 (5-85)

8-B.2372

| DRILL LOG | By AIRHART | Rig CABLE TOOL # 6 | Well Number 299-W18-22 | Computer Number NA | Project or Work Order No. KEH-1914 |
|---|---|---|---|---|---|
| | Date 9-10-87 | KELLY OLSON | Depth COMPLETION To | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | checked D/grout ~ 205 - 210' | 0730 | |
| | | | | Instructed drillers to pump 200 gallons | 0745 | |
| | | | | more grout in hole before pulling 10' | | |
| | | | | casing out of hole. | | |
| | | | | Setting tremie pipe | 0800 | |
| | | | | Mixed 8 bags volclay grout & 8 bags initiator | 0830 | |
| | | | | w/ 200 gallons $H_2O$. Slurry density = 9.3 lbs/gal | | |
| | | | | D/grout (based on level on tremie pipe) | | |
| | | | | ~ 75' below land surface | | |
| | | | | Pulled 10" casing to 125' below land surface | 0900 - 1700 | |
| | | | | | | |
| | | | | Shut Down | 1700 | |
| | | | | | | |
| | | | | S.P. Airhart | | |
| | | | | 9-10-87 | | |
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REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (6-85)

8-B.2373

| DRILL LOG | By AIRHART | Rig CABLE TOOL #6 | Well Number 299-N18-22 | Computer Number NA | Project or Work Order No. KEH-1914 |
|---|---|---|---|---|---|
| | Date 9-11-87 | KELLY O. | Depth COMPLETION To | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Pulled remaining 10" casing out of hole | 0830 | |
| | | | | D/grout ~ 210'-215' - may actually be | 0900 | |
| | | | | 200', however, it is very difficult to | | |
| | | | | determine using steel tape. | | |
| | | | | Driller took off. | 1200 | |
| | | | | S.P. Nisbet | | |
| | | | | 9-11-87 | | |
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REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2374

-1337 ft/HR -6176 " / 1.- Ft



| DRILL LOG | By AIRHART | Rig CABLE TOOL #6 | Well Number 299-W18-22 | Computer Number NA | Project or Work Order No. KEH-1914 |
|---|---|---|---|---|---|
| | Date 9-14-87 | | Depth COMPLETION To | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | | 0715 | Began setting |
| | | | | | | 1½" tremie pipe |
| | | | | | | 189'- |
| | | | | D/grout ~ 200' below land surface | 0900 | |
| | | | | Mixed 4 bags Volclay grout & 4 bags initetor | | |
| | | | | w/ 100 gallons $H_2O$. No slurry density taken | | |
| | | | | Pumped slurry down hole. | 1000 | |
| | | | | D/grout uncertain due to large amount of | | |
| | | | | $H_2O$ in hole. $H_2O$ level inside annulus rose | | |
| | | | | to ~ 152'. | | |
| | | | | Began pulling 12" casing - slow pulling | | |
| | | | | Pulled 12" casing to 245' below land surface | 1100 | |
| | | | | Pulled 12" casing to 216' below land surface | 1300 | |
| | | | | Mixed 8½ bags Volclay grout & 8 bags initetor w/ | | |
| | | | | ~ 200 gallons $H_2O$. Slurry density 9.3-9.4 lbs/gal. | 1445 | |
| | | | | Will check D/grout in morning | | |
| | | | | Shut Down | 1500 | |

REMARKS:

S.P Ambart 9-14-87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000-021 (5-85)

8-B.2375

.1737 gal/ft³, .6196 lbs/in ft.



| DRILL LOG | By AIRHART | Rig CABLE TOOL #6 | Well Number 299-W18-22 | Computer Number NA | Project or Work Order No. KEH-1914 |
|---|---|---|---|---|---|
| | Date 9-15-87 | | Depth COMPLETION To | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | D/grout = 189' below land surface. | 0720 | |
| | | | | Instructed driller to begin pumping | | Top of Grout @ 189' |
| | | | | bentonite. | | |
| | | | | Mixed 400 lbs. Enviro-Gel (-10 - 100 mesh) | 0930 | |
| | | | | bentonite w/ 400 gallons $H_2O$. Slurry density | | |
| | | | | = 8.9 lbs/gal. - D/bentonite ~ 152' below | | |
| | | | | land surface. | | |
| | | | | | 0935 | Removing Tremie |
| | | | | Pulled 12" casing to 184' below land surface | 1300 | |
| | | | | D/bentonite ~ 170'-180' | 1325 | |
| | | | | | 1326 | Inserting Tremie |
| | | | | Mixed 600 lbs. Enviro-Gel (-10-100 mesh) bentonite | 1420 | |
| | | | | w/ 600 gallons $H_2O$. Slurry density 8.8-8.9 lbs/gal. | | |
| | | | | - | 1425 | Removing Tremie |
| | | | | | 1445 | Welded on 12" |
| | | | | | | Pull-head. |
| | | | | | 1500 | Shut Down |
| | | | | | | |

REMARKS:

12-661

S.P. Airhart
9-15-87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2376

| DRILL LOG | By AIRHART | Rig CABLE TOOL #6 | Well Number 298-W18-22 | Computer Number NA | Project or Work Order No. KEH-1914 |
|---|---|---|---|---|---|
| | Date 9-16-87 | | Depth COMPLETION To | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | D/bentonite ~ 120' below land surface | 0730 | |
| | | | | Pulled 12" casing to 174' below land surface | 0830 | |
| | | | | | 0900 | Added 126' of tremie |
| | | | | Mixed 400 lbs of Enviro Gel (70-100 mesh) bentonite | 0930 | |
| | | | | w/ 400 gallons $H_2O$. Slurry density = 8.9 lbs/gal | | |
| | | | | D/bentonite = 137' below land surface | 1100 | |
| | | | | | 1130 | Added tremie to 147' |
| | | | | Mixed 200 lbs. of Enviro Gel w/ 200 gallons | 1200 | |
| | | | | $H_2O$. Pumped slurry down hole. | | |
| | | | | D/bentonite = 112.5' below land surface | 1205 | |
| | | | | | 1210 | Begin removing Tremie |
| | | | | Pulled 12" casing to 164' below land surface | 1300 | |
| | | | | D/bentonite = 141'8" below land surface | 1325 | |
| | | | | | | |
| | | | | Mixed 400 lbs of Enviro Gel w/ 400 gallons | 1420 | |
| | | | | $H_2O$. Slurry density = 8.9 lbs/gal. Pumped | | |
| | | | | slurry down hole. D/bentonite = 106.5' | | |
| | | | | | 1500 | Shut Down |

REMARKS:

S. P. Airhart
9-16-87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-8000-021 (5-85)

8-8-2377

| DRILL LOG | By: T Gilmore | Rig: CABLE TOOL #6 | Well Number: 299-W18-22 | Computer Number: NA | Project or Work Order No.: KEH-191 |
|---|---|---|---|---|---|
| | Date: 9-17-87 | | Depth: COMPLETION To | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Depth to Grout 130'; Dropped ~24' overnight | 700 | |
| | | | | Added 200 gal of Grout (~16 mixed) | 730 | |
| | | | | Depth to Grout 96' | 755 | |
| | | | | Pull Tremmy Pipe | 805 | |
| | | | | Weld on puller head to Pull 12" pipe; 164' of 12" in | | |
| | | | | hole w/ Grout level at 26' | | |
| | | | | | | |
| | | | | Pulled rest of 12" out of hole | 1230 | |
| | | | | Build 16" puller head | 1300 | |
| | | | | End of Day | 1500 | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-8000-021 (5-85)

8-B.2378

1 of 9/18

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| T Gilmore | Cable Tool # 6 | 299 W18 22 | NA | LEH 1914 |
| Date 9/18/87 | Kelly Olsen | Depth Completion To | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Broke puller Bar, building a new one | 730 | |
| | | | | Pulling 16" 10' pulled | 1000 | |
| | | | | Pouring grout 300 gal / 300 lbs enviro gel | 1245 | |
| | | | | Pouring grout 300 gal / 300 lbs enviro gel | 1330 | |
| | | | | Pouring grout 300 gal / 300 lbs enviro gel | 1415 | |
| | | | | Averaging 10 gal / foot in 16" | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2379

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| J.S. Hilbur | Rig # 6 | 299-W18-22 | NA | KEH-1914 |
| **Date** 9/21/87 | Kelly Olsen | **Depth** Completion Drill To | | **Subcontract No.** NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Welds on 16" puller head on to casing — | 7:00 | |
| | | | | Driller back pulls 10.7' of 16" casing out of the | | |
| | | | | hole @ | 9:05 | |
| | | | | Removed 10.7' section of pipe from puller head | | |
| | | | | Welds 16" puller head back on to casing in the ground | | |
| | | | | Driller back pulls 10.3 section 16" casing out of | | |
| | | | | the hole @ | 11:45 | |
| | | | | Waiting for the grout truck — | | |
| | | | | | | |
| | | | | Add 11 x100 lb bags of bentonite - 1100 gals of | | |
| | | | | slurry. | | |
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**REMARKS:**

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2380

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| J.S. Wilbur | Rig # 6 | 299-W18-22 | NA | KEH-1914 |
| Date 9/22/87 | Kelly Olsen | Depth Completion Work To | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Driller arrived to the well site @ | 7:00 | |
| | | | | Back pulled 30' of 16" carbon steel casing : D/B of casing | | |
| | | | | 87' from ground surface at the end of the day D/T | | |
| | | | | grout 76' below ground surface. We'll grout first thing | | |
| | | | | tommrow morning. | | |
| | | | | Driller heads home @ | 15:00 | |
| | | | | J.S. Wilbur DOE 9/22/87 | | |
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REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2381

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| J.S. Kilbur | Rig #6 | 299-118-22 | N/A | KEH-1919 |
| **Date** 9/23/87 | Kelly Olsen | **Depth** Completion work To | | **Subcontract No.** N/A |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Driller arrived @ the drill site @ | 7:00 | |
| | | | | Welded on pulling head to 16" carbon steel casing | | |
| | | | | | | |
| | | | | Added 600 gal of slurry added to the well (6 x 100 lb | | |
| | | | | sacks of bentonite) - D/T of grout @ 79' from | | |
| | | | | GS. | | |
| | | | | | | |
| | | | | Driller pulls all the remaining 16" casing out of the hole. | | |
| | | | | | | |
| | | | | Driller heads home @ | 1300 | |
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**REMARKS:**

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000 021 (5-85)

8-B.2382

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| J.S. Hillow | Rig #C | C99-418-72 | NA | KH1 1719 |
| Date: 9/29/87 | Kelly Olsen | Depth: Completion To | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Driller arrives at the well site @ | 7:00 | |
| | | | | Driller welds up a 20" puller head for the 20" casing | 11:30 | |
| | | | | Added 600 gal of bentonite slurry to the hole | | |
| | | | | D/T of grout @ ~9.5' from the GS. | | |
| | | | | Back pulled 7' of 20" casing | | |
| | | | | Driller heads home @ | 15:00 | |
| | | | | J.S. Hillow PNL 9/29/87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2383

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| J.S. Hilbur | Rig | 299-N18-22 | NA | KEII-1919 |
| Date: 9/29/87 | Kelly Olsen | Depth: Completion Work | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Driller arrived to well site c | 7:00 | |
| | | | | Started to brake down rig to move to well 299-N8-1, | | |
| | | | | moved rig to lay down yard for steam cleaning — | | |
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REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5/85)

8-B.2384

10/1 9,25

| DRILL LOG | By T Gilmore | Rig Cable Tool #6 | Well Number 899 W19 22 | Computer Number | Project or Work Order No. KEH 1914 |
|---|---|---|---|---|---|
| | Date 9/25/87 | Kelly Olsen | Depth Completion To | NA | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Driller on location | 730 | |
| | | | | Pulling 20" 3' pulled | | |
| | | | | Cut off joint | 820 | |
| | | | | Weld on Pulled Hood | 900 | |
| | | | | Pour Grout 200gal/200lbs Bg/bag Bentonite | | |
| | | | | (100lbs powder, 100lbs granular) | | |
| | | | | Mix more Grout 300gal/300lbs, Came up to ground surface | 1010 | |
| | | | | Finish welding puller head and pull more pipe | 1055 | |
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REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2385

page 1 of 1

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| J.S. Hilbur | Cable Tool Rig #3 | 299-W18-22 | NA | RFH-1914 |
| **Date** | **Depth** | | | **Subcontract No.** |
| 9/24/87 | Kelly Olsen | Completion Work | | NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION<br>% Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Fill remain 9' of open hole w/ 32 x 50 lb sack of dry bentonite. | | |
| | | | | J.S. Hilbur 9/24/87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ___ Standing Water

A-6000-021 (5-85)

8-B.2386

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| J.S. Wilbur | Cable Tool Rig 5 | 299-N18-77 | N/A | KEH-1914 |
| Date: 9/28/87 | Kelly Olsen | Depth: completion To | | Subcontract No.: N/A |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Added 5 x 100 lb sacks of bentonite slurry – | | |
| | | | | removed remain 11' of 20" carbon steel casing | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | J.S. Wilbur 9/28/87 | | |
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REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2387

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| K. Olson | | | | |
| Date: 5/27/87 | | Depth: To | | Subcontract No.: KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Picked up propane trailer, mice at yard, moved blue rig to 200 west, un-loaded mice from flat bed, picked up fuel truck with big truck & moved it to town | 8 | Hrs |
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KEH-1914

H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-8.2388

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| K. Olson | | | | |
| Date: 5/29/87 | | Depth: To | | Subcontract No.: JAJ-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Moved ~~Do~~ green rig in, moved ~~a~~ big water tank int. west, took off flat tire, moved rotary, parts trailer etc. from old lay-down yard to new one, moved & set up Will ~~drilling~~ rig | 8 | hrs |

REMARKS:

O - Drive Barrel; H - Hard Tool; L - Large; M - Medium; S - Small; VC - Very Coarse; C - Coarse; F - Fine; VF - Very Fine; ____ Standing Water

A-8000-021 (5-85)

8-B.2389

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| K. Olson | #16 RO | 299-W18-22 | | |
| Date: 6/1/87 | | Depth: To | | Subcontract No.: JAS-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION<br>% Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Re-washed blue rig, added extra blocking to green rig, moved blue rig to site, stripped bailer line off green rig, made up guy wires, set up blue rig. | 8 | hrs |

REMARKS:

Karen R. Oster
6/2/87

D - Drive Barrel  H - Hard Tool  L - Large  M - Medium  S - Small  VC - Very Coarse  C - Coarse  F - Fine  VF - Very Fine  ____ Standing Water

A 6000-021 (5-85)

8-B.2390

| DRILL LOG | By Kelly Olson | Rig K.O. #6 | Well Number 299-W18-22 | Computer Number | Project or Work Order No. |
|---|---|---|---|---|---|
| | Date 6/2/87 | | Depth 0 To 4' | | Subcontract No. KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time Item | Drilling Comments |
|---|---|---|---|---|---|---|
| 20'5½" | 4' | H | W. | 0-2 - road bed - fill, | #1 | 4' |
| | | | | 2-4 - brown sand-silt | #6 | 4' |
| | | | | Hooked up guy lines, made up tools on green & blue rig, helped load 16" pipe, welded on 20" shoe, drilled from 0' to 4' | | 8 hrs |

REMARKS: 1

Karen P. Oster
6/2/87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000 021 (5-85)

8-B.2391

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| K. Olson | #6 | 299-W18-22 | | |
| Date: 6/3/87 | | Depth: 4' to 10' | | Subcontract No.: KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time Item | Drilling Comments |
|---|---|---|---|---|---|---|
| 20" 20'5" | 10' | H | W | Changed tire on water | #1 | 6' |
| | | | | truck, hauled water (4,000 gals.), | #6 | 6' |
| | | | | Pulled 20" pipe back out, | | |
| | | | | re-set mast in line with | | |
| | | | | mast, drilled from 4' to | | |
| | | | | 10', cable broke above | | |
| | | | | rope socket, changed cable | | |
| | | | | in rope socket | | |
| | | | | | 8 | hrs |
| | | | | 6' to 10' - sand - brown | | |
| | | | | & black | | |

8-B.2392

REMARKS:

Karen P. Oster
6/4/87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

| DRILL LOG | By K. Olsen | Rig II | Well Number 299-W18-22 | Computer Number | Project or Work Order No. |
|---|---|---|---|---|---|
| | Date 6/4/87 | | Depth 10' To 15' | | Subcontract No. KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 20" 20'5½" | 15' | H | W | drilled from 10' to 15' in | #1 | 5' |
| | | | | brown & black sand with | #6 | 5' |
| | | | | gravel, & put drive head | | |
| | | | | back on, drove casing to | | |
| | | | | 19', loaded & re-washed 20" | | |
| | | | | pipe (1½ hrs) hauled pipe to | | |
| | | | | site, cut into 10' lengths, | | |
| | | | | repaired broken drive head | | |
| | | | | | | |
| | | | | | 8 | 4 hrs |

REMARKS:

Karen P. Olsen
4/14/87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2393

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| K. Olson | #6 | 299-W18-22 | | |
| Date: 6/5/87 | | Depth: 15 To 24' | | Subcontract No.: KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | ~~Time~~ Item | Drilling Comments |
|---|---|---|---|---|---|---|
| 20" 5½ | 15' | H | W | 15' to 24' black | #1 | 9' |
| + 10' | - | | | sand with gravels, some brown | #6 | 10' |
| 30' 5½" | 24' | " | " | sand | | |
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| | | | | | | 8 hrs |
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REMARKS: welded 10' joint, drilled from 15' to 24'

B V Last 6-8-87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-8.2394

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| K. Olson | #6 | 299-W18-22 | | |
| Date 6/8/87 | | Depth 24' To 44' | | Subcontract No. KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 20" 30'S½" | 24' | | | 24-25- Black sand & gravel | | |
| + 10½" | | | | 25-40- Brown sand & silt | | |
| 40'6 | | | | 40-44 cobbles & gravel, sand | | |
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| | | | | | 8 | hrs |
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| | | | | | Karen R. Oster 6/10/87 | |

REMARKS: drilled from 24' to 30' welded additional 10½ in. casing, drilled from 30' to 44'

O - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-8000-021

8-B.2395

| DRILL LOG | By K. Olson | Rig #6 | Well Number 299-W18-22 | Computer Number | Project or Work Order No. |
|---|---|---|---|---|---|
| | Date 6/9/87 | | Depth 44' To " | | Subcontract No. KEH-194 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 40'6" | | | | | | |
| 10' | | | | Tried advancing open hole in morning from 44', no success, Hauled # 10" bit & sub to Hanes, helped Homer break out & make up head tools, loaded 20" pipe, hauled to wash pad & re-washed (1½ hrs), returned to site cut pipe & welded joint, re-drilled cave after driving pipe from 39' to 43', trouble drilling open hole or advancing casing in afternoon, no progress | | |
| 50'6" | | | | | | |
| | | | | | | 8 hrs |

REMARKS:

Karen P. Oster
6/10/87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2396

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| K. Olson | #6 | 299-W15-22 | | |
| Date: 6/10/87 | | Depth: 44' To 99' | | Subcontract No.: KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Item | Drilling Comments |
|---|---|---|---|---|---|---|
| 20" 50'6" | 49' | H | W | 44-49: Cobbles sand & gravel | #1 | 5' |
| | | | | | | 8 hrs |
| | | | | | | Karen P. Oster 6/12/87 |

REMARKS: Drilled 5' Cased from 44' to 49, Hauled water helped Darrel load 10' pipe, (2 hrs last two items)

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-8000-021 (6-85)

8-B-2397

| DRILL LOG | By K. Olson | Rig #6 | Well Number 299-W18-22 | Computer Number | Project or Work Order No. |
|---|---|---|---|---|---|
| | Date 6/11/87 | | Depth 49' To 50 | | Subcontract No. KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 50'6 | 50' | H | W | picked up water truck at Bills, filled his barrels, returned to rig, drilled 49' to 50', terminated 20" pipe, tool sanek, baled well, loaded 16" pipe, moved water truck, washed pipe (1hr), picked up 16" shoe washed shoe, hauled water to Homer, helped Dale un-load 20" bits, picked up pump rig at Vis. Ecology, re-loaded 10" bits, set up pump-rig & hung bits, welded on 16" shoe, tried to drill open hole, no success | 8 hrs | |

REMARKS:

Karen R. Oster
6/12/87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-8.2398

| DRILL LOG | By K. Olson | Rig | Well Number 299-W18-27 | Computer Number | Project or Work Order No. |
|---|---|---|---|---|---|
| | Date 6/12/87 | | Depth 50' To " | | Subcontract No. KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 16" 20'4" + 19'11½" 40' 3½" | | | | Helped load 10" bits, built up 16" bit with round stock, welded 16" pipe joint, worked on water truck so Jones could un-load oxygen | | 8 hrs |

REMARKS:

Karen R. Oster
6/15/87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-8.2399

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| K. Olson | #6 | 299-W19-22 | | |
| Date 6/15 | | Depth 50' To 52' | | Subcontract No. KEH-1917 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | ~~Time~~ Hrs | Drilling Comments |
|---|---|---|---|---|---|---|
| 16" 40'3" | 50' | H | W. | Removed 20" drive head | #2 | 2' |
| + 19'11 | | | | welded 16" joint, drilled | #7 | 19'11 |
| 60' 2½" | 52' | | | from 50' to 52' in cobbles | | |
| | | | | & gravel, repaired 16" to 24" | | |
| | | | | drive head broke tools & | | |
| | | | | installed 16" head | | |
| | | | | G.S. Hill 6/22/81 | | 10 hrs |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-8-2400

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| K. Olson | #6 | 299-W19-22 | | |
| Date: 6/16/87 | | Depth: 52' to 60' | | Subcontract No.: KEH-1917 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Item | Drilling Comments |
|---|---|---|---|---|---|---|
| 6" 60'2½" | 52' | H | W | 52' to 60' cobbles, gravels, & sand | #2 | ~~10~~ 8' |
| + 10' | | | | | #7 | 10' |
| 70'2½" | 60' | | | | | |
| | | | | J. S. Hill 6/23/87 | | |
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REMARKS: drilled from 52' to 60', added 10' section of pipe

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000 021 (5-85)

8-8-2401

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| K. Olson | #6 | 299-419-22 | | |
| **Date** 6/17/87 | | **Depth** 60' To 85' | | **Subcontract No.** KEH-191 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | ~~Time~~ Item | Drilling Comments |
|---|---|---|---|---|---|---|
| 70'2½ | | | | 60-67- cobbles, gravel, sand | #2 | 25' |
| 19'11½ | | | | 67-85 - Brown sand-silt | #3 | 19'11½" |
| 90'2" | | | | | | |
| | | | | J.S. Hill 6/22/87 | | |
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| | | | | | Time - 10 hrs | |
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REMARKS: Drilled from 60' to 85', added 19'11½" 16" casing

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B-2402

| DRILL LOG | By K. Olsen | Rig #6 | Well Number 299-W19-22 | Computer Number | Project or Work Order No. |
|---|---|---|---|---|---|
| | Date 6/18/87 | | Depth 85' To 100' | | Subcontract No. KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time Hsm | Drilling Comments |
|---|---|---|---|---|---|---|
| 90'2" | 115' | H | W. | 85-88- Brown sand-silt | #2 | 15' |
| | | | | 88-100- " silt-caliche | | |
| | | | | J.S. Hill 6/22/87 | | |
| | | | | | Time - 10 hrs | |

REMARKS: Sand-caliche seemed cemented- drilled slow

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-8000-021 (5-85)

8-8.2403

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| K. Olson | #6 | 299-W19-22 | | |
| Date: 6/19/87 | | Depth: 100 To 115' | | Subcontract No.: KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time Item | Drilling Comments |
|---|---|---|---|---|---|---|
| 16" 90'2" | 100' | | | 100' -115 - brown sand-silt | #2 | 15' |
| + 20'1 | | | | possible caliche | #7 | 20' 1" |
| 110'3 | 115' | | | | | |
| | | | | A.S. Hill 6/22/87 | | |
| | | | | | Tims | 5hrs |

REMARKS: left early - brought Hobart Starter to AGS, Barrel washed rig

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-8-2404

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| K. Olson | #6 | 299-W19-22 | | |
| Date: 6/23/87 | | Depth: 115' To 135' | | Subcontract No.: KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | ~~Time~~ Hsm | Drilling Comments |
|---|---|---|---|---|---|---|
| 16" 110'3" | 115' | H | W | 115- 135- Brown sand - silt | #2 | 20" "drilled |
| + 19'10" | | | 120' | | #7 | 19'10" casing added |
| 130'1" | 135' | | 125' | samples taken | | |
| | | | 130' | | | |
| | | | 135' | J.S. Hill 6/23/87 | | |
| | | | | | | Time - 10 hrs |

REMARKS: changed starter on welder, installed new clutch in big truck, Blaine watched rig, added 19'10" casing, picked up new starter for Dave at A65

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-8-2405

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| K. Olsen | #6 | 299-W19-22 | | |
| Date: 6/24/87 | | Depth: 135' to 149' | | Subcontract No.: KEH-1918 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time Item | Drilling Comments |
|---|---|---|---|---|---|---|
| 16" 130'1" | 135' | H | W | | #2 | 14' drilled |
| 1 20' | | " | 135' | } samples taken | #7 | 20' casing added |
| 150'1 | 149' | " | 140' | | | |
| | | | 145' | | | |
| | | | | 135' - 141 - silt & sand | | |
| | | | | 141 - 149 - cemented gravels | | |
| | | | | | Time | 10 hrs |
| | | | | S.P. Aitchet 6-29-87 | | |

REMARKS: Helped Darrel pull main shaft on Green rig, Bleine watched rig, added 20' 16" pipe

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B-2406

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| K. Olson | #6 | 299-W19-22 | | |
| Date: 6/25/87 | | Depth: 149' To 165' | | Subcontract No.: KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time-HEM | Drilling Comments |
|---|---|---|---|---|---|---|
| 16" 150'1" | 165' | H | W | | #2 | 16" drilled (16" Hole) |
| | | | 150' | samples taken | | |
| | | | 155' | | | |
| | | | 160' | | | |
| | | | 165' | 149-165 - cemented gravels | | |
| | | | | | Time - 10 hrs | |
| | | | | S.P. Airhart 6-29-87 | | |

REMARKS: ~~Drill~~ Terminated 16" casing at 150'1", drilled K" hole below pipe to lower 12" stains into, (picked up mud truck at yard in morning)

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000-021 (5-85)

8-B-2407

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| K. Olson | # 6 | 299-419-22 | | |
| Date 6/26 | | Depth 165 To " | | Subcontract No. KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time-Hom | Drilling Comments |
|---|---|---|---|---|---|---|
| 12" 21' | 3" | | | Terminated 16" pipe @ 150' 1", started running 12" liner after welding shoe | 12" Rec | 104' 7½" installed |
| + 20 | 9½" | | | | | |
| + 20' | 4½" | | | | | |
| + 20' | 11" | | | | | |
| + 20 | 10½" | | | | | |
| 104 | 7½" | | | | | |
| | | | | | Time - 10 hrs | |
| | | | | S.P Aubert 6-29-87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5 85)

8-8-2408

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| K. Olson | #6 | 299-W19-22 | | |
| Date 6/27 | | Depth 165' To " | | Subcontract No. KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time Item | Drilling Comments |
|---|---|---|---|---|---|---|
| 12" 104' 7½" | | | | ? washed new rig (3 hrs) | 12" pc | 62' 9" installed |
| + 21 ½ | 4. | | | finished running 12" liner | | |
| 125' 8" | | | | | | |
| + 20 11½ | | | | | | |
| 196' 7½ | | | | | | |
| + 20' 9" | | | | | | |
| 167' 9½" | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | Time | 9 hrs |
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| | | | | S.P Antweb 6-29-87 | | |
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REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-8-2409

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| K. Olson | #6 | 299-W19-22 | | |
| Date: 6/29/87 | | Depth: 165' To 174' | | Subcontract No.: KEH-1919 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | ~~Time~~ Hole | Drilling Comments |
|---|---|---|---|---|---|---|
| 12" 167' 4½" | 165' | H | W | | #3 | 9' drilled |
| + 10' | | | | | #8 | 10' 12" casing added |
| 177' 4½" | 174' | | 170' | sample taken | | |
| | | | | 165'-174' - cemented gravels | | |
| | | | | | Time - 8 hrs | |
| | | | | SP Hewlett 6"x7" | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2410

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| K. Olson | #6 | 299-W19-22 | | |
| Date 1/30/87 | | Depth 174' To 179' | | Subcontract No. KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time & Size | Drilling Comments |
|---|---|---|---|---|---|---|
| 12" 177'4" | 174' | H | W | | #3 | 5' |
| | | | | 174' - 179' cobbles and gravel | #8 | 10' 10" cored |
| | | | | loose formation | | |
| | | | | | | |
| | | | 175' | sample taken | | |
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| | | | | | Time - 8 hrs | |
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| | | | | SP Author 1-30-87 | | |
| | | | | | | |

REMARKS: Tried drilling open hole, no success, poured new rope socket, welded 11' 10" joint of pipe drilled from 174' to 179'

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-8-2411

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| K. Olson | #6 | 299-W19-22 | | |
| Date: 7/11/87 | | Depth: 179' To 188' | | Subcontract No.: KEH-1917 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | ~~Time~~ Item | Drilling Comments |
|---|---|---|---|---|---|---|
| 12" 188'2½" | 179' | H | W | 179' to 188' - cobbles, gravels | #3 | 9' drilled |
| | 188' | | | & sand | | |
| | | | | | | |
| | | | 180' | 3 samples taken | | |
| | | | 185' | 3 | | |
| | | | | | | |
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| | | | | | | |
| | | | | | Time - | 8 hrs |
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REMARKS:

SP Author 7-7-87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000-021 (5-85)

8-B.2412

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| K. Olson | #6 | 299-419-22 | | |
| **Date** | | **Depth** | | **Subcontract No.** |
| 7/2/87 | | 188' To 199' | | REH-1919 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | ~~Time~~ Item | Drilling Comments |
|---|---|---|---|---|---|---|
| 12" 188'2½" | 188' | H | W | 188' to 199' cobbles, gravels, sand | #3 | 11' drilled 12" |
| + 10'6" | | | | | #8 | 10'6" casing added |
| 198' 8½" | | | | | | |
| | | | 190' | 3 samples taken | | |
| | | | 195' | | | |
| | | | | | Time | 8 hrs |

REMARKS:

S.P. Arnold 7-7-87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B-2413

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| K. Olson | # 1 | 299-W19-22 | | |
| Date 6/7/82 | | Depth 199' To 212' | | Subcontract No. KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time — Item | Drilling Comments |
|---|---|---|---|---|---|---|
| 12" 198' 8½" | 199' | H | W | 199' to 212' Gravels, sand & silt | #3 | 13' drilled |
| + 10' 5" | | | | | #8 | 20' 11" |
| 209' 1½" | | | | | | 12" casing seated |
| + 10' 6" | | | | | | |
| 2 19' 7½" | 212 | | 200' | | | |
| | | | 205' | } samples taken | | |
| | | | 210' | | | |
| | | | | | Time - 10 hrs | |

SP Nielsen 7-8-87

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 5000 921 '5 85'

8-B-2414

| DRILL LOG | By K. Olson | Rig #1 | Well Number 299-W19-22 | Computer Number | Project or Work Order No. |
|---|---|---|---|---|---|
| | Date 7/8/87 | | Depth 212' To 227' | | Subcontract No. KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time Item | Drilling Comments |
|---|---|---|---|---|---|---|
| 12" 219' | 1½" | H | W | 212-220 sand, gravels, silt | #3 | 15' drilled |
| + 10'5½" | | | | 220-227 - sand & gravels, small | #8 | 10'5½" |
| 230' | 1" | | | amount of silt | | 12" casing added |
| | | | | | | |
| | | | | | stand-by | - 2 hrs |
| | | | | | | stand-by |
| | | | | | | time |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | 210 | | Time | 10 hrs |
| | | | 215' | | | |
| | | | 220' | samples taken | | |
| | | | 225' | | | |
| | | | | water static - 197' | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

REMARKS: 2 hrs stand-by 3:00 P.M. to 5:00 waiting on water samples
SP Atkins 7-8-87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2415'

| DRILL LOG | By K. Olson | Rig # 1 | Well Number 299-W19-22 | Computer Number | Project or Work Order No. |
|---|---|---|---|---|---|
| | Date 7/9/87 | | Depth To | | Subcontract No. KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | ~~Time~~ Hours | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Hauled 10" pipe, washed & welded 10" shoe, Helped Lenny fishing, Helped Russell hauling stainless etc, Helped Mac hauling pipe & misc. from sites | Standby - | 4 hrs |
| | | | | | Time - | 10 hrs |

SP Filed 7-9-87

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-8.2416

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| K. Olson | #1 | 299-019-22 | | |
| Date 7/10/97 | | Depth To | | Subcontract No. KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | 4 hrs stand-by, changed drill line on #1 rig, did stickiness tests on Daniels & Homers wells, set screens in same wells, pulled aproximately 7½' of pipe in each well, helped Dave fish for bit | | |
| | | | | 299-W18-21 — Set screen 5' back pulled | | |
| | | | | 299-W15-19 — Set screen 5' back pulled 4/1' of screen top. | | |
| | | | | S. Wit — RHL 7/10/97 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000 021 (5-95)

8-B.2417

| DRILL LOG | By K. Olson | Rig | Well Number 299-W19-22 | Computer Number | Project or Work Order No. |
|---|---|---|---|---|---|
| | Date 7/13/87 | | Depth To | | Subcontract No. KEH-1917 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time — Hrs | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | | 30 | 4 hrs st-by |
| | | | | Picked up tandem axle | | |
| | | | | trailer at 100-N (problems | | |
| | | | | with security) - | | |
| | | | | Hauled 8" discharge line | | |
| | | | | from town, Helped Parrel | | |
| | | | | moving generator, hooking up test | | |
| | | | | pump (6 hrs total) | 1 | |
| | | | | | Time | 10 hrs |
| | | | | SP Aldrich 7-15-87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2418

**DRILL LOG**

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| K. Olson | #1 | 29S-6W8-22 | | Subcontract No. KEH-1914 |
| Date 7/14/87 | | Depth To | | |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time Item | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Picked up 8" discharge line in town, Hauled to Hartford, Helped Darrel set up discharge & run lines, (3 hrs) dig ditch across road, etc., Helped start pump test, cleaned up drill site, picked up empty oxygen bottles & trailer for pipe stands, hauled to town, filled gas truck at Doxel, loaded bottles in gas truck, hooked gas truck back to main tank | #29 | - 3 hrs |
| | | | | | #30 | - 4 hrs |
| | | | | | Time | - 12 hrs |
| | | | | SP Ambient 7-15-87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-8-2419

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| K. Olson | #1 | 299-W18-22 | | |
| Date 7/15/87 | | Depth 227' to 241' | | Subcontract No. KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | ~~Time~~ Item | Drilling Comments |
|---|---|---|---|---|---|---|
| 12" 230' | 1" | H | W | 227' - 232 - Gravels & sand - loose | #3 | 14' drilled |
| + 10' | 6" | | | 232 - 241 partially cemented gravels | #8 | 10' 6" |
| 240' | 7" | | | | | casing added |
| | | | | | | |
| | | | | | | |
| | | | 230 | } Samples taken | | |
| | | | 235 | | | |
| | | | 240 | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | water level - 196' | Time - 10 hrs | |
| | | | | SP. Lvl 7-15-87 | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-8-2420

# DRILL LOG

By: K. Olson
Date: 7/16/87
Rig: #1
Well Number: 299-W18-22
Depth: 241' To 250'
Computer Number:
Project or Work Order No.:
Subcontract No.: KEH-1914

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time Hammer | Drilling Comments |
|---|---|---|---|---|---|---|
| 12" 240' | 1" | H. | W. | 241-250 cemented gravels | #3 | 9' drilled |
| 7" 10'9" | | | | | #8 | 10'4" |
| 250' | 1" | | | | | casing added |
| | | | 245 | sample taken | | |
| | | | | G.S. Wilt PHIL 7/16/87 | | |
| | | | | | Time - 10 hrs | |

REMARKS: 1 hr building up bit

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B-2421

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| K. Olson | #1 | 299-W18-22 | | |
| Date: 7/17/87 | | Depth: 250' To 253' | | Subcontract No.: KEH-1919 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | ~~Time~~ Hole | Drilling Comments |
|---|---|---|---|---|---|---|
| 10" 21'4" | | H | W | 250- 253. cemented | #4 | 3' drilled |
| + 20'10" | | | | gravels | #9 | 166'4½" |
| + 20'11" | | | | | | 10" casing |
| + 21' | | | | | | installed |
| + 20'8" | | | | | | |
| + 20'11" | | | | | | |
| + 20'9½" | | | | | | |
| = 166'4½" | | | | | | |
| | | | 250' | - sample taken | | |
| | | | | | | |
| | | | | /S. Hill PHC 7/17/87 | | |
| | | | | | Time - 10 hrs | |

REMARKS: drilled from 250' to 253'; Terminated 12" casing at 250' 11", changed to 10" drive-head, installed 166' 4½" 10" casing

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5-85)

8-8.2422

| DRILL LOG | By K. Olson | Rig #1 | Well Number 299-W18-22 | Computer Number | Project or Work Order No. |
|---|---|---|---|---|---|
| | Date 7/20/87 | | Depth 253' To 259' | | Subcontract No. KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Type Item | Drilling Comments |
|---|---|---|---|---|---|---|
| 10" 166'4½" | | H | W | 253'- cemented gravels | #9 | 6' drilled |
| + 20'9" | | | | | #4 | 83' ½" |
| + 20'10" | | | | | | 10" casing |
| + 20'7" | | | | | | installed |
| + 20'10½" | | | | | | |
| 249'5" | | | | | | |
| | | | 255' | sample taken | | |
| | | | | AS Hill PHE 7/20/87 | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | Time - 10 hrs | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-8-2423

# DRILL LOG

By: K. Olson
Date: 7/21/87
Rig: #1
Well Number: 299-W18-22
Depth: 259' To 269'
Computer Number:
Project or Work Order No.:
Subcontract No.: KEH-1914

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time-Units | Drilling Comments |
|---|---|---|---|---|---|---|
| 10" 249'5" | 259' | H | W | 259' to 262' cemented gravels | #4 | 20' 2" |
| + 20'2" | | | | 262' to 263' - silt lens (clay seam?) soft | 1 | 10" pipe added |
| 269'7" | 269' | | | | #9 | 10' drilled |
| | | | | 263-269 - cemented gravels | | |
| | | | 260' 265' | 3 samples taken | | |
| | | | | PIC 7/21/87 | | |
| | | | | | Time - 10 hrs | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B-2424

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| K Olson | #1 | 299-W18-22 | | |
| Date 7/22/87 | | Depth 269' to 277' | | Subcontract No. KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time Item | Drilling Comments |
|---|---|---|---|---|---|---|
| 269'7" | | H | W | 269' to 277' - cemented gravels | #9 | 10'6 |
| + 10'6" | | | | | | 10" casing added |
| 280'1" | | | | | #9 | 8' drilled |
| | | | 270' 275 | } samples taken | | |
| | | | | PAH 7/22/87 | | |
| | | | | | Time - | 10 hrs |

REMARKS: 1 hr building up bit in morning/slow drilling

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000 021 (5-85)

8-8-2425

# DRILL LOG

By: K. Olson | Rig: #1 | Well Number: 299-W18-22 | Computer Number: | Project or Work Order No.:
Date: 7/23/87 | Depth: 277' To 289 | Subcontract No.: KEH-1917

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 10" 280'1" | | H | W | 277' to 289' cemented gravels | #4 | 10'3" |
| + 10'3" | | | | " | | 10" casing added |
| 290'4" | | | | | | |
| | | | | | #9 | 12' drilled |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | 280' | | | |
| | | | 285' | samples taken | | |
| | | | | | | |
| | | | | | | |
| | | | | SP Auchard 7/24/87 | | |
| | | | | | Time | 10 hrs |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

REMARKS: Drilled from 277' to 289', moved & set up pump rig at 2-East in afternoon (1 hr)

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2426

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| K. Olson | #1 | 299-U18-22 | | |
| Date 7/24/87 | | Depth 289' To 305' | | Subcontract No. KEH-1919 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time Item | Drilling Comments |
|---|---|---|---|---|---|---|
| 290' 4" | | H | W | 289' to 305 cemented gravels, sand | #9 | 16' drilled |
| | | | 290' | } samples taken | | |
| | | | 295' | | | |
| | | | 300' | | | |
| | | | 305' | | | |
| | | | | | Time - 10 hrs | |

S.P. [signature] 7/24/87

REMARKS: Built up bit in morning (1hr)

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000-021 (5-85)

8-B.2427

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| K. Olson | #1 | 299-W1S-22 | | |
| Date: 7/22/87 | | Depth: 305' To 317' | | Subcontract No.: KEH-1979 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time Items | Drilling Comments |
|---|---|---|---|---|---|---|
| 290' | 4" | H | W | 305 - 317 - cemented gravels | #9 | 12' - chilled |
| 20' | 11" | | | | #4 | 20' 11" |
| 311' | 3" | | | | | 10" casing added |
| | | | 310' | 3 samples taken | | |
| | | | 315' | | | |
| | | | | S.P. Airhart 7/22/87 | Time - 10 hrs | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-8-2428

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| K. Olson | #1 | 299-W18-22 | | |
| Date: 7/28/87 | | Depth: 317' To 324' | | Subcontract No.: KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | ~~Time~~ Item | Drilling Comments |
|---|---|---|---|---|---|---|
| 10' 311' 3" | | H | W | 317' - 324' cemented gravel | #9 | 7' drilled |
| + 10' 6" | | | | | #1 | 10' 6" |
| 321' 9" | | | | | | 10" casing added |
| | | | 320' | | | |
| | | | | samples taken | | |
| | | | | | | Time - 10 hrs |
| | | | | Sp. Ahrent 7/28/87 | | |

REMARKS: Built up bit, welded 10' 6" joint of pipe, helped Parrel move, drilled from 317' to

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-86)

8-B-2429

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| K. Olson | #1 | 299-W18-22 | | |
| Date: 7/29/87 | | Depth: 324' To 336' | | Subcontract No.: KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time/Item | Drilling Comments |
|---|---|---|---|---|---|---|
| 10' 321'9" | | H | W | 324 - 328 - cemented gravels | #9 | 12' drilled |
| + 10' 3" | | | | 328 - 331 - cemented sands with gravel | #9 | 10' 3" |
| 332' | | | | | | 10" casing added |
| | | | | 331 - 336 - cemented gravels | | |
| | | | 325' | } Samples taken | | |
| | | | 330' | | | |
| | | | 335' | | | |
| | | | | | Time - 10 hrs | |
| | | | | SP Auchard 7/29/87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-86)

8-B.2430

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| K Olson | #1 | 299-W18-22 | | |
| Date 7/30/87 | | Depth 336 To 342' | | Subcontract No. KEH-1919 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time Hrs | Drilling Comments |
|---|---|---|---|---|---|---|
| 332' | | H | W | 336' to 342' Cemented gravels | #4 | 10'6" |
| + 10'6" | | | | | | casing added |
| 342' 6" | | | | | #9 | 6' drilled |
| | | | | G.S.W.L RH 7/30/87 | | |
| | | | 340' | sample taken | | |
| | | | | | Time | 10 hrs |

REMARKS: changed line in rope socket, built up bit, serviced rig (3 hrs) welded 10'6" joint of casing (1 hr)

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B-2431

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| K. Olson | #1 | 299-W18-22 | | |
| Date: 7/31/87 | | Depth: 342' To 359' | | Subcontract No. KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time Hrs/m | Drilling Comments |
|---|---|---|---|---|---|---|
| 10" 342'6" | | H | W | 342 - 359' cemented gravels & sands | #9 | 17' drilled |
| | | | 345' | samples taken | | |
| | | | 350' | | | |
| | | | 355' | | | |
| | | | | S.P. Olson 7/31/87 | Time - 10 Hrs | |

REMARKS: Softer formation from 347' down

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B-2432

# DRILL LOG

By K. Olson | Rig #1 | Date 8/3/87 | Well Number 299-418-22 | Depth 359' To 370' | Computer Number | Project or Work Order No. | Subcontract No. KEH-1914

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | ~~Time~~ Item | Drilling Comments |
|---|---|---|---|---|---|---|
| 10" - 342' | ~~#~~ | H | W | 359 - 370' cemented gravels & sand | #5 | 11' drilled |
| | | | | | #10 | 109' 4½" casing |
| 8" - 21'1 | | | | | | installed (8") |
| + 20' 10½" | | | | | | |
| + 20' 10½" | | | | | | |
| + 20' 10" | | | 260 | } | | |
| + 20' 8½" | | | 265 | } Samples taken | | |
| 109' 4½" | | | 270 | } | | |
| | | | | SP Lent 8/4/87 | | |
| | | | | | Time - 10 hrs | |

REMARKS: Terminated 10" casing at 342', drilled open hole to 370', broke out tools, started running 8" Liner pipe

O - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-8-2433

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| K. Olson | | 299-W18-28 | | |
| Date: 8/4/87 | | Depth: To | | Subcontract No.: KEH-1919 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time Hrs | Drilling Comments |
|---|---|---|---|---|---|---|
| 8" 104' | 4½ | | | Ran 8" Liner with | #10 | 250' 1½" |
| + 21' | ½" | | | Tims help | | 8" casing |
| + 20' | 8" | | | | | installed |
| + 20' | 10" | | | | | |
| + 21' | ½" | | | Steve Olson 8/4/87 | | |
| + 20' | 7½" | | | | | |
| + 21 | ½" | | | | | |
| + 20' | 7" | | | | | |
| + 20' | 8½" | | | | | |
| + 20' | 9" | | | | Time | ~10 hrs |
| + 20' | 11½" | | | | | |
| + 20' | 11½" | | | | | |
| + 20' | 11" | | | | | |
| 354' | 6" | | | | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5 85)

8-B.2434

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| K. Olson | #1 | 299-W18-22 | | |
| Date: 8/5/87 | | Depth: 370' To 389' | | Subcontract No.: KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | ~~Time~~ Item | Drilling Comments |
|---|---|---|---|---|---|---|
| 8" 354'6" | | H | W | 370-382 - cemented gravels & sand, silt | #5 | 19' drilled |
| + 20'11" | | | | 382-388 " sand, silt same gravel | #10 | 20'11" |
| 375'5" | | | | 388-390 - very little cemented Gravels, & sand | | 8" casing added |
| | | | 375' | samples taken | | |
| | | | 380' | | | |
| | | | 385' | | | |
| | | | | GS, WL PM 8/5/87 | | |
| | | | | | Time - 10hrs | |

REMARKS: Finished running 8" liner, built up bit, drilled from 370' to 389

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2435

# DRILL LOG

By: K. Olson
Date: 8/6/87
Rig: #1
Well Number: 299-W18-22
Depth: 389' To 404'
Project or Work Order No.:
Subcontract No.: KEH-1918

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time Hour | Drilling Comments |
|---|---|---|---|---|---|---|
| 8" 375'5 | | H | W | 389-403 cemented sands, silt, & gravels | #5 | 15' drilled |
| 1 21' | | | | | #10 | 21' |
| 396'5" | | | | 403'-404' gray clay, with sand & small gravels | | 8" casing added |
| | | | 390 | | | |
| | | | 400 | } samples taken | | |
| | | | | J.S. Hill — Pitt Sheet | | |
| | | | | | Tank - 10 hrs | |

REMARKS: Built up bit, welded 21' joint of 8" pipe, drilled from 389' to 404'

D - Drive Barrel H - Hard Tool L - Large M - Medium S Small VC - Very Coarse C Coarse F Fine VF Very Fine ___ Standing Water

A 6000 021 (9 85)

8-8-2436

# DRILL LOG

By K. Olson | Rig #1 | Well Number 299-W18-22 | Project or Work Order No.

Date 8/7/87 | Depth 404' To 420' | Subcontract No. KEH-1919

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time Item | Drilling Comments |
|---|---|---|---|---|---|---|
| 396' 5" | | | | 404' - 410' - gray silty clay, with | #5 | 16' drilled |
| + 10' 3" | | | | sand & Fine gravels | #10 | 20'6" |
| 406' 8" | | | | 410 - 420 cemented sands & small | | 8" casing |
| + 10' 3" | | | | amount of fine gravels | | added |
| 416' 11" | | | | | | |
| | | | 405' | | | |
| | | | 410' | | | |
| | | | 415' | } samples taken | | |
| | | | 420' | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | SP Author 8/7/87 | | |
| | | | | | Time - 10 hrs | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

REMARKS: Abrisive material - built up bit twice

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ▽ Standing Water

A 6000 021 (5-85)

8-B-2437

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| K. Olson | #1 | 299-W19-22 | | |
| Date: 8/10/87 | | Depth: 420' To 432' | | Subcontract No.: KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time Hr'ly | Drilling Comments |
|---|---|---|---|---|---|---|
| 8" 416'11" | 1 | H | W | 420-432- cemented sands & gravels, occasional silt lenz | #5 | 12' drilled |
| + 10'4" | | | | | #10 | 20' 8½" & 8" casing added |
| 427'3" | | | | | | |
| + 10'4½" | | | | | | |
| 437'7½" | | | | | | |
| | | | 425' | 3' samples taken | | |
| | | | 430' | | | |
| | | | | SP Olson 8/10/87 | | |
| | | | | | Time - 10 hrs | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B-2438

# DRILL LOG

By: K. Olsen
Date: 8/11/87
Rig: #1
Well Number: 259-418-22
Depth: 432' To 450'
Project or Work Order No.:
Subcontract No.: KEH-1917

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time Taken | Drilling Comments |
|---|---|---|---|---|---|---|
| 432'± | | H | W | 432 - 447 - cemented sands & gravel | #5 | 18' drilled |
| | | | | 447 - 448 grey clay & fine gravel | | |
| | | | | 448 - 450 - purple-grey clay - fine gravels | | |
| | | | 435 | samples taken | | |
| | | | 440 | | | |
| | | | 445 | | | |
| | | | 450 | | Time - 10 hrs | |

S.P. Lund 8/11/87

REMARKS:

D - Drive Barrel  H - Hard Tool  L - Large  M - Medium  S - Small  VC - Very Coarse  C - Coarse  F - Fine  VF - Very Fine  ____ Standing Water

A 6000 021 (5-85)

8-B.2439

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| K. Olson | #1 | 299-W18-22 | | |
| Date: 8/12/87 | | Depth: 450' To 455' | | Subcontract No.: KEH-1919 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION (% Each Grain Size, Color, Roundness, Caliche, Etc.) | ~~Time~~ Hcm | Drilling Comments |
|---|---|---|---|---|---|---|
| 4' | 437' 7½" | | | 450 - 451 - gray clay with silt & fine gravel | #5 | 5' drilled |
| + | 10' 3" | | | | #10 | 20' 6" |
| | 447' 10½" | | | 451 - 453 - Dark gray clay | | 8" casing added |
| + | 10' 3" | | | 453 - 455 - Blue clay | | |
| | 458' 1½" | | | | #19 | 1 split spoon |
| | | | | | | sample - 455' to 457' |
| | | | | | #30 | 1½ hrs |
| | | | 455' | ? sample taken | | ~~Equip~~ crew |
| | | | | SP Anderson 8-12-87 | | standby for |
| | | | | | | geophysical logging |
| | | | | | Time - | 10 hrs |

REMARKS: Drilled from 450' to 455', cased to that point, took split spoon 455' to 457', stand-by 3:30 to 5:00

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2440

| DRILL LOG | By K. Olson | Rig #1 | Well Number 299-W18-22 | Computer Number | Project or Work Order No. |
|---|---|---|---|---|---|
| | Date 9/13/87 | | Depth B 155' To 195 | | Subcontract No. KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Tube #Sm | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | 3½ hrs standby for Logging, washed straightness tester, loaded on trailer & hauled to site, made straightness test (1 hr), washed & hauled bailers to mine & Darrels sites, hauled 10" pipe to Russel, Picked up half jaws etc. at Bills, broke out jaws, i sub, made up half jaws pulled back casing from ~~B~~ 155' to ~~B~~ 145', installed 12 sacks sand to back-fill hole | 15 | 10' 5" casing pulled |
| | | | | | #30 | 3½ hrs crew st-by |
| | | | | | #20 | 12 sacks sand |
| | | | | | Time | 10 hrs |

J. S. Hill PHC 8/13/87

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B-2441

| DRILL LOG | By K. Olson | Rig #1 | Well Number 299-W18-22 | Computer Number | Project or Work Order No. |
|---|---|---|---|---|---|
| | Date 8/17/87 | | Depth To | | Subcontract No. KE4-1919 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time Item | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Hauled sand (5 sacks) to well | 1124 | 5 hrs |
| | | | | site, measured bottom with bailer | | (cleaning out |
| | | | | line at 422' (23' over-filled | | sand) |
| | | | | with sand from previous Thursday). | 1130 | 3 hrs - |
| | | | | * Tim washed & Hauled sand pump, | | (for measurements) |
| | | | | ran sand-pump in hole, it broke | | |
| | | | | off at plunger short pivot, washed | | |
| | | | | & Hauled fishing string, fished out | | ~ hrs fishing |
| | | | | broken sand pump, cleaned out | | |
| | | | | excess sand, 1½ hrs st-by for | | |
| | | | | measurement | | |
| | | | | SDA-Lwd 9/15/87 | | |
| | | | | | Time - 10 hrs | |

REMARKS

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000 021 (5-87)

8-B.2442

| DRILL LOG | By K Olson | Rig #1 | Well Number 299-W18-22 | Computer Number | Project or Work Order No. |
|---|---|---|---|---|---|
| | Date 8/15/87 | | Depth 445' - To 489½ | | Subcontract No. KE-H-1917 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time-Hrs. | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | cleaned out hole to 447½', | #15 | 5'6" - 8" casing pulled |
| | | | | installed well screen, pulled casing back ~~5'~~ 5'6" to expose screen, (screen set from 447'6" to 437'6" | | |
| | | | | developed well 3 hrs by bailing | #16 | 10'3" 7" screen |
| | | | | (9:30 - 12:30) 1 hr stand-by for | | installed (2 hrs) |
| | | | | water samples (12:30 - 1:30) Helped | | |
| | | | | Darrel install pump & fittings, | #28 | 3 hrs |
| | | | | set up generator etc. (2:00 to 5:00) | | (development time) |
| | | | | | #30 | 1 hr (water samples) (stand-by) |
| | | | | | | |
| | | | | INSTEAD OF GOING ON STAND-BY, KELLY | #29 | 3 hrs |
| | | | | CHOSE TO HELP DARREL W/ AQUIFER TEST SET-UP. | | (aquifer testing - |
| | | | | ARE BOTH STAND-BY ½ AQUIFER TEST SET-UP | | helping Darrel install pump) |
| | | | | CHARGED @ SAME RATE ? | | |
| | | | | S.P. Aslett 8/19/87 total | Time | - 10 hrs |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B-2443

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| K. Olson | # | 299-W18-22 | | |
| Date: 9/19/87 | | Depth: To | | Subcontract No.: KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time Item | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | 4 hrs crew stand-by waiting | #30 | - 4 hrs CREW-S.B. |
| | | | | for pump tests 1 hr | | |
| | | | | well development, 5 hrs | #31 | 5 hrs |
| | | | | Rig stand-by | | Equip- S.B. |
| | | | | | #28- | 1 hr development |
| | | | | crew time | 8 | hrs - Kelly |
| | | | | Rig time | 10 | hrs |
| | | | | — S.P. Ailport | | |
| | | | | 8/20/87 | | |

REMARKS: Picked up misc. in town in afternoon

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (6-85)

8-B, 2444

# DRILL LOG

By K. Olson
Date ~~8/20/87~~ 8/20/87
Rig #1
Well Number 299-W18-22
Depth To
Computer Number
Project or Work Order No.
Subcontract No. KEH-1914

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time Hrs | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | 4 hrs, crew stand-by, | #130 | 4 hrs crew S.by |
| | | | | 6 hrs rig stand-by waiting | #131 | 6 hrs Equip. S.by |
| | | | | for Blaine & Diesels pump tests. | | |
| | | | | JS Hill PHC - 8/24/87 | | |
| | | | | | Time | 10 hrs |

REMARKS: Pulled Engine out of Rig, washed & hauled to town

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000-021 (5-85)

8-B-2445

| DRILL LOG | By K. Oliver | Rig #1 | Well Number 299-418.22 | Computer Number | Project or Work Order No. |
|---|---|---|---|---|---|
| | Date 8/21/87? | | Depth To | | Subcontract No. |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time Items | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | | #131 | 10 hrs Equip. st.-by |
| | | | | worked at yard on Engine & boilers | Time | - 8 hrs |
| | | | | JS Hill PWI 8/24/87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000-021 (5-85)

8-8-2446

8-B-2447

| DRILL LOG | By K. Olson | Rig #1 | Well Number 299-W18-22 | Computer Number | Project or Work Order No. |
|---|---|---|---|---|---|
| | Date 8/24/87 | | Depth To | | Subcontract No. KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | ~~Time~~ Item | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Moved pump rig to well site, set up rig, moved pump, pipe, wire etc. to site. installed 15-horse pump to depth of 444' 11" from +2' above ground, installed 3/4" heat-tape line to 438' 9" from +2 with Tim's help | #29 | 10 hrs aquifer testing |
| | | | | | Time | 10 hrs |

S.P. Arnold 8/25/87

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5-85)

| DRILL LOG | By K. Olson | Rig #1 | Well Number 299-W18-22 | Computer Number | Project or Work Order No. |
|---|---|---|---|---|---|
| | Date 8/25/87 | | Depth To | | Subcontract No. KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time Hours | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Hooked up discharge from pump, picked up discharge line strung out from Bkine's well, moved ramps into place over road-way, installed discharge line out for W18-22 well. | #29 | 9hrs aquifer testing |
| | | | | Made preliminary drawn-down & recovery test (plus development). | | |
| | | | | Worked on Parcels well- (1hr) | | |
| | | | | Time - 10 hrs | | |
| | | | | SPA-Lot 8/25/87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000-021 (5 85)

8-B-2448

| DRILL LOG | By K. Olson | Rig #1 | Well Number 299-W18-22 | Computer Number | Project or Work Order No. |
|---|---|---|---|---|---|
| | Date 8/26/87 | | Depth To | | Subcontract No. KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time Item | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Made 8 hr. pump test | #29 | - 9 hrs |
| | | | | on W18-22 well, removed ramps, | | aquifer testing |
| | | | | & helped with initial recovery test | | |
| | | | | (1 hr for last 2 items) | | |
| | | | | Hallwood PNL | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | Time | - 9 hrs |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000 021 (5-85)

8-8-2449

| DRILL LOG | By K. Olson | Rig #1 | Well Number 299-W18-22 | Computer Number | Project or Work Order No. |
|---|---|---|---|---|---|
| | Date 8/27/87 | | Depth To | | Subcontract No. KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | ~~Time~~ Item | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Pulled 3/4 in. heat tape line, & 3" pump pipe & pump out of well with pump rig, moved pump equipment, generator etc. off well site to lay down yard | #29 | 9 hrs aquifer testing |
| | | | | J. Fulmore PNL | | |
| | | | | | Time | 10 hrs |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2450

| DRILL LOG | By K. Olson | Rig #1 | Well Number 299-W18-22 | Computer Number | Project or Work Order No. |
|---|---|---|---|---|---|
| | Date 8/28/87 | | Depth To | | Subcontract No. KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | ~~Time~~ Hrs. | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | installed screens & 9" | #24 | 1 (centralizer installed) |
| | | | | stainless to depth of | | |
| | | | | 248' from ground (2' 9" | #167 | 30' 9" stainless |
| | | | | stick-up) moved pump rig | | screen installed |
| | | | | cleaned site. | | |
| | | | | Returned to town | #18 | 450' 9" stainless |
| | | | | picked up Engine, returned | | 9" casing |
| | | | | to yard, started re-assembling | | installed |
| | | | | engine. | | (5 hrs) |
| | | | | S.P.A. Lab 9-2-87 | | |
| | | | | | Time = 10 hrs | |
| | | | | | | (2 hrs yard) |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-86)

8-B-2451

| DRILL LOG | By K. Olson | Rig #1 | Well Number 299-U18-22 | Computer Number | Project or Work Order No. |
|---|---|---|---|---|---|
| | Date 8/3/87 | | Depth To | | Subcontract No. KE17-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time Hrs | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Put engine back together | N/A | |
| | | | | at yard (5 hrs) picked up | | |
| | | | | heel shive etc. at Pasco, Hauled | | |
| | | | | engine out to area, got it | | |
| | | | | set in rig, nothing hooked up. | | |
| | | | | | | |
| | | | | Time | 10 | hrs |
| | | | | SP 9-2-87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B-2452

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| K. Olson | #1 | 299-W18-22 | | |
| Date: 9/1/87 | | Depth: To | | Subcontract No.: KE #-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | ~~Time~~ 1/2 91 | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Hooked up all fittings wires, | N/A | |
| | | | | etc. to new engine, got it running, | | |
| | | | | changed heel shiv, shaft & | | |
| | | | | shaft mounts, went to install | | |
| | | | | tensioner pully & noticed | | |
| | | | | bearings hadn't been | | |
| | | | | changed, picked up all | | |
| | | | | empty bottles & hauled | | |
| | | | | them to town. left tensioner | | |
| | | | | pully at Monarch, picked up | | |
| | | | | oxygen, welding rod, rubber | | |
| | | | | tape & misc. in town - | 8 | hrs |
| | | | | S.P. 9-2-87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-8-2453

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| K. Olson | #1 | 299-W18-22 | | |
| Date: 9/2/87 | | Depth: 439' 6" To 431 1/2' | | Subcontract No.: KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time Hers | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | | #20 | installed 11 sacks Sand |
| | | | | picked up belt tensioner pully at Monarch machine at 12:00, took it out to rig, installed pully, belt, & guard, adjusted engine to run straight with drill shaft, installed 11 sack sand, pulled 8" pipe back 8' | #15 | 8' 8" pipe pulled |
| | | | | S.P. 9-2-87 | | |
| | | | | | Time - | 5 hrs |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-8-2454

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| K. Olson | #1 | 299-W18-22 | | |
| Date 9/3/87 | | Depth 431' 6" — To 402' 6" | | Subcontract No. KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | installed 3 sacks sand, | #10 | 29' 5" |
| | | | | 6 buckets pellets, pulled | | casing |
| | | | | casing back to 402' 6" | | pulled |
| | | | | pellets bridged at water | #20 | 3 sacks |
| | | | | table, 5 hrs trying to | | sand added |
| | | | | break through bridge, finally | #21 | 6 buckets |
| | | | | pushed ~~through~~ thru with tremie | | pellets added |
| | | | | pipe, ran tremie to 240' | | |
| | | | | | | (5 hrs knocking |
| | | | | S.P. Arnbrust 9-8-87 | | out bridged pellets) |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | Time | 10 | hrs |
| | | | | | | |
| | | | | | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-8-2455

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| K. Olson | #1 | 299-418-22 | | |
| Date 9/4/87 | | Depth 402'6" To 382' | | Subcontract No. KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Pulled out 240' of tremie | #10 | 20'6" |
| | | | | pipe, cut off smashed end, | | 8" casing |
| | | | | Ran tremie pipe to 404' 7", | | pulled |
| | | | | checked depth to pellets at | #22 | - 18 ½ |
| | | | | 404', pulled tremie back | | sacks |
| | | | | to 360', installed 500 | | Volclay grout installed |
| | | | | gals volclay, pulled | | 500 gals. |
| | | | | tremie pipe, | | |
| | | | | pulled 8" pipe | | |
| | | | | back 20'6" | | |
| | | | | | | |
| | | | | installed new | Time | - 10 hrs |
| | | | | Carburetor on rig | | |
| | | | | | | |
| | | | | | | |
| | | | | S.P.A. [signature] 9-4-87 | | |
| | | | | | | |
| | | | | | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000.021 (6.85)

8-B-2456

| DRILL LOG | By K. Olson | Rig #1 | Well Number 299-W18-22 | Computer Number | Project or Work Order No. |
|---|---|---|---|---|---|
| | Date 9/8/87 | | Depth To | | Subcontract No. KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Pulled remaining 8" casing / | Item | |
| | | | | measured wireline at 340', started | #10 | 382' |
| | | | | getting things ready for pulling | | 8" casing |
| | | | | 10" casing | | pulled |
| | | | | SP Anderson 9/8/87 | | |
| | | | | | Time - | 10 hrs |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B-2457

8-B-2458

| DRILL LOG | By K. Olsen | Rig #1 | Well Number 259-W18-22 | Computer Number | Project or Work Order No. |
|---|---|---|---|---|---|
| | Date 9/9/87 | | Depth To | | Subcontract No. KEH-174 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | ~~Time~~ Key | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Installed 232' 1½" tremie | #14 | 23' 10" pipe |
| | | | | pipe, pumped & mixed 42 | | pulled |
| | | | | sacks volclay grout, pulled | #22 | 42 sacks |
| | | | | 10" pipe back 23' from | | volclay grout |
| | | | | 342' to 319'. | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | Time | ~10 hrs |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

K. Olson

| DRILL LOG | By 9/10/87 | Rig #1 | Well Number 299-W18-22 | Computer Number | Project or Work Order No. |
|---|---|---|---|---|---|
| | Date 9/10/87 | | Depth To | | Subcontract No. KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time Item | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | installed 125' termie pipe, | #22 | 8 sacks |
| | | | | pumped & mixed 8 sacks voldag | | voldag installed |
| | | | | checked grout at 70', | | |
| | | | | pulled 10" casing back | #22 | 191' ~~EST~~ |
| | | | | to 125' from 319' | | 10" casing |
| | | | | with Mac's help | | pulled |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | Time | 10 hrs |
| | | | | S.P. A-Lunt 9-14-87 | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-8-2459

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| K. Olson | #1 | 299-W18-22 | | |
| Date 9/11/87 | | Depth To | | Subcontract No. KEH-1911 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | ~~Time~~ Hrs on | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Pulled 10" casing back from 125' to 0', hauled pipe to lay-down yard, picked up pipe extension for thermic and material for 12" puller head, Mo made new 12" head, picked up Oxygen, acetylene, rod at lay-down yard, hauled up empty bottles, cleaned up drill site | #1A | 125' 10" pipe pulled |
| | | | | | Time - | 4 hrs |
| | | | | ST. A. [signature] 9-14-87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-8-2460

**DRILL LOG**

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| K. Olson | #1 | 299-W18-22 | | |
| Date 9/14/87 | | Depth To | | Subcontract No. KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | installed tremie to 159' | #13 | 34' |
| | | | | pumped 100 gals grout, | | 12" casing |
| | | | | pulled tremie, pulled | | pulled |
| | | | | 12" casing back to 216' | | |
| | | | | From 250' (189'), re-installed | #22 | 12 sacks |
| | | | | tremie, pumped additional | | volclay |
| | | | | 200 gals grout | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | Time | ~~#~~ 8 | hrs |
| | | | | S.P. Luna 9-14-87 | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-8-2461

| DRILL LOG | By K. Olson | Rig #1 | Well Number 299-W18-22 | Computer Number | Project or Work Order No. |
|---|---|---|---|---|---|
| | Date 9/15 | | Depth To | | Subcontract No. KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time Item | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | ~~this~~ installed 400 gals | #13 | 32' |
| | | | | bentonite grout, via tremie, | | 12" casing |
| | | | | pulled 12" pipe from | | pulled |
| | | | | 216' to 184', ran tremie, | | |
| | | | | installed 600 gals bentonite | #22 | 10 sacks |
| | | | | slurry. | | enviro gel |
| | | | | | | (granular) |
| | | | | | | 1000 gals, |
| | | | | this | | 1-1 mix |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | Time | 8 | hrs |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000 021 (5 85)

8-B.2462

| DRILL LOG | By K. Olson | Rig # 1 | Well Number 29S-W18-22 | Computer Number | Project or Work Order No. |
|---|---|---|---|---|---|
| | Date 9/16/87 | | Depth To | | Subcontract No. KEH-1917 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time Item | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Pulled 10' section of casing, | #13 | 20' of |
| | | | | installed tremie to 147', | | 12" casing |
| | | | | pumped 600 gals. mud, | | pulled, |
| | | | | pulled tremie, pulled 10' | | (from 189' |
| | | | | section of casing, installed | | to 169') |
| | | | | tremie to 147', pumped | | |
| | | | | additional 400 gals mud | #22 | 10 sacks |
| | | | | | | granular |
| | | | | | | bentonite |
| | | | | | | 1000 gals |
| | | | | | | 1-1 mix |
| | | | | | | |
| | | | | Time | 8 | hrs |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5-85)

8-B.2463

| DRILL LOG | By K Olsen | Rig #1 | Well Number 299-W18-22 | Computer Number | Project or Work Order No. |
|---|---|---|---|---|---|
| | Date 9/17/87 | | Depth To | | Subcontract No. KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time #(hrs) | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | installed 200 gals bentonite | #13 | 164' |
| | | | | slurry, pulled tremie pipe, | | 12" casing |
| | | | | pulled 164' of 12" casing, | | pulled |
| | | | | hauled 12" to lay down | | |
| | | | | yard. | #12 | 1' |
| | | | | Hauled 20' piece of 16" | | 16" |
| | | | | from Kaiser's yard to ours, | | casing |
| | | | | cut 5' piece for puller | | pulled |
| | | | | head, (washed pipe), | | |
| | | | | retrieved to rig built puller | #22 | 2 sacks |
| | | | | head, pulled 1' of 16" | | granular |
| | | | | casing, broke puller bar | | bentonite, |
| | | | | | | 200 gals |
| | | | | | | 1-1 mix |
| | | | | Final | | |
| | | | | Time | 8 | hrs |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000 021 (5 85)

8-8-2464

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| K. Olson | #1 | 299-W18-22 | | |
| Date 9/18/87 | | Depth To | | Subcontract No. KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Built 16" pulley head | #12 | 13' |
| | | | | with cross brace to reduce | | 16" |
| | | | | span, (3 bolts), pulled | | casing pulled |
| | | | | 13' of 16" pipe 150 | | |
| | | | | to 147', sealed | #22 | 11 sacks |
| | | | | with gals bentonite slurry | | grout thru |
| | | | | | | bentonite |
| | | | | | | with gals |
| | | | | | | 1-1 mix |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000 021 (5-85)

8-8-2465

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| K. Olson | # 1 | 299-W18-22 | | Subcontract No. ~~299-W18-22~~ RFI-1914 |
| Date 9/21/87 | | Depth To | | |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time Item | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | | #22 | 1100 gals |
| | | | | Pulled & 20' 16" pipe | | bentonite slurry |
| | | | | from 137' to 117'. | # | 11-sacks - (1-1) |
| | | | | | #13 | |
| | | | | added 1100 gals | | 20' |
| | | | | bentonite slurry | | 16" pipe |
| | | | | | | pulled |
| | | | | | | |
| | | | | | | |
| | | | | J.S. Wilk 9/22/87 Time | 4 | hrs |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000-021 (5-85)

8-B-2466

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| K. Olson | #1 | 299-W18-22 | | |
| Date: 9/22/87 | | Depth: To | | Subcontract No.: KEH-KM |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | helped Dave with wiring on rig, pulled 3 10' joints 16" pipe | #13 | 30' 16" pipe pulled |
| | | | | J. Schult PNL 9/22/87 | | |
| | | | | | Time 8 hrs | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000 021 (5-85)

8-B-2467

| DRILL LOG | By K. Olson | Rig #1 | Well Number 299-w18-22 | Computer Number | Project or Work Order No. |
|---|---|---|---|---|---|
| | Date 9/23/87 | | Depth To | | Subcontract No. KE If-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time Hrs | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | added 600 gals | #13 | 87' |
| | | | | bentonite slurry / removed | | 16" |
| | | | | remaining 16" / casing | | pipe pulled |
| | | | | (87' - 0') | | |
| | | | | | #22 | 6 sacks |
| | | | | J.S. Hill Inc 9/24/87 | | granular |
| | | | | | | bentonite |
| | | | | | | (slurry |
| | | | | | | 1-1 mix) |
| | | | | Time | 8 | hrs |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-8.2468

| DRILL LOG | By K. Olson | Rig #1 | Well Number 299-W18-22 | Computer Number | Project or Work Order No. |
|---|---|---|---|---|---|
| | Date 9/29/87 | | Depth To | | Subcontract No. KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time Hrs | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Built 20" puller head | # | |
| | | | | (4 hrs) installed 600 | 22. | 3 sacks |
| | | | | gals bentonite slurry | | powdered |
| | | | | (10' level from ground) | | bentonite |
| | | | | | | 3 sacks |
| | | | | Pulled 7' 20" casing | | granular |
| | | | | from 50' to 43' | | bentonite |
| | | | | | | 600 gals |
| | | | | J.S. Wilbur PNL 9/29/87 | | 1-1 mix |
| | | | | | | |
| | | | | 1 | #11 | 7' |
| | | | | | | 20" casing |
| | | | | | | pulled |
| | | | | | | |
| | | | | Time | 8 | hrs |
| | | | | | | |
| | | | | | | |
| | | | | | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-8-2469

| DRILL LOG | By K. Olson | Rig #1 | Well Number 299-W18-22 | Computer Number | Project or Work Order No. |
|---|---|---|---|---|---|
| | Date 9/25/87 | | Depth To | | Subcontract No. KEH-1917 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time Item | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | added 500 gals bentonite | #22 | 500 gals |
| | | | | slurry pulled 20" casing | | bentonite slurry |
| | | | | from 43' to 17' | | |
| | | | | | | 5 sacks |
| | | | | J.S. Will - PNL 9/29/87 | | (2½ granular |
| | | | | | | 2½ powder) |
| | | | | | | 1-1 mix |
| | | | | | | |
| | | | | | #11 | 26' 20" |
| | | | | | | casing pulled |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | Time | 8 | hr's |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000 021 (5-85)

8-B.2470

| DRILL LOG | By K. Olson | Rig #1 | Well Number 299-W18-22 | Computer Number | Project or Work Order No. |
|---|---|---|---|---|---|
| | Date 9/28/82 | | Depth To | | Subcontract No. KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time Item | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | cut 30' joint of 20" pipe, | #11 | 17' |
| | | | | welded puller head, pulled | | 20" pipe |
| | | | | remaining 17' of 20", (pulled | | pulled |
| | | | | head all the way to surface) | | |
| | | | | installed 500 gals slurry, | #22 | 500 gals |
| | | | | washed & hauled 15' 3" | | bentonite slurry |
| | | | | bailer, wouldn't go down | | (50% powder |
| | | | | stainless due to curving | | 50% granular) |
| | | | | of 1" pipe in large diameter | | 1-1 mix |
| | | | | casing, washed & hauled | | 5 sacks - 500 lbs |
| | | | | 8" 3" - bailer, bailed | | |
| | | | | well 20 mins, | #28 | -1 hr |
| | | | | | | washing, hauling |
| | | | | J.S. Hill DATE 9/29/82 | | bailers, bailing |
| | | | | | | 20 min |
| | | | | | | |
| | | | | Time | 8 | hrs |
| | | | | | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B-2471

# DRILL LOG

By: K. Olson
Date: 9/29/87
Rig: #1
Well Number: 299-418-22
Depth: To
Computer Number:
Project or Work Order No.:
Subcontract No.: KEH-1917

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time Item | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Tore down rig, cleaned up site, hauled off misc., washed rig at lay-down yard, hauled water for pressure washer, moved rig to next site, Mo filled in top part of hole with 32 sacks bentonite crumbles | 22 | 32 sacks bentonite 1600 lbs (dry) |
| | | | | J.S. Will DWC 9/29-1 | | |
| | | | | Time | 8 | hrs |

REMARKS:

D - Drive Barrel  H - Hard Tool  L - Large  M - Medium  S - Small  VC - Very Coarse  C - Coarse  F - Fine  VF - Very Fine  ____ Standing Water

A-6000 02 (5-85)

8-B-2472

WELL 299-W18-23

Battelle
Pacific Northwest Laboratories

# Well Completion Report/Title III Inspection List

Project KEH-1914
Location 200 WEST AREA
Driller DAVE GARCIA
Drilling Co. ONWEGO
Geologist S.P. AIRHART

Well Number 299-W18-23
Temporary Well Number NA
Coordinates N. 38,487 W. 78,120
Casing Elevation 696.81
Ground Elevation 694.75

## DRILLING METHOD

Rotary Air NA Mud NA
Cable Tool D 0'-63' H 63'-255'
Drilling Fluid $H_2O$
Other —

## COMPLETION DATA

Drilled Depth 255'
Completion Depth 251'
Date Started 5-20-87 Completed 7-1-87
Static Water Level/Date 224' / 6-12-87

## CASING DATA

| Type | Size | | |
|---|---|---|---|
| Schedule 40 Carbon Steel | 12" diameter | to | 62'4" |
| Schedule 40 Carbon Steel | 10" diameter | to | 145'6" |
| Schedule 40 Carbon Steel | 8" diameter | to | 255' |
| Schedule 5 Stainless Steel 4" diameter +2.1' – 220'4" | | | |

Approved By GSH Date 12/30/87

## PERFORATIONS

Type NA

| Depth | | Schedule |
|---|---|---|
| — | — | — |
| — | — | — |
| — | — | — |
| — | — | — |

App. By — Date —

## SCREEN

| Type | 8" Continuous Wrap Telescoping | 4" continuous wrap |
|---|---|---|
| Length | 10'5" | 30'5½" |
| Slot Size | #40 30 | 20 |
| Depths | 241'-251' | 220'9"-251' |
| | — | — |

App. By GSH Date 12/30/87

## ANNULAR SEAL

| Type | Interval | Volume |
|---|---|---|
| 20-30 silica sand | 255'9"-255' | 15 ft³ |
| Volclay Tablets | 210'-215'9" | 4 ft³ |
| Volclay Grout | 8'-210' | 185 ft³ |
| Pre-mix Concrete | 0'-3' | 12.3 ft³ |

App. By GSH Date 12/30/87

## GEOPHYSICAL LOGGING

| Sondes | Interval | Date |
|---|---|---|
| Nat. Gamma | — | 6-15-87 |
| gamma-gamma | — | 6-15-87 |
| neutron | — | 6-15-87 |
| | — | |
| | — | |
| | — | |
| | — | |

Approved By GSH Date 6/15/87

## AQUIFER TESTING

Type of Test Continues drawdown / recovery
Length of Test 5 hr. drawdown / 1 hr. recovery
Volume Pumped 52,800 gals
Drawdown 2.62'

Approved By GSH Date 12/30/87

## OTHER APPLICABLE ITEMS

- ✓ Steam Cleaning
- ✓ Storage of Const. Material
- ✓ Tool Lubricants
- ✓ Concrete Pad
- ✓ Protective Steel Posts
- — Safety Paint
- ✓ Straightness Test
- ✓ Well Development
- ✓ Downhole TV Inspection
- NA Well Abandonment
- ✓ Complete As-Built Diagram, Driller's and Geologist's Logs

Approved By G.S. Hill Date —

Reviewed By W.K. McGhan Date 1-8-88

A-1600-167 (3/87)

INSPECTION PLAN
CONSTRUCTION PROJECT KEH-1914 (B-677)

Prepared by
U.S. Department of Energy
Pacific Northwest Laboratory
Operated by
Battelle Memorial Institute

PNL

Project Manager — Date: 5/18/87

Facilities Engineering — Date: 5/18/87

PNL Cognizant QA Engineer — Date: 5/18/87

RHO Concurrence:

Construction Engineer — Date: 5/28/87

Quality Assurance — Date: 5-22-87

DOE-RL Concurrence

Project Engineer — Date: 6-1-87

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## PREFACE

This Inspection Plan identifies the inspections required and the responsible people to perform the inspections of the monitoring wells to be constructed under contract KEH-1914 (B-677).

The inspection of well construction activities is intended to provide assurance that the work performed by construction forces is in accordance with the approved contract documents. The degree of inspection is commensurate with the significance of the monitoring wells with regard to function and safety.

### Inspectors

Listed below are the names of the individuals whose initials appear within this inspection plan.

| Name | Initial | Organization | Job Title |
|---|---|---|---|
| Mel Colby | | KEH | Contract Administrator |
| Tom Nemzek | | KEH | Contract Engineer |
| Jim Mortimer | | KEH | Contract Administrator |
| Steve Airhart | | PNL | Field Geologist |
| Tyler Gilmore | | PNL | Field Geologist |
| Scott Wilbur | | PNL | Field Geologist |

The PNL project manager has reviewed the conceptual inspection plan and is satisfied that all the applicable inspections of the work were made during the construction of the wells.

G. V. Last
PNL Project Manager

1-8-88
Date

## CONSTRUCTION INSPECTION SERVICES

Described herein are the inspection services to be provided and documented by PNL.

### Pre-Award Submittal Review

| | Item | Contract Reference | Initial | Date |
|---|---|---|---|---|
| 1. | Verify contractor and drillers are licensed for well drilling in the State of Washington. | 01100-1.2<br>01300-1.2.1A | [illegible] | 5-7-87 |
| 2. | Verify cable tool drilling experience is five years or more with drive barrel and hard tool. | 01100-1.2 | [illegible] | 5-7-87 |
| 3. | Verify documentation of ground-water monitoring wells drilled by contractor. | 01100-1.2 | [illegible] | 5-7-87 |
| 4. | Verify contractor submitted description of drilling method and equipment. | 01300-1.2.1B | [illegible] | 5-7-87 |
| 5. | Verify contractor submitted resumes of personnel. | 01300-1.2.1C | [illegible] | 5-7-87 |

### Procurements

Verify materials to be furnished to the contractor are as described in the construction specification.

| | Item | Contract Reference | Initial | Date |
|---|---|---|---|---|
| 1. | Stainless steel screen (8 inch telescope size). | 01100-1.5A | [illegible] | 5-15-87 |
| 2. | Stainless steel screen (4 inch). | 01100-1.5B | TN | 5-15-87 |
| 3. | Centralizers. | 01100-1.5C | TN | 5-15-87 |
| 4. | Stainless steel casing (4 inch). | 01100-1.5D | TN | 5-15-87 |

| | Item | | Contract Reference | Initial | Date |
|---|---|---|---|---|---|
| 5. | Artificial sand packs. | | 01100-1.5E | TW | 5-15-87 |
| 6. | Bentonite pellets. | | 01100-1.5F | TW | 5-15-87 |
| 7. | Bentonite grout. | | 01100-1.5G | TW | 5-15-87 |
| 8. | Granular bentonite. | | 01100-1.5H | TW | 5-15-87 |
| 9. | Sack crete. | | 01100-1.5I | TW | 5-15-87 |
| 10. | Portland cement. | | 01100-1.5J | TW | 5-15-87 |
| 11. | Well cap. | | 01100-1.5K | TW | 5-15-87 |
| 12. | Brass survey marker. | | 01100-1.5L | TW | 5-15-87 |
| 13. | Sample jars. | | 01100-1.5M | TW | 5-15-87 |
| 14. | Hydrologic sampling equipment. | | 01100-1.5O | TW | 5-15-87 |
| 15. | Drive shoes. | | 01100-1.5P | TW | 5-15-87 |
| 16. | Carbon steel casing. | a. 16 inch | 01100-1.5Q | TW | 5-15-87 |
| | | b. 12 inch | 01100-1.5Q | TW | 5-15-87 |
| | | c. 10 inch | 01100-1.5Q | TW | 5-15-87 |
| | | d. 8 inch | 01100-1.5Q | TW | 5-15-87 |
| 17. | Guard posts. | | 01100-1.5R | TW | 5-15-87 |
| 18. | Paint: primer | | 01100-1.5S | TW | 5-15-87 |
| | finish enamel | | 02011-3.5I | TW | 5-15-87 |

Performance Submittals

| | Item | Contract Reference | Initial | Date |
|---|---|---|---|---|
| 1. | Verify submission and approval of construction schedule. | 01300-1.2.2A | JM | 10/29/87 |
| 2. | Verify drilling logs are submitted daily. | 01300-1.2.2B | JM | 10/29/87 |
| 3. | Verify submission and acceptability of flow meter certification. | 01300-1.2.2C | JM | 10/29/87 |

Well Number 299-W18-23

The remaining sections of this inspection plan shall be completed for each well.

Well Drilling Activities

| | Item | Contract Reference | Initial | Date |
|---|---|---|---|---|
| 1. | Verify wells are constructed in continuous operation. | 01100-1.3 | SPA | 7-9-87 |
| 2. | Verify contractor uses approved water source. | 01600-2.0 | SPA | 7-9-87 |
| 3. | Verify beveled edge is cut on temporary casing by contractor. | 01600-2.1A | SPA | 7-9-87 |
| 4. | Verify suitability of split spoon sampling equipment. | 01600-2.2 | NA | NA |
| 5. | Steam cleaning equipment. | 01600-2.3 | SPA | 7-9-87 |
| 6. | Aquifer testing equipment. | 01600-2.4 | JSW | |
| 7. | Verify contractor has copy of WAC Chapter 173-160 "Minimum Standards for Construction and Maintenance of Water Wells" and the construction specification at the jobsite. | 02011-1.2 | JSW | |
| 8. | Verify contractor has a copy of all addendums and change orders at the jobsite. | 02011-1.2 | JSW | |

Monitoring Well Construction

| | Item | Contract Reference | Initial | Date |
|---|---|---|---|---|
| 1. | Verify proper technique of cable tool drilling. | 02011-3.1.1 | JSW | |
| 2. | Verify proper technique of air rotary drilling. | 02011-3.1.2 | NA | NA |

Well Number 299-W18-23

| | Item | Contract Reference | Initial | Date |
|---|---|---|---|---|
| 3. | Verify steam cleaning is being done properly. | 02011-3.1.3 | SPA | 7-9-87 |
| 4. | Verify contractor is handling and storing construction materials properly. | 02011-3.1.4 | SPA | 7-9-87 |
| 5. | Verify the contractor uses proper tool lubricants. | 02011-3.1.6 | SPA | 7-9-87 |
| 6. | Verify only approved drilling additives are used. | 02011-3.1.7 | SPA | 7-9-87 |
| 7. | Verify the proper disposal of drill cuttings and water. | 02011-3.1.8 | ASW | |

Well Testing

| | Item | Contract Reference | Initial | Date |
|---|---|---|---|---|
| 1. | Verify water-level measurements are taken. Note in log. | 02011-3.2.1 | SPA | 7-9-87 |
| 2. | Verify the bottom of temporary casing is free of plugging material at end of each day. Note in log. | 02011-3.2.1 | SPA | 7-9-87 |
| 3. | Verify ground-water samples are taken when needed. | 02011-3.2.2 | ASW | |
| 4. | Verify aquifer testing is done at ~~each~~ well. 299-W18-23 | 02011-3.2.3 | SPA | 6-23-87 |
| 5. | Verify formation samples are taken as required. | 02011-3.3 | SPA | 7-9-87 |

Well Number 299-W18-23

Borehole Construction

| | Item | Contract Reference | Initial | Date |
|---|---|---|---|---|
| 1. | Verify temporary casing is telescoped at no more than 100 feet intevals. | 02011-3.4A | SPA | 7-9-87 |
| 2. | Verify depth of well. | 02011-3.4B | SPA | 6-16-87 |
| 3. | Verify proper action is taken if overdrilling occurs. | 02011-3.4C | SPA | 6-16-87 |
| 4. | Verify acceptable passing of alignment test. | 02011-3.4D | SPA | 6-16-87 |
| 5. | Verify all temporary casing is removed from the well. | 02011-3.4E | SPA | 7-1-87 |

Well Construction

| | Item | Contract Reference | Initial | Date |
|---|---|---|---|---|
| 1. | Verify position of 8 inch screen and pullback of casing to expose screen. | 02011-3.5A | SPA | 6-16-87 |
| 2. | Verify adequate well development. | 02011-3.5B | SPA | 6-16-87 |
| 3. | Witness aquifer test. | 02011-3.5B | SPA | 6-22-87 |
| 4. | Verify proper setting of 4 inch screen, casing, and centralizer. | 02011-3.5C | SPA | 6-23-87 |
| 5. | Verify proper placement of sand pack. | 02011-3.5D | SPA | 6-23-87 |
| 6. | Verify proper location and thickness of bentonite pellet seal. | 02011-3.5E | SPA | 6-24-87 |
| 7. | Verify proper mixing, placement, and location of Volclay bentonite-based grout. | 02011-3.5F | SPA | 7-1-87 |

Well Number 299-W18-23

| | Item | Contract Reference | Initial | Date |
|---|---|---|---|---|
| 8. | Verify proper concrete seal at top of well. | 02011-3.5G | SPA | 7-1-87 |
| 9. | Verify proper construction of concrete pad and placement of brass survey marker. | 02011-3.5H | SPA | 7-8-87 |
| 10. | Verify proper placement, construction, and painting of guard posts. | 02011-3.5I | ASW | |
| 11. | Verify contractor cleans up site and properly stores excess materials. | 02011-3.5J | ASW | |
| 12. | If abandonment of well occurs, verify proper abandonment. | 02011-3.6 | NA | NA |
| 13. | Verify contractor maintains the drill log daily. | 02011-3.7 | ASW | |
| 14. | Prepare punchlist at construction completion for exceptions. | | — | — |

| | Item | | Contract Reference | Initial | Date |
|---|---|---|---|---|---|
| 5. | Artificial sand packs. | | 01100-1.5E | SPA | 6-24-87 |
| 6. | Bentonite pellets. | | 01100-1.5F | SPA | 6-24-87 |
| 7. | Bentonite grout. | | 01100-1.5G | SPA | 7-1-87 |
| 8. | Granular bentonite. | | 01100-1.5H | NONE USED | |
| 9. | Sack crete. | | 01100-1.5I | SPA | 7-9-87 |
| 10. | Portland cement. | | 01100-1.5J | SPA | 7-9-87 |
| 11. | Well cap. | | 01100-1.5K | SPA | 7-9-87 |
| 12. | Brass survey marker. | | 01100-1.5L | SPA | 7-8-87 |
| 13. | Sample jars. | | 01100-1.5M | SPA | 7-9-87 |
| 14. | Hydrologic sampling equipment. | | 01100-1.5O | | |
| 15. | Drive shoes. | | 01100-1.5P | SPA | 6-3-87 |
| 16. | Carbon steel casing. | a. 16 inch | 01100-1.5Q | NA | NA |
| | | b. 12 inch | 01100-1.5Q | SPA | 7-9-87 |
| | | c. 10 inch | 01100-1.5Q | SPA | 7-9-87 |
| | | d. 8 inch | 01100-1.5Q | SPA | 7-9-87 |
| 17. | Guard posts. | | 01100-1.5R | SPA | 7-8-87 |
| 18. | Paint: primer | | 01100-1.5S | SPA | 7-8-87 |
| | finish enamel | | 02011-3.5I | | |

Performance Submittals

| | Item | Contract Reference | Initial | Date |
|---|---|---|---|---|
| 1. | Verify submission and approval of construction schedule. | 01300-1.2.2A | | |
| 2. | Verify drilling logs are submitted daily. | 01300-1.2.2B | | |
| 3. | Verify submission and acceptability of flow meter certification. | 01300-1.2.2C | | |

Battelle
Pacific Northwest Laboratories

# AS-BUILT DIAGRAM

Well Number 299-W18-23 Geologist S.P. AIRHART Page 1 of 2

Reviewed by V.L. McGhan Date 1-8-88

| Construction Data | | Depth in Feet | Geologic/Hydrologic Data | |
|---|---|---|---|---|
| Description | Diagram | | Diagram Litho. | Lithologic Description |
| 2.1' STICKUP Above Pad | | | | |
| Concrete Surface Seal 0'-3' | | 5 | | SILTY GRAVELLY SAND |
| | | 10 | | |
| 12" Temporary Carbon Steel Casing | | 15 | | GRAVELLY SAND |
| 10" Temporary Carbon Steel Casing | | 20 | | SLIGHTLY SILTY SAND |
| 8" Temporary Carbon Steel Casing | | 25 | | SILTY SAND |
| 4" Stainless Steel Casing | | 30 | | |
| | | 35 | | SLIGHTLY GRAVELLY SILTY SAND |
| | | 40 | | SILTY SAND |
| | | 45 | | SLIGHTLY GRAVELLY SILTY SAND |
| | | 50 | | SILTY SAND |
| | | 55 | | SILTY SANDY GRAVEL |
| 62'4" | | 60 | | SILTY GRAVELLY SAND |
| | | 65 | | SILTY SANDY GRAVEL |
| | | 70 | | |
| | | 75 | | |
| Volclay Grout | | 80 | | |
| | | 85 | | |
| | | 90 | | |
| | | 95 | | |
| | | 100 | | |
| | | 105 | | |
| | | 110 | | GRAVELLY SILTY SAND |
| | | 115 | | |
| | | 120 | | SLIGHTLY GRAVELLY SILTY SAND |
| | | 125 | | |
| | | 130 | | SILTY SAND |

A-1800-186 (3/87)

Battelle
Pacific Northwest Laboratories

# AS-BUILT DIAGRAM

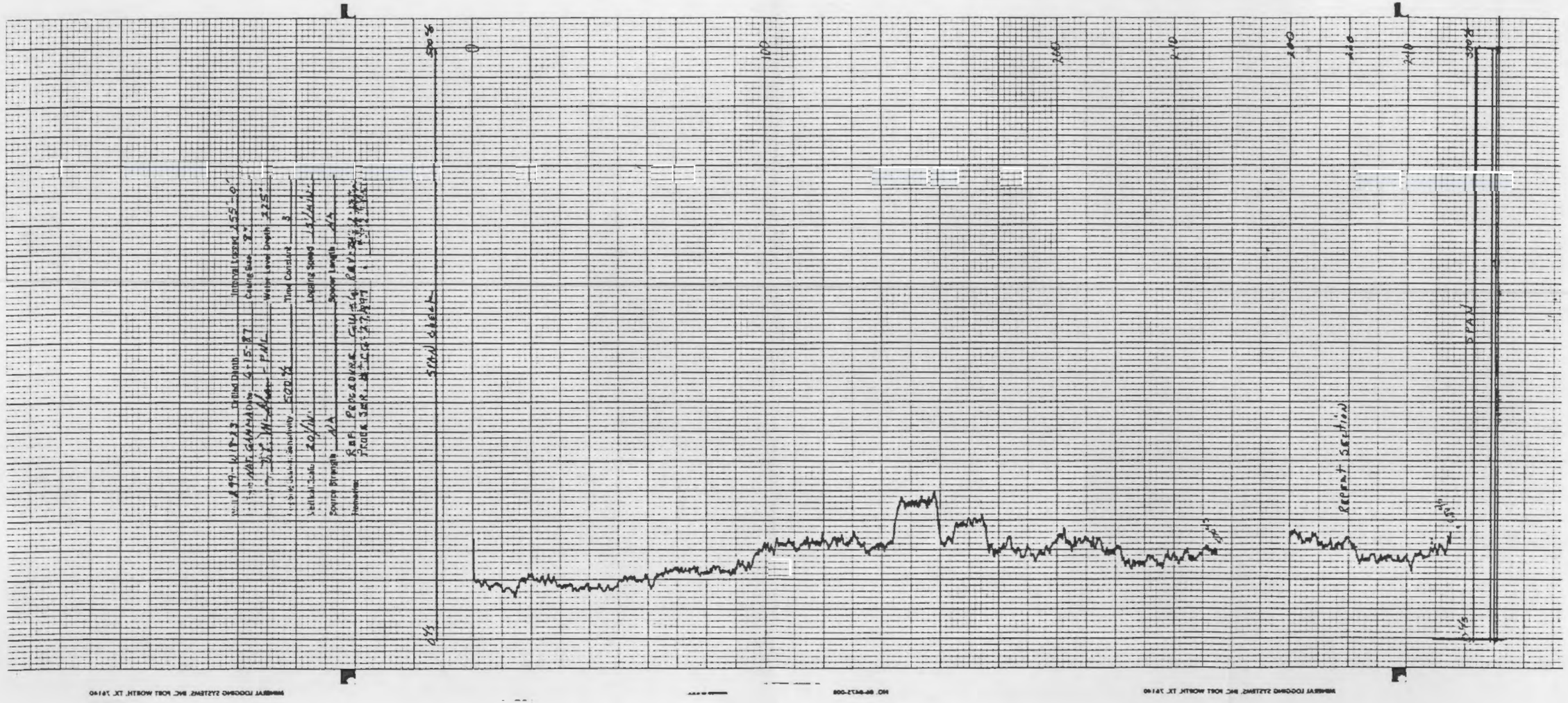
Well Number 299-W18-23 Geologist S. P. AIRHART Page 2 of 2

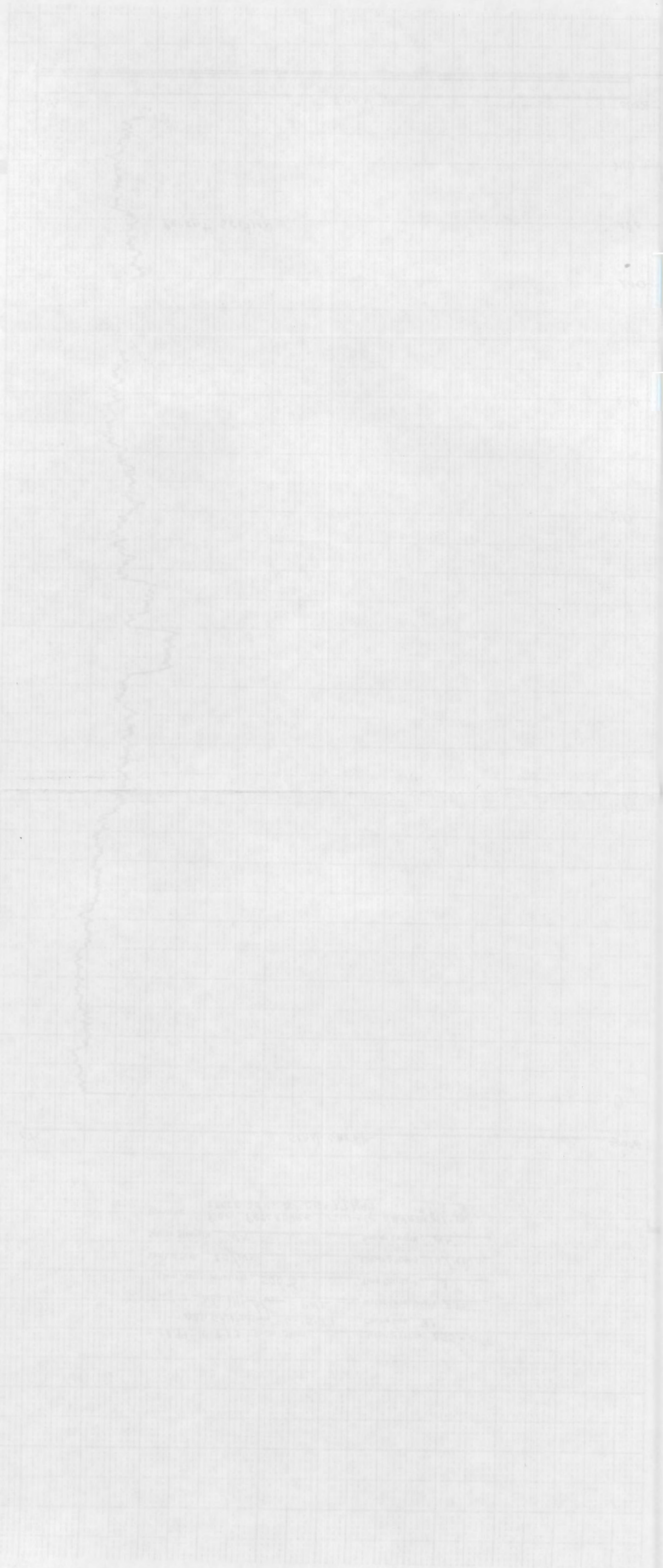
Reviewed by W.E. McShane Date 1-8-88

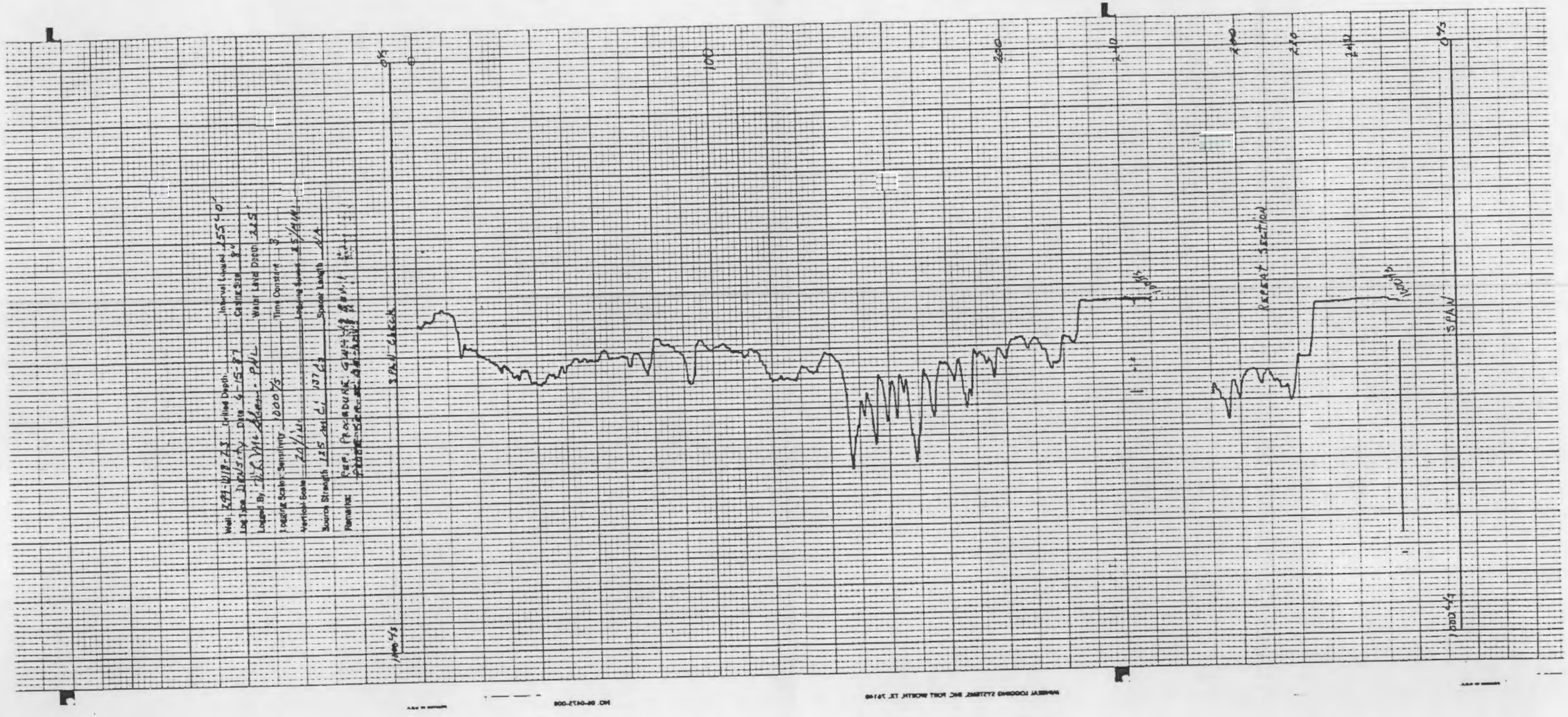
| Construction Data | | Depth in Feet | Geologic/Hydrologic Data | |
|---|---|---|---|---|
| Description | Diagram | | Diagram Litho. | Lithologic Description |
| | | 135 | | SILTY SAND |
| | | 140 | | |
| | | 145 | | |
| 145'6" | | 150 | | SANDY SILT / CLAY |
| | | 155 | | |
| | | 160 | | SILT/CLAY W/ SAND |
| | | 165 | | SLIGHTLY GRAVELLY SILT/CLAY |
| | | 170 | | SLIGHTLY GRAVELLY SILTY/CLAYEY SAND |
| | | 175 | | SILTY SAND |
| | | 180 | | |
| Volclay Grout | | 185 | | SILTY SANDY GRAVEL |
| | | 190 | | SANDY GRAVEL |
| | | 195 | | |
| | | 200 | | |
| | | 205 | | |
| Volclay Tablets | 210' | 210 | | |
| | 215'9" | 215 | | |
| Centralizers | 220'4" | 220 | | |
| 6-12-87 ▽ | | 225 | | |
| 20'8" of 4" 20-slot stainless steel screen | | 230 | | |
| | | 235 | | SILTY GRAVELLY SAND |
| | | 240 | | SILTY/CLAYEY SANDY GRAVEL |
| | | 245 | | SANDY GRAVEL |
| 10'5" of 8" 40-slot stainless steel telescoping screen | 251' | 250 | | SILTY SANDY GRAVEL |
| 20-30 mesh Colorado Silica Sand | 255' | 255 | | SILTY GRAVELLY SAND |
| | | 260 | | |

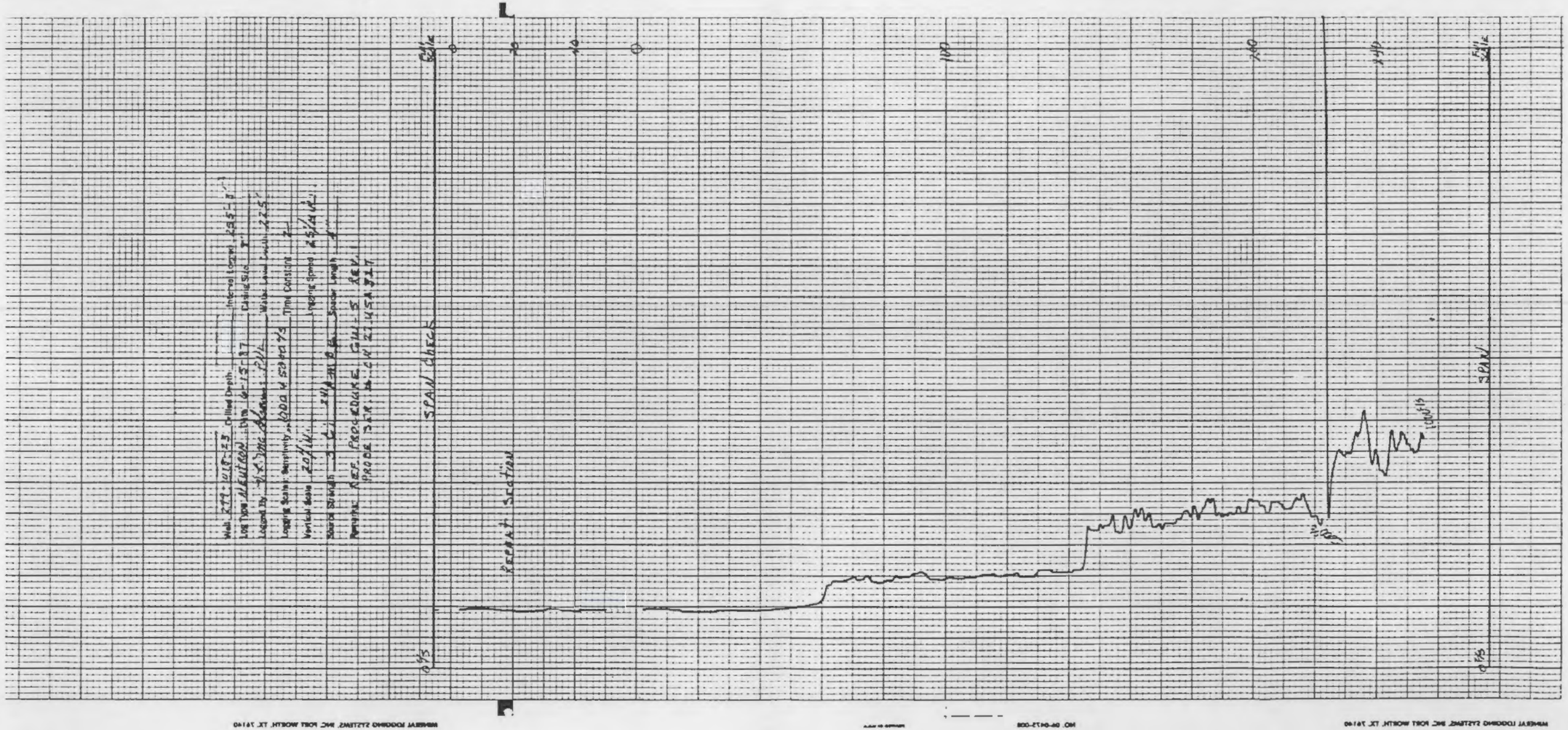
□ → CALICHE

A-1600-186 (3/87)


Recent Section




Depth Interval Logged 2550'
Well 2-15-87 Drilled Depth
Log Taken 12/5/87 Casing Size
Logged By: W.S. Mills Address - PVC
Logging Scale: Sensitivity - 1000%
Vertical Scale Time Constant 3
Source Strength 1215 Spacing Sheave 45/8"
Remarks: Ref: Production Log Spacing Sheave
0
100
2550
2510
2490
2470
2450
2430
REPEAT SECTION
TOOL 4-9


Scale
0
20
40
100
200
400
Full Scale
SCAN checks
Recent Section
0.45
SCAN
Well 211-U/B-33
Log Date 11/15-17
Logged By H.K. Mac Adams
Logging Scale: Sensitivity 1000 # scale
Vertical Scale 20 ft/in
Source Strength 3 Ci
Remarks REF. PRODUCING ZONE
PROBE DATE 11/15-17
Interval Logged 455-0'
Casing Size 5" SW
Water Level Depth 225'
Time Constant 2"
Recent Speed 45/24 hr
Spacer Length 4"
SCALE 1" = 20'
21 45 SEC
MINERAL LOGGING SYSTEMS, INC. FORT WORTH, TX. 76140

| DRILL LOG | By SP AIRHART | Rig BUCYRUS ERIE 22W | Well Number 18-23 | Computer Number NA | Project or Work Order No. KEH-1914 |
|---|---|---|---|---|---|
| | Date 5-20-87 | CABLE TOOL #1 | Depth 0' To 10' | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | DRILLER - DAVE GARCIA (ONWEGO DRILLING) | | |
| | 4-5' | D | MOIST | SILTY GRAVELLY SAND - 30% GRAVEL, 65% SAND, | 08:30 | |
| | | | | 5% SILT - (GRAVEL) 80% V.F. Pebble 15% F Pebble | | |
| | | | | 5% M. Pebble, comp. includes 70% basaltic, | | |
| | | | | 30% qtz.-rich, clasts subangular-to-subrounded, | | |
| | | | | large clasts have caliche coating (SAND) | | |
| | | | | 40% VCS, 20% CS, 30% MS, 10% VFS-FS, comp | | |
| | | | | includes 50% basalt 50% qtz-rich, mica - | | |
| | | | | grains angular-to-subrounded; FM. unconsolidated; | | |
| | | | | No HCl to test rxn. although appears CaCO3 | | Moist color olive gray 5Y4/1 |
| | | | | present; Moisture sample taken 5 hrs. after | | |
| | | | | sample collected - taken from bottom of bucket | | |
| | | | | 13'4" of starter casing installed | 11:00 | |
| | 9-10' | D | MOIST | SILTY GRAVELLY SAND - 85% SAND, 10% GRAVEL, | | |
| | | | | 5% - (GRAVEL) 90% V.F. Pebble 10% F. Pebble, | | |
| | | | | comp. includes 90% basalt 10% qtz-rich, clasts | | |
| | | | | are subangular, (sand) 80% VCS, 10% CS, | | |
| | | | | 10% VF-MS, grains angular-to-subangular, | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000 021 (5-85)

8-B.2493

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| SD AIRHART | CABLE TOOL | 299W-18-23 | | KEH-1914 |
| Date: 5-20-87 | #1 | Depth: 10' To 13' | NA | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | (cont. 9-10') comp. includes 70% basalt, 30% g/s.-rich, mica- | | |
| | | | | FM unconsolidated, caliche present; overall | | |
| | | | | color Dark Olive Gray 5Y/3/2 wet (raining), | | |
| | | | | Moisture sample taken 3½ hrs. after removed- | | |
| | | | | sample from bottom of bucket | | |
| | | | | Removed starter casing - installed 12" | | |
| | | | | instead of 14" | | |
| 14'6" OF 12" | | CASING | | Added 12" casing and drive-shoe 14'6" | 1415 | |
| | | | | SHUT DOWN | 1500 | |
| | | | | SD Airhart 5/20/87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000-021 (5-85)

8-B.2494

| DRILL LOG | By SP AIRHART | Rig CABLE TOOL #1 | Well Number 299-W18-23 | Computer Number NA | Project or Work Order No. KEH-1914 |
|---|---|---|---|---|---|
| | Date 5-21-87 | | Depth 13' To 20' | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 14'6" | | | | BEGAN DRILLING | 7:27 | |
| | 14-15' | D | MOIST | GRAVELLY SAND : 15% Gravel 85% sand, | 0730 | |
| | | | | (GRAVEL) 80% VFP 10% FP 10% MP, comp. includes | | |
| | | | | 70% basalt 20% Qtz. 10% metam., clasts are | | |
| | | | | angular-to-subangular (SAND) 40% VCS, 30% | | |
| | | | | CS, 20% MS, 10% VFS-FS, comp. includes 60% | | |
| | | | | qtz-rich & metam, 40% basalt, grains | | |
| | | | | angular-to-subangular, dry color 5Y 4/1, | | |
| | | | | mod. rxn. to HCl, poorly sorted, caliche | | |
| | | | | on clast surfaces. Moisture sample taken. | | |
| | | | | Added 7' of 12" casing | | |
| 21'6" of | 12" CASING | | | Total 12" casing = 14'6" + 7' = 21'6" | | |
| | | | | 16' → sand size decreases | 0931 | ~~DRILL RATE~~ 20 min/5' |
| | 19-20' | D | MOIST | SLIGHTLY SILTY SAND : 90% sand, 10% silt | 0935 | |
| | | | | (SAND) 10% VCS, 10% CS, 40% MS, 20% FS, 20% VFS | | |
| | | | | comp includes 40% basalt, 40% qtz., 30% metam | | |
| | | | | and mica, grains are dominantly angular, | | |
| | | | | caliche grains react strongly w/ 10% HCl, | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B-2495

| DRILL LOG | By SP AIRHART | Rig CABLE TOOL | Well Number 299-W18-23 | Computer Number | Project or Work Order No. KEH-1914 |
|---|---|---|---|---|---|
| | Date 5-21-87 | #1 | Depth 20' To 30' | NA | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | (cont. 19-20') wet color dark olive gray (5Y 3/2) | | |
| | | | | dry color dark gray (5Y 4/1), poorly sorted, | | |
| | | | | unconsolidated. Decrease in ave. grain size | | Drill rate increased |
| | 24-25' | D | MOIST | SILTY SAND: 85% sand, 15% silt | 10:05 | 5' in 8 min |
| | | | | (SAND) 5% CS, 20% MS, 50% FS, 25% VFS, | | |
| | | | | grains are angular-to-subangular, comp. | | |
| | | | | includes 30% basalt, 30% Qtz, 40% metam., | | |
| | | | | brown mudstone, mica, caliche grains (react | | |
| | | | | strongly w/ 10% HCl) - poorly sorted, | | |
| | | | | slightly compacted, wet color very dark | | |
| | | | | grayish brown (2.5Y 3/2) dry color dark | | |
| | | | | grayish brown (2.5Y 4/2), decrease in ave. | | |
| | | | | grain size. | | |
| | 29-30' | D | MOIST | SILTY SAND: 70% sand 30% silt | 10:19 | 5' in 10 min |
| | | | | (SAND) 15% MS, 50% FS, 35% VFS - grains | | |
| | | | | are angular, comp includes 30% basalt, | | |
| | | | | 25% Qtz, 15% brown and yellow mudstone, 20% | | |
| | | | | metam., 10% mica - silt is evident as | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2496

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| SP AIRHART | CABLE TOOL | 299-W18-23 | NA | KEH-1914 |
| Date: 5-21-87 | #1 | Depth: 30' To | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | (29-30' ft.) (~2 cm size laminae in compacted sand (brown silt), overall color wet very dark grayish brown (2.5Y 3/2) dry dark grayish brown (2.5Y 4/2), formation is well sorted, moderately compacted, strong rxn. w/ 10% HCl. | | ~9' open hole |
| | | | | Added 10' of 12" casing | 1100 | |
| 31'6" OF 12" | casing | | | Total 12" casing = 21'6" + 10' = 31'6" | | |
| | | | | ~33' Grain size increased VCS - w/ a few small cobbles | 1230 | |
| | 34-35' | D | MOIST | SLIGHTLY GRAVELLY SILTY SAND: 85% sand 10% silt 5% gravel: (GRAVEL) 80% VFP 20% FP <5% MP-CP, comp. includes 75% basalt, 20% qtz., granites 5% metam., clasts are angular-to-subangular (SAND) 20% VCS, 50% CS, 20% MS, 10% FS-VFS; grains are angular-to-subangular; comp includes 60% basalt, 20% qtz. rich 20% metam; overall color | 1233 | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2497

| DRILL LOG | By SP AIRHART | Rig CABLE TOOL | Well Number 299-W18-23 | Computer Number | Project or Work Order No. KEH-1914 |
|---|---|---|---|---|---|
| | Date 5-21-87 | #1 | Depth 35 To 40 | NA | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | (34-35' cont'd) wet very dark gray (5Y 3/1) dry dark | | |
| | | | | gray (5Y 4/1); slight rxn w/ 10% HCl (caliche | | |
| | | | | grains); Formation is poorly sorted; unconsolidated; | | |
| | | | | increase in ave grain size | | |
| | | | | Formation is caving - can't drill open hole | 1245 | |
| | | | | Added 10'10½" of 12" casing | 1325 | |
| 42'4½" OF 12" CASING | | | | Total 12" casing = 31'6" + 10'10½" = 42'4½" | | |
| | | | | LITHOLOGY CHANGE FROM PREVIOUS DESC. TO SILTY SAND @ 39'. | | |
| | 39-40' | D | MOIST | SILTY SAND; 30% SILT, 70% Sand - 10% VCS | 1456 | |
| | | | | 10% CS, 20% MS, 15% FS, 15% VFS, 30% SILT; | | |
| | | | | Poorly sorted, comp includes 40% basalt, 30% | | |
| | | | | qtz, 20% metam., 10% mica; grains are angular-to- | | |
| | | | | subangular, dry color grayish brown (2.5Y 5/2); | | |
| | | | | strong rxn. w/ 10% HCl; slightly consolidated; | | |
| | | | | caliche grains present; decrease in ave grain | | |
| | | | | size | | |
| | | | | Shut down | 1510 | |
| | | | | | | |

REMARKS:

S.P. Airhart 5-22-87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2498

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| SD AIRHART | CABLE TOOL #1 | 299-W18-23 | NA | KEH-1914 |
| Date: 5-22-87 | | Depth: 40' To 45' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 42'4½" | | | | STARTED DRILLING | 0725 | |
| | | | | @ ~ 42' Formation keeps caving - several | 0750 | |
| | | | | small-to-medium cobbles were found | | |
| | | | | in sediments @ this depth. | | |
| 53' of | 12" casing | | | | 0810 | Added 10'7½" of 12" |
| | | | | | | casing - Total casing |
| | | | | | | = 42'4½" + 10'7½" = 53' |
| | 44-45' | D | MOIST | SILTY SAND w/ TRACE OF GRAVEL; <5% gravel, | 0955 | |
| | | | | 90% sand, 10% silt - <5% VFP-FP, 50% VCS, | | Fast drilling |
| | | | | 20% CS, 15% MS, 5% VFS-FS, 10% silt | | rate |
| | | | | (GRAVEL) angular-to-subangular clasts composed | | |
| | | | | of 70% basalt 30% qtz-rich (SAND) 60% basalt, | | |
| | | | | 20% qtz 20% metam, mudstones, Note: Thin | | |
| | | | | layer of med-to-fine sand w/ $CaCO_3$ cementation | | |
| | | | | @ this layer - sand grains angular-to- | | |
| | | | | subangular; dry color dark gray (5Y 4/1) wet | | |
| | | | | color very dark gray (5Y 3/1); strong rxn w/ | | |
| | | | | 10% HCl; unconsolidated | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2499

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| SP AIRHART | CABLE TOOL | 299-W18-23 | NA | KEH-1914 |
| Date: 5-22-87 | #1 | Depth: 45 To 55' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | 49-50' | D | MOIST | SILTY SAND ; 70% sand , 30% silt ; 5% cs, | 10:05 | VERY FAST |
| | | | | 20% ms ; 30% FS ; 15% VFS - angular-to- | | DRILLING RATE |
| | | | | subangular grains composed of 40% qtz , | | |
| | | | | 25% metam and other (mica) , 35% basalt - | | |
| | | | | mod. sorted - wet color very dark gray | | |
| | | | | (10YR 3/1) dry color dark gray-isL brown- | | |
| | | | | (10YR 4/2) ; mod rxn w/ 10% HCl ; slightly | | |
| | | | | consolidated ; definite decrease in ave. | | |
| | | | | grain size. | | 6-7' of open hole |
| | | | | Color change / decrease in basalt content | | |
| | | | | @ 53' . Gravel begins @ 54' . | | |
| | 54-55 | D | MOIST | SILTY SANDY GRAVEL ; 40% Gravel 50% sand | 10:15 | |
| | | | | 10% silt - 5% CP , 15% MP , 10% FP, 10% VFP , | | |
| | | | | 5% VCS , 20% CS , 15% MS , 5% FS , 5% VFS, 10% | | |
| | | | | silt - very poorly sorted - (Gravel) 60% | | |
| | | | | basalt , 25% metam, 15% qtz-rich and granite ; | | |
| | | | | clasts are subangular-to-rounded - caliche on | | |
| | | | | some surfaces ; (sand) 55% qtz-rich 35% basalt | | |

REMARKS:

15% metam, mica, other , grains are angular-to-subrounded.

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine _ _ Standing Water

A-6000 021 (5-85)

8-8.2500

8-B.2501

| DRILL LOG | By: SP AIRHART | Rig: CABLE TOOL #1 | Well Number: 299-W1B-23 | Computer Number: NA | Project or Work Order No.: KEH-1914 |
|---|---|---|---|---|---|
| | Date: 5-22-87 | | Depth: 55' To 60' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 53' | | | | wet color dark grayish brown (10YR 4/2) | | |
| | | | | dry color grayish brown (2.5Y 5/2), strong | | |
| | | | | rxn w/ 10% HCl Note: sand grains cemented ($CaCO_3$) | | |
| | | | | to surfaces of some clasts; slightly consolidated; | | |
| | | | | increase in ave. grain size. | | |
| 63'3" OF 12" CASING | | | | | 11:10 | Added 10'3" of |
| | | | | | | 12" casing - |
| | | | | | | Total casing = |
| | | | | NOTE CHANGE | | 53' + 10'3" = 63'3" |
| | 59-60 | D | SLIGHTLY MOIST | SILTY GRAVELLY SAND: 20% gravel, 70% sand, 10% | 13:05 | Fast drilling |
| | | | | silt - 5% MF-CP, 10% FP, 5% VFP, 20% VCS, 30% | | |
| | | | | CS, 10% MS, 10% FS, 10% SILT, POORLY sorted, | | |
| | | | | (GRAVEL) subangular-to-subrounded, 65% basalt, 25% | | |
| | | | | qtz. rich (sand) angular-to-subangular - 40% basalt | | |
| | | | | 60% qtz rich - wet color dark grayish brown | | |
| | | | | (10YR 4/2) dry color grayish brown (2.5Y 5/2); slight | | |
| | | | | rxn w/ 10% HCl although sand is cemented to surfaces | | |
| | | | | of a few clasts; slightly consol. dated, no Δ ave. grain size. | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| SP AIRHART | CABLE TOOL | Z99-WIP-73 | NA | KEH-1914 |
| Date: 5-22-87 | #1 | Depth: 60 To 63' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Drive barrel not picking up sample - driller | 14 10 | |
| | | | | says sediment too dry. Will change over to | | |
| | | | | hard tool. Apparently too much gravel for | | |
| | | | | drive barrel also. | | |
| | | | | | | |
| | | | | S.P. Airhart | | |
| | | | | 5-22-87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2502

| DRILL LOG | By: SP AIRHART | Rig: CABLE TOOL #1 | Well Number: 299-W18-23 | Computer Number: NA | Project or Work Order No.: KEH -1914 |
|---|---|---|---|---|---|
| | Date: 5-26-87 | | Depth: 63 To 63 | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Driller picking up milled drive shoes | 700-1000 | |
| | | | | Arrived @ drill site | 1030 | |
| | | | | Put 10" hard tool on drill stem | 1255 | |
| | | | | | 1300-1510 | Added the Following |
| | | | | Note: 11" of stickup on 12" casing ∴ 62'4" of | | sections of 10" casing |
| | | | | 12" casing in ground. | | 21'3" (includes drive shoe) |
| | | | | | | 20'10¼" |
| | | | | | | 20'10" |
| | | | | | | 62'11¼" |
| | | | | Shut Down | 1515 | |
| | | | | S.P. Airhart 5-26-87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2503

| DRILL LOG | By SP AIRHART | Rig CABLE TOOL | Well Number 299-W18-23 | Computer Number | Project or Work Order No. KEH-1914 |
|---|---|---|---|---|---|
| | Date 5-27-87 | # 1 | Depth 63' To 65' | NA | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Driller arrived | 0800 | |
| | | | | Driller locating $H_2O$ source for drilling | 0815– | 1010 |
| | | | | $H_2O$. (200W Power Plant) | | |
| | | | | Steam cleaning 55 gal barrels which will | | |
| | | | | hold drilling $H_2O$ | | |
| | | | | Added 20 gals $H_2O$ / Began drilling w/ | 1015 | |
| | | | | hard tool. | | |
| | | | | Unable to drill open hole. Must add casing | 1110 | |
| | | | | | 1115-1200 | Added 10'7¼" |
| | | | | casing driving hard – | | of 10" casing - |
| | | | | | | Total casing = |
| | | | | | | 62'11¼" + 10'7¼" = |
| 73'6½" | of 10" casing | | | | | 73'6½" |
| | | | | Added ~10 gals $H_2O$ / Began drilling | 1225 | |
| | 64-65' | H | Wet | SILTY SANDY GRAVEL – 10% silt, 35% sand, 55% | 1235 | |
| | | | | gravel - 5% CP, 30% MP, 10% FP, 10% VFP, 10% VCS, 10% CS, | | |
| | | | | 15% MS, <5% F-VFS, 10% silt - very poorly sorted, comp | | |
| | | | | Includes (gravel) 70% basalt 30% qtz & metam., preserved | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine Standing Water

A-6000-021 (5-85)

8-B.2504

| DRILL LOG | By: SP AIRHART | Rig: CABLE TOOL | Well Number: 299-W18-23 | Computer Number: NA | Project or Work Order No.: KEH-19 W |
|---|---|---|---|---|---|
| | Date: 5-27-87 | ± 1 | Depth: 65' To 70' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | (4-65' cont) clasts are subrounded-to-rounded (sand) 50% basalt 50% qtz-rich, metam. grains are angular (fractured) to-subrounded - overall color (wet) olive gray (5Y 4/2), (dry) gray (5Y 5/1); strong rxn. w/ 10% HCl, formation won't stay open, however, appears mod. consolidated, increase in ave. grain size | | |
| | | | | | | SLOW DRILLING 2.5 ft/hr. |
| | 67-70' | H | Wet | SILTY SANDY GRAVEL: 50% gravel 35% sand 15% silt/clay (adhesiveness of fines to clasts as well as clods suggests clay content) - 10% CP, 25% MP, 10% FP, 5% VFP, 5% VCS, 15% CS, 10% MS, 5% FS-VFS, very poorly sorted, comp. includes (gravel) 75% basalt, 10% qtz-rich, 15% metam., highly fractured few preserved clasts - subrounded-to-rounded (sand) 70% basalt, 10% qtz 20% metam. - angular-to-subangular, overall color (wet) olive gray (5Y 4/2) (dry) gray (5Y 5/1), strong rxn w/ 10% HCl, caliche chunks present, mod. consolidated, | 1430 | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
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| | | | | | | |
| | | | | | | |
| | | | | | | |

REMARKS: SP Airhart 5-27-87

NO Δ ave grain size.

Shut down 1500 hrs.

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2505

| DRILL LOG | By SP AIRHART | Rig CABLE TOOL | Well Number 299-W18-23 | Computer Number | Project or Work Order No. KEH-1914 |
|---|---|---|---|---|---|
| | Date 5-28-87 | # 1 | Depth 70' to 75' | NA | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Driller arrived | 0700 | |
| 83'11½" of 10" casing | | | | | 0815 | Added 10'5" of 10" |
| | | | | | | casing. Total casing |
| | | | | Driller still unable to drill ahead of casing | | = 73'6½" + 10'5" = 83'11½" |
| | | | | SLOW DRILLING ~1'/hr. | | |
| | 73-75' | H | wet | SILTY SANDY GRAVELLY - (highly fractured sample - | 1120 | |
| | | | | hard to estimate true texture) - 45% gravel, 40% | | |
| | | | | sand, 15% silt/clay (slightly adherrs to clast surfaces) | | |
| | | | | overall 10% MP, 25% FP, 10% VFP, 10% VCS, 5% CS, | | |
| | | | | 10% MS, 10% FS, 5% VFS, 15% silt/clay - very | | |
| | | | | poorly sorted, (gravel) preserved clasts subangular- | | |
| | | | | to- subrounded, composition 85% basalt, 10% qtz | | |
| | | | | rich, 5% metam. (sand) angular - to - subrounded, | | |
| | | | | 70% basalt, 15% qtz-rich, 15% metam; overall | | |
| | | | | color (wet) dark olive gray (5Y 3/2) (dry) light | | |
| | | | | olive gray (5Y 6/2); strong rxn w/ 10% HCl, mod | | |
| | | | | consolidated, slight decrease in ave grain size | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A GOOD 321 (5-85)

8-B.2506

| DRILL LOG | By: SP AIRHART | Rig: CABLE TOOL | Well Number: 299-W18-23 | Computer Number: | Project or Work Order No.: KEH-1914 |
|---|---|---|---|---|---|
| | Date: 5-28-87 | #1 | Depth: 75 To 85' | NA | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 83'11.5" | | | | Added 10 gals $H_2O$ | 1200 | |
| | 78-80' | H | wet | SILTY SANDY GRAVEL - 50% gravel, 35% sand, 15% | 1247 | |
| | | | | silt - (sample very fractured) 45% CP, 10% MP, | | |
| | | | | 25% FP, 15% VFP, 5% VCS, 10% CS, 10% MS, 5% FS, 5% | | |
| | | | | VFS, 15% silt/clay (clods and adheres to clast surfaces) | | |
| | | | | (gravel) mostly fractured, preserved clasts exhibit | | |
| | | | | subangular-to-subrounded texture, comp. includes | | |
| | | | | 80% basalt, 10% qtz. 10% metam. (sand) angular-to- | | |
| | | | | subrounded, 70% basalt, 15% qtz-rich, 15% metam; | | |
| | | | | overall color (wet) olive gray (5Y 4/2) (dry) light | | |
| | | | | olive gray (5Y 6/2), strong rxn w/ 10% HCl, | | |
| | | | | mod. consolidated, no Δ in ave. grain size | | |
| | | | | (sample basically same as previous sample) | | |
| | | | | Added 10 gals $H_2O$ | 1328 | |
| | | | | Able to drill ahead a few ft. | | |
| | | | | Added ~ 10 gals $H_2O$ | 1451 | Drilling rate ~ 25 ft/hr |
| | 84-85' | H | wet | SILTY SANDY GRAVEL - 50% gravel, 40% sand, 10% | 1505 | |
| | | | | silt - 45% CP, 25% MP, 15% FP, 10% VFP, 10% VCS, | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-86)

8-B.2507

| DRILL LOG | By: SP AIRHART | Rig: CABLE TOOL #1 | Well Number: 299-W18-23 | Computer Number: NA | Project or Work Order No.: KEH-1914 |
|---|---|---|---|---|---|
| | Date: 5-28-87 | | Depth: 85 To 85 | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | (84-85' cont.) 10% CS, 15% MS, 5% F-VFS, 10% silt (gravel) preserved clasts exhibit subrounded texture, comp. 65% basalt, 20% qtz-rich, 10% metam. (sand) 80% basalt, 20% qtz-rich & metam, grains angular-to-subrounded, very poorly sorted, overall color (wet) olive gray (5Y 4/2) (dry) light olive gray (5Y 6/2); strong rxn. w/ 10% HCl, caliche on surface of a few clasts; mod.-to-well consolidated, slight increase in ave. grain size. | | |
| | | | | S.P. Airhart 5-28-87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2508

| DRILL LOG | By: SP AIRHART | Rig: CABLE TOOL | Well Number: 299-W18-23 | Computer Number: NA | Project or Work Order No.: KEH-1914 |
|---|---|---|---|---|---|
| | Date: 5-29-87 | # 1 | Depth: 85' To 95' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 53'11½" | | | | STARTED DRILLING | 0700 | |
| | 89-90' | H | wet | SILTY SANDY GRAVEL — 50% gravel, 40% sand, 10% silt - overall → 15% MP, 25% FP, 10% VFP, 15% VCS, 10% CS, 10% MS, 5% FS-VFS, 10% silt, very poorly sorted, (gravel) highly fractured from hard tools, preserved clasts are subangular-to-rounded, comp. includes 85% basalt, 10% qtz, granite 5% metam. (sand) angular-to-subrounded grains composed of 70% basalt, 15% qtz, 15% metam, overall color (wet) dark olive gray (5Y 3/2) (dry) light olive gray (5Y 6/2); strong rxn. w/ 10% HCl - caliche present; well consolidated; no Δ in ave. grain size. | 0930 | very slow drilling ~ 2 Ft/hr |
| | | | | Change in drilling rate (faster) noted @ ~ 91' | 955 | |
| | 94-95' | H | Wet | SILTY SANDY GRAVEL - 50% gravel, 40% sand, 10% silt - overall → 5% CP, 15% MP, 20% FP, 10% VFP, 15% VCS 10% CS, 10% MS, 5% F-VFS, 10% silt, very poorly sorted, (gravel) subangular-to-rounded clasts | 1020 | drilling rate ~ 7 Ft/hr |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2509

| DRILL LOG | By: SP AIRHART | Rig: CABLE TOOL #1 | Well Number: 299-W18-23 | Computer Number: NA | Project or Work Order No.: KEH-1914 |
|---|---|---|---|---|---|
| | Date: 5-29-87 | | Depth: 95' To 100' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | (94-95' cont.) composed of 80% basalt, 10% qtz, 10% metam - | | |
| | | | | caliche present on clast surfaces and as pebble- | | |
| | | | | size fragments (sand) angular-to-subrounded | | |
| | | | | grains composed of 50% basalt, 30% qtz-rich, | | |
| | | | | 20% metam.; overall color (wet) dark olive gray | | |
| | | | | (5Y 3/2) (dry) light olive gray (5Y 6/2); strong rxn | | |
| | | | | w/ 10% HCl; mod.-to-well consolidated; No significant | | |
| | | | | change in formation texture or composition ∴ Δ | | Note: 15' of open hole |
| | | | | drilling rate must be due to decrease in cementation!) | | |
| | | | | | 1045 | Added 11' of 10" casing - Total Casing = 83'11½" + 11' = 94'11½" |
| 94'11½" of 10" casing | | | | | | |
| | | | | Built up bit on one side | 1240 | |
| | 99-100' | H | wet | SILTY SANDY GRAVEL - 35% gravel, 50% sand, 15% silt | 1400 | |
| | | | | - overall → 5% CP, 5% MP, 10% FP, 15% VFP, 5% VCS, 10% CS, | | |
| | | | | 20% MS, 10% FS, 5% VFS, 15% silt, very poorly sorted, | | |
| | | | | (gravel) subangular-to-subrounded clasts composed of | | |
| | | | | 80% basalt, 15% qtz-rich, 5% metam. (sand) subangular-to- | | |
| | | | | rounded grains composed of 65% qtz-rich & metam, | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000.021 (5-85)

8-B.2510

| ORILL LOG | By SP AIRHART | Rig CABLE TOOL | Well Number 299-W18-23 | Computer Number | Project or Work Order No. KEH-194 |
|---|---|---|---|---|---|
| | Date 5-29-87 | #1 | Depth 100' To 109' | NA. | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | 30% basalt, 5% mica ; overall color (wet) dark grayish brown (2.5Y 4/2), (dry) light brownish gray (2.5Y 6/2) ; mod. rxn. w/ 10% HCl, mod-to well consolidated ; note decrease in grain size, change in sand comp, presence of mica | | |
| | | | | Drill rate increased between 100 - 104' | | |
| | | | | | | |
| | 104-105' | H | Wet | SILTY SANDY GRAVEL — 35% gravel, 50% sand, | 1420 | 5ft in 20 min. |
| | | | | 15% silt - overall → <5% CP, 10% MP, 10% FP, 15% VFP, 5% VCS, 10% CS, 20% MS, 10% FS, 5% VFS, 15% silt, very poorly sorted, (gravel) subangular-to-subrounded clasts composed of 80% basalt, 15% qtz, 5% meta-. (sand) subangular-to-rounded grains composed of 70% qtz-rich, mriam. mica, 30% basalt ; overall color (wet) dark grayish brown (2.5Y 4/2) (dry) light brownish gray (2.5Y 6/2) ; strong rxn w/ 10% HCl, mod. consolidation ; same as previous sample. chunks of caliche present. | | |
| REMARKS: | | | | Shut Down | 1500 | |

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000 021 (5-85)

8-B.2511

| DRILL LOG | By: S.P. AIRHART | Rig: CABLE TOOL | Well Number: 299-W18-23 | Computer Number: | Project or Work Order No.: KEH-1914 |
|---|---|---|---|---|---|
| | Date: 6-1-87 | #1 | Depth: 109' To 113' | | Subcontract No.: |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Driller arrived | 0700 | |
| | | | | Began drilling - sediment settled over weekend necessary to drill out. | 0830 | |
| | | | | Added ~10 gals $H_2O$ | 0840 | |
| | 109-110' | H | Wet | GRAVELLY SILTY SAND : 30% gravel, 20% silt, 50% sand, | 0851 | |
| | | | | - overall → 5% MP, 15% FP, 10% VFP, 5% VCS, 5% CS, | | |
| | | | | 20% MS, 10% FS, 10% VFS, 20% silt/clay (evident as | | |
| | | | | very poorly sorted, clods); A (gravel) angular-to-subrounded clasts | | |
| | | | | composed of 80% basalt, 15% qtz-rich, 5% metam. | | |
| | | | | (sand) 20% basalt, 80% qtz-rich grains are angular- | | |
| | | | | to-subangular; overall color (wet) olive gray | | |
| | | | | (5Y 4/2) (dry) pale yellow (5Y 7/3); strong rxn. w/ | | |
| | | | | 10% HCl, mod. consolidated, decrease in ave. grain size. | | |
| | | | | | 0930 | Added 10' of 10" |
| | | | | | | casing Total 10" casing |
| 104'11½" | of 10" casing | | | | | = 94'11½" + 10' = 104'11½" |
| | | | | | | |
| | | | | | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000-021 (6-85)

8-B.2512

| DRILL LOG | By SP AIRHART | Rig CABLE TOOL #1 | Well Number 299-W18-23 | Computer Number NA | Project or Work Order No. KEH-1914 |
|---|---|---|---|---|---|
| | Date 6-1-87 | | Depth 113' To 120' | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 104' 11½" | 115-115' | H | Wet | GRAVELLY SILTY SAND : 15% gravel, 60% sand, | 1050 | Drilling rate: Fast ~ 10 ft / hr. |
| | | | | 25% silt ; overall → 5% MP, 5% FP, 5% VFP, 10% | | |
| | | | | VCS, 10% CS, 15% MS, 15% FS, 10% VFS, 25% silt, | | |
| | | | | poorly sorted, (gravel) angular-to-subrounded | | |
| | | | | clasts composed of 85% basalt, 15% qtz-rich, | | |
| | | | | some caliche chunks - as in previous sample (sand) | | |
| | | | | angular-to-subangular grains composed of 70% | | |
| | | | | qtz-rich, 30% basalt ; overall color (wet) olive | | |
| | | | | gray (5Y 4/2) (dry) light olive gray (5Y 6/2), poorly to- | | |
| | | | | mod. cons. ; slight decrease in ave. grain size; | | |
| | | | | strong rxn - w/ 10% HCl | | |
| | 119-120' | H | Wet | SLIGHTLY GRAVELLY SILTY SAND ; <5% gravel 60% sand | 1124 | Drilling rate ~10 ft/hr |
| | | | | 40% silt ; overall <5% VF-MP, 5% VCS, 10% CS, | | |
| | | | | 20% MS, 15% FS, 10% VFS, 40% silt - very thick mud (poorly sorted) | | |
| | | | | (sand) angular-to-subangular grains composed of | | |
| | | | | 75% qtz-rich, mica, 25% basalt ; overall color (wet) | | |
| | | | | olive (5Y 5/3) (dry) pale olive (5Y 6/3) ; strong rxn - w/ 10% HCl; | | |
| | | | | mod. consolidated ; | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-8000 021 (5-85)

8-B.2513

| DRILL LOG | By: SP AIRHART | Rig: CABLE TOOL #1 | Well Number: 299-W18-23 | Computer Number: NA | Project or Work Order No.: KEH-1914 |
|---|---|---|---|---|---|
| | Date: 6-1-87 | | Depth: 120' To 130' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | NOTE: Lined 95' thru 120' samples up to compare | | |
| | | | | color - slight color change between 105 and 110' | | |
| | | | | samples - color becomes lighter (more silt ?) | | |
| | 124-125' | H | wet | SLIGHTLY GRAVELLY SILTY SAND : <5% gravel, 60% sand | 1155 | drill rate: 10 ft/hr |
| | | | | 40% silt - <5% VFP-FP, 5% VFS, 5% CS, 15% MS, | | |
| | | | | 20% FS, 15% VFS, 40% silt, poorly sorted, (sand) | | |
| | | | | 20% basalt, 60% qtz, 15% melan, 5% mica, grains | | |
| | | | | are angular-to-subrounded; overall color (wet) | | |
| | | | | olive (5Y 4/3), (dry) pale yellow (5Y 7/4), mod.-to- | | |
| | | | | strong rxn w/ 10% HCl, mod. consolidated, | | |
| | | | | | 1330 | Added 20'7" of 10" |
| | | | | | | casing. Total casing |
| 125'6" of 10" casing | | | | | | = 104'11½" + 20'7" = 125'6" |
| | | | | continued fast drilling rate | | |
| | 129-130' | H | WET | SILTY SAND : 60% sand, 90% silt : 5% VCS, 5% CS, | 1505 | |
| | | | | 15% MS, 15% FS, 20% VFS, 40% silt, poorly sorted (sand) angular-to- | | |
| | | | | subrounded grains composed of 30% basalt, 50% qtz, 20% | | |
| | | | | melan & other (mica); overall color (wet) olive (5Y 5/3) | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2514

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| S P AIRHART | CABLE TOOL | 229-W18-23 | NA | KEH-1914 |
| **Date** | **#1** | **Depth** | | **Subcontract No.** |
| 6-1-87 | | 130 To 130' | | NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | (129-130 cont.) | | |
| | | | | (dry) light olive gray (5Y 6/2); strong. rxn w/ 10% HCl; | | |
| | | | | slightly-to-mod. consolidated. | | |
| | | | | Shut down | 1510 | |

S.P. Airhart
6-1-87

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2515

| DRILL LOG | By: SP AIRHART | Rig: CABLE TOOL | Well Number: 299-W18-23 | Computer Number: NA | Project or Work Order No.: KEH-1914 |
|---|---|---|---|---|---|
| | Date: 6-2-87 | #1 | Depth: 130 To 145' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | DRILLER ARRIVED | 0700 | |
| | 134-135' | H | Wet | SILTY SAND : 60% sand 40% silt - 5% ves, <5% VFP gravel | 0730 | DRILL RATE ~10 FT/hr. |
| | | | | 10% CS, 15% MS, 15% FS, 15% VFS, 40% silt (sand) grains | | |
| | | | | are angular-to-subrounded composed of 75% qtz-rich, mica | | |
| | | | | & metam, 25% basalt ; overall color (wet) olive | | |
| | | | | (5Y 4/3), (dry) pale yellow (5Y 7/3) ; mod. consolidated, | | |
| | | | | mod. rxn. w/ 10% HCl ; overall decrease in | | |
| | | | | ave grain size | | |
| | 139-140' | H | wet | SILTY SAND : 60% sand, 40% silt, <5% VFP gravel, | 0800 | |
| | | | | 5% VCS, 10% CS, 15% MS, 15% FS, 15% VFS, 40% silt (sand) | | |
| | | | | angular-to-subrounded composed of 75% qtz-rich, metam | | |
| | | | | mica, 25% basalt, overall color (wet) olive | | |
| | | | | (5Y 4/3), (dry) pale yellow (5Y 7/3) ; mod. consolidated; | | |
| | | | | mod. rxn. w/ 10% HCl ; same as previous sample | | |
| | 144-145' | H | Wet | SILTY SAND : <5% gravel, 60% sand, 40% silt, | 0835 | |
| | | | | <5% VFP, 5% VCS, 10% CS, 15% MS, 15% FS, 15% VFS | | |
| | | | | 40% silt, MS-PS (sand) angular-to-subrounded composed of | | |
| | | | | 85% qtz-rich, mica, 15% basalt, overall color | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2516

| DRILL LOG | By SP AIRHART | Rig CABLE TOOL | Well Number 299-W18-23 | Computer Number | Project or Work Order No. VEH-1914 |
|---|---|---|---|---|---|
| | Date 6-2-87 | #1 | Depth 145' To 150' | NA | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | (144-145' cont.) (wet) olive (5Y 4/4), (dry) light gray (2.5Y 7/2) | | |
| | | | | strong rxn w/ 10% HCl, mod. consolidated, | | |
| | | | | No A in ave. grain size, silt evident as | | |
| | | | | clumps. | | |
| | | | | | 0930 | Added 21' of 10" casing |
| | | | | | | Total 10" casing = |
| 146'6" of 10" casing | | | | | | 125'6" + 21' = 146'6" |
| | | | | cont. Fast drilling rate ~10 Ft./hr. | | |
| | 149-150' | H | Wet | SANDY SILT/CLAY : 45% sand, 55% silt/clay | 1130 | |
| | | | | - <5% VCS-CS, 10% MS, 20% FS, 15% VFS, 55% silt/ | | |
| | | | | clay (clay clumps, tan color evident in sample), mod. sorted. | | |
| | | | | (sand) 85% qtz-rich, mica 15% basalt, angular- to- | | |
| | | | | subangular grains (silt) appears to be mostly | | |
| | | | | small mica frags; overall color (wet) light olive | | |
| | | | | brown (2.5Y 5/4) (dry) light gray (2.5Y 7/2); | | |
| | | | | slightly consolidated; decrease in ave grain size. | | |
| | | | | Strong rxn. w/ 10% HCl. | | |
| | | | | | | |

REMARKS:

O - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2517

| DRILL LOG | By S P. AIRHART | Rig CABLE TOOL #1 | Well Number 299-W18-27 | Computer Number NA | Project or Work Order No. KEH-1914 |
|---|---|---|---|---|---|
| | Date 6-2-87 | | Depth 150' To 160' | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | 154-156' | H | Wet | SANDY SILT/CLAY: 65% silt/clay 35% sand | 11:50 | drill rate ~ 12 ft/hr. |
| | | | | - <5% VCS - CS, 5% MS, 10% FS, 20% VFS, 65% | | |
| | | | | silt/clay (clay evident as tan colored | | |
| | | | | clumps, very thick mud, lots of mud on | | |
| | | | | hard tool); mod. to well sorted; (sand) | | |
| | | | | 85% qtz-rich, metam., mica 15% basalt, angular-to- | | |
| | | | | subangular grains; overall color (wet) light | | |
| | | | | olive brown (2.5Y 5/4) (dry) light brownish gray | | |
| | | | | (2.5Y 6/2); strong rxn w/ 10% HCl; mod | | |
| | | | | consolidated | | |
| | 159-160' | H | Wet | SILT/CLAY w/ TRACE OF SAND - >95% silt/clay | 1230 | |
| | | | | <5% sand, VWS; overall color (wet) light | | |
| | | | | olive brown (2.5Y 5/4), (dry) light gray (2.5Y 7/2); | | |
| | | | | strong rxn w/ 10% HCl; mod. consolidation. | | |
| | | | | | | |
| | | | | NOTE: Drilling rate slowed down @ 161' - bailed | | |
| | | | | noticed some gravel and caliche' mixed in w/ | | |
| | | | | mud. | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF Very Fine ____ Standing Water

A 6000 021 (5-85)

8-B.2518

| DRILL LOG | By: S P AIRHART | Rig: CABLE TOOL | Well Number: 299-W18-23 | Computer Number: NA | Project or Work Order No.: KEH-1914 |
|---|---|---|---|---|---|
| | Date: 6-2-87 | #1 | Depth: 160' To 170' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | 164-165' | H | WET | SLIGHTLY GRAVELLY SILT/CLAY AND CALICHE : | 1305 | |
| | | | | 5% VFP-MP (50% qtz 50% basalt, highly fractured | | |
| | | | | 40% silt/clay 55% caliche ; VWS ; overall color | | |
| | | | | (wet) between pale olive (5Y 6/3) and olive (5Y | | |
| | | | | 5/3) NOTE : lighter color from previous sample, | | |
| | | | | (dry) pale yellow (5Y 7/3) ; very strong rxn. w/ 10% | | |
| | | | | HCl ; mod. consolidated ; Trace of VFS also evident. | | |
| | 169-170' | H | WET | SLIGHTLY GRAVELLY SILTY/CLAYEY SAND AND CALICHE : | 1325 | |
| | | | | 5% VFP-MP , 5% VCS, 5% CS, 25% MS, 20% FS, 10% VFS | | |
| | | 35% | | 35% silt/clay (caliche' evident as VFS-MP size pieces) | | |
| | | | | comp includes 35% caliche , 65% qtz-rich , metam. | | |
| | | | | mica , 5% basalt ; mod-to-poorly sorted ; overall | | |
| | | | | color (wet) pale olive (5Y 6/3) (dry) light gray (5Y 7/2); | | |
| | | | | very strong rxn. w/ 10% HCl ; mod. consolidated ; | | |
| | | | | NOTE: Increase in sand content. | | |
| | | | | Currently 26' of open hole | 1350 | |
| | | | | Driller went to transport 8" casing to hole, & | 1430 | |
| | | | | drive shoe - 13 21 ft sections and 1 8" drive shoe | | |

REMARKS:

All steam cleaned
Shut down

S.P. Airhart 6-2-87 1500

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2519

5½"

| DRILL LOG | By SP AIRHART | Rig CABLE TOOL #1 | Well Number 299-W18-23 | Computer Number NA | Project or Work Order No. KEH-1914 |
|---|---|---|---|---|---|
| | Date 6-3-87 | | Depth 170' To 170' | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | The following sections of 8" carbon steel | 0700- | 1500 |
| | | | | casing was added: | | |
| | | | two | 21'3" w/ drive shoe | | |
| | | | 1 3 4 | 20'10" | | |
| | | | 2½ | 21'3½" | | |
| | | | two 2½ | 20'10" | | |
| | | | | 20'11" | | |
| | | | | 20'3" | | |
| | | | | 20'10" | | |
| | | | | 21' | | |
| 167'2½" of 8" casing | | | | Total 8" casing = 167'2½" | | |
| | | | | | | |
| | | | | | | |
| | | | | SP. Airhart 6-5-87 | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2520

20'7'

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| SP AIRHART | CABLE TOOL | 299-W18-23 | NA | KEH-1914 |
| Date: 6-4-87 | #1 | Depth: 170' To 180' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Driller arrived – Had to get badged | 0805 | |
| | 174-175' | H | Wet | SILTY SAND w/ CALICHE – 80% sand, 20% silt; | 1000 | |
| | | | | <5% VFP-FP | | |
| | | | | 60% MS, 10% FS, 10% VFS, 20% silt; mod-to-well sorted; | | |
| | | | | (SAND) grains are angular-to-subrounded and are | | |
| | | | | composed of 85% qtz-rich, rock frags, and mica, | | |
| | | | | 15% basalt; overall color (wet) light olive | | |
| | | | | brown (2.5Y 5/4), (dry) light gray (2.5Y 7/2); | | |
| | | | | mod consolidated, very strong rxn w/ 10% HCl | | |
| | | | | (caliche is primarily ground up into sand size | | |
| | | | | frags, few FP pebble size frags.; hard chunks | | |
| | | | | of tan clay/silt evident | | |
| | 179-180' | H | Wet | SILTY SAND w/ SOME CALICHE – 80% sand 20% silt; | 1030 | |
| | | | | <5% VFP, FP | | |
| | | | | 40% VCS, 20% CS, 10% MS, 5% FS, 5% VFS, 20% silt; | | |
| | | | | mod. sorted; (SAND) angular-to-subangular | | |
| | | | | comp. of 40% basalt, 60% qtz-rich, metaw.; mica | | |
| | | | | ; overall color (wet) light olive brown (2.5Y 5/4) | | |
| | | | | (dry) light gray (2.5Y 7/2); mod. consolidated, | | |
| | | | | very strong rxn. w/ 10% HCl; NOTE the following | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2521

| DRILL LOG | By: SP AIRHART | Rig: CABLE TOOL | Well Number: 299-W18-23 | Computer Number: NA | Project or Work Order No.: KEH-1914 |
|---|---|---|---|---|---|
| | Date: 6-4-87 | #1 | Depth: 180' to 185' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | (cont 179'-180') | | |
| | | | | changes from previous sample: more basalt, | | |
| | | | | less caliche, coarser | | |
| | | | | | 1200 | Adding 20'7" of 8" casing = Total |
| | | | | | | casing = 167'2½" + 20'7" = |
| 187'9½" of 8" casing | | | | | | 187'9½" |
| | | | | ~ 1 ft of stickup on 10" casing ∴ 145'6" in | 1210 | |
| | | | | ground | | |
| | | | | | | |
| | | | | Driller noticed significant decrease in drill | | |
| | | | | rate @ ~ 181' | | |
| | | | | Resumed Drilling | 1235 | |
| | | | | Stopped Drilling - Cutting off excess build-up | 1250 | |
| | | | | on bit - bit is catching on rocks inside | | |
| | | | | casing | | |
| | | | | Resumed Drilling | 1315 | |
| | 184-185' | H | wet | SILTY SANDY GRAVEL - 35% gravel, 55% sand, 10% | 1450 | |
| | | | | silt - 10% MP, 10% FP, 15% VFP, 15% VCS, 20% CS, 10% | | |
| | | | | MS, 5% FS, 5% VFS 10% silt; poorly sorted; (GRAVEL) highly | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5 85)

8-B.2522

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| S P AIRHART | CABLE TOOL #1 | 299-W18-23 | NA | KEIL-1914 |
| Date: 6-4-87 | | Depth: 185' To 185' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | fractured, preserved clasts are subrounded-to-rounded, comp. includes 40% metam, 30% granitic, 30% metam (SAND) angular-to-subrounded comp of 60% qtz. rich 40% basalt; overall color (wet) olive gray (5Y 4/2) (dry) light gray (5Y 7/2); strong rxn. w/ 10% HCl; well consolidated; NOTE: Change in color; presence of gravel; increase in consolidation; Change occurred @ ~ 181'. | | |
| | | | | Shut Down | 15:00 | |

S.P. Airhart 6-4-87

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000-021 (5-85)

8-B.2523

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| SP AIRHART | CABLE TOOL | 299-W18-23 | NA | KEH-1914 |
| Date: 6-5-87 | #1 | Depth: 185' To 193' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Driller arrived | 0745 | |
| | | | | Began drilling | 0820 | |
| | | | | Very slow drilling ~ 1 ft/hr | 0930 | |
| | 189-190' | H | Wet | SANDY GRAVEL: 46% gravel, 55% sand, 5% silt = | 1310 | |
| | | | | 5% CP, 5% MP, 15% FP, 15% VFP, 20% VCS, 15% CS, 10% MS | | |
| | | | | 5% FS, 5% VFS, 5% SILT; Poorly sorted; (GRAVEL) highly | | |
| | | | | fractured - not very representative of insitu formation- | | |
| | | | | preserved clasts are subangular-to-rounded, comp. | | |
| | | | | includes 40% basalt, 30% gbrites & granite, 10% other | | |
| | | | | (SAND) angular-to-subrounded grains comp. of 40% | | |
| | | | | basalt, 60% qtz-rich; overall color olive grey | | |
| | | | | (5Y 4/2) (dry) light grey (5Y 7/2); strong rxn. w/ | | |
| | | | | 10% HCl; well consolidated; slight increase | | |
| | | | | in ave. size of gravel fraction. | | |
| | | | | Shut Down | 1500 | |
| | | | | | | Added 10' of 8" casing |
| | | | | SP Airhart 6-8-87 | | Total 8" casing = |
| 197'9½" of 8" casing | | | | | | 187'9½" + 10' = 197'9½" |

REMARKS:

Forgot to note: added 6-9-87 to drill logs

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2524

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| S.P. AIRHART | CABLE TOOL | 299-W18-23 | NA | PFH 1914 |
| Date: 6-8-87 | | Depth: 113' To 200' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Arrived @ well site | 0700 | |
| | | | | Began drilling | 0715 | |
| | | | | Weather: Overcast, raining lightly | 0730 | |
| | 191-195' | H | Wet | SANDY GRAVEL: Sample poorly | 1120 | Drilling Rate ~ 1 ft/hr. |
| | | | | represents insitu formation - highly crushed; 40% | 1130 | Resumed Drilling |
| | | | | gravel, 55% sand, 5% silt, 25% CP, 5% MP, 15% FP, | | |
| | | | | 20% VFP, 25% VCS, 15% CS, 10% MS, 5% FS, 5% VFS, | | |
| | | | | 5% silt; poorly sorted; (GRAVEL) fine recovered, unbroken | | |
| | | | | clasts are rounded, comp. includes 60% basalt, 25% | | |
| | | | | gneiss & metam., 15% granites (SAND) angular-to- | | |
| | | | | rounded (glt-gravel), comp. 70% glt-rich, 10% basalt; | | |
| | | | | color (wet) dark olive gray (5Y 3/2) (dry) olive gray | | |
| | | | | (5Y 5/2), slight rxn w/ 10% HCl; well consolidated; | | |
| | | | | NOTE: change in color (darker); less rxn w/ 10% | | |
| | | | | HCl. | | |
| | 199-200' | H | Wet | SANDY GRAVEL: (conglomerate) 45% gravel, 50% sand, | 1500 | SH / 3.5 hrs. |
| | | | | 5% silt; 15% MP, 10% FP, 20% VFP, 10% VCS, 10% CS, | | |
| | | | | 20% MS, 5% FS, 5% VFS, 5% silt, poorly sorted, | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2525

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| S P AIRHART | CABLE TOOL | 299-WIB-23 | | KEH - 1911 |
| **Date** 6-8-87 | #1 | **Depth** 200' To 200' | NA | **Subcontract No.** NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | (cont - 199 - 200) | | |
| | | | | (GRAVEL): clasts dominantly rounded, comp. | | |
| | | | | includes 70% granite, metam., other 30% basalt | | |
| | | | | (SAND) 70% basalt, 80% gtz-rich, mica - | | |
| | | | | grains are angular-to-subrounded; color | | |
| | | | | (wet) olive gray, 5Y 4/2 (dry) light olive gray, 5Y 6/2; | | |
| | | | | slight rxn w/ 10% HCl, well consolidated | | |
| | | | | NOTE: less basalt, slightly lighter color, | | |
| | | | | | | |
| | | | | Shut Down | 1505 | |
| | | | | S.P. Airhart | | |
| | | | | 6-8-87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000 021 (5-85)

8-B.2526

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| SP AIRHART | CABLE TOOL | 299-W18-23 | NA | RFH-1914 |
| **Date** | **Depth** | | | **Subcontract No.** |
| 6-9-87 | H 1 | 200' To 205' | | NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | DRILLER ARRIVED | 0715 | |
| | | | | Began Drilling | 0748 | |
| | 204-205' | H | wet | SANDY GRAVEL: 35% Gravel, 60% sand, 5% silt, | 1000 | Drill rate 5FT/3hrs 10 min. |
| | | | | 5% MP, 15% FP, 15% VFP, 5% VCS, 5% CS, 20% MS, | | |
| | | | | 20% FS, 10% VFS, poorly sorted, (GRAVEL) few | | |
| | | | | preserved clasts, otherwise subrounded-to-rounded, | | |
| | | | | comp includes 75% basalt, 75% granite, gltites, metam. | | |
| | | | | (SAND) mostly subrounded, 15% basalt, 85% glt-rich; | | |
| | | | | overall color olive gray 5Y 4/2, (dry) light olive | | |
| | | | | gray 5Y 6/2; very weak rxn w/ 10% HCl - only | | |
| | | | | a few sand size caliche grains react, matrix | | |
| | | | | doesn't react; well consolidated | | |
| | | | | NOTE: Decrease in gravel size | 1100 | Stopped Drilling |
| | | | | | | Added 10'10" of |
| | | | | | | 8" casing. Total |
| | | | | | | 8" casing = |
| 208'7½" of 8" casing | | | | | | 197'1½" + 10'10" = 208'7½" |
| | | | | | 1145 | Resumed Drilling |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2527

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| S.P. AIRHART | CABLE TOOL | 299-W16-23 | NA | EEM-191-1 |
| **Date** | **#1** | **Depth** | | **Subcontract No.** |
| 6-9-87 | | 205' To 210' | | NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | 209-210' | H | Wet | SANDY GRAVEL: 30% gravel 65% sand 5% silt | 1425 | Drilling rate ~ 5 ft/4 hrs. |
| | | | | : 5% MP, 15% FP, 10% VFP, 10% VCS, 10% CS, 25% MS, | | |
| | | | | 10% FS, 10% VFS, poorly sorted, (GRAVEL) highly | | |
| | | | | fractured, few if any preserved clasts - angular, | | |
| | | | | 30% basalt, 70% granite, metam., (sand) 30% basalt | | |
| | | | | 70% gl-lith, angular-to-subrounded; color | | |
| | | | | (wet) olive gray 5Y 4/2 (dry) light olive gray | | |
| | | | | 5Y 6/2; weak rxn. w/ 10% HCl; well consolidated. | | |
| | | | | Basically same as previous sample | | |
| | | | | | | |
| | | | | Shut Down | 1500 | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | SP Airhart 6-9-87 | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

**REMARKS:**

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000-021 (5-85)

8-B.2528

| DRILL LOG | By: SP AIRHART | Rig: CABLE TOOL | Well Number: 299-W18-23 | Computer Number: NA | Project or Work Order No.: RFH-1911 |
|---|---|---|---|---|---|
| | Date: 6-10-87 | #1 | Depth: 210' to 219' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | DRILLER ARRIVED | 0700 | |
| | 214-215' | H | Wet | SANDY GRAVEL : 35% gravel 60% sand 5% silt ; | 1015 | |
| | | | | overall : 5% MP, 15% FP, 15% VFP, 10% VCS, 15% CS, | | |
| | | | | 20% MS, 10% FS, 5% VFS, 5% SILT ; poorly sorted, | | |
| | | | | (GRAVEL) highly broken, angular-to-rounded clasts | | |
| | | | | composed of 30% basalt 70% glass-rich (predominantly | | |
| | | | | glasites) (SAND) angular-to-subrounded grains composed | | |
| | | | | of 25% basalt 75% glass-rich ; overall color (wet) | | |
| | | | | olive gray 5Y 4/2 (dry) pale yellow 5Y 7/4 ; | | |
| | | | | NO rxn w/ 10% HCl ; well consolidated | | |
| | | | | NOTE: NO rxn w/ 10% HCl | | |
| | | | | | 11:15 | Adding 11' of 8" casing |
| | | | | | | Total 8" casing = |
| 219' 7½" of 8" casing | | | | | | 208' 7½" + 11' = 219' 7½" |
| | | | | | | |
| | | | | Shut Down | 1500 | |
| | | | | | | |

REMARKS:

S.P Aulard
6-10-87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000-021 (5-85)

8-B-2529

8-B.2530

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| SP AIRHART | CABLE TOOL | 299-W18-23 | NA | KEH-1914 |
| Date: 6-11-87 | #1 | Depth: 219' To 220' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Driller arrived | 0700 | |
| | | | | Unable to drill open hole past 219' - adding casing | 0800 | |
| | | | | | 0830 | Added 10' of 8" casing |
| | | | | | | Total 8" casing |
| 229'7½" | OF 8" CASING | | | | | 219'7½" + 10' = 229'7½" |
| | 219-220 | H | Wet | SANDY GRAVEL : 35% gravel, 60% sand, 5% silt/clay | 0950 | Drill rate = 5 ft/hr |
| | | | | overall → 5% MP, 15% FP, 15% VFP, 15% VCS, 10% CS, | | |
| | | | | 20% MS, 10% FS, 5% VFS ; poorly sorted ; (GRAVEL) | | |
| | | | | highly crushed fragments are angular - preserved | | |
| | | | | clasts subrounded - to - rounded, composition 45% basalt | | |
| | | | | 65% qtzites, granites, other metam. (SAND) VCS-CS | | |
| | | | | appear to be rock fragments, angular - to- | | |
| | | | | subrounded, comp. 30% basalt, 70% qtz-vict ; | | |
| | | | | Overall color (wet) olive gray 5Y 4/2 (dry) light | | |
| | | | | olive gray 5Y 6/2 ; well consolidated ; no rxn | | |
| | | | | w/ 10% HCl - Generally same as prev. sample | | |
| | | | | | | |
| | | | | Cut off bottom of bit - too rounded | 1130 | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 0000 021 (5-85)

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| SP AIRHART | CABLE TOOL | 299-W18-23 | NA | KEH-1914 |
| Date: 6-11-87 | #1 | Depth: 220 To 229' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 229' 7½" | 224-225' | H | wet | SANDY GRAVEL: 50% gravel, 45% sand, 5% silt/clay; overall → 5% CP, 15% MP, 20% FP, 10% VFP, 15% VCS, 10% CS, 10% MS, 5% FS, 5% VFS, 5% silt/clay; poorly sorted (GRAVEL) a few MP's-VFP's preserved, subangular-to-subrounded composed of 30% basalt 70% qtzites, granite, red & green mudstones (SAND) angular-to-subrounded grains composed of 50% basalt 50% qtz-rich; overall color (wet) olive gray 5Y 4/2 (dry) light olive gray 5Y 6/2; NO rxn. w/ 10% HCl; well consolidated. | 1250 | |
| | | | | NOTE: increase in gravel fraction | | |
| | | | | NOTE: Slight increase in drill rate after 225' - may be due to bit modification or may be nearing $H_2O$-bearing zone | 1315 | |
| 229' 7½" | 229-230 | H | wet | SANDY GRAVEL: 35% gravel, 60% sand, 5% silt; overall 10% MP, 10% FP, 15% VFP, 15% VCS, 10% CS, 15% MS, 10% FS, 10% VFS, 5% silt; poorly sorted; (GRAVEL) highly crushed; predominantly angular; comp. includes | 1425 | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-8.2531

| DRILL LOG | By: S P AIRHART | Rig: CABLE TOOL #1 | Well Number: 299-W18-23 | Computer Number: NA | Project or Work Order No.: KEH-1914 |
|---|---|---|---|---|---|
| | Date: 6-11-87 | | Depth: 229' To 230' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | (CONTINUED) 25% basalt, 75% qtzite, granite, other | | |
| | | | | (SAND) angular-to-subrounded grains composed of | | |
| | | | | 25% basalt 75% qtz-rich, overall color olive gray | | |
| | | | | 5Y 4/2, (dry) light olive gray 5Y 6/1; No rxn w/ | | |
| | | | | 10% HCl; well consolidated. | | |
| | | | | | | |
| | | | | No plug in casing - bailed to clean out | | |
| | | | | hole D/W = 225.5' (E-tape # 12021) | 1500 | |
| | | | | | | |
| | | | | Shut Down | 1500 | |
| | | | | | | |
| | | | | S.P. Airhart | | |
| | | | | 6-12-87 | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C Coarse F Fine VF Very Fine ____Standing Water

A-6000-021 (5-85)

8-8.2532

8-B.2533

| DRILL LOG | By: SP AIRHART | Rig: CABLE TOOL #1 | Well Number: 299-W1B-23 | Computer Number: NA | Project or Work Order No.: KFH-1914 |
|---|---|---|---|---|---|
| | Date: 6-12-87 | | Depth: 230' To 235' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | D/W from ground surface = 224' | 0710 | |
| | | | | Compared to yesterdays measurement of 225.5' | | |
| | | | | it appears we're in $H_2O$. Plan to drill to | | |
| | | | | 255' assuming 224' is true static $H_2O$ level. | | |
| | | | | Driller arrived | 0710 | |
| 240'5½" | of 8" casing | | | | 0840 | Added 10'10" of 8" |
| | | | | | | casing. Total 8" |
| | | | | | | casing = 229'7½" + 10'10" |
| | | | | | | = 240'5½" |
| | 234-235' | H | Wet | SILTY GRAVELLY SAND: 25% gravel, 65% sand, 10% | 1115 | |
| | | | | silt/clay; overall → <5% CP, 10% MP, 10% FP, 5% VFP, | | |
| | | | | 5% VCS, 10% CS, 25% MS, 15% FS, 10% VFS, 10% silt/clay; | | |
| | | | | poorly sorted; (GRAVEL) highly crushed angular-to- | | |
| | | | | subrounded (~1% clasts are preserved), 30% basalt, | | |
| | | | | 70% qtzites, granite, metam. (SAND) angular-to-sub- | | |
| | | | | angular grains composed of 25% basalt, 75% qtz-rich, mica | | |
| | | | | overall color (wet) olive gray 5Y 4/2 (dry) light gray | | |
| | | | | 5Y 6/2; no rxn w/ 10% HCl; well consolidated | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000-021 (5-85)

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| SP AIRHART | CABLE TOOL | 299-W18-23 | NA | KEH-1914 |
| Date: 6-12-87 | #1 | Depth: 235' To 243' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 240'5½" | 239-240' | H | Wet | SILTY/CLAYEY SANDY GRAVEL : 35% gravel 55% sand, | 1245 | Drilling rate 3ft/hr |
| | | | | 10% silt/clay (evident as clumps) ; overall ~ <5% CP, | | |
| | | | | 5% MP, 15% FP, 15% VFP, 15% VCS, 15% CS, 10% MS, 10% FS, | | |
| | | | | 5% VFS, 10% silt/clay ; (GRAVEL) predominantly crushed, | | |
| | | | | preserved clasts are subrounded-to-rounded and | | |
| | | | | composed of 35% basalt 65% glass, granitic, | | |
| | | | | metam. (SAND) angular-to-subrounded grains composed | | |
| | | | | of 35% basalt, 65% glass ; overall color (wet) | | |
| | | | | olive gray 5Y 4/2 (dry) light olive gray 5Y 6/2 ; | | |
| | | | | No rxn w/ 10% HCl ; well consolidated | | |
| | | | | NOTE: Slight increase in drill rate - driller says | | |
| | | | | due to water | | |
| 250'5½" | of 8" | casing | | | 1320 | Added 10' of 8" casing |
| | | | | | | Total 8" casing = |
| | | | | | | 240'5½" + 10' = 250'5½" |
| | | | | No plug - bailed - will check D/W on Monday | | |
| | | | | Shut Down | 1505 | |

REMARKS:

SP. Airhart 6-12-87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000-021 (5-85)

8-B.2534

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| SP AIRHART | CABLE TOOL | 299-W18-23 | NA | KEH-1914 |
| Date: 6-15-87 | #1 | Depth: 243' To 245' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Driller arrived | 0715 | |
| | | | | D/W from ground surface = 224' | 0730 | |
| | 244-245 | H | Wet | SANDY GRAVEL ; 50% gravel, 45% sand, 5% silt | 0835 | |
| | | | | NOTE: lots of $H_2O$ in bailer - some of fines | | |
| | | | | washed out ; overall → sample highly crushed | | |
| | | | | fragments 15% MP, 20% FP, 15% VFP, 25% VCS, 10% | | |
| | | | | CS, 5% MS, 5% FS-VFS (GRAVEL) predominantly | | |
| | | | | fragments of angular clasts, few subrounded, | | |
| | | | | comp includes 30% basalt, 40% granite, qtz-lt, | | |
| | | | | 30% red, green metam. (SAND) angular-to-subrounded | | |
| | | | | grains composed of 30% basalt 70% qtz-rich ; | | |
| | | | | overall color (wet) olive gray 5Y 4/2 (d-y) | | |
| | | | | light olive gray 5Y 6/2 ; No rxn w/ 10% HCl ; | | |
| | | | | well consolidated : NOTE: Increase in gravel fraction | | |
| 260'5½" | of 8" | casing | | | 1045 | Added 10' of 8" |
| | | | | | | casing. Total 8" |
| | | | | | | casing = 250'5½" + 10' |
| | | | | | | = 260'5½" |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2535

| DRILL LOG | By SP AIRHART | Rig CABLE TOOL #1 | Well Number 299-W18-23 | Computer Number NA | Project or Work Order No. KEH-1911 |
|---|---|---|---|---|---|
| | Date 6-15-87 | | Depth 245' To 250' | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | 249-250' | H | wet | SILTY SANDY GRAVEL : 35% gravel, 55% sand, 10% silt overall -> 5% MP, 15% FP, 15% VFP, 10% VCS, 5% CS, 10% MS, 15% FS, 15% VFS, poorly sorted (GRAVEL) highly fractured (crushed) all clasts are angular, comp includes 10% basalt 90% granitic, gneiss, other metam. (SAND) angular-to-subrounded grains composed of 10% basalt 90% ghtz-rich, mica ; overall color (wet) olive gray 5Y 5/2 (dry) light gray 5Y 7/2 ; No rxn w/ 10% HCl well consolidated. NOTE: Driller drove casing ahead to 255' after 245' sample because he was expecting heaving sand. NOTE: Decrease in grain size (more sand & silt) Decrease in basalt content. | 1250 | Drill rate ~1.5 ft/hr. |
| | | | | see next page → | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2536

8-B.2537

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| SP AIRHART | CABLE TOOL | 299-W18-23 | NA | KEH - 1914 |
| Date: 6-15-87 | #1 | Depth: 250' To 255' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | 255' | H | WET | SILTY GRAVELLY SAND : 10% gravel, 75% sand, | 1355 | |
| | | | | 15% silt, overall -> 2% FP, 8% VFP, 25% VCS, | | |
| | | | | 20% CS, 15% MS, 10% FS, 5% VFS, 15% silt : (GRAVEL) poorly sorted | | |
| | | | | all angular, composed of 15% basalt 85% | | |
| | | | | qtzite, granite, other metam (SAND) predominantly | | |
| | | | | angular grains composed of 15% basalt 85% | | |
| | | | | qtz.-rich ; overall color (wet) olive gray 5Y5/2 | | |
| | | | | (dry) light gray 5Y 7/2 ; well consolidated ; | | |
| | | | | NO REN. w/ 10% HCl | | |
| | | | | NOTE: Significant decrease in gravel | | |
| | | | | Unable to get measurement w/ steel tape - | 1415 | |
| | | | | sticking to side of casing (wet from bailing) | | |
| | | | | Geophysical logger arrived (N. Meghan) - found D/B | 1430 | NOTE: 4'6" of stickup |
| | | | | @ 255' - performed natural γ, density, and | | on 8" casing |
| | | | | neutron tests. | | |
| | | | | Completed logging | 1615 | |

REMARKS:

Shut Down 1700

S.P. Airhart 6-15-87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

256.5 - 11 2nd 4' 260'

| DRILL LOG | By SP AIRHART | Rig CABLE TOOL | Well Number 299-W18-23 | Computer Number NA | Project or Work Order No. KEH-1914 |
|---|---|---|---|---|---|
| | Date 6-16-87 | #1 | Depth 255' To 255' | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | D/W from ground surface = 224' (tape # 12021) | 0725 | |
| | | | | Driller arrived | 0730 | |
| | | | | Performed straightness test: 20' of 6" casing | 0800 | |
| | | | | passed freely | | |
| | | | | | | |
| | | | | Measured total amount of 8" casing cut off | 1000 | |
| | | | | during course of drilling to be ~8" | | |
| | | | | Cut off 1'4" of 8" casing - now 3.1' of | 1030 | |
| | | | | stickup. 255'5" of 8" casing in ground. | | |
| | | | | Measured D/B from ground surface = 255.1' | 1045 | |
| | | | | (Steel Tape # 3 ; 500 ft) | | |
| | | | | Added 1.5 bags of 20 30 Colorado Silica Sand | 1130 | |
| | | | | to 250' | | |
| | | | | Pulled 8" casing to ~253' ; D/B = 251.5' | | |
| | | | | Added .5 bags of 20-30 Col. Sil. Sand | | |
| | | | | Pulled 8" casing to 248'2" D/B = 251' | 1300 | |
| | | | | Lowered 10'3" of 8" stainless steel telescoping | 1330 | |
| | | | | screen in hole D/B = 251' | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000-021 (5-85)

8-B.2538

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| SP AIRHART | CABLE TOOL | 299-W18-23 | NA | KEH-1410 |
| Date: 6-16-87 | #1 | Depth: 255' To 255' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Pulled 8" casing to 243' - top of telescoping | | |
| | | | | screen = 241' | | |
| | | | | | | |
| | | | | @ ~ 26 gal/min<br>Began bailing using 15' 4" dia. dart bailer | 14:58 | |
| | | | | D/W = 224' | | |
| | | | | stopped bailing after 10 min - no drawdown | 15:08 | |
| | | | | continued bailing for 45 min. - significant | 16:15 | 17:00 |
| | | | | amount of sand and silt still present. Will | | |
| | | | | continue bailing tomorrow. | | |
| | | | | Shut Down | 17:00 | |
| | | | | | | |
| | | | | SP Airhart<br>6-16-87 | | |
| | | | | | | |
| | | | | | | |
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| | | | | | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000 021 (5-85)

8-B.2539

| DRILL LOG | By: SP AIRHART | Rig: CABLE TOOL | Well Number: 299-W18-23 | Computer Number: NA | Project or Work Order No.: KEH-1914 |
|---|---|---|---|---|---|
| | Date: 6-17-87 | # 1 | Depth: 255' To 255' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Driller arrived | 0710 | |
| | | | | D/W From ground surface = 224' | 0785 | |
| | | | | D/B From ground surface = 251' | 0740 | |
| | | | | Resumed bailing w/ "1" dart bailer - | 0745 | |
| | | | | fine sand & silt still present in bailing $H_2O$. | | Total bailing |
| | | | | Checked bailing $H_2O$ - sufficient for pumping - | 1000 | time = 1.75 hrs |
| | | | | ~ 1 cup of fine sand & silt w/ each bail | | |
| | | | | Driller went to locate equipment to splice | 1005 | |
| | | | | wires to pump | | |
| | | | | Placed 5" 15 hp submersible pump w/ 3-inch | 1100 - | 1700 |
| | | | | riser pipe - intake of pump @ 245' below ground surface. | | |
| | | | | - pipe outlet 1.5' above ground surface | | |
| | | | | Shut Down | 1700 | |
| | | | | S.P. Airhart 6-17-87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine Standing Water

A 6000 021 (5-85)

8-B.2540

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| S.P. AIRHART | CABLE TOOL | 209-W18-23 | NA | KEH-1914 |
| Date: 6-18-87 | #1 | Depth: 255' To 255' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | DRILLER ARRIVED | 0930 | |
| | | | | ASSEMBLED DISCHARGE PIPE | | |
| | | | | PLACED 241' OF 3/4" TREMMIE PIPE DOWN HOLE | | |
| | | | | TO AID IN D/W MEASUREMENTS - (SOUNDING PIPE) | | |
| | | | | STARTED STEP-DRAWDOWN UNDER DIRECTION OF | 1310 | |
| | | | | CHUCK CLINE - PNL | | |
| | | | | STOPPED STEP DRAWDOWN | 1530 | |
| | | | | WILL PUMP @ 100 gals/min ~ 4' of drawdown | | |
| | | | | S.P. Airhart 6-18-87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (6-85)

8-B.2541

| DRILL LOG | By: S P AIRHART | Rig: CABLE TOOL | Well Number: 299-W18-23 | Computer Number: NA | Project or Work Order No.: KEH-1914 |
|---|---|---|---|---|---|
| | Date: 6-19-87 | #1 | Depth: NO DRILLING From To | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Bergen Constant - discharge test @ 108 gpm. | 0715 | |
| | | | | Test was stopped due to insufficient ramp over | 1015 | |
| | | | | discharge pipe - Hanford Patrol required shut down. | | |
| | | | | Measured recovery | 1015 - | 1515 |
| | | | | | | |
| | | | | See aquifer test data sheets for more information | | |
| | | | | | | |
| | | | | | | |
| | | | | S.P. Airhart 6-12-87 | | |
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REMARKS:

O - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2542

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| S P AIRHART | CABLE TOOL | Z99-W18-23 | NA | KEH-1914 |
| Date: 6-22-87 | #1 | Depth: NO DRILLING To | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Performed 8 hr. constant-discharge | | |
| | | | | aquifer test | | |
| | | | | Drawdown - 08:05 - 16:05 | | |
| | | | | Recovery - 16:05 - 17:05 | | |
| | | | | S.P. Airhart 6-22-87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2543

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| SP AIRHART | CABLE TOOL | 299-W18-23 | NA | KEH-1914 |
| Date: 6-23-87 | # 1 | Depth: NO DRILLING To | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Driller arrived | 0700 | |
| | | | | Taking tremmie pipe, riser pipe & pump | 0715 – | 0915 |
| | | | | out of hole. | | |
| | | | | D/B = 251' from ground surface | 0930 | |
| | | | | The following sections of 4" stainless steel | 1130 – | 1515 |
| | | | | screen and casing were added in given | | |
| | | | | order: | | |
| | | | | 20' 4" of 20-slot screen | | |
| | | | | 10' 4½" of 20-slot screen | | |
| | | | | 1 section of 20' casing w/ centralizer | | |
| | | | | 9 sections of 20' casing | | |
| | | | | 1 section of 10' casing, 1 section of 5' casing | | |
| | | | | NOTE: Driller welded a 2" x 1" stainless steel | | NOTE: A |
| | | | | plate @ each joint to ensure sections | | |
| | | | | don't unscrew. Used s.s welding rod. Will | | |
| | | | | add additional 10' of s.s casing once | | |
| | | | | pull-back of temporary casing is completed. | | |
| | | | | D/B inside s.s = 251' | 1520 | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2544

| DRILL LOG | By: S.P. AIRHART | Rig: CABLE TOOL #1 | Well Number: 299-W18-23 | Computer Number: NA | Project or Work Order No.: KEH-1914 |
|---|---|---|---|---|---|
| | Date: 6-23-87 | | Depth: NO DRILLING To | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | TOP of screen @ 220'4" | | |
| | | | | Added 4 100 lb. bags of 20-30 mesh | 1620 | |
| | | | | Colorado Silica sand to 231'. | | |
| | | | | | | |
| | | | | Shut Down | 1700 | |
| | | | | S.P. Airhart 6-23-87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2545

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| SP AIRHART | CABLE TOOL | 294-W18-2 | NA | KEH-1414 |
| Date: 6-24-87 | # 1 | Depth: NO DRILLING To | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Driller arrived | 0700 | |
| | | | | Welded pull-head on | 0700 - 0800 | |
| | | | | Began pulling | 0800 | |
| | | | | Pulled 8" casing to 238' D/B = 235' | 0820 | |
| | | | | Added 3 100 lb bags of 20-30 Col. Silica Sand | 0910 | |
| | | | | D/B = 222' | | |
| | | | | Welded pull-head on | 0920 | |
| | | | | Pulled 8" casing to 228' D/B = 228 | 0955 | |
| | | | | Added 4 bags of 20-30 Col. Silica Sand | 1025 | |
| | | | | D/B = 210.5' | | |
| | | | | Welded pull-head on | 1045 | |
| | | | | Pulled 8" casing to 217.5' D/B = 222.5' | 1120 | |
| | | | | Added 2 bags of 20-30 sand to 215' | 1150 | Top of sand @ 215.75' |
| | | | | Pulled 8" casing to 215.5' D/B = 215.75' (SAND) | 1210 | TOTAL 15 50 lb bags of 20-30 mesh Colorado silica sand used. |
| | | | | Added 4 5 gal buckets of Volclay Tablets | 1250 | |
| | | | | D/B = 208' | | |
| | | | | Pulled 8" casing to 206.5', D/B = 210' (TABLETS) | 1315 | Top of Volclay Tablets = 210' |
| | | | | Added 187 ft. of 1¼" tremie pipe | 1430 | TOTAL 4 5-gal. buckets of Volclay tablets used |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2546

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| S P AIRHART | CABLE TOOL | 299-W18-23 | NA | KEH-1914 |
| Date: 6-24-87 | # 1 | Depth: NO DRILLING To | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Mixed 6 50 lb bags of Volclay Grout + 6 bags | 1500 | |
| | | | | initiator w/ 150 gals. $H_2O$. Slurry density = | | |
| | | | | 9.3-9.4 lbs/gal. Slurry clumped on bottom of | | |
| | | | | mixing tank causing pipes to plug. More $H_2O$ | | |
| | | | | was added and ~ 1/2 bag of Volclay. | | |
| | | | | Approximately 150 gals. slurry pumped down hole. | | |
| | | | | Excess slurry was dumped & pipes were flushed | | |
| | | | | D/B = 168½' | 1545 | |
| | | | | 1½" tremie removed from hole | 1550 | |
| | | | | Pulled 8" casing to 189½' | 1615 | |
| | | | | D/B = 168' | 1630 | |
| | | | | Welded on pull-head | 1640 | |
| | | | | Shut Down | 1650 | |
| | | | | S.P. Airhart 6-24-87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2547

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| SP AIRHART | CABLE TOOL | 299-W18-23 | NA | KEH - 1914 |
| Date: 6-25-87 | #1 | Depth: NO DRILLING To | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | D/B ~ 140' | 1250 | |
| | | | | Pulled remaining 8" casing out of hole | 1355 | |
| | | | | D/B = 143' | 1400 | |
| | | | | Welded pull-head on | 1445 | |
| | | | | Pulled 10" casing to 193 - D/B = 144 | 1520 | |
| | | | | Pulled 10" casing to 134 1/2" | 1540 | |
| | | | | D/B ~ 147' | 1610 | |
| | | | | Set 126' of 1 1/2" tremie pipe | 1640 | |
| | | | | Shut Down | 1655 | |
| | | | | | | |
| | | | | S.P Airhart 6-25-87 | | |
| | | | | | | |
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| | | | | | | |

REMARKS:

D - Drive Barrel  H - Hard Tool  L - Large  M - Medium  S - Small  VC - Very Coarse  C - Coarse  F - Fine  VF - Very Fine  ____ Standing Water

A-6000-021 (5-85)

8-B.2548

| DRILL LOG | By: SP AIRHART | Rig: CABLE TOOL #1 | Well Number: 299-W18-23 | Computer Number: NA | Project or Work Order No.: KEH-10 NL |
|---|---|---|---|---|---|
| | Date: 6-25-87 | | Depth: 110 DRILLING To | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Driller arrived | 0710 | |
| | | | | Pulled 8" casing to 185' | 0730 | |
| | | | | Geologist had to go get badge picture taken. During | 0820- | 0840 |
| | | | | that time drillers placed 147' of 1½" tremie | | |
| | | | | down hole. Also mixed 8 50 lb bags of Volclay | | |
| | | | | grout and 8 bags initiator w/ 200 gals. $H_2O$. | | |
| | | | | Slurry density = 9.4 lbs/gal (measured by Dave | | |
| | | | | Garcia). Slurry was pumped down hole. | | |
| | | | | D/B = 130' | | |
| | | | | Welding pull-head on - Able to straight-line | 1015 | |
| | | | | Pulled 8" casing to 165' | 1045 | |
| | | | | D/B = 133' | 1115 | |
| | | | | Pulled 8" casing to 144' | 1123 | |
| | | | | Checked D/B = 121' - This measurement can't | 1143 | |
| | | | | be right - grout must be coming up w/ | | |
| | | | | pipe - will check after lunch. | | |
| | | | | Re-measured @ 131' - question accuracy of measurement | 1225 | |
| | | | | Pulled 8" casing to 125' | 1230 | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000-021 (5-85)

8-B.2549

| DRILL LOG | By SP AIRHART | Rig CABLE TOOL #1 | Well Number 299-W18-23 | Computer Number NA | Project or Work Order No. KEH-M14 |
|---|---|---|---|---|---|
| | Date 6-26-87 | | Depth NO DRILLING To | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Driller arrived | 0710 | |
| | | | | Mixed 6 bags of Volclay grout and 6 bags initiator w/ 150 gals. drilling $H_2O$ and pumped slurry down hole. Slurry density 9.3 - 9.4 lbs/gal. Actually only 125 gals. was pumped. 25 gals was retained in mixing tank because it contained clumps of unmixed grout. | 0850 | |
| | | | | D/B = 113' (based on mark on tremie pipe) | 1000 | |
| | | | | 119' (based on mark on steel tape) | | |
| | | | | Welded pull-head on | 1015 | |
| | | | | Pulled 10" casing to 123' | 1024 | |
| | | | | D/B = 122' | 1113 | |
| | | | | Place 84' of 1½" tremie pipe in hole | 1253 | |
| | | | | Mixed 8 bags Volclay grout and 8 bags initiator w/ 200 gals $H_2O$ and pumped slurry down tremie. | 1320 | |
| | | | | D/B = 77' (based on mark on tremie pipe) | 1335 | |

REMARKS:

D Drive Barrel H Hard Tool L Large M Medium S Small VC Very Coarse C Coarse F Fine VF Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2550

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| SP AIRHART | CABLE TOOL | 299-W18-23 | NA | KEH-1914 |
| Date: 6-26-87 | #1 | Depth: NO DRILLING To | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Pulled 10" casing to 113' | 1415 | |
| | | | | D/B = 85' (steel tape) | 1425 | |
| | | | | Welding pull-head on | 1430 | |
| | | | | Pulled 10" casing to 103' | 1510 | |
| | | | | Welded pull-head on | 1600 | |
| | | | | Shut Down for drillers meeting | 1600 | |
| | | | | S.P. Airhart 6-26-87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5/85)

8-B-2551

| DRILL LOG | By SP AIRHART | Rig CABLE TOOL | Well Number 29-W18-23 | Computer Number | Project or Work Order No. KEH-1914 |
|---|---|---|---|---|---|
| | Date 6-29-87 | #1 | Depth NO DRILLING To | NA | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Driller arrived | 0700 | |
| | | | | pulled 10" casing to 93' | 0800 | |
| | | | | D/B = 90' | | |
| | | | | placed 48' of 1¼" tremie pipe | 0830 | |
| | | | | mixed 6 bags of Volclay grout and 6 bags | 0840 | |
| | | | | initiator w/ 150 gallons $H_2O$. Slurry density | | |
| | | | | 9.3 lbs/gal. Slurry pumped down hole | | |
| | | | | D/B = 63' | 0900 | |
| | | | | Welded on pull-head | 0930 | |
| | | | | Pulled 10" casing to 82' | 0945 | |
| | | | | D/B = 65' | 1000 | |
| | | | | Welded on pull-head | 1030 | |
| | | | | Pulled 10" casing to 72½' | 1045 | |
| | | | | D/B ~ 70' | 1055 | |
| | | | | Mixed 4 bags of Volclay grout and 4 bags | 1115 | |
| | | | | initiator w/ 100 gallons $H_2O$. Slurry density | | |
| | | | | 9.3-9.4 lbs/gal. Slurry pumped down hole. | | |
| | | | | D/B = 40' | 1130 | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2552

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| S.P. AIRHART | CABLE TOOL | 299-W18-23 | NA | WEH-1914 |
| Date: 6-29-87 | #1 | Depth: NO DRILLING To | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Welded pull-head on | 1145 | |
| | | | | Pulled 10" casing to 61' | 1230 | |
| | | | | Pulled remaining 10" casing out of hole | 1315 | |
| | | | | D/B = 51' | 1425 | |
| | | | | Driller constructing 12" pull-head | 1425 - 1500 | |
| | | | | S.P. Airhart 6-29-87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000-021 (5-85)

8-B.2553

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| S.P. AIRHART | CABLE TOOL | 299-W18-23 | NA | KEH-1914 |
| Date: 6-30-87 | #1 | Depth: NO DRILLING To | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | DRILLER ARRIVED | 0700 | |
| | | | | CONSTRUCTING 12" PULL-HEAD | 0820 | |
| | | | | Started pulling 12" casing | 0930 | |
| | | | | Pulled 12" casing to 51.5' | 0950 | |
| | | | | D/B = 53' | 1030 | |
| | | | | Placed 21' of 1¼" tremie in hole | 1035 | |
| | | | | Mixed 8 bags of Volclay grout and 8 bags initiator | 1115 | |
| | | | | w/ 200 gals. $H_2O$. Slurry density = 9.4 lbs/gal. | | |
| | | | | pumped slurry down hole. | | |
| | | | | D/B = 11.5 | 1120 | |
| | | | | Welded on 12" pull-head | 1135 | |
| | | | | Pulled 12" casing to 40.5' | 1215 | |
| | | | | D/B = 17' | 1245 | |
| | | | | Welded on 12" pull-head | 1310 | |
| | | | | Pulled 12" casing to 29.5' | 1345 | |
| | | | | D/B = 22' | 1400 | |
| | | | | Welded on 12" pull. head | 1415 | |
| | | | | | | |

REMARKS:

S.P. Airhart
6-30-87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000 021 (5-85)

8-B.2554

8-B.2555

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| S P AIRHART | CABLE TOOL | 299-W18-23 | NA | KEH-1914 |
| Date: 7-1-87 | #1 | Depth: NO DRILLING To | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Checked D/B = 23' | 0800 | |
| | | | | Mixed 2.5 bags volclay grout and 3 bags initiator | 1050 | |
| | | | | w/ ~ 60 gallons $H_2O$. Slurry density = 9.3-9.4 lbs/gal. | | |
| | | | | Pumped slurry down hole. | | |
| | | | | D/B = 10' | 1035 | |
| | | | | Pulled 12" casing to 19' | 1100 | |
| | | | | D/B = 15' | 1110 | |
| | | | | Pulled 12" casing to 13' | 1140 | |
| | | | | Placed final 10' section of 4" stainless steel | 1240 | |
| | | | | casing | | |
| | | | | Mixed 3 bags Volclay grout and 3 bags initiator | 1255 | |
| | | | | w/ 75 gallons $H_2O$. Slurry density = 9.4 lbs/gal. | | |
| | | | | Pumped slurry down hole | | |
| | | | | D/B = 0' ground surface | | |
| | | | | Pulled remaining 12" casing out of hole | 1300 | |
| | | | | Depth to grout = 3' w/ ~ ½' of sediment | 1305 | |
| | | | | caved on top. | | |
| | | | | Mixed 5 bags pre-mix concrete + 1 bag cement. | 1400 | |

REMARKS:

Poured surface seal in remaining annulus

Shut Down 1500

SA Ahrhart 7/1/87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000-021 (5 85)

8-B.2556

| DRILL LOG | By: S.P. AIRHART | Rig: CABLE TOOL #1 | Well Number: 299-W18-23 | Computer Number: NA. | Project or Work Order No.: RFI-1914 |
|---|---|---|---|---|---|
| | Date: 7-7-87 | | Depth: NO DRILLING To | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Driller tore down rig and moved off hole | 0730 - | 1030 |
| | | | | Dug post holes & set 4 guard posts around the hole. Did not cement posts in ground (!) | 1430 - | 1600 |
| | | | | S.P. Airhart 7-7-87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C Coarse F Fine VF Very Fine . Standing Water

A 6000 021 (5 85)

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| S.P AIRHART | NO RIG | 299-W18-23 | NA | RE11-1914 |
| Date: 7-8-87 | | Depth: NO DRILLING To | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Mixed 9 bags of pre-mix concrete & ~ 1/2 bag Type I & II Portland cement for concrete pad. Set brass marker | 0900- | 1100 |
| | | | | Note: Yesterday 7-7-87 driller cut off ~ 2' of 4" stainless steel casing to meet stick-up limit outlined in Specs. | | |
| | | | | Currently 2.1' of stick-up above concrete pad | 12:30 | |
| | | | | Painted primer coat on guard posts | 1600-1630 | |
| | | | | S.P Airhart 7-8-87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5 85)

8-B.2557

David Dawa

| DRILL LOG | By: DAVID | Rig: | Well Number: W 295-15-18 - W 229-18-23 | Computer Number: PNL | Project or Work Order No.: RHO |
|---|---|---|---|---|---|
| | Date: 5-18-87 | | Depth: To | | Subcontract No.: KEH 1914-1 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time. HRS. | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Work on rigs get ready to move too 200 west steam clean, ect. moved yellow rig to well site W 295 - 15-18, W 295 - 18-23 moved red rig, also moved pump rig and drive shoes | | |
| | | | | -3P Airbank | | |
| | | | | | | Total 9 hrs. |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Wate.

A-6000-021 (5-85)

8-B.2558

David Davis

**DRILL LOG**

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| DAVID | | W299-18-23 | PNL | RHO |
| Date: 5-19-87 | | Depth: To | | Subcontract No.: KEH 1914-1 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | ~~Time~~ 1750 | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Loaded truck with tools, water | | |
| | | | | TANK, haul Too 200 WEst Also | | |
| | | | | pick up drive shoe 12"-20" at | | |
| | | | | machine shoe moved propane tanks | | |
| | | | | to well sites set red rig up on | | |
| | | | | well site W299-18-23, went | | |
| | | | | And help toomoved rig to well # | | |
| | | | | W299 15-18, Haul move drive | | |
| | | | | shoes in to yard | | |
| | | | | SP Aubert | | |
| | | | | | | Total 9 hrs |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000-021

8-8-2559

David Davies

| DRILL LOG | By David | Rig | Well Number W295-18-23 | Computer Number PNL | Project or Work Order No. RHO |
|---|---|---|---|---|---|
| | Date 5-20-87 | | Depth To | | Subcontract No. KEH 1914-1 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Tions | Drilling Comments |
|---|---|---|---|---|---|---|
| 14'5" | 13 | D | D | 0-5' silt f. sand | 3 | 13' |
| | | | | 10-13' V.C. sand | 8 | 14'5" |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | Haul surface casing drill down was not 14" and 12" and shoe would not go inside pull out welded 12" shoe on 14' of 12" casing drilled down to 13' | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | Total this. |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine Standing Water

A-6000-021 (5-85)

8-B.2560

25-BIC-005

David Davis

# DRILL LOG

By: David
Date: 5-21-87
Rig:
Well Number: 29SW-18-23
Depth: 13' To 40
Computer Number: PNL
Project or Work Order No.: RHO
Subcontract No.: KEH 1014-1

| | Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|---|
| Start | 14'5" | | D | D | 13' to 16' ~~5/ft~~ F. sand to C. sand | 3 | 27' |
| Add | 7 | | D | D | 16' to 25' 5/ft C. sand. | 8 | 28' |
| Add | 10 | | D | D | 25' to 40 C. sand | | |
| Add | 10'10½" | | | | | | |
| Total | 42'3" | | | | | | |
| | | | | | Drilled from 13' to 40' | | |
| | | | | | welded 7' 10 and 10'6" of | | |
| | | | | | 12" casing | | |
| | | | | | SP Aiken 5-22-87 | | |
| | | | | | | | Total 8hrs 30 |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2561

# DRILL LOG

By: David Davis
Rig:
Date: 5-22-87
Well Number: 29SW-18-23
Depth: 40' To 62'
Computer Number: PNL
Project or Work Order No.: KHO
Subcontract No.: KEH 1914

| | Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time (MIN) | Drilling Comments |
|---|---|---|---|---|---|---|---|
| start | 42'1⅓" | | D | D | 40 to 60' f. to C. sands, Layer | 3 | 22' |
| Add | 10'7½" | | | | of silt | 8 | 21' |
| Add | 10'3" | | D | D | 60'to 62' saturated very dry | | |
| Total | 63'1½" | | | | with f. sand | | |
| | | | | | Drilled from 40' to 62' | | |
| | | | | | welded 10'7½" and 10'3" | | |
| | | | | | SP Airhart 5-26-87 | | Total 8 hrs. |

REMARKS:

D - Drive Barrel  H - Hard Tool  L - Large  M - Medium  S - Small  VC - Very Coarse  C - Coarse  F - Fine  VF - Very Fine  ____ Standing Water

A 6000 021 (5 85)

8-B.2562

David Duncan

**DRILL LOG** 10"

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| David | | 299 W 18-23 | PNL | RHO |
| Date: 5-26-87 | | Depth: 62 To 63' | | Subcontract No.: ~~RE~~ H 1914-1 |

| | Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | ~~Time~~ HEM | Drilling Comments |
|---|---|---|---|---|---|---|---|
| Add | 20'3" | | | | Pick up shoes at pasco and | 9 | 63' |
| Add | 20'10" | | | | pitman Arm haul to yard | | |
| Add | 20'10 | | | | moved drive shoes to 200 WEST | | |
| Total | 63' | | | | Help Russ cut and redo rope socket | | |
| | | | | | welded 10" shoe on 21' Length of | | |
| | | | | | 10" casing welded 21' & 21' | | |
| | | | | | A total of 63' also steam clean | | |
| | | | | | drive shoe | | |
| | | | | | SP Ainhart 5-28-87 | | |
| | | | | | | | Total 8hrs |

REMARKS:

D - Drive Head H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5 86)

8-B.2563

David Davies

| DRILL LOG | By David | Rig | Well Number 299W 18-23 | Computer Number PNL | Project or Work Order No. RHO |
|---|---|---|---|---|---|
| | Date 5-27-87 | | Depth 62' To 72' | | Subcontract No. KEH 1914-1 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | ~~Time~~ | Drilling Comments |
|---|---|---|---|---|---|---|
| Start 63' | 62' | D | D | From 62' to 72' c. gravel f. SAND | 4 | 10 |
| add 10'7" | | | | | 9 | 10'7" |
| Total 73'7" | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | Stop and pick temporary badge | | |
| | | | | Stop and help me broke down ("truck") | | |
| | | | | went and welded 10'7" of 10" CASING | | |
| | | | | drill from 62' to 72' big and small | | |
| | | | | gravel very to drive CASING in or | | |
| | | | | drill out front | | |
| | | | | | | |
| | | | | SP Hubert 5-28-87 | | Total 8hrs |
| | | | | | | |
| | | | | | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-8-2564

David Dacia

**DRILL LOG** 10" CASING

By: David | Rig: | Date: 5-28-87

Well Number: 299-W18-23 | Depth: 72 To 85

Computer Number: PNL

Project or Work Order No.: RHO

Subcontract No.: KEH 1914-1

| | Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | ~~Time~~ | ~~Drilling Comments~~ |
|---|---|---|---|---|---|---|---|
| start | 73'6" | 72 | D | D | FrDm 72' to 85' VC gravels & SAND | 4 | 13' |
| Add | 10'5" | | | | CEMENT | 9 | 10'05" |
| Total | 84' | 85' | | | | | |
| | | | | | Drill from 72' to 85 welded 10'6" of 10" CASING and drilled down | | |
| | | | | | Stuart P. Aitwell 5-29-87 | | |
| | | | | | | | Total 8hrs. |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2565

Dario Garcia

**DRILL LOG** 10" casing

By: David | Rig: | Date: 5-29-87

Well Number: 29GW18-23 | Depth: 85' To 109

Computer Number: PNL

Project or Work Order No.: RHO

Subcontract No.: AEH 1914-1

| | Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time Item | Drilling Comments |
|---|---|---|---|---|---|---|---|
| start | 84' | | H | W | From 85' to 92' VC. gravels cement & sand | 4 | 24' |
| add | 11 | | H | W | 92 to gravels c-f sand | 9 | 11' |
| Total | 95' | | | | Not As compacted | | |
| | | | | | Drill from 85' to 109' VC gravel to f sand | | |
| | | | | | welded 11' of 10" casing drilled down | | |
| | | | | | | | Total 8 hrs |

REMARKS:

SP Aiken 5-29-87

8-8-2566

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

David Davis

| DRILL LOG | By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|---|
| 10" CASING | DAVID | | 299-W18-23 | PNL | RHO |
| | Date 6-1-87 | | Depth 109 To 130 | | Subcontract No. KEH 1914-1 |

| | Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time Items | Drilling Comments |
|---|---|---|---|---|---|---|---|
| Start | 95' | 94 | H | W | From 109 to 125' F. SAND LAYERS OF SILT | 4 | 21' |
| Add | 10' | | | | WITH SOME S. GRAVELS | 9 | 30' 7" |
| Add | 20'7" | | | | 125 TO 130' SILT AND F. SAND | | |
| Total | 125'7" | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | WENT TO GET LOADED OF WATER FILL UP WATER AND HAUL WATER TRUCK TO LAY DOWN YARD THEN | | |
| | | | | | DRILL FROM 109' TO 130' WELDED 10', 20'7" OF 10" CASING WENT TO GET PIPE CUTTER | | |
| | | | | | ALSO WENT TO GET WATER TRUCK HAUL MORE WATER | | Total 9 |
| | | | | | PICK THINGS NEEDED ON JOB SITE THEN | | |

REMARKS:

D. A. V. 6/1/87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B-2567

David Davis

# DRILL LOG

10" CASING

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| DAVID | | 299-W18-23 | PNL | RHO |
| Date: 6-2-87 | | Depth: 170' To 130' | | Subcontract No.: KEH 1914-1 |

| | Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time Hr. | Drilling Comments |
|---|---|---|---|---|---|---|---|
| start | 125' | | H | W | From 130' to 150' f. sand with layer | 4 | 40 |
| add | 21' | | | | of silt | | |
| Total | 146' | | H | W | 150 to 161' silt and some f. sand | 9 | 21' |
| | | | H | W | 161 to 170 caliche and f. sand | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | Drilled from 130' to 170' welded | | |
| | | | | | 21' of 10" casing, haul water | | |
| | | | | | haul steam cleaner to KEH yard | | |
| | | | | | and water and steam clean casing | | |
| | | | | | and drive shoe, haul 2 load of 8" casing | | |
| | | | | | or 13' lengths | | |
| | | | | | | | Total 8 hrs |
| | | | | | | | |
| | | | | | | | |

SP Ashworth 6-4-87

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5 85)

8-8-2568

David David

DRILL LOG

8" CASING

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| David | | 299-W18-23 | PNL | RHO |
| Date | | Depth | | Subcontract No. |
| 6-3-87 | | 170 To 170' | | KEH 1914-1 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time ~~Feet~~ | Drilling Comments |
|---|---|---|---|---|---|---|
| 21'3" | | | | | 10 | 167' |
| 20'10" | | | | | | |
| 21'3" | | | | | | |
| 20'10" | | | | | | |
| 20'11" | | | | | | |
| 20'3" | | | | | | |
| 20'10" | | | | Take 10" bit and sub off tools | | |
| 21'. | | | | weld shoe on 8" casing | | |
| Total 167'2" | | | | run 8" liner in well 167' | | |
| | | | | didn't finished welding last | | |
| | | | | joint | | |
| | | | | S.P. Arnhart 6-4-87 | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| - | | | | | | Total 8hrs. |
| | | | | | | |
| | | | | | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B-2569

David Davis

DRILL LOG
8" CASING

By: DAVID
Date: 6-4-87
Rig:
Well Number: 29-W18-23
Depth: 170' To 185'
Computer Number: PNL
Project or Work Order No.: RHO
Subcontract No.: KEH 1914-1

| | Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Celiche, Etc. | Time ITEM | Drilling Comments |
|---|---|---|---|---|---|---|---|
| start | 167 2½" | 166 | H | W | 170' – 175' CALICHE f. SAND | 5 | 15' |
| Add | 20' 7½" | | H | W | 175' – 180 f. SAND AND COARSE SAND | 10 | 20' 7½" |
| Total | 187 10" | | H | W | 180' – 185 RINGOLD | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | Stop to get new BADGE | | |
| | | | | | Finish welded last joint, MAKE | | |
| | | | | | drill bit and started drill AGAIN | | |
| | | | | | From 170' to 185' welded 20' 7½" | | |
| | | | | | OF 8" CASING | | |
| | | | | | | | |
| | | | | | SP Mulant | | |
| | | | | | 6-5-87 | | |
| | | | | | | | Total 8 Hrs. |
| | | | | | | | |
| | | | | | | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S Small VC Very Coarse C Coarse F Fine VF Very Fine ____ Standing Water

A 6000 021 (5-85)

8-8-2570

David Dascie

# DRILL LOG

8 CASING

By: David
Date: 6-5-87
Rig:
Well Number: 299W18-23
Depth: 185' To
Computer Number: PNL
Project or Work Order No.: RHO
Subcontract No.: KEH 1914-1

| | Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time Item | Drilling Comments |
|---|---|---|---|---|---|---|---|
| start | 187'10" | | H | W | 185' to Ringold | 5 | |
| Add | 10 | | | | | 10 | 10' |
| Total | 197'10" | | | | | | |
| | | | | | Haul water fill up barrels move | | |
| | | | | | Green from Layed down yard to well site | | |
| | | | | | Drill from 185' to very hard | | |
| | | | | | drilling. Well 10' of 8" casing | | |
| | | | | | SP Ambrose 6-5-87 | | |
| | | | | | | | Total 8hrs. |

REMARKS:

D - Drive Barrel | H - Hard Tool | L - Large | M - Medium | S - Small | VC - Very Coarse | C - Coarse | F - Fine | VF - Very Fine | ___ Standing Water

A-6000-021 (5-85)

8-B.2571

Ft Union Davies

**DRILL LOG** 8" CASING

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| DAVID | | 29S 018-23 | PNL | RHO |
| **Date** 6-8-87 | | **Depth** 192' To 200' | | Subcontract No. KEH 1914-T |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time-Min. | Drilling Comments |
|---|---|---|---|---|---|---|
| 197'10" | 192' | 11 | W | 192' to 200' Ringold | 5 | 8' |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | Drilled from 192' to 200' Ringold | | |
| | | | | vc. cement grad f sand | | |
| | | | | | | |
| | | | | S.P. Dinkart | | |
| | | | | 6-9-87 | | |
| | | | | | | |
| | | | | | | |
| | | | | | | Total 8hrs |
| | | | | | | |

REMARKS:

D - Drive Barrel  H - Hard Tool  L - Large  M - Medium  S - Small  VC - Very Coarse  C - Coarse  F - Fine  VF - Very Fine  ___ Standing Water

A 6000 021 (5 85)

8-8.2572

Land Water

**DRILL LOG** 8" Casing

By: David | Date: 6-9-87 | Rig: | Well Number: 99W 18-23 | Depth: 200' To 210' | Computer Number: PNL | Project or Work Order No.: RHO | Subcontract No.: TA #1990-1

| | Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time (Hrs) | Drilling Comments |
|---|---|---|---|---|---|---|---|
| start | | | H | W | 200' to 210' Alluvial f. sand & gravels | .5 | 10' |
| Add | 10'10" | | | | | 10 | 11' |
| Total | 108'8" | | | | | | |
| | | | | | Drilled from 200' to 210' welded 10'10" of 8" casing Haul water | | Total 8 hrs. |

REMARKS:

SP Aulenbach 4-10-87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000 021 (5-85)

-8-8.2573-

David Davis

# DRILL LOG

By David | Rig | Well Number 299-W 18-23 | Computer Number PNL | Project or Work Order No. KHO

Date 6-10-87 | Depth 210' To 219' | Subcontract No. KEH 1914-1

| | Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time ~~Item~~ | Drilling Comments |
|---|---|---|---|---|---|---|---|
| start | 208'8" | | H | W | 210-219 Ringold f. SAND AND GRAVEL | 5 | 9' |
| Add | 11' | | | | | 10 | 11' |
| TOTAL | 1198' | [redacted]' | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | Drill from 210' to 219 Ringold welded | | |
| | | | | | 11' of 8" CASING | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | Total 8 hrs. |
| | | | | | | | |
| | | | | | | | |

REMARKS:

SP Hubert
6-11-87

D - Drive Barrel | H - Hard Tool | L - Large | M - Medium | S - Small | VC - Very Coarse | C - Coarse | F - Fine | VF - Very Fine | ____ Standing Water

A-6000-02 (5-85)

8-B-2574

# DRILL LOG

8" Casing

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| David | | 299-W18-23 | PNL | RHO |
| Date: 6-11-87 | | Depth: 219' To 230' | | Subcontract No.: KEH 1914-1 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time Min | Drilling Comments |
|---|---|---|---|---|---|---|
| start 219'8 | | H | W | 219' to 230' Ringold Lsand and gravel | 5 | 11' |
| Add 10' | | | | | 10 | 10' |
| Total 229'8" | | | | | | |
| | | | | Drilled from 219' to 230' Hit water bearing formation about 224' water static welded 10' of 8" casing | | |
| | | | | Sp. Anbart 6-12-87 | | Total Shrs, |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B-2575

David Davis

# DRILL LOG

8" CASING

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| David | | 299 W 18-23 | PNL | RHO |
| Date: 6-12-87 | | Depth: 230 To 243' | | Subcontract No.: KEH 1914-1 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time (Hrs) | Drilling Comments |
|---|---|---|---|---|---|---|
| start 229' 8" | | H | W | 230' to 243' F. SAND AND GRAVELS | 5 | 13' |
| add 10' 10" | | | | | 10 | 21' |
| Add 10 | | | | | | |
| [illegible] | | | | | | |
| 250' 6" | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | Drilled from 230' to 243' welded | | |
| | | | | 10' 10" AND 10' of 8" CASING | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | Total 8hrs. |
| | | | | | | |

REMARKS:

SP Nichols
6-16-87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5 85)

8-B-2576

David Duncan

| DRILL LOG | By David | Rig | Well Number 299-W18-25 | Computer Number | Project or Work Order No. AHO |
|---|---|---|---|---|---|
| 8 casing | Date 6-15-87 | | Depth 243 To 255' | PAIL | Subcontract No. KEH 1910-1 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time Hrs | Drilling Comments |
|---|---|---|---|---|---|---|
| 250' 8" | | H | W | 243' to 255' C-L sand gravels | 5 | 12' |
| add 10' | | | | | 10" | 10' |
| Total 260' | | | | | ~~3~~ | |
| | | | | | 31 | 2 hrs. |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | Drilled from 243' to 255' | | |
| | | | | welded 16' of 8" casing | | |
| | | | | prepare for running screens | | |
| | | | | test pump other than needed | | |
| | | | | to complete well | | |
| | | | | | | 10 hrs. |
| | | | | SP Nuland | | |
| | | | | 6-16-87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B-2577

David Duran

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| DAVID | | 299-W18-23 | PNL | RHO |
| **Date** 6-16-87 | | **Depth** 255 To 250' | | Subcontract No. KEH 1914-1 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | ~~Time~~ | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | | 15 | 12' |
| | | | | | 16 | 10' |
| | | | | | 20 | 2 SACKS |
| | | | | | | CAL. |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | RE do rope socket CHANGE STEM | | |
| | | | | too pull STEM cut plug plate AND | | |
| | | | | WELDED too 8" CASING to pull 8" BACK out | | |
| | | | | BACK fill USE 2 SACKS of silica SAND | | |
| | | | | BACK fill FROM 255' to 251' SET 10' OF | | |
| | | | | 8" Telescoping 55 SCREEN 30 slot | | |
| | | | | pull 8" Casing BACK out AND went | | |
| | | | | to get tool to bail AND bail for the | | |
| | | | | | | |
| | | | | | | 10 |
| | | | | | | Total 90 hrs. |
| | | | | | | |

REMARKS:

SP Allen 6-16-87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-8-2578

David Davies

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| David | | 299-W18-23 | PNL | K.H.O |
| Date: 6-17-87 | | Depth: 251' To 251' | | Subcontract No.: TEH 1914-1 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time Hours | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | | 28 | 9 hrs 3 hrs. |
| | | | | | 2½ | 6 hrs |
| | | | | Boiled water well till 10 A.M. went to look for things to splice Submersible pump cable 1 hr. | | |
| | | | | Spice pump cable run 15 hp pump on 3" pipe down to 243' 6" from ground level to INTAKE and 247' bottom of pump. Had 1 3/4" pipe for E Tape | | |
| | | | | | | 10 |
| | | | | | | Total 10 hrs. |

REMARKS:

SP. Anderson 6-18-87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2579

David Lincoln

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| David | | 299 W18-23 | PNL | K.H.O. |
| Date: 6-18-87 | | Depth: 251' To 251' | | Subcontract No. KEH 1944-1 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time Item | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | | 29 | 8 hrs |
| | | | | | 30 | 1 hrs. |
| | | | | pickup base 3" with fitting | | |
| | | | | pickup fittings, 3" tapes splice kits | | |
| | | | | for job site haul 400 200 WEST | | |
| | | | | installed 3/4" pipe to 400 run taps | | |
| | | | | inside hook up discharge line water meter | | |
| | | | | gate valve started Aquifer testing | | |
| | | | | 100 GPM, 3' 30 rec'd discharge | | |
| | | | | line | | |
| | | | | one hour standby | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | 16 Total 9hrs |
| | | | | | | |

REMARKS:

SP 6-18-87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-8.2580

DRILL LOG

By: David
Date: 6-19-87
Rig:
Well Number: 299 W18-23
Depth: 251 To 251
Computer Number: PNL
Project or Work Order No.: RHO
Subcontract No.: REH 1914-1

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time Items | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | set discharge line up started | 29 | 3 hrs. |
| | | | | pump test at 7:15 a.m. stop | 30 | 7 hrs |
| | | | | at 10:18 a.m. ; didn't have | | |
| | | | | the proper signs and ramp | | |
| | | | | car were high center over ramp. | | |
| | | | | stand by and too go and | | |
| | | | | look for sign ect. too get ready | | |
| | | | | for pump test monday | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | AP Aiken 6-22-87 | | Total 10 hrs |
| | | | | | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B-2581

David Davies

| DRILL LOG | By DAVID | Rig | Well Number 299-W18-23 | Computer Number PNL | Project or Work Order No. PHO |
|---|---|---|---|---|---|
| | Date 6-22-87 | | Depth 251 To 251 | | Subcontract No. KEH 1914-1 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | ~~Time~~ ITEMS | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | | 29 | 10 hrs. |
| | | | | Test pump WATER WELL pump at | | |
| | | | | 100 gpm with about 3' of drawdown | | |
| | | | | run from 8:05 AM to 4:05 p.m. | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | Total 10 hrs |
| | | | | | | |

REMARKS:

SP Ambient 6-25-87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-86)

8-B-2582

David Barnes

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| David | | 299-W18-23 | PNL | RHO |
| Date: 6-23-87 | | Depth: 251' To 251' | | Subcontract No.: KEH 1914-1 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | ~~Time~~ ITEMS | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | | 29 | 2½ hrs |
| | | | | | 17 | 30' |
| | | | | | 18 | 223' |
| | | | | pulled ¾" trim pipe 241' pulled | 20 | 4 SACKS |
| | | | | 3" pipe 245' of pipe and submersible | | |
| | | | | pump 2½ hrs. | | |
| | | | | | | |
| | | | | installed 30' of ss. screen and | | |
| | | | | 223' of ss pipe 4" used 4 sacks | | |
| | | | | of 20 - 30 silica sand | | |
| | | | | started welding puller head 8" casing | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | Total 10 hrs |
| | | | | | | |

REMARKS:

Tom M
SP Rumbaugh
6-25-87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-8.2583

David Davies

| DRILL LOG | By: David | Rig: | Well Number: 299-W18-23 | Computer Number: PNL | Project or Work Order No.: RHO |
|---|---|---|---|---|---|
| | Date: 6-24-87 | | Depth: 251 To 251 | | Subcontract No.: KEH 1914-1 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time HRS. | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | | 15 | 53' |
| | | | | | 20 | 9 BAGS SAND |
| | | | | | 21 | 4 PELLETS |
| | | | | | 22 | 150 GALS |
| | | | | SAND PACK UP TOO 215' WHILE PULLING 8" CASING POUR 5 BUCKETS OF | | |
| | | | | UP TO 210' RUN TREMI PIPE 1½" MIX | | |
| | | | | AND POUR 150 GALS OF BENTONITE GROUT | | |
| | | | | PULL 8" CASING FROM 243' TO 190 | | |
| | | | | TOTAL OF 53' | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | Total 80 hrs. |
| | | | | SP Ambient 6-25-87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B-2584

# DRILL LOG

David Bacon

By David | Rig | Well Number 29S-41E-23 | Computer Number PNL | Project or Work Order No. RHO

Date 6-29-87 | Depth 251 To 251 | Subcontract No. KEH 19W-51

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time Hour | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | | 15 | 190' |
| | | | | | 14 | 10' |
| | | | | | 22 | 200 gals |
| | | | | Mix and pour bentonite grout 200 gals pulled 190' of 8" casing and 10' of 10" casing | | |
| | | | | | | Total 18 hrs. |

S.P. Amrhein 6-26-87

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000 021 (5-85)

8-B-2585

David Dixon

| DRILL LOG | By DAVID | Rig | Well Number 299-W18-23 | Computer Number PNL | Project or Work Order No. RHO |
|---|---|---|---|---|---|
| | Date 6-26-87 | | Depth 251 To 251 | | Subcontract No. KEH 1914-1 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time Items | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | | 14 | 33' |
| | | | | | 22 | 225 gals |
| | | | | mix and pour bentonite grout 225 gals | | |
| | | | | pulled 33' of 10" casing | | |
| | | | | SP Ambient 6-30-87 | | |
| | | | | | | Total 10 hrs. |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-8000 021 (5-85)

8-B, 2586

David Davies

**DRILL LOG**

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| David | | 299-W18-23 | PNL | RHO |
| Date: 6-29-87 | | Depth: 251 to 251 | | Subcontract No.: KEH 1914-1 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time Item | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | | 14 | 103' |
| | | | | | 22 | 300 GALS |
| | | | | Mix and pour bentonite grout pulled 103' of 10" CASING | | |
| | | | | SP Aubert 6-30-87 | | Total 8 hrs. |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B-2587

David Davis

| DRILL LOG | By David | Rig | Well Number 299-W18-23 | Computer Number PNL | Project or Work Order No. RHO |
|---|---|---|---|---|---|
| | Date 6-30-87 | | Depth To | | Subcontract No. REH 1914-1 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time 17:00 | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | | | 34' |
| | | | | | | 200 gals |
| | | | | Mix and pour bentonite grout | | |
| | | | | and pull 34' of 12" casing | | |
| | | | | well to steam clean mud truck | | |
| | | | | S.P. Arndt 6-30-87 | | |
| | | | | | | 8 hrs. |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5 85)

8-B-2588

David Davies

| DRILL LOG | By David | Rig | Well Number 299-W-15-23 | Computer Number PNL | Project or Work Order No. AHO |
|---|---|---|---|---|---|
| | Date 7-1-87 | | Depth 251 To 251 | | Subcontract No. KEH 1914-1 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time ~~ITEMS~~ | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | | 14 | 30' |
| | | | | | 22 | 140 gal/s |
| | | | | | 23 | 5 SACK(SACI EHE MIX 1 SACK CEMENT |
| | | | | STEAM CLEAN MUD TRUCK | | |
| | | | | MIX BENTONITE 140 GAL/S | | |
| | | | | PULLED 30' OF 12" CASING | | |
| | | | | MIX AND POUR 5 SACKS OF PREMIX | | |
| | | | | CONCRETE AND 1 SACK OF POZZOLANT | | |
| | | | | CEMENT | | |
| | | | | | | Total 8 hrs |

REMARKS:

SP 7/1/87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B-2589

WELL 299-W18-24

Battelle
Pacific Northwest Laboratories

# Well Completion Report/Title III Inspection List

Project: Low Level Burial Ground RECRA Wells
Location: 200 West Area
Driller: Russ Vance
Drilling Co.: Onaneco Drilling
Geologist: J.S. Wilbur

Well Number: 299-W18-24
Temporary Well Number: NA
Coordinates: N38,998 W77,180
Casing Elevation: 684.35
Ground Elevation: 682.18

## DRILLING METHOD

Rotary Air: NA  Mud: NA
Cable Tool: D 0-40'; 75'-112'  H 45'-70'; 125'-240'
Drilling Fluid: H2O
Other: ———

## COMPLETION DATA

Drilled Depth: 239' 11"
Completion Depth: 235.5'
Date Started: 5/20/87  Completed: 8/11/87
Static Water Level/Date: 211.6'  7/9/87

## CASING DATA

| Type | Size | | |
|---|---|---|---|
| Schedule 40 Carbon Steel | 16" | to | 0-10.5' |
| Schedule 40 Carbon Steel | 12" | to | 0-70.2' |
| Schedule 40 Carbon Steel | 10" | to | 0-153.2' |
| Schedule 40 Carbon Steel | 8" | to | 0-240' |

Approved By: _____  Date: _____

## PERFORATIONS

Type: NA

| Depth | | Schedule |
|---|---|---|
| ——— | ——— | ——— |
| ——— | ——— | ——— |
| ——— | ——— | ——— |

App. By: ———  Date: ———

## SCREEN

4" diameter continuous slot stainless steel wrap; 8" dia. continuous slot stainless steel wrap

| Type | Stainless Steel | Stainless Steel |
|---|---|---|
| Length | 30' | 10' |
| Slot Size | 20 | 30 |
| Depths | 205.5' - 235.5' | ~~240'~~ 230' - ~~240~~ 240' |

App. By: GSW  Date: 8/11/87

## ANNULAR SEAL

| Type | Interval | Volume |
|---|---|---|
| Sand | 148.-240. | 13.5 ft³ |
| Volclay pellets | 198' - 191 | 4.5 ft³ |
| Volclay grout | 5' - 191' | 288.75 ft³ |
| Cement seal | 0 - 5' | 15.0 ft³ |

App. By: G.S.W  Date: 8/11/87

## GEOPHYSICAL LOGGING

| Sondes | Interval | Date |
|---|---|---|
| Neutron | 0' - 240' | 7/9/87 |
| Gamma-Gamma | 0' - 240' | 7/9/87 |
| Natural Gamma | 0' - 240' | 7/9/87 |
| ——— | ——— | ——— |
| ——— | ——— | ——— |
| ——— | ——— | ——— |
| ——— | ——— | ——— |

Approved By: GSW  Date: 7/9/87

## AQUIFER TESTING

Type of Test: Constant Discharge
Length of Test: 7.5 hr
Volume Pumped: * 45,000 gals.  □ 48,300 gals.
Drawdown: 1.68 ft'

* test discharge volume
□ total volume discharge test + development

Approved By: GSW  Date: 7/17/87

## OTHER APPLICABLE ITEMS

- ✓ Steam Cleaning
- ✓ Storage of Const. Material
- ✓ Tool Lubricants
- ✓ Concrete Pad
- ✓ Protective Steel Posts
- ✓ Safety Paint
- ✓ Straightness Test
- ✓ Well Development
- ~~✓~~ Downhole TV Inspection
- NA Well Abandonment
- ✓ Complete As-Built Diagram, Driller's and Geologist's Logs

Approved By: GSW  Date: 8/15/87

Reviewed By: D.L. McMillan  Date: 1-8-88

A-1800-187 (3/87)

8-B.2591

INSPECTION PLAN
CONSTRUCTION PROJECT KEH-1914 (B-677)

Prepared by
U.S. Department of Energy
Pacific Northwest Laboratory
Operated by
Battelle Memorial Institute

PNL

Project Manager — Date: 5/18/87

Facilities Engineering — Date: 5/18/87

PNL Cognizant QA Engineer — Date: 5/18/87

RHO Concurrence:

Construction Engineer — Date: 5/28/87

Quality Assurance — Date: 5-22-87

DOE-RL Concurrence

Project Engineer — Date: 6-1-87

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## PREFACE

This Inspection Plan identifies the inspections required and the responsible people to perform the inspections of the monitoring wells to be constructed under contract KEH-1914 (B-677).

The inspection of well construction activities is intended to provide assurance that the work performed by construction forces is in accordance with the approved contract documents. The degree of inspection is commensurate with the significance of the monitoring wells with regard to function and safety.

### Inspectors

Listed below are the names of the individuals whose initials appear within this inspection plan.

| Name | Initial | Organization | Job Title |
|---|---|---|---|
| Mel Colby | | KEH | Contract Administrator |
| Tom Nemzek | | KEH | Contract Engineer |
| Jim Mortimer | | KEH | Contract Administrator |
| Steve Airhart | | PNL | Field Geologist |
| Tyler Gilmore | | PNL | Field Geologist |
| Scott Wilbur | | PNL | Field Geologist |

The PNL project manager has reviewed the conceptual inspection plan and is satisfied that all the applicable inspections of the work were made during the construction of the wells.

PNL Project Manager — Date: 1-8-88

## CONSTRUCTION INSPECTION SERVICES

Described herein are the inspection services to be provided and documented by PNL.

Pre-Award Submittal Review

| | Item | Contract Reference | Initial | Date |
|---|---|---|---|---|
| 1. | Verify contractor and drillers are licensed for well drilling in the State of Washington. | 01100-1.2<br>01300-1.2.1A | [illegible] | 5-7-87 |
| 2. | Verify cable tool drilling experience is five years or more with drive barrel and hard tool. | 01100-1.2 | [illegible] | 5-7-87 |
| 3. | Verify documentation of groundwater monitoring wells drilled by contractor. | 01100-1.2 | [illegible] | 5-7-87 |
| 4. | Verify contractor submitted description of drilling method and equipment. | 01300-1.2.1B | [illegible] | 5-7-87 |
| 5. | Verify contractor submitted resumes of personnel. | 01300-1.2.1C | [illegible] | 5-7-87 |

Procurements

Verify materials to be furnished to the contractor are as described in the construction specification.

| | Item | Contract Reference | Initial | Date |
|---|---|---|---|---|
| 1. | Stainless steel screen (8 inch telescope size). | 01100-1.5A | [illegible] | 5-15-87 |
| 2. | Stainless steel screen (4 inch). | 01100-1.5B | TW | 5-15-87 |
| 3. | Centralizers. | 01100-1.5C | TW | 5-15-87 |
| 4. | Stainless steel casing (4 inch). | 01100-1.5D | TW | 5-15-87 |

| | Item | | Contract Reference | Initial | Date |
|---|---|---|---|---|---|
| 5. | Artificial sand packs. | | 01100-1.5E | TN | 5-15-87 |
| 6. | Bentonite pellets. | | 01100-1.5F | TN | 5-15-87 |
| 7. | Bentonite grout. | | 01100-1.5G | TN | 5-15-87 |
| 8. | Granular bentonite. | | 01100-1.5H | TN | 5-15-87 |
| 9. | Sack crete. | | 01100-1.5I | TN | 5-15-87 |
| 10. | Portland cement. | | 01100-1.5J | TN | 5-15-87 |
| 11. | Well cap. | | 01100-1.5K | TN | 5-15-87 |
| 12. | Brass survey marker. | | 01100-1.5L | TN | 5-15-87 |
| 13. | Sample jars. | | 01100-1.5M | TN | 5-15-87 |
| 14. | Hydrologic sampling equipment. | | 01100-1.5O | TN | 5-15-87 |
| 15. | Drive shoes. | | 01100-1.5P | TN | 5-15-87 |
| 16. | Carbon steel casing. | a. 16 inch | 01100-1.5Q | TN | 5-15-87 |
| | | b. 12 inch | 01100-1.5Q | TN | 5-15-87 |
| | | c. 10 inch | 01100-1.5Q | TN | 5-15-87 |
| | | d. 8 inch | 01100-1.5Q | TN | 5-15-87 |
| 17. | Guard posts. | | 01100-1.5R | TN | 5-15-87 |
| 18. | Paint: primer | | 01100-1.5S | TN | 5-15-87 |
| | finish enamel | | 02011-3.5I | TN | 5-15-87 |

Performance Submittals

| | Item | Contract Reference | Initial | Date |
|---|---|---|---|---|
| 1. | Verify submission and approval of construction schedule. | 01300-1.2.2A | JM | 10/29/87 |
| 2. | Verify drilling logs are submitted daily. | 01300-1.2.2B | JM | 10/29/87 |
| 3. | Verify submission and acceptability of flow meter certification. | 01300-1.2.2C | JM | 10/29/87 |

Well Number 299-W18-24

The remaining sections of this inspection plan shall be completed for each well.

Well Drilling Activities

| | Item | Contract Reference | Initial | Date |
|---|---|---|---|---|
| 1. | Verify wells are constructed in continuous operation. | 01100-1.3 | ASW | 8/11/87 |
| 2. | Verify contractor uses approved water source. | 01600-2.0 | ASW | 8/11/87 |
| 3. | Verify beveled edge is cut on temporary casing by contractor. | 01600-2.1A | ASW | 8/11/87 |
| 4. | Verify suitability of split spoon sampling equipment. | 01600-2.2 | ASW | 8/11/87 |
| 5. | Steam cleaning equipment. | 01600-2.3 | ASW | 8/11/87 |
| 6. | Aquifer testing equipment. | 01600-2.4 | ASW | 8/11/87 |
| 7. | Verify contractor has copy of WAC Chapter 173-160 "Minimum Standards for Construction and Maintenance of Water Wells" and the construction specification at the jobsite. | 02011-1.2 | ASW | 8/11/87 |
| 8. | Verify contractor has a copy of all addendums and change orders at the jobsite. | 02011-1.2 | ASW | 8/11/87 |

Monitoring Well Construction

| | Item | Contract Reference | Initial | Date |
|---|---|---|---|---|
| 1. | Verify proper technique of cable tool drilling. | 02011-3.1.1 | ASW | 8/11/87 |
| 2. | Verify proper technique of air rotary drilling. | 02011-3.1.2 | ASW | 8/11/87 |

Well Number 299-W18-24

| | Item | Contract Reference | Initial | Date |
|---|---|---|---|---|
| 3. | Verify steam cleaning is being done properly. | 02011-3.1.3 | JSH | 8/11/87 |
| 4. | Verify contractor is handling and storing construction materials properly. | 02011-3.1.4 | JSH | 8/11/87 |
| 5. | Verify the contractor uses proper tool lubricants. | 02011-3.1.6 | JSH | 8/11/87 |
| 6. | Verify only approved drilling additives are used. | 02011-3.1.7 | JSH | 8/11/87 |
| 7. | Verify the proper disposal of drill cuttings and water. | 02011-3.1.8 | JSH | 8/11/87 |

Well Testing

| | Item | Contract Reference | Initial | Date |
|---|---|---|---|---|
| 1. | Verify water-level measurements are taken. Note in log. | 02011-3.2.1 | JSH | 8/11/87 |
| 2. | Verify the bottom of temporary casing is free of plugging material at end of each day. Note in log. | 02011-3.2.1 | JSH | 8/11/87 |
| 3. | Verify ground-water samples are taken when needed. | 02011-3.2.2 | JSH | 8/11/87 |
| 4. | Verify aquifer testing is done at each well. | 02011-3.2.3 | JSH | 8/11/87 |
| 5. | Verify formation samples are taken as required. | 02011-3.3 | JSH | 8/11/87 |

Well Number 299-W18-24

Borehole Construction

| | Item | Contract Reference | Initial | Date |
|---|---|---|---|---|
| 1. | Verify temporary casing is telescoped at no more than 100 feet intevals. | 02011-3.4A | ASH | 8/11/87 |
| 2. | Verify depth of well. | 02011-3.4B | ASH | 8/11/87 |
| 3. | Verify proper action is taken if overdrilling occurs. | 02011-3.4C | ASH | 8/11/87 |
| 4. | Verify acceptable passing of alignment test. | 02011-3.4D | ASH | 8/11/87 |
| 5. | Verify all temporary casing is removed from the well. | 02011-3.4E | ASH | 8/11/87 |

Well Construction

| | Item | Contract Reference | Initial | Date |
|---|---|---|---|---|
| 1. | Verify position of 8 inch screen and pullback of casing to expose screen. | 02011-3.5A | ASH | 8/11/87 |
| 2. | Verify adequate well development. | 02011-3.5B | ASH | 8/11/87 |
| 3. | Witness aquifer test. | 02011-3.5B | ASH | 8/11/87 |
| 4. | Verify proper setting of 4 inch screen, casing, and centralizer. | 02011-3.5C | ASH | 8/11/87 |
| 5. | Verify proper placement of sand pack. | 02011-3.5D | ASH | 8/11/87 |
| 6. | Verify proper location and thickness of bentonite pellet seal. | 02011-3.5E | ASH | 8/11/87 |
| 7. | Verify proper mixing, placement, and location of Volclay bentonite-based grout. | 02011-3.5F | ASH | 8/11/87 |

Well Number 299-K1B-24

| | Item | Contract Reference | Initial | Date |
|---|---|---|---|---|
| 8. | Verify proper concrete seal at top of well. | 02011-3.5G | JSH | 8/11/87 |
| 9. | Verify proper construction of concrete pad and placement of brass survey marker. | 02011-3.5H | JSH | 8/11/87 |
| 10. | Verify proper placement, construction, and painting of guard posts. | 02011-3.5I | JSH | 8/11/87 |
| 11. | Verify contractor cleans up site and properly stores excess materials. | 02011-3.5J | JSH | 8/11/87 |
| 12. | If abandonment of well occurs, verify proper abandonment. | 02011-3.6 | NA | NA |
| 13. | Verify contractor maintains the drill log daily. | 02011-3.7 | JSH | 8/11/87 |
| 14. | Prepare punchlist at construction completion for exceptions. | | — | — |

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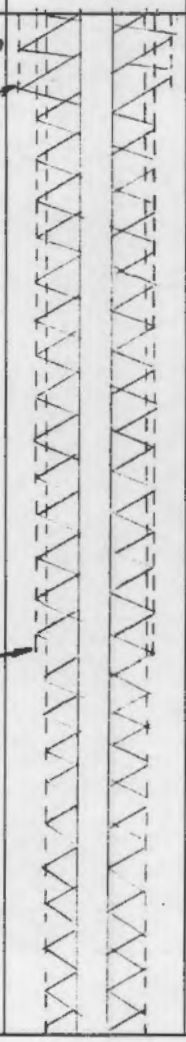
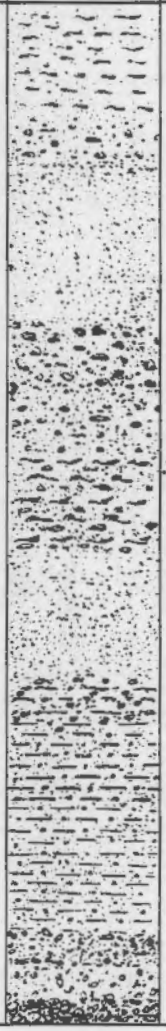
Pacific Northwest Laboratories

# AS-BUILT DIAGRAM

Well Number 299-W13-24 Geologist T.S. Wilbur Page 1 of 2

Reviewed by V.L. McGhan Date 1-8-88

| Construction Data | | Depth in Feet | Geologic/Hydrologic Data | |
|---|---|---|---|---|
| Description | Diagram | | Diagram Litho. | Lithologic Description |
| Starter casing 10.5' Section of 16" Carbon Steel pipe |  | 5 |  | SLIGHTLY SILTY SAND |
| | | 10 | | SLIGHTLY SILTY SAND |
| | | 15 | | SLIGHTLY SILTY SAND |
| | | 17 | | SLIGHTLY GRAVELY SAND |
| | | 20 | | SAND |
| | | 25 | | SAND |
| | | 30 | | SAND |
| | | 35 | | SAND |
| | | 38 | | GRAVELY SAND |
| | | 40 | | GRAVELY SAND |
| | | 45 | | SLIGHTLY GRAVELY SAND |
| | | 50 | | SLIGHTLY SILTY SLIGHTLY GRAVELY SAND |
| | | 55 | | SLIGHTLY SILTY GRAVELY SAND |
| | | 60 | | SLIGHTLY SILTY GRAVELY SAND |
| | | 65 | | SAND |
| 70.2" of 12" carbon steel casing | | 70' | | SAND |
| | | 75' | | SAND |
| | | 80' | | SLIGHT SILTY GRAVELLY SAND |
| | | 85' | | SLIGHT SILTY SAND |
| | | 90' | | SILTY SAND |
| | | 95' | | SILTY SAND |
| | | 100' | | SILTY SAND |
| | | 110' | | SILTY SAND |
| | | 112' | | SANDY GRAVEL |
| | | 115' | | SANDY GRAVEL |
| | | 120' | | GRAVEL |

A-1800-186 (3/87)

Battelle
Pacific Northwest Laboratories

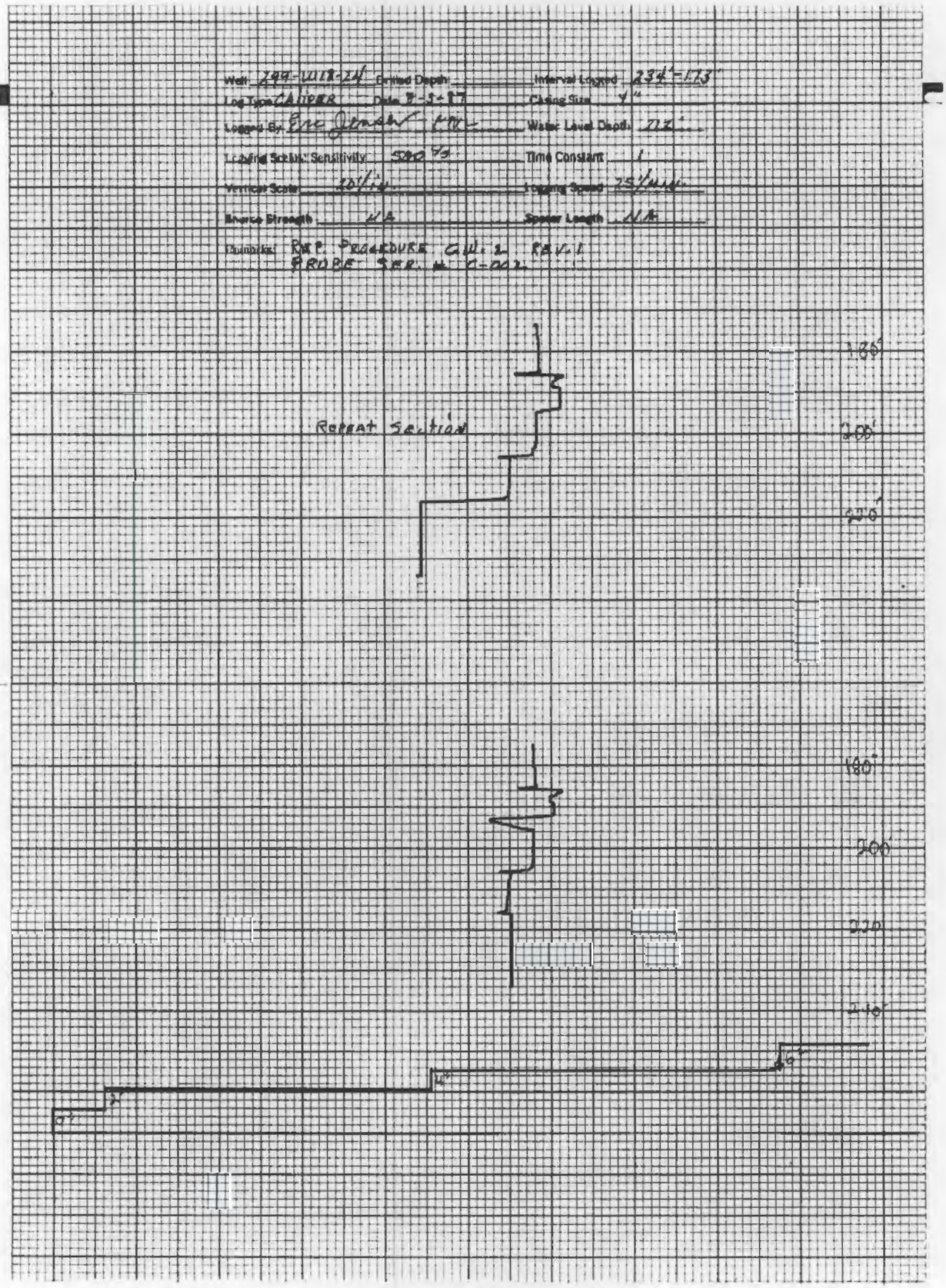
# AS-BUILT DIAGRAM

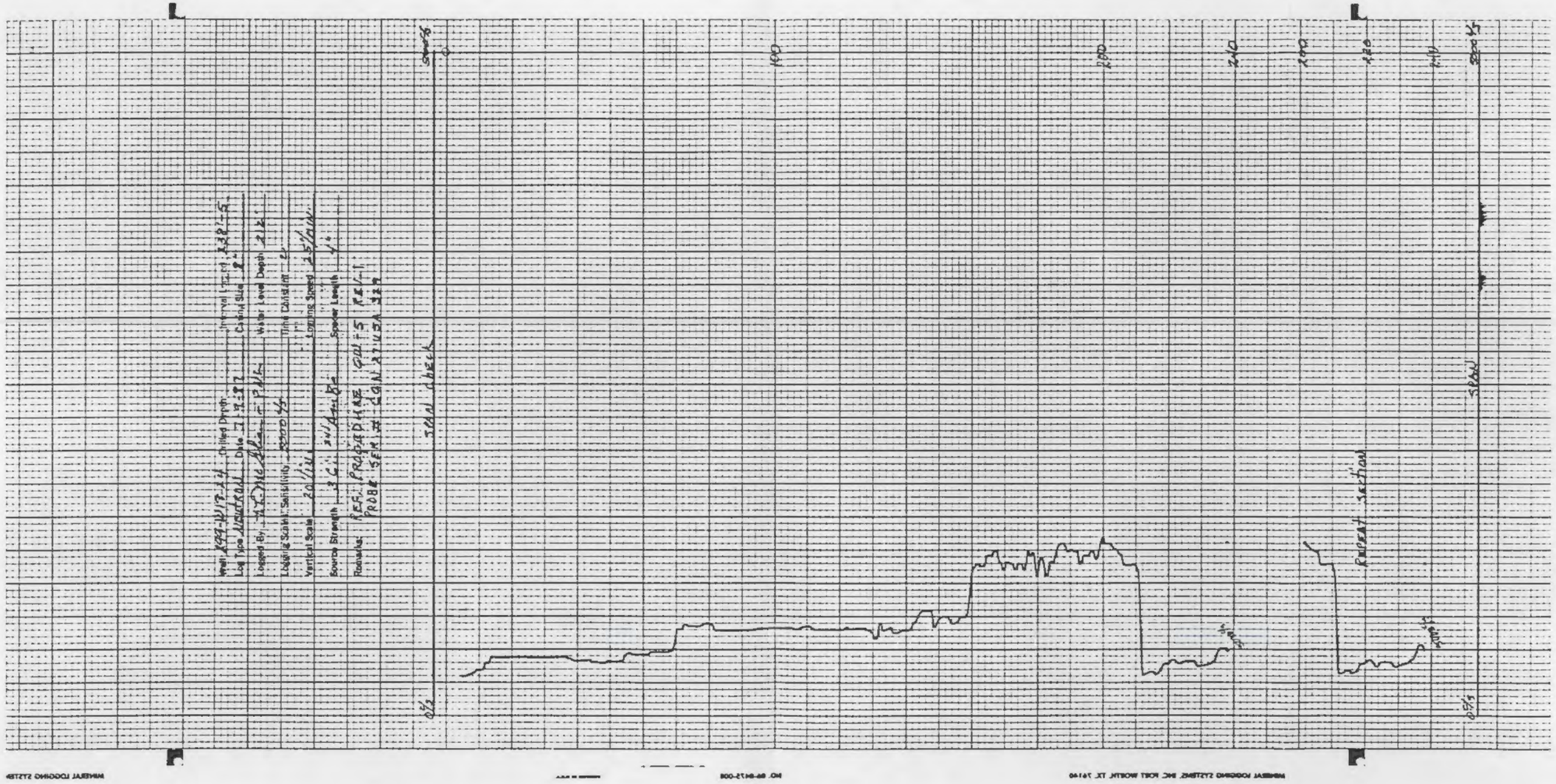
Well Number 299-W18-24 Geologist J.S. Wilbur Page 2 of 2

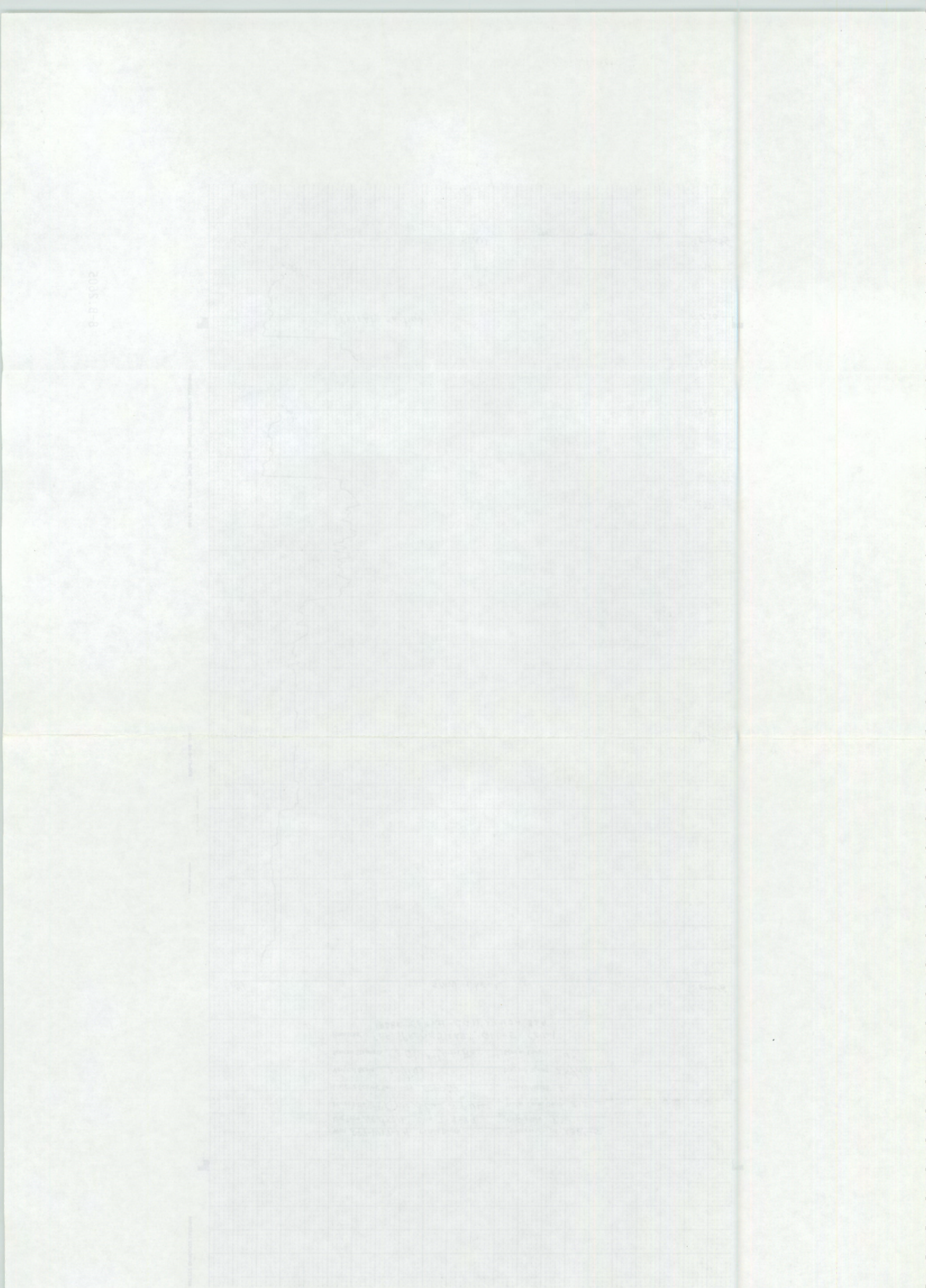
Reviewed by W.L. McGhan Date 1-8-88

| Construction Data | | Depth in Feet | Geologic/Hydrologic Data | |
|---|---|---|---|---|
| Description | Diagram | | Diagram Litho. | Lithologic Description |
| | | 125' | | SANDY GRAVEL |
| | | 130' | | SANDY GRAVEL |
| | | 135' | | SILTY SAND |
| | | 140' | | SILTY SAND |
| | | 145' | | SILTY SAND |
| | | 150' | | SANDY GRAVEL |
| T/D of 10" - 153' 10" | | 155' | | SANDY GRAVEL |
| | | 160' | | SAND |
| | | 165' | | SAND |
| | | 170' | | SANDY GRAVEL |
| | | 175' | | SLIGHTLY SILTY SANDY GRAVEL |
| | | 180' | | SLIGHTLY SILTY SANDY GRAVEL |
| | | 185' | | SLIGHTLY SILTY SANDY GRAVEL |
| | | 190' | | SANDY GRAVEL |
| Top of volclay pellets 191.6' | 191.6' | 195' | | SILTY SANDY GRAVEL |
| Top of Sand @ 198.2' | 198.2' | 200' | | SILTY SANDY GRAVEL |
| Top of 4" SS screen @ 205.5' | | 205' | | SANDY GRAVEL |
| H2O Level @ 211.8' from ground surface | ▼ | 210' | | GRAVELLY SILTY SAND |
| | ▼ | 215' | | SLIGHTLY SANDY GRAVEL |
| | | 220' | | SANDY GRAVEL |
| B/B of 4" SS casing @ 235.5' | | 225' | | SANDY GRAVEL |
| 8" telescoping screen 240'-230' | | 230' | | SANDY GRAVEL |
| | | 235' | | SANDY GRAVEL |
| B/B 240' of 8" Carbon Steel Casing | | 240' | | SANDY GRAVEL |

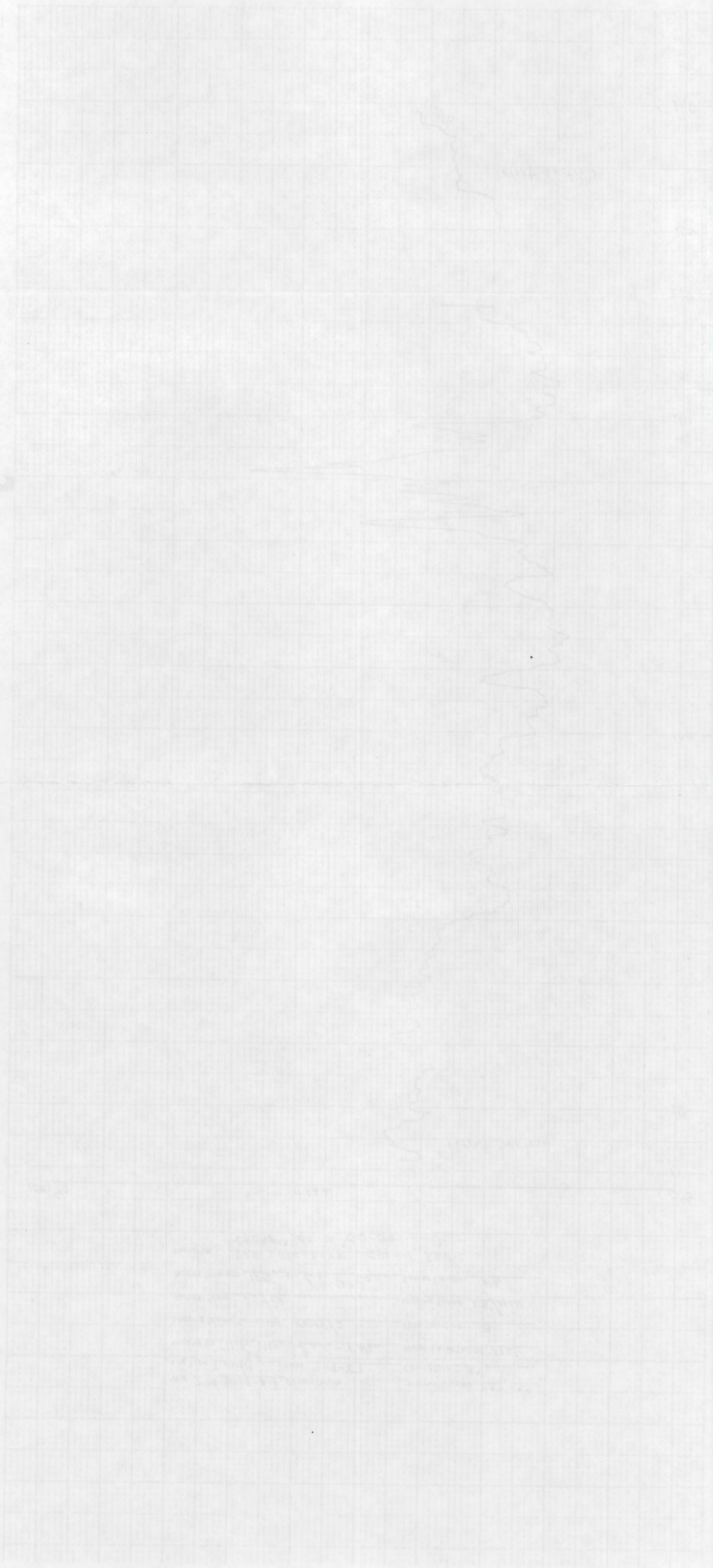
A-1800-186 (3/87)

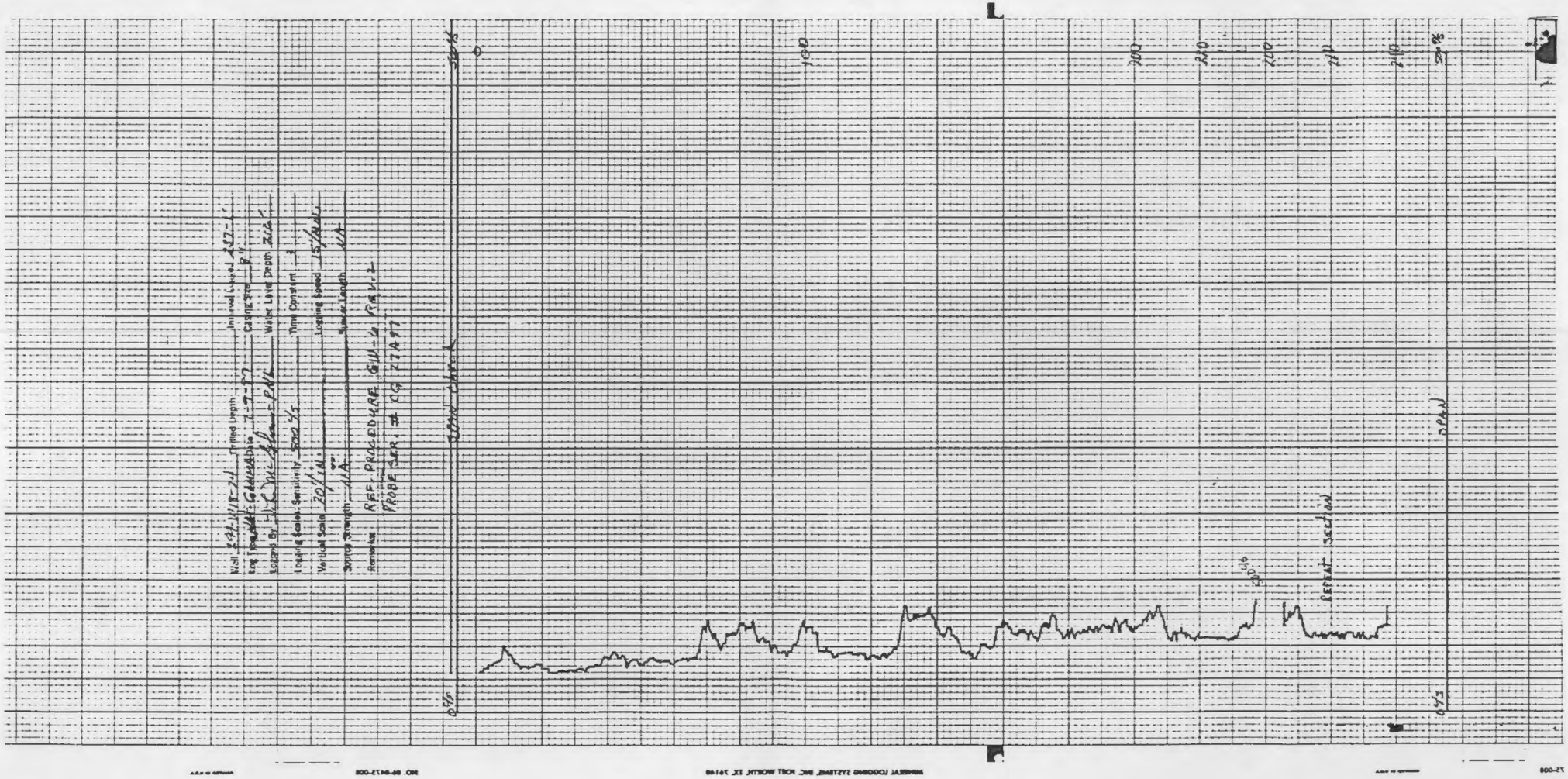

Well 299-W18-24
Logged Depth
Interval Logged 234'-173'
Log Type CALIPER
Date 8-3-17
Casing Size 4"
Logged By Eric Straehl FHI
Water Level Depth 172'
Logging Sonde/Sensitivity SGW 73
Time Constant 1
Vertical Scale 20'/in
Logging Speed 25'/min
Source Strength N/A
Spacer Length N/A
Remarks: REF. PROCEDURE GW-1 REV. 1
PROBE SER. # C-002
Repeat Section
180'
200'
220'
240'
0°
3"
4"
6"

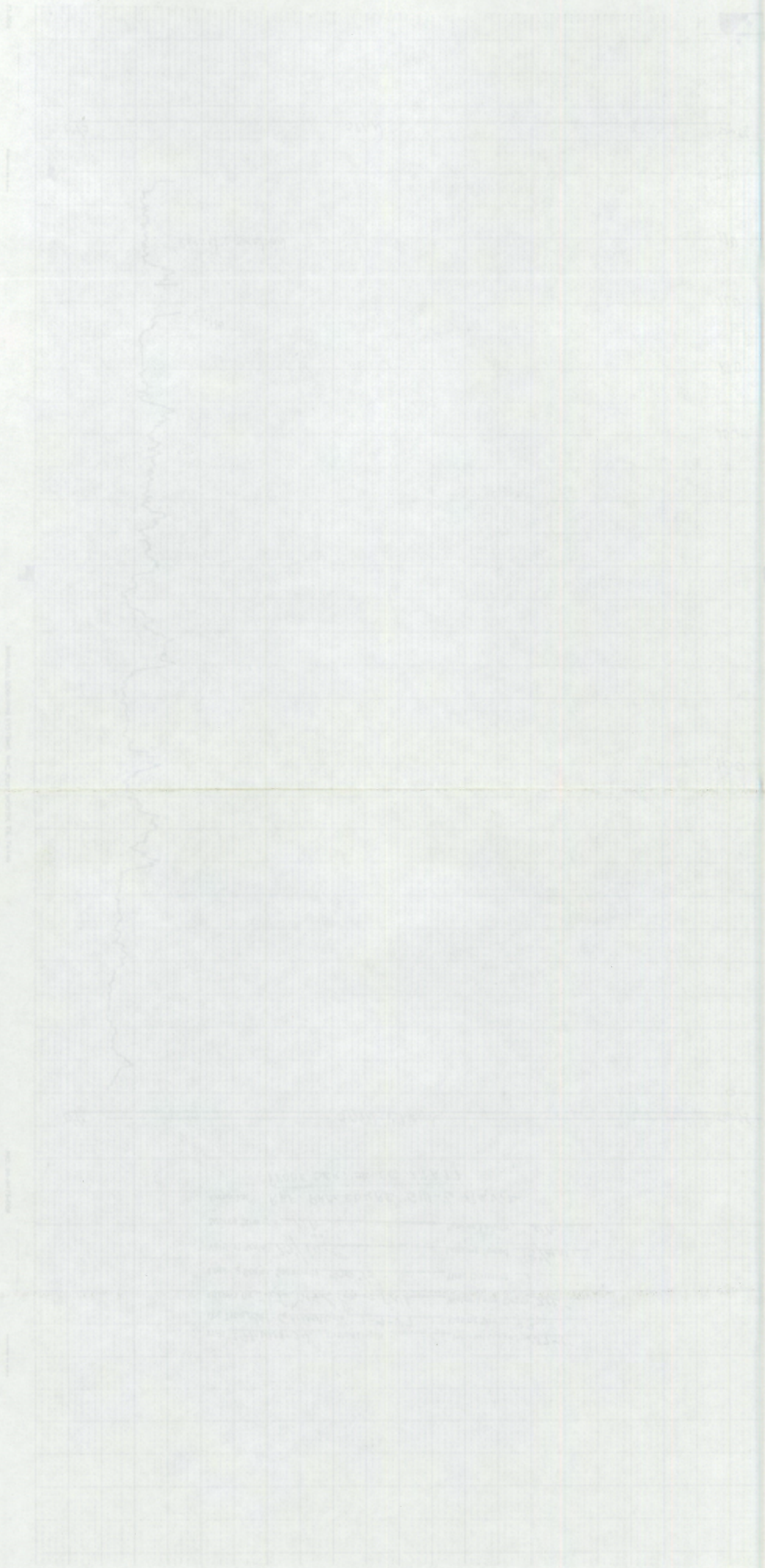

Well KGS-W/P-4
Log Type Monitored
Logged By
Logging Speed 25'/min
Bowtie Strength
Remarks
Interval Tested 332'-52'
Casing Size 2"
Water Level Depth 21'
Time Datum
Sensor Levels
Probe Length
Probe Diameter
Probe Serial #
Chilled Drnk.
Date
Sensitivity
Vertical Scale
Sensor Spacing
Probe Type
Probe Serial #
Static Water Level
Packer Set
Packer Set
Packer Inflated
Packer Inflated
Packer Released
Packer Released


θ-B' SiO2

B-B.2607




Initial Level 40.1
Casing Size 8"
Water Level Depth 30.6
Time Constant 3
Logging Speed 15'/min
Tape Length 1LT
Remarks: REF. PROCEDURE GW-4 (10/82)
PROBE SER. # CG 2774 P7
Bottom
100
200
210
220
230
240
250
30.96
Bottom
0.50
0.43



# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| T.S. Miller | Cable Tool # 2 | 299-W15-24 | NA | 14114-1914 |
| Date 5/20/87 | Russ | Depth 0' To 0' | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | moved drill rig to well site and set up for [illegible] | 9:00 | |
| | | | | | | |
| | | | | three 20' sections of 12" diameter carbon steel | | |
| | | | | were steam cleaned and moved to the drill site, | 13:00 | |
| | | | | | | |
| | | | | Driller hands to pipe used to start casing; using | 14:15 | |
| | | | | a 16" diameter carbon steel ~10' section | | |
| | | | | Winds and rain - Big time | 14:30 | |
| | | | | | | |
| | | | | Head back to the trailer @ | 15:30 | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

REMARKS:

JS Will - 5/20/87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2611

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| J.S. Wilbur | Cable Tool Rig #7 Ross | 299-W19-24 | NA | KH1-1914 |
| Date 5/21/87 | | Depth 5' To 10' | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 0' | 5' | Core Barrel | moist | SLIGHTLY SILTY SAND - Sample contains 90% sand sized grains & 10% fines (≤ silt sized material). (Sand) these grains are 10% fine sand & 19% very fine sand w/ ~1% VCS sized grains. VCS are light green & appear to be angular in shape and composed of basalt (mafic) materials. Very fine and fine sand sized grains are subrounded to rounded in shape and are composed of 90% qtz & F/M/m minerals (mica) & 10% mafic. The sample was made up of well sorted material and displays moderate reaction to HCl. Dry sample color is 2.5Y 7/N7 Light gray. Sample material is unconsolidated. Moisture sample collected | 11:30 | ground drill pad at the surface, driller is drilling open hole |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | Driller setting 10' section of 16" starter casing | 11:38 | |
| 10' of 16" Starter casing | | | | completed setting starter casing @ | 12:40 | |
| | | | | | | |
| | 9'-10' | Core Barrel | moist | SLIGHTLY SILTY SAND - Sample is the same as all 5' samples above; Moisture sample collected | 13:50 | |
| | | | | | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2612

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| J.S. Wilbur | Cable Tool Rig #2 / Russ | 299-E33-77 | NA | KEH-1919 |
| Date: 5/21/89 | Depth: 12' To 15' | | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| surface | pipe - 10' of | 16" | | | | |
| Carbon | steel | | | | | |
| | 14'-15' | Core Barrel | Moist | SLIGHTLY SILTY SAND — Sample contains 90% sand sized grains & 10% fine (≤ silt sized material). (Sand) these grains are 60% fine sand, 25% very fine sand, and 15% very coarse sand sized grains. VCS are highly angular in shape and are composed of basalt (mafic) materials. Very fine & fine sand sized grains are subrounded to rounded and are composed of 90% qtz & 10% m/m material or minerals (mica). Sample is well sorted — note; that there appears to be a increase in grain size of the sand as well as a compositional change, more mafics over the last sample. Sample displays a moderate reaction w/ 10% HCl. Dry Sample color is 2.5Y 7/N7 Light gray. Sample material was unconsolidated, driller had a hard time keeping the sample in the core barrel. Moisture sample taken | 19:35 | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2613

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| T.S. Wilbur | Cable Tool Rig #2 | 229 WIB-6-1 | | KEH-1914 |
| Date: 5/21/87 | | Depth: 17' To 17' | | Subcontract No. |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 10' of 16" carbon steel | | | | | | |
| drive casing | | | | | | |
| | 17' | Core Barrel | Dry | SLIGHTLY GRAVELLY SAND - Sample contains | 14:55 | |
| | | | | 10% Gravels sized clasts & 90% Sand sized grains. | | |
| | | | | (Gravels) 5% very fine pebbles, 3% fine pebbles & | | |
| | | | | 2% medium sized pebbles. These clasts are subrounded | | |
| | | | | to rounded in shape and are composed of 90% qtz | | |
| | | | | rich materials & 10% m/p materials. (Sands) | | |
| | | | | 60% very coarse sand, 10% coarse sand, 10% | | |
| | | | | medium sand & 10% fine sand sized grains. | | |
| | | | | Composition of these grains is 60% mafic and | | |
| | | | | 40% qtz & m/p materials. Sand grains are angular | | |
| | | | | to rounded in shape (mafic tend to be more angular in | | |
| | | | | shape). Dry sample color is 2.5Y 4/N4 Dark Gray | | |
| | | | | Sample was unconsolidated when collected. Sample | | |
| | | | | has a slight reaction w/ 10% HCl. | | |

REMARKS:

T.S.W. 5/21/87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000 021 (5-85)

8-B.2614

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| J.S. Wilbur | Cable Tool Rig # | 299-W23-7 | | KEH-19 |
| Date 5/22/87 | | Depth 20' To 25' | | Subcontract No. |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| .5' | length of drive | shoe | driller welds on a drive shoe to 20.8' section of 12" | | |
| 20.8' | length of casing | steel | carbon steel casing, started @ 11:30 (approx.) @ 12:30 | | |
| 21.3' | total length of casing | | | | |
| | | | | driller goes to help set up three casing up | 11:10 | |
| | | | | starts drilling @ 11:57 | | |
| | 20' | Core Barrel | Moist | SAND - Sample consists 100% fine sized grains, sands | 12:07 | |
| | | | | are 20% very coarse sand, 40% coarse sand and 40% | | |
| | | | | medium sized sand. These grains are subrounded to | | |
| | | | | subangular and are composed of 60% quartz (base) minerals | | |
| | | | | 30% qtz rich materials and 10% misc minerals & materials. | | |
| | | | | Dry sample color is 5Y 6/6/1 Gray. Sample was uncontaminated | | |
| | | | | when collected. Sample has a moisture content of 10% H2O. | | |
| | | | | Moisture sample was collected. | | driller starts to add |
| | | | | | | 10.5' section of 12" |
| | 24'-25' | Core Barrel | Moist | SAND - Sample is the same as the 20' sample. | 12:55 | diameter carbon steel |
| | | | | Driller is getting tools to cut casing. 20' sections are to | 13:06 | to the casing. |
| | | | | long for the drill stem on this rig. | | |

REMARKS:

J.S. Wilbur 5/22/87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2615

8-B.2616

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| J.S. Hilbur | Cable 35 / Rig #- | 299-N18-77 | NA | KEH-177 |
| Date 3/26/87 | | Depth 30' To 35' | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Driller arrives @ the well site and continues to weld the | 7:45 | 10.5' section of 12" |
| 31.8 of 12" Carbon steel | | | | 10.5' section carbon steel casing into place. | | casing added. |
| | | | | | | 21.3' |
| | | | | Driller completes welding and lubricates fitting on the | 8:30 | 10.5 |
| | | | | rig | | 31.8' |
| | | | | Driller starts drilling | 8:50 | |
| | | | | Main cable has a strand broken off, driller has to | | |
| | | | | cut cable & replace cable socket | 9:50 | |
| | | | | Driller starts drilling again | 12:55 | Having a hard time |
| | | | | | | keep material in the |
| | 30'-31' | Core Barrel | Moist | SAND- sample material is the same as the 25' | 13:17 | core barrel. |
| | | | | sample. | | |
| | 34'-35' | Core Barrel | Moist | SAND - Sample is made up of 100% sand sized material | 13:40 | |
| | | | | Sand are composed of 60% quartz sand & 40% | | |
| | | | | coarse sized sand grains. There is a decrease in sand | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| J.S. Wilbur | Cable Tool Rig #2 | 27N-NW3 34 | NA | 2717-1913 |
| Date: 5/2c/87 | | Depth: 35' To 35' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | 34'-35' | Core Barrel | Moist | Cor. size of this sample comprised of last sample. Then | | |
| | | | | Sand grains are subrounded to subangular in shape and | | |
| | | | | are composed of 60% mafic (basalt) materials & 35% qtz | | |
| | | | | rich material & 10% misc material & minerals. Dry | | |
| | | | | Sample color is 5Y 6/6/1 Gray. Sample was unconsolidated | | |
| | | | | when collected. Sample has a very weak reaction to | | |
| | | | | 10% HCl. Moisture Sample was taken | | |
| | | | | | | |
| 38.8' | total amount of | | | Driller cuts and stabs to add a 7' section of | | |
| | 12" Carbon Steel | | | 12" casing to the well. | 14:55 | |

REMARKS:

J.S.W. — 5/2c/87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-8000-021 (5-85)

8-B.2617

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| J.S. Wilbur | Cable Tool Rig # Rus | 299-W18-39 | NA | REH-1914 |
| Date 5/27/87 | | Depth 38' To 38' | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 38.8' | 38' | Core Barrel | Moist | GRAVELLY SAND - [illegible] gravel-size clasts [illegible] 85% [illegible]. Gravels are 5% pebble-size [illegible] 10% [illegible] clasts. These clasts are subrounded to rounded in shape and are composed of qtz rich f m/m materials. Sands are 30% medium sand, 30% coarse sand, and 25% very coarse sand. These grains are subangular to angular in shape and composed of 75% mafic (basaltic) material and 60% qtz rich f m/m materials. Dry sample color is 7.5YR 6/0 6/6 grey. Gravel size clasts have some $CaCO_3$ material on the surface which has a strong reaction w/ 10% HCl solution. Sand size fines shows a very weak reaction w/ 10% HCl solution. [illegible] sample was collected. This sample has a increase in grain size over the last sample, several large basalt clasts from drilling action were removed from the well. These clasts were to large for the sample jars. [illegible] the rest | 9:41 | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine _____ Standing Water

A-6000-021 (5-85)

8-B.2618

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| J.S. Wilbur | Cable Tool Rig #2 | ZPP-WIB-24 | NA | KFH 1914 |
| Date: 5/27/87 | | Depth: 40' To 40' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 38.8 | 40'-41' | Core Barrel | slightly moist | GRAVEL, SAND - sample is the same as the last sample, driller commented that the sand fraction may be sluffing off the sides and the material @ 40' may coarser grain than the sample reflects. Drill hole is ~ 4' ahead of the casing, | 11:15 | |
| 38.8' | | | | Driller cuts a 7'-12" section of carbon steel casing to add to the well. | 11:30 | |
| 7.0' | | | | | | |
| 45.8' | of 12" | Carbon | steel | | | |
| | | | | driller changing to hard tool, sample not staying in the core barrel. | 13:05 | |

REMARKS:

J.S. Wilbur 5/27/87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2619

8-B.2620

| DRILL LOG | By J.S. Wilbur | Rig Cable Tool Rig #2 | Well Number 299-W18-23 | Computer Number NA | Project or Work Order No. KE11-1914 |
|---|---|---|---|---|---|
| | Date 5/28/87 | | Depth 40' To 45' | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 45.8' | | | | Changing to hard tool | 5:33 | |
| | | | | Driller waiting for water to start hard tooling - | 5:33 | |
| | | | | Starts drilling @ 11:55 after [illegible] arrives. | 11:55 | changes to hard tool |
| | | | | | | driller adding H2O to |
| | | | | Driller adds an additional joint to back end of the rig | | hole |
| | | | | rig for support. Add 5 gal H2O (12:30, 13:20, 13:50) | 12:15 - | |
| | | | | | | |
| | | | | Driller stops drilling to get a bailer to remove crushed | 13:10 | |
| | | | | material from the hole; returns to bail hole out @ 13:41 | | |
| | | | | Driller add 10 gals H2O and starts the hammer | 13:43 | |
| | | | | | | |
| | 44'-45' | Hand Tool | Wet | SLIGHTLY GRAVELLY SAND - Sample has been highly | 14:52 | driller has hammered |
| | | | | altered by the hand tool. Sample is made up of 5%. | | on this sample for ~ |
| | | | | gravel sized clasts and 95% sand sized grains. 3% | | 1 hr. before it was |
| | | | | fine pebbles; 2% very fine pebbles 5% very coarse | | collected. |
| | | | | sand, 30% coarse sand, 30% medium sand, and 30% | | |
| | | | | fine sand. Gravels - these clasts are highly angular | | |
| | | | | to angular in shape. Unaltered surfaces indicate | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 15-851

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| J.S. Hilton | Cable Tool Rig #2 | 39N-4W3-27 | NA | REM-1914 |
| Date 5/28/87 | | Depth 45' To 15' | | Subcontract No. |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 45.8' | 14'-45' | Hard Tool | Wet | that these clasts were formed from larger more rounded material. The composition of these gravels is 50%mafic (basaltic) & 50% qtz rich w/ some m/m materials. The sand sized grains are angular to subangular & shape analysis composed of 60% mafic (basaltic) & 40% qtz rich material as m/m mineral (mica) were seen in the samples. Wet sample color is 5Y 4/2 Olive gray. No moisture sample taken. Sample has a very weak reaction w/ 10% HCl. | | |
| | | | | Stop drilling @ | 1500 | |

REMARKS:

J.S. Hilton 5/28/87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2621

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| J.S. Wilbur | Cable Tool | 299-W18-2-1 | NA | KEH-1914 |
| Date: 5/29/87 | Rig #: | Depth: 50' To 50' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 13.9' | of 12" Carbon Steel | | | Driller is adding a 13.9' section to casing started | | |
| casing added | to the | | | welding @ | 9:05 | |
| 45.8 | | | | completed welding (3 passes) | 9:55 | |
| 13.9 | | | | Driller starts driving adds 5 gals | 10:05 | |
| 59.7 | total casing length of 12" | | | Well is backed @ 13:30 -- some of the gravel sized clasts present. | | |
| | | | | | | |
| | 50'-52' | Hard Tool | Wet | SLIGHTY SILTY SLIGHTY GRAVELY SAND - Sample is made up of 5% gravels, 85% sand, & 10% silt size material. Gravels are coarse to very coarse sized pebbles that have been crushed by the hammer. Unaltered surfaces indicate that these clasts were rounded in shape. The composition of the gravel sized clasts is ~ 50% qtz rich material & 50% mafic. These clasts show no signs of calcium carbonate coatings. Sand are composed of 20% fine sand, 40% medium sand, 20% Coarse sand, & 5% very coarse sand. These sands are rounded to subangular in shape and are composed of 60% qtz rich mineral (w/ much m/m minerals [mica]) & | 11:43 | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000-021 (5-85)

8-B.2622

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| J.S. Wilbur | Cable Tool Rig #2 | 299-W18-24 | NA | RFH-1914 |
| Date: 5/29/87 | Depth: 50' To 50' | | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 59.7' | 50'-52 | Hard Tool | Wet | con. 40% mafic minerals. Silts & fines mak up 10% | | |
| | | | | sample. Wet sample color is 5Y 4/3 Olive, this is a | | |
| | | | | change in the color over the last sample. high silt content | | |
| | | | | may account for this. Sample a good reaction w/ 10% HCl | | |
| | | | | no moisture sample was collected. | | |
| | | | | | | |
| | | | | Stop drilling @ | 15:00 | |
| | | | | | | |
| | | | | | | |
| | | | | J.S. Wil 5/29/87 | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2623

| DRILL LOG | By J.S. Wilbur | Rig Cable Tool Rig #2 | Well Number 299-W18-24 | Computer Number NA | Project or Work Order No. KEH-1914 |
|---|---|---|---|---|---|
| | Date 6/1/87 | | Depth 55' To 55' | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 59.7 | | | | Driller is readressing the chisel and starting 2 | 5:50 | |
| | | | | Start drilling 2 | 8:55 | |
| | | | | | | |
| | 55'-56' | Hard Tool | Wet | SLIGHTLY SILTY GRAVELLY SAND - Sample is made up of | 9:50 | |
| | | | | 15% gravels, 70% sand, and 15% silt & fines. (Gravel) | | |
| | | | | 5% medium pebbles & 10% fine to very fine pebble sized | | |
| | | | | clasts. These clasts are composed of 35% qtz rich & m/m | | |
| | | | | materials & 65% mafic (basalt) materials. Clast shape | | |
| | | | | are subrounded to rounded based on unaltered surfaces. | | |
| | | | | (Sand) 10% very coarse sand, 10% coarse sand, 20% | | |
| | | | | medium sand, 20% fine sand, and 10% very fine sand | | |
| | | | | sized grains. These grains are composed of 40% mafic | | |
| | | | | materials & 60% qtz rich & m/m minerals & minerals | | |
| | | | | (mica). These grains are subangular & subrounded in | | |
| | | | | shape. Wet sample color of fines is 5Y 4/2 olive gray. | | |
| | | | | Dry sample color of fines is 5Y 7/2 light gray | | |
| | | | | Fines have a very weak reaction w/ 10% HCl | | |
| | | | | | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2624

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| J.S. Hilbur | Cable Tool Rig #2 | 209-bl13-24 | NA | LEH-1914 |
| Date: 6/1/87 | | Depth: 55' To 60' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Driller goes to get water @ 10:15 returns 10:40 | | |
| | | | | | | |
| | | | | Driller has been baling well to dry for 60' sample lots of | 13:20 | |
| | | | | fine sands and more silt than the driller thinks he added | | |
| | | | | After the baling the well has stopped producing silt. | | |
| | | | | | | |
| 59.7' of 12" Casing | 59'-60' | Hard Tool | Wet | SLIGHTY SILTY GRAVELLY SAND -- No difference in the thin | 13:45 | |
| | | | | sample when compared to 55' sample. | | |
| | | | | | | |
| | | | | Driller heads to pipe yard to look for 10" casing | 14:30 | |
| | | | | & drive shoe. | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

REMARKS:

J.S. Hil 6/1/87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-86)

8-B.2625

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| J.S. Wilbur | Cable Tool Rig #2 | 299-W15-54 | NA | RFI-19.4 |
| Date: 6/2/87 | | Depth: 60' To 60' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 59.7' | of 12" | Casing | | Driller in @ the [illegible] yard steam cleaning casing & drive | | |
| | | | | shoes for other drillers | 8:10 | |
| | | | | | | 59.7' |
| | | | | Driller returns @ 12:15 and [illegible] 10.5' Section 12" | 12:10 | 10.5' |
| 70.2' | of 12" | Casing | | Completes welding 12" casing @ | 13:20 | 70.2' total 12" |
| | | | | | | Carbon steel casing |
| | | | | Driller starts drilling | 13:26 | |
| | | | | Stops drilling @ | 15:00 | |
| | | | | no samples — | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5 85)

8-B.2626

| DRILL LOG | By J.S. Wilbur | Rig Cable Tool Rig #2 Ross Vance driller | Well Number 299-K118-24 | Computer Number NA | Project or Work Order No. KEH-194 |
|---|---|---|---|---|---|
| | Date 6/3/87 | | Depth 65' To 65' | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 70.2' of 12" casing | | | | Start drilling @ 7:30 | | |
| | CA'-65' | Hard Tool | Wet | SLIGHTLY GRAVELLY SAND - Sample contains 7% GRAVELS f 93% SANDS w/ a trace of silts. (Gravels) are made up of 5% very fine pebbles f 2% fine pebble sized clasts. These clasts based on unaltered surfaces are subrounded in shape. Clasts are composed of 95% mafics [basalt] f 5% qtz rich materials. (Sands) are made up of 3% very coarse sand, 5% coarse sand, 45% medium sand, 20% fine sand, f 20% very fine sand sized grains. These grains are subangular to subrounded in shape and are composed of 75% qtz rich f m/m materials and minerals [mica] w/ 25% mafic [basalt] materials. (Silts) make < 1% of the sample but are noted when sample. Wet sample color is 5Y 4/3 (olive) dry sample color is 5Y 6/2 (pale olive). Sample has a weak reaction w/ 10% HCl solution. There is a decrease in the grain size of this sample compared to 60' sample. | 8:40 | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B-2627

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| J.S. Wilbur | Cable Tool Rig #2 Russ Vance driller | 299-W18-24 | NA | RFH-1914 |
| **Date** 6/3/89 | **Depth** 65' To 70' | | | **Subcontract No.** NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 70.2' of 12" casing | | | | Driller is lubricating the rig & redressing the drill bit from 9:05-9:35 | | |
| | 70'-71' | Hard Tool | Wet | SAND - Sample contains 3% GRAVELS, 80% sands & 7% silts. (Gravels) are made up of 3% fine pebble sized clasts. These clasts are subrounded in shape and are composed of 97% mafic [basalt] material & 3% qtz rich material. (Sands) are made up of 5% very coarse sand, 10% coarse sand, 35% medium sand, 15% fine sand, & 15% very fine sand sized grains. These grains are angular to subrounded in shape and are composed of 90% qtz. rich & m/m materials & minerals [mica]. Silts make up 7% of the samples volume. Wet sample color is 5Y 4/2 (olive gray) the dry sample color is 2.5Y 7/2 (light gray). Sample has a moderate reaction w/ 10% HCl solution. There is a decrease grain size in this sample compaired to 65' sample; decrease gravel content and increase in silts. | 10:10 | At 10:10 the driller stops drilling to look for 10" casing & hammer drill bit. |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2628

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| J.S. Wilbur | Cable Tool Rig #2 Rose Vance | 299-W18-29 | N/A | REH-1914 |
| **Date** 6/3/89 | | **Depth** 70' To 70' | | **Subcontract No.** N/A |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Celiche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 70.2' | | | | Driller heads to the pipe yard to steam clean pipe and 10" drive shoe. Driller is changing over to 10" and will possibly also change to core barrel. | | |

REMARKS:

J.S. Wilbur 6/3/89

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2629

| DRILL LOG | By J.S. Wilbur | Rig Cable Tool Rig #2 Russ Vance | Well Number 299-W18-24 | Computer Number NA | Project or Work Order No. KEH-19A |
|---|---|---|---|---|---|
| | Date 6/4/87 | | Depth To | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Driller necking down to 10" casing from 12" casing | | |
| | | | | adds 21'3" of 10" carbon steel casing w/ drive shoe | | |
| | | | | adds 20'9" of 10" carbon steel casing | | |
| | | | | adds 21' of 10" carbon steel casing | | |
| | | | | adds 13' of 10" carbon steel casing | | |
| 76' 10" carbon steel casing | | | | 76 total of 10" casing added | | |
| | | | | Driller thinks that he maybe able to use a core barrel in these new sediments | | |
| | | | | J.S. Wilbur — 6/4/87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5 85)

8-B.2630

| DRILL LOG | By J.S. Wilbur | Rig Cable Tool Rig #2 Bass Vance | Well Number 299-W18-24 | Computer Number NA | Project or Work Order No. KEH-1914 |
|---|---|---|---|---|---|
| | Date 6/5/87 | | Depth 70' To 70' | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Driller arrives @ 7:20 and begains welding the last of | | |
| | | | | 10" carbon steel casing to the well from yesterday. The driller | | |
| | | | | changes from hard tool to core barrel based on previous samples | | Driller removes a silt |
| | | | | collected. The driller drives the casing to 70' depth, cleans | | lens from 73'-74' depth. |
| | | | | material out of 10" casing and starts drilling @ | 9:35 | |
| | | | | | | |
| | 75' | Core Barrel | Slightly Moist | Sand- Sample contains 90% sand and 10% silts, | 9:45 | The driller is 5' ahead |
| | | | | (Sand) is made up of 70% fine sand and 20% very fine | | of the casing. |
| | | | | sand sized grains. These grains are anglur to rounded in | | |
| | | | | shape and are composed of 80% qtz & qtz rich material, | | |
| | | | | 20% m/m materials & minerals (mica) w/ a trace mafics | | |
| | | | | (basalt) < 1%. Dry sample color is 2.5Y 7/2 (light | | |
| | | | | gray). The sample shows a moderate reaction w/ 10% | | |
| | | | | HCl solution. The sample is highly sorted & has uniform | | |
| | | | | texture. There is a decrease in the over all grain size of | | |
| | | | | the sample compared to the 70' sample. The sample | | |
| | | | | was unconsolidated when collected. A moisture sample | | |
| | | | | was collected. | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2631

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| T.S. Wilbur | Cable Tool Rig #2 Russ Vance | 299-W18-24 | NA | KEH-1914 |
| Date: 6/5/87 | | Depth: 80' To 90' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | 80' | Core Barrel | Slighty Moist | SLIGHTY SILTY SAND - Sample contains 80% sand and 20% silt. (Sands) are made up of 60% fine sand & 20% very fine sand sized grains. These grains are rounded to subrounded in shape and are composed of 80% qtz & qtz rich material, 20% m/m material including minerals (mica), w/ a trace < 1% matics (basalt). The dry sample color 2.5 y 7/2 (light gray). The sample is well sorted. There is an increase in the silt size fraction compaired to 75' sample. The sample was unconsolidated when collected. The sample has a strong reaction w/ 10% HCl solution. A moisture sample was collected. | 10:05 | |
| | 85' | Core Barrel | Slighty Moist | SLIGHTY SILTY SAND - No change in the sample compaired to 80' sample. A moisture sample was collected. | 10:35 | |
| | 90' | Core Barrel | Slighty Moist | SILTY SAND - Samples contains 75% sand & 25% silt. (Sands) are made up of 15% coarse sand, 15% medium sand, 25% fine sand, & 30% very fine sand sized grains. | 11:10 | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2632

| DRILL LOG | By J.S. Wilbur | Rig Cable Tool Rig #2 Russ Vance | Well Number 299-W18-24 | Computer Number NA | Project or Work Order No. KEH-1914 |
|---|---|---|---|---|---|
| | Date 6/5/87 | | Depth 90' To ~~100~~ 97' | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 76' | 90' | Core Barrel | Slightly Moist | con. These grains are subangular to round in shape & are composed of 80% qtz & qtz rich material, 15% m/m materials w/ minerals (mica), and 5% ~~ba~~ mafics (basalt). (Silts) make up 25% of the sample which is an increase in their volume over the 85' sample. The dry sample color is 2.5Y 6/2 (light brownish gray). The sample has good reaction to 10% HCl. Sample is moderately sorted - there is greater range of sand sizes w/in this sample compared to the 85' sample. A moisture sample was collected. | | |
| | | | | | | |
| | | | | Driller is adding an 8' section 10" to the casing, he | | |
| 84' of | 10" casing - | | | is 20' ahead of the casing. | | |
| | | | | | | |
| | 95' | Core Barrel | Slightly Moist | SILTY SAND - Sample contains 70% sand & 30% Silts | 1455 | |
| | | | | (Sands) are made up of 10% medium sand, 30% fine sand, & 30% very fine sand sized grains. These grains are sub- | | |
| | | | | round to rounded in shape & are composed of 80% qtz & | | |

REMARKS:

D - Drive Barrel . H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000-021 (5-85)

8-B.2633

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| J.S. Hillbur | Coble Tool Rig #2 | Z49-W18-24 | NA | REH-1919 |
| Date: 6/5/87 | Russ Vance driller | Depth: 95' To 95' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 84'0"10" | 95' | Core Barrel | Slightly Moist | Con. qtz rich material, 15% m/m materials including minerals (mica), and 5% mafics (basalt). (Silts) compose 30% of the sample. The dry sample color is 5Y 7/3 (pale yellow). The sample is moderately sorted. The silt content has increased over the 90' sample. The sample has slight to moderate reaction to 10% HCl solution. The sample was unconsolidated when collected. A moisture sample was collected. | | |
| | | | | Driller stops drilling @ 1305 —— | | |
| | | | | J. S. Hill 6/5/87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2634

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| J.S. Wilbur | Cable Tool | 299-W18-24 | NA | KEH-1914 |
| Date: 6/8/87 | Rig #2 Ross Vance | Depth: 91' To 99' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 92' of 10" carbon steel casing | | | | Driller adds a 8' section of 10" carbon steel casing to | | 84' of 10" casing |
| | | | | the well starting @ | 8:10 | 8' of 10" added |
| | | | | Measured the depth of the hole @ 97.4', a lost of | | 92' of 10" casing |
| | | | | 2.6' over the | | |
| | | | | | | |
| | | | | Driller starts drilling @ | 9:14 | |
| | | | | | | |
| | 91'-100' | Cable Tool | Slightly Moist | SILTY SAND - Sample contains 70% sand & 30% silts. | 9:30 | |
| | | | | (Sands) are made up of 2% coarse sand, 33% medium | | |
| | | | | sand, 33% fine sand, & 2% very fine sand. Mixed sized | | |
| | | | | sand grains. These grains are subround to rounded in shape | | |
| | | | | and are composed of 80% qtz & qtz rich materials, 15% | | |
| | | | | m/m materials & minerals (mica), and 5% mafics (basalt). | | |
| | | | | (Silts) make up 30% of the sample. Dry sample color is | | |
| | | | | 5Y 7/1 (light gray). The sample is well sorted and was | | |
| | | | | unconsolidated when collected. Sample has moderate reaction | | |
| | | | | to 10% HCl Solution. There is an increase in sand grain | | |
| | | | | size over the 95' sample. A moisture sample was collected. | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2635

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| J.S. Wilbur | Cable Tool Rig #2 Ross Vance drillers | 299-W18-24 | NA | KEH-1914 |
| Date: 6/8/87 | | Depth: 105' To 110' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 92' | 104'-106' | Core Barrel | Moist | SLITY SAND - Sample contains 70% sand & 30% silts. (Sands) are made up of 2% coarse sand, 40% medium sand, 28% fine sandsized grains. These grains are subrounded to rounded in shape and are composed of 80% qtz & qtz rich materials, 15% m/m materials & minerals (mica), and 5% mafics (basalt). (Silts) make up 30% of the sample. Dry sample color 5Y 7/1 (light gray). The sample is well sorted and was unconsolidated when collected. Sample has a moderate reaction to 10% HCl solution. This sample has an increase in the sand grain size and is slightly more uniform than the 100' sample. A moisture sample was collected. | 10:02 | |
| 100' of 10" casing | 10" Carbonsteel | | | Driller is adding a 8' section to the well, started @ Driller starts drilling @ 12:47 - | 10:55 | 92' of 10" casing<br>8' of 10" cacklad<br>100' of 10" casing |
| | 109'-111' | Core Barrel | Moist | SLITY SAND - Sample is the same as the 105' sample above no change in lithology | 13:20 | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5 86)

8-B.2636

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| J.S. Wilbur | Cable Tool Rig #2 Ross Vance driller | 299-W18-24 | NA | KEH-1989 |
| Date: 6/8/87 | | Depth: 112' To | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 100' of | 10" carbon steel | | | A change in lithology was noted @ 112' depth, material being removed from the was coarse grained reflecting an increase in the grain sized. | | Driller is having a hard time keeping material in the core barrel. |
| | ~112' | Core Barrel | Slightly Moist | SANDY GRAVEL - Sample contains 45% gravel and 54% sand, w/ a trace of silts. (Gravels) are made up of 10% coarse pebbles, 5% medium pebbles, and 30% fine to very fine pebble sized clasts. These clasts are subrounded to rounded in shape and are composed of 75% mafics & 25% qtz & qtz rich materials. (Sands) are made up of 20% very coarse sand, 15% coarse sand, 10% medium sand, 5% fine to very fine sand sized grains. These grains are subangular in shape and are composed of 60% mafics (basalt) & 40% qtz & qtz rich materials. There less than 1% silts in the sample, these may have been carried down in the open hole the driller is 12' ahead of the casing. Sample is poorly sorted and was unconsolidated when collected. The dry sample color is 5Y 7/1 | 14:30 | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2637

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| J.S. Wilbur | Cable Tool Rig #2 | 249-H18-29 | NA | |
| Date: 6/8/87 | Russ Vance driller | Depth: 112' To | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 100' | ~112' | Core Barrel | Slightly Moist | Con. (light gray). Sample has a moderate reaction w/ 10% HCl solution. A moisture sample was collected. There is dramatic increase in the grain size of this sample over the 110' sample | | |
| 100' of 10" Carbon Steel | | | | After adding the 100' of 10" carbon steel casing to the well | | Driller having a hard time keeping the sample material in the core barrel. Driller add ~25 gals of H2O to the well. |
| 8' of 10" " | | | " | | | |
| 108' total amount of carbon steel casing | | | | | | |
| | | | | Driller heads home @ 15:11 | | |
| | | | | J.S. Wilbur 6/8/87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2638

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| T.S. Wilbur | Cable Tool Rig #3 | 299-W18-24 | NA | KEH-1914 |
| Date: 6/9/87 | Ross Vance driller | Depth: 115' To 115' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 108' of 10" carbon steel casing — | | | | | | |
| | 114'-116' | Core Barrel | Moist | SANDY GRAVEL — Sample contains 65% gravels & 35% sands. (Gravels) are made up of 10% coarse pebbles, 25% medium pebbles, 15% fine pebbles, and 15% very fine pebble sized clasts. These clasts are subangular for coarse pebbles and subround to rounded for the medium through very fine pebbles. These gravels are composed of 90% mafics (basalt) and 10% qtz & qtz rich materials, (Sands) are made up of 10% very coarse sands, 10% coarse sands, 10% medium sands, and 5% fine sands sized grains. These grains are subround to rounded in shape and are composed of 60% mafics (basalt) and 40% qtz & qtz rich materials. The sample is moderately sorted and has no change in composition compared to 112' sample. Dry sample color is 5Y 7/1 (light gray). Sample has a moderate reaction w/ 10% HCl Solution | 11:00 | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2639

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| J.S. Wilbur | Cable Tool Rig #2 Rossi Reverse drill | 299-W18-24 | NA | KEH-1914 |
| Date: 6/9/87 | | Depth: 115' To 115' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 108' | 119'-115' | Core Barrel | Moist | A moisture sample was collected. | | |
| | | | | | | |
| | | | | continue on to next page for CCl4 air quality data collected @ the well. | | |
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REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (6-85)

8-B.2640

| DRILL LOG | By J.S. Wilbur | Rig Cable Tool Rig #2 Russ Vance driller | Well Number 299-W18-24 | Computer Number NA | Project or Work Order No. KEH-1914 |
|---|---|---|---|---|---|
| | Date 6/9/87 | | Depth 115' To 115' | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Carbon Tetrachloride ($CCl_4$) was detected @ the bore hole and near the drill rig by the geologest's nose @ 11:04. All personal were moved away & up wind of the well site and air quality samples were collected. Air quality samples for $CCl_4$ were made w/ a Bendix Qastec hand held sample pump & $CCl_4$ analyzer tubes. 5-60 ppm $CCl_4$ analyzer tubes were used for air quality measurements. The results of these measurements are listed below. Three measurements were made. | | Safty personal of PNL & KEH were informed of the $CCl_4$ problem and measurement readings. |
| | | | | Sample #1. read > 60 ppm $CCl_4$ w/ one 100cc volume stroke of the pump @ one foot depth inside the casing. | | |
| | | | | Sample #2. read > 60 ppm $CCl_4$ w/ one 50cc volume stroke of the pump @ one foot depth inside the well casing. | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2641

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| J.S. Wilbur | Cable Tool Rig #3 | 299-W18-24 | NA | KEH-1914 |
| Date: 6/9/87 | Ross Vance driller | Depth: 115' To 115' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Sample #3 read ~33 ppm CCl4 w/ one 50 cc volume stroke of the pump @ 5.5' above the ground surface at the well. | | additional samples taken 13:47 by myself & RHO safty personal Bill Shane @ the well w/in the working area. Sample #4 @ 50 cc volume Stroke @ 3' above well >60 ppm CCl4. RHO reading @ 5' and ten feet away was 15-20 ppm CCl4. |
| | | | | Note: that the 5-60 ppm CCl4 analyzer tubes are to have one 100 cc volume of air pass through them for measurement. The measurement made by sample #3 should be multiplied by 2 to determine the concentration @ 5.5' above the bore hole. That to 66 ppm CCl4 in the working environment of the geologest & the driller. | | |
| | | | | Driller went on stand by @ 11:05 because of the air quality problems | | |
| | | | | J.S. Will 6/9/87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2642

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| J.S. Wilbur | Cable Tool Rig #2 | 299-W18-24 | NA | KEH-1914 |
| **Date** | **Depth** | | | **Subcontract No.** |
| 6/10/87 | Russ Vance drilling | 115' To 115' | | NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Work shut down on the well because of carbon tetrachloride concentrations in the air around the well. | | |
| | | | | Driller & geologist take Rockwells mask & air quality training class during the afternoon. 1:00 - 2:45 - | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____Standing Water

A-6000-021 (5-85)

8-B.2643

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| T.S. Wilbur | Cable Tool Rig #2 | 299-W18-24 | NA | KEH-1914 |
| Date: 6/11/89 | Russ Vance driller | Depth: 115' To 115' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 108' | | | | Driller arrives w/ escort to well site @ | 7:20 | |
| | | | | | | |
| | | | | Well is measured for carbon tetrachloride — none was | | |
| | | | | detected. Driller get the OK to start work @ | 835 | |
| | | | | | | |
| 114' 3" | | | | Driller is welding a 6' 3" section of 10" casing to | | 108' |
| | | | | the well. | | 6.5 |
| | | | | | | 114.3" |
| | | | | Driller removes two core barrels w/ sediment in 8 | 1200 | |
| | | | | trays, changing over to hard tools. Sediments removed | | |
| | | | | are being cov up @ the site. Placed in drum no. 1. | | |
| | | | | | 1344 | Added 20 gal. $H_2O$. |
| | | | | | 1359 | Started drilling hard |
| | | | | | | tool. Driller says he |
| | | | | | | lost 5' of hole. |
| | | | | | 1407 | Added 5 gal. $H_2O$. |
| | | | | Tripd. bailing. No luck. No silt to make mud in hole. | 1450 | |
| | | | | | | |

REMARKS:

J V Lindsey 6-11-89

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5-85)

8-B.2644

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| T.S. Wilbur | Cable Tool Rig #2 | 299-W18 24 | NA | REH-1914 |
| Date: 6/12/87 | Ross Vance driller | Depth: 115' To | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Driller arrived @ 7:15 w/ escort @ the well site | | |
| | | | | | | |
| | | | | RHO personnel check the well for Cl's & found none — | | |
| | | | | Driller starts drill w/ hard to | 7:50 | adds 5 gal H2O |
| | | | | | | |
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REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (6-85)

8-B.2645

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| J.S. Wilbur | Cable Tool Rig # 2 | 299-W18-24 | NA | KEH-1919 |
| Date: 6/15/87 | Ross Vence driller | Depth: 115' To 115' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Driller ackls 8' section of 10" ~~carbon~~ casing | -- | |
| | | | | | | |
| | 119-121 | Hard Tool | Wet | GRAVEL - Sample contains 90% gravels ~~and~~ 5% sands and 5% | | S/L 1:40 |
| | | | | (GRAVELS) are composed of 10% course pebbles, 30% | | |
| | | | | medium pebbles, 40% fine pebbles, 15% very fine | | |
| | | | | pebble sized clasts. These clasts are highly altered | | |
| | | | | because of the hard tool, they are rounded to sub- | | |
| | | | | rounded in shape and are composed of 80% matic | | |
| | | | | (basalt) & 20% qtz rich materials (SANDS) | | |
| | | | | are composed of 2% very coarse sands, and | | |
| | | | | 3% coarse sand sized ~~per~~ grains. (Silts) make up | | |
| | | | | 5% of the sample. Dry sample color is 5Y 6/4 (gray), | | |
| | | | | Wet sample color is 5Y 4/3 (olive). The sample ~~contains~~ | | |
| | | | | was a strong reaction w/ 10% HCl solution. Sample | | |
| | | | | was unconsolidated upon collection | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2646

| DRILL LOG | By HARSH | Rig ONWARD #3 | Well Number 299-NJ18-24 | Computer Number N/A | Project or Work Order No. HEIT-1914 |
|---|---|---|---|---|---|
| | Date 6/17/87 | CABLE TOOL | Depth 120' to 129' | | Subcontract No. N/A |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 126'10" | of 10" | casing | | Driller is Russell Vance | 1100 | Began drilling |
| | 124-125 | H | W | SANDY GRAVEL. Sample consists of 1% CP, 24% MP, 25% FP, 10% VFP, 5% VCS, 15% CS, 10% MS, 5% FS. Sample is very poorly sorted. Gravel is composed of 65% basalt, 20% metamorphics, 15% other fragments. Sand is composed of 80% basalt, 10% qtz, 10% R.F. Gravel clasts are rounded to subangular (unbroken surfaces), sand grains are angular to subrounded (broken & unbroken surfaces). Wet color is 5Y 4/2 (olive gray); dry color is 5Y 6/2 (light olive gray). Weak HCl rxn on partly dried sample. Material is unconsolidated. Change from previous sample is unknown (no logs for previous samples in map board). 60% gravel, 35% sand, 5% silt. | 1215 | |
| | | | | | 1245 | Stopped drilling - added |
| 133' | of 10" | casing | | | | 6'2" of 10" casing. |
| | | | | End of day's drilling @ 129' | 1700 | |
| | | | | P.F.A. 6/17/87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5 85)

8-B.2647

| DRILL LOG | By: JLS Wilbur | Rig: Cable Tool Rig #2 | Well Number: 299-N18-29 | Computer Number: NA | Project or Work Order No.: KEH-1919 |
|---|---|---|---|---|---|
| | Date: 6/18/87 | Ross Vance | Depth: 130' To 130' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 133' of 10" casing | | | | Driller arrives @ drill site @ 7:15 w/ escort | | |
| | | | | | | |
| | 129-131' | Hard Tool | Wet | SANDY GRAVEL - Sample contains 75% gravels, 20% sand, and 5% silts. (Gravels) 5% coarse pebbles, 10% medium pebbles, 30% fine pebbles, and 30% very fine pebbles. The larger of these clasts have been altered, the medium through very fine pebbles are unaltered. Unaltered clasts are subangular in shape and are composed of 90% mafics (basalt) and 10% qtz & qtz rich materials. (Sands) are made up of 5% very coarse sands, 10% coarse sands, and 5% medium sands & silts grains. These grains are angular to subangular in shape and are composed of 95% basalt & 4% qtz rich materials w/ 1% caliche material. (Silts) make up 5% of sample volume. Dry Sample color is 2.5Y 6/2 (light brownish gray) wet 2.5Y 4/2 (dark grayish brown). Sample has a moderate reaction to 10% HCl Solution. | 10:00 | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5 85)

8-B.2648

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| J. S. Wilbur | Cable Tool Rig #2 | 249-N18-24 | NA | KEH-1914 |
| Date: 6/18/87 | Ross Vance driller | Depth: 135' To 135' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Driller notes a change in the lithology – @ 132' | | |
| | | | | depth, the hammer isn't moving as fast. | 10:30 | |
| | | | | | | |
| | 134'-136' | Hard Tool | Wet | SILTY SAND - The sample contains 60% sands and | 10:50 | |
| | | | | 40% Silts. (Sands) are made up of 5% very | | |
| | | | | coarse sands (possible drill cuttings), 15% fine sands, | | |
| | | | | 40% very fine sands sided grains. These grains are | | |
| | | | | subangular in shape and are composed of 90% qtz | | |
| | | | | & qtz rich materials w/ m/m minerals (mica). (Silts) | | |
| | | | | make up 40% of the sample volume. The silt | | |
| | | | | fraction contains 15% clay sized materials. Dry | | |
| | | | | sample color is 5Y 7/3 (pale yellow), Wet sample | | |
| | | | | color is 5Y 5/4 (olive). The sample has a strong | | |
| | | | | reaction to 10% HCl solution. These sample has a | | |
| | | | | decrease in the grain size compaired to the 130' | | |
| | | | | sample - more sands & silts no gravels. The sample | | |
| | | | | color has become lighter & has a stronger reaction | | |
| | | | | w/ 10% HCl Solution than the 130' sample. | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000 021 (5-85)

8-B.2649

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| J.S Kilbur | Cable Tool Rig #2 | 299-H18-24 | N/A | RFH-1914 |
| Date: 6/18/87 | Ross Vance driller | Depth: 140' To 145' | | Subcontract No.: N/A |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | | | |
| 143' 5" of 10" casing | | | | Driller adds a 10'5" section of 10" carbon steel casing | | 133' " |
| | | | | to the well. Start @ | 12:05 | 10 5 / 143 5" |
| | | | | End @ | 12:50 | |
| | | | | | | |
| | 139'-141' | Hard Tool | Wet | SILTY SAND - No change in lithology this sample is | 13:05 | Very hot drilling |
| | | | | the same as 135' sample - | | in the silts & sands. |
| | | | | | | |
| | 144'-146' | Hard Tool | Wet | SILTY SAND - Sample contains 60% sands and 40% | 13:25 | |
| | | | | silts. (Sands) are made up of 20% fine sands and | | |
| | | | | 40% very fine sands. These grains are angular to | | |
| | | | | sub rounded in shape 50% qtz rich materials, 30% | | |
| | | | | mafics (basalt), and 20% caliche material. Silts | | |
| | | | | are 40% of the sample volume, clays make up | | |
| | | | | 20% of the silt fraction. Dry sample color is 5Y 7/8 | | |
| | | | | (pale yellow), wet sample color is 5Y 5/4 (olive). Sample | | |
| | | | | has a very strong reaction w/ 10% HCl solution. | | |
| | | | | | | |

REMARKS:

— $CCl_4$ detected @ the well — measured @ >60 ppm — 13:30
@ 4' away & up from the well. —

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5-85)

8-B.2650

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| J.S. Wilbur | Cable Tool Rig #2 | 299-W18 24 | NA | KEH-1914 |
| Date: 6/18/87 | Ross Vance driller | Depth: 150' To 150' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 143' | 5" of 10" casing | | | The driller and the geologest have gone to fresh air | 14:35 | |
| | | | | lines because of the CCl4 concentrations (15ppm) | | |
| | | | | @ the well site. This action has been ordered by | | |
| | | | | Rockwell air quality monitoring personal - Bill Shane. | | |
| | | | | | | |
| | 149'-150' | Hard Tool | Wet | SANDY GRAVEL - Sample contains 75% gravels, 25% | 14:59 | |
| | | | | sand, and 5% silts. (Gravels) are made up of 5% | | ← 105 %? |
| | | | | coarse pebbles, 20% medium pebbles, 25% fine pebbles | | |
| | | | | and 25% very fine pebble sized clasts. These | | |
| | | | | clasts have been altered by the hammer, unaltered | | |
| | | | | surfaces of clasts indicate the clasts to have | | |
| | | | | been subrounded to rounded in shape. Gravels are | | |
| | | | | composed of 75% qtz & qtz rich materials and | | |
| | | | | 25% mafics (basalts). (Sands) are made up of | | |
| | | | | 2% coarse sands, 3% medium sands, 10% fine | | |
| | | | | sands, and 10% very fine sand sized grains. | | |
| | | | | These grains are angular to subangular in shape | | |
| | | | | and are composed of 30% mafics (basalts), 30% qtz & | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000 021 (5-85)

8-B.2651

| DRILL LOG | By J.S. Wilbur | Rig Cable Tool Rig #2 | Well Number 299-W18-24 | Computer Number NA | Project or Work Order No. REH-1914 |
|---|---|---|---|---|---|
| | Date 6/18/87 | Russ Vance driller | Depth 150' To 152' | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | 149'-151' | Hard Tool | Wet | cont. qtz rich materials, and 30% caliche material, (Silts) make up 5% of the sample volume there is some clay sized materials in the silts. Dry sample color is 5Y 7/2 (light gray), wet sample color is 5Y 4/4 (olive brown). The sample is highly reactive w/ 10% HCl solution. This sample reflects a lithologic change compaired to the 145' sample. There is a increase in the grain size and a big larger volume of these materials present in the sample. | | Driller is not wearing his mask @ all times in the zone, I've warned him of the reasons & needs for wearing the mask. drill rate has dropped - harder materials — |
| | | | | Driller Stops drilling @ 17:00 — Surveied out! | | |
| | | | | J. Scott Wilbur — 6/18/87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000-021 (5-85)

8-B.2652

| DRILL LOG | By GV LAST | Rig CABLE TOOL #2 | Well Number 299-W18-24 | Computer Number NA | Project or Work Order No. KEH-1914 |
|---|---|---|---|---|---|
| | Date 6-19-87 | Russ Vance | Depth 154' To 160' | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 153' 10" of 10" | casing. | | | S.R. MOORE (RHO-RES. PROTECTION) MEASURED $CCl_4$ AT WELL HEAD AT ~15 ppm, WITH DRAGER TUBE. | 1300 | |
| +6' 5" | | | | | 1410 | ADDED 6'5" OF 10". |
| 160' 3" of 10" | casing. | | | | | TOTAL = 160' 3". |
| | | | | | 1433 | DROVE CASING TO ~156' (2' ADDED) STARTED DRILLING. |
| | | | | | 1500 | BAILED WELL & ADDED 4 GAL. $H_2O$. ADDED 2 more. |
| | 154-156' | H | WET | SANDY GRAVEL; 10% M. PEBBLE, 20% F. PEBBLE, 30% VF. Pebble, | 1520 | |
| | | | | 5% VCS, 10% CS, 10% MS., 3% FS, 2% VFS, 10% SILT. GRAVELS | 1535 | CRAWFORD OF RHO |
| | | | | ARE 70% BASALTIC, 20% Yellow Quartzites, 10% White Quartzite | | RES. PROTECTION MEASURED |
| | | | | GRANITES & others. SAND IS 40% BASALTIC, 60% QUARTZ RICH. | | $CCl_4$ AT WELL HEAD AT |
| | | | | GRAVELS ARE CRUSHED. UNBROKEN SURFACES ARE ROUNDED. SAND | | 5/3 × 10 ppm or ≈ 17 ppm. |
| | | | | IS SUBROUNDED TO SUBANGULAR. WET COLOR IS OLIVE GRAY | | |
| | | | | (5Y 4/2). DRY COLOR IS LT. OLIVE GRAY (5Y 6/2). REACTION | | |
| | | | | TO 10% HCl is very strong. Formation is well consolidated; IT | | |
| | | | | DRILLS VERY SLOW AND STAYS OPEN. MATERIAL IS SAME AS ABOVE | | |
| | | | | EXCEPT NO CALICHE CHUNKS WERE NOTED IN THIS SAMPLE. | | |
| | | | | | 1630 | ADDED 6 GAL. $H_2O$. |

REMARKS:

G.V. Last 6-19-87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5-85)

8-B.2653

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| LAST | CABLE TOOL #2 | 299-W18-24 | NA | KEH-1914 |
| Date: 6-19-87 | RUSS VANCE | Depth: 152' To 154' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 143' 5" | of 16" | | | CHECKED WELL HEAD FOR CARBON TET. W/BENDIX PUMP | 08:20 | DRILLER WENT ON |
| | | | | AND DETECTOR TUBE. READING W/1 PUMP WAS | | FRESH AIR. |
| | | | | >60 ppm. S.R. MOORE OF ROCKWELL RESPIRATORY | | |
| | | | | PROTECTION MEASURED WITH DRAGER TUBE AT >50 ppm | | |
| | | | | WITH ONLY 3 pumps instead of the normal 5 PUMPS. THAT | | |
| | | | | CALCULATES TO $\frac{5}{3} \times 50$ OR >83 ppm. | | |
| 10' 5" | | | | | 1000 | Added 10' 5" of 16" |
| 153' 10" | of 10" casing. | | | | | casing. Total = 153' 10" |
| | | | | | 1020 | Drove pipe. Pipe very loose |
| | | | | | | went down extremely easy (Opened hole) |
| | | | | | | STARTED DRILLING. ADDED |
| | | | | | | ~7 GAL. $H_2O$. DRILLING SLOW! |
| | | | | S.R. MOORE OF RHO-RES. PROT. MEASURED $CCl_4$ levels at approx | 1040 | ADDED 4 GAL. $H_2O$ |
| | | | | 15 ppm at the well head. | | |
| | | | | | 1150 | BAILED WELL AND ADDED 4 GAL. $H_2O$. |
| | | | | | 1214 | ADDED 6 GAL. $H_2O$. |
| | | | | | 1220 | ADDED 5 GAL. $H_2O$. 154' |
| | | | | | 1240 | STARTED DRILLING @ MARKING |
| | | | | | | NO PROGRESS (BOULDER?) |
| | | | | | | DRILLING RATE < 1'/hr. |

REMARKS:

6-19-87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2654

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| GV LAST | CABLE TOOL #2 | 299-W18-24 | NA | KEH-1714 |
| Date: 6-19-87 | RUSS VANCE | Depth: 160' To 160' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | 159-160' | H | WET | SAND; 5% VF. PEBBLE, 5% VCS, 35% CS, 35% MS, 10% FS, 5% VFS, 15% SLT & CLAY. GRAVELS ARE 60% BASALT, 40% OTHER. SAND IS 70% QUARTZ & OTHER AND 30% BASALT. GRAVELS ARE BROKEN AND PROBABLY WERE CAPPED DOWN. SAND IS SUBROUNDED. WET COLOR IS 2.5Y 4/2, DK. GREYISH BROWN. DRY COLOR IS 2.5Y 6/2, LT. BROWNISH GREY. REACTION TO 10% HCl IS MODERATE. FORMATION IS POORLY CONSOLIDATED. DRILLING RATE REALLY PICKED UP. DRILLER THINKS CONTACT IS AT 159! | 1700 | ← 110%? |

REMARKS:

G V Last 6-19-87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5 85)

8-B.2655

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| J.S. Wilbur | Cable Tool Rig #2 | 299-N18-24 | NA | KEH-1914 |
| Date 6/22/89 | Russ Vance driller | Depth To | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Driller arrives @ drill site w/ escort @ 7:20 | | |
| | | | | Driller waiting for carbon tetrachloride measurement – | | |
| | | | | Measurement taken – No $CCl_4$ detected @ all | | |
| | | | | Driller changes over to 8" casing from 10" – | | |
| | | | | Driller adds 21' 4" section of 8" w/ drive shoe | | |
| | | | | 20' 9" Section of 8" | | |
| | | | | 20' 11" Section of 8" | | |
| | | | | 20' 11" Section of 8" | | |
| | | | | 20' 10" Section of 8" | | |
| | | | | 20' 10" Section of 8" | | |
| | | | | 126 15" | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5-85)

8-8.2656

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| J.S. Wilbur | Cable Tool Rig #2 | 299-W18-24 | N/A | KEH-1914 |
| Date: 6/23/87 | Russ Vance driller | Depth: 165 To 165 | | Subcontract No.: N/A |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 153' 10" of 10" casing | | | | Driller arrives @ the well site w/ escort @ | 7:20 | — |
| | | | | Rockwell air quality personal monitored the site for $CCl_4$ @ 10-15 ppm. The driller working @ the well has to be on air today. | 8:10 | |
| | | | | [redacted] | | No $CCl_4$ detected @ the well @ 12:30, driller off supplied air. |
| | | | | Driller mock up — for welding operation — Driller adds 20' 11" section of 8" casing Driller adds 20' 10" section of 8" casing | | |
| | 164'LL' | Hard Tool | Wet | SAND- Sample contains 97% sand and 3% silts. (Sands) are made up of 30% coarse sands, 30% medium sands, 30% fine sands, and 7% very fine sand sized grains. These grains are sub angular to sub rounded in shape and are composed of 60% qtz & qtz rich material w/ m/m materials & minerals (mica). Sand moderately well sorted. Silts make up 3% of the | 16:15 | |

REMARKS:

O - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____Standing Water

A-6000-021 (5-85)

8-B.2657

8-B.2658

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| J.S. Wilbur | Cable Tool Rig | 299-W18-24 | NA | KEH-1914 |
| Date: 6/23/87 | Ross Hunce drill | Depth: 165 To | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | 164'-164 | Hard Tool | Wet | Cont. sample volume. Wet silt color is 2.5Y 4/2 | | |
| | | | | (dark grayish brown) and dry silt color is | | |
| | | | | . Sample has a weak reaction w/ 10% | | |
| | | | | HCl solution. Note a volatile sample was collected. | | |
| | | | | | | |
| | | | | Driller adds 10' 2" section of 8" casing | | |
| | | | | | | 10' 2" |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
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| | | | | | | |
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| | | | | | | |
| | | | | | | |
| | | | | | | |

REMARKS:

D - Drive Barrel · H - Hard Tool · L - Large · M - Medium · S - Small · VC - Very Coarse · C - Coarse · F - Fine · VF - Very Fine · ____ Standing Water

A-6000-021 (5-85)

| DRILL LOG | By J.S. Wilbur | Rig Cable Tool Rig #2 | Well Number 299-W18-24 | Computer Number NA | Project or Work Order No. KEH-1914 |
|---|---|---|---|---|---|
| | Date 6/24/87 | Ross Vance | Depth 170' To 170' | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Well is check for CCl4 by the geologest @ 7:20 no detectable CCl4 noted. | | |
| | | | | Driller starts work @ 7:20 | | |
| | | | | Rockwell air quality monitors measure well for CCl4 no detectable CCl4 measured. | 8:15 | |
| | | | | | | Driller has a hard |
| | 169'-171' | Hard Tool | Wet | SANDY GRAVEL — Sample contains 80% gravels and 20% sands; note much H2O has been added to the hole & the silt fraction may have been removed. (Gravels) are highly altered by the hammer bit, they are made up of 3% very coarse pebbles, 7% coarse pebbles, 20% medium pebbles, 20% fine pebbles, and 20% very fine pebble sized clasts. The unaltered surfaces of these clasts indicate that these clasts were subrounded to rounded in shape. Clasts are composed of 70% qtz & qtz rich materials and 30% mafics (basalt). | 14:20 | time keeping H2O in the hole — has added 30 gals |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2659

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| T.S. Wilbur | Cable Tool Rig #2 | 299-W18-24 | NA | KEH-1919 |
| Date: 6/24/87 | Ross Vance driller | Depth: 170 To 171 | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | 169-171' | Hard Tool | Wet | Cont (Sands) are made up of 5% very coarse sands, 10% coarse sands, and 5% medium sands sized grains. These grains are subangular to subrounded in shape and are composed of 80% qtz & fgth rich materials w/ 20% mafic. Sample does not have a uniform color to it. No reaction w/ 10% HCl solution. The sample has been modified by the hard tool bit little can be said about it orginal sorting. | | |
| | | | | Rock well monitoring stops by @ 1500 to measure CCl4 none detected @ all. | | |
| | | | | Driller leaves @ 1630 - hrs first aid course | | |
| | | | | T.S. Wilbur 6/29/87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000-021 (5-85)

8-B-2660

8-8.2661

| DRILL LOG | By J.S. Kilbur | Rig Cable Tool Rig #2 | Well Number 299-W18-24 | Computer Number NA | Project or Work Order No. KEH-1919 |
|---|---|---|---|---|---|
| | Date 6/25/87 | Russ Vance | Depth 175' To 175 | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | Driller arrives w/escort at well site @ | 7:15 | |
| | | | | Geologist check well out for CCl4 – none detected @ | 7:20 | |
| | | | | Driller starts drilling @ | 7:25 | |
| | | | | | | driller adds - H2O. |
| | | | | Rock well air quality personal monitor the well for CCl4, | | 20 gals, 5 gal |
| | | | | none is detected @ all. | | |
| | | | | | | |
| | 174'-176' | Hard Tool | Wet | SLIGHTY SILTY SANDY GRAVEL - Sample contains | 9:52 | |
| | | | | 50% gravels, 30% sands, and 20% silts & clays - | | |
| | | | | (Gravels) are made up of 10% medium pebbles, 20% | | |
| | | | | fine pebbles, and very fine pebble sized clasts. These | | |
| | | | | clasts have been altered by the hammer, unaltered | | |
| | | | | clasts surfaces indicate that the gravels were subrounded to | | |
| | | | | rounded in shape. Clasts are composed of 75% mafics | | |
| | | | | and 25% qtz rich materials. (Sands) are made up | | |
| | | | | of 5% very coarse sands, 5% coarse sands, 15% | | |
| | | | | medium sands, and 5% fine sand sized grains. These | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| J.S. Wilbur | Cable Tool Rig #2 | 299-W18-24 | NA | KEH-1919 |
| Date: 6/25/89 | Ross Vance driller | Depth: 195' To 180 | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | 174'-176' | Hard Tool | Wet | Cont. grains are subangular to angular in shape and are composed of 60% qtz & qtz rich materials & 40% mafics. (Silts & Clays) make up about 20% the sample volume, 15% Silts & 5% clays. Wet sample color is 2.5Y 4/4 (olive brown), dry sample color is 2.5Y 7/2 (light gray). Sample has no reaction w/ 10% HCl solution. The sample is some what sorted, but the hammer action of drilling has altered the sample. | | |
| | | | | | 10:41 | Driller notes much easier drilling. |
| | | | | Tyler Gilmore take over logging @ 13:22 — | | |
| | 179-180 | H | W | SLIGHTLY SILTY SANDY GRAVEL: 50% Gravels, 35% Sands, and 15% Silts; Gravels contain 5% C pebble, 10% M pebble, 15% F pebble and 10% V Fine pebble, Sands contain 5% VCS, 5% CS, 10 MS, 10 FS, 5% UFS, 15% Silts Subrounded to Subangular grains, Sample contain large number of fragmented grains from drill bit; Poor Sorting | 13:25 | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2662

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| T Gilmore | Cable tool 2 | A99 W18 24 | N/A | KEH 1914 |
| Date: 6/25 | | Depth: 180 To 185' | | Subcontract No.: N/A |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | Cont. | Gravels contain 80% Basalts and 20% silica-rich grains incl red brn chert and qtz; Sands contain 75% Basalts and 25% Silica-rich grains, Wet color 2.5 y 4/4 (olive brown), Dry color is 2.5Y 7/2 (light gray); No rxn in HCl; Sample very similar to previous sample | | |
| | 185' | H | Wet | SLIGHTLY SILTY SANDY GRAVEL: 60% Gravel 25% Sand 15% Silt — Gravel: 10% CP, 20% MP, 15% FP, 15% VFP Sand: 5% VCS, Tr CS, 5% MS, 10% FS, 5% VFS, 15% Silt Poor Sorting; Gravels contain 85% Basalt, 15% Silica-rich grains Sands contain 85% Basalt and 15% Silica-rich grs; Subround to Subangular; many grains Fragmented from drill bit, Wet color 2.5 y 4/4 (dk brn) Dry color 2.5 Y 7/4 (lt gy) no rxn in HCl Sample contains slightly more gravel than previous sample | 1405 | |
| | | | | | 1635 | Stopped Drilling |

REMARKS: TD 189' 6/25/87 TGilmore
Footage 16'

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2663

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| T Gilmore | Cable tool #2 | 299 W18 24 | NA | REH 1914 |
| Date: 6/26/87 | | Depth: 189' To 194' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | 50ppm Carbon Tetrachloride detected by Rockwell | 815 | 50ppm Carbon Tet. |
| | | | | monitor at well head driller to go on air. | | wetted casing 21' of 8" |
| | 190 | H | Wet | SANDY GRAVEL 65% Gravel, 30% Sand, 5% Silt | 1015 | |
| | | | | Tr M pebble, 20% Fpebble, 45% VFpebble, 5% vcs, | | |
| | | | | 10% cs, Tr MS, Tr Fs, 5% VFs, 5% Silt, Poorly Sorted, | | |
| | | | | Gravels contain 60% Silica-rich grains and 40% Basalts; | | |
| | | | | Sands contain 70% Silica-rich grains and 30% Basalts; | | |
| | | | | Wet color 2.5Y 3/2 (vdk grysh brn) Dry color 2.5Y 5/2 | | |
| | | | | (grysh brn); Subangular, majority of grains fragmented from | | |
| | | | | Drill bit; Sample contains less silts and fines than previous | | |
| | | | | sample. | | |
| | | | | | 1215 | 5 gal $H_2O$ added |
| | | | | | 1240 | 10 gal $H_2O$ added |
| | | | | Rockwell monitor measured 50ppm Carbon Tetrachloride coming | 1330 | |
| | | | | from wellhead between the 8" and 10" casing; no Carbon | | |
| | | | | Tet. measure from inside 8" (10" goes to approx 1160' and | | |
| | | | | 8" is now at 195') | 1540 | 10 gal $H_2O$ added |
| | | | | | 1600 | Shutdown for day |

REMARKS:

6/26/87 TD 194'
Footage 5'
$H_2O$ added 25gal
Total casing ? 21'-0" of 8" added 6/26/87 T Gilmore

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2664

# DRILL LOG

By: T Gilmore
Date: 6/29/87
Rig: cable tool #2, Russ Univ. driller
Well Number: 299 W18 24
Depth: 194' To 600
Computer Number: NA
Project or Work Order No.: KEH 1914
Subcontract No.: NA

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Rockwell monitor did not detect $CCl_4$ at well head | 0800 | |
| | 195' | H | Wet | SILTY SANDY GRAVEL: 50% Gravel, 35% Sand, 15% Silt; | 0920 | |
| | | | | 5% M pebble, 15% Fine pebble, 30% VF pebble, 5% VCS; | | |
| | | | | 10% CS, 10% MS, 5% FS, 5% VFS, 15% Silt; poor sorting, | | |
| | | | | Gravels contain 65% silica-rich grains (incl cht, qtz, ; pt granit) | | |
| | | | | 35% Basalt grains; Sands contain 75% silica-rich grs w/ | | |
| | | | | 25% Basalt; Subrounded, much of the sample, however, is | | |
| | | | | fragmented from drill bit; slight rxn in HCl; moderately | | |
| | | | | consolidated, Sample contains more silts and also coarser | | |
| | | | | gravels than previous sample W color 2.5Y 4/4 olv brn | | |
| | | | | | 1200 | Stopped drilling |
| | 200' | H | Wet | SILTY SANDY GRAVEL 60% Gravel, 20% Sand, 20% Silt, | 1230 | |
| | | | | 10% M pebble, 20% F pebble, 30% VF pebble, 5% VC Sand, 5% C Sand, | | |
| | | | | 10% MS, Tr FS, T VFS, 20% Silt; Poor sorting, | | |
| | | | | Gravels contain 60% silica-rich, 40% Basalt; Sands | | |
| | | | | Contain 75% silica-rich, 25% Basalts; V-fragmented | | |
| | | | | Subang - subrd, no rxn HCl; Dry color 2.5Y 6/2 lt brn gry | | |
| | | | | Wet C 2.5 4/4 olv brn Sample contains more silts, less gravels | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-8000-021 (5-85)

8-B.2665

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| T Gilmore | Cable tool #3 | 299 W18 24 | NA | ETH 1914 |
| Date: 6/29/87 | | Depth: 200 To 205 | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | 205' | H | wet | SANDY GRAVEL 60% Gravels, 30% Sands, 10% Silt | 1400 | |
| | | | | Gravels 10% MP, 25% FP, 30 VFP; Sands 10% VCS | | |
| | | | | 5% C, 10% MS, 5% F-UF, 30% Silt; Gravel contains | | |
| | | | | 60% Silica-rich, 40% Basalt, Sands Contain 80% silica-rich (mica) | | |
| | | | | 20% Basalts; angular - subangular; no rxn HCl; | | |
| | | | | Wet color 2.5 Y 4/2 (olive brn Dry) 2.5Y 7/6 (lt brn gy) | | |
| | | | | Sample contains less silt and more silica minerals | | |
| | | | | 1st apperance of mica | | |

REMARKS: 6/29/87 TD 209' Footage 15' Jeffrey Gilmore

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000 021 (5-85)

8-B.2666

| DRILL LOG | By T.S. Kilbur | Rig Cable Tool Rig #2 | Well Number 299-W18-29 | Computer Number NA | Project or Work Order No. PEH 914 |
|---|---|---|---|---|---|
| | Date 6/30/87 | Ross Vance | Depth 210' To 215' | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Driller arrives w/ escort @ the well site 7:10 - | | |
| | | | | Rockwell air quality personal measured 60 ppm $CCl_4$ @ the well @ 7:30 - Driller on air. - | | $CCl_4$ measured in the 8" casing |
| | 209-211' | Hard Tool | Wet | GRAVELEY SILTY SAND: 20% Gravel, 60% Sand 20% Silt; Tr Mpebble, 10% Fpebble, 10% VF pebble, 10% VCS 15% CS, 15% MS, 10 FS, 10% VFS, 20% Silt, moderately-poor sorting; Gravels contain 75% Silica-rich grains (incl q/z, pk granite, metamorphics) and 25% Basalt; Sands contain 80% Silica-rich grains and 20% Basalt (no mica observed) Subangular to subrounded; Wet Color 2.5Y 4/2 (dk gybrn), dry color 2.5Y 6/2 (ltbrn gy) No rxn in HCl. Sample contains more silt than last sample; no mica | 0900 | |
| 219'4" | of 9" | Total casing. | | Recap of 8": 21' 4"; 20' 9"; 20' 11"; 20' 10"; 20' 10"; 20' 11"; 20' 10"; 10' 2"; 21' 8"; 20' 10" | 0910 | Welding casing 21' 10" of 8" casing |
| | | | | | 1030 | 20gal $H_2O$ added |
| | | | | | 1055 | 10gal $H_2O$ added |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2667

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| T Gilmore | Cable tool #2 | 299 W18 24 | NA | KEH 1914 |
| Date: 6/30/87 | Russ Vance driller | Depth: 215' To 216' | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | 214-215 | H | Wet | SLIGHTLY SANDY GRAVEL: 70% Gravel, 25% Sand, 5% Silt | 1135 | |
| | | | | 5% C pebble, 5% m pebble, 40% F pebble, 20% VF pebble, | | |
| | | | | 5% VCS, 5% CS, 5% MS, 5% FS, 5% VFS, 5% Silt; | | |
| | | | | Moderately Sorted; Grains contain 80% Siliceous, 20% Basalt; | | |
| | | | | (Siliceous grs incl qtz, pt granite, chert, metas) Pebbles contain | | |
| | | | | 85% Siliceous, 15% Basalts; Subrounded, most of sample | | |
| | | | | is fragmented from drill bit; Wet color 5Y 4/2 (olv gy), Dry color | | |
| | | | | 5Y 6/2 (lt olv gy); No rxn in HCl; Sample contains more gravels | | |
| | | | | and much less sands & silt than previous sample | | |
| | | | | | 1140 | Shut down to fill |
| | | | | | | water drums |
| | | | | Rockwell monitor found 50+ ppm $CCl_4$ between 9" & 10" | 1240 | |
| | | | | Casing, Inside 8" was clean | | |
| | | | | | 1315 | 10 gal $H_2O$ added |
| | | | | | 1400 | 10 gal $H_2O$ added |
| | | | | Water level measurement taken | 1430 | 10 gal $H_2O$ added |
| | | | | depth to water 214' 6" approx 1½' of water (water in | 1435 | Bailing hole |
| | | | | hole is most likely driller's water & not formation water) | | |

REMARKS: 6/30/87 TD 216' Total casing 219' 4" of 8" Tyler Gilmore
Footage 7' water added 30 gal

D - Drive Barrel · H - Hard Tool · L - Large · M - Medium · S - Small · VC - Very Coarse · C - Coarse · F - Fine · VF - Very Fine · ____ Standing Water

A-6000-021 (6-85)

8-8.2668

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| T Gilmore | Cabletool #2 | 299 W18 24 | NA | KEH 1914 |
| Date 7/1/87 | Russ Hinz Drlr | Depth 216' To | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Depth to Water 212' (E-tape, from ground level) | 0750 | |
| | | | | Driller did not show; no drilling | | |

REMARKS:

7/1/87 T Gilmore

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-8.2669

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| J.S. Wilbur | Cable Tool Rig 2 | 29-N18-29 | NA | KEH-1914 |
| Date: 7/2/87 | Russ Vance | Depth: To | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | No drilling today — | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2670

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| S. Teel | Cable Tool #2 | 297 W15 84 | NA | KEH - 1914 |
| Date: 7-7-87 | Russ Vance | Depth: ≈222? To 226 | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Water level 210' 3" (E tape, ground level) | 0745 | |
| | | | | | 0800 | Began drilling |
| | | | | | | Added a column of |
| | | | | | | water. |
| | | | | | 1115 | Trying to bail |
| | | | | | | sample but rocks |
| | | | | | | keep plugging flap. |
| | | | | | | Drilling down a little |
| | | | | | | more then will try |
| | | | | | | again. |
| | 225' | H | Wet | SANDY GRAVEL 10% MP, 20% FP, 10% VFP, Trace VCS, | 1230 | Took awhile to get |
| | | | | 30% CS, 20% MS, 7% FS, 3% VFS, Trace silt. | | sample because hole |
| | | | | Poorly sorted. (Gravels) 60% qtz + qtz-rich; 40% | | kept caving. |
| | | | | basalt. (sand) 85% qtz, 15% basalt and other. Gravels | 1510 | Lost all water from |
| | | | | appear to be rounded, sands are sub-angular to rounded. | | hole - shut down to |
| | | | | Wet color: 5Y 4/2 (olive gray), Dry color: 5Y 7/2 | | get water truck |
| | | | | (light gray) to 5Y 6/2 (lt olive gray). No reaction to 10% HCl | 1340 | Started drilling |
| | | | | Consolidated. | 1400/1430 | Stopped/started |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000 021 (5-85)

8-B.2671

8-B.2672

| ORILL LOG | By S. Teel | Rig Cable Tool #2 Russ Hanke | Well Number 299-W18-24 | Computer Number NA | Project or Work Order No. KEH-1914 |
|---|---|---|---|---|---|
| | Date 7-7-87 | | Depth 226 To 226 | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Added 10'2" of 8" casing on 7/2 or 7/1 | | After "lost water" |
| 229'6" of 8" | | | | | | hole caved in - had |
| | | | | | | to drill it back out |
| | | | | | | |
| | | | | | 1700 | End of day |
| | | | | | | |
| | | | | | | |
| | | | | | | |
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| | | | | | | |
| | | | | | | |
| | | | | Steve Teel | | |
| | | | | 7-7-87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000 021 (5-85)

| DRILL LOG | By S. Teel | Rig Cable Tool #2 | Well Number 299 - W18-24 | Computer Number | Project or Work Order No. KEH-1914 |
|---|---|---|---|---|---|
| | Date 7-8-87 | Rues Vance | Depth 226 To 230 | NA | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Water level measured at 204'6" | 0740 | |
| | | | | (may not be accurate - driller says there is a plug in | | |
| | | | | the hole) | | |
| | | | | | 0750 | began drilling |
| | | | | 0 ppm Carbon Tetrachloride measured by Westinghouse | 0820 | |
| 229'6" | | | | Safety. | | |
| + 10'5" | | | | Added 10'5" of 8" casing | 0850 | Stopped - welding |
| 239'11" | of 8" | casing | | | 1020 | Started |
| | 230' | H | Wet | SANDY GRAVEL. Trace MP, 20% FP, 10% VFP, | 1045 | |
| | | | | 10% VCS, 15% CS, 30% MS, 10% FS, 5% VFS, | | |
| | | | | Trace silt and clay. Very poorly sorted. (Gravel) - | | |
| | | | | 75% qtz and qtz-rich, 25% basalt and other. | | |
| | | | | (sand) - 85% qtz, 15% basalt and other. Gravels | | |
| | | | | appear to be rounded (too broken-up to tell for sure); sands | | |
| | | | | are angular to rounded. Wet color: 5Y 4/2 (olive gray) | | |
| | | | | Dry color: 5Y 7/2 to 5Y 6/2 (light gray to lt. olive gray). | | |
| | | | | No reaction to 10% HCL. Consolidated. Sample is fairly | | |
| | | | | representative. Similar to previous sample except slightly more sand / less gravel. | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5 85)

8-B.2673

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| S. Teel | Cable Tool #2 | 299-W18-24 | NA | KEH-1914 |
| Date: 7-6-87 | Russ Vance | Depth: 230 To 240 | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 239' 11" of 8" | | | | | 1230 | Total water added |
| | | | | | | today so far ≈ 100 gal |
| | | | | | 1300 | added 25 gal |
| | | | | | 1340/1345 | stopped / started |
| | 235' | H | Wet | SANDY GRAVEL 15% MP, 25% FP, 25% VFP | 1415 | |
| | | | | 10% VCS, 7% CS, 5% MS, 3% FS, 10% VFS, | 1420 | Added 25 gal |
| | | | | silt, and clay. Very poorly sorted. (Gravel) - | | |
| | | | | 85% qtz and qtz-rich; 15% basalt and other. | | Drill rate ≈ 1.6 ft/hr. |
| | | | | (sand) - 80% qtz, 20% basalt. Gravels are too | | |
| | | | | broken-up to tell roundness; sands are angular to sub- | 1455 | Stopped |
| | | | | rounded. Wet color: 5Y 4/3 (olive); Dry color: | 1545 | Started |
| | | | | 5Y 7/2 (light gray). No reaction to 10% HCL. | | Added 25 gal |
| | | | | Consolidated. More gravel and silt / less sand than | | |
| | | | | previous sample. | | |
| | | | | | 1700 | End of day |
| | | | | Steve Teel | | |
| | | | | 7-8-87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5.85)

8-B.2674

| DRILL LOG | By S. Teel | Rig Cable Tool #2 Rus | Well Number 299-W18-24 | Computer Number NA | Project or Work Order No. KEH-1919 |
|---|---|---|---|---|---|
| | Date 7-9-87 | | Depth 240 To 240 | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | E-tape water level measured at 211.8 | 0705 | |
| | | | | Depth to bottom = 239.5 | 0815 | |
| | | | | Westinghouse safety measured Carbon Tetrachloride | 0840 | |
| | | | | concentration between 5 to 10 ppm between the | | |
| | | | | 8 and 10" casing. Driller on air. | | |
| | 240 | H | Wet | SANDY GRAVEL. 10% MP, 25% FP, 15% VFP, 15% | (from end of day yesterday) | |
| | | | | VCS, 20% CS, 10% MS, 5% FS, VFS, silt, and | | |
| | | | | clay, very poorly sorted. (Gravel) - 90% qtz and | | |
| | | | | qtz-rich, 10% basalt. (sand) - 85% qtz, | | |
| | | | | 15% basalt and other. Gravels appear to be rounded | | |
| | | | | but are too broken-up to tell. Sands are angular to | | |
| | | | | sub-rounded. Wet color: 5Y 5/3 (olive), Dry | | |
| | | | | color 5Y 7/2 (light gray). No reaction to 10% | | |
| | | | | HCL. Consolidated. Similar to previous sample. | | |
| | | | | | | |
| | | | | Geophysical logger (Vern) arrives to log well | 0845 | |
| 239'11" | of 8" | total | | Logging complete | 1020 | |
| | | | | | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5 85)

8-B.2675

| DRILL LOG | By S. Teel | Rig Coble Tool #2 | Well Number 299-W18-24 | Computer Number | Project or Work Order No. KEH-1914 |
|---|---|---|---|---|---|
| | Date 7-9-87 | Russ Vance | Depth Completion To | NA | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Bailing out well | 1030 | |
| | | | | Bailed 3 bailer volumes but hole is starting to cave — | 1055 | |
| | | | | — have lost about 5" so will stop bailing and go ahead | | |
| | | | | and set screen and stainless. | | |
| | | | | Depth to bottom measured at 238' | | |
| | | | | Setting 4" stainless steel and screen — | 1100 — | |
| | | | | 10 x 20' casing | | |
| | | | | 1 x 10' " | | |
| | | | | 1 x 20' 4" screen | | |
| | | | | 1 x 10' 5" screen | | |
| | | | | | | |
| | | | | All wells put on standby by the State | 1545 | |
| | | | | screen pulled out of hole and laid out | | |
| | | | | | | |
| | | | | Steve Teel | | |
| | | | | 7-9-87 | | |
| | | | | | | |
| | | | | | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5 85)

8-B.2676

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| S. Teel | Cable Tool #2 Russ Vance | 299-W18-24 | NA | KEH-1914 |
| **Date** 7-10-87 | | **Depth** Completion To | | **Subcontract No.** NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 289'11" of 8" | | | | Depth to bottom = 237'10" | 1445 | |
| | | | | Setting temporary 8" telescoping screen | 1500 | |
| | | | | (10'3" long) | | |
| | | | | Depth to bottom = 237'7" | 1515 | |
| | | | | Depth of casing = 238'4" | | |
| | | | | Need to raise casing 10'3" | | |
| | | | | Welding on drive head | 1520 | |
| | | | | Pulling casing | 1600 | |
| | | | | End of day - pulled 5½" | 1700 | |
| | | | | | | |
| | | | | | | |
| | | | | Steve Teel | | |
| | | | | 7-10-87 | | |
| | | | | | | |
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| | | | | | | |
| | | | | | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5 85)

8-B.2677

| DRILL LOG | By S. Teal | Rig Cobb Tool #2 | Well Number 27S-W18-29 | Computer Number | Project or Work Order No. KEH-1914 |
|---|---|---|---|---|---|
| | Date 7-10-87 | Russ Vance | Depth Completion To | NA | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | E-tape water level measured at 212.2' | 0814 | |
| | | | | Still waiting on word from the State on whether a pump test can be done. Completion on hold. | | |
| | | | | Note: When assembling stainless steel screen (4") and preparing to put down hole (yesterday), mineral oil was used at the joint between the 20' and 10' section. Also, a few grease smudges were found on the outside of the screen from contact by dirty gloves in handling. Screen was not put down hole and did not come in contact with groundwater. Screen is now laid out beside well with the stainless casing. Will steam clean before use. | | |
| | | | | Driller on standby | 0700 - 1100 | |
| | | | | Performed straightness test - passed O.K. (showed 29'7" of water) | 1100 | |
| | | | | Received O.K. to set temporary screen for pump test | 1330 | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (6 85)

8-B.2678

tape 2'F"

| DRILL LOG | By S. Teel | Rig Cable Tool #2 Russ Vance | Well Number 299-W18-24 | Computer Number NA | Project or Work Order No. KEH-1914 |
|---|---|---|---|---|---|
| | Date 7-13-87 | | Depth Completion To | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 239'11" of 8" | | | | | 0715 | Driller arrives |
| | | | | | 0800 | Standby - waiting |
| | | | | | | for steel tape |
| | | | | Westinghouse safety measures Oppm $CCl_4$ | 0815 | |
| | | | | E-tape water level = 210.25 | 1000 | |
| | | | | Depth to bottom (steel tape) = 238'2" | 1030 | |
| | | | | Pulled total of 8'6" of casing. | | |
| | | | | top of screen = 227'11" | | |
| | | | | depth of casing = 229'10" | | |
| | | | | overlap = 1'11" | | |
| | | | | | | |
| | | | | | 1115 | cutting off casing |
| | | | | Cut off 8' 7" piece of 8" casing | | |
| | | | | Bailing rate = 8-9 gal/min | 1350 | Began bailing |
| | | | | Depth to water (e-tape) = 210.25 | 1500 | (Stopped bailing for |
| | | | | | | about 7 min) |
| | | | | | 1550 | Stopped for about 10 min, |
| 231'4" of 8" casing | | | | | 1700 | End of day |

REMARKS:

Steve Teel
7-13-87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6001 021 (5-85)

8-B.2679

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| S.P. AIRHART | CABLE TOOL | 299-W18-24 | NA | KEH-1914 |
| Date: 7-14-87 | #3 | Depth: NO DRILLING To | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Waiting for aquifer test | | |
| | | | | SP Airhart 7-14-87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S Small VC Very Coarse C Coarse F Fine VF Very Fine ____ Standing Water

A 6000 021 (5 85)

8-B.2680

8-B.2681

| DRILL LOG | By: S P AIRHART | Rig: CABLE TOOL #2 | Well Number: 299-W18-24 | Computer Number: NA | Project or Work Order No.: KEH-1014 |
|---|---|---|---|---|---|
| | Date: 7-15-87 | | Depth: NO DRILLING To | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Set 5", 15 h.p. submersible pump | | |
| | | | | intake ~ 233' | | |
| | | | | partially assemble discharge pipe (4") | | |
| | | | | - had to go to town to pick up | | |
| | | | | 4" - to - 8" coupling | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | SP Airhart 7-15-87 | | |
| | | | | | | |
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REMARKS:

D - Drive Barrel H - Herd Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

Page 1 of 1

| DRILL LOG | By T.S. Kilbur | Rig Cable Tool Rig 2 | Well Number 299-W18-24 | Computer Number NA | Project or Work Order No. K511-1914 |
|---|---|---|---|---|---|
| | Date 7/16/87 | Russ Vince | Depth Completion To | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Driller on Standby for $H_2O$ analysis work | | |

REMARKS:

D - Drive Barrel H Hard Tool L Large M Medium S Small VC Very Coarse C Coarse F Fine VF Very Fine ____ Standing Water

A 6000 021 (5-85)

8-B.2682

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# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| J.S. Hilbur | Cable Tool Rig 2 | 29-N18-29 | NA | 2611-1919 |
| **Date** 7/17/87 | Ross Vance | **Depth** Completion Hole | | **Subcontract No.** NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Running aquifer pump test all day. | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-8000-021 (5-85)

8-B.2683

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| T.S. Wilbur | Cable Tool Rig | 299-W13-21 | NA | RFH-19.4 |
| Date 7/20/89 | Ross Vance | Depth TD To | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Driller arrives @ 7:05 by exit | | |
| | | | | Ross & Homer are removing the pump from the well. | | |
| | | | | They are to steam clean it and the column pipe before | | |
| | | | | setting it in well 299-W15-18. | | |
| | | | | | | |
| | | | | finish pulling pump @ | 10:00 | — |

REMARKS:

D - Drive Barrel H - Hard Tool L Large M Medium S Small VC Very Coarse C Coarse F - Fine VF - Very Fine Standing Water

A 6000 021 (5 85)

8-B.2684

Page 1 of

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| J.S. Kilbur | Cable Tool Rig #1 - Ross Maier | 299-W18-24 | NA | REH-1914 AVL |
| Date 7/21/87 | | Depth 237'4" To | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Driller helping set up aquifer test @ 299-W15-18 | 7:40 – | 10:00 |
| | | | | D/B of well @ 237'4" below ground surface (GS) | 10:15 | |
| | | | | D/H2O @ 210'2" below GS | 10:17 | |
| | | | | 27' of H2O in the hole (need 30' of screen) | | |
| | | | | | | |
| | | | | Driller adds 1/3 bag of 20/30 sand D/B 235'6" GS | 10:24 | |
| | | | | | | |
| | | | | Driller installs 30' of 20 slot screen | | |
| | | | | | | |
| | | | | Centralizer 20' above screen | 1110 | |
| | | | | Run Stainless steel pipe in hole | 1115 | |
| | | | | Pipe in hole | 1400 | |
| | | | | Take top joint off to pull casing easier | 1415 | |
| | | | | added 4 3/4 bags Sand Sandpack up to 224'6" | 1450 | |
| | | | | Weld head on to pull casing | 1500 | |
| | | | | Pulled casing ~ 3' | | |
| | | | | added 2 bags Sand (210'6" Sandpack) | 1600 | |
| | | | | Pulled casing ~ 11' exposing 219'4" casing weld | 1640 | Shut down 1650 |

REMARKS:

7/21/87

7 bags Sand added

casing 219'4" total in hole

Sand level 210'6" (bottom casing pulled)

J Kilbur

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2685

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| S.P. AIRHART | CABLE TOOL | 299-W18-24 | NA | KEH-1914 |
| Date: 7-22-87 | # 2 | Depth: NO DRILLING To | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Driller arrives | 0705 | |
| | | | | Checked D/B from land surface: 216.5' | 0835 | |
| | | | | Added 3 bags of 20-30 mesh Colorado Silica | 0850 | |
| | | | | Sand. D/B = 203.5' | | |
| | | | | Welded pull-head on | 0900 | |
| | | | | Pulled 8" casing to 206.5' | 1000 | |
| | | | | D/B = 108' | | |
| | | | | Added 3.5 bags of 20-30 mesh Col. silica sand | 1025 | |
| | | | | D/B = 194' | | |
| | | | | Welded on pull-head | 1055 | |
| | | | | Pulled 8" casing to 196.5' | 1120 | |
| | | | | D/B = 198.2' (top of sandpack) | 1145 | |
| | | | | Added 4½ buckets of Volclay® Pellets; D/B = 191.6' | 1205 | > NOTE: 3½ hrs. |
| | | | | Started setting 1½" tremie pipe | 1530 | |
| | | | | Set 189' of 1½" tremie | 1600 | |
| | | | | Shut Down | 1700 | |
| | | | | S.P. Airhart 7-22-87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2686

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| S.P. AIRHART | CABLE TOOL | 299-W18-24 | NA | KEH-1914 |
| Date: 7-23-87 | # 2 | Depth: NO DRILLING To | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Driller arrived | 0725 | |
| | | | | Mud truck arrived @ site | 0810 | |
| | | | | Added 5 gals of $H_2O$ to hydrate pellets | 0820 | |
| | | | | Mixed 12 bags of Volclay grout & 12 bags initiator | 0830 - | 0950 |
| | | | | w/ 300 gallons $H_2O$ (1ST batch 200 gallons - 9.4 lbs/gal; | | |
| | | | | 2nd batch 100 gallons 9.3-9.4 lbs/gal). Slurry | | |
| | | | | was pumped down hole. D/B = 9' from ground | | |
| | | | | surface. | | |
| | | | | Began pulling 8" casing | 1015 | |
| | | | | At approx. 1300 hrs. - the "ear" supporting the | 1300 | hrs. |
| | | | | 8" casing broke off - the casing fell w/ the | | |
| | | | | top @ ~ 27' below ground surface. There is | | |
| | | | | ~ 131' of 8" that fell. | | |
| | | | | Attempting to fish casing out of hole | | |
| | | | | Shut Down | 1700 | |
| | | | | S.P. Airhart 7/23/87 | | |
| | | | | | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2687

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| T Gilmore | Cable Tool # 2 | 27S W18 24 | NA | KE 4 10/4 |
| **Date** 7/24/87 | Duss Vance | **Depth** Completion To | | **Subcontract No.** N/A |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Driller at Driller/Geologist meeting | 700 | |
| | | | | Fishing for 8" casing lost down hole | 725 | |
| | | | | Still fishing at quiting time, some progress made | 1650 | |
| | | | | | | |
| | | | | Hook used for fishing broke off twice leaving a small | | |
| | | | | amount of Iron in the grout | | |
| | | | | | | |
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REMARKS: 7/24 T Gilmore

D - Drive Barrel H - Hard Tool L Large M - Medium S Small VC Very Coarse C Coarse F Fine VF Very Fine ____ Standing Water

A-6000-02 (10-85)

8-B.2688

| DRILL LOG | By T Gilmore | Rig Cable Tool #2 | Well Number 299 WIF 24 | Computer Number n/a | Project or Work Order No. AEN 1914 |
|---|---|---|---|---|---|
| | Date 7/28/87 | Russchure | Depth ~~Depth~~ To | | Subcontract No. n/a |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | 8" casing fished out of hole 1705 7/27/87 | | |
| | | | | Began to pull casing | 750 | |
| | | | | Welder broken down went to look for replacement or repair | 825 | |
| | | | | Pulling casing | 900 | |
| | | | | All 8" casing out of hole (pulled 162' today) | 1310 | |
| | | | | Run 4" Bailer in hole to see if stainless steel casing damaged after fishing for 8" casing that was stuck previously. | 1520 | |
| | | | | - Some mud was dropped inside 4" Stainless As the last of the 8" casing was pulled, a plug of mud that was trapped in pipe, pulled off cap of stainless steel and then mud dropped back inside Stainless (cap was recovered) | | |
| | | | | - As the 4" bailer was run in stainless it encountered mud at 40'. Mud then bailed 2 times | 1340 | |
| | | | | - 4" bailer (20' long) Encountered some resistance possible damage in stainless steel pipe | 1400 | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5 85)

8-B.2689

| DRILL LOG | By JS, Wilbur | Rig Cable Tool Rig 2 | Well Number 299-W18-29 | Computer Number NA | Project or Work Order No. K811-1914 |
|---|---|---|---|---|---|
| | Date 7/27/87 | Ross Vance | Depth Completion Work | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Attempting to fish out 8" carbon steel casing that was dropped down the well. | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC Very Coarse C Coarse F Fine VF Very Fine ____ Standing Wate:

A 6000.021 (5-85)

8-B.2690

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| T Gilmore | Cable tool #3 | Jam 1-18 24 | NA | KEH 1010 |
| Date 7/28/87 | Rig Thurse | Depth Complete for JO | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Bail Stainless casing w/ 4" bailer | 1630 | |
| | | | | Encountered mud 96' (3rd Trip) | | |
| | | | | Encountered mud at 102' (4th Trip) | | |
| | | | | Bailed total (3) 5gal buckets of Grout from inside Stainless | 1702 | |
| | | | | Depth to Grout pending 176' outside pipe | | |
| | | | | (10" casing is at 165' .·. ~30' open hole) | | |
| | | | | Bailed (1) 5gal bucket Grout (5th 6th trips) | 1706 | |
| | | | | | | |
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REMARKS: Casing pulled 167' of 8" casing

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5 85)

8-B.2691

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| J.S. Wilbur | Rig # 2 | 399-N18-24 | NA | KEH-1914 |
| Date 7/29/87 | Russ Vance | Depth NO DRILLING To | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Lenny Bultena & Russ Vance are working @ the well today. | 7:00 | |
| | | | | D/B inside the 4" SS casing is at ~185' measured w/ the dart bailer on the sand line, 4" is filled w/ volclay | | |
| | | dart bailer | | A 5' section of rebar is welded on to the end of the dart bailer. The smaller diameter rebar should be able to penitrate the bottom if its volclay grout. | 8:00 | |
| | | 5' Section of Rebar | | The modified bailer does not penitrate past the 185' depth. | 8:37 | |
| | | | | Driller desides to swedge the hole out, rigging up tool | 9:00 | |
| | | | | Drillers reach the 205' depth in 4" SS @ 11:35 w/ the swedge tool. | | |

REMARKS:

D Drive Barrel H - Hard Tool L Large M Medium S Small VC Very Coarse C Coarse F Fine VF Very Fine ____ Standing Water

A 6000 021 (5 85)

8-B.2692

| DRILL LOG | By: S.P. AIRHART | Rig: CABLE TOOL #2 | Well Number: 299-W18-24 | Computer Number: NA | Project or Work Order No.: KEH-1914 |
|---|---|---|---|---|---|
| | Date: 7/29/87 | | Depth: NO DRILLING To | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Lenny Bultena was able to penetrate to bottom of 4" stainless w/ 3" - 20' dart bailer - sandpack & muddy water comes out of each bail. Will continue to bail & clean grout out. | 1500 | |
| | | | | S.P. Airhart 7/29/87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2693

pg 1 of 1

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| T Gilmore | Cable Tool #2 | 299 W18 84 | NA | REL 1710 |
| Date: 7/30/87 | Russ Vance | Depth: Completion To | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Driller arrives at Driller's location | 700 | |
| | | | | Bailing 4" Stainless to clean mud out | 720 | |
| | | | | Bailed all day | 1650 | |
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REMARKS:

7/30/87 T Gilmore

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-8000 021 (5 85)

8-B.2694

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| T Gilmore | Cable Tool #1 | 299 W/18 24 | NA | KEH 1914 |
| Date: 7/31/87 | Russ Ware | Depth: Completion To | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Driller arrives at Driller's meeting. | 7(?) | |
| | | | | Steam cleans scrubber To clean 4" Stainless steel casing | 7(?) | |
| | | | | Bailing and Scrubbing 4" Stainless steel casing | | |
| | | | | Bailing water is essentially free of grout | 0950 | |
| | | | | D/B = 234.9' | | |
| | | | | Shut Down between ~ 11:00 - 13:00 due to | | |
| | | | | activities @ E-plant. | | |
| | | | | quit bailing. $H_2O$ appears silty w/ ~ 1 cup | 1450 | |
| | | | | of fine sand and sand pack per bail. | | |
| | | | | Instructed driller we would put T.V. camera | | |
| | | | | down hole Monday a.m. | | |
| | | | | Checked depth-to-grout between 4" and 10" | 1500 | |
| | | | | ~ 167' - Hard to tell w/ steel tape. Lots | | |
| | | | | of grout on wall of casing. | | |

REMARKS:

S.P. Arbeit 7/31/87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2695

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| S.P. AIRHART | CABLE TOOL | 199-W18-24 | NA | KEH-1914 |
| Date: 8-3-87 | # 2 | Depth: NO DRILLING To | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Geophysical logger arrived - Eric Jensen | 0805 | |
| | | | | Examined 4" s.s. casing w/ T.V. camera. | | |
| | | | | Noticed dents between 185' - 194' (@ the | | |
| | | | | top of the 20' section above the screen - | | |
| | | | | below the centralizer) | | |
| | | | | Examined 4" s.s. casing using 3-armed | | |
| | | | | caliper. Caliper arms close only ~ ¼" in dented | | |
| | | | | region. | | |
| | | | | Logger departed | 1014 | |
| | | | | Hauling 8" casing away from site | | |
| | | | | Cleaning drill stem | | |
| | | | | Setting 147' of 1½" tremie pipe | 1450 | |
| | | | | Mixed 16 bags of Volclay grout and 16 bags | | |
| | | | | initiator w/ ~400 gals $H_2O$. Slurry density = 9.4 lbs/gal | | |
| | | | | D/B = 52' | 1615 | |
| | | | | Working on 10" pull-head | 1650-1700 | |
| | | | | S.P. Airhart 8/3/87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ..... Standing Water

A 6000-021 (5-85)

8-B.2696

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| GILMORE/AIRHART | CABLE TOOL #2 | 299-W18-24 | NA | KEH-614 |
| Date: 8/4/87 | | Depth: Completion To | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Driller @ drillers meeting | 0700 | |
| | | | | Welding 10" pull-head | 0720 | |
| | | | | Depth to grout = 53.5' | | |
| | | | | Pulled 10" casing to 123'7" | 1650 | |
| | | | | Will grout in morning | | |
| | | | | S.P. Airhart 8/4/87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000.021 (5-85)

8-B.2697

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| J.S. Hilbur | CABLE TOOL #2 | 299-W18-24 | NA | KEH-1914 |
| Date: 8-5-87 | | Depth: Completion To | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Driller arrives @ location waiting to grout well before pulling | 9:00 | |
| | | | | Mud truck arrives @ well | 9:50 | |
| | | | | | | |
| | | | | Mixed 200 gals. $H_2O$ w/ 8.5 sacks of volclay grout (wt. ~9.3) | | |
| | | | | and ackled to the well. Depth to grout ~40' from | | |
| | | | | the top of the casing. | | |
| | | | | | | |
| | | | | Drillers deside to mix 200 gals $H_2O$ w/ 8.5 sacks of | | |
| | | | | volclay grout to place down the hole. Grout over | | |
| | | | | flows the casing, as a result grout goes down the | | |
| | | | | hole. Approximently 150 gals were not used. | | |
| | | | | | | |
| | | | | Driller is bailing Stainless steel out. | | |
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REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-86)

8-B.2698

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| J.S. Wilbur | Rig #2 | 299-N18-24 | NA | KEH-1919 |
| Date 8/6/87 | Russ Vance | Depth Completion Work To | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Driller arrives @ 7:00 – | 7:00 | |
| | | | | Well (4" Stainless casing) is inspected to that volclay | 7:30 | |
| | | | | has been removed. | | |
| | | | | | | |
| | | | | Driller back pulls 13 ' of 10" carbon steel casing | 7:40 to | 9:40 |
| | | | | from the well. | | |
| | | | | | | |
| | | | | Volclay grout added to 12" carbon steel casing – | 10:00 | |
| | | | | mixed 200 gals w/ 8½ sacks of volclay grout. | | |
| | | | | mixed 100 gals w/ 4 sacks of volclay only used | | |
| | | | | 50 gals of grout. | 11:50 | |
| | | | | | | |
| | | | | Driller back pulls 13'10" of 12" carbon steel casing | 12:35 to | 16:40 |
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REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-8000-021 (5-85)

8-B.2699

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| AIRHART | CABLE TOOL #2 | 299-W18-24 | NA | KEH-1914 |
| Date: 8-7-87 | | Depth: COMPLETION To | | Subcontract No.: NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Has pulled 12" casing to 43', D/grout = 33' | 0900 | |
| | | | | Has pulled 12" casing to 32', D/grout = 36.5' | 1100 | |
| | | | | Set 21' of 1½" tremie pipe | 1105 | |
| | | | | Mixed ~5 bags Volclay grout & 4 bags initator w/ | 1135 | |
| | | | | 100-125 gallons of $H_2O$. Slurry density 9.3-9.4 lbs/gal. | | |
| | | | | Pumped slurry down hole. D/grout = 15' | | |
| | | | | Mixed 3 4½ bags Volclay grout & 3 4 bags initator w/ | 1200 | |
| | | | | 100 gals $H_2O$. Slurry density 9.4 lbs/gal. Only | | |
| | | | | pumped 75 gals down hole. D/grout = +1' above | | |
| | | | | ground surface. | | |
| | | | | Has pulled 12" casing to 30'8". | 1315 | |
| | | | | Has pulled 12" casing to 18'10" | 1535 | |
| | | | | Pulled remaining 12" casing out of hole. | | |
| | | | | D/B ~ 10' (used mirror) | 1720 | |
| | | | | | | |
| | | | | | | |
| | | | | S.P. Airhart 8/7/87 | | |
| | | | | | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5-85)

8-B.2700

| DRILL LOG | By AIRHART | Rig CABLE TOOL | Well Number 299-W18-24 | Computer Number NA | Project or Work Order No. KEH-1914 |
|---|---|---|---|---|---|
| | Date 8-10-87 | #2 | Depth COMPLETION TO | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Mixed 6 bags of Volclay grout & 6 bags | 0900 | |
| | | | | initiator w/ 150 gals $H_2O$. Slurry density | | |
| | | | | ~ 9.4-9.5 lbs/gal ~ pumped & poured (w/ | | |
| | | | | 5 gal. bucket) slurry down hole. D/grout = 1.5' | | |
| | | | | D/W from ground surface = 210.25' | 0925 | |
| | | | | Pulled 16" starter casing out of hole | 1010 | |
| | | | | D/grout = 2.7' | 1015 | |
| | | | | Mixed 5 bags of pre-mix concrete & ½ | 1400 | |
| | | | | bag Portland cement. Poured surface seal. (0'-2.7') | | |
| | | | | Bailed using 3" dart bailer | 1500 - 1640 | |
| | | | | Starting to tear down rig | 1695 | |
| | | | | SP Airhart 8/10/87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000-021 (5-85)

8-B.2701

| DRILL LOG | By AIRHART | Rig CABLE TOOL #2 | Well Number 299-W18-24 | Computer Number NA | Project or Work Order No. WEH-1914 |
|---|---|---|---|---|---|
| | Date 8-11-87 | | Depth COMPLETION To | | Subcontract No. NA |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Resumed tearing down rig | 0700 | |
| | | | | Moved rig over to steam clean | 1000 | |
| | | | | S.P. Airhart 8/11/87 | | |

REMARKS:

D Drive Barrel H Hard Tool L Large M Medium S Small VC Very Coarse C Coarse F Fine VF Very Fine ____ Standing Water

A-6000 021 (5-85)

8-8.2702

8-B-2703

| DRILL LOG | By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|---|
| | Date | | Depth To | | Subcontract No. |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
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| | | | | Dried in Bed | | |
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REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000.021 (5-85)

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| Date | | Depth To | | Subcontract No. |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
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REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5 85)

8-8-2704

| DRILL LOG | By R. Vance | Rig White | Well Number 27-18-24 | Computer Number | Project or Work Order No. |
|---|---|---|---|---|---|
| | Date 5-20-87 | 2 IV | Depth To | | Subcontract No. KCH 1 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
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REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____Standing Water

A-6000.021 (5-85)

8-8-2705

8-B.2706

# DRILL LOG

By: R. Vance | Rig: White 22W | Well Number: #299-W18-24 | Computer Number: | Project or Work Order No.:
Date: 5-21-87 | Depth: 0 To 15' | Subcontract No.: KEH-1914

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | ~~Drill~~ Time | Drilling Comments |
|---|---|---|---|---|---|---|
| ~~2"~~ | | 0 | 5 | Fill + small gravels | 3 | 15 Ft. |
| 10'6" | | 5 | 10 | Black sand + fine gravels | | |
| surface pipe | | 10 | 15 | " | | |
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| | | | | | 8 lbs | Russ |
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REMARKS: ½ hr. washing surface pipe & shoe

D - Drive Barrel | H - Hard Tool | L - Large | M - Medium | S - Small | VC - Very Coarse | C - Coarse | F - Fine | VF - Very Fine | Standing Water

A-6000-021 (5-85)

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| R. Vance | White 22W | 297-W18-24 | | |
| Date: 5-22-87 | | Depth: 15' To 28' | | Subcontract No.: KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Rem Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 21'6" | | 15 | 20 | Black sand + fine gravels | 3 | 13 Ft. |
| 10'7" / 32'1" | | 20 | 25 | 11 | 8 | 32 Ft. |
| | | 25 | 28 | Black sand | | |
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| | | | | | 8 hrs. | Russ |
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REMARKS: Helped Homer Rig up

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-8-2707

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| R. Vance | White | -94-417-24 | | |
| Date | | Depth | | Subcontract No. |
| 5-26-77 | 12 W | 28' To 35' | | KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 7' | | 28 | D | Black sand | 3 | 7 Ft. |
| | | 30 | D | " | 8 | 7 Ft. |
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| | | | | | 2 hr. | Russ |
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REMARKS: Drill line broke - pulled rest up socket

5/26/77

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000.021 (5-85)

8-B.2708

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| R. Vance | White 2214 | 297-W18-24 | | |
| Date 5-27-87 | | Depth 35' to 40' | | Subcontract No. KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 7' | | 35' | 40' | Gravels, small cobbles, brown sand (Dry) | 3 | 5 Ft. |
| | | | | | 8 | 7 Ft. |
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| | | | | | 8 hrs. | Russ |
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REMARKS: Hard to drive & keep in barrel 4.S.W. 5/28/87

O - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-8-2709

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| R. Vance | White 2-IV | EPT 1112-24 | | |
| Date 7-28-87 | | Depth 40' To 47' | | Subcontract No. KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | 40 | 45 | Clay and gravels | 3 | 7 Ft. |
| | | 47 | 47 | " " | | |
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| | | | | | 8 hrs. | Ru 3 |
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REMARKS: Changed to Hard tools J.V.V. 5/28/87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ___ Standing Water

A 6000 021 (5 85)

8-8.2710

# DRILL LOG

By: R. Vance | Rig: Idaho 22 IV | Well Number: 29-W18-24 | Computer Number: | Project or Work Order No.:
Date: 5-29-87 | Depth: To | Subcontract No.: KEH-1914

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | 47' | 54' | Cemented gravels & sand | 3 | 7 Ft. |
| 13'11" | | | | | 8 | 13'11" |
| | | | | | | |
| To 12" Casing 60' | | | | The lithology is changing from gravels & lens of sand | | |
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| | | | | | 8 hrs. | Russ |
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REMARKS: Hard Rock

J.S. Will 5/29/87

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B-2711-

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| R. Vance | White 220V | 299-W17-24 | | |
| Date: 6-1-87 | | Depth: 54' To 61' | | Subcontract No.: KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | 54' | 60' | Brown Silty Sand & Gravels | 3 | 7 Ft. |
| | | 60' | 61' | " (more sand) | | |
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| | | | | | 8 Hrs Rig | |
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REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5 85)

8-B.2712

8-8.2713

| DRILL LOG | By K. Vance | Rig White 22W | Well Number 299-1N1-24 | Computer Number | Project or Work Order No. |
|---|---|---|---|---|---|
| | Date 6-2-87 | | Depth 61' To 64' | | Subcontract No. KEH-1917 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 10'5" | | 61' | 61' | Brown Silty Sand, some gravels | 3 | 3 Ft. |
| | | | | | 8 | 10'5" |
| 12" casing | | | | | | |
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| | | | | | | |
| | | | | Washed & sanded over 12" pipe | | |
| | | | | | | |
| | | | | 1 hr. Steam Cleaning | | |
| | | | | | 8 hrs | Rig 22 |
| | | | | | | |
| | | | | | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

| DRILL LOG | By R. Vance | Rig White 2210 | Well Number 197-W12-24 | Computer Number | Project or Work Order No. |
|---|---|---|---|---|---|
| | Date 6-3-87 | | Depth 64' To 70' | | Subcontract No. ACH-1101 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | 64' | 70' | Fine to coarse sand - some gravel. | | 6 Ft. |
| | | | | Washed + Hauled pipe for Darrel + I | | |
| | | | | Started welding 10" shoe | | |
| | | | | 2 hrs. Steam Cleaning | | |
| | | | | | 8 hrs. | Rig |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2714

| DRILL LOG | By R. Vance | Rig White 421 W | Well Number 27 W17-24 | Computer Number | Project or Work Order No. |
|---|---|---|---|---|---|
| | Date 6-4-87 | | Depth To | | Subcontract No. KCH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 21'3" | | | | | 9 | 73 Ft. |
| 20'9" | | | | | | |
| 12' | | | | | | |
| 31' | | | | | | |
| 63' | | | | | | |
| 13' | | | | | | |
| 76' | | | | | | |
| | | | | | | |
| 10" casing | | | | | | |
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| | | | | | | |
| | | | | | 8 hrs | Russ |
| | | | | | | |
| | | | | | | |

REMARKS: Changed back to drive barrel

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-8000 021 (5-85)

8-8-2715

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| K. Vance | White 32 W | 99-018-24 | | |
| Date: 6-5-82 | | Depth: 75' To 97' | | Subcontract No.: KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 8' | | 75 | 80 | Brown Silty Sand | 4 | 27 Ft. |
| | | 80 | 85 | " | 9 | 8 Ft. |
| 10" casing. | | 85 | 90 | " (Dryer) more silt | | |
| | | 90 | 95 | " | | |
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| | | | | | | |
| | | | | | 8 hrs. | Russ |
| | | | | | | |
| | | | | | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5 85)

8-B.2716

| DRILL LOG | By R. Vance | Rig White 2110 | Well Number -17-11E-24 | Computer Number | Project or Work Order No. |
|---|---|---|---|---|---|
| | Date 6-8-87 | | Depth 97' To 112' | | Subcontract No. KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | ~~Time~~ | Drilling Comments |
|---|---|---|---|---|---|---|
| 8' | 11 | 95 | 100 | Brown Silty Sand (Dry) | 4 | 15 Ft |
| | | 100 | 105 | " | 9 | 8 Ft. |
| | | 105 | 110 | " (slight moist) | | |
| | | 110 | 112 | caliche, coarse sand, gravels | | |
| | | | | | | |
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| | | | | | 8hr. | Russ |
| | | | | | | |
| | | | | | | |

REMARKS: Nasty dust at 112' Hard to keep in barrel

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____Standing Water

A-6000-021 (5-85)

8-B.2717

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| K. Vance | White | 299-1N18-24 | | |
| Date: 6-9-87 | 22N | Depth: 112' To 115' | | Subcontract No.: KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 8' | | 112 | 114 | Course sand + gravels, some caliche | 4 | 3 Ft. |
| | Drilling | 114 | 115 | Detected Carbon Tetrachloride | 9 | 8 Ft. |
| Pull casing | | | | | 31 | 4 hrs. |
| | | | | | | |
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| | | | | | | |
| | | | | Stand by from 11 am to 5 pm | | |
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| | | | | | 8 hrs | Rig |
| | | | | | | |
| | | | | | | |

REMARKS: 115 Ft. – Greater than 120 ppm. ~~Detected~~ Carbon Tetrachloride inside well casing
60 ppm. at operators nose level

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2718

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| R. Jance | W.H. | [illegible] 4 | | |
| Date 6-10-87 | 22 N | Depth 115' To | | Subcontract No. 1714-1714 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | | 31 | 8 hrs. |
| | | | | On Standby all day | | |
| | | | | [illegible] | | |
| | | | | | 8 hrs. Tues | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000.021 (5 85)

8-8.2719

| DRILL LOG | By K. Vance | Rig White 2310 | Well Number 299-W12-24 | Computer Number | Project or Work Order No. |
|---|---|---|---|---|---|
| | Date 6-11-87 | | Depth 115' To 117' | | Subcontract No. KEH-1114 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 6'3" | | | | | 4 | 2 Ft. |
| | 117 | | | Stand by from 7am to 8:30am | 9 | 6' 3" |
| 10' 6" | | | | | 31 | 1½ hrs. |
| | | | | | | |
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| | | | | | | |
| | | | | Couldn't keep material in barrel — Hard to drive barrel into it | | |
| | | | | | | |
| | | | | Changed to Hand tools — (slow) | | |
| | | | | | | |
| | | | | | | |
| | | | | | 2½ | 1. |
| | | | | | | |
| | | | | | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M Medium S Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2720

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| A. Vance | White 22W | 299-118-24 | | |
| Date 6-12-87 | | Depth 115' To 115' | | Subcontract No. KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | gravels & course sand (some cobbles) | | |
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| | | | | Changed to new 10" bit - pulled back casing 3 Feet to keep from Hanging up on drive shoe - Drilled to 117' - Hole caved - Drilled back to 116' | | |
| | | | | | | |
| | | | | | | |
| | | | | | 8 hr. | Kiss |
| | | | | | | |
| | | | | | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2721

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| R. Vance | White 2201 | SA-III-24 | | |
| **Date** 6-15-87 | **Depth** 116' To 123' | | | Subcontract No. Wit-1704 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 6'4" | | 116' | 120' | Gravel - Very little sand | 4 | 7 Ft. |
| 6'3" | | 120' | 123' | " | 9 | 12'7" |
| 12'7" | | | | | | |
| | casing | | | | | |
| 10' | | | | | | |
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| | | | | | 10 hr. | Time |
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REMARKS: Very Fine-grade

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000-021 (5-85)

8-B.2722

| DRILL LOG | By K. Vance | Rig White 22 W | Well Number 299-W18-24 | Computer Number | Project or Work Order No. |
|---|---|---|---|---|---|
| | Date 6-17-87 | | Depth 123' To 129' | | Subcontract No. RLH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Fines | Drilling Comments |
|---|---|---|---|---|---|---|
| 6'2" | | 123 | 125 | Gravels + Cobbles | 4 | 6 Ft. |
| | | 125 | 129 | " | 9 | 6'2" |
| 10" casing | | | | | | |
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| | | | | | 6½ hrs. | Rain |
| | | | | | | |
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REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2723

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| R. Vance | White 22W | 299-W18-24 | | |
| Date: 6-18-87 | | Depth: 129' To 152' | | Subcontract No.: KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 10'5" | | 129 | 132 | Gravels & Cobbles | 4 | 23 Ft. |
| | ing | 132 | 135 | Silt & some fine sand | 9 | 10'5" |
| 10" casing | | 135 | 140 | " | | |
| | | 140 | 145 | " | | |
| | | 145 | 149 | " | | |
| | | 149 | 152 | Gravels, Cobbles, sand, & Caliche | | |
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| | | | | | 10 hrs. | Time |
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| | | | | | | |

REMARKS: High levels of Carbon Tet. at 149 Feet, (Fresh Air)

D - Drive Barrel (H - Hard Tool) L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000-021 (5-85)

8-B.2724

| DRILL LOG | By R. Vance | Rig White 22W | Well Number 299-W18-24 | Computer Number | Project or Work Order No. |
|---|---|---|---|---|---|
| | Date 6-19-87 | | Depth 152' To 160' | | Subcontract No. KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 10' 5" | | 152 | 155 | Gravels, some sand & caliche | 4 | 8 Ft. |
| 6' 5" / 16' 10" | | 155 | 159 | Gravels, some sand & cobbles | 9 | 16' 10" |
| | | 159 | 160 | Med. sand, silt, some clay | 31 | 1.5 hrs. |
| 10" casing | | | | | | |
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| | | | | | 10 hrs. | Russ |
| | | | | | | |
| | | | | | | |

REMARKS: Stand by from 7 am to 8:30 am.

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000 021 (5-85)

8-B.2725

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| R' Vance | White 2510 | 271-1918-24 | | |
| Date: 6-22-87 | | Depth: To | | Subcontract No.: RCH-8414 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Calliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 21'4" | | | | | 10 | 125'7" |
| 20'9" | | | | | 31 | 1 hr. |
| 42'1" | | | | | | |
| 20'11" | | | | | | |
| 63' | | | | | | |
| 20'11" | | | | | | |
| 83'11" | | | | | | |
| 20'10" | | | | | | |
| 104'9" | | | | | | |
| 20'10" | | | | | | |
| 125'7" | | | | | | |
| | | | | Washed & Hauled 8" pipe | | |
| | | | | ½ hr. steam cleaning | | |
| 8" csg | | | | | | |
| | | | | | | |
| | | | | | 10 hrs. | Russ |
| | | | | | | |
| | | | | | | |

REMARKS: Stand by from 2am to 8am waiting for Carlson Td. check

D - Drive Barrel  H - Hard-Tool  L - Large  M - Medium  S - Small  VC - Very Coarse  C - Coarse  F - Fine  VF - Very Fine  Standing Water

A 6000 021 (5 85)

8-8.2726

| DRILL LOG | By R. Vance | Rig White 22N | Well Number 299-W18-24 | Computer Number | Project or Work Order No. |
|---|---|---|---|---|---|
| | Date 6-23-87 | | Depth 160' To 166' | | Subcontract No. KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 20'11" | | 160' | 166' | Med. to course sand, silt, some gravels | 4 | 6 Ft. |
| 20'10" | | | | | 10 | 51'11" |
| 41'9" | | | | | | |
| 10'2" | | | | | | |
| 51'11" | | | | | | |
| 8" casing | | | | | | |
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| | | | | | 10 hrs. | Russ |
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REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ___ Standing Water

A-6006-B2148-B5R

8-B 2727

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| R Vance | White | 299-W18-24 | | |
| Date: 6-24-87 | 25V | Depth: 166' To 173' | | Subcontract No.: KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | 166 | 168 | Course sand, very little silt | 4 | 7 Ft. |
| | | 168 | 173 | Gravels & Cobbles, some course sand | | |
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| | | | | | 7½hrs | Rigs |
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REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2728

8-B.2729

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| R. Vance | White 221V | 299-W18-24 | | |
| Date: 6-25-87 | | Depth: 173' To 189' | | Subcontract No.: KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | 173 | 175 | Gravels & Cobbles w/some silt & sand (course) | 4 | 16 Ft. |
| | | 175 | 180 | " | | |
| | | 180 | 185 | " | | |
| | | 185 | 189 | " | | |
| | | | | Silt Lense from 176' to 177' | | |
| | | | | | 9½ hrs. | Russ |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| R. Vance | White 22W | 299-W18-24 | | |
| Date: 6-26-87 | | Depth: 189' To 194' | | Subcontract No.: KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 21' | | 189 | 194 | Gravels & Cobbles w/some silt, very little sand (course) | 4 | 5 Ft. |
| 8" casing | | | | | 10 | 21 Ft. |
| | | | | | 31 | 1 hr. |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | 1 hr. stand by to check well & get more bottled air | | |
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| | | | | | | |
| | | | | | 9 hrs. | Russ |
| | | | | | | |
| | | | | | | |

REMARKS: Carbon Tet. 50 ppm (Fresh air)

D - Drive Barrel (H - Hand Tool) L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B-2730

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| R. Vance | White 22W | 299-W18-24 | | |
| Date: 6-29-87 | | Depth: 2194' To 2209' | | Subcontract No.: KEH-1314 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | 194 | 200 | Gravels, Cobbles, w/some course sand & silt | 5 | 15 Ft. |
| | | 200 | 205 | " | | |
| | | 205 | 209 | " (more silt) | | |
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| | | | | | | |
| | | | | | 2 hrs. | Russ |
| | | | | | | |
| | | | | | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2731

| DRILL LOG | By R. Vance | Rig White 22IV | Well Number 299-W18-24 | Computer Number | Project or Work Order No. |
|---|---|---|---|---|---|
| | Date 6-30-87 | | Depth 209' To 216' | | Subcontract No. KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | ~~Time~~ | Drilling Comments |
|---|---|---|---|---|---|---|
| 20'10" | | 209 | 212 | Gravels, cobbles, course sand w/some silt | 5 | 7 Ft. |
| | casing | 212 | 216 | Course sand w/some gravels | 10 | 20' 10" |
| 6" casing | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
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| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | 8 hrs. | Russ |
| | | | | | | |
| | | | | | | |

REMARKS: Carbon tet. - Fresh Air

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine Standing Water

A-6000 021 (5-85)

B-B.2732

B-B.2733

| DRILL LOG | By R. Vance | Rig No. #7 | Well Number 299-W18-24 | Computer Number | Project or Work Order No. |
|---|---|---|---|---|---|
| | Date 7-2-87 | | Depth 2216' To 2223' | | Subcontract No. KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 10'2" | | 216 | 220 | Gravels & sand (course) | 5 | 7 Ft. |
| | casing | 220 | 223 | " (more gravels) | 10 | 10'2" |
| 8" | | | | | 31 | 1 Hr. |
| | | | | 1 hrs. Standby | | |
| | | | | Waiting for Carbon tet. test | | |
| | | | | | 8 hrs. | Rigs |

REMARKS: Heaving Sand

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

| DRILL LOG | By R Vance | Rig No. # 7 | Well Number 299-W18-24 | Computer Number | Project or Work Order No. |
|---|---|---|---|---|---|
| | Date 7-7-87 | | Depth 223' To 228' | | Subcontract No. KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | 123 | 128 | Gravels, Cobbles, + course sand | 5 | 5 Ft. |
| | | | | | 31 | ½ hrs. |
| | | | | Check Carbon tet. ½ hr. | | |
| | | | | Chase water truck 1 hr. | | |
| | | | | Steve Well 7-8-87 | | |
| | | | | | 10 hrs. | Russ |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000.021 (5-86)

8-B-2734

8-B-2735

| DRILL LOG | By R. Vance | Rig No. #7 | Well Number 299-W18-24 | Computer Number | Project or Work Order No. |
|---|---|---|---|---|---|
| | Date 7-8-87 | | Depth 228' To 240' | | Subcontract No. KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | 228 | 230 | Gravels, Cobbles & course sand | 10 | 10'5" |
| 10'5" | | 230 | 235 | " | 5 | 12 Ft. |
| | wg | 235 | | " | 31 | ½ hr. |
| 8" ca's | | | | | | |
| | | | | ½ hr. Standby - Meeting of the minds | | |
| | | | | Steve Veal 7-8-87 | | |
| | | | | | 10 hrs. | Russ |

REMARKS:

D - Drive Barrel (H - Hard Tool) L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| R. Vance | No. #7 | 299-W18-24 | | |
| Date: 7-9-87 | | Depth: To 240' | | Subcontract No.: KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | | ~~4~~ | |
| | | | | 3 hrs. stand by waiting for well | 30 | 4 hrs. |
| | | | | to be logged | 31 | 4 hrs. |
| | | | | Rounded up equip., stainless liner, and pulling stem | | |
| | | | | Changed out tools & bailed well 4 bailor loads - sand heaved, bringing total depth up to 238' | | |
| | | | | Ran screens in hole - shut down by geologyst - pulled screens back out. | | |
| | | | | Stand by from 1:45 to 5 pm | | |
| | | | | 4.5 hrs PNL 7/9/87 16:42 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine 211' Standing Water

A-6000 021 (5 85)

8-B-2736

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| R. Vance | No. #7 | 299-W18-24 | | |
| Date: 7-10-87 | | Depth: To | | Subcontract No.: KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | | 16 | 10' 3" |
| 5'6" | | | | | 15 | 5'6" |
| 6" casing pulled | | | | Stand by until 11:00 am then ran | 30 | 4 hrs. |
| | | | | Straightness test, after cleaning 6" pipe | 31 | 4 hrs. |
| | | | | | | |
| | | | | Helped run straightness tests, set | | |
| | | | | screens, and set pump | | |
| | | | | | | |
| | | | | | | |
| | | | | Steve Teel | | |
| | | | | 7-10-87 | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | 10 hrs. | Russ |
| | | | | | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000-021 (5-85)

8-B-2737

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| R. Vance | No. # 7 | 299-W18-24 | | |
| Date: 7-13-87 | | Depth: To | | Subcontract No.: KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 3' | | | | | 15 | 3 Ft. |
| 8" casing pulled | | | | | 28 | 3 hrs. |
| | | | | Pulled 3' casing, exposing 8½' screen | 30 | 3½ hrs. |
| | | | | | 31 | 3½ hrs. |
| | | | | Bailed well 3 hrs. (No drawdown) | | |
| | | | | | | |
| | | | | Stand by | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | Steve Todd | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | 10 hrs. | Russ |
| | | | | | | |
| | | | | | | |

REMARKS:

D - Drive Barrel  H - Hard Tool  L - Large  M - Medium  S - Small  VC - Very Coarse  C - Coarse  F - Fine  VF - Very Fine  ___ Standing Water

A 6000 021 (5 85)

8-8-2738

8-B.2739

| DRILL LOG | By R. Vance | Rig No. # 7 | Well Number 297-W18-24 | Computer Number | Project or Work Order No. |
|---|---|---|---|---|---|
| | Date 7-14-87 | | Depth To | | Subcontract No. KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Waiting for equip. to pump test | | |
| | | | | Layed out discharge pipe for pump testing Darrel's well | 1 hr. | |
| | | | | Helped Lenny with his well rest of day | 9 hrs. | |
| | | | | | 10 hrs. | Russ |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

| DRILL LOG | By R. Vance | Rig No. #7 | Well Number 299-W18-24 | Computer Number | Project or Work Order No. |
|---|---|---|---|---|---|
| | Date 7-15-87 | | Depth To | | Subcontract No. KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Pulled pump from W18-24, Took | 29 | 8 hrs. |
| | | | | it to Lay down yard and cleaned | 30 | 1 hr. |
| | | | | it, stood by while security had | | |
| | | | | games at 2-plant; Installed pump | | |
| | | | | in W18-24, got generator and wired | | |
| | | | | in, started laying out discarge | | |
| | | | | line | | |
| | | | | | | |
| | | | | Item #30 (1 hour) was due to military ~~exercise~~ exercise | | |
| | | | | | | |
| | | | | SP Ainsworth 7-15-87 | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | 9 hrs. | Russ |
| | | | | | | |
| | | | | | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5-85)

8-8-2740

| DRILL LOG | By R. Vance | Rig No. # 7 | Well Number 299-W18-24 | Computer Number | Project or Work Order No. |
|---|---|---|---|---|---|
| | Date 7-16-87 | | Depth To | | Subcontract No. KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | Picked up and Layed out discharge | | |
| | | | | pipe, Washed out Hauled casing | 29 | 4 hrs |
| | | | | for Blain, | | |
| | | | | | | |
| | | | | 2 hrs. Standby for Radiation Monitors | 30 | 2 hrs. |
| | | | | | | |
| | | | | ½ hrs Standby for Pencils | 30 | ½ hr |
| | | | | | | |
| | | | | Layed out rest of discharge pipe | 29 | 1 hr. |
| | | | | | | |
| | | | | Step test on well W18-24 | 29 | 1½ hrs. |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000 021 (5-85)

8-B-2741

| DRILL LOG | By R. Vance | Rig No. #7 | Well Number 299-W18-24 | Computer Number | Project or Work Order No. |
|---|---|---|---|---|---|
| | Date 7-17-87 | | Depth To | | Subcontract No. KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | Meeting w/ drillers to set up well completion | .5 hr | |
| | | | | Set up pump test; final set up, F-tape, | 1.5 hr | |
| | | | | | | |
| | | | | Started pump test at 8 am | 29 | 8 hrs. |
| | | | | | | |
| | | | | G.S.Wh PHC 7/17/87 | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
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| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | 10 hrs. | Russ |
| | | | | | | |
| | | | | | | |

REMARKS:

D - Drive Barrel H - Hard Tool L Large M Medium S Small VC Very Coarse C Coarse F Fine VF Very Fine ____ Standing Water

A 6000-021 (5-85)

8-B-2742

8-B.2743

**DRILL LOG**

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| R. Vauce | No. # 7 | 299-W18-24 | | |
| Date: 7-20-87 | | Depth: To | | Subcontract No.: KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | Pulled Pump + Tremmy pipe from | 29 | 10 hrs. |
| | | | | W18-24, took to Lay down yard | | |
| | | | | + cleaned, Installed Pump + | | |
| | | | | Tremmy in W15-18, braught gen- | | |
| | | | | erator to site also | | |
| | | | | | | |
| | | | | 1 Deluge PKR | | |
| | | | | | | |
| | | | | | | |
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| | | | | | | |
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| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | 10 hrs. | Russ |
| | | | | | | |
| | | | | | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000 021 (5-85)

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| R. Vance | No. #7 | 299-W18-24 | | |
| Date: 7-21-87 | | Depth: To | | Subcontract No.: KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | ~~Time~~ | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | | 15 | 12 Ft. |
| 12' 8" casing pulled | | | | | 20 | 7 sacks |
| | | | | | 17 | 30 Ft. |
| | | | | | 18 | 210 Ft. |
| | | | | Trouble with liner joints | 33 | 1 hr. |
| | | | | Help Holmer set up discharge line well (W15-18) | 29 | 3 hrs. |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | 10 hrs. | Russ |
| | | | | | | |
| | | | | | | |

REMARKS:

O - Drive Barrel H - Hard Tool L - Large M - Medium S Small VC Very Coarse C Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2744

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| R. Vance | No. #7 | 299-W18-24 | | |
| Date 7-22-87 | | Depth To | | Subcontract No. KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | | 20 | 6½ sacks |
| 20' 8" casing pulled | | | | Poured 6½ sacks sand (198') | 21 | 4½ buckets |
| | | | | 4½ buckets Pellets (191'6") | 15 | 20 Ft. |
| | | | | Pulled 20 Ft. Pipe | | |
| | | | | Couldn't Find pipe trailor - Got Tim to help with Big truck - loaded, cleaned, and Hauled tremmy pipe to well site - ran Tremmy in hole, Hauled bentonite - Repaired Winch on Big Truck | 33 | 3½ hrs. |
| | | | | | ~~22~~ | ~~½ hr.~~ |
| | | | | S.P. Ainsworth 7/22/87 | 10 hrs | Rus |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-86)

8-B.2745

| DRILL LOG | By R. Vance | Rig No. # 7 | Well Number 299-1W18-24 | Computer Number | Project or Work Order No. |
|---|---|---|---|---|---|
| | Date 7-23-87 | | Depth To | | Subcontract No. KFH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | | 22 | 12 ½ sacks |
| 31' | | | | | 15 | 31 Ft. |
| 8" casing Pulled | | | | Tremmy in Grout (300 gal.) up to 10 Feet, Pulled 31 Ft. casing | | |
| | | | | Broke cas at 1pm lost 8" casing | 13:00 | |
| | | | | 167' sitting on sand jack (198) | | |
| | | | | tried tremmying torch down to cut hole | | |
| | | | | try again tommoro | | |
| | | | | 4.5 N.L. - IHL 7/23/87 | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | 10 hp. | Russ |
| | | | | | | |
| | | | | | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000 021 (5-85)

8-B-2746

8-B.2747

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| R. Vance | No. #7 | 299-W18-24 | | |
| Date: 7-24-87 | | Depth: To | | Subcontract No. KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | ~~Time~~ | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | Fished for 8" casing | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | SP Archuleta 7/24/87 | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | 10 hrs. | Russ |
| | | | | | | |
| | | | | | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000.021 (5-85)

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| Date 7/27/87 | 22W | Depth To | | Subcontract No. Tech 1514 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | 7:50 PM to 5:00 PM | | |
| | | | | Fished for 8" casing | | |
| | | | | Retrieved 8" at 5:00 | | |
| | | | | [redacted] | | |
| | | | | Steve Tool 7-27-87 | | |
| | | | | | 10 hrs. | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5-85)

8-B.2748

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| [illegible] | #10 | 299-W18-24 | | |
| Date 7/28/87 | 20½ | Depth 10 To 20 | | Subcontract No. 1-L 1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 20½" | | | | 7:00 to 5:30 AM PM | | |
| | | | | ~~Hard~~ Moved rig on hole | | |
| | | | | set up to drilling 20" hole | | |
| | | | | set 20" casing and shoe. | | |
| | | | | Drilled from 10' 20' | | |
| | | Jkm | c. | 20½" Total | | |
| | | | l. | 10' | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | Steve Tool | | |
| | | | | 7-29-87 10½ hrs. | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5-85)

8-B.2749

| DRILL LOG | By R. Vance | Rig No. #7 | Well Number 299-W18-24 | Computer Number | Project or Work Order No. |
|---|---|---|---|---|---|
| | Date 7-29-87 | | Depth To | | Subcontract No. KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | ~~Time~~ | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Checked for possible wedge with tailes | 6 | 13 Ft. (W10-13) |
| | | | | Made up small fishing tools with wedge, | | |
| | | | | Went in stainless & opened up dust at 186' | | |
| | | | | Welded on 13 Ft. 20" casing at Leahy's | | |
| | | | | well (W10-13) | | |
| | | | | | | |
| | | | | | | |
| | | | | Steve Teel | | |
| | | | | 7-29-87 | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | D hrs | Russ |
| | | | | | | |
| | | | | | | |

REMARKS:

D - Drive Barrel H - Hard Topt L - Large M - Medium S Small VC Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B-2750

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| R. Vance | No. #7 | 299-W18-24 | | |
| Date: 7-30-87 | | Depth: To | | Subcontract No.: KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | Bailed to clean up stainless | | |
| | | | | J Dilmore PNL | | |
| | | | | | 10 hrs | Russ |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B-2751

8-B-2752

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| R. Vance | No. #7 | 299-W18-24 | | Subcontract No. KEH-1914 |
| Date 7-31-87 | | Depth To | | |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | Bailed liner with brushes on | 30 | 2½ hrs. |
| | | | | line | 31 | 2G hrs. |
| | | | | | | |
| | | | | Stand by for security exercises | | |
| | | | | | | |
| | | | | S.P. Ambert 8/3/87 | | |
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| | | | | | | |
| | | | | | 10 hrs. | Russ |
| | | | | | | |
| | | | | | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000 021 (5-85)

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| R. Vance | No. #7 | 299-W18-24 | | |
| Date: 8-3-87 | | Depth: To | | Subcontract No.: KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | ~~Time~~ | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | | 22 | 16 sacks |
| | | | | Log truck sent camera down liner, checked out OK., also sent down caliper - O.K., to lay down yard picked up Nav-string tools (steam cleaned) & puller head, poured rope socket & made up tools, ran tremmy pipe down to 145 Ft., pumped two batches down hole, came up to 52 Ft., Finished up puller head | | |
| | | | | SP Aikens 8/3/87 | | |
| | | | | | 10 hrs | Russ |

REMARKS:

D - Drive Barrel  H - Hard Tool  L - Large  M - Medium  S - Small  VC - Very Coarse  C - Coarse  F - Fine  VF - Very Fine  ____ Standing Water

A-6000-021 (5-85)

8-8-2753

| DRILL LOG | By R. Vance | Rig No. #7 | Well Number 299-W18-24 | Computer Number | Project or Work Order No. |
|---|---|---|---|---|---|
| | Date 8-4-87 | | Depth To | | Subcontract No. |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | | 14 | 33 Ft. |
| 33 Ft. 10" casing Pulled | | | | Tripped out tremmy pipe & welded on puller head - pulled 10" casing, Helped Dave load tremmy & get Mud truck, went back to pulling pipe | | |
| | | | | 1 hr. with Dave | | |
| | | | | [illegible] PNE 8/6/87 | | |
| | | | | | 10 hrs | Russ |

REMARKS: Casing very tight in places

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B.2754

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| R. Vance | No. #7 | 29-W18-24 | | |
| Date: 8-5-87 | | Depth: To | | Subcontract No.: KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 13 Ft 10" casing filled | | | | Tremmy in two leads grout (over filled) | | |
| | | | | filled 13 Ft. casing | 14 | 13 Ft. |
| | | | | tremmyed in 3rd lead grout | 22 | 26 sacks |
| | | | | bailed out liner | | |
| | | | | [signature] PHH 8/5/87 | | |
| | | | | | 10 hrs. | Russ |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B-2755

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| K. Vance | No. #7 | 29S-11W18-24 | | |
| Date: 8-6-87 | | Depth: To | | Subcontract No. KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | ~~Time~~ | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | | | |
| 114 Ft. 10" casing | Pulled 12" casing | | | Pulled 10" casing | | |
| | | | | Trimmed in 1½ loads - cut 65 sacks + 4 sacks in Hole | | |
| 14 Ft. | pulled | | | Built 12" Miller Head | | |
| | | | | Pulled 14 Ft. 12" casing | | |
| | | | | [signature] DNC 8/6/87 | | |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5-85)

8-B-2756

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| R. Vance | No. # 7 | 299-1017-24 | | |
| Date: 8-7-87 | | Depth: To | | Subcontract No. KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| 56 Ft 12" mild steel pipe | | | | Pulled 56 ft. 12" casing | 13 | 56 Ft. |
| | | | | Tremied in grout to 11 ft. | 22 | 10 sacks |
| | | | | SP Lee 8/10/87 | | |
| | | | | | 10 hrs | Russ |

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A-6000-021 (5-85)

8-B-2757

# DRILL LOG

| By | Rig | Well Number | Computer Number | Project or Work Order No. |
|---|---|---|---|---|
| K. Vance | No. #7 | C-97-L-18-24 | | |
| Date: 8-10-87 | | Depth: To | | Subcontract No.: KEH-1914 |

| Total Casing | Depth | Drill Method | Wet/Dry Sample | LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc. | Time | Drilling Comments |
|---|---|---|---|---|---|---|
| | | | | | 22 | 6 sacks |
| | | | | Poured 175 gal. grout in surface | 23 | 5 sacks |
| | | | | pipe, pulled surface pipe, Helped | 28 | 1 hr. |
| | | | | Tim pour pad for Holmers well, took | | |
| | | | | equip. back to WI8-24 & poured Cement | | |
| | | | | in hole up to surface, hauled well | | |
| | | | | for 1 hr., started rigging down | | |
| | | | | J. S. Witt Pac 8/10/87 | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | 10 hrs. | Russ |
| | | | | | | |
| | | | | | | |

REMARKS:

D - Drive Barrel  H - Hard Tool  L - Large  M - Medium  S - Small  VC - Very Coarse  C - Coarse  F - Fine  VF - Very Fine  ____ Standing Water

A-6000-021 (5-85)

85.B.2758

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