EXPLORATION LOGGING

A GEOLOGICAL - ENGINEERING SERVICE

REMARKS

DRILLING CONTRACTOR: Hunnicutt & Camp

RIG NO.: 2

SPUD DATE: 6/8/77 7:45PM

TYPE MUDS: GEL-WATER, AIR-FOAM

CASING RECORD

16" AT 377'

10 3/4 AT 2525'

HOLE SIZE

14 3/4 TO 2525'

9 7/8" TO 7684'

ABBREVIATIONS

NB	NEW BIT	W	MUD WEIGHT
RRB	RERUN BIT	V	MUD VISCOSITY
CB	CORE BIT	F	MUD FILTRATE ☐ CC/30 MIN
CR	CIRCULATE RETURNS	FC	FILTER CAKE
NR	NO RETURNS	SD	SAND CONTENT
PR	POOR RETURNS	S	SALINITY ☐ G/G ☒ PPM CL⁻
LAT	LOGGED AFTER TRIP	R	RESISTIVITY OF MUD
TG	TRIP GAS	RF	RESISTIVITY MUD FILTRATE
CG	CONNECTION GAS		
C	CARBIDE		
DST	DRILL STEM TEST		
]	DST INTERVAL		
▮	CORE INTERVAL		

OIL: Based on live oil in unwashed cuttings and percentage staining of washed cuttings.

GAS UNITS: Gas Detector calibrated to record 100 units with a mixture of 2% methane-in-air.

LITHOLOGY SYMBOLS

LIMESTONE, DOLOMITE, GYPSUM AND ANHYDRITE, SALT, COAL AND LIGNITE, CLAY, SHALE, SILTSTONE, SANDY SILTST., SAND, CONGLOMERATE, CHERT, VOLCANICS, INTRUSIVE, TUFF, TUFFACEOUS

COMPANY: MICHEL T. HALBOUTY

WELL: "FEDERAL" 1-10

FIELD: HARNEY BASIN

LOCATION: SEC. 10, T23S-R29E, WB&M FROM NE COR. 2299'S, 334'W

COUNTY, STATE: HARNEY, OREGON

API WELL INDEX NO.

ELEVATION: GL 4765' KB 4778'

DATE FROM 6/28/77 TO 9/2/77

DEPTH FROM 430FT TO 7684FT

UNIT NO. 19

LOGGING GEOLOGISTS:
J.E. HINER
J.B. BOBBITT
W.D. ALTER
K.N. GIBSON

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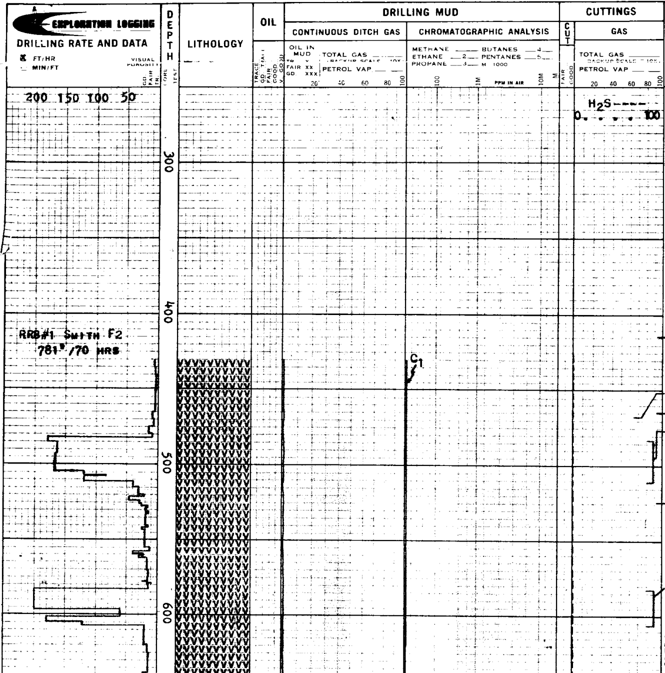


REMARKS AND LITHOLOGY DESCRIPTION

RIG WATER SALINITY 300 PPM CL⁻

SET 16" CSG AT 377

DRLG 14 3/4 HOLE USING AIR/FOAM

414' 2°15'

BASALT: DK GY, VF GR, OCC PLAG PHNOCRSTS; GEN MSSV APPRNCE

TRC PROB WLDED TUFF; LT-M GY, GLSSY, SB-CONCH FRAC

464' 2°00'

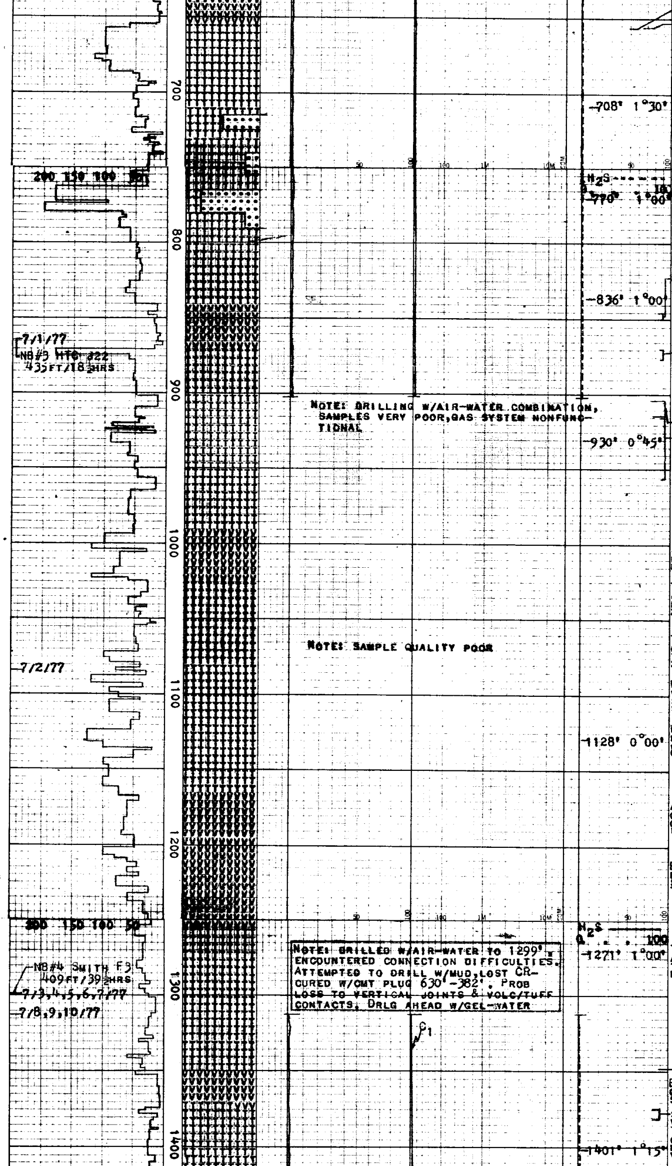
SCORIA: BRICK RD, 1MM VES IN GLSSY, APHNTC GRNDMSS, OCC-RARE WH PLAG PHNOCRST, GEN SBHED

524' 1°15'

ANDESITE: LT GY, PURP-GY, PORPHYRITC W/COM PLAG, ACC MGNTITE, OCC VES STRUC

SCORIA: DULL-BRICK RD 2-1MM VES IN DEVIT GLSS MTX, MSSV APPRNC

ANDESITE: M GY, DOM APHNTC, OCC PHNOCRST PLAG, DISM MGNTITE, COM INTSTL GLSS IN VF GR GRNDMSS



NOTE: DRILLING W/AIR-WATER COMBINATION, SAMPLES VERY POOR,GAS SYSTEM NONFUNCTIONAL

NOTE: SAMPLE QUALITY POOR

NOTE: DRILLED W/AIR-WATER TO 1299', ENCOUNTERED CONNECTION DIFFICULTIES. ATTEMPTED TO DRILL W/MUD,LOST CR-CURED W/CMT PLUG 630'-382'. PROB LOSS TO VERTICAL JOINTS & VOLC/TUFF CONTACTS. DRLG AHEAD W/GEL-WATER

657' 1°45'

BAKED ZONE:ABUN GLSS SHARDS,TRC FLOW BNDS

TUFF:VCOL LT GY-LT BRN,BUFF,TOP 20FT OXIDIZED TO DULL RD, ABUN GLSS SHARDS, COM QTZ,PLAG,DK VOLC GRNS,ALL SBRD-RD,IN BUFF DEVIT GLSS MTX, PROB SBAERIAL/WATER-LAIN TUFF INTBDS

708' 1°30'

SD:VF-F,ANG-SBRD,WL SRTD,DOM VOLC GLSS FRGS W/COM WLDED TUFF FRGS,SCORIA PCS LACUSTRINE DETRITUS?

SD:BUFF-YLW,SLT SZ-VF,SBANG-SBRD,WL SRT, DOM CLR/FRSTD QTZ,COM ALT PLAG,TUFF FRGS, OBS,TRC ZEOLITES,IN WL HYDR BENT MTX

770' 1°00'

OBSIDIAN:BL,PRED UNALT,MAS,VITR LSTR, CONC FRAC,OCC LITHOPHYSAL STRUC

836' 1°00'

BASALT:LT GY,VF GR, PRED MAS W/ OCC PLAG PHNOCRSTS,OCC VES STRUC

ALT TUFF:LT GY TO WH COMP ALT TO BENT, W/ RR BROKEN XLS

TUFF:VCOL LT GR,BUFF LOC OXI TO DULL RD, COM GLSS SHARDS,COM PLAG,IN BUFF DEVIT GLSS MTX

WELDED TUFF:DK GY, VITRIC,ABUN GLSS SHRDS ASH FLOW TUFF,SCORIAC NEAR TOP,DULL RD,1/2 MM VES,GRDG DOWN TO VF GR,OCC PHNOCRSTS QTZ,PLAG,POSS K-SPAR RHYO-DACITIC,COMM FLOW STRUC-FLATTND VES,TRC MINL BANDING

930' 0°45'

INTBD VCOL TUFF:BUFF, YLW,GN-YLW,APHNTC,VF GR,GEN ALT PARTLY TO BENT,COM SFT,BRIT,LTL HYDR

SCORIA:BRICK RD,½-1 MM VES IN DEV GLSS MTX

TUFF:VCOL,LT-DK GY, COM GLSS SHDS,LOC DEVIT MTX,COM BROKEN XLS,

TUFF:VCOL,MDT GY,WM GY-PURP,PARTLY ALT TO BENT, COM PLAG XLS

WELDED TUFF:LT GY, VITRIC,ABNT GLSS SHDS, COM FLATTENED SHARDS

1128' 0°00'

WELDED TUFF:LT GY W/ BANDS OF WHG PURP, VITRIC,COM FLATTENED GLSS SHDS,PRED UNALT

ANDESITE:PURP TO PURP-GY,VF GR,PRED MAS W/ OCC VES,OCC PORPH W/ F GR PLAG PHNOCRSTS

BASALT:LT-DK GY,VF GR MAS;COM RD (IRON-OX??) STN OCCURING IN BANDS TO 1MM

1271' 1°00'

TUFF:LT GY,WM,BUFF, APH MTX PARTLY ALT TO BENT,RARE BROKEN PLAG AND QTZ XLS

w 8.6 v 40

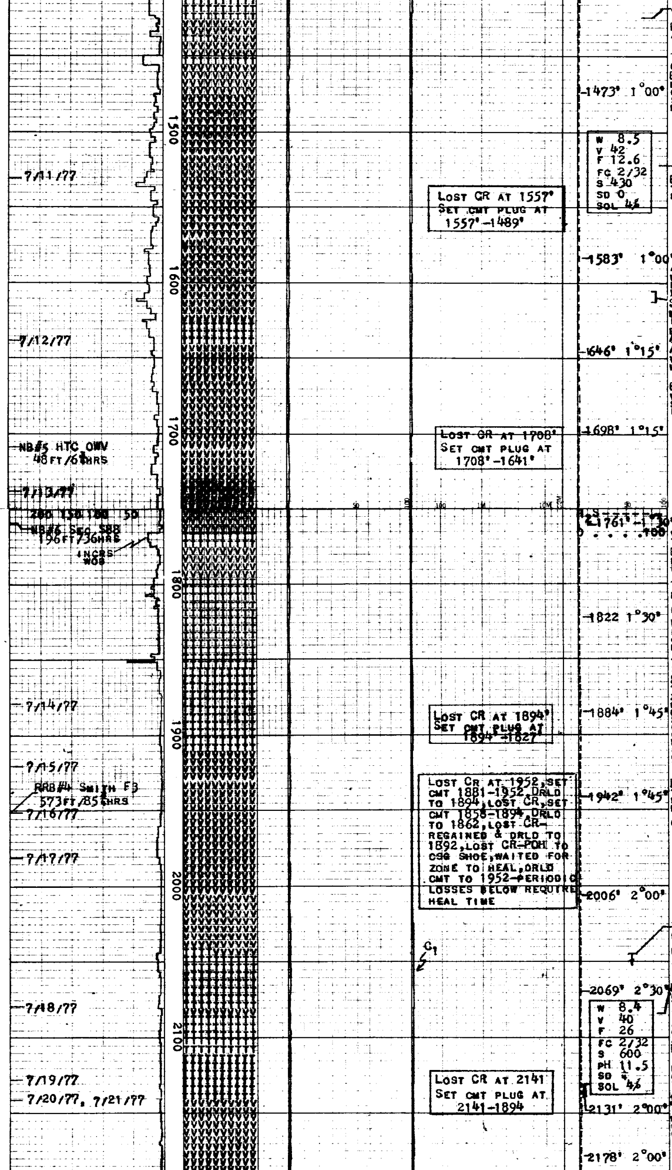
1348' 1°45'

BASALT:LT-DK GY,VF GR TO APH,MAS,COM RD STN

SCORIACEOUS:½-1MM VES,OCC CHAL FILL

TUFF:BRICK RED,VF GR, OCC MFC INCLUS,TRC K-SPAR,POSS PLAG,IN VAR ALT BENT CLY MTX

1401' 1°15'



ABUN GLSS: SHARDS, VOLC FRGS IN CHILLD MTX

BASALT: APHNTIC, SLI ALT ALONG FRACS, W/ INTBD PURP-GY VF TUFF

TUFF: BUFF, LT BRN, VF GR, GEN ALT BENT MTX

BASALT: M GY, APHNTC, MNUT PLAG XL FACES, OCC TRC JOINT FACES SLI COATED W/SEC MIN, PROB CHLOROPHAEITE

1473' 1°00'

W 8.5
V 42
F 12.6
FC 2/32
S 430
SD 0
SOL 4%

1522' 1°30'

BASALT: LT-M GY, VF GR TO APHNTC, MAS, COM RD STN

LOST CR AT 1557'
SET CMT PLUG AT
1557'-1489'

1583' 1°00'

ANDESITE: PK-RD, PORPH W/ COM F-M GR SBHED PLAG PHEN, OCC TNN VES, IN APH MTX

SCORIA: BRICK RD, ½-1 MM VES, OCC CHAL FILL

TUFF: LT PURP-GY, OCC BROKEN PLAG XLS IN ASH MTX

1646' 1°15'

ANDESITE: PURP-GY, MAS, VF GR-APHNTC, OCC VES W/ CHAL FILL

BASALT: LT-DK GY, MAS, VF GR-APHNTC, COM RD STN, MNUT PLAG XL FACES

1698' 1°15'

W 8.3 V 41

LOST CR AT 1708'
SET CMT PLUG AT
1708'-1641'

S 1761' 1°30'

TUFF: RD-PURP, LT PURP, VF GR, SLI SCORIAC AT TOP, OCC ALT BENT

BASALT: MCROXLN, COM PLAG INCLUS, AMYGDALOIDAL IN PART, TRC ZEOLITES

TUFF: YLW-BRN, WLDED IN PART, COM SHARDS & MFC INCLUS, INTBD W/VF GR RD APHNTC TUFF

1822 1°30'

WELDED TUFF: BRN, LT RD-BRN, COM GLSS SHRD & MFC FRGS IN SILIC MTX, SBCONCH FRAC, COM FLATTND INCLUS, OCC TRC AMYGDALOIDAL STRUC W/ZEOLITIC FL

SILICIFIED TUFF: LT GY TO LT PURP, COM F-M GR XLS OF QTZ, MFC MINS, OCC FLATTENED FRAGS OF PUMICE IN HIGHLY SILIC ASH MTX, GRAD CTC W/ ABOVE TUFF; COM EVIDENCE OF HYDROTHERMAL ALT INCL EUHED F-M GR QTZ W/ COCKSCOMB STRUC, OCC F-M GR EUHED TOURMALINE

LOST CR AT 1894'
SET CMT PLUG AT
1894'-1827'

1884' 1°45'

LOST CR AT 1952, SET CMT 1881-1952, DRLD TO 1894, LOST CR, SET CMT 1858-1894, DRLD TO 1862, LOST CR-REGAINED & DRLD TO 1892, LOST CR-POH TO CSG SHOE, WAITED FOR ZONE TO HEAL, DRLD CMT TO 1952-PERIODIC LOSSES BELOW REQUIRE HEAL TIME

1942' 1°45'

BASALT: LT-M GY, VF GR TO APHNTC, PRED MAS W/ OCC F-M GR SBHED PLAG PHEN, OCC FRAC FILL MAT INCL CLR-WH QTZ, IRON OXIDE STN

W 8.4 V 44

C = 8U AT 40 VIS
LAG=39 MIN W/30 SPM

2006' 2°00'

TUFF: M GY, BRTTL, AMYGDALOIDAL W/COM BLU FILL-POSS CELADONITE; MTX DEVIT GLSS, OCC SPHERULITIC STRUC, SL TR ALT MFC PHNOCRSTS

2069' 2°30'

BASALT: APHNTIC, GY-BK, OLIVN IN GRNDMSS ALT TO IDDINGSITE(YLW), & CHLOROPHAEITE(RD)

W 8.4
V 40
F 26
FC 2/32
S 600
pH 11.5
SD ¼
SOL 4%

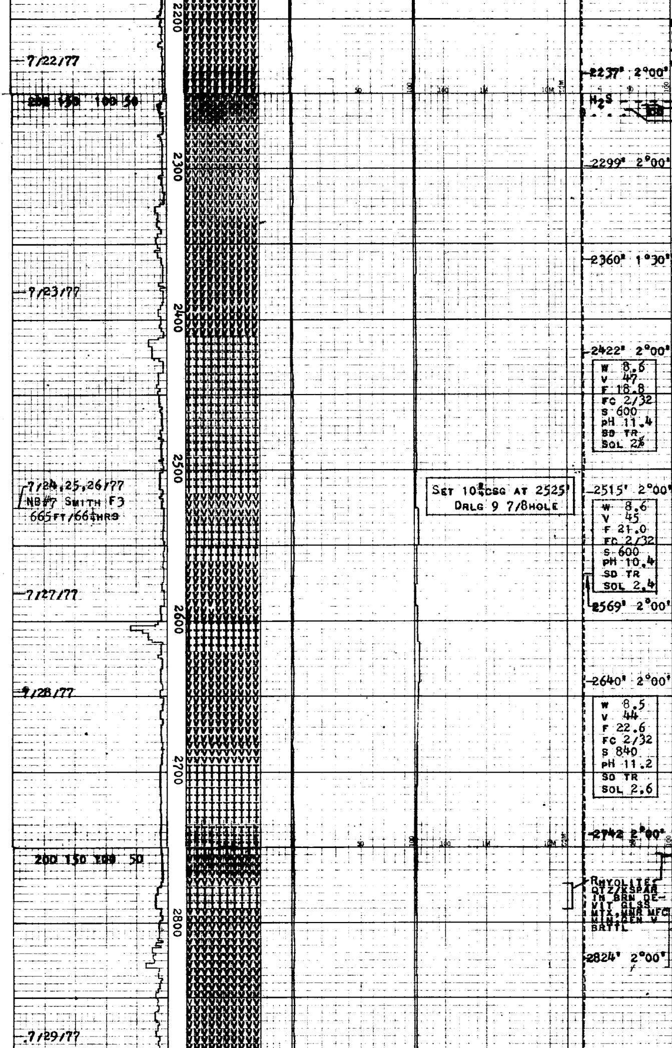
ANDESITE?: LT-M BRN, OCC-COM EUHED PLAG IN APR PILOTAXITIC GRNDMSS, OCC AMYG STRUC W/ YLW, GN, CLR ZEOLITIC FILL, POSS LEUCITE, NONTRONITE, NATROLITE; OCC MTX ALT ZEOLITIC-POSS ASH-FLOW TUFF?

LOST CR AT 2141
SET CMT PLUG AT
2141-1894

2131' 2°00'

ALT BASALT: LT GY, OLVN & PYRXN PHNOCRSTS IN FELTY GRNDMSS-DOM PLAG W/INTSTL GLSS, OLVN COM ALT TO IDDINGSITE, CHLOROPHAEITE, MTX ALT IN PART CLYEY & ALBITIZED?

2178' 2°00'



BASALT:LT-MD GY,VF-F GR,MAS TO PORPH W/ F GR-VF GR PLAG PHEN IN APHNTC GRNDMSS,OCC FRACT FILL MAT INCL WH-MLKY QTZ

ABUN DK BRN GLSS PCS

OXIDIZED ZONE:ALT BASALT,SFT BRICK RD CLYEY INTVL

BASALT:GY,MCROXLN,GEN APHNTIC,OCC PLAG PHNOCRST,MNR ALT OF MTX ALONG FRACS,RARE FLL

SCORIA:DULL BRICK RD, MOD DNS-MCROVESIC,TR 2DRY MINRLS-CHAL,QTZ

ANDESITE:LT-M GY, PORPH W/ COM F-M GR EUHED-SBHED TWND PLAG OCC F GR EUHED MAG PHEN IN APHNTC-VF GR GRNDMSS,ABNT VES W/ OCC CHAL FILL

C = 7U AT 44VIS
LAG=54MIN W/58SPM

TUFF:LT BRN-RD BRN, ABUN VOLC FRAGS,CHAL &OTHER SEC MINS IN BRN TUFF MTX,OCC ALT BENT

W 8.6
V 47
F 18.8
FC 2/32
S 600
pH 11.4
SD TR
SOL 2%

WELDED ANDESITIC ASH-FLOW TUFF:GY-BRN,PRPL BRN,PORPH;COM FLTND CLR SBHED PLAG PHNOCRSTS,OCC FLOW BNDNG, &MIN ALINEMNT,ACC MGNTITE,GEN APHNTIC MTX-RARELY AMYG W/ ZEO ALT

CONT ANDESITE:MOTTLD RD/BRN,OCC YLW BRN, OCC AMYG W/CHAL &ZEO FLL

SET 10¾CSG AT 2525'
DRLG 9 7/8HOLE

BASALT:GY,MCROXLN,OCC WH PLAG PHNOCRST,GRND MSS W/ALT OLIVN,AMYG W/ZEO FLL,RARE FRACS W/QTZ-CHAL FLL

W 8.6
V 45
F 21.0
FC 2/32
S 600
pH 10.4
SD TR
SOL 2.4

TUFF:GY,BRN,COM PLAG XLS IN ASHY MTX,OCC VOLC FRAGS,OCC FRAC FILL INCL CHAL,QTZ

BASALT: GY,PRED MAS, OCC PORPH W/ F GR PLAG PHEN IN VF GR-APHNTC GRNDMSS,OCC QTZ FRAC FILL

DACITIC TUFF:MOT WH BR,ABNT F GR QTZ,PLAG XLS IN WH ASH MTX COM ALT TO BENT,OCC ALT MFC MINS

DACITE:GY,BRN,PRED MAS,GRAN,ABNT CLR RDD QTZ,ABNT WH SBHED PLAG, COM BRN-BL PRIS PYX (AUGITE?),LOC WTHRD TO BRN-RD,

W 8.5
V 44
F 22.6
FC 2/32
S 840
pH 11.2
SD TR
SOL 2.6

C = 20U AT 44VIS
LAG=21MIN W/58SPM

RHYOLITIC TUFF:LT-M BRN,OCC WH,RSNS TO TRNSL,COM SLI GLSSY MTX,OCC QTZ PHNOCRSTS & RARE BLK MFC SPECS COM BENT ALT,TRC OF OCC LT GY-GN TUFF INTBDS

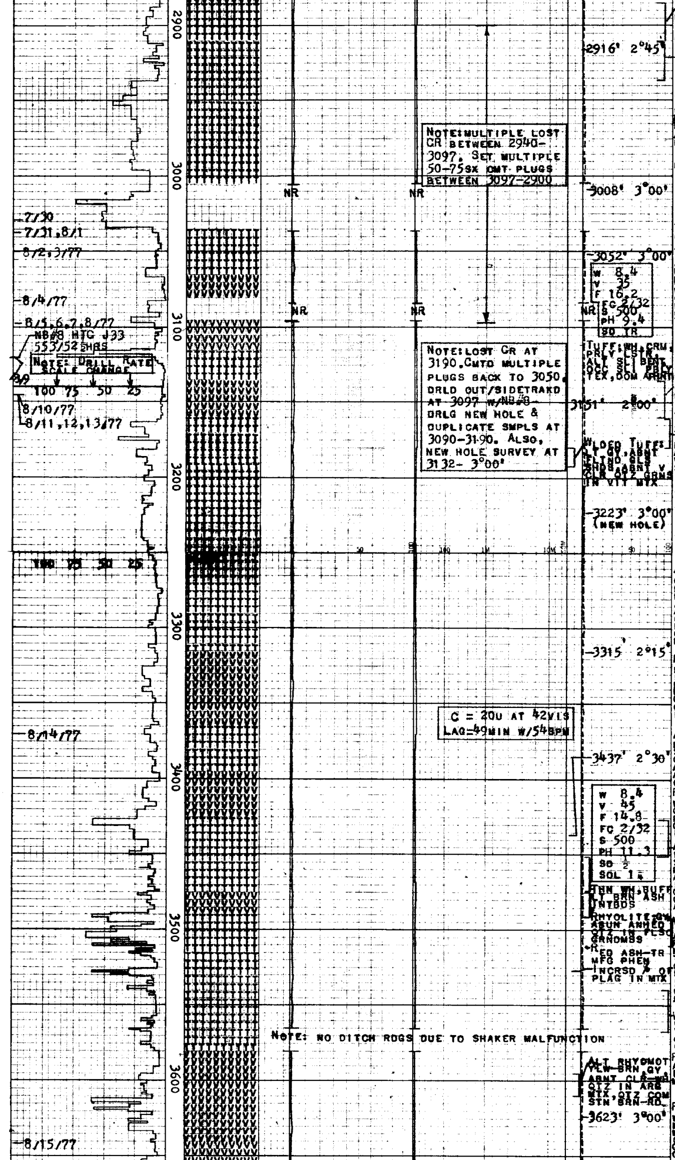
DACITE:M GY,OCC GN TINT,CLR QTZ,MLKY PLAG PHNOCRSTS IN MOTTLD GY-BRN MTX, PLAG GEN ALT CLYEY, TR MFCS-CLR TO BRN; HYPOXLN MTX-GLSS PTLY DEVIT,FLDSPR POSS SAUSSORITIZED

RHYOLITE: QTZ/KSPAR IN BRN DE-VIT GLSS MTX,MNR MFC MIN,GEN V BRTTL

ALTERED RHYOLITE:MOT BRN,WH,COM CLR M GR QTZ;BRN-BL F GR ALT BIO IN ARGILLIZED MTX

DACITE:MOT WH-LT GY, PRED PORPH W/COM CLR ANHED QTZ,WH SBHED PLAG,OCC F GR MFC MIN IN VF GR-APHNTC MTX OCC BRN-RD STN

DACITE:LT GY,PRED MAS W/ F GR WH PLAG,F GR CLR QTZ,PLAG PRED ALT TO SAUSURITE



NOTE: MULTIPLE LOST CR BETWEEN 2940-3097. SET MULTIPLE 50-75SX CMT PLUGS BETWEEN 3097-2900

NOTE: LOST CR AT 3190. CMTD MULTIPLE PLUGS BACK TO 3050. DRLD OUT/SIDETRAKD AT 3097 W/NB#8- DRLG NEW HOLE & DUPLICATE SMPLS AT 3090-3190. ALSO, NEW HOLE SURVEY AT 3132- 3°00'

C = 20U AT 42VIS
LAG-49MIN W/54SPM

NOTE: NO DITCH RDGS DUE TO SHAKER MALFUNCTION

2916' 2°45'

3008' 3°00'

3052' 3°00'

W 8.4
V 35
F 16.2
FC 2/32
S 500
pH 9.4
SD TR

TUFF: WH, CRM, PRLY LSTR, ALT SLI BENT, OCC SLI PRLY TEX, DOM APHNTC

3151' 2°00'

WLDED TUFF: LT GY, ABNT FLTND GLS SHDS, ABNT V CLR QTZ GRNS IN VIT MTX

3223' 3°00' (NEW HOLE)

3315' 2°15'

3437' 2°30'

W 8.4
V 45
F 14.8
FC 2/32
S 500
PH 11.3
SD ½
SOL 1¼

THN WH, BUFF, LT BRN ASH INTBDS

RHYOLITE: GY, ABUN ANHED QTZ IN FLSC GRNDMSS

R ED ASH-TR MFG PHEN

INCRSD % OF PLAG IN MTX

ALT RHYOMOT YLW-BRN GY, ABNT CLR-WH QTZ IN ARG MTX, QTZ COM STN BRN-RD

3623' 3°00'

TUFF BRECCIA: BUFF, LT BRN, ABNT F-M GR ANG TO V ANG VOLC AND TUFF LITH FRAGS IN GLSSY MTX, VOLC FRAGS PRED DACITE

TUFF: BRN, GY, BUFF, ABNT F-M GR CLR QTZ, F GR WH PLAG XLS, COM VOLC LITH FRAGS IN ASH MTX

TUFF: WH, LT GY, F GR CL QTZ, COM F-M GR BL MFC MINS IN WH ASH MTX

WELDED TUFF: LT PURP, ABNT FLTND & PARALLEL DEVIT GLS SHDS, OCC FLTND VES, R FLTND PUM FRAGS IN PARTLY VITRIFIED ASH MTX

TUFF: DULL RD, GY, VF GR-APHNTC, HIGHLY SILICIFIED, SBCONCH FRAC

TUFF: GY, GY-WH, PROB AIR FALL, OCC ALT TO BENT

DACITE: WH, LT GY, PORPH W/ ABNT V CLR ANHED QTZ, BL SBHED PRISM HBLD IN VF GR PLAG GRNDMSS, PLAG COM ALT TO SAUSURITE, COM MLKY SEC QTZ, PROB FRAC FILL

RHYO-DACITE: LT GY, GY-GN, ABUN K-SPAR, QTZ; POSS PLAG, MNR MFCS; OCC MIN ALINEMENT, MTX COM ALT CLYEY, PROB WLDED

ANDESITE: LT-DK GY, PORPH W/ COM WH F GR EUHED PLAG PHEN IN APHNTC GRNDMSS, OCC BL SBHED EQUANT PYX, PHEN COM ALIGHNED

TUFF: LT BR, BUFF, OCC KSPAR XLS, MNR MFCS IN ARGILLIZED MTX, ABNT V CLR V ANG QTZ IN SMPL

INTBD TUFFS: VCOL GY, BRN, CRM, YLW; XPR THN BDS ASH-PARTLY BENT, OCC-COM PROB LAPILLI TUFF, COM-ABUN VCOL ZEOLITIC ALT (CELADONITE), COM TUFF BCCAS W/SILCD FRGS, GLSS PCS

ALT TUFFS: VCOL BLU, GY, GN, WH, BRN, BUFF, PROB TUFF BCCAS & LITHIC TUFFS-COM BENT ALT, TR-OCC CHLORITIC ALT, ABUN ZEOLITIC, COM CHAL ROX GEN OF RHYOLITIC-ANDESITIC COMP, OCC SPHERULITIC TEX, POSS PROTOCLASTIC TEX

RHYO-DACITE: LT GY, PINK-GY, PORPH W/ ABNT F-M GR CLR ANHED QTZ PHEN, OCC F-M GR SBHED BLK PYX PHEN IN APHNTC GRNDMSS, RARE FLOW BND, OCC ALT PRODUCTS INCL F-MICXL PY, F GR CHLORITE

ALTRERD TUFF: VCOL BRN MOT BR-WH, COM IRON-OX STN, ABNT V CLR ANHED QTZ, COM ALT MFCS IN ARGILLIZED MTX, OCC ALT PRODUCTS INCL F GR CHLORITE, SAUSURITE

RHYOLITE: LT PINK, PORPH W/ COM M GR CLR ANHED QTZ COM F GR EQUANT PYX PHEN IN APHNTC GRNDMSS, OCC ALT PROD INCL CHLORITE, SAUS

ALT RHYODACITIC ASH-FLOW TUFF: LT GY, ABUN SBHED QTZ; SOME ALT PINK K-SPAR, DK BRN ALT MFCS, POSS BIOT IN ALT PLAG & DEVIT GLSS MTX, MFCS OCC CHLORITIZD, RARE ZEOL ALT, POSS DEUTERIC ALT

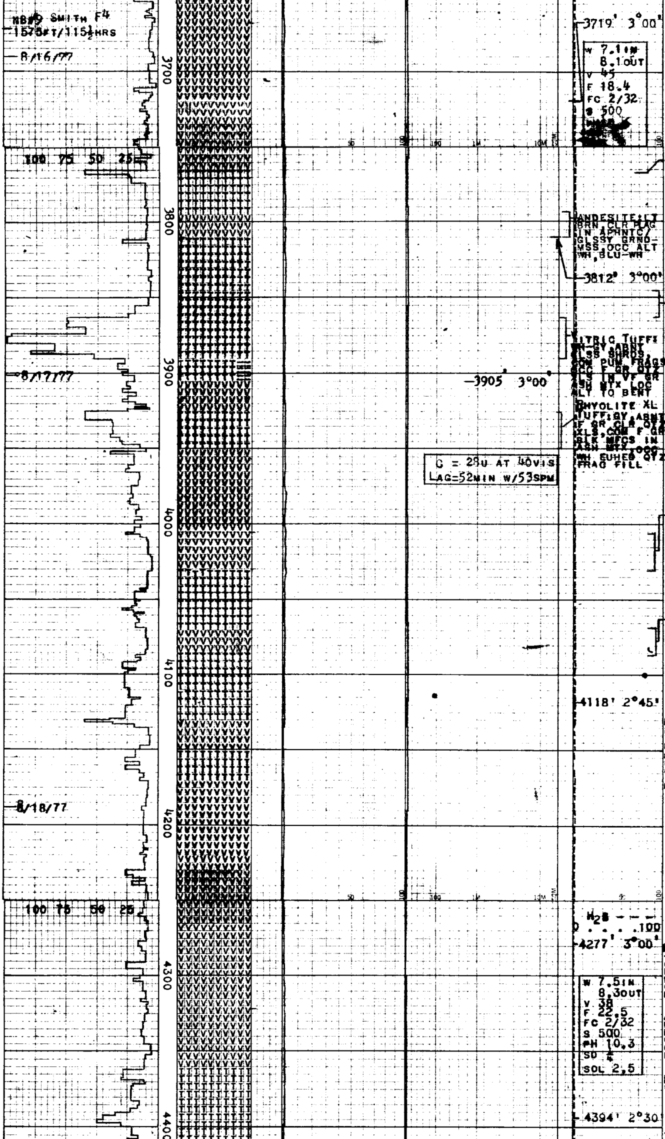
VITRIC RHYOLITIC TUFF: M GY, COM ANHED QTZ, ABUN DK BRN MFCS IN RSNS-GLSSY GRNDMSS, MTX COM ALT WH, V SLI TR GLSS SHRDS; TRC CHLORITIC ALT; COM FLOW BNDNG

INCRSD CHLORITIC ALT OF MFCS, DCRSD % QTZ PHNOCRSTS

WELDED TUFF: MOTTLD GY GY-WH, GY-BRN, OCC ALT YLW-WH QTZ PHNOCRSTS & COM FLTTND INCLUSGEN GLSS SHRDS

RHYOLITE: LT GY-PINK ABNT V CLR ANHED QTZ IN APHNTC MTX, OCC ALT MFCS PROB VF GR BIOT

RHOLITE: LT GY, PORPH W/ COM V CLR ANHED M GR QTZ, VF GR ALT MFCS IN APHNTC GRNDMSS COM SAUS, OCC FLOW BND GRNDMSS OCC ARGILLIZED OCC IRON-OX STN



3719' 3°00'

W 7.1 IN
8.1 OUT
V 45
F 18.4
FC 2/32
S 500

ANDESITE: LT BRN, CLR PLAG IN APHNTC/GLSSY GRNDMSS, OCC ALT WH, BLU-WH

3812' 3°00'

VITRIC TUFF: WH-GY, ABNT GLSS SHRDS, COM PUM FRAGS, OCC F GR QTZ XLS IN VF GR ASH MTX, LOC ALT TO BENT

3905 3°00

RHYOLITE XL TUFF: GY, ABNT F GR CLR QTZ XLS, COM F GR BLK MFCS IN ASH MTX, OCC WH EUHED QTZ FRAC FILL

C = 28u AT 40VIS
LAG=52MIN W/53SPM

4118' 2°45'

4277' 3°00'

W 7.5 IN
8.3 OUT
V 38
F 22.5
FC 2/32
S 500
PH 10.3
SD ¼
SOL 2.5

4394' 2°30'

INTBD VOLCS: DACITE: MOT GY-WH, PORPH W/ COM VF-F GR CLR QTZ AND WH PLAG, F GR BLK MFCS IN APHNTC-GLSSY MTX, RHYODACITE: MOT GY-WH, PORPH W/ F-M GR V CLR ANHED QTZ, F GR BLK EQUANT SBHED PYX PHEN IN APHNTC MTX

NOTE: DRLG WITH AERATED MUD

CHILLD ZONE, ALT IN PART BENT

ALT TUFF: M-DK GY, GEN APHNTC W/OCC MFC & FLDSPR PHNOCRSTS, PROB ANDESITIC COMP, COM SILICIFIED, OCC BENT, TR POSS PROPYLITIZATION (GN TINT), OVERALL RSNS TEX

RHYOLITIC ASH FALL TUFF: PK, GY, VF-F GR, OCC F GR CLR QTZ XLS, OCC PUM FRAGS TO 2MM IN F GR ASH MTX, SBCON FRACT

ASH FLOW TUFF: WH, GY, LT PURP, ABNT F-C GR CLR BROKEN QTZ XLS, ABNT GLSS SHRDS, OCC PUM FRAGS, OCC BLK MFC MINS IN ASHY-GLSSY MTX, OCC SBPAR ALIGNMENT OF SHRDS, MTX LOC ALT TO BENT

TUFFACEOUS SILTSTONE: RD-BRN, MOD HD, NON-CAL PRED ASH W/ COM SILT SIZED CLASTS

RHYOLITE: LT PURP, GY, ABNT LITHOPHYSAE TO 2MM, OCC F GR ANHED QTZ IN VF GR-APHNTC MTX, TR M-C GR MLKY QT

RHYOLITE: PK, GY, PORPH W/ COM F-M GR ANHED QTZ, OCC F GR BLK MFCS IN GLSSY-APHNTC GRNDMSS, OCC C GR CLR EUHED QTZ FRAC FILL

ANDESITE: DK GY-GN, PLAG & MFC PHNOCRSTS IN SLI VITREOUS GRNDMSS, OVERALL SLI PROPYLITIZATION; COMP MAY BE PARTLY BASALTIC

RHYOLITIC TUFF: MOTTLD SALMON, PINK-BRN, SBHED QTZ/MNR K-SPAR IN APHNTC MTX, SOME FLDSPR ALT, COM-ABDN CHAL & CALCITE FRAC FILL; GEN XLN

DACITE: M BRN, K-SPAR & PLAG IN F GR MTX, GEN UNALT APR, OCC TR FLOW BNDNG

RHYOLITE: LT GY, COM ALT WH, ABUN SBHED QTZ IN ALT FLDSPR GRNDMSS, RARE MFCS

RHYOLITE: SALMON, PK, PORPH W/ ABNT F-M GR V CLR-ROSE QTZ, COM ALT MFCS IN APHNTC GRNDMS

RHYODACITIC TUFF: WH, LT GY, OCC CLR ANHED QTZ, OCC F GR BLK MFCS IN WH LITHIFIED ASH MTX

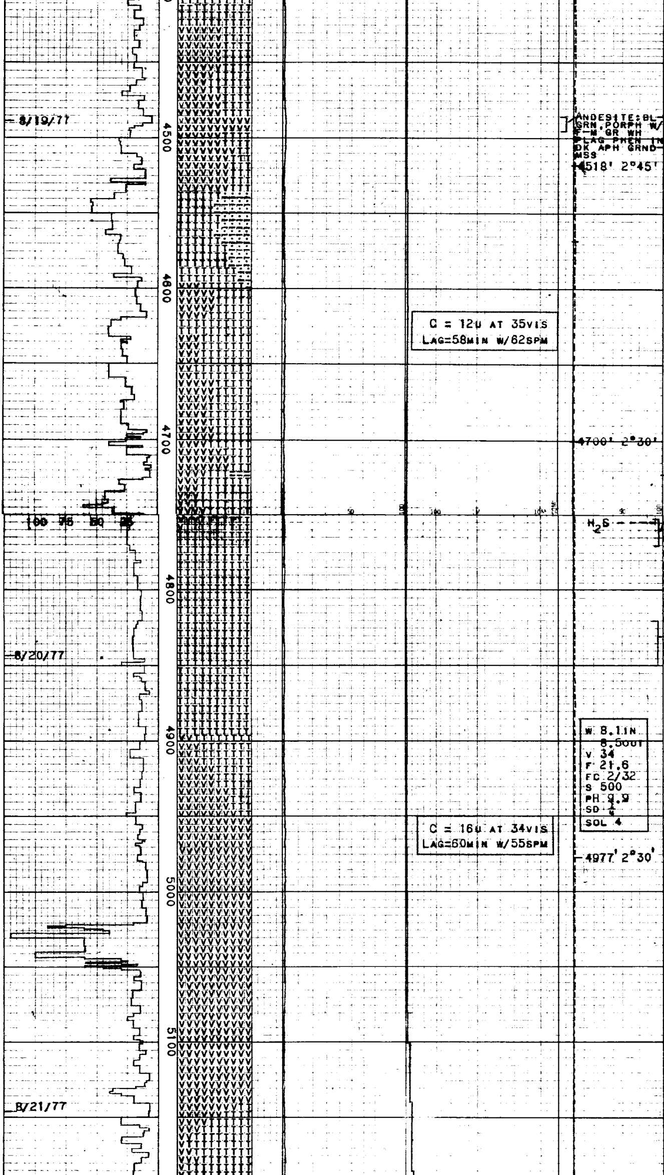
RHYODACITE: LT GY, WH PORPH W/ COM F-C GR CLR-ROSE SBHED QTZ, COM M GR EQUANT BLK MFCS, RARE BLK ELONGATE HBLD PHEN IN APHNTC-GLSSY GRNDMSS, OCC EVIDENCE OF FLOW INCL THIN (1MM) BANDS OF GLSS, SBPAR ALIGNMENT OF ELONGATE MINS GRNDMSS OCC ARGILLIZED

RHYOLITE-DACITE: LT GY-WH, MASS W/CLR SBHED QTZ PHEN, PRED MICXL FLD, PROB PLAG, APHNTC WH GLASSY GRNDMSS, OCC CHALKY-TUFFACEOUS, MNR DK BRN-BLK MAFICS

ANDESITE: LT BRN-CRM, W/MNR MLKY WH PLAG PHEN, LT TAN SILICEOUS GRNDMSS, OCC ELONGATED CLR QTZ XLS, GD TR BLK HBLD & BIOT

RHYOLITIC TUFF: LT GY-WH, SLY CHALKY TEX, PRED FLD, MNR CLR QTZ PHEN

TUFF: LT-M GY, MNR GY-BRN, APHANITIC, RHYOLITE-ANDESITE COMP



RHYODACITIC XL TUFF: WH,LT GY,COM F-M GR SBHED CLR-ROSE QTZ XLS OCC F GR BLK PYX,RARE PUM FRAGS TO 1MM IN ASHY MTX

INTBD RHYOLITE AND RHYOLITIC XL TUFF:PK-WH,SALMON,ABNT F-M GR EUHED CLR-ROSE QTZ XLS OCC PUM FRAGS TO 2MM, RARE F GR BLK MFCS IN ASHY MTX,RARE EVIDENCE OF BDG INCL PARALLEL ALIGN OF PUM,ELG MINS; EXTRUSIVES PORPH W/ QTZ PHEN AS ABOVE,OCC LITHOPHYSAE TO 2MM, GRNDMSS VAR GLSSY-APH-NTC,RARE FLOW BNDG

ANDESITE:BL-GRN,PORPH W/ F-M GR WH PLAG PHEN IN DK APH GRNDMSS

TUFFACEOUS SNDY SLTST: WH,MOD HD,P SRTD,ABNT F-M GR ANG-SBANG CLR QTZ IN ASHY SILT MTX, NON CALC

RHYOLITIC WELDED TUFF: DK GY,PURP,ABNT FLTND GLSS SHRDS,COM GLSSY STREAKS,OCC FLTND PUM FRAGS IN DULL GLSSY MTX

ANDESITE:M BRN-LT BRN PALE BRN-ORNG FLD W/ MNR QTZ GRNS,FLD IS PRED,HI SIL GRNDMSS, OCC SLY ASHY & VES

RHYODACITIC TUFF:LT GY,GY-BRN,MNR AMNT F QTZ XLS,W/PLAG PHEN IN WH-LT TAN ASH MTX, APRS SLY GLASSY,SCAT MAFICS-HBLD&/OR PYRX, TR BIOT

RHYOLITE-TUFF:M ORNG -BRN,HD RHYOLITE,PRED FLD,SME CLR QTZ,GRDG TO DACITE,INTBD W/LT GY-GN,VF GRN,WELDED ASH TUFF

SLTST:RED-BRN,VF GRN, SLY GRITTY,W/V SOL, RED-BRN CLAY,APRS TO GRD TO VOLC TUFF

RHYOLITIC TUFF:MOT WH BRN,BRN-RD,ABNT ALT PUM FRAGS,OCC F GR CLR QTZ IN ASH MTX,WTHRD, POSSIBLY REWORKED

RHYOLITIC XL TUFF: PURP-GY,ABNT VF-F GR CLR BROKEN QTZ XLS, COM F GR ELG BLK PYX XLS,OCC KSPAR XLS,RARE LAPILLI,RARE PUM FRAGS IN GLSSY MTX,OCC WH QTZ FRAC FILL,OCC IRON OX STN

RHYOLITIC TUFF:WH,BRN-RD,OCC CLR QTZ XLS, OCC ALT PUM FRAGS IN ASHY-GLSSY MTX,COM IRON OX STN,WTHRD

RHYOLITIC TUFF:PURP, OCC F GR QTZ,OCC F GR BLK MFCS,RARE PUM FRAG IN ASHY-GLSSY MTX

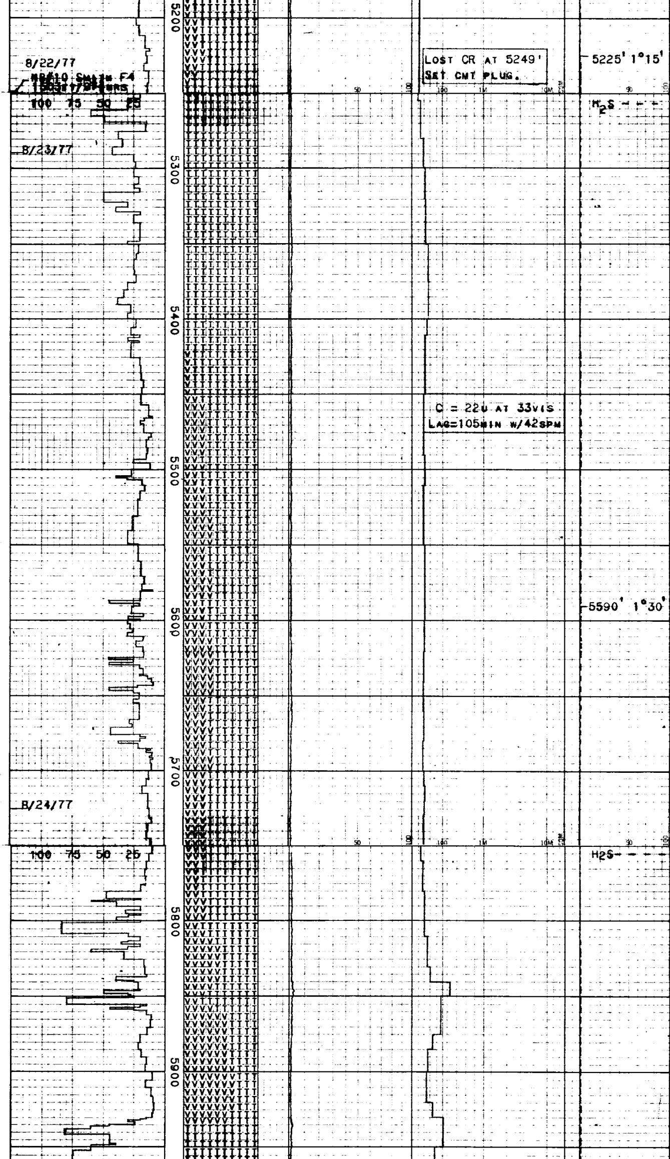
RHYOLITE:LT PNK-PURP, V HD,PORPHYRITIC W/ ABNDT WH-LT PNK FLD, OCC PLAG LATHS,MNR CLR QTZ PHEN,COM HBLD SCAT THRU,APRS V DNSE

RHYODACITE:LT GY-TAN, V HD,PORPHYRITIC W/ ABNDT FLD XLS,CLR QTZ PHEN,HBLD-S&P TEX,WH FLD GRNDMSS-SUGARY TEX,APRS SLY GRANITIC

RHYOLITE:WH-LT GY,MOD FRM,ABNDT WH FLD-SLY SUGARY,FLD SLY WTHRD, MNR CLR QTZ PHEN,BLK HBLD

RHYOLITE:WH-LT GY-LT GYGN,V HD,SMWHT S&P TEX,PORPHYRITIC W/ ABNDT FLD XLS,SME CLR-FROS QTZ PHEN,LOC CALC,PYR,FE STN.

RHYOLITIC XLN TUFF: PRED WH-SME CLR,HD-V HD,PORPHY W/ FLD & QTZ PHEN,LARGE DECR IN MICA,SL INCR IN PYR,TR CALC.



LOST CR AT 5249'
SET CMT PLUG.

C = 22U AT 33VIS
LAG=105MIN W/42SPM

TUFF:LT GY-WH,V HD, PRED FLD,MNR PHEN QTZ &PLAG,V SIL GRNDMSS, TR PYR XLS,RHYOLITE-ANDESITE IN COMP

NOTE:DROP SURVEY INSTEAD OF WIRELINE

XLN TUFF:WH-LT GY-CLR,HD-V HD,PRED FLD+SME QTZ,MNR FLD & QTZ PHEN,SCATT PYR PHEN,LOC TR XLN CALC.

TUFF:WH-LT GY,SME SL LT GN,TR LT PINK,HD, PRED FLD,MNR PHEN OF FLD & QTZ IN SIL GRNDMSS,SL INCR IN CLR CALC,TR PYR & PYR PHEN.

XLN TUFF:WH,SLY GRANULAR-SUGARY TEX,MOD FRM,TR PLAG XL FACES, SME CLR VOLC QTZ PHEN, SCAT,LSE,CLR SPARRY CAL XLS

DACITE TUFF:WH-LT GY, MNR PALE GN&LT BRN,V SILICIC,CONT GD TR CLR ANG QTZ PHEN W/ CONCH SURFS,ABNDT FLD, VF GRN,SLY CHALKY MTX -PROB GLSS SHARDS & WTHRD FLD,TR CAL GNS

XL TUFF:LT GY,HD,PRED FLD W/PLAG PHEN-GD XL FACES,ABNDT CLR QTZ PHEN,COM SLY CHALKY TEX GRNDMSS-ASHY,MNR XLN CAL,GD TR QTZ VEINLETS

DACITE TUFF:OVERALL WH-LT GY,SME SCATT LT GN FRAGS,HD,PRED FLD W/ SME PLAG PHEN,ABNT CLR ANHED QTZ PHEN IN SFT-HD WH SIL GNDMSS, COM QTZ VEINLETS,TR PYR XLS,XLN CALC.

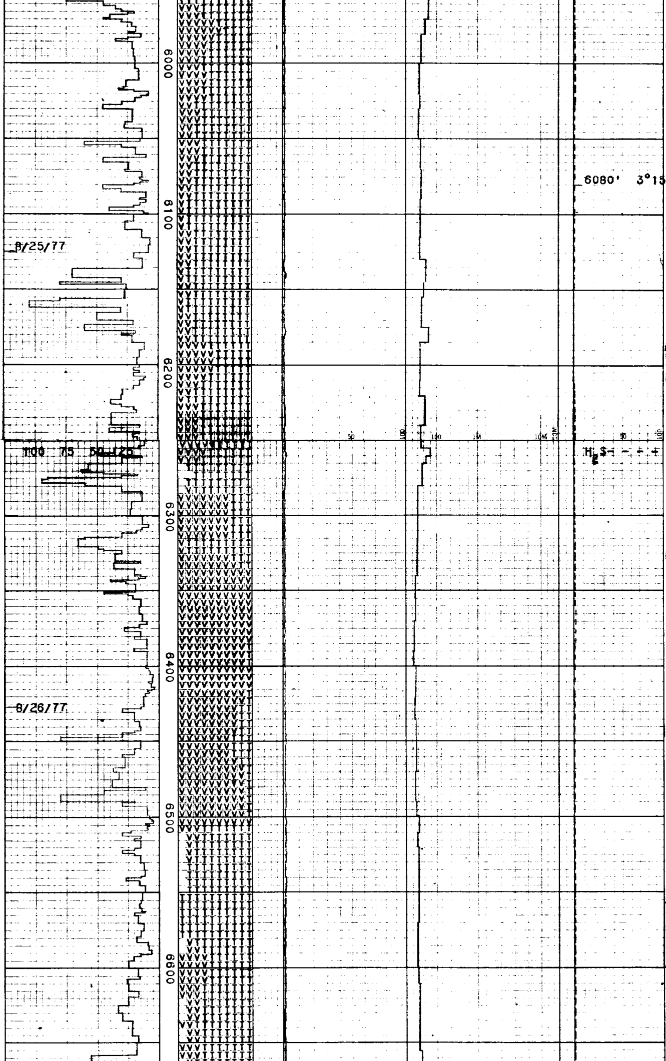
TUFF:INCR IN GY,HD, XLN TUFF,SME CONTAINING GLASS SHARDS,FLD & QTZ PHEN,SME BDD W/WH OR CLR XLN TUFF.

DACITE TUFF:OVERALL WH-LT GY,LOC PALE GN, PRED FLD & QTZ,CLR QTZ PHEN IN WH SIL GNDMSS,ABNT BNDING OF QTZ VEINLETS &WH GNDMSS MAT,DECR IN GY XLN TUFF.

C = 36U AT 35VIS
LAG=90MIN W/45SPM

RHYOLITE:LT-M GY,V HD, PRED F GRN FLD GRDMSS W/MNR PLAG PHEN,COM CLR EUHED QTZ PHEN, OCC FLOW BNDNG W/QTZ &SIL GNDMSS,TUFF IN PART,TR MAFICS-POSS HBLD

TUFF:WH,MOD FRM,XLN W/SCAT CLR QTZ,PLAG PHEN IN WH,F GRN SIL GNDMSS



RHYOLITE TUFF:WH-LT GY,MASS,FRM-V HD,CONT WH SIL GNDMSS-SUGARY TEX W/GD XL FACES OF PLAG,CLR QTZ PHEN W/ CONCH SURFACES,TR PYR

XLN TUFF:WH,LT-DK GY, HD,MASS, SL DECR IN PLAG & QTZ PHEN,COM FLOW BNDG OF QTZ,GY & WH SIL GNDMSS TUFF, OCC BN GNDMSS BNDG, TR MAFICS.

C = 36U AT 34VIS
LAG=94MIN W/40SPM

RHYOLITE TUFF:OVERALL LT-M GY,HD,MASS,PRED FLD & QTZ,PHEN OF CLR ANHED QTZ,OCC PLAG PHEN,CONT OCC BNDG, TR PYR,MAFICS,CALC.

TUFF:WH,SFT-MOD FRM, OCC SLY BRIT TEX,VF GRN,SLY CHALKY-ASHY, FLD PRED,TR MAFICS

RHYOLITE:M GY,WH-GY, V HD,F GRN,SIL,OCC PHEN WH FLD,CLR QTZ, GD BNDNG VIS-ALT BNDS OF GY&BRN-GY SIL MAT, TR HBLD

RHYOLITE:WH,LT-M GY, V HD,DENSE,MSTLY APHAN,OCC PHEN OF FLD & CLR QTZ,OCC BNDG, SCATT TR MICA,LOC TR CALC.

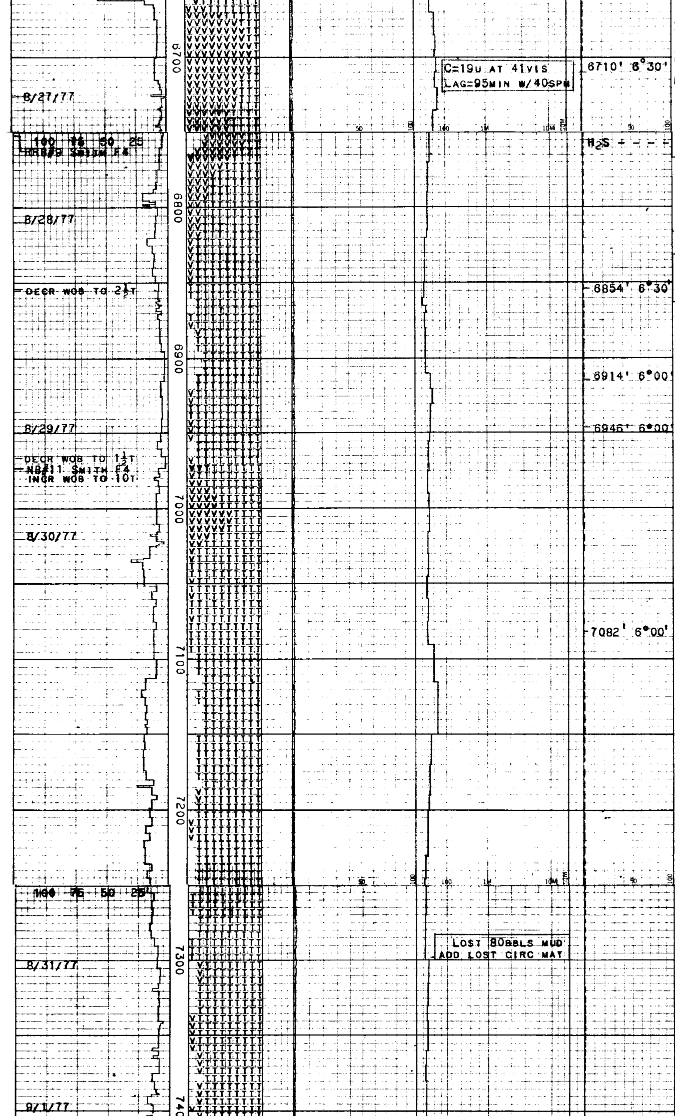
TUFF:WH-LT GY,SFT, MOD FM,SL CHALKY-ASHY,SME CONTNG QTZ PHEN.

RHYOLITE:CLR-WH-GY,V HD,DENSE,PHEN OF QTZ & FLD AS ABOVE,FM PROB FRAC DUE TO MUCH LRGR CUTTINGS,TR MAFIC PHEN,SME BNDG.

VOLC XLN TUFF:PALE GN -WH,HD,VF GRN SIL XLN GNDMSS,SCAT OCC PHEN CLR QTZ,R TR MAFICS, ABNDT MICRO-FRACS,GN COL-POSS SLY CHLORITIZED

W 8.3 V 35 F 24.0
FC 2/32 PH 10.6
SD $\frac{1}{4}$ S 500 SOL 3.0

TUFF:MOTTLED GN&WH, PRED WH SIL GNDMSS-PROB FLD,R TR QTZ PHEN,GD BNDNG VIS-ALT PALE GN&WH SIL MAT, COM BRN-GY SIL VOLC FRAGS,ABNDT LOST CIRC MAT INCL MUSC



ANDESITE:POSS WTHRD, DK GY-GN-BLK,MOD HD, BRIT,SMWHT ASHY,HIGHLY MAFIC,FLD PHEN W/ G XL FACES ON SME,TR PYR XLS,MOD CALC.

RHYOLITE TUFF PORPHY: POSS WTHRD,LT GY-LT GN,MOD HD,BRIT,GNDMSS SPTD W/ SMALL WH PHEN, LGR M GN PHEN OF CHL, MOD CALC.

NOTE:DECR WOB TO 5T TO CORR FOR DEV HOLE

XLN TUFF:WH,LOC LT GY-LT GN,HD-V HD, PRED FLD,GNDMSS CONT LGE CLR QTZ PHEN-G XL SURF,SME CLR CALC PHEN,LOC GN STND CALC MAT-POSS CHL.

W 8.5 V 38 F 18.4
FC 2/32 PH 10.7
SD--TR S 500 SOL 3

TUFF:WH-LT GN,MOD HD PRED MLKY WH SIL,SLY GRAN GNDMSS,COM LGE CLR EUHED QTZ PHEN, SCAT LT-DK GN WTHRD MNRL THRU-PROB CHL, OCC LG PARALLEL XLS OF QTZ,SLY CALC IN PART,LOC SLY CLAYEY

XLN TUFF:WH-LT GY, MOD HD-HD,SIL GNDMSS CONT MSTLY LGE EUHED QTZ PHEN,SCATT GN MNRL AS BEFORE,TR PYR & CALC.

RHYOLITE TUFF:WH-GY, GN,BN,MOD HD-HD, PORPHY,GNDMSS SPEC W/ SM WH PHEN,LRGR PHEN-POSS CHL;MOD CALC,TR PYR.

XLN TUFF:WH-LT GY,M HD-HD,SUGARY TEX,PRED F SIL GNDMSS W/ SME QTZ PHEN,LOC TR CALC.

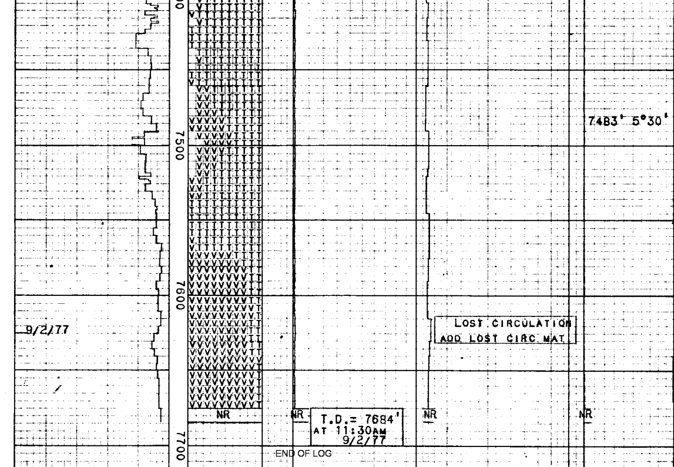
ASH TUFF:WH-PALE GNSH -GY,PRED ASHY-CHALKY WH MICXL SIL GNDMSS, W/TR SMALL QTZ & FLD PHEN,APRS SUGARY-SLY GRAN IN TEX,LOC SLY CLAYEY,OCC TR PYR

ASH TUFF:A/A W/SME SMALL CLR QTZ VNLETS, CONT VF GRN WH ASH FORMING GNDMSS,TR M-DK GN CHLORITIZED MIC MICA MNRL

ASH TUFF:WH-PALE GN, ASHY & CHALKY AS BEFORE,TR QTZ & FLD PHEN,CHL STNG,TR CALC & BIOT.

ABNDT LCM IN SAMPLES

VOLC ASH TUFF:WH W/ PALE GNSH-GY TINT, PRED MICXL WH ASHY GNDMSS W/FEW SCAT S PHEN FLD&QTZ,OCC THN VNLETS QTZ,TR MICROFRACS,LOC SLY CLAYEY, SMALLER CTGS THAN LAST SAMP



9/2/77

7483' 5°30'

LOST CIRCULATION
ADD LOST CIRC MAT

T.D.= 7684'
AT 11:30AM
9/2/77

XLN ASHY TUFF: WH-LT GY-LT GN, MOD HD-HD, ASHY GNDMSS W/ OCC FLD & QTZ PHEN, TR YEL CALC MAT, TR PYR, TR CHL MAT.

RHYOLITE-ANDESITE: M-DK GNSH-GY, F GRN, ABNT S ACIC PLAG XLS, SME QTZ, COM HBLD OR PYRX W/S&P TEX, APRS GRNLAR-NRLY GRANITIC, LOC ASHY MTRX-TUFFACEOUS, TR PYR, SLY CALC, LGER CTNGS THAN ABV

C = 27U AT 30VIS
LAG=79MIN W/53SPM

XLN TUFF: LT GN-WH, SL INCR IN ASHY MTRX, MICXL GNDMSS, RHYOLITE IN COMP W/MNR FLD & QTZ, SLY SUGARY TEX

ANDESITE: M-DK GNSH-GY, V HD, APHANITIC SIL GNDMSS W/SCAT V SMALL PLAG LATHS, SME SIL VNLETS, COM PYRX &/OR HBLD

ABNDT LCM IN SAMPLES

LOST CIRC AT 7684', SET CMT PLUGS, DRILL PIPE STUCK, FISHING FOR PIPE 9/2 - 9/8/77

RAN SCHLUMBERGER LOGS