



Copyright © 2003 by Epoch Well Services, Inc.

Houston, TX
(281) 784-5500
Bakersfield, CA
(661) 328-1595
New Iberia, LA
(337) 364-2322
Anchorage, AK
(907) 561-2465

Geothermal Formation Log

COMPANY Terra-Gen Operating Co.
WELL BLM North 83-11
FIELD Coso Geothermal
REGION Coso Mountains
COORDINATES NAD 1927 (N)= 258,671.7
(E)= 2,344,346.0
ELEVATION GL: 4076.0
KB: 4098.0 (22')
COUNTY, STATE Inyo, California
API INDEX NA
SPUD DATE 6/13/2009
CONTRACTOR Kenai Drilling, U.S.A
CO. REP. Jeff Potter, Warren Ash
RIG/TYPE Kenai 15A/Rotary Double
LOGGING UNIT ML046
GEOLOGISTS Marquel Mosebay
Daniel Nagy
ADD. PERSONS Josiah Failing
Scot Clark
CO. GEOLOGIST Jess McCulloch

LOG INTERVAL

CASING DATA

DEPTHS: 92' **TO** 9480'
DATES: 6/14/2009 **TO** 8/12/2009
SCALE: 2" = 100'

13 3/8" **AT** 92'
9 5/8" **AT** 701'
7" Liner **AT** 1995'
5 1/2" Liner **AT** 9480'

MUD TYPES

HOLE SIZE

Spud Mud **TO** 630'
Gel/Polymer **TO** 9480'

17 1/2" **TO** 708'
12 1/4" **TO** 2000'
8 3/4" **TO** 8500'
6 1/8" **TO** 9480'

ABBREVIATIONS

NB NEWBIT	PP PUMP PRESSURE	CO CIRCULATE OUT
RRB RERUN BIT	SPM STROKES/MIN	NR NO RETURNS
CB CORE BIT	PR POOR RETURNS	TG TRIP GAS
WOB WEIGHT ON BIT	LAT LOGGED AFTER TRIP	WG WIPER GAS
RPM ROTARY REV/MIN	LC LOST CIRCULATION	CG CONNECTION GAS

ALTERED ZONE	DIORITE	PYRITE
ANDESITE	DOLOSTONE	PYROCLASTICS
ANHYDRITE	FELSIC SILIC DIKE	QUARTZ DIORITE
BASALT	GABBRO	QUARTZ LATITE
BRECCIA	GLASSY TUFF	QUARTZ MONZONITE
CALCAREOUS TUFF	GRANITE	RECRYSTALLIZED CALCITE
CALCILUTITE	GRANITE WASH	RHYOLITE
CARBONATES	GRANODIORITE	SAND
CARBONACEOUS MAT	GYPSUM	SANDSTONE
CARBONACEOUS SH	HALITE	SANDSTONE-TUFFACEOUS
CEMENT CONTAM.	HORNBL-QTZ-DIO	SERPENTINE
CRYSTALLINE TUFF	INTRUSIVES	SHALE
CHERT - UNDIFF	LIMESTONE	SHALE TUFFACEOUS
CLAY	LITHIC TUFF	SHELL FRAGMENTS
CLAY-MUDSTONE	MARL - CALC	SILTSTONE
CLYST-TUFFACEOUS	METAMORPHICS	SILTST-TUFFACEOUS
COAL	OBSIDIAN	TUFF
CONGLOMERATE	PORCELANITE	VOLCANICLASTICS SEDS
DACITE	PORCELANEOUS CLYST	VOLCANICS

MINERAL PERCENTAGE

< 1% 1-3% 4-6% 7-9% > 10%



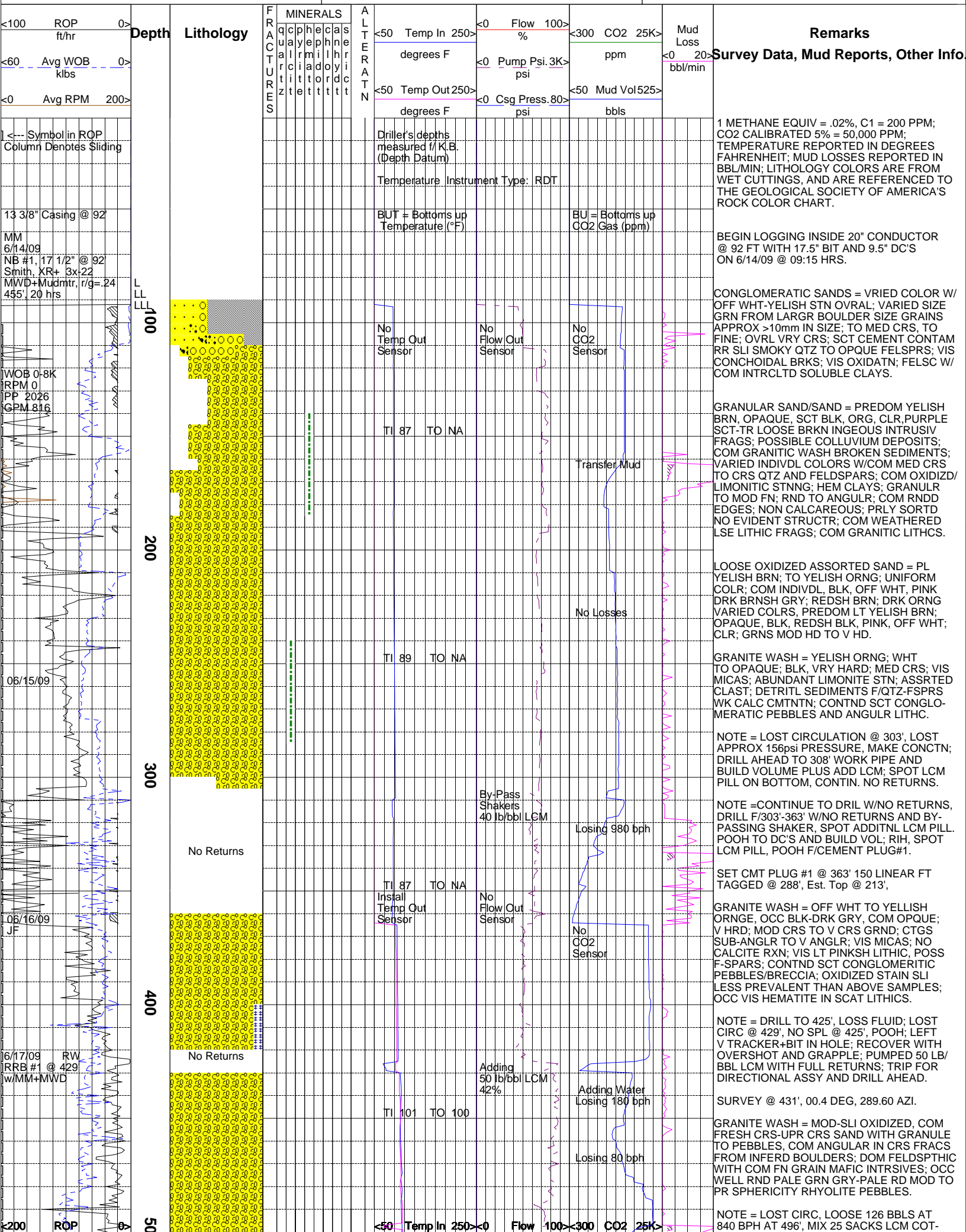
ALTERATION TYPES

SERICITIZATION	BIOTITIC
SILICIFICATION	CHLORITIC
	KAOLINITIC

ALTERATION INTENSITY

WEAK MODERATE STRONG





WOB 29K
RPM 0+177 MM
PP 2470
GPM 741

DN
06/18/09
NB #2, 17 1/2" @ 556'
Reed, EMS61A, 3x24
MWD+Mudmtr, r/g = .15
145' - hrs
MM

06/25/09
RRB#2, No Jets

DN
06/26/09

MM
13 3/8" Casing @ 701'

DN 06/30/09
NB #3, 12 1/4" @ 708'
Smith GF308, 3x28
Mudmtr, r/g = .15
708' - 31hrs

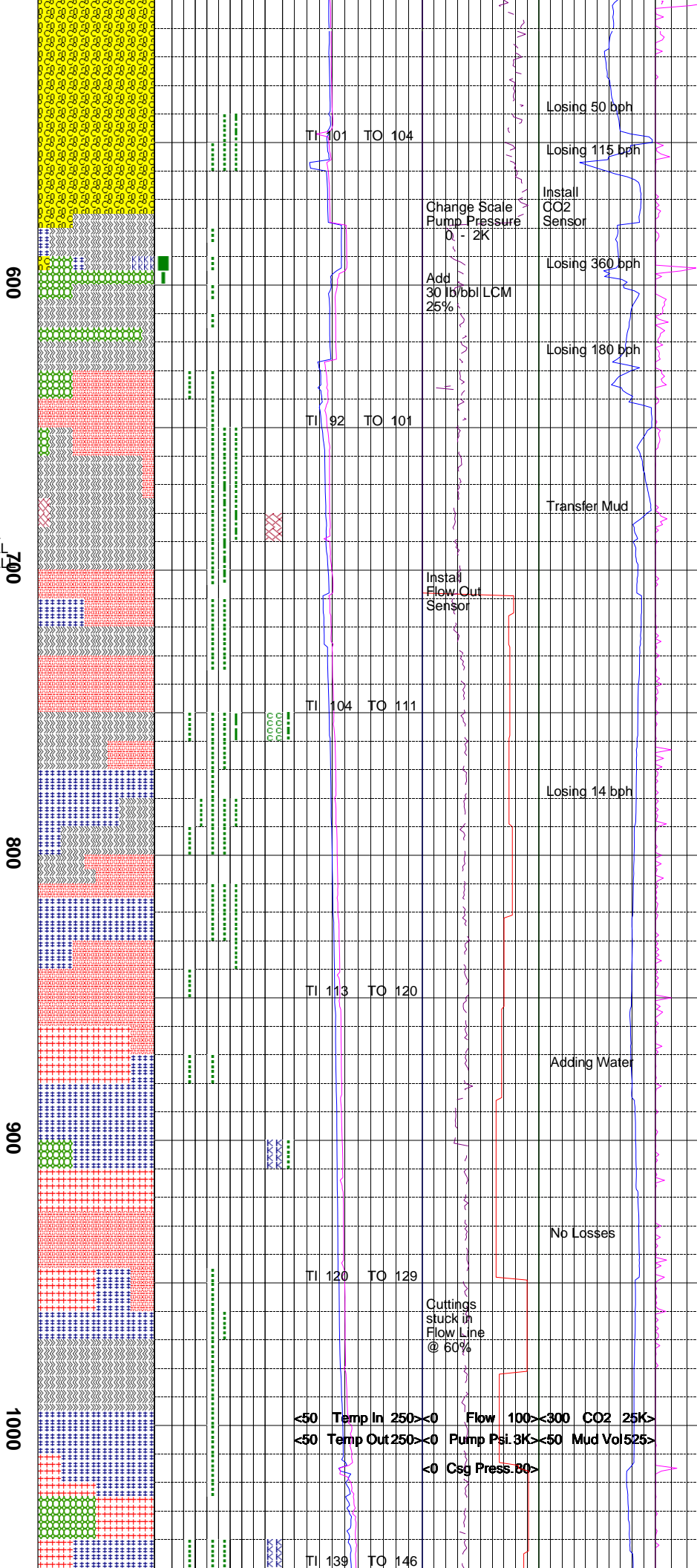
WOB 30K
RPM 0+111 MM
PP 1034
GPM 749

MM

(ROP) Scale Change
200
100

<100 ROP >
<60 Avg WOB >

<0 Avg RPM >



SURVEY @ 444', 00.25 DEG

NOTE = LOST CIRC, 103 BBLS AT 1030 BPH OFF BTM REAMING AT CONNECTION, 547'; ADD 25 SACKS OF LCM, REGAIN RETURNS; LOST CIRC, 75 BBLS AT 750 BPH AT 553',

MW 8.8 VIS 62 PV 7 YP 26 PH 10 CL 5500
GEL 17/25 SOL 2.93 Pf/Mf .3/.7 SD .01

PLUG#2 @ 579'/300LF, TAG 499', BASE XXX'
PLUG#3 @ 499'/300LF, TAG 199', BASE 499'
PLUG#4 @ 190'/150LF, TAG 127', BASE 297'
PLUG#5 @ 303'/300LF, TAG 270', BASE 292'
PLUG#6 @ 000'/300LF, TAG 070', BASE 300'
PLUG#7 @ 000'/300LF, TAG 053', BASE 303'

SURVEY @ 548', 2.4 DEG

Lost Fluid @ 594', 360 bbl/Hr to 596'

GRANITE = WHT TO OFF WHITE, TAN TO LT ORNGE; MOD HARD, HVLY OXIDIZED; FN TO CRSE GRAINED; SUCROSIC TEX; WK RXN TO HCL; SCAT MASS HEM FROM OXIDATION; SCAT TO COM FELSIK DIKES.

DIORITE = BLK TO DK GRY, WHT TO OFF-WHITE; HARD; SUCROSIC TO PORPH TEX; MED TO CRSE GRAINED; NO TO V WK RXN TO HCL; SCAT MASS HEM, R HEM VEINLETS; COM MASS EPID, V RR EUHD EPID; SCAT MASS CHLOR REPLACING PRIM MINERALS; MICAS, HORNBLLENDE PRESENT.

SURVEY @ 565', 2.17 DEG

NOTE: DRILL TO 708', CSG PT, RUN 13 3/8" CASING TO 701', INSTALL NEW BOPE, RIG UP BLOOE LINE, FLOW SENSOR INSTLLD

DIORITE = BLK TO DK GRY, TRNSLCT WHT TO OFF-WHITE, BLUISH-GRY TO GRY; MOD HD TO V HD; PORPH TEXTURE; MED TO CRS GRAINED; SCAT MASS HEM, V RR HEM VEINLETS; SCAT TO COM MASS EPID; SCAT CHLOR ALT, WHERE PRES, ALT IS REPLCING PRIM MINERALS WITH MASS CHLOR; V WK-NO RXN TO HCL.

QTZ DIORITE = GRNISH BLK TO BLK, CLR TO OFF WHITE, BLUISH; HD TO V HD; SLI BRRTL HYPIDIO TEXT; V RR FN EPID PHENOCRYSTS; MED TO CRSE GRAINED; MASS HEM; V RARE MASS CHLOR; V WK TO WK RXN TO HCL.

GRANODIORITE = WHT TO OPQE, GRY-LT GRY, COM DRK GRY; HD TO V HD; V WK TO WK RXN TO HCL; HYPIDIO TEXTURE; MED TO CRSE GRAINED; ABDNT MAFICS; SCAT BIOT + MICAS; SPL TRANS-WHT GRANTIE, TRANS-OPQE TR PINK/ORNG HUES; RR EPID + CHLOR; SCAT MASS HEMATITE.

MW 8.8 VIS 62 PV 7 YP 26 PH 10 CL 5500
GEL 17/25 SOL 2.93 Pf/Mf .3/.7 SD .01

GRANITE = WHITE TO OPQE, PINK TO LT PNK, LT ORNG TO DK ORNGE, COM LT GRY; HD TO V HD; HYPIDIO TEXT, WITH SCAT SUCROSIC TEXT WHERE HEAVILY OXDZD; COM HEM STAINING, RR MASS HEM; WK TO NO RXN TO HCL; V RR MASS EPID.

GRANITE = WHT, LT GRY, OPAQUE, SUBTLE PINK-V LT BRN HUES; VRY HRD; CRS TO MED CRS; FELSIK W/QTZ; SCT TO ABDNT ORTHO NON CALC; SCT KAOLIN CLAYS; V-TR INSITU BLK MAFICS; VRY FNT; PORPH TEX; LACKING ANY SIGNIFCNT STN OR ANY OTHER ALTRD INDICTR, CLEAN; NON ALTRD.

DIORITE = BLK, GRNISH BLK, LT GRY-PRDM BLK, VRY HARD; VRY CRS; OCC >10mm SIZE CTNGS; COM HRNBLD; COM PORPHYRY TEX; SBTLE MERGE ASSOC W/GABBRO INTRUSIV V HD; MED-OCC CRS OPHIR TEX GRAPHIC FSPR, QTZ+MED HNDBLD+MAFC; NON CALC; TR HEM STN, CLEAN, NON ALTRD; SLI INCR IN PLAG RICH GRANODRIT+WEATHERD/SIMI OXIDZD QTZ DIORITE.

LOST 52 BBLS @ 1015', PARTIAL RETURNS, REGAIN FULL RETRNS, BEGIN LCM SWEEPS

SURVEY @ 1000', 0.2 DEG, 63.8 AZI.

QUARTZ DIORITE = DRK GRY-WHT, SPECKLD W/DRK BLK MAFICS; PHAN W/COM PORPH TEX; VRY HRD-HRD; V CRS-CRS; COM-VRY

TI 101 TO 104

Losing 50 bph

Losing 115 bph

Change Scale Pump Pressure 0 - 2K

Install QC2 Sensor

Losing 360 bph

Add 30 lb/bbl LCM 25%

Losing 180 bph

TI 92 TO 101

Transfer Mud

Install Flow Out Sensor

TI 104 TO 111

Losing 14 bph

TI 113 TO 120

Adding Water

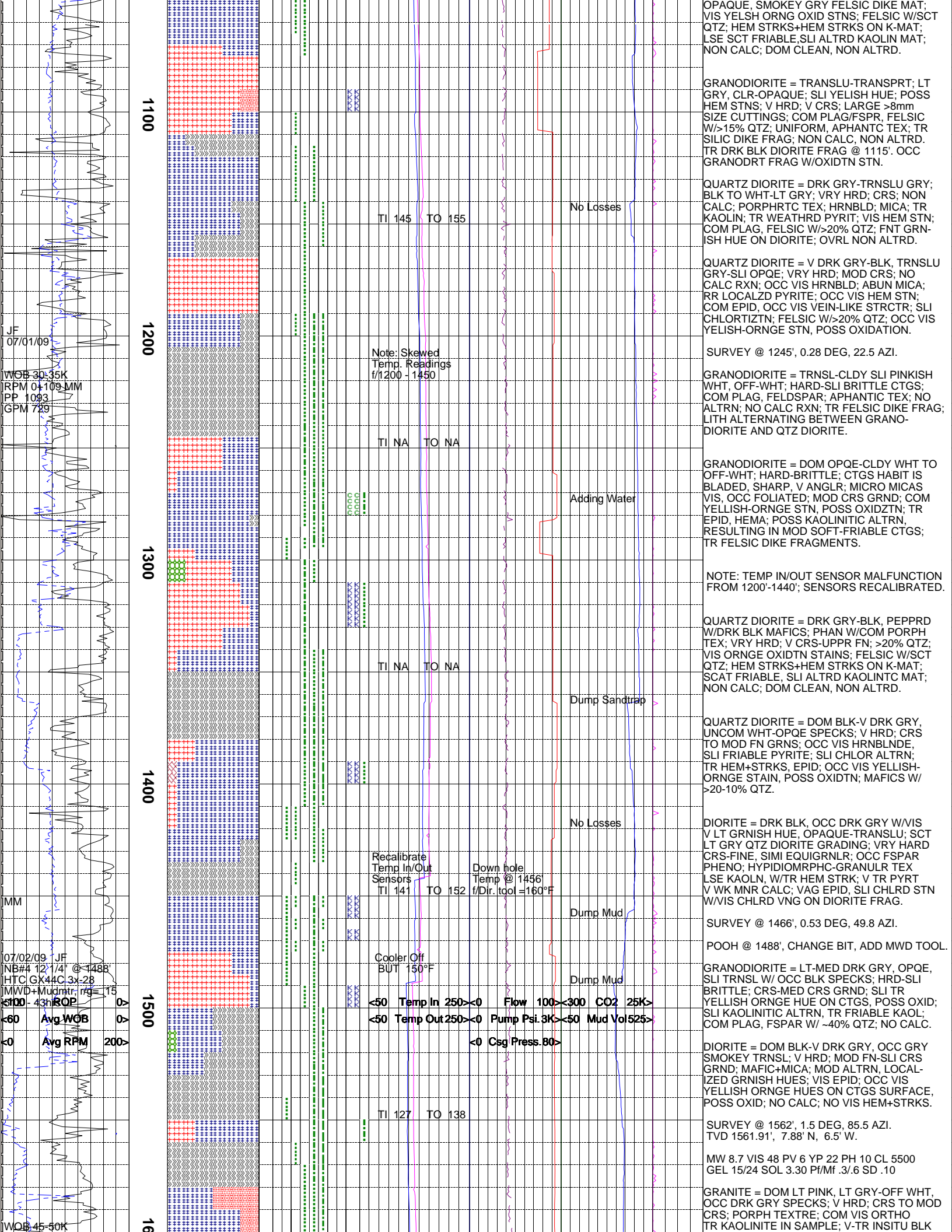
No Losses

TI 120 TO 129

Cuttings stuck in Flow Line @ 60%

TI 139 TO 146

<50 Temp In 250><0 Flow 100><300 CO2 25K>
<50 Temp Out 250><0 Pump Psi 3K><50 Mud Vol 525>
<0 Csg Press 30>



1100

1200

1300

1400

1500

16

OPAQUE, SMOKEY GRAY FELSIC DIKE MAT;
VIS YELSH ORNG OXID STNS; FELSIC W/SCT
QTZ; HEM STRKS+HEM STRKS ON K-MAT;
LSE SCT FRIABLE, SLI ALTRD KAOLIN MAT;
NON CALC; DOM CLEAN, NON ALTRD.

GRANODIORITE = TRANSLU-TRANSPRT; LT
GRY, CLR-OPAQUE; SLI YELISH HUE; POSS
HEM STNS; V HRD; V CRS; LARGE >8mm
SIZE CUTTINGS; COM PLAG/FSPR, FELSIC
W/>15% QTZ; UNIFORM, APHANTIC TEX; TR
SILIC DIKE FRAG; NON CALC, NON ALTRD.
TR DRK BLK DIORITE FRAG @ 1115'. OCC
GRANODRT FRAG W/OXIDTN STN.

QUARTZ DIORITE = DRK GRY-TRANSLU GRY;
BLK TO WHT-LT GRY; VRY HRD; CRS; NON
CALC; PORPHRT TEX; HRNBLD; MICA; TR
KAOLIN; TR WEATHRD PYRIT; VIS HEM STN;
COM PLAG, FELSIC W/>20% QTZ; FNT GRN-
ISH HUE ON DIORITE; OVRL NON ALTRD.

QUARTZ DIORITE = V DRK GRY-BLK, TRANSLU
GRY-SLI OPQE; VRY HRD; MOD CRS; NO
CALC RXN; OCC VIS HRNBLD; ABUN MICA;
RR LOCALZD PYRITE; OCC VIS HEM STN;
COM EPID, OCC VIS VEIN-LIKE STRCTR; SLI
CHLORTZTN; FELSIC W/>20% QTZ; OCC VIS
YELISH-ORNGE STN, POSS OXIDATION.

SURVEY @ 1245', 0.28 DEG, 22.5 AZI.

GRANODIORITE = TRNSL-CLDY SLI PINKISH
WHT, OFF-WHT; HARD-SLI BRITTLE CTGS;
COM PLAG, FELDSPAR; APHANTIC TEX; NO
ALTRN; NO CALC RXN; TR FELSIC DIKE FRAG;
LITH ALTERNATING BETWEEN GRANO-
DIORITE AND QTZ DIORITE.

GRANODIORITE = DOM OPQE-CLDY WHT TO
OFF-WHT; HARD-BRITTLE; CTGS HABIT IS
BLADED, SHARP, V ANGLR; MICRO MICAS
VIS, OCC FOLIATED; MOD CRS GRND; COM
YELLISH-ORNGE STN, POSS OXIDZTN; TR
EPID, HEMA; POSS KAOLINITIC ALTRN,
RESULTING IN MOD SOFT-FRIABLE CTGS;
TR FELSIC DIKE FRAGMENTS.

NOTE: TEMP IN/OUT SENSOR MALFUNCTION
FROM 1200'-1440'; SENSORS RECALIBRATED.

QUARTZ DIORITE = DRK GRY-BLK, PEPPRD
W/DRK BLK MAFICS; PHAN W/COM PORPH
TEX; VRY HRD; V CRS-UPPR FN; >20% QTZ;
VIS ORNGE OXIDTN STAINS; FELSIC W/SCT
QTZ; HEM STRKS+HEM STRKS ON K-MAT;
SCAT FRIABLE, SLI ALTRD KAOLINTC MAT;
NON CALC; DOM CLEAN, NON ALTRD.

QUARTZ DIORITE = DOM BLK-V DRK GRY,
UNCOM WHT-OPQE SPECKS; V HRD; CRS
TO MOD FN GRNS; OCC VIS HRNBLNDE,
SLI FRIABLE PYRITE; SLI CHLOR ALTRN;
TR HEM+STRKS, EPID; OCC VIS YELLISH-
ORNGE STAIN, POSS OXIDTN; MAFICS W/
>20-10% QTZ.

DIORITE = DRK BLK, OCC DRK GRY W/VIS
V LT GRNISH HUE, OPAQUE-TRANSLU; SCT
LT GRY QTZ DIORITE GRADING; VRY HARD
CRS-FINE, SIMI EQUIGRNLR; OCC FSPAR
PHENO; HYPIDIOMRPHC-GRANULR TEX
LSE KAOLN, W/TR HEM STRK; V TR PYRT
V WK MNR CALC; WAG EPID, SLI CHLRD STN
W/VIS CHLRD VNG ON DIORITE FRAG.

SURVEY @ 1466', 0.53 DEG, 49.8 AZI.

POOH @ 1488', CHANGE BIT, ADD MWD TOOL.

GRANODIORITE = LT-MED DRK GRY, OPQE,
SLI TRNSL W/ OCC BLK SPECKS; HRD-SLI
BRITTLE; CRS-MED CRS GRND; SLI TR
YELLISH ORNGE HUE ON CTGS, POSS OXID;
SLI KAOLINITIC ALTRN, TR FRIABLE KAOL;
COM PLAG, FSPAR W/ ~40% QTZ; NO CALC.

DIORITE = DOM BLK-V DRK GRY, OCC GRY
SMOKEY TRNSL; V HRD; MOD FN-SLI CRS
GRND; MAFIC+MICA; MOD ALTRN, LOCAL-
IZED GRNISH HUES; VIS EPID; OCC VIS
YELLISH ORNGE HUES ON CTGS SURFACE,
POSS OXID; NO CALC; NO VIS HEM+STRKS.

SURVEY @ 1562', 1.5 DEG, 85.5 AZI.

TVD 1561.91', 7.88' N, 6.5' W.

MW 8.7 VIS 48 PV 6 YP 22 PH 10 CL 5500
GEL 15/24 SOL 3.30 Pf/Mf .3/.6 SD .10

GRANITE = DOM LT PINK, LT GRY-OFF WHT,
OCC DRK GRY SPECKS; V HRD; CRS TO MOD
CRS; PORPH TEXTRE; COM VIS ORTHO
TR KAOLINITE IN SAMPLE; V-TR INSITU BLK

TI 145 TO 155

No Losses

Note: Skewed
Temp. Readings
f/1200 - 1450

TI NA TO NA

Adding Water

TI NA TO NA

Dump Sandtrap

Recalibrate
Temp In/Out
Sensors
TI 141 TO 152

Down hole
Temp @ 1456
f/Dir. tool = 160°F

No Losses

Dump Mud

Cooler Off
BUT 150°F

Dump Mud

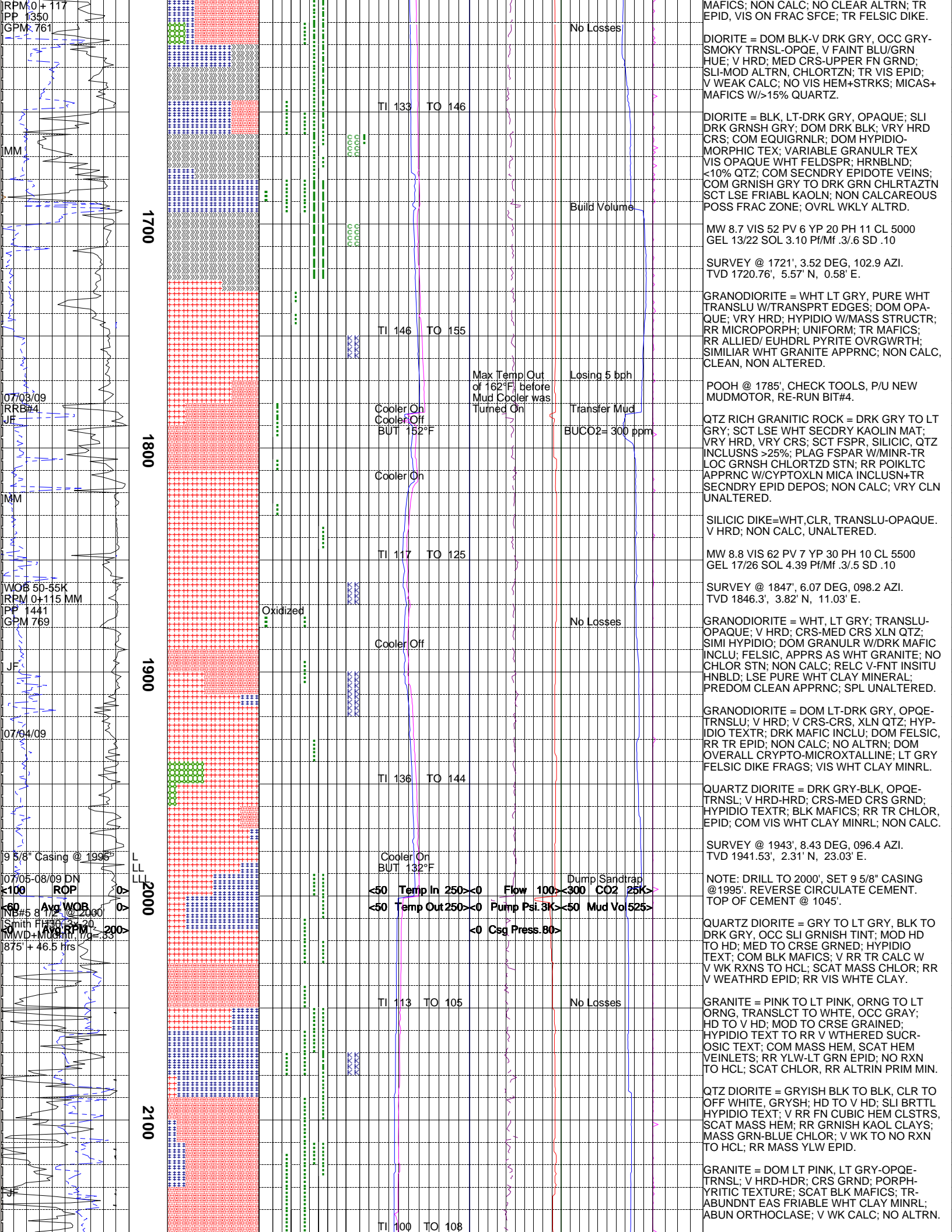
<50 Temp In 250><0 Flow 100<300 CO2 25K>
<50 Temp Out 250><0 Pump Psi 3K<50 Mud Vol 525>
<0 Csg Press 80>

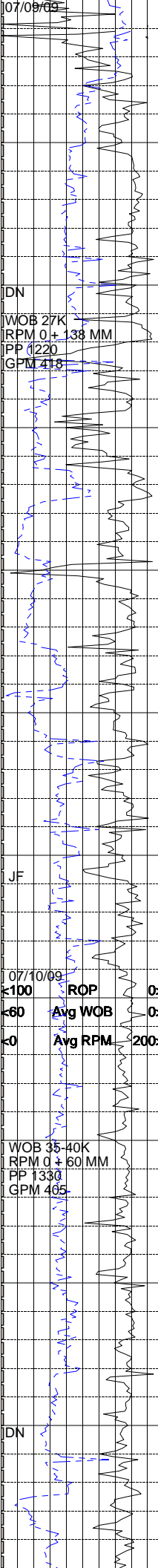
TI 127 TO 138

JF
07/01/09
WOB 30-35K
RPM 04109 MM
PP 1093
GPM 729

MM
07/02/09 JF
NB#4 12 1/4" @ 1488'
HTC GX44C 3x-28
MWD+Mudmtr; rig = 18
ST00-43h ROP

WOB 45-50K





2200

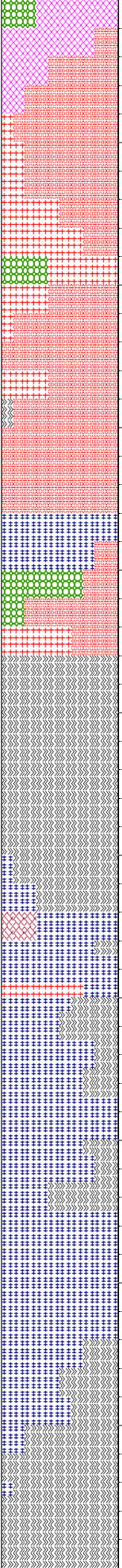
2300

2400

2500

2600

27



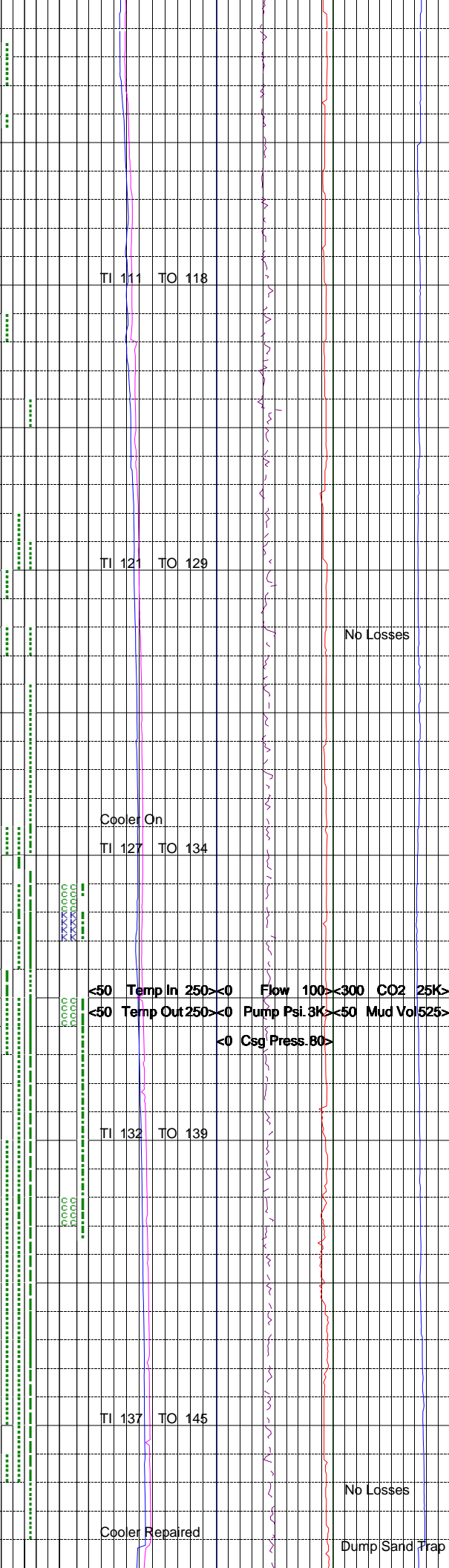
TI 111 TO 118

TI 121 TO 129

TI 127 TO 134

TI 132 TO 139

TI 137 TO 145



MW 8.7 VIS 48 PV 6 YP 28 PH 12 CL 5500
GEL 17/26 SOL 2.28 Pf/Mf .5/8 SD .00

GRANITE = LT GRY TO OPQE, WHT, SCAT PINK TO ORNG; HYPIDIO TEXTURE, WKLY FRAC; PRED PLAG, ROUNDED QTZ, TR OF BIOT/MICAS, BIOT OCC ALTRD TO CHLOR + HEM; MOD HD TO HD; NO RXN TO HCL; TR YLW + PNK FRAC FILL; V RR PYR.

GRANODIORITE = DK GRY TO GRY, LT GRY - OPQE OFF WHT W/SOME GRNS; HD-V HD; MOD TO CRSE GRAINED; PREDOM PLAG + BIOT; HYPIDIO TEXT; V WK RXN TO HCL.

SURVEY @ 2270', 17.4 DEG, 99.87 AZI.
TVD 2258.93', 6.84' N, 99.50' E.

GRANITE = LT PINK TO PINK. OPQE-WHITE, OCC ORNG; FRIABLE TO HD, WHRE FRIABLE SOME KAOL PRES; FN TO CRSE GRAINED; COM CHLOR SEEN IN SCAT DIORITE PIECES; NO RXN TO HCL; RR MASS HEM + EPID.

QUARTZ DIORITE = BLK TO DK GRY, LT GRY TO OFF WHITE; HD TO V HD; HYPIDIO TEXT; CHLOR REPLCING BIOT/MICAS, SOME FELD-SPARS; RR CUBIC HEM; DARK MAFICS ABUN; SCAT MASS EPID REPLCING SOME MAFICS; WK RXN TO HCL; COM OPQE GRNTIC GRAINS.

FELSIC DIKE = LT GRY TO GRY, WHT TO OPQE, W/SCAT BLK MAFICS THROUGHOUT; RR HEM INCLUSION; NO RXN TO HCL; V HD; APHANITIC TEXTURE; V RR MASS CHLOR.

GRANODIORITE = BLK TO DK GRY, GRY TO GRN WHERE CHLOR IS REPLCING DRK MAFICS; V HARD; WK RXN TO HCL; SCAT HEM; SCAT MASS DK GRN CHLOR.

DIORITE = BLK TO DRK GRY, GRY TO LT GRY, RR DRK GRY OPQE, AS DEPTH INCR GRN BECMING MORE PREVALENT; HD TO V HD; HYPIDIO TEXTURE; COM MASS CHLOR, AS DEPTH INCR, COM CHLOR ALTR, REPLCING PRIM MIN, MICAS/BIOT, PLAG; TRACE-LOC MASS EPID, SLI ALTR; MED TO CRSE GRND; SCAT HEM; WK RXN W/HCL.

QUARTZ DIORITE = DOM DRK GRN-BLK, TRSNL-OPQE, V DRK GRY-LT GRY; HRD-MOD SOFT; HYPIDIO TEXTRE; ABUN VIS CHLORITIZATION, LOC ABUN WHT CLAY MINRL; TR VIS EPID, HEMA; ABUN VIS MICAS, POSS BIOT; MOD-WK LOC CALC; OVERALL MED-CRS GRND.

SURVEY @ 2491', 21.9 DEG, 103.9 AZI.
TVD 2467.18', 25.03' N, 183.38' E.

GRANODIORITE = LT GRY-BLK, OPQE-TRNSL; V HRD-HRD; MED-UPPR FIN GRND; LOC MASS LT ORNGE-PINK HEMATITE; WK CALC; TR WHT CLAY MINRL; TR EPID, CHLOR; SLI CHLORITIZATION.

QUARTZ DIORITE = BLK-V DRK GRY, TRSNL-OPQE; HRD-MOD HRD; CRS-MED CRS GRND; HYPIDIO TEXTRE; COM VIS DRK REDDISH-BRWN HEM STAIN IN TRNSL XTALS; COM CHLOR; TR EPID; WK-MOD CALC; DOM-MED CHLOR ALTRN, TR WHT CLAY MINERAL; COM MICAS/BIOTITE+PLAG, BLK MAFICS; OVERALL DRK GREENISH HUE; TR-COM SUBHEDRAL PYRITE.

MW 8.8 VIS 49 PV 7 YP 25 PH 12 CL 5500
GEL 16/26 SOL 3.3 Pf/Mf 0.5/0.8 SD 0.1

QUARTZ DIORITE = DRK BLUISH GRN-BLK, LT-DRK GRY, OPQE-TRNSL; HRD-MOD HRD; HYPIDIO TEXTURE; CRS-MED CRS GRND; TR VIS EPID VEINLETS, SUBHED PYRITE; DOM CHLORITE ALTRN; LOC WHT CLAY MINERAL, OCC CLAY-LIKE TEXTR; ABUN MICAS/BIOT+PLAG; COM DRK BRWN-RED HEMATITE STAIN; SCAT V FN BLK MAFICS.

DIORITE = BLK- SLI V DRK GRN, OPQE-TRNSL; HRD-MOD HRD; MED CRS-UPPR FN GRND; TR-COM EPID, SUBHED PYR, HEM STAINING; DOM CHLORITE ALTRN, OCC-TR WHT CLAY MINERAL; NO CALC.

QUARTZ DIORITE = BLK TO DK GRY, LT GRY TO OPQE OFFWHITE, GRN TO BLUISH GRN; MOD HD TO HD; MED TO CRSE GRND; HYPIDIO TEXT; TR EPID, SUBHED PYR, SCAT HEM + HEM STAINING; SOME CHLOR ALTRN, WHERE OCCURS, RPLCING DRK MAFICS; NO TO V WK RXN TO HCL.

No Losses

No Losses

Dump Sand Trap

NOTE: BAKER TANK RIGGED UP, ADDING H2O FROM TANK TO LOWER MUD TEMPS.

SURVEY @ 2710', 24.4 DEG, 99.37 AZI. TVD 2668.38', 42.73' N, 255.56' E.

DIORITE = BLK TO DK GRY, SOME GRAY, GRN TO DRK GRN; HD TO V HD; HYPIDIO TEXTURE; MED TO CRSE GRND; TR TO COM SUBHED/MASS EPID, IS COM WHERE MORE CHLOR ALTRN SEEN; SCAT TO COM CHLOR ALTRN, GRN TO LT GRN, IN SOME CASES REPLCING DARK MAFICS, IN OTHERS REPLCING ALL PRIM MINERALS; SUB EUHED TO MASS HEM COM TO SCAT; KAOL ALTRN OF DRK MAFICS BEGINNING @ 2755'; NO TO V WK RXN TO HCL.

QUARTZ DIORITE = DRK GRY-BLK, GRY-GRN, OPQE-OFF WHT; HRD-MOD HRD; HYPIDIO TEX; MED-CRS GRND; COM CHLOR ALTRN OF DRK MAFICS, GRN-LT GRN; SCAT TO COM MASS YELLOW-GRN EPID; TR TO SCAT SUBHED-EUHEDRAL PYR; MASS HEM+STAINING SCAT; MOD TO V STRNG RXN TO HCL.

GRANITE = LT GRY-OPQE, ORNGE-TAN, OCC OFF WHT; HD TO V HD; V CRS-CRS GRND; HYPIDIO TEXTRE; TR EPID; CHLOR; V WK RXN TO HCL.

NOTE: POOH @ 2875' TO REPLACE BIT.

QUARTZ DIORITE = DRK BLUISH GRN-BLK, OPQE-TRNSL, LT-DRK GRY; UPPR CRS-MED CRS GRND; HYPIDIO TEXTRE; HRD-MOD SOFT; LOC ABUND WHT CLAY MINRL; DOM CHLOR ALTRN, SCNDRY MINRLS REPLCD BY CHLOR; TR EPID, HEM STAIN; COM MICAS+BIOT; NO CALC.

DIORITE = BLK TO DRK GRY, GRY TO OPQE, GRN TO BLUISH GRN, YLW; MOD HD TO V HD; FRIABLE TO HYPIDIO TEXT DEPENDING ON CLAY CONTENT; MED TO CRSE GRND; COM GRNISH KAOL CLAYS ALTRNG FRMTN; COM TO SCAT YLW/GRN CHLOR/EPID ALTRN REPLCING DRK MAFICS, SOME SUBHED EPID; OCC EUHED PYR, RR MASS PYR; SCAT MASS HEM; MOD TO V STRNG RXN W/HCL.

SURVEY @ 2940', 23.9 DEG, 105.3 AZI. TVD 2878.05', 61.46' N, 348.21' E.

MW 8.7 VIS 52 PV 7 YP 26 PH 11 CL 5500 GEL 14/23 SOL 2.3 Pf/Mf 0.4/0.8 SD 0.1

DIORITE = BLK TO DRK GRY; HD TO V HD; HYPIDIO TEXT, FRIABLE WHERE CLAYS PRES; CRSE GRAINED; CHLOR ALTRN STRENGTH VARIES, SCAT TO COM REPLCING DRK MAFICS; WK TO STRNG RXN TO HCL, DEP ON CLAY CNT; SCAT EPID, HEM.

QUARTZ DIORITE = DRK GRY TO GRY, OCC BLK, GRN TO YLW WHERE ALTRD; HYPIDIO TEXT; HD TO V HD; MED TO CRSE GRND; TR SUB-EUHED TO EUHED HEM + PYRITE; STRNG CHLOR ALT OF PRIM MINERALS, SOME EPID ALTRN; WK RXN TO HCL.

DIORITE = BLK TO DRK GRY, GRY TO DRK GRN; FRIABLE TO V HRD DEPENDING ON CLAY CONTENT; CLAYS SEEN THRU LAST 200'+ MOST LIKELY FROM ALTERATION FROM RHYOLITIC DIKES, COM TO SCAT SLICKENLINE/SIDES GENERALLY ASSOC W/CLAYS AS WELL; FN TO CRSE GRND; V STRNG RXN W/HCL, HIGH CALC CONC; RR EUHED PYR; V RR MASS HEM; CHLOR ALTRN COM, MORE PREV NEAR AREAS OF HIGH CLAY CONTENT, REPLCING DRK MAFICS; TR TO COM EUHED/MASS EPID.

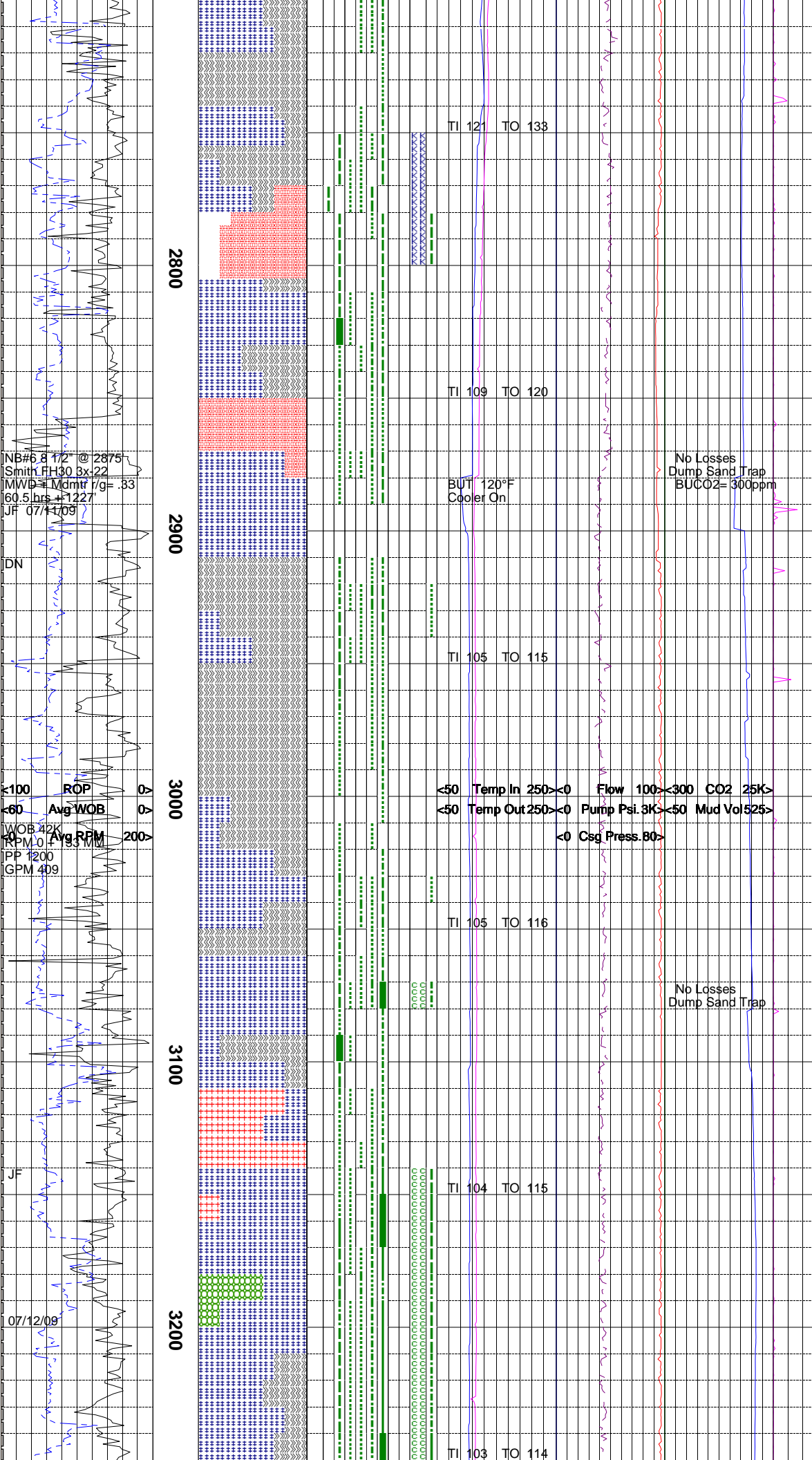
QUARTZ DIORITE = DOM DRK-LT BLUISH GREEN, WHT, OPQE-TRNSL, BLK; HRD-MOD SOFT; HYPIDIO TEXTRE; ABUND-TR WHT MINERAL, POSS RHYOLITIC DIKE MAT'L, TR V FINE DRK GREEN INCLUSNS; STRONG CALC; HEAVY CHLOR ALTRN; TR EUHEDRL EPID, SUBHED/EUHED PYR; RR HEM+STAIN; TR MICAS+BIOT.

FELSIC DIKE = DOM LT-DRK ORANGEISH PINK, LT-DRK GRY, V FINE DRK GREEN SPECKS; V HRD-HRD; MICROXTALLINE-SLI PORPHYR TEXTRE; COM HEM STAIN; NO CALC; NO ALTRN; V FN MICROMAFICS.

WHITE DIKE MATERIAL = WHITE, OCC VIS V FN DRK GREEN-BRWN SPECKS; FIRM-MOD SOFT, V FRIABLE; WK CALC; OCC VIS CLEAR MICROVEINS, POSS CALC; COM CLAY-LIKE TEXTURE; OCC VIS ALTRN, DRK-LT GREEN, POSS CHLORITIZATION.

SURVEY @ 3226', 24.3 DEG, 101.6 AZI. TVD 3138.65', 83.76' N, 463.78' E.

QUARTZ DIORITE = DOM DRK BLUISH GRN,



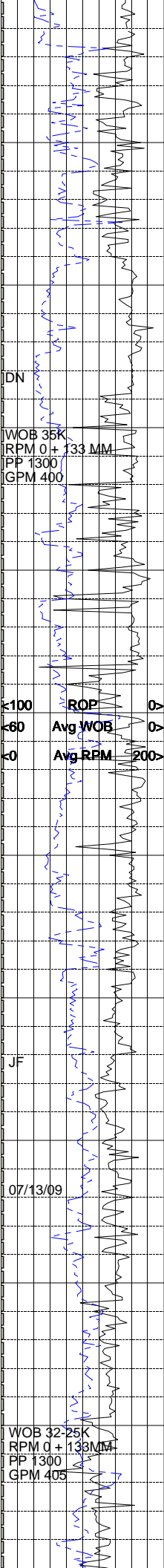
NB#6.8 172 @ 2875
Smith FH30 Bx-22
MWB= Mdmtr /g= .33
60.5 hrs +1227
JF 07/12/09

DN

<100 ROP
<60 Avg WOB
WOB 42K
RPM 0 Avg RPM
IPP 1200
GPM 409

<50 Temp In 250><0 Flow 100<300 CO2 25K>
<50 Temp Out 250><0 Pump Psi 3K<50 Mud Vol 525>
<0 Csg Press 80>

07/12/09



3300

3400

3500

3600

3700

38

TI 103 TO 111

TI 108 TO 116

TI 112 TO 122

TI 112 TO 122

TI 110 TO 123

No Losses

Dump Sand Trap

No Losses

Transferred Mud

No Losses

BLK, OPQE-TRNSLU GRY, WHT; HRD-MOD SOFT; MINIML CLAY CONTENT; MED CRS-UPPR FN GRND; HYPIDIO-SLI PORPHYR TEXTRE; STRONG-MOD CALC. COM VIS WHT-TRNSL CALC XTALS, HRD-FRIABLE. VIS VEINLETS; STRONG-MOD CHLOR ALTRN; COM EPID, VIS EUHED XTALS, IN SITU ALONG PLANES; VIS TWINNING/FOLIATIONS IN CHLOR THROUGHOUT SAMPLE.

MW 9.0 VIS 46 PV 8 YP 26 PH 11 CL 5500 GEL 15/22 SOL 4.8 Pf/Mf 0.4/0.7 SD 0.1

QUARTZ DIORITE = DOM BLK, DRK BLUISH-GREEN, OPQE-SMOKY TRNSL; HRD TO MOD HRD; CRS-MED CRS GRND; HYPIDIO TEXTRE; COM EPID, VIS VEINLETS, EUHED-SUBHED; TR VIS CALC, DIMINISHES F/ 3340', STRNG-MOD RXN W/ HCL; STRONG-MOD CHLOR ALTRN, COM VIS TWINNING/FOLIATIONS IN CHLOR; TR PYR, HEM+STAINS, MICA/BIOT; TR-COM WHT MINERAL, FRIABLE, STRONG CALC RXN, MICROXTALLINE, POSS RHYOLITIC DIKE MAT'L.

GRANODIORITE = MED-LT GRY, OFF WHITE, OCC GRN; FIRM TO HD, FRIABLE WHERE WHT CLAY MINERAL PRES; HYPIDIO TEXT; HCL REACTS WELL W/PLAGS; SLI ALTRD BIOT/MICAS FROM CHLOR; MED TO CRSE GRND; SCAT EPID REPLCING DRK MAFICS; COM FOLIATIONS/SLICKENLINES IN CHLOR ALTRD PIECES; RR PYR, HEM + HEM STAINS.

QUARTZ DIORITE = DOM BLK TO DRK GRY, LT GRY TO WHT, DRK BLUSIH-GRN. OPQE-SMOKY; FIRM TO HD; CRSE GRND; HYPIDIO TEXT; SCAT EPID REPLCING MICAS; SCAT FOLIATIONS, DOM ON PLAG/WHT MINERAL, MOST LIKELY CLAYS FROM RHYOLITIC DIKE; WK RXN TO HCL, EXCEPT WHERE WHT MIN PRES; V RR PYR, HEM + HEM STAINING.

SURVEY @ 3479', 24.2 DEG, 101.9 AZI. TVD 3369.35', 106.1' N, 565.21' E.

GRANODIORITE = WHITE TO OFFWHITE/OPQE OCC LT GRY TO GRY; MOD HD TO HD, FRIABL WHERE WHT MIN/CLAYS PRES; FIN TO MED GRND; HYPIDIO TEXT; WHT CLAY MIN STILL PRES, REPLCING DRK MAFICS + OTHR PRIMARY MINERALS AS WELL; FOLIATIONS MORE COM IN THE GRANODIORITE VS DIORITE/QTZ DIOR; RR HEM STAINING, MASS EPID; STRNG RXN TO HCL; CHLOR ALTRN STRNG-MOD, SCAT TO COM, GRN TO YLW.

QTZ DIORITE = LT GRY TO GRY, DRK GRY TO BLK, BLUISH TO SMOKEY OPQE; HD TO V HD; CRSE GRND; HYPIDIO TEXT; SCAT SLICKENLINES/FOLIATIONS; RR HEM STAINING, MASS EPID; RR EUHED PYR; WK RXN W/HCL EXCPT WHR WHT CLAYS ARE PRES; CHLOR ALTRN COM, WK TO MOD, GRN TO YLW.

QTZ DIORITE = GRN TO DRK GRN, BLK; MOD HD TO HD; HYPIDIO TEXT; COM TWINNING, SLICKENSIDES, FOLIATIONS, V STRNG CHLOR ALTRN; WK-NO CALC; MED TO CRSE GRND; TR EPID, SUBHED-ANHED PYR, MICA/BIOT.

DIORITE = DOM LT-DRK BLUISH GREEN, BLK, OCC OPQE-SMOKY TRNSL; HRD-MOD SOFT; HYPIDIO TO SLI PORHPYR TEXTRE; V STRONG CHLOR ALTRN, VIS TWINNING, SLICKENSIDES/FOLIATIONS; WK-NO CALC; CRS-MED CRS GRND; TR EPID, SUBHED-ANHED PYR, ALTRD HORNBLNDE; MOD SOFT-FRIABLE CLAY COMPOSITION, POSS RHYOLITIC DIKE MAT'L.

SURVEY @ 3669', 24.4 DEG, 103.5 AZI. TVD 3542.31', 122.7' N, 642.05' E.

DIORITE = DOM BLK, DRK BLUISH-GREEN, OPQE-SMOKY TRNSL; HRD-MOD HRD; CRS-MOD CRS GRND; HYPIDIO TEXTRE; RR TR EUHED QUARTZ XTALS; TR EPID, VIS VEINLETS; TR-COM SUBHED-EUHED PYR; WK-MOD CALC; V STRONG-MOD CHLOR ALTRN, VIS TWINNING/SLICKENSIDES ON SURFACE OF CTGS; TR HORNBLNDE; WHT-LT GRN CLAY CONTENT INCRSNG W/ DPTH F/ 3720'.

CLAY/DIKE MINERAL = DOM LT GRYISH BLUE/GREEN, OFF WHT; CLAY-LIKE TEX-CONSISTENCY; MOD-STRONG CALC; SOFT-FRIABLE; OCC VIS WHT LAMINATIONS/VEINLETS, POSS CALCAREOUS; APPARENT IN SITU CHLOR, FN BLK MFICS.

MW 9.2 VIS 51 PV 9 YP 26 PH 11 CL 5500 GEL 16/22 SOL 6.3 Pf/Mf 0.4/0.7 SD 0.1

DIORITE = DOM BLK, DRK BLUISH-GREEN HUES, SMOKY TRNSL-OPQE; HRD-MOD SOFT; HYPIDIO TEXTRE; UPPR CRS-MOD CRS GRND; STRONG-MOD CHLOR ALTRN, VIS TWINNING/SLICKENSIDES, OCC LT-TEAL COLOR IN SAMPLE; STRNG-MOD CALC,

DN

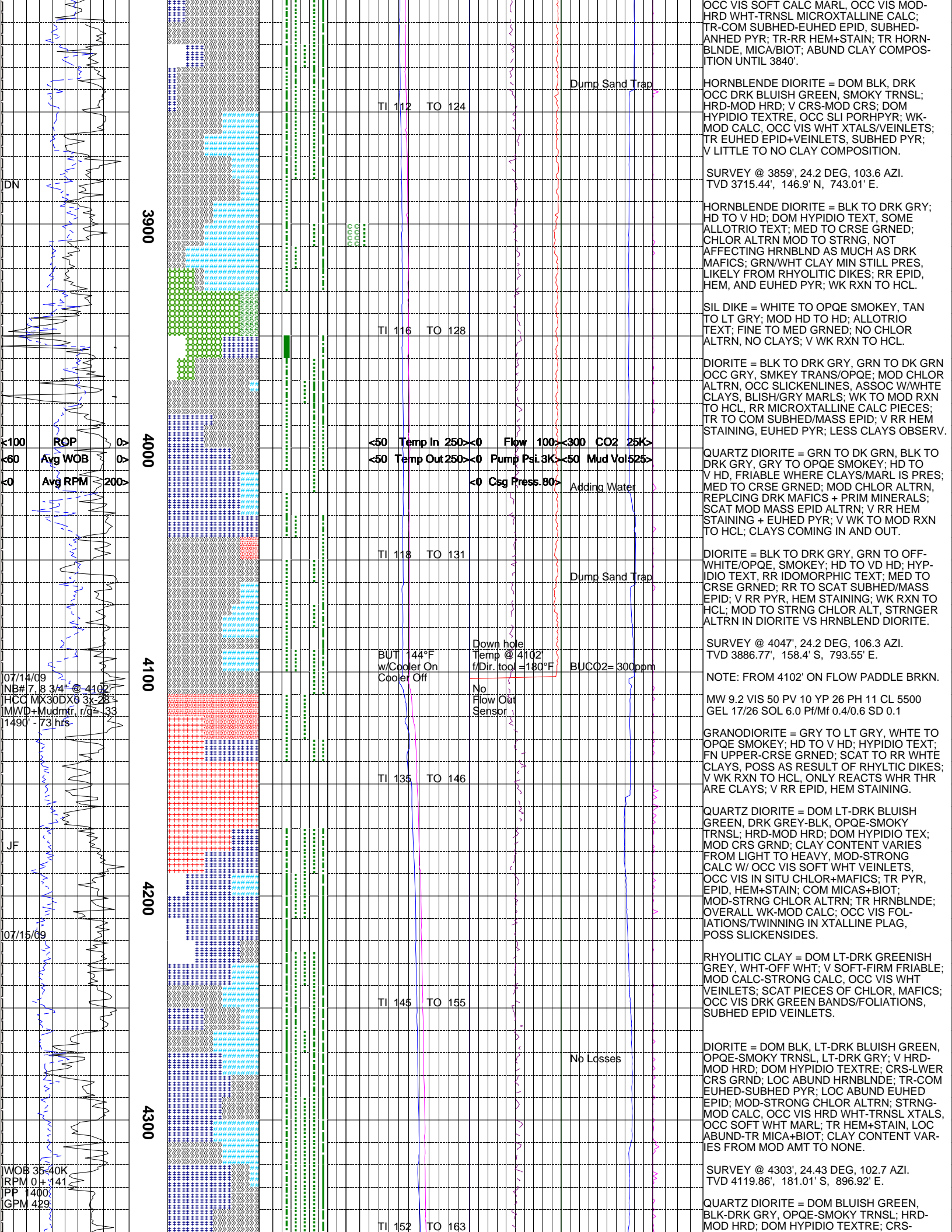
WOB 35K
RPM 0 + 133 MM
PP 1300
GPM 400

ROP
Avg WOB
Avg RPM

JF

07/13/09

WOB 32-25K
RPM 0 + 133 MM
PP 1300
GPM 405



DN

3900

4000

4100

4200

4300

ROP
Avg WOB
Avg RPM

07/14/09
NB# 7.8 3/4 @ 4102
HCC MX30DX0 3x28
MWD+Mudmtr. r/d= 33
1490' - 73 hrs

JF

07/15/09

WOB 35-40K
RPM 0+341
PP 1400
GPM 429

TI 112 TO 124

Dump Sand Trap

TI 116 TO 128

<50 Temp In 250><0 Flow 100><300 CO2 25K>
<50 Temp Out 250><0 Pump Psi 3K><50 Mud Vol 525>
<0 Csg Press 80>

Adding Water

TI 118 TO 131

Dump Sand Trap

BUT 144°F
w/Cooler On
Cooler Off

Down hole
Temp @ 4102
f/Dir. tool = 180°F
No
Flow Out
Sensor

BUCCO2= 300ppm

TI 135 TO 146

TI 145 TO 155

No Losses

TI 152 TO 163

OCC VIS SOFT CALC MARL; OCC VIS MOD HRD WHT-TRNSL MICROXTALLINE CALC; TR-COM SUBHED-EUHED EPID; SUBHED-ANHED PYR; TR-RR HEM+STAIN; TR HORN-BLNDE, MICA/BIOT; ABUND CLAY COMPOSITION UNTIL 3840'.

HORNBLNDE DIORITE = DOM BLK, DRK OCC DRK BLUISH GREEN, SMOKY TRNSL; HRD-MOD HRD; V CRS-MOD CRS; DOM HYPIDIO TEXTRE. OCC SLI PORHPYR; WK-MOD CALC, OCC VIS WHT XTALS/VEINLETS; TR EUHED EPID+VEINLETS, SUBHED PYR; V LITTLE TO NO CLAY COMPOSITION.

SURVEY @ 3859', 24.2 DEG, 103.6 AZI. TVD 3715.44', 146.9' N, 743.01' E.

HORNBLNDE DIORITE = BLK TO DRK GRY; HD TO V HD; DOM HYPIDIO TEXT, SOME ALLOTRIO TEXT; MED TO CRSE GRNED; CHLOR ALTRN MOD TO STRNG, NOT AFFECTING HRNBLND AS MUCH AS DRK MAFICS; GRN/WHT CLAY MIN STILL PRES, LIKELY FROM RHYOLITIC DIKES; RR EPID, HEM, AND EUHED PYR; WK RXN TO HCL.

SIL DIKE = WHITE TO OPQE SMOKEY, TAN TO LT GRY; MOD HD TO HD; ALLOTRIO TEXT; FINE TO MED GRNED; NO CHLOR ALTRN, NO CLAYS; V WK RXN TO HCL.

DIORITE = BLK TO DRK GRY, GRN TO DK GRN OCC GRY, SMOKY TRANS/OPQE; MOD CHLOR ALTRN, OCC SLICKENLINES, ASSOC W/WHITE CLAYS, BLISH/GRY MARLS; WK TO MOD RXN TO HCL, RR MICROXTALLINE CALC PIECES; TR TO COM SUBHED/MASS EPID; V RR HEM STAINING, EUHED PYR; LESS CLAYS OBSERV.

QUARTZ DIORITE = GRN TO DK GRN, BLK TO DRK GRY, GRY TO OPQE SMOKEY; HD TO V HD, FRIABLE WHERE CLAYS/MARL IS PRES; MED TO CRSE GRNED; MOD CHLOR ALTRN, REPLCING DRK MAFICS + PRIM MINERALS; SCAT MOD MASS EPID ALTRN; V RR HEM STAINING + EUHED PYR; V WK TO MOD RXN TO HCL; CLAYS COMING IN AND OUT.

DIORITE = BLK TO DRK GRY, GRN TO OFF-WHITE/OPQE, SMOKEY; HD TO VD HD; HYPIDIO TEXT, RR IDOMORPHIC TEXT; MED TO CRSE GRNED; RR TO SCAT SUBHED/MASS EPID; V RR PYR, HEM STAINING; WK RXN TO HCL; MOD TO STRNG CHLOR ALT, STRNGER ALTRN IN DIORITE VS HRNBLND DIORITE.

SURVEY @ 4047', 24.2 DEG, 106.3 AZI. TVD 3886.77', 158.4' S, 793.55' E.

NOTE: FROM 4102' ON FLOW PADDLE BRKN.

MW 9.2 VIS 50 PV 10 YP 26 PH 11 CL 5500 GEL 17/26 SOL 6.0 Pf/Mf 0.4/0.6 SD 0.1

GRANODIORITE = GRY TO LT GRY, WHITE TO OPQE SMOKEY; HD TO V HD; HYPIDIO TEXT; FN UPPER-CRSE GRNED; SCAT TO RR WHT CLAYS, POSS AS RESULT OF RHYLTIC DIKES; V WK RXN TO HCL, ONLY REACTS WHR THR ARE CLAYS; V RR EPID, HEM STAINING.

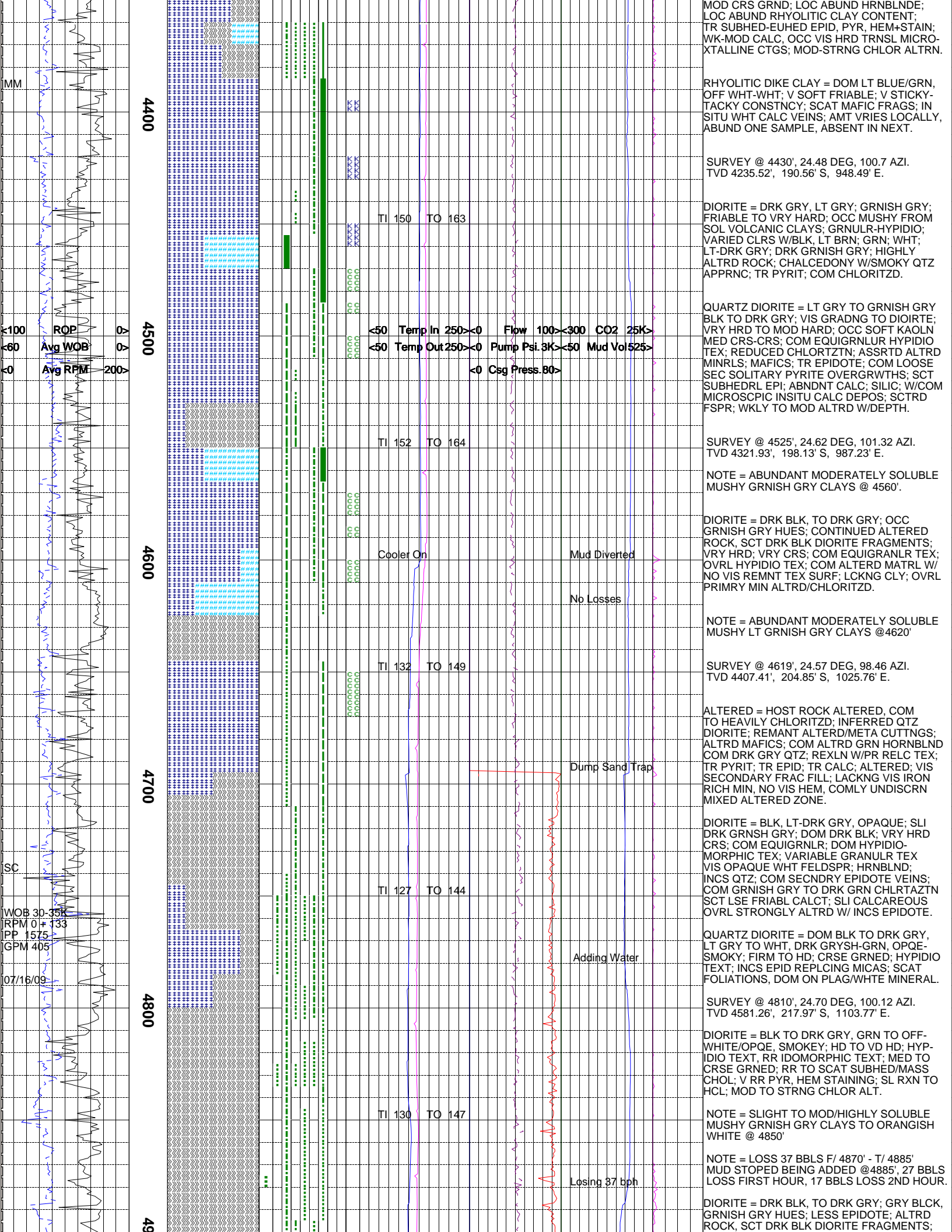
QUARTZ DIORITE = DOM LT-DRK BLUISH GREEN, DRK GREY-BLK, OPQE-SMOKY TRNSL; HRD-MOD HRD; DOM HYPIDIO TEX; MOD CRS GRND; CLAY CONTENT VARIES FROM LIGHT TO HEAVY, MOD-STRONG CALC W/ OCC VIS SOFT WHT VEINLETS, OCC VIS IN SITU CHLOR+MAFICS; TR PYR, EPID, HEM+STAIN; COM MICAS+BIOT; MOD-STRNG CHLOR ALTRN; TR HRNBLNDE; OVERALL WK-MOD CALC; OCC VIS FOLIATIONS/TWINNING IN XTALLINE PLAG, POSS SLICKENSIDES.

RHYOLITIC CLAY = DOM LT-DRK GREENISH GREY, WHT-OFF WHT; V SOFT-FIRM FRIABLE; MOD CALC-STRONG CALC, OCC VIS WHT VEINLETS; SCAT PIECES OF CHLOR, MAFICS; OCC VIS DRK GREEN BANDS/FOLIATIONS, SUBHED EPID VEINLETS.

DIORITE = DOM BLK, LT-DRK BLUISH GREEN, OPQE-SMOKY TRNSL, LT-DRK GRY; V HRD-MOD HRD; DOM HYPIDIO TEXTRE; CRS-LWER CRS GRND; LOC ABUND HRNBLNDE; TR-COM EUHED-SUBHED PYR; LOC ABUND EUHED EPID; MOD-STRONG CHLOR ALTRN; STRNG-MOD CALC, OCC VIS HRD WHT-TRNSL XTALS, OCC SOFT WHT MARL; TR HEM+STAIN, LOC ABUND-TR MICA+BIOT; CLAY CONTENT VARIES FROM MOD AMT TO NONE.

SURVEY @ 4303', 24.3 DEG, 102.7 AZI. TVD 4119.86', 181.01' S, 896.92' E.

QUARTZ DIORITE = DOM BLUISH GREEN, BLK-DRK GRY, OPQE-SMOKY TRNSL; HRD-MOD HRD; DOM HYPIDIO TEXTRE; CRS-



MOD CRS GRND; LOC ABUND HRNBLNDE;
 LOC ABUND RHYOLITIC CLAY CONTENT;
 TR SUBHED-EUHED EPID, PYR, HEM+STAIN;
 WK-MOD CALC, OCC VIS HRD TRNSL MICRO-
 XTALLINE CTGS; MOD-STRNG CHLOR ALTRN.

RHYOLITIC DIKE CLAY = DOM LT BLUE/GRN,
 OFF WHT-WHT; V SOFT FRIABLE; V STICKY-
 TACKY CONSTNCY; SCAT MAFIC FRAGS; IN
 SITU WHT CALC VEINS; AMT VRIES LOCALLY,
 ABUND ONE SAMPLE, ABSENT IN NEXT.

SURVEY @ 4430', 24.48 DEG, 100.7 AZI.
 TVD 4235.52', 190.56' S, 948.49' E.

DIORITE = DRK RHYOLIT, LT GRY; GRNISH GRY;
 FRIABLE TO VRY HARD; OCC MUSHY FROM
 SOL VOLCANIC CLAYS; GRNULR-HYPIDIO;
 VARIED CLRS W/BLK, LT BRN; GRN; WHT;
 LT-DRK GRY; DRK GRNISH GRY; HIGHLY
 ALTRD ROCK; CHALCEDONY W/SMOKY QTZ
 APPRNC; TR PYRIT; COM CHLORITZD.

QUARTZ DIORITE = LT GRY TO GRNISH GRY
 BLK TO DRK GRY; VIS GRADNG TO DIOIRTE;
 VRY HRD TO MOD HARD; OCC SOFT KAOLN
 MED CRS-CRS; COM EQUIGRNLR HYPIDIO
 TEX; REDUCED CHLORTZTN; ASSRTD ALTRD
 MINRLS; MAFICS; TR EPIDOTE; COM LOOSE
 SEC SOLITARY PYRITE OVERGRWTHS; SCT
 SUBHEDRL EPI; ABNDNT CALC; SILIC; W/COM
 MICROSCPIC INSITU CALC DEPOS; SCTRD
 FSPR; WKLY TO MOD ALTRD W/DEPTH.

SURVEY @ 4525', 24.62 DEG, 101.32 AZI.
 TVD 4321.93', 198.13' S, 987.23' E.

NOTE = ABUNDANT MODERATELY SOLUBLE
 MUSHY GRNISH GRY CLAYS @ 4560'.

DIORITE = DRK BLK, TO DRK GRY; OCC
 GRNISH GRY HUES; CONTINUED ALTERED
 ROCK, SCT DRK BLK DIORITE FRAGMENTS;
 VRY HRD; VRY CRS; COM EQUIGRNLR TEX;
 OVRL HYPIDIO TEX; COM ALTRD MATRL W/
 NO VIS REMNT TEX SURF; LCKNG CLY; OVRL
 PRIMRY MIN ALTRD/CHLORITZD.

NOTE = ABUNDANT MODERATELY SOLUBLE
 MUSHY LT GRNISH GRY CLAYS @ 4620'

SURVEY @ 4619', 24.57 DEG, 98.46 AZI.
 TVD 4407.41', 204.85' S, 1025.76' E.

ALTERED = HOST ROCK ALTERED, COM
 TO HEAVILY CHLORITZD; INFERRED QTZ
 DIORITE; REMANT ALTERD/META CUTTNNGS;
 ALTRD MAFICS; COM ALTRD GRN HORNBLND
 COM DRK GRY QTZ; REXLN W/PR RELC TEX;
 TR PYRIT; TR EPID; TR CALC; ALTERED; VIS
 SECONDARY FRAC FILL; LACKNG VIS IRON
 RICH MIN, NO VIS HEM, COMLY UNDISCRN
 MIXED ALTERED ZONE.

DIORITE = BLK, LT-DRK GRY, OPAQUE; SLI
 DRK GRNSH GRY; DOM DRK BLK; VRY HRD
 CRS; COM EQUIGRNLR; DOM HYPIDIO-
 MORPHIC TEX; VARIABLE GRANULR TEX
 VIS OPAQUE WHT FELDSPR; HRNBLND;
 INCS QTZ; COM SECNDRY EPIDOTE VEINS;
 COM GRNISH FRAC TO DRK GRN CHLRTAZTN
 SCT LSE FRIABL CALCT; SLI CALCAREOUS
 OVRL STRONGLY ALTRD W/ INCS EPIDOTE.

QUARTZ DIORITE = DOM BLK TO DRK GRY,
 LT GRY TO WHT, DRK GRYSH-GRN, OPQE-
 SMOKY; FIRM TO HD; CRSE GRNED; HYPIDIO
 TEXT; INCS EPID REPLCING MICAS; SCAT
 FOLIATIONS, DOM ON PLAG/WHTE MINERAL.

SURVEY @ 4810', 24.70 DEG, 100.12 AZI.
 TVD 4581.26', 217.97' S, 1103.77' E.

DIORITE = BLK TO DRK GRY, GRN TO OFF-
 WHITE/OPQE, SMOKEY; HD TO VD HD; HYP-
 IDIO TEXT, RR IDOMORPHIC TEXT; MED TO
 CRSE GRNED; RR TO SCAT SUBHED/MASS
 CHOL; V RR PYR, HEM STAINING; SL RXN TO
 HCL; MOD TO STRNG CHLOR ALT.

NOTE = SLIGHT TO MOD/HIGHLY SOLUBLE
 MUSHY GRNISH GRY CLAYS TO ORANGISH
 WHITE @ 4850'

NOTE = LOSS 37 BBLS F/ 4870' - T/ 4885'
 MUD STOPED BEING ADDED @ 4885', 27 BBLS
 LOSS FIRST HOUR, 17 BBLS LOSS 2ND HOUR.

DIORITE = DRK BLK, TO DRK GRY; GRY BLCK,
 GRNISH GRY HUES; LESS EPIDOTE; ALTRD
 ROCK, SCT DRK BLK DIORITE FRAGMENTS;

ROP
 Avg WOB
 Avg RPM

WOB 30-35K
 RPM 0+133
 IPP 1525
 GPM 405

07/16/09

TI 150 TO 163

<50 Temp In 250><0 Flow 100><300 CQ2 25K>
 <50 Temp Out 250><0 Pump Psi 3K><50 Mud Vol 525>
 <0 Csg Press 80>

TI 152 TO 164

Cooler On

Mud Diverted

No Losses

TI 132 TO 149

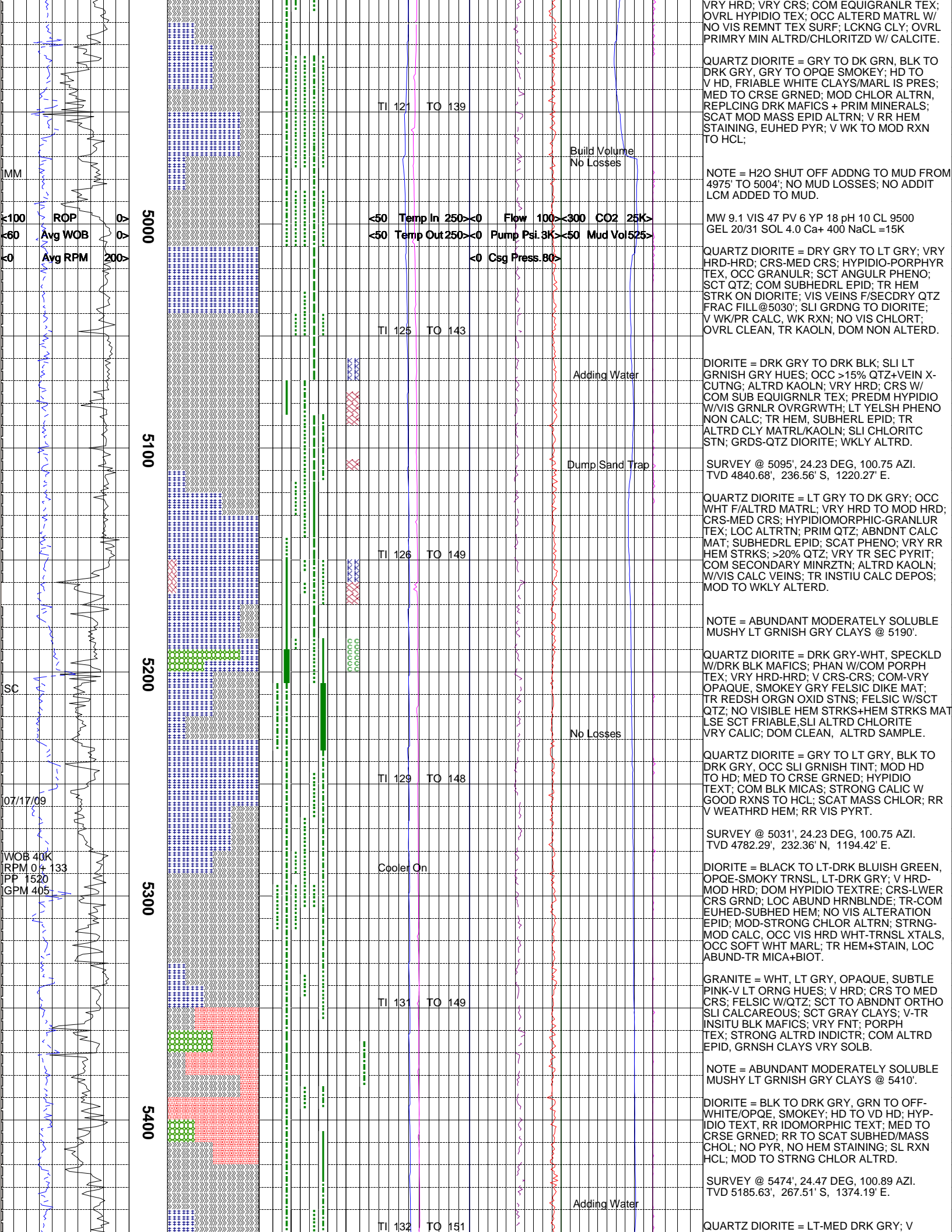
Dump Sand Trap

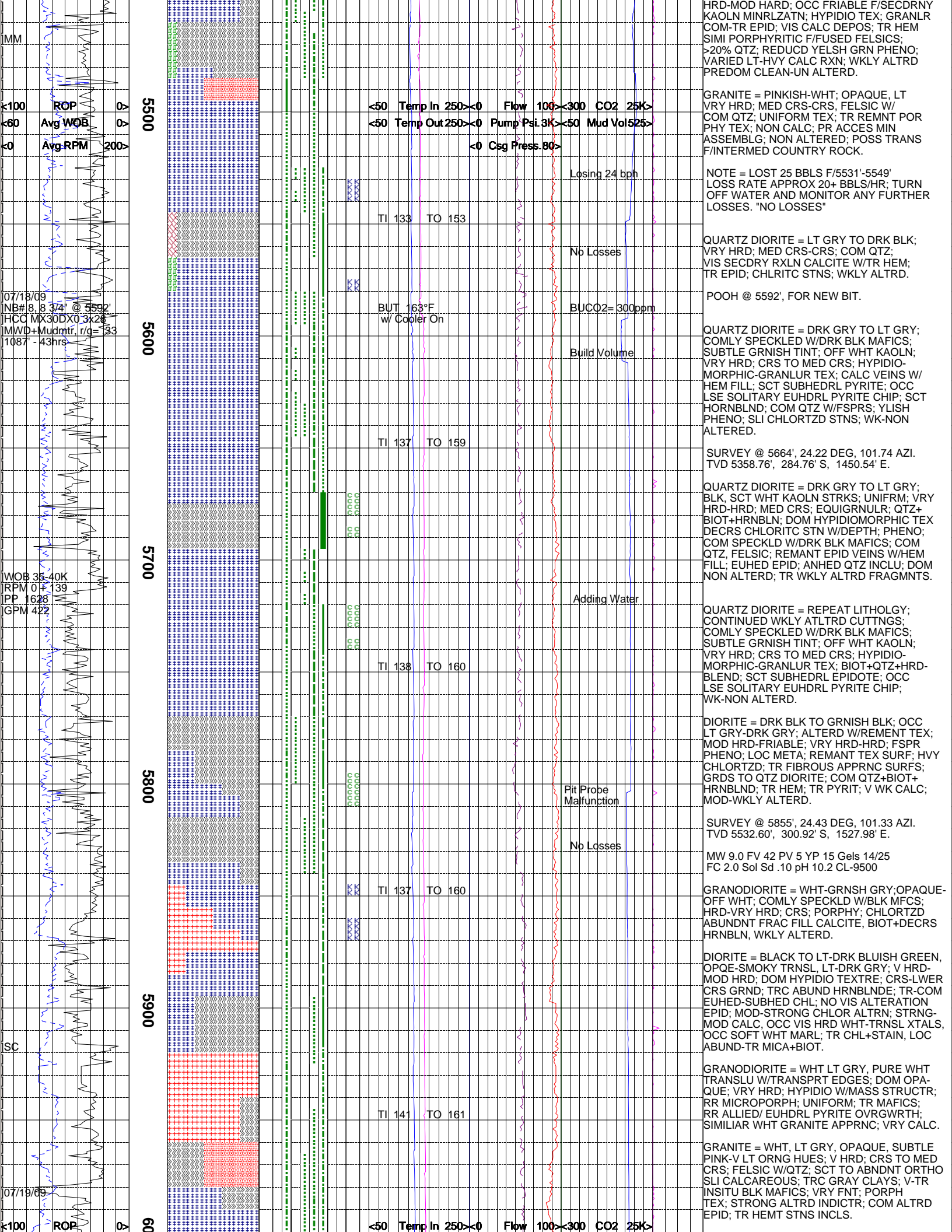
TI 127 TO 144

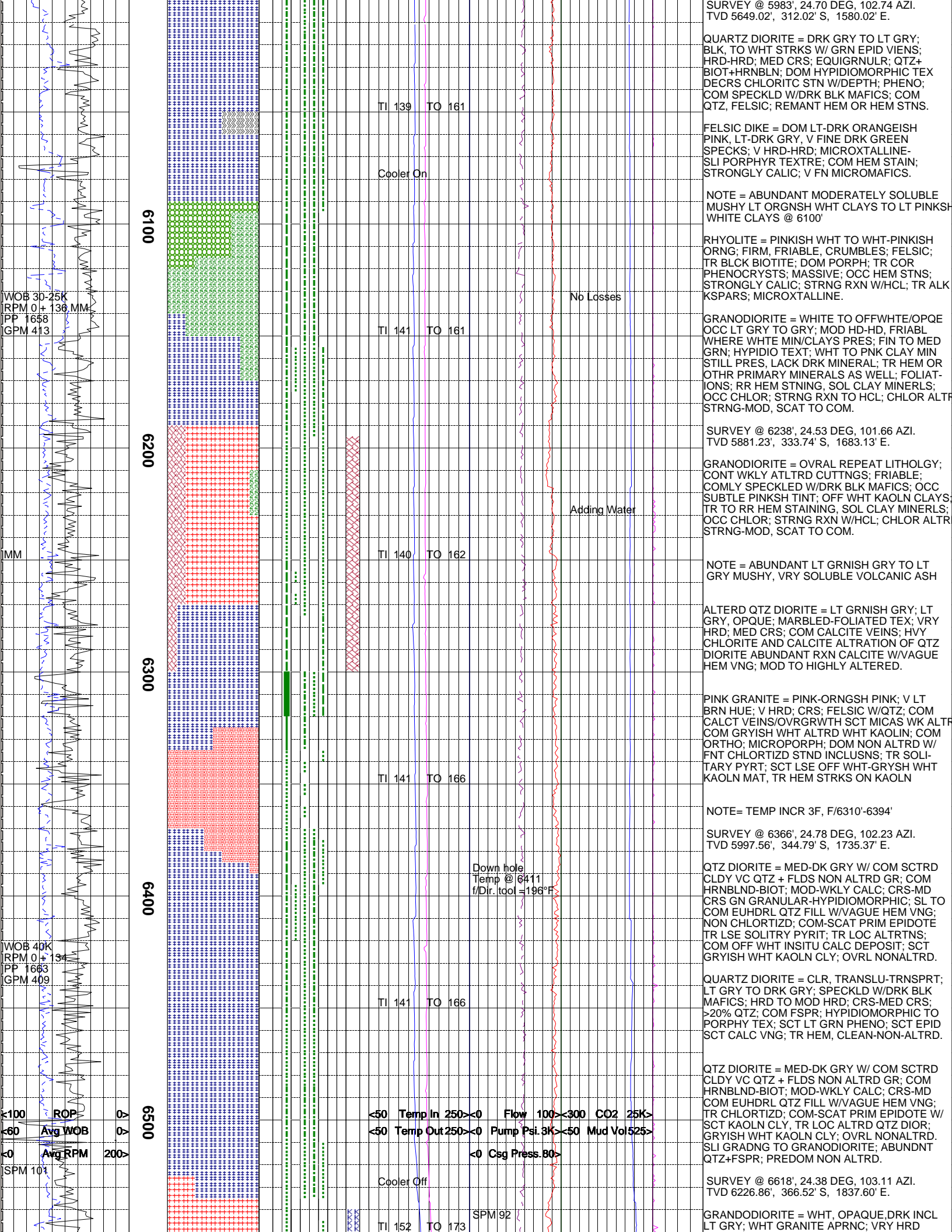
Adding Water

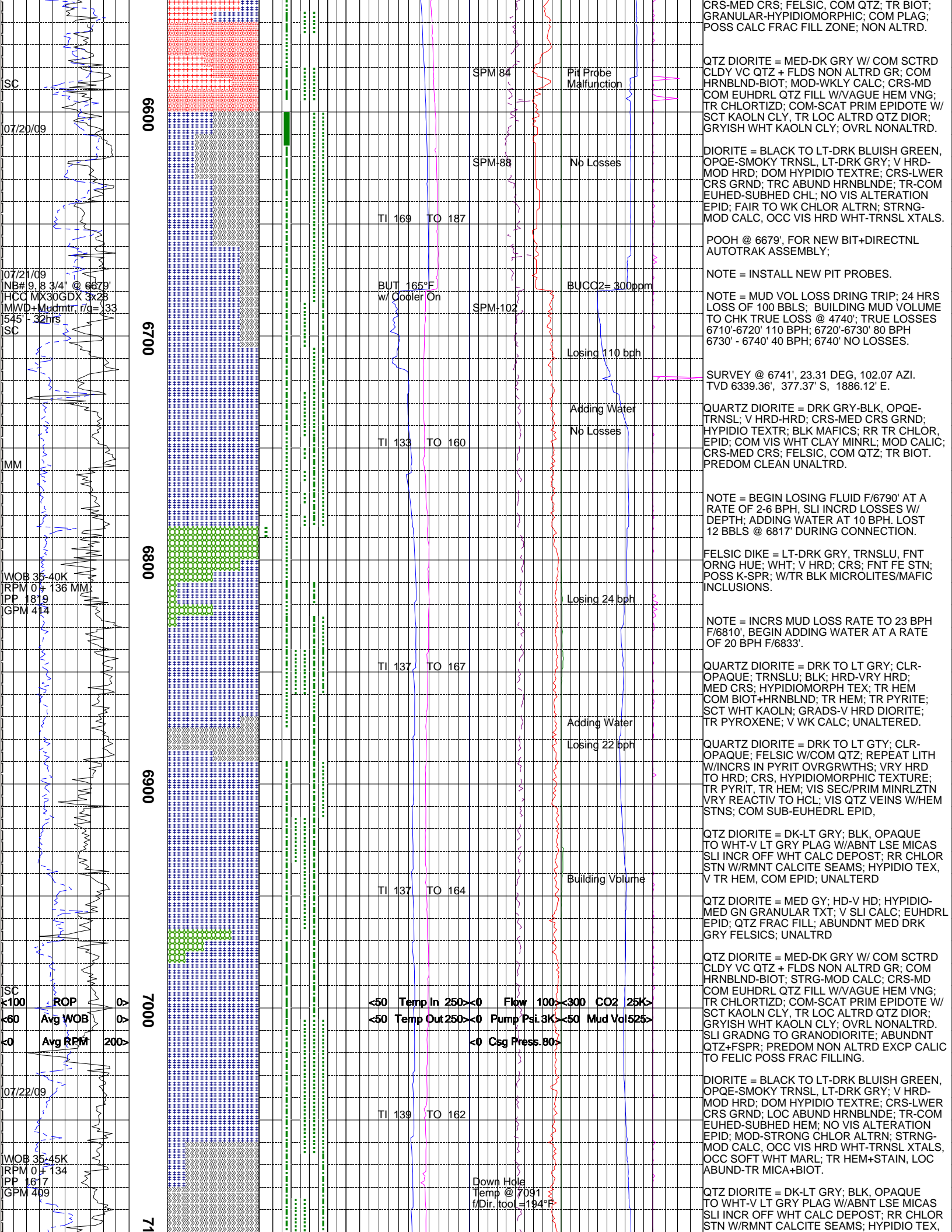
TI 130 TO 147

Losing 37 bph









CRS-MED CRS; FELSIC, COM QTZ; TR BIOT;
 GRANULAR-HYPIDIOMORPHIC; COM PLAG;
 POSS CALC FRAC FILL ZONE; NON ALTRD.

QTZ DIORITE = MED-DK GRY W/ COM SCTR
 CLDY VC QTZ + FLDS NON ALTRD GR; COM
 HRNBLND-BIOT; MOD-WKLY CALC; CRS-MD
 COM EUHDLR QTZ FILL W/VAGUE HEM VNG;
 TR CHLORTZD; COM-SCAT PRIM EPIDOTE W/
 SCT KAOLN CLY, TR LOC ALTRD QTZ DIOR;
 GRYSH WHT KAOLN CLY; OVRL NONALTRD.

DIORITE = BLACK TO LT-DRK BLUISH GREEN,
 OPQE-SMOKY TRNSL, LT-DRK GRY; V HRD-
 MOD HRD; DOM HYPIDIO TEXTRE; CRS-LWER
 CRS GRND; TRC ABUND HRNBLNDE; TR-COM
 EUHED-SUBHED CHL; NO VIS ALTERATION
 EPID; FAIR TO WK CHLOR ALTRN; STRNG-
 MOD CALC, OCC VIS HRD WHT-TRNSL XTALS

POOH @ 6679', FOR NEW BIT+DIRECTNL
 AUTOTRAK ASSEMBLY;

NOTE = INSTALL NEW PIT PROBES.

NOTE = MUD VOL LOSS DRING TRIP; 24 HRS
 LOSS OF 100 BLS; BUILDING MUD VOLUME
 TO CHK TRUE LOSS @ 4740'; TRUE LOSSES
 6710'-6720' 110 BPH; 6720'-6730' 80 BPH
 6730' - 6740' 40 BPH; 6740' NO LOSSES.

SURVEY @ 6741', 23.31 DEG, 102.07 AZI.
 TVD 6339.36', 377.37' S, 1886.12' E.

QUARTZ DIORITE = DRK GRY-BLK, OPQE-
 TRNSL; V HRD-HRD; CRS-MED CRS GRND;
 HYPIDIO TEXTR; BLK MAFICS; RR TR CHLOR,
 EPID; COM VIS WHT CLAY MINRL; MOD CALIC;
 CRS-MED CRS; FELSIC, COM QTZ; TR BIOT.
 PREDOM CLEAN UNALTRD.

NOTE = BEGIN LOSING FLUID F/6790' AT A
 RATE OF 2-6 BPH, SLI INCRD LOSSES W/
 DEPTH; ADDING WATER AT 10 BPH. LOST
 12 BLS @ 6817' DURING CONNECTION.

FELSIC DIKE = LT-DRK GRY, TRNSLU, FNT
 ORNG HUE; WHT; V HRD; CRS; FNT FE STN;
 POSS K-SPR; W/TR BLK MICROLITES/MAFIC
 INCLUSIONS.

NOTE = INCRS MUD LOSS RATE TO 23 BPH
 F/6810', BEGIN ADDING WATER AT A RATE
 OF 20 BPH F/6833'.

QUARTZ DIORITE = DRK TO LT GRY; CLR-
 OPAQUE; TRNSLU; BLK; HRD-VRY HRD;
 MED CRS; HYPIDIOMORPH TEX; TR HEM
 COM BIOT+HRNBLND; TR HEM; TR PYRITE;
 SCT WHT KAOLN; GRADS-V HRD DIORITE;
 TR PYROXENE; V WK CALC; UNALTERD.

QUARTZ DIORITE = DRK TO LT GTY; CLR-
 OPAQUE; FELSIC W/COM QTZ; REPEAT LITH
 W/INCRS IN PYRIT OVRGRWTHS; VRY HRD
 TO HRD; CRS, HYPIDIOMORPHIC TEXTURE;
 TR PYRIT, TR HEM; VIS SEC/PRIM MINRLZTN
 VRY REACTIV TO HCL; VIS QTZ VEINS W/HEM
 STNS; COM SUB-EUHEDRL EPID,

QTZ DIORITE = DK-LT GRY; BLK, OPAQUE
 TO WHT-V LT GRY PLAG W/ABNT LSE MICAS
 SLI INCR OFF WHT CALC DEPOST; RR CHLOR
 STN W/RMNT CALCITE SEAMS; HYPIDIO TEX,
 V TR HEM, COM EPID; UNALTERD

QTZ DIORITE = MED GY; HD-V HD; HYPIDIO-
 MED GN GRANULAR TXT; V SLI CALC; EUHDLR
 EPID; QTZ FRAC FILL; ABUNDNT MED DRK
 GRY FELSICS; UNALTRD

QTZ DIORITE = MED-DK GRY W/ COM SCTR
 CLDY VC QTZ + FLDS NON ALTRD GR; COM
 HRNBLND-BIOT; STRG-MOD CALC; CRS-MD
 COM EUHDLR QTZ FILL W/VAGUE HEM VNG;
 TR CHLORTZD; COM-SCAT PRIM EPIDOTE W/
 SCT KAOLN CLY, TR LOC ALTRD QTZ DIOR;
 GRYSH WHT KAOLN CLY; OVRL NONALTRD.
 SLI GRADNG TO GRANODIORITE; ABUNDNT
 QTZ+FSPR; PREDOM NON ALTRD EXCP CALIC
 TO FELIC POSS FRAC FILLING.

DIORITE = BLACK TO LT-DRK BLUISH GREEN,
 OPQE-SMOKY TRNSL, LT-DRK GRY; V HRD-
 MOD HRD; DOM HYPIDIO TEXTRE; CRS-LWER
 CRS GRND; LOC ABUND HRNBLNDE; TR-COM
 EUHED-SUBHED HEM; NO VIS ALTERATION
 EPID; MOD-STRONG CHLOR ALTRN; STRNG-
 MOD CALC, OCC VIS HRD WHT-TRNSL XTALS,
 OCC SOFT WHT MARL; TR HEM+STAIN, LOC
 ABUND-TR MICA-BIOT.

QTZ DIORITE = DK-LT GRY; BLK, OPAQUE
 TO WHT-V LT GRY PLAG W/ABNT LSE MICAS
 SLI INCR OFF WHT CALC DEPOST; RR CHLOR
 STN W/RMNT CALCITE SEAMS; HYPIDIO TEX,

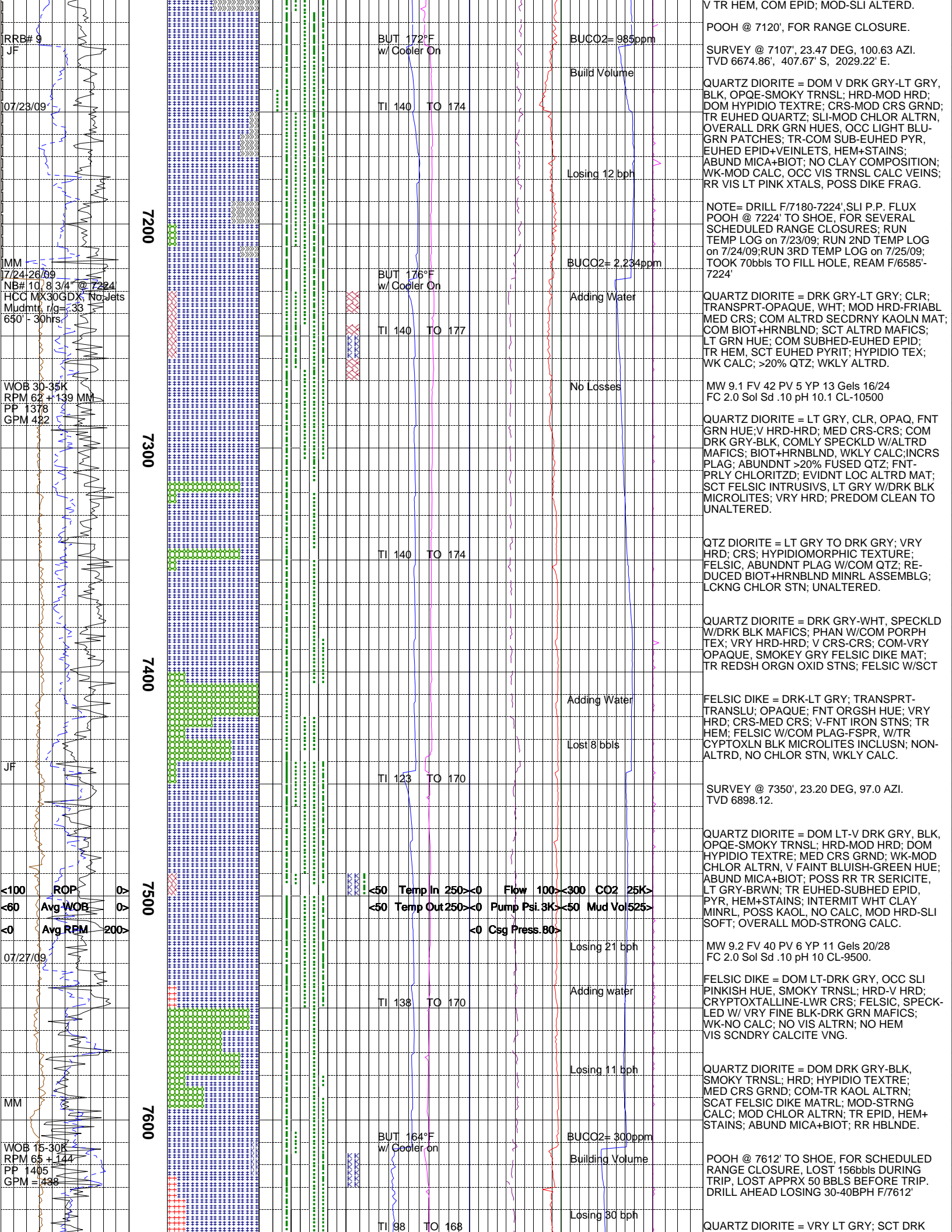
<50	Temp In	250	>0	Flow	100	<300	CO2	25K
<50	Temp Out	250	>0	Pump Psi	3K	<50	Mud Vol	525
<0	Csg Press	80	>					

Down Hole
 Temp @ 7091
 f/Dir. tool = 194°F

07/20/09
 07/21/09
 NB# 9, 8 3/4" @ 6679'
 HCC MX30GDx 3x28
 MWD+Mudmtr, r/c = 133
 545' - 32hrs
 WOB 35-40K
 RPM 0 + 136 MM
 IPP 1819
 GPM 414
 WOB 35-45K
 RPM 0 + 134
 IPP 1617
 GPM 409

6600
 6700
 6800
 6900
 7000
 71

SC
 MM
 SC
 SC



V TR HEM, COM EPID; MOD-SLI ALTER.

POOH @ 7120', FOR RANGE CLOSURE.

SURVEY @ 7107', 23.47 DEG, 100.63 AZI. TVD 6674.86', 407.67' S, 2029.22' E.

QUARTZ DIORITE = DOM V DRK GRY-LT GRY, BLK, OPQE-SMOKY TRNSL; HRD-MOD HRD; DOM HYPIDIO TEXTRE; CRS-MOD CRS GRND; TR EUHED QUARTZ; SLI-MOD CHLOR ALTRN, OVERALL DRK GRN HUES, OCC LIGHT BLU-GRN PATCHES; TR-COM SUB-EUHED PYR, EUHED EPID+VEINLETS, HEM+STAINS; ABUND MICA+BIOT; NO CLAY COMPOSITION; WK-MOD CALC, OCC VIS TRNSL CALC VEINS; RR VIS LT PINK XTALS, POSS DIKE FRAG.

NOTE= DRILL F/7180-7224'; SLI P.P. FLUX POOH @ 7224' TO SHOE, FOR SEVERAL SCHEDULED RANGE CLOSURES; RUN TEMP LOG on 7/23/09; RUN 2ND TEMP LOG on 7/24/09; RUN 3RD TEMP LOG on 7/25/09; TOOK 70bbbls TO FILL HOLE, REAM F/6585'-7224'

QUARTZ DIORITE = DRK GRY-LT GRY; CLR; TRANSPRT-OPAQUE, WHT; MOD HRD-FRIABL, MED CRS; COM ALTRD SECDRNY KAOLN MAT; COM BIOT+HRNBLND; SCT ALTRD MAFICS; LT GRN HUE; COM SUBHED-EUHED EPID; TR HEM, SCT EUHED PYRIT; HYPIDIO TEX; WK CALC; >20% QTZ; WKLY ALTRD.

MW 9.1 FV 42 PV 5 YP 13 Gels 16/24 FC 2.0 Sol Sd .10 pH 10.1 CL-10500

QUARTZ DIORITE = LT GRY, CLR, OPAQ, FNT GRN HUE; V HRD-HRD; MED CRS-CRS; COM DRK GRY-BLK, COMLY SPECKLD W/ALTRD MAFICS; BIOT+HRNBLND, WKLY CALC; INCRS PLAG; ABUNDNT >20% FUSED QTZ; FNT-PRLY CHLORITZD; EVIDNT LOC ALTRD MAT; SCT FELSIC INTRUSIVS, LT GRY W/DRK BLK MICROLITES; VRY HRD; PREDOM CLEAN TO UNALTERED.

QTZ DIORITE = LT GRY TO DRK GRY; VRY HRD; CRS; HYPIDIOMORPHIC TEXTURE; FELSIC, ABUNDNT PLAG W/COM QTZ; REDUCED BIOT+HRNBLND MINRNL ASSEMBLG; LCKNG CHLOR STN; UNALTERED.

QUARTZ DIORITE = DRK GRY-WHT, SPECKLD W/DRK BLK MAFICS; PHAN W/COM PORPH TEX; VRY HRD-HRD; V CRS-CRS; COM-VRY OPAQUE, SMOKEY GRY FELSIC DIKE MAT; TR REDSH ORGN OXID STNS; FELSIC W/SCT

FELSIC DIKE = DRK-LT GRY; TRANSPRT-TRANSLU; OPAQUE; FNT ORGSH HUE; VRY HRD; CRS-MED CRS; V-FNT IRON STNS; TR HEM; FELSIC W/COM PLAG-FSPR, W/TR CYPTOXLN BLK MICROLITES INCLNS; NON-ALTRD, NO CHLOR STN, WKLY CALC.

SURVEY @ 7350', 23.20 DEG, 97.0 AZI. TVD 6898.12.

QUARTZ DIORITE = DOM LT-V DRK GRY, BLK, OPQE-SMOKY TRNSL; HRD-MOD HRD; DOM HYPIDIO TEXTRE; MED CRS GRND; WK-MOD CHLOR ALTRN, V FAINT BLUISH-GREEN HUE; ABUND MICA+BIOT; POSS RR TR SERICITE, LT GRY-BRWN; TR EUHED-SUBHED EPID, PYR, HEM+STAINS; INTERMIT WHT CLAY MINRL, POSS KAOL, NO CALC, MOD HRD-SLI SOFT; OVERALL MOD-STRONG CALC.

MW 9.2 FV 40 PV 6 YP 11 Gels 20/28 FC 2.0 Sol Sd .10 pH 10 CL-9500.

FELSIC DIKE = DOM LT-DRK GRY, OCC SLI PINKISH HUE, SMOKY TRNSL; HRD-V HRD; CRYPTOXTALLINE-LWR CRS; FELSIC, SPECKLED W/ VRY FINE BLK-DRK GRN MAFICS; WK-NO CALC; NO VIS ALTRN; NO HEM VIS SCNDRY CALCITE VNG.

QUARTZ DIORITE = DOM DRK GRY-BLK, SMOKY TRNSL; HRD; HYPIDIO TEXTRE; MED CRS GRND; COM-TR KAOL ALTRN; SCAT FELSIC DIKE MATRL; MOD-STRNG CALC; MOD CHLOR ALTRN; TR EPID, HEM+STAINS; ABUND MICA+BIOT; RR HBLNDE.

POOH @ 7612' TO SHOE, FOR SCHEDULED RANGE CLOSURE, LOST 156bbbls DURING TRIP, LOST APPRX 50 BBLS BEFORE TRIP. DRILL AHEAD LOSING 30-40BPH F/7612'

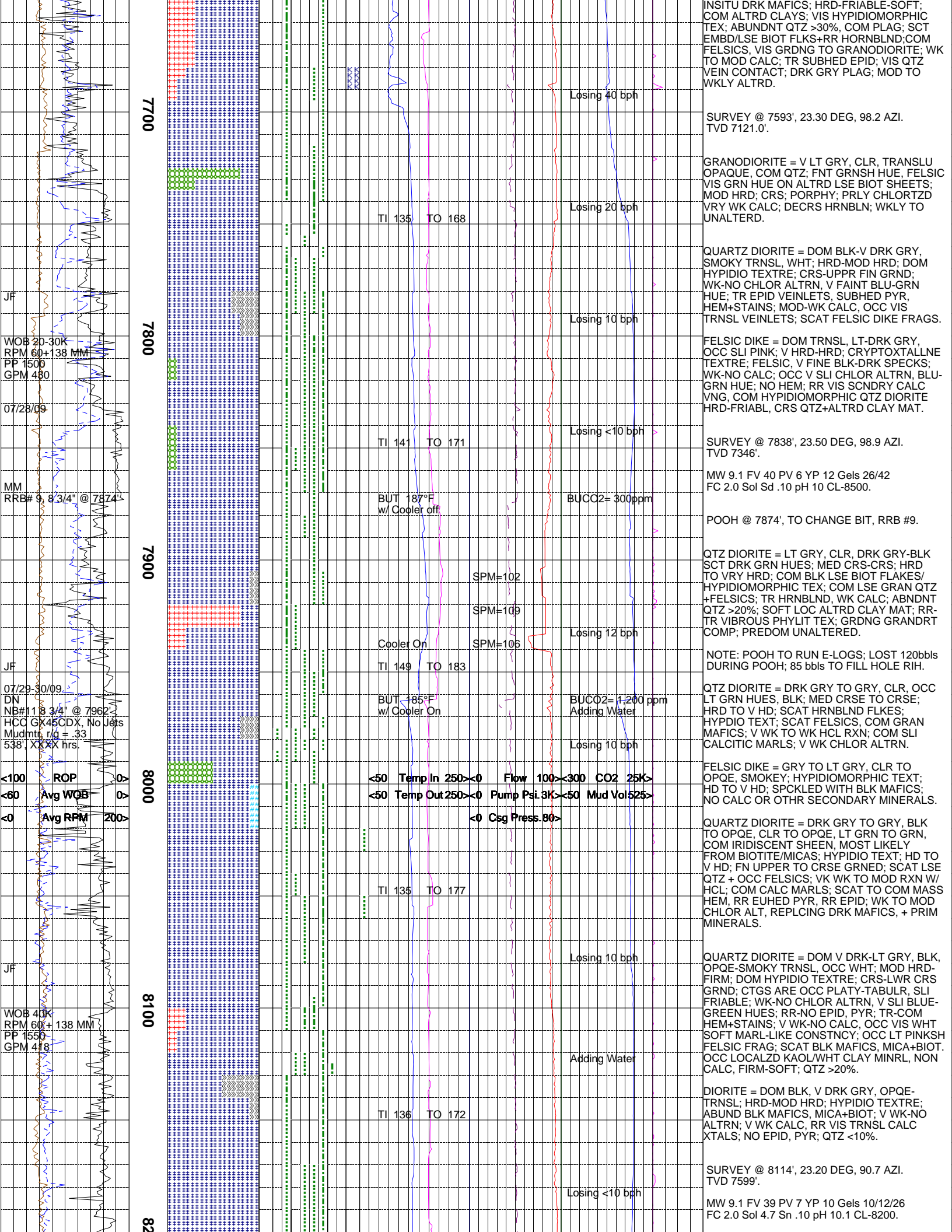
QUARTZ DIORITE = VRY LT GRY; SCT DRK

IRRB# 9
JF
07/23/09
MM
7/24/26/09
NB# 10, 8 3/4 @ 7224
HCC MX30GDX, No Jets
Mudmt. r/g = 33
650' - 30hrs.
WOB 30-35K
RPM 62 + 139 MM
PP 1378
GPM 422
JF
ROP
Avg WOB
Avg RPM
07/27/09
MM
WOB 15-30K
RPM 65 + 144
PP 1405
GPM = 438

BUT 172°F
w/ Cooler On
TI 140 TO 174
BUCO2= 985ppm
Build Volume
Losing 12 bph
BUT 176°F
w/ Cooler On
TI 140 TO 177
BUCO2= 2,234ppm
Adding Water
No Losses
TI 140 TO 174
TI 123 TO 170
TI 138 TO 170
BUT 164°F
w/ Cooler on
TI 98 TO 168
BUCO2= 300ppm
Building Volume
Losing 30 bph

7200
7300
7400
7500
7600

<50 Temp In 250><0 Flow 100><300 CO2 25K>
<50 Temp Out 250><0 Pump Psi 3K><50 Mud Vol 525>
<0 Csg Press 80>



INSITU DRK MAFICS; HRD-FRIABLE-SOFT;
 COM ALTRD CLAYS; VIS HYPIDIOMORPHIC
 TEX; ABUNDNT QTZ >30%, COM PLAG; SCT
 EMBD/LSE BIOT FLKS+RR HORNBLND;COM
 FELSICS, VIS GRDNG TO GRANODIORITE; WK
 TO MOD CALC; TR SUBHED EPID; VIS QTZ
 VEIN CONTACT; DRK GRY PLAG; MOD TO
 WKLY ALTRD.

SURVEY @ 7593', 23.30 DEG, 98.2 AZI.
 TVD 7121.0'.

GRANODIORITE = V LT GRY, CLR, TRANSLU
 OPAQUE, COM QTZ; FNT GRNSH HUE, FELSIC
 VIS GRN HUE ON ALTRD LSE BIOT SHEETS;
 MOD HRD; CRS; PORPHY; PRLY CHLORTZD
 VRY WK CALC; DECRS HRNBLN; WKLY TO
 UNALTERD.

QUARTZ DIORITE = DOM BLK-V DRK GRY,
 SMOKY TRNSL, WHT; HRD-MOD HRD; DOM
 HYPIDIO TEXTRE; CRS-UPPR FIN GRND;
 WK-NO CHLOR ALTRN, V FAINT BLU-GRN
 HUE; TR EPID VEINLETS, SUBHED PYR,
 HEM+STAINS; MOD-WK CALC, OCC VIS
 TRNSL VEINLETS; SCAT FELSIC DIKE FRAGS.

FELSIC DIKE = DOM TRNSL, LT-DRK GRY,
 OCC SLI PINK; V HRD-HRD; CRYPTOXTALLNE
 TEXTRE; FELSIC, V FINE BLK-DRK SPECKS;
 WK-NO CALC; OCC V SLI CHLOR ALTRN, BLU-
 GRN HUE; NO HEM; RR VIS SCNDRY CALC
 VNG, COM HYPIDIOMORPHIC QTZ DIORITE
 HRD-FRIABL, CRS QTZ+ALTRD CLAY MAT.

SURVEY @ 7838', 23.50 DEG, 98.9 AZI.
 TVD 7346'.

MW 9.1 FV 40 PV 6 YP 12 Gels 26/42
 FC 2.0 Sol Sd .10 pH 10 CL-8500.

POOH @ 7874', TO CHANGE BIT, RRB #9.

QTZ DIORITE = LT GRY, CLR, DRK GRY-BLK
 SCT DRK GRN HUES; MED CRS-CRS; HRD
 TO VRY HRD; COM BLK LSE BIOT FLAKES/
 HYPIDIOMORPHIC TEX; COM LSE GRAN QTZ
 +FELSICS; TR HRNBLND, WK CALC; ABNDNT
 QTZ >20%; SOFT LOC ALTRD CLAY MAT; RR-
 TR VIBROUS PHYLIT TEX; GRDNG GRANDRT
 COMP; PREDOM UNALTERED.

NOTE: POOH TO RUN E-LOGS; LOST 120bbbs
 DURING POOH; 85 bbbs TO FILL HOLE RIH.

QTZ DIORITE = DRK GRY TO GRY, CLR, OCC
 LT GRN HUES, BLK; MED CRSE TO CRSE;
 HRD TO V HD; SCAT HRNBLND FLKES;
 HYPIDIO TEXT; SCAT FELSICS, COM GRAN
 MAFICS; V WK TO WK HCL RXN; COM SLI
 CALCITIC MARLS; V WK CHLOR ALTRN.

FELSIC DIKE = GRY TO LT GRY, CLR TO
 OPQE, SMOKEY; HYPIDIOMORPHIC TEXT;
 HD TO V HD; SPCKLED WITH BLK MAFICS;
 NO CALC OR OTHR SECONDARY MINERALS.

QUARTZ DIORITE = DRK GRY TO GRY, BLK
 TO OPQE, CLR TO OPQE, LT GRN TO GRN,
 COM IRIDISCENT SHEEN, MOST LIKELY
 FROM BIOTITE/MICAS; HYPIDIO TEXT; HD TO
 V HD; FN UPPER TO CRSE GRNED; SCAT LSE
 QTZ + OCC FELSICS; VK WK TO MOD RXN W/
 HCL; COM CALC MARLS; SCAT TO COM MASS
 HEM, RR EUHED PYR, RR EPID; WK TO MOD
 CHLOR ALT, REPLCING DRK MAFICS, + PRIM
 MINERALS.

QUARTZ DIORITE = DOM V DRK-LT GRY, BLK,
 OPQE-SMOKY TRNSL, OCC WHT; MOD HRD-
 FIRM; DOM HYPIDIO TEXTRE; CRS-LWR CRS
 GRND; CTGS ARE OCC PLATY-TABULR, SLI
 FRIABLE; WK-NO CHLOR ALTRN, V SLI BLUE-
 GREEN HUES; RR-NO EPID, PYR; TR-COM
 HEM+STAINS; V WK-NO CALC, OCC VIS WHT
 SOFT MARL-LIKE CONSTNCY; OCC LT PINKSH
 FELSIC FRAG; SCAT BLK MAFICS, MICA+BIOT.
 OCC LOCALZD KAOL/WHT CLAY MINRL, NON
 CALC, FIRM-SOFT; QTZ >20%.

DIORITE = DOM BLK, V DRK GRY, OPQE-
 TRNSL; HRD-MOD HRD; HYPIDIO TEXTRE;
 ABUND BLK MAFICS, MICA+BIOT; V WK-NO
 ALTRN; V WK CALC, RR VIS TRNSL CALC
 XTALS; NO EPID, PYR; QTZ <10%.

SURVEY @ 8114', 23.20 DEG, 90.7 AZI.
 TVD 7599'.

MW 9.1 FV 39 PV 7 YP 10 Gels 10/12/26
 FC 2.0 Sol 4.7 Sn .10 pH 10.1 CL-8200.

WOB 20-30K
 RPM 60+138 MM
 PP 1500
 GPM 480

07/28/09

MM
 RRB# 9, 8 3/4" @ 7874'

07/29-30/09.
 DN
 NB# 11 8 3/4" @ 7962'
 HCC GX45CDX, No Jets
 Mudmt, r/g = .33
 538', XXXX hrs.

<100 ROP
 <60 Avg WOB
 <0 Avg RPM 200

WOB 40K
 RPM 60+138 MM
 PP 1550
 GPM 418

TI 135 TO 168

Losing 40 bph

Losing 20 bph

Losing 10 bph

TI 141 TO 171

Losing <10 bph

BUIT 187°F
 w/ Cooler off

BUCO2= 300ppm

SPM=102

SPM=109

SPM=106

Losing 12 bph

Cooler On
 TI 149 TO 183

BUIT 185°F
 w/ Cooler On

BUCO2= 1,200 ppm
 Adding Water

Losing 10 bph

<50 Temp In 250><0 Flow 100><300 CO2 25K>
 <50 Temp Out 250><0 Pump Psi 3K><50 Mud Vol 525>
 <0 Csg Press 80>

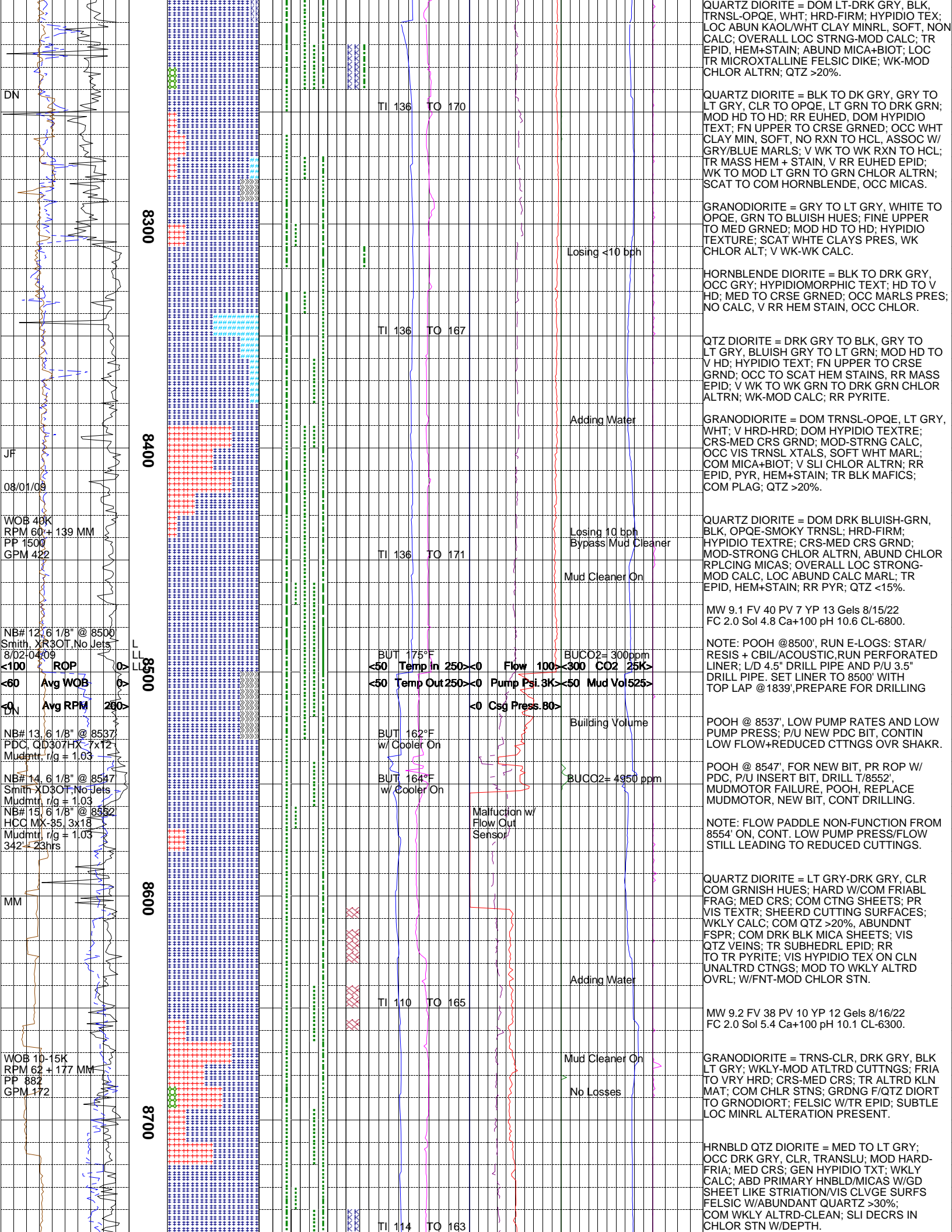
TI 135 TO 177

Losing 10 bph

Adding Water

TI 136 TO 172

Losing <10 bph



QUARTZ DIORITE = DOM LT-DRK GRY, BLK, TRNSL-OPQE, WHT; HRD-FIRM; HYPIDIO TEX; LOC ABUN KAOL/WHT CLAY MINRL, SOFT, NO CALC; OVERALL LOC STRNG-MOD CALC; TR EPID, HEM+STAIN; ABUND MICA+BIOT; LOC TR MICROXTALLINE FELSIC DIKE; WK-MOD CHLOR ALTRN; QTZ >20%.

QUARTZ DIORITE = BLK TO DK GRY, GRY TO LT GRY, CLR TO OPQE, LT GRN TO DRK GRN; MOD HD TO HD; RR EUHED, DOM HYPIDIO TEXT; FN UPPER TO CRSE GRNED; OCC WHT CLAY MIN, SOFT, NO RXN TO HCL, ASSOC W/ GRY/BLUE MARLS; V WK TO WK RXN TO HCL; TR MASS HEM + STAIN; V RR EUHED EPID; WK TO MOD LT GRN TO GRN CHLOR ALTRN; SCAT TO COM HORNLENDE, OCC MICAS.

GRANODIORITE = GRY TO LT GRY, WHITE TO OPQE, GRN TO BLUISH HUES; FINE UPPER TO MED GRNED; MOD HD TO HD; HYPIDIO TEXTURE; SCAT WHT CLAYS PRES, WK CHLOR ALT; V WK-WK CALC.

HORNLENDE DIORITE = BLK TO DRK GRY, OCC GRY; HYPIDIOMORPHIC TEXT; HD TO V HD; MED TO CRSE GRNED; OCC MARLS PRES; NO CALC, V RR HEM STAIN, OCC CHLOR.

QTZ DIORITE = DRK GRY TO BLK, GRY TO LT GRY, BLUISH GRY TO LT GRN; MOD HD TO V HD; HYPIDIO TEXT; FN UPPER TO CRSE GRNED; OCC TO SCAT HEM STAINS, RR MASS EPID; V WK TO WK GRN TO DRK GRN CHLOR ALTRN; WK-MOD CALC; RR PYRITE.

GRANODIORITE = DOM TRNSL-OPQE, LT GRY, WHT; V HRD-HRD; DOM HYPIDIO TEXTRE; CRS-MED CRS GRND; MOD-STRNG CALC, OCC VIS TRNSL XTALS, SOFT WHT MARL; COM MICA+BIOT; V SLI CHLOR ALTRN; RR EPID, PYR, HEM+STAIN; TR BLK MAFICS; COM PLAG; QTZ >20%.

QUARTZ DIORITE = DOM DRK BLUISH-GRN, BLK, OPQE-SMOKY TRNSL; HRD-FIRM; HYPIDIO TEXTRE; CRS-MED CRS GRND; MOD-STRONG CHLOR ALTRN, ABUND CHLOR RPLCNG MICAS; OVERALL LOC STRONG-MOD CALC, LOC ABUND CALC MARL; TR EPID, HEM+STAIN; RR PYR; QTZ <15%.

MW 9.1 FV 40 PV 7 YP 13 Gels 8/15/22
FC 2.0 Sol 4.8 Ca+100 pH 10.6 CL-6800.

NOTE: POOH @8500', RUN E-LOGS: STAR/RESIS + CBIL/ACOUSTIC, RUN PERFORATED LINER; L/D 4.5" DRILL PIPE AND P/U 3.5" DRILL PIPE. SET LINER TO 8500' WITH TOP LAP @1839', PREPARE FOR DRILLING

POOH @ 8537', LOW PUMP RATES AND LOW PUMP PRESS; P/U NEW PDC BIT, CONTIN LOW FLOW+REDUCED CTTNGS OVR SHAKR.

POOH @ 8547', FOR NEW BIT, PR ROP W/ PDC, P/U INSERT BIT, DRILL T/8552', MUDMOTOR FAILURE, POOH, REPLACE MUDMOTOR, NEW BIT, CONT DRILLING.

NOTE: FLOW PADDLE NON-FUNCTION FROM 8554' ON, CONT. LOW PUMP PRESS/FLOW STILL LEADING TO REDUCED CUTTINGS.

QUARTZ DIORITE = LT GRY-DRK GRY, CLR COM GRNISH HUES; HARD W/COM FRIABL FRAG; MED CRS; COM CTTNG SHEETS; PR VIS TEXTR; SHEERD CUTTING SURFACES; WKLY CALC; COM QTZ >20%, ABUNDNT FSPR; COM DRK BLK MICA SHEETS; VIS QTZ VEINS; TR SUBHEDRL EPID; RR TO TR PYRITE; VIS HYPIDIO TEX ON CLN UNALTRD CTTNGS; MOD TO WKLY ALTRD OVRL; W/FNT-MOD CHLOR STN.

MW 9.2 FV 38 PV 10 YP 12 Gels 8/16/22
FC 2.0 Sol 5.4 Ca+100 pH 10.1 CL-6300.

GRANODIORITE = TRNS-CLR, DRK GRY, BLK LT GRY; WKLY-MOD ATLTRD CTTNGS; FRIA TO VRY HRD; CRS-MED CRS; TR ALTRD KLN MAT; COM CHLR STNS; GRDNG F/QTZ DIORT TO GRNODIORT; FELSIC W/TR EPID; SUBTLE LOC MINRL ALTERATION PRESENT.

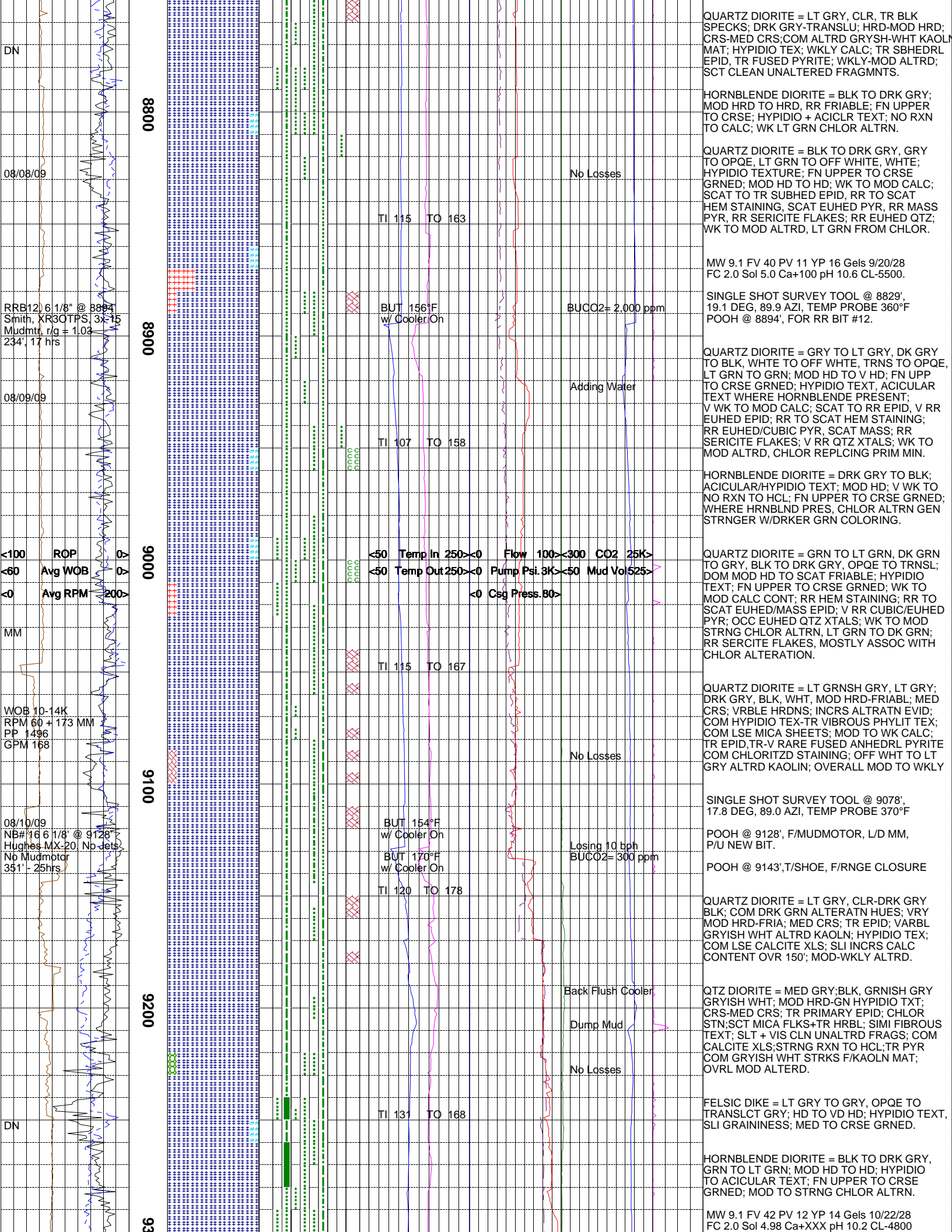
HRNBLD QTZ DIORITE = MED TO LT GRY; OCC DRK GRY, CLR, TRANSLU; MOD HARD-FRIA; MED CRS; GEN HYPIDIO TXT; WKLY CALC; ABD PRIMARY HNBLD/MICAS W/GD SHEET LIKE STRIATION/VIS CLVGE SURFS FELSIC W/ABUNDANT QUARTZ >30%; COM WKLY ALTRD-CLEAN; SLI DECRS IN CHLOR STN W/DEPTH.

DN
JF
08/01/09
WOB 40K
RPM 60 + 139 MM
PP 1500
GPM 422
NB# 12, 6 1/8" @ 8500
Smith, XR3OT, No Jets
8/02/04/09
ROP
<60 Avg WOB
<20 Avg RPM
NB# 13, 6 1/8" @ 8537
PDC, QD307HX-7x12
Mudmtr. r/g = 1.03
NB# 14, 6 1/8" @ 8547
Smith, XD3OF, No Jets
Mudmtr. r/g = 1.03
NB# 15, 6 1/8" @ 8552
HCC MX-35, 3x18
Mudmtr. r/g = 1.03
342 = 23hrs
MM
WOB 10-15K
RPM 62 + 177 MM
PP 882
GPM 172

8300
8400
8500
8600
8700

TI 136 TO 170
TI 136 TO 167
TI 136 TO 171
BUT 175°F
<50 Temp In 250><0 Flow 100<300 C02 25K>
<50 Temp Out 250><0 Pump Psi 3K><50 Mud Vol 525>
<0 Csg Press 80>
BUT 162°F
w/ Cooler On
BUT 164°F
w/ Cooler On
TI 110 TO 165
TI 114 TO 163

Losing <10 bph
Adding Water
Losing 10 bph
Bypass Mud Cleaner
Mud Cleaner On
Building Volume
BUCO2= 4950 ppm
Malfunction w/
Flow Out
Sensor
Adding Water
Mud Cleaner On
No Losses



8800

8900

9000

9100

9200

9300

DN

08/08/09

RRB12 6 1/8" @ 8894
Smith, KR30TPS, 3x7.15
Mudmt, r/g = 1.03
234', 17 hrs

08/09/09

>100 ROP
<60 Avg WOB
<0 Avg RPM

MM

WOB 10-14K
RPM 60 + 173 MM
PP 1496
GPM 168

08/10/09
NB# 16 6 1/8" @ 9128
Hughes MX-20 No Jets
No Mudmotor
351' - 25hrs

DN

TI 115 TO 163

BUT 156°F
w/ Cooler On

TI 107 TO 158

<50 Temp In 250><0 Flow 100><300 CO2 25K>
<50 Temp Out 250><0 Pump Psi. 3K><50 Mud Vol 525>
<0 Csg Press. 80>

TI 115 TO 167

BUT 154°F
w/ Cooler On

BUT 170°F
w/ Cooler On

TI 120 TO 178

TI 131 TO 168

No Losses

BUCO2= 2,000 ppm

Adding Water

No Losses

Losing 10 bph
BUCO2= 300 ppm

Back Flush Cooler

Dump Mud

No Losses

QUARTZ DIORITE = LT GRY, CLR, TR BLK SPECKS; DRK GRY-TRANSLU; HRD-MOD HRD; CRS-MED CRS; COM ALTRD GRYSH-WHT KAOLN MAT; HYPIDIO TEX; WKLY CALC; TR SBHEDRL EPID, TR FUSED PYRITE; WKLY-MOD ALTRD; SCT CLEAN UNALTERED FRAGMNTS.

HORNBLLENDE DIORITE = BLK TO DRK GRY; MOD HRD TO HRD, RR FRIABLE; FN UPPER TO CRSE; HYPIDIO + ACICLR TEXT; NO RXN TO CALC; WK LT GRN CHLOR ALTRN.

QUARTZ DIORITE = BLK TO DRK GRY, GRY TO OPQE, LT GRN TO OFF WHITE, WHITE; HYPIDIO TEXTURE; FN UPPER TO CRSE GRNED; MOD HD TO HD; WK TO MOD CALC; SCAT TO TR SUBHED EPID, RR TO SCAT HEM STAINING, SCAT EUHED PYR, RR MASS PYR, RR SERICITE FLAKES; RR EUHED QTZ; WK TO MOD ALTRD, LT GRN FROM CHLOR.

MW 9.1 FV 40 PV 11 YP 16 Gels 9/20/28
FC 2.0 Sol 5.0 Ca+100 pH 10.6 CL-5500.

SINGLE SHOT SURVEY TOOL @ 8829',
19.1 DEG, 89.9 AZI, TEMP PROBE 360°F
POOH @ 8894', FOR RR BIT #12.

QUARTZ DIORITE = GRY TO LT GRY, DK GRY TO BLK, WHITE TO OFF WHITE, TRNS TO OPQE, LT GRN TO GRN; MOD HD TO V HD; FN UP TO CRSE GRNED; HYPIDIO TEXT, ACICULAR TEXT WHERE HORNBLLENDE PRESENT; V WK TO MOD CALC; SCAT TO RR EPID, V RR EUHED EPID; RR TO SCAT HEM STAINING; RR EUHED/CUBIC PYR, SCAT MASS; RR SERICITE FLAKES; V RR QTZ XTALS; WK TO MOD ALTRD, CHLOR REPLCING PRIM MIN.

HORNBLLENDE DIORITE = DRK GRY TO BLK; ACICULAR/HYPIDIO TEXT; MOD HD; V WK TO NO RXN TO HCL; FN UPPER TO CRSE GRNED; WHERE HRNBLND PRES, CHLOR ALTRN GEN STRNGER W/DRKER GRN COLORING.

QUARTZ DIORITE = GRN TO LT GRN, DK GRN TO GRY, BLK TO DRK GRY, OPQE TO TRNSL; DOM MOD HD TO SCAT FRIABLE; HYPIDIO TEXT; FN UPPER TO CRSE GRNED; WK TO MOD CALC CONT; RR HEM STAINING; RR TO SCAT EUHED/MASS EPID; V RR CUBIC/EUHED PYR; OCC EUHED QTZ XTALS; WK TO MOD STRNG CHLOR ALTRN, LT GRN TO DK GRN; RR SERICITE FLAKES, MOSTLY ASSOC WITH CHLOR ALTERATION.

QUARTZ DIORITE = LT GRNSH GRY, LT GRY; DRK GRY, BLK, WHT, MOD HRD-FRIABL; MED CRS; VRBLE HRDNS; INCRS ALTRATN EVID; COM HYPIDIO TEX-TR VIBROUS PHYLLIT TEX; COM LSE MICA SHEETS; MOD TO WK CALC; TR EPID, TR-V RARE FUSED ANHEDRL PYRITE COM CHLORITZD STAINING; OFF WHT TO LT GRY ALTRD KAOLIN; OVERALL MOD TO WKLY

SINGLE SHOT SURVEY TOOL @ 9078',
17.8 DEG, 89.0 AZI, TEMP PROBE 370°F

POOH @ 9128', F/MUDMOTOR, L/D MM, P/U NEW BIT.

POOH @ 9143', T/SHOE, F/RNGE CLOSURE

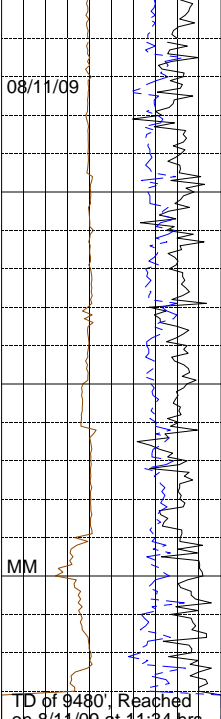
QUARTZ DIORITE = LT GRY, CLR-DRK GRY BLK; COM DRK GRN ALTRATN HUES; VRY MOD HRD-FRIA; MED CRS; TR EPID; VARBL GRYSH WHT ALTRD KAOLN; HYPIDIO TEX; COM LSE CALCITE XLS; SLI INCRS CALC CONTENT OVR 150; MOD-WKLY ALTRD.

QTZ DIORITE = MED GRY; BLK, GRNISH GRY GRYSH WHT; MOD HRD-GN HYPIDIO TXT; CRS-MED CRS; TR PRIMARY EPID; CHLOR STN; SCT MICA FLKS+TR HRBL; SIMI FIBROUS TEXT; SLT + VIS CLN UNALTRD FRAGS; COM CALCITE XLS; STRNG RXN TO HCL; TR PYR COM GRYSH WHT STRKS F/KAOLN MAT; OVRL MOD ALTERD.

FELSIC DIKE = LT GRY TO GRY, OPQE TO TRANSLCT GRY; HD TO VD HD; HYPIDIO TEXT, SLI GRAININESS; MED TO CRSE GRNED.

HORNBLLENDE DIORITE = BLK TO DRK GRY, GRN TO LT GRN; MOD HD TO HD; HYPIDIO TO ACICULAR TEXT; FN UPPER TO CRSE GRNED; MOD TO STRNG CHLOR ALTRN.

MW 9.1 FV 42 PV 12 YP 14 Gels 10/22/28
FC 2.0 Sol 4.98 Ca+XXX pH 10.2 CL-4800



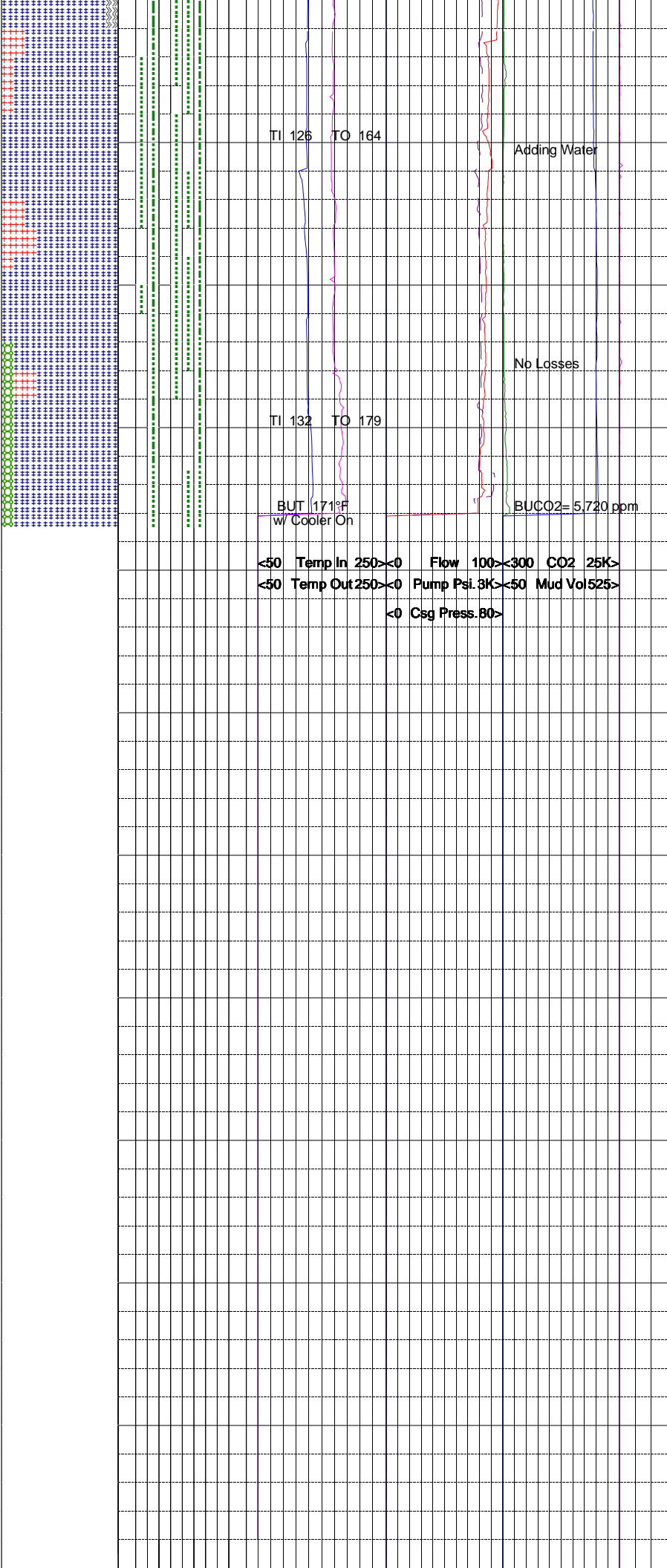
9400

9500

9600

9700

9800



GRANODIORITE = WHTe TO OFF WHTe, GRy TO LT GRy, OPQe TO LT GRN, GRN; MOD HD TO HD; HYPIDIO TEXT; MED TO CRSe GRND; WK CALC TO MOD CALC WHEN GRANODIOR PRES; WK TO MD CHLOR ALTRN.

QUARTZ DIORITE = BLK TO DRK GRy, GRy TO LT GRy, OFF WHTe TO OPQe, GRN TO LT GRN; MOD HD TO V HD; HYPIDIO TEXT; ACICULAR TEXT WHERE HORNBLENDES PRES; SCAT HEM STAINING, MASS HEM, RR HEM VEINLETS; OCC TO SCAT MASS EPID; V RR EUHED EPID; SCAT TO COM EUHED QTZ; WK TO MOD RXNS TO HCL; V RR MASS PYR; MOD TO FAIRLy STRNG CHLOR ALTRN, REPLACING PRIM MIN, HORNBLENDES.

GRANODIORITE = WHTe TO OFF WHTe, GRy TO LT GRy, GRN; MOD HD TO HD; HYPIDIO TEXT; FN UPPER TO CRSe GRND; LOW TO MOD CALC CONT; LOC HEM STAINING, RR VEINLETS; RR MASS EPID; FELSIC DIKES OCC PRES; WK TO MOD CHLOR ALTRN; SCAT TO COM EUHED QTZ; V RR MASS PYR; DOM QTZ DIORITE W/HYPID TEX+CHLOR STN.

SINGLE SHOT SURVEY TOOL @ 9434', 21.8 DEG, 86.0 AZI, TEMP PROBE 360°F

TD DRILLER'S DEPTH @ 9480', K.B.

POOH @ 9480', STRAP OUT HOLE; STRAP-OUT DEPTH = 9482', INSPECT BHA, RIH W/ GAGED ASSEMBLY F/CLEAN OUT RUN;

POOH, AND RUN 5 1/2" PERFORATED LINER. RELEASE AND SET LINER ON BOTM @9480' TOP OF LINER @ 8316'; DUMP MUD, CLEAN PITS AND CHANGE HOLE OVER TO WATER P/U 2 7/8" TUBING, RIH W/TUBING + DP TO UNLOAD WELL, BEGIN ON 8/14/2009.

RIH+UNLOAD WELL @ 1490' AND 3007'

RIH+UNLOAD WELL @ 4466'; BUILD AIR PR TO 1200 PSI, UNLOAD TEMP NA, BL PR 10 PSI, CSG PR MAX 26 PSI, CO2=9.775ppm INITIAL AIR PR DROP TO 500 PSI. MAINTAIN AIR PR, 2.2 Hr TEMP RANGE 143-165 LQ TEMP 162F, W/BL TEMP AT 165F.

RIH+UNLOAD WELL @ 6007'; BUILD AIR PR TO 1400 PSI, BLOW DOWN WELL 60 SPM; UNLOAD AT 1170PSI AIR PR, BL TEMP 187, CSG PR 23 PSI, BL PR 8 PSI, CO2=19,893 ppm, SUSTAIN AT 615 AR PR, WITH BL TEMP 172F LQ TEMP 170F MAX.

RIH+UNLOAD WELL @ 6962'; BUILD AIR PR TO 1350 PSI, BLOW DOWN WELL 60 SPM; NOT UNLOADING AFTER 1 HR, BLOW DOWN WELL 63 SPM, UNLOAD AT 1167PSI, MAX BL TEMP 192, CSG PR 37 PSI, BL PR 14, CO2=598ppm, SUSTAINED AT 650 AR PR, BL TEMP AT 180, LQ TEMP 178 MAX; FLUID RATE REDUCD;KILL AIR PR,BL PR UP 1 PSI BL TEMP UP FROM 177 TO 191.

RIH+UNLOAD WELL @ 7927'; BUILD AIR PR TO 1305 PSI, BLOW DOWN WELL 62 SPM; UNLOAD AT 1150PSI AIR PR, BL TEMP 190, CSG PR 22 PSI, BL PR 6 PSI, CO2=12,654 ppm, SUSTAIN AT 615 AR PR, WITH BL TEMP 182F LQ TEMP 180F MAX.

RIH+UNLOAD WELL @ 8701'; BUILD AIR PR TO 1500 PSI, BLOW DOWN WELL 64 SPM; UNLOAD AT 1330PSI AIR PR, BL TEMP 186, CSG PR 36 PSI, BL PR 14 PSI, CO2=61,500 ppm, SUSTAIN AT 740 AR PR, WITH BL TEMP 187F LQ TEMP NA.

RIH+UNLOAD WELL @ 9374'; BUILD AIR PR TO 1180 PSI, BLOW DOWN WELL 64 SPM; UNLOAD AT 1375PSI AIR PR, BL TEMP 192, CSG PR 14 PSI, BL PR 4 PSI, CO2=4.958 ppm, SUSTAIN AT 864 AR PR, WITH BL TEMP 183F LQ TEMP 180F MAX. FLOW RATE FROM MUFFLER 130 bph, LQ TEMP 174F. CONTINUE TO FLOW WELL W/AIR AND WATER @ 12 BPH, PLUS ADDING SOAP SWEEPS AND CORRISION INHIBITOR, PERIODICALLY CHECK FLOW RATES+TEMP AT MUFFLER (REFER TO CHARTS)

NOTE: ATTEMPT TO RTB, NOT ABLE TO RUN DRILL STRING PAST 9375' +/- 10'

SHUT AIR OFF AND DETERMINE IF WELL FLOWS. (WELL NOT FLOWING), MAINTAIN TEMPS BETWEEN 185-205, AFTER AIR WAS SHUT OFF, DURING TRIP OUT OF HOLE F/LOGS.

RIG UP LOGGERS, ON 8/16/2009, RUN

0066

WIRELINE STATIC PT SURVEY TOOL,
RECORDED FLUID LEVEL @ 1215' MD
W/MAX TEMP OF APPROX 547F

SHUT IN WELL, PERFORM INJECTION TEST
PUMP @51 SPM, FOR 2hrs, LEAKING FLUID
OVER STACK AT 6696 STKS; CONTINUE W/
INJECTION TEST (REFER TO CHART).

BEGIN ADDITIONAL INJECTOR TEST
WITH PTS-GAMMA LOG @ 400PSI, WIRE-
LINE SNAPPED (FISH FOR LINE/TOOL)

POOH TO LAY DOWN TUBNG/DP, RELEASE
RIG AND TURN OVER TO PRODUCTION.

The log data, interpretations and recommendation provided by Epoch are inferences and assumptions based on measurements of drilling fluids. Such inferences and assumptions are not infallible and reasonable professionals may differ. Epoch does not represent or warrant the accuracy, correctness or completeness of any log data, interpretations, recommendations or information provided by Epoch, its officers, agents or employees. Epoch does not and cannot guarantee the accuracy of any such interpretation of the log data, interpretations or recommendations and Company is fully responsible for all decisions and actions it takes based on such log data, interpretations and recommendations.

