



FORMATION EVALUATION LOG

Scale: 2"=100'

COMPANY: NW NATURAL
WELL: IW 24c-15-65
FIELD: Mist (Busch Pool Storage)
COUNTY: Columbia, OR
Location: Sec. 22, T6N-R5W; WB&M
Coordinates: 2496.05' East and 312.47' South from the NW corner of Sec. 22
X: 1291514.389 Y: 861741.020
API No.:
Spud Date: 10/27/04
Total Depth: 11/3/04
Elevation: K.B. 650.00' (G.L. +19')
G.L. 631.00' (GPS)
Company Geologist: Jack Meyer
Company Engineer: Todd Thomas
Company Pusher: Ed Vader
Directional Engineer: Charlie McClintock-SDI
Mud Company: Enterprise Drilling Fluids
Mud Engineer: Tom McDonald
Drilling Contractor: Taylor Drilling, Inc
Rig Pusher: John Taylor
Rig No.: 9
Geolog Unit No.: 102
Logging Geologists: Jim MacLean, Mike Kizer

LOG INTERVAL
DATES: 10/27/04 TO 11/3/04
DEPTHS: 43' TO 2359'
MUD TYPES
Gel/Water TO 443'
LSND TO 2359'
MUD PUMPS
PUMP #1: National N-1100 7" x 16"
PUMP #2:
LEGEND
BG - Background Gas
CB - Core Bit
CG - Connection Gas
CK - Filter Cake
CKF - Check for Flow
CL - Salinity, ppm Cl
CR - Circulate Returns
DC - Diamond Bit
DB - Depth Correction
DCB - Diamond Core Bit
DF - Derrick Floor
DG - Drilling Gas
DS - Directional Survey
DST - Drill Stem Test
E.L. - Electric Log
E.M.A. - Equivalent Methane in Air, % = 50 Units
F - Filtrate, API cc's
F/T - Flowline Temperature
GCM - Gas Cut Mud
GCW - Gas Cut Water
G & OCM - Gas and Oil Cut Mud
GL - Ground Level
KB - Kelly Bushing
LAT - Logged After Trip
NCB - New Core Bit
NR - No Returns
PDC - Polycrystalline Diamond Compact Bit
LC - Lost Circulation
PPM - Parts Per Million
PR - Poor Returns
PP - Pump Pressure
PV - Plastic Viscosity
RM - Mud Resistivity, Ohm-Meter
RMC - Mud Cake Resistivity, Ohm-Meter

TOTAL DEPTH
MEASURED: 2359'
TRUE VERTICAL: 1789.62'
HOLE SIZE
17-1/2" TO 443'
8-3/4" TO 2359'
CASING DATA
13-3/8" AT 442'
AT
AT

Legend table with symbols for CEMENT, LIMESTONE, DOLOMITE, GYPSUM, ANHYDRITE, COAL & LIGNITE, CLAY, SHALE, SILTSTONE, SANDY SILTSTONE, FINE SAND, MEDIUM SAND, COARSE SAND, CONGLOMERATE, SANDSTONE, KAOLINITE, TUFF, DIATOMITE, PORCELANITE, CHERT, VOLCANIC, IGNEOUS, METAMORPHIC.

Main log table with columns: DRILL RATE (ft/hr), DEPTH (ft), CUTTINGS LITHOLOGY (%), OIL, TOTAL GAS (Ditch Cuttings units), CHROMATOGRAPH (C1, C3, C4, C5 ppm), LITHOLOGY DESCRIPTIONS & REMARKS. Includes detailed lithology descriptions and survey data.

Comments:
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