GFZ-OSG - Logging Report
OUTO Project
20-August - 06-September 2011

Statistics
Travel to: 20-22-AUG-2011, 3 d
Rig-up: 22-AUG, 15:00-17:00
Logging: 23-AUG - 01-SEP, no night shifts
Logging time: 89 h
Rig-down: 01-SEP, 16:45-17:30
Travel back: 02-06-SEP, 5 d (incl. 1 day stand-by on 03-SEP)
Total time: 18 d
GFZ participants: Christian Carnein, Jochem Kück, Matxalen Rey Abasolo, Martin Töpfer, Stefan Weisheit, Thomas Wiersberg
Project representative: Ilmo Kukkonen, GTK, Espoo, & Riika K
Cable type /Owner: 7-H422D 7-conductor cable Rochester/GFZ
Winch type /Owner: Logging Truck, International Harvester/GFZ

GFZ-OSG - Logging Report
OUTO Project
20-August - 06-September 2011

Site Parameters
Well: OUTO
Location: Outokumpu, Sysmiejärvi, Finland
Geographic Coordinates: Lat: N62° 43.0684, Long: E29° 03.7196
Depth reference: top of casing
Elevation depth reference above ground: 1.1 m
Elevation of ground above sea level: 99.04 m

Well Parameters
Max. depth driller: 2516 m

<table>
<thead>
<tr>
<th>Casing/Liner/OH</th>
<th>ID</th>
<th>Top [m]</th>
<th>Bottom [m]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Casing</td>
<td>324 mm</td>
<td>0</td>
<td>44</td>
</tr>
<tr>
<td>OH</td>
<td>220 mm</td>
<td>44</td>
<td>2516</td>
</tr>
</tbody>
</table>

Drilling method in open hole: rotary coring
Type of fluid in hole: saline rock fluids
Remarks: pumping tests with a downhole membran pump were performed earlier this year
<table>
<thead>
<tr>
<th>Sonde</th>
<th>Parameters</th>
<th>Log Range [m]</th>
<th>Date in 2011</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>TS1-MP-TEMP</td>
<td>T, p, MRES, GR</td>
<td>0 - 2500</td>
<td>23-AUG</td>
<td>sonde stood up 7 times, could be overcome by 4 people pulling laterally on the rope ('monkey business')</td>
</tr>
<tr>
<td>TS1-MS</td>
<td>MSUS, GR</td>
<td>44 - 2500</td>
<td>26-AUG</td>
<td></td>
</tr>
<tr>
<td>TS1-DIP</td>
<td>Mx, My, Mz, GR, DEVI, DAZI</td>
<td>1260 - 2500</td>
<td>28-AUG</td>
<td>run as magnetometer w/ arms not opened</td>
</tr>
<tr>
<td>FAC40</td>
<td>borhehole images</td>
<td>160 - 235, 950 - 980, 1275 - 1742, 1740 - 1900</td>
<td>29-31 AUG</td>
<td></td>
</tr>
<tr>
<td>TS1-FS</td>
<td>GR, fluid samples</td>
<td>500, 970, 1470, 1820, 2480, 500, 2350, 1470</td>
<td>24-29 AUG</td>
<td>8 Samples, sonde was left downhole overnight for sampling several times</td>
</tr>
<tr>
<td>MP standard</td>
<td>T, MRES, GR</td>
<td>0 - 1500</td>
<td>01-SEP</td>
<td>8 m/min in 4 sections for comparison w/ slimhole sonde, inbetween run fast</td>
</tr>
</tbody>
</table>

Logging Program OUTO 2011