Personnel Resources

Tadahiro NAGANO

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Executive Summary

This report is for the GeoVISION invasion processing within GeoFrame. The inversion is carried out using the producer DLIS with RAB Inversion in GeoFrame 4.5 DC-6. Processed data was acquired at JFAST C0019B.

Contextual Information

The GeoVISION Resistivity tool (GVR) outputs 5 resistivity curves, 3 from button measurements, one RING measurement and one Bit measurement. The depth of investigation (DOI) of the measurement increases from the shallow button to the bit measurement. This array of resistivities can be inverted to simultaneously solve for up to four formation characteristics: formation resistivity (Rt), invaded zone resistivity (Rxo), Diameter of Invasion (Di) and Hole size (Dh). The button resistivities can be used as an average measurement around the borehole or as directional measurements.

The translatory separation of resistivity curve from different depth of investigations may indicate the invasion profile. No separation means ‘no invasion’ or ‘significant washout’. Washout case can be identified by the gap between bit resistivity and the others.

Logging area is located around trench. Pelagic, channel sediments and igneous rocks may be observed. Drilling pass is 858.5 m under 6883.5 m water column.

Data processing and/or interpretation

Input Data Acceptance Criteria

In general, the image data quality is affected by incomplete rotation. Image interruptions are caused by higher angular acceleration indicator (AAI) with lower rotation per minute (RPM). These conditions are observed at shallower interval than 7180 m and at the depth of drill pipe connected. Azimuthal data continuity looks enough to pick bed boundaries and faults. Average resistivity arrays are less affected by incomplete rotation.
Fig. 1 Incomplete rotation at shallower interval
**Processing Steps**

Data was loaded and quality controlled within GeoFrame. Average measurement invasion inversion was carried out. Because the separation did not occur, there is no clear difference between the invasions in individual layers. Major input/output curves and parameters are summarised in table 1.

**Table 1. Input and output data for the GVR Inversion**

<table>
<thead>
<tr>
<th>Curves</th>
<th>Input</th>
<th>Output</th>
<th>Parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input</td>
<td>RBIT</td>
<td>Rt</td>
<td>Rm</td>
</tr>
<tr>
<td>Output</td>
<td>RING</td>
<td>Rxo</td>
<td>0.29 ohm m</td>
</tr>
<tr>
<td></td>
<td>BDAV</td>
<td>Di</td>
<td>@ 2 degC</td>
</tr>
<tr>
<td></td>
<td>BMAV</td>
<td>Dh</td>
<td>12 degC</td>
</tr>
<tr>
<td></td>
<td>BSAV</td>
<td>MRES</td>
<td></td>
</tr>
</tbody>
</table>

**Output Data**

Outputs of the GVR Inversion processing are summarised in table 1. The following digital and graphical files were generated:

- CDEX_JFAST_GVRinversion.dlis
- CDEX_JFAST_GVRinversion200.pds
- CDEX_JFAST_GVRinversion500.pds

**Output Data Evaluation and Quality Review**

As it is mentioned above, there are only a few separations on resistivity inputs. This implies invasions did not occur frequently. Generally, only shallow button resistivity reads smaller than the other DOI resistivities and it could be caused by standoff changing. It is clear that longer ‘time after bit’ make the borehole be washed out by mud circulations.
Fig. 2 Inversion output. RTIM (time after bit of RING resistivity) is shown on linear scale.
Terms and Definitions

AAI  
Angular Acceleration Indicator

BDAV  
Deep button average resistivity

BHT  
Bottom Hole Temperature

BMAV  
Medium button average resistivity

BS  
Bit Size

BSAV  
Shallow button average resistivity

CRPM / RPM  
Collar Revolutions Per Minute

Di  
Diameter of invasion

ECAL / HD  
Electrical caliper - Hole Diameter

FLAG  
Inversion Flag

GR_RAB / GR  
Gamma Ray Error

GVR  
GeoVISION Resistivity

LWD  
Logging While Drilling

MRES  
Mud Resistivity

MST  
Mud Sample Temperature

RBIT  
Bit resistivity

RING  
RING resistivity

Rm  
Mud resistivity

Rmf  
Mud Filtrate Resistivity

Rt  
Formation Resistivity

RTIM / TAB_RES_RING  
RING resistivity time after bit

Rxo  
Flushed Zone Resistivity

Rw  
Formation Water Resistivity

References