

# NOV Treatment Systems Process WBM Liquids and Solids & SBM Sludge and Residue in Remote Asian Region

### Challenges

- To prove that NOV equipment and systems are up to challenge of task of handling sludge and residue.
- Remote location, extreme climatic conditions, using the right equipment, tankage and pipework, augers, excavator and ancillary equipment to complete the job.

### Well Information

- Location: Extremely remote Asian region

### Solution & Results

- After the dewatering process, some oily wastes from drilling sources contaminated the residual waste fluid in storage. This was addressed by skimming off the residual oil and water and mixing with oily cuttings for processing through the HTDU to meet discharge levels and with the NOV DW250 FE chemically enhanced centrifuge system for water based mud treatment.
- Solids levels in the active mud system were maintained at the series levels due to observations and recommendations by NOV operators and the NOV SR series transportable hot oil thermal treatment (HTDU) for the non-aqueous based solids/ sludge and base oil recovery.
- Given this was a first for total water-based and oily waste treatment on a remote land-based drilling site, the complexity of the processes and the numerous unknown factors encountered during the first well, it is an outstanding testament to the reliability and performance of NOV equipment and services.



In the first quarter of 2010, National Oilwell Varco was invited to bid on a package of solids control and waste treatment systems for a large IOC operating in an extremely remote Asian region. The equipment and technology package was required to process both Water Based Mud liquids and solids and Synthetic Based Mud sludge and residue. All equipment was to be installed to allow total waste treatment at the rig site, and operate “on-line” with the rig.

The equipment and services offered were based on NOV’s expertise as the largest Original Equipment (OEM) manufacturer of solids control and waste treatment systems, and specialized waste transfer, treatment and disposal equipment.

The package offered included:

- Providing an environmental responsible closed loop process solution.
- Assistance to the Operator with full CAD drawings showing equipment positions and operational limits to allow the civil construction phase to commence early.
- DW250 FE chemically enhanced centrifuge system for water based mud treatment.
- NOV SR series transportable hot oil thermal treatment (HTDU) for the non-aqueous based solids/sludge and base oil recovery.
- Upgrading the rig solids control system to include additional BRANDT™ HS-3400 series centrifuges.
- A purpose built multi directional closed auger system to transport either WBM or SBM drill solids to their respective treatment or disposal areas on the rig location.
- NOV Portable Power Generators to power all the equipment.
- Associated tankage and pipework, augers, excavator and ancillary equipment to complete the above processes.

### The Results

The first well was successfully completed in early 2011.

During the WBM stage of the well 6,200 bbls of waste mud/water were treated and disposed of over a 19-day period. All discharged water met both the local authorities, and IOC’s internal, environmental standards.

During the drilling of the SBM sections a NOV Soil Recovery A/S model 500 Hot Oil Thermal Desorption unit (HTDU) was installed and operated. The mobile HTDU plant has a capacity of up to 2.5MT/h input, with the average being 1 to 1.5 MT/h.

As thermal treatment is a continuous process, a buffer was required between the instantaneous loading from the rig and the even infeed requirements of the HTDU. To achieve this sludge and cuttings were transferred via screw conveyors to transportable 20 m<sup>3</sup> bins, then loaded via an excavator with “clamshell” bucket to the regulated infeed hopper.

The HTDU was powered by NOV Portable Power gensets (including backup 350kw Generator).

Over the course of the SBM section of the well, 1100 MT of cuttings and sludge was processed at location with an average OOC (oil on cuttings) of 0.25% v/v, and

137, 800 ltr (866 bbls) of valuable base oil was recovered for recycling into the mud system.

The treatment of synthetic based cuttings was a total success, with full recovery of the base oil and water phases for recycling, and a dry material for safe disposal in accordance with the country’s and IOC’s strict environmental regulations.

The complete package offered is built into standard container sized loads to facilitate mobilization, site installation and operation.

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