

WELL DESIGN AND COST ESTIMATE SLIM HOLE & ULTRASLIM HOLE CASE STUDY

Helium One - Rukwa Rift
Rukwa Region, Tanzania

AWT DISCIPLINES

Drilling Engineering
Completions Engineering
Contracts & Procurement
Materials & Logistic
Health, Safety & Environment

PROJECT BACKGROUND

Helium One was founded in September 2015 as a focussed explorer, developer, and ultimately producer of high value bulk liquid helium for the international market.

One of Helium One's exploration plays was the Rukwa Rift Helium System.

Helium One Ltd. requested AWT International (AWT) to provide preliminary conventional well cost estimates for three well types, being Shallow, Mid-Depth and Deep.

The wells were located in the Rukwa Region, Tanzania. The exploration objective was to establish if a Helium resource is present, and to evaluate the production potential via wireline and potentially production testing methods.

The initial program was to drill four (4) wells.

AWT WORKSCOPE

The primary scope of services and deliverables were to provide

- Basis of well design and well AFE for a conventional well design.
- Slim hole conceptual well designs as an alternative to the conventional program.
- Feasibility, including available rig options, for executing the conventional and slim hole designs.
- Well evaluation options for the conventional and slim hole designs.
- Comparative budgetary costs for the Slim Hole Program as opposed to the conventional program.
- Work program and schedule for developing the conventional and slim hole program.



AWT ADDED VALUE

- Prior to the well planning work commencing, the exact locations, depth objectives and geologic prognosis were not yet defined. Therefore, the conceptual well designs and drilling time estimates were based on two offset wells drilled by Amoco in 1987.
- Logistics and road access are a major consideration in Tanzania and it was necessary to determine the bridge and road suitability for rig access.
- Rig selection was also difficult and required a lot of effort to select the alternative rigs and work through the various operational, logistical and contractual issues and details.
- Logistics and road access are a major consideration in Tanzania, therefore it is extremely advantageous to contract a small footprint rig such as a mineral rig, a heli rig (such as operated by EMAS, or the Cluff Geothermal Predator Rig) as opposed to a conventional rig such as the Carol 2.
- Slim Hole Rigs were identified as available options for the Helium One Exploration Program therefore these unconventional rigs were considered to be suitable.
- In AWT's opinion and recent Tanzanian experience, using an alternative and out of country rig was not viable as opposed to the rig that was available in country. Therefore the preliminary well cost estimates were based on using the rig that was available in country and for which the rates and mobilization / demobilization requirements were understood.
- To minimize costs to Helium One, AWT proposed the project team to work remotely and only spending time in country as required.