

Pressurized Cores Fully Captured, Retained & Analyzed at Reservoir Pressure in the Burgan Oilfield

SUBJECT	PRESSURE CORING AND PRESSURIZED CORE ANALYSIS UTILIZING THE RESDOC™-SYSTEM
CUSTOMER	KUWAIT OIL COMPANY
REGION	SOUTH KUWAIT
DATE	JULY 2017

INTRODUCTION

In July 2017, the first commercial pilot of the ResDOC™ System was successfully conducted in the Giant Burgan Oilfield, Kuwait.

The ResDOC™ system consists of the Large-diameter Pressure Corer (LPC) and the on-site Pressurized Core Analysis system (PCAL). It ultimately provides access to a pristine and representative "Micro Reservoir" at surface. By encapsulating the whole core in a pressure vessel downhole, the reservoir conditions are maintained within the core during retrieval. This enables all fluids to remain under original conditions and distribution across the core's undisturbed pore structure and provides the opportunity to investigate the unaltered core properties on-site, within hours.

OBJECTIVE & CORING PROGRAM

The objective was to recover 3—1/3" diameter cores with maintained reservoir pressure to subsequently derive reservoir data from the pressurized core samples which is not obtainable by other means.

To meet those challenges, it was proposed to utilize Corsyde's ResDOC™ system.

Three runs of 8 ft. each, at a depth of approximately 4,500 ft. were cored in the Upper Burgan formation, consisting of consolidated sandstone interspersed with layers of shale and argillaceous sands.

Without consuming further rig time, a subsequent slow depressurisation procedure of the pressurized cores minimizes stress-release induced fractures and delivers cores of superior quality for RCAL/SCAL. High- and low-pressure fluid samples from selected pressure intervals were collected and analysed both on- and off-site. Throughout the process, the bubble point behaviour of the whole core was determined and used to cross evaluate with the client's open hole log and lab data. Providing complete core fluids allows for a determination of crucial reservoir data like GIP, OIP, GOR at the most accurate level.

RESULTS AND DELIVERABLES PROVIDED ON-SITE



Whole Core Bubble Point



6 × Compositional Gas analysis at different pressure stages throughout the depressurization process



4 × High Pressure PVT-Samples of Core Fluids



14 × Liquid samples from different pressure stages



8 × Gas samples from different pressure stages



Complete volume of gases produced by the core



Complete volume of core liquids expelled from the core



High integrity, low invasion core



P&T Logs recording the entire coring and analysis process

CONCLUSION

- Flawless operation of all LPC activation mechanisms
- Pressurized cores were recovered at 2–3 % above the in-situ reservoir pressure of 2,000 psi and provided 91,3 % recovery in two out of three runs with all fluids captured and retained.
- All PCAL procedures were carried out on fully pressurized cores and the deliverables provided ultimately added new and unprecedented information
- Whole Core Bubble Point estimation with 2% accuracy
- All operations were carried out with zero incidents or Non-Productive Time

Through the consistent Teamwork between the client and Corsyde International, this project has successfully achieved the objectives and was carried out in a safe and effective manner.