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About Target

Target is a privately owned Omani company providing services and technology to the E&P industry in Oman and the Gulf Region. The company was formed by a group of local oil & gas professionals with deep international experience in the Oil & Gas services industry. Target has since its formation established strong alliances and relationships with key technology and service provider in the E&P industry. Target brings value to its customers through its experienced staff and carefully selected technologies.

As a local company Target believes in local knowledge preservation, knowledge transfer and encourages training as part of its normal workflow (on-job-training and in house training).

Target brings value to its customers through its experienced staff and carefully selected technologies in the following domains:

- Open hole Wireline and LWD borehole images (FMI, STAR, etc., ) processing and interpretation
- Open hole logs Wireline and LWD petrophysical evaluation and uncertainty analysis
- Cased hole evaluations
- Full wave sonic and NMR processing
- Near wellbore to full filed scale fracture modeling
- Static reservoir modeling through well to seismic integration
- Sub-Seismic fault detection
- High resolution seismic inversion & spectral images
- Seismic interpretation and prospect generations
- Software Solutions & Services
- Training Courses

Some of Target key service delivery approaches include:

- Customised solutions
- Data acquisition vendor neutral
- Continuity for knowledge preservation
- Solution based approach to services
- Utilize key technology partners as solution require
- Fast turn around time

Target Clients

PDO OXY
DALEL PTTEP
ADCO ADMA
ZADCO OILEX
ARAMCO KOC
**Geological Services**

Geological services provided ranges from single well to full field predictions by applying advanced techniques, maximizing the value of acquired data in an integrated and customized workflows.

**Fracture & Fault Characterization in Well Data**

We work with all fracture and flow-related well data, especially core, image logs, sonic logs, production logs, drilling history and well testing. We advise on data acquisition programs for fractured reservoirs and carry out detailed interpretation and data integration to identify and characterize the fracture network, generate synthetic fracture flow curve and its subset of producing features. The results are used to build fracture models and also to advise on operational issues such as perforation.

**In-situ Stress Anisotropy**

Present day in-situ stress may influence fracture aperture and permeability, with a consequent impact on flow anisotropy. Understanding the role of stress may have a direct impact on the determination of drilling direction, especially where wellbore stability is also an issue. We can determine the stress condition in the reservoir and overburden and evaluate its impact on reservoir flow, as well as prepare the inputs for geomechanical models.

**Sedimentological Evaluations**

Understanding the rock internal patterns and various scales of sedimentary bedforms is very important for delineating rock stacking patterns, depositional environment and flow behavior. Target has capabilities in processing and utilizing all types borehole image used in the industry to capture high resolution variability along the well trajectory. This include determining a correct structural dip to refine seismic interpretation and dip closures in exploration wells and/or determining current flow direction to optimize well locations and improve well correlations.

**High Resolution Reservoir Textural and Heterogeneity Analysis**

This textural heterogeneity and rock fabric corresponds to extreme, porosity and permeability variation that is the controlling factor in reservoir production both in carbonate and clastics, some of which get missed by conventional OH Logs measurements. Target Oilfield adopt a unique approach to quantify fine-scale reservoir complexity by bridging the caps between coarser OH logs measurement and detailed core description through use of borehole image data. High resolution secondary porosity, total porosity, permeability, porosity anisotropy, grain packing, sedimentary logs can be generated and utilized for minimizing coring, full fill core caps, refining mobility and pressure measurements selections and model reservoir properties.

**Core Facies and Reservoir Rock Type Predictions**

The detailed geological and petrophysical analysis captured from core –borehole images-and other OH logs measurements are used to predict core facies and reservoir rock typing through neural network supervised...
and un-supervised technology. Stable neural network training set can be built for each field and input parameters stored in a master file to be utilized for future drilling campaigns.

**Geophysical Services**

**Seismic Evaluation/Re-Evaluation of Prospects**

This involves time interpretation of shallow, reservoir, deep horizons, fault interpretation, synthetic seismogram generation, attribute extraction, velocity model building and depth conversion, uncertainty analysis, and volumetric estimation for field development planning.

![Seismic Evaluation/Re-Evaluation of Prospects](image)

**High Resolution spectral Imaging**

This is based on instantaneous Spectral Analysis (ISA) which utilizes wavelet transform of seismic data to give excellent localization of events in both time and frequency domain and avoids windowing problems that complicate conventional Fourier analysis. It provides definition and information on key reservoir properties such as oil distribution and seismic facies. It is widely applied for resolution enhancement, improved visualization of stratigraphic features, thickness estimation of thin beds, and direct hydrocarbon indications. This is important for prospect exploration, reservoir understanding, production optimization and prospect maturation.

![High Resolution Spectral Imaging](image)

*The High Resolution Spectral Imaging is capable of separating seismic events that are otherwise seen as one event in conventional Spectral Imaging techniques.*
High Resolution Deterministic Seismic Inversion

This is widely used in the petroleum industry; both for exploration and production purposes as a tool for reservoir property quantification (porosity, for example). High resolution inversion provides sufficient vertical resolution of 1m as well as areal resolution for use in reservoir characterization. It is used to constrain 3D reservoir property model. High resolution Seismic Impedance volume may be incorporated directly with well data via geostatics, neural networks, or other methods to populate the cells of the petrophysical model. Seismic Impedance data may as well be combined with facies data to derive a facies volume. Petrophysical properties can then be distributed by facies within the overall model framework.

High Resolution Deterministic Inversion capable of production subsurface image at 0.5 ms (1 m) resolution. There is high correlation between predicted and actual impedance as shown by the well log data to the right.
**Petrophysical Services**

**Petrophysical evaluation**

The petrophysical evaluations and rock characteristics can be computed on all types of wireline and LWD log suits. This provides all conventional petrophysical properties such as: Litho-logy, Volume of shale (VSH), Porosity, Saturation, Permeability, etc.,

**Uncertainty analysis of petrophysical calculations**

The uncertainty analysis of the petrophysical properties is the error associated with the measurement and calculation of these properties. These uncertainties give the risk associated with amount of the hydrocarbon recoverable and the development the field reservoir. The uncertainty analysis helps to build multi-scenario on the field development and strategy in how to mitigate these uncertainties with less impact in the field development.

**Saturation Height Function**

The hydrocarbon saturation in nature is a function of rock properties and column height of the hydrocarbon. The well data gives the Hydrocarbon saturation at 1-2 m radius from the well bore. For the dynamic modeling and future well location prediction for the field reservoir production the saturation height function is required. Log and/or core data are used to define the saturation height function.

**Petro-facies Analysis**

The petro-facies analysis is the study to use the petrophysical log and properties to differentiate between the changes in the rock type with the few inches scale, these changes called facies. Knowing the litho-logy type will help to better estimate the Hydrocarbon volume of the reservoir and better production from the well.

**Multi Well Analysis**

Normally in the mature field there are more the one well, so multi-well analysis try to integrate all the relevant data (e.g. open hole, cased hole data and cored data) for the field to have one set of parameters to evaluate the field, the final set of the data will be used for the static and the dynamic reservoir modeling. The multi-well analysis help to understand the field reservoir better and reduce the uncertainty in the petrophysical properties calculation and it is the basic for the FDP.
**NMR processing (CMR, MRIL, MR Explorer)**

NMR is a tool that reacts with fluid in the pore space regardless of the rock type. NMR is used to calculate the different types of porosity (total, effective, secondary), and permeability with good core calibration, as well as being used for fluid identification (saturation calculation).

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**Cased Hole evaluation (Production logging, RST, RPM and basic TD)**

After a while of production from the well, the amount of hydrocarbon starts to change, special tools can be run to estimate the amount of saturation reduction over time and use that to understand and optimize the way to produce the well and the reservoir. The production logging used to evaluate the different fluid flow (gas, oil, and water) under reservoir conditions and the contribution of different parts of the well to the total flow, as well as being used to optimize and maximize well production, for example, by zonal shut off or create more flow interval (adding perforation).

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**Rock mechanics properties evaluation**

Rock mechanics is the study used to use open hole data to estimate the compressibility magnitude of the rock and magnitude and direction of the minimum and maximum horizontal stress of the reservoir. The rock mechanic will be used to better drill the new wells, (mud type, drilling bit selection) and the effect of these parameters to well component e.g. casing, tubing and well head. This will lead to better optimizing and developing the reservoir field and maximize the hydrocarbon recovery.
**Full Field Modeling**

**Upscaling and Fractured Reservoir Models**

We build static and dynamic fracture models by integrating the results of the well data analysis with reservoir scale information, geophysical derivatives and, if available, outcrop or other analog information (often collected by geologists working in the field). These models provide conceptualisations of the fracture system that are used to constrain reservoir simulations. The adapted Continuous Fracture Modeling approach, also generate the parameters needed by the simulation process and in reserve estimation (fracture spacing, orientation, permeability and porosity etc), and provide recommendations on drilling location and direction.

**Reservoir Property Modeling**

A successful reservoir simulation model relies on the integrity of its underlying static model. All the basic static data has to be processed in readiness for a simulation model, by incorporate all available static data in a 3D geological model where it can be interrogated in many ways (e.g., filtering, visualization, cross-sectioning, etc). A 3D model would therefore be constructed using the available wells and would act as a ‘living’ 3D database to be updated as new information becomes available and can form a basis for rapid sensitivity modeling, facies trend analyses, well planning, volumetrics, upscaling, etc. A fundamental requirement is to understand the 3D spatial relationships of all the reservoir facies and attributes can be modeled.

The static 3D model could be analyzed in terms of connectivity by identifying cell clusters or geobodies with similar facies or properties. The geobodies could be variously defined to locate good oil-filled reservoir volumes, barrier horizons or fault-bounded compartments and to design well planning.
**Project Examples: Water Influx Prediction**

Integration of dynamic data and high resolution borehole images measurements to evaluate the cause of near wellbore water entry points in the carbonate reservoir. The secondary objectives were: 1) To highlight any image log anomalies for detecting water entry points in the future wells, 2) To providing a methodology with fast turn around time so that it can be implemented in future wells completion decisions. A customized workflow was established to achieve the above objectives. Some of the results and implications are highlighted in diagram bellow:

**Results & Implications:**
- Major water entry points in reservoir caused by: presence of open fractures in brittle dense zones, presence of fracture swarms, Presence of fault , presence of high permeability streaks
- A good correlation exists between cumulative and normalized fracture occurrence curve and PLT profile (Track 6 above)
- Majority of the water production originates from a heavily fractured zone (NW-SE and NE-SW trending fracture sets)
- Run Natural Gamma Ray Tool (NGT) to evaluate and detect the source of gamma ray spikes (close to fractured zones), to provide first guide to the nature of filling (uranium vs. clay) in fractured areas
**Project Examples: New Block Assessments**

Block acquisition assessment and evaluating uncertainty analysis from well to seismic scale. A detailed geological, petrophysical, geophysical and reservoir engineering interpretation was conducted to evaluate the hydrocarbon prospectively in immature block. The local knowledge and experience with analogue area was a critical factor for the evaluation due to very limited data availability in the block. The results helped client to estimate hydrocarbon in place and a more realistic bedding strategies by knowing the uncertainty associated with analysis.
Project Examples: Facies & Rock Type Prediction
The study is centered towards better prediction and identifications of flow units/RRT in an attempt to be implemented in other wells in the field and to improve construction of static model. A neural network technique is implemented in the study and integrating core information, geological and petrophysical properties extracted from borehole image (BHI) logs and conventional OH logs were used to achieve the objectives. The ultimate goal for client is to be able to predict consistent and improved (geological and petrophysical) RRT from conventional OH logs. This is to better extend the finding of this study to the remaining wells in the field where majority of data acquired are conventional OH logs with relatively limited number of BHI logs. Several algorithms were building during the project to quantify the reservoir textural and capture actual reservoir properties.
Project Examples: Fracture Modeling
The study objectives is to provide a 3D fracture model over a faulted complex and generate a permeability models to perform reservoir simulation and assess the importance of fracturing on fluid movements in the field. The following data were integrated and ranked (Artificial Intelligence methodology) in terms of its importance and control on fracture distributions. 1) Well data [Image logs, core measurements, production data, well tests], 2) Geomechanical data [Spatial distribution of stress and strain related parameters based on seismic interpretation and geomechanical computation], 3) Geometrical data [Geometry of the reservoir (thickness, dip, curvature, slopes, etc.), 4) Seismic data and 5) static model properties. Unique high resolution seismic attributes derived from post-stack seismic data can be used directly as drivers in fracture modeling along with the generated sub-seismic faults maps. The DFN models constrained to the CFM models show consistent results with the features connectivity analysis around well data (BHI).