

Core Analysis

Item	Geological Study	Unit	Duration (days)	Unit Price (\$US)	Qty	Total Costs (\$US)
1	Macroscopic Core Description		90			
1.1	Lithology type	ft			1500	
1.2	Sedimentary texture (Based on Dunham classification)	ft			1500	
1.3	Grain types (Allochems, Fossils, ...)	ft			1500	
1.4	Preliminary core facies determination	ft			1500	
1.5	Sedimentary structures (bedding, lamination, ...)	ft			1500	
1.6	Fracture type, direction and aperture measurements	ft			1500	
1.7	Diagenesis features (Dissolution, stylolite, cementation, ...)	ft			1500	
1.8	Visual porosity types and measurement	ft			1500	
1.9	Log drawing and core photography	ft			1500	
	<i>Total cost (1)</i>					
2	Petrographical study	sample	60			
2.1	Scanning Electron Microscopy (SEM)	sample			100	
2.2	Grain types (Skeletal, non skeletal, minerals, ...)	sample			700	
2.3	Fossils (macro, micro, Ichnofossils...)	sample			700	
2.4	Facies imaging with digital camera	sample			700	
2.5	Diagenesis processes (Cementation type, Solution, ...)	sample			700	
2.6	Lithologic accessories (pyrite, glauconite, ...)	sample			700	
2.7	Trace fossils types (Bioturbation types and rates)	sample			700	
2.8	Thin-Section Study: Full description, mineralogy, diagenesis and porosity analysis, and identification of pore destroying phases, & including representative colour photographs	sample			700	
2.9	Reservoir quality and hydrocarbon staining	sample			700	

2.10	Defining pore type, pore geometry and pore classification	sample			700		
2.11	Microfacies classification	sample			700		
2.12	Preparation of Sedimentological log and paleolog (range chart)	well			3		
<i>Total cost (2)</i>							
3	Thin Section Preparation			90			
3.1	Thin section preparation from cuttings	sample			1000		
3.2	Thin section preparation from core samples (Alizarin Red-S thin sections and Blue dyed thin sections)	sample			400		
3.3	X-ray Diffraction	sample			200		
3.4	X-ray Fluorescence	sample			200		
<i>Total cost (3)</i>							
4	Regional facies study (Field scale)			45			
4.1	Defining reservoir facies, microfacies and electrofacies (Field scale)	a/data			1		
4.2	Sedimentary basin and environment analysis (Field scale)	a/data			1		
4.3	Petrographical study based on available cuttings (at least 3 wells)	a/data			1		
4.4	Diagenesis modeling and study link to petrography and petrophysical data	a/data			1		
4.5	Extending reservoir facies through the field	a/data			1		
4.6	Sequence stratigraphical study including depositional sequences and systems tracts	a/data			1		
<i>Total cost (4)</i>							
5	Total Project Cost						

Routine core Analysis

Item	Tests Description	Unit	Duration (days)	Qt.	Unit Price (US\$)	Total Price (US\$)	
1	Core Gamma Ray (Total and Spectral)	ft	30	3500			
2	Depth Match of wire line logs with core gamma	Well	10	3			
3	CT Scanning of Whole Core (one scout and 11 cross section per foot)	ft	10	50			
4	CT Scanning (1 scout and 8-10 cross section per plug)	Plug	10	50			
5	Digital white and UV photography	Plug	20	1500			
6	Drilling of core plug samples	Plug	20	1500			
7	Core Slabbing and Trimming	ft	20	1500			
8	Sample Cleaning (Soxhlet)	Plug	50	1500			
9	Fluid Saturation by Dean & Stark	Plug	30	60			
10	Helium Porosity, Air Permeability and Grain Density	Plug	90	1500			
11	Porosity and gas permeability at overburden stress at 5 pressures (Pore volume compressibility included)	Plug	50	50			
12	Slabbing and Trimming (Whole Core)	ft	5	10			
13	Dean & Stark (Whole Core)	Whole Core	5	10			
14	Helium Porosity (Whole Core)	Whole Core	5	10			
15	Vertical/Horizontal Permeability (Whole Core)	Whole Core	5	10			
16	Total Project Price						

Special Core Analysis

No.	Descriptions	Samples	Duration (days)	Unit Price (US\$)	Qty	Total Price (US\$)
1	SCAL Sample Selection	-----		-----		
1.1	Review of data including, CT scans, RCAL and Geology Reports	foot / sample	30		1	
1.2	X-ray defraction (XRD) preparation and analysis	sample	10		50	
1.3	Scanning Electron Microscopy (SEM) preparation and analysis	sample	10		50	
2	Reservoir Properties	-----		-----		
2.1	USS Relative permeability at Ambient temp. and confining stress using lab oil and clean core	-----		-----		
2.1.1	Water- Oil (Unsteady State)	Sample	100		50	
2.1.2	Gas-Oil (Unsteady State)	Sample	100		50	
2.1.3	Numerical simulation of the tests and validity studies	sample	60		100	
2.2	SS Relative Permeability at Res. condition using restored cores and reservoir fluids	-----		-----		
2.2.1	Water-Oil	sample	100		10	
2.2.2	Gas-Oil	sample	100		10	
2.2.3	Numerical simulation of the tests and validity studies	sample	10		20	
2.3	Interfacial Tension by Pendant Drop Method	-----		-----		
2.3.1	Oil-Water IFT at room condition	Sample	5		5	
2.3.2	Gas-Oil IFT at room condition	Sample	5		5	
2.3.3	Reservoir Oil and Water IFT at reservoir condition	Sample	5		5	
2.3.4	Reservoir Gas and Oil IFT at reservoir condition	Sample	5		5	
2.4	Capillary Pressure by porous plate at reservoir condition using reservoir fluids	-----		-----		
2.4.1	Primary drainage Pc including RI and saturation exponent "n"	Sample	100		10	
2.4.2	Spontaneous imbibition Pc including RI and saturation exponent "n"	Sample	100		10	
2.4.3	Determination of Wettability by Amott or USBM after items 2.4.1 & 2.4.2	Sample	2		10	

2.4.4	Simultaneous determination of Kr and Pc curves from porous plate data	sample	20		10	
2.5	Capillary Pressure by Centrifuge method at Ambient temp. using lab oil and clean core	-----		-----		
2.5.1	Drainage-Imbibition Cycles in Gas-Oil System	Sample	60		50	
2.5.2	Drainage-Imbibition Cycles in Water-Oil System	Sample	60		50	
3	Electrical Properties	-----		-----		
3.1	Formation resistivity factor including "a" and "m", sample saturation at Reservoir condition	Sample	60		50	
3.2	Cation Exchange Capacity	Sample	10		10	
4	Mercury Injection	-----		-----		
4.1	MICP Sample Preparation	Sample	30		50	
4.2	High (0-60,000 psi) Mercury injection and pore throth distribution	Sample	150		50	
5	Mechanical properties	-----		-----		
5.1	Unconfined Compressive Strength	Sample	150		50	
5.2	Unconfined Compressive Strength plus P & S Acoustic Wave Velocity	Sample	150		50	
5.3	P & S Wave Determination at Elevated Pore Pressure and with Fluid Substitution	Sample	150		50	
5.4	Uniaxial Pore Volume Compressibility Measurement with Vertical Permeability	Sample	150		50	
5.5	Uniaxial Pore Volume Compressibility Measurement with Sonic Velocity	Sample	150		50	
6	Total Project Cost					