

GIS GEOPACKAGES

1. Framework GeoPackage
2. Digital Atlas GeoPackage
3. Enhanced Atlas GeoPackage

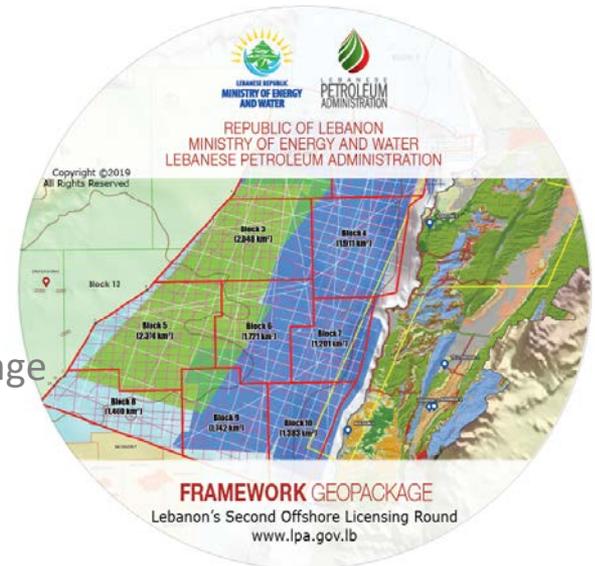


Geopackages

The Ministry of Energy and Water (MEW) and the Lebanese Petroleum Administration (LPA) are pleased to provide details of the different GeoPackages.

Three separate GeoPackages are available for the First License Round as follows;

1. “Framework GeoPackage” - free to download or via CD
2. “Digital Atlas GeoPackage” – provided as part of the bid package
3. “Enhanced Atlas GeoPackage” – provided for additional fee



The GeoPackages are provided in ArcGIS format and can be utilised using free ArcReader software (supplied) or a full Arc (ESRI) license.



Framework GIS - GeoPackage

Framework GIS – GeoPackage

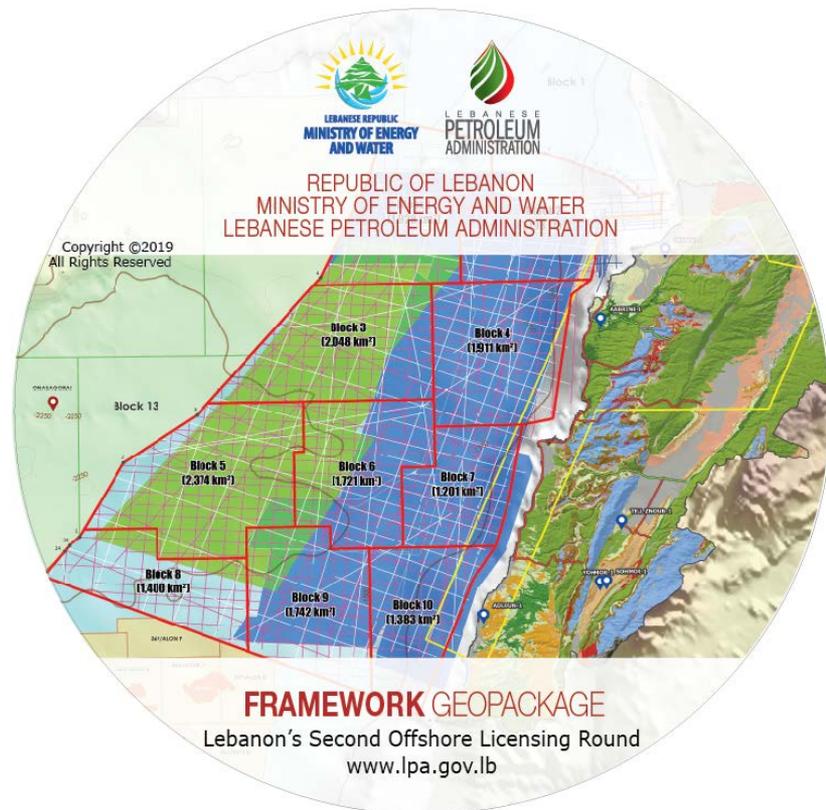


The Framework GIS Geopackage is available under a public license at no cost. The data is described in the Tender Protocol, Schedule A of Annex 2 and can be accessed via the LPA website at www.lpa.gov.lb/geopackages.php

Why are we providing a framework?

Some of the reasons include:

- Correct Project System
- Correct Boundaries
- Correct Well Locations
- Updated Stratigraphy
- Updated Cross Sections
- Updated Geology maps
- Example Seismic Lines
- Input to EIA
- Blocks in the 2nd License Round



Framework GeoPackage Contents

Lebanon 2nd Offshore Licensing Round - Framework GIS

- Version January 2019
- Blocks
 - Blocks Points
 - Blocks
 - Blocks Labels
 - Blocks
 -
 - Open blocks as per LPA's recommendation
 - Awarded_Blocks
- Geophysical Surveys
 - 2D Seismic Surveys
 - Spectrum 2D Onshore 2014 (Hyperlinked)
 - PGS 2D 2011
 - PGS 2D 2008
 - LEB 2D 2002
 - Spectrum 2D 2002
 - Spectrum 2D 2000
 - Geco - Prakla 2D 1993
 - Spectrum 2D 1975
 - 3D Seismic Surveys
 - PGS PSDM 3D MegaSurvey
 - PGS 3D 2006
 - PGS 3D 2007
 - PGS 3D 2011
 - PGS 3D 2012
 - PGS 3D 2012-Extension
 - PGS 3D 2013
 - PGS 3D 2013- 2007 Extension
 - Spectrum 3D 2012
 - Spectrum 3D 2013
 - Airborne Surveys
 - Geophysical Airborne Survey 2014
- Wells
- Geology
- International Boundaries

High quality digital information relating to:

- Seismic Data Coverage
- Geology
- Wells
- Int. Boundaries
- Culture Data
- Seismic Interpretation (Water Depth)
- Topography & Bathymetry



Framework GIS

Schedule A of Annex 3

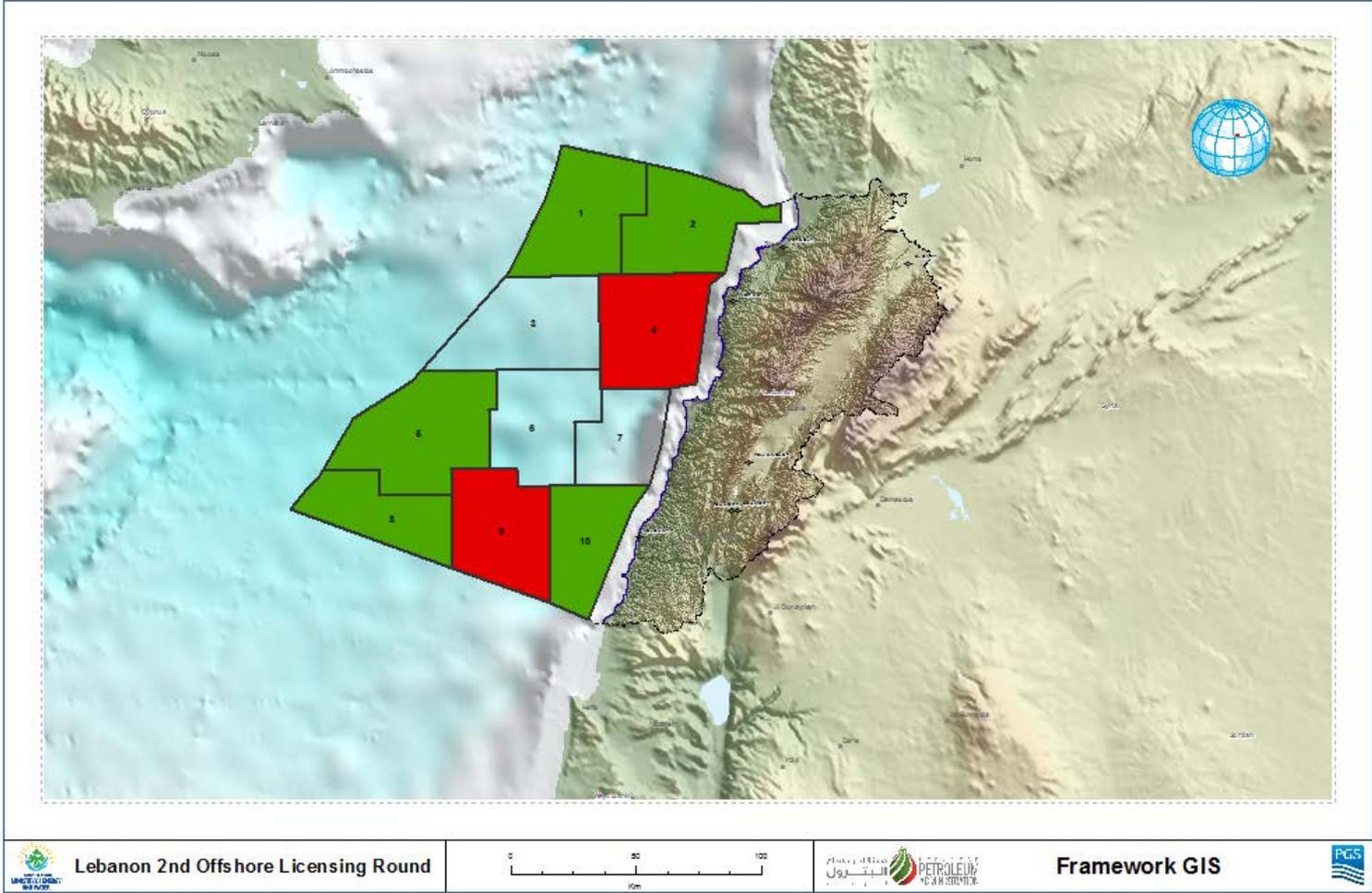
SCHEDULE A OF ANNEX 3 – FRAMEWORK GIS PROJECT

REF	DESCRIPTION	FORMAT
1	Culture	
1.1	Lebanon Shaded Area	ESRI-Digital
1.2	Coastline	ESRI-Digital
1.3	Countries Names	ESRI-Digital
1.4	Cities	ESRI-Digital
1.5	Rivers	ESRI-Digital
1.6	Lakes	ESRI-Digital
2	International Boundaries	
2.1	Lebanon Onshore Boundaries	ESRI-Digital
2.2	Lebanon Offshore Boundaries	ESRI-Digital
2.3	Regional International Boundaries	ESRI-Digital
3	Contract Areas	
3.1	Contract Areas	ESRI-Digital
4	Wells	
4.1	Well Coordinates	ESRI-Digital
4.2	Well Attributes (Formation Tops)	Digital
4.3	Well Summary	Digital
5	Geology (Onshore)	
5.1	Stratigraphic Column	Pdf
5.2	Geological Cross Sections (Hyperlinked)	Pdf
5.3	Stratigraphic Correlation (Hyperlinked)	Pdf
5.4	Faults (200,000 Scale)	ESRI-Digital
5.5	Geology (200,000 Scale)	ESRI-Digital
5.6	Structural Elements (Regional)	ESRI-Digital
6	Geophysical Surveys	
6.1	2D Seismic Surveys	ESRI-Digital
6.2	3D Seismic Surveys	ESRI-Digital
6.3	Airborne Survey	ESRI-Digital
7	Seismic Interpretation	
7.1	Regional Seismic Profiles (Hyperlinked)	Pdf

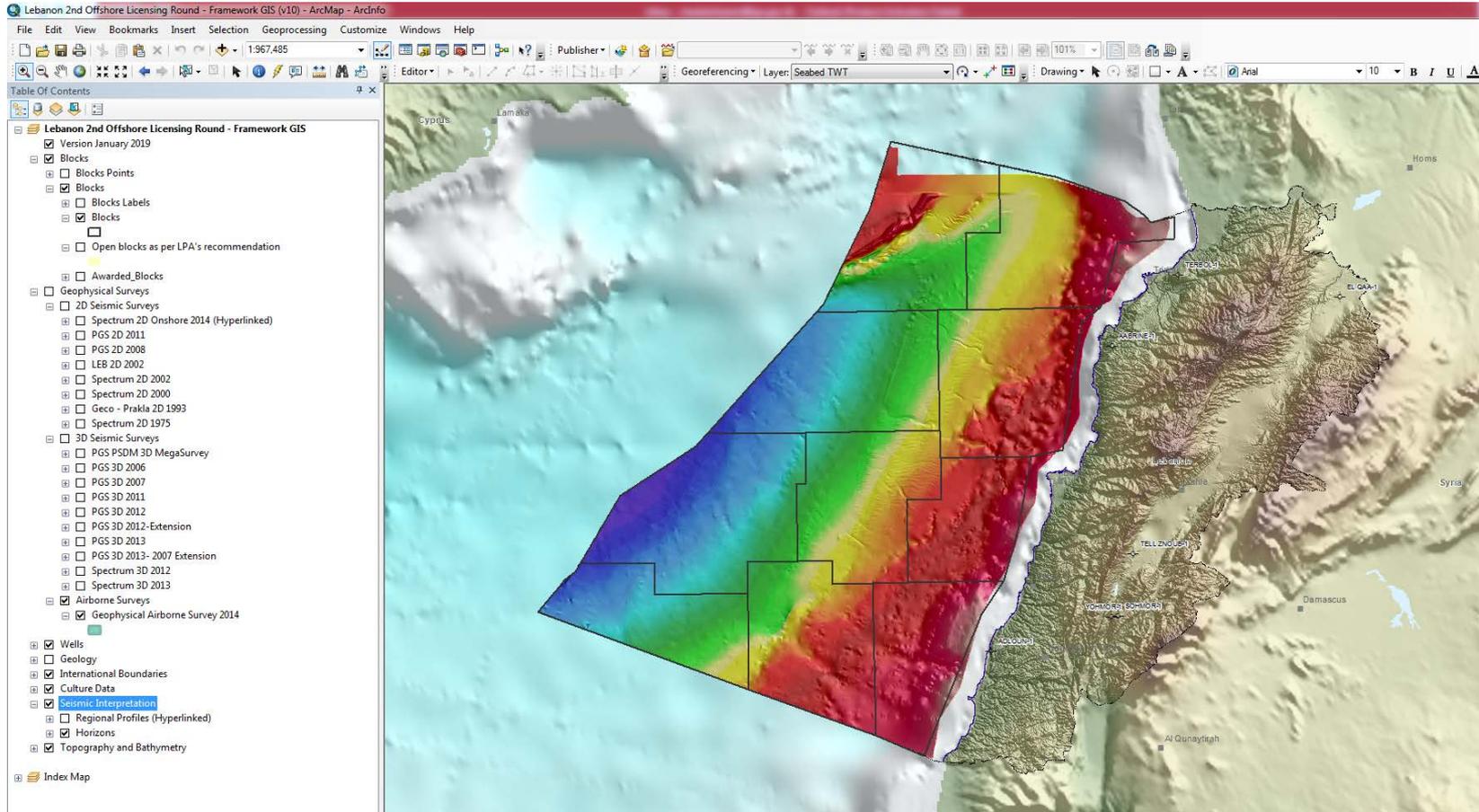
	7.2	Seabed Horizon (Two Way Time)	ESRI-Digital
	7.3	Seabed Horizon (Depth)	ESRI-Digital
8	Topography and Bathymetry		
	8.1	Regional Bathymetry 250m	ESRI-Digital
	8.2	Gebco - Topography	ESRI-Digital
	8.3	Gebco-Global Bathymetry	ESRI-Digital
	8.4	Lebanon Hillshade 50m	
9	Presentations & Reports		
	9.1	Geopackage Overview	ppt - pdf

The data described in Schedule A of Annex 2 can be accessed free of charge at <http://www.lpa.gov.lb/geopackages.php>

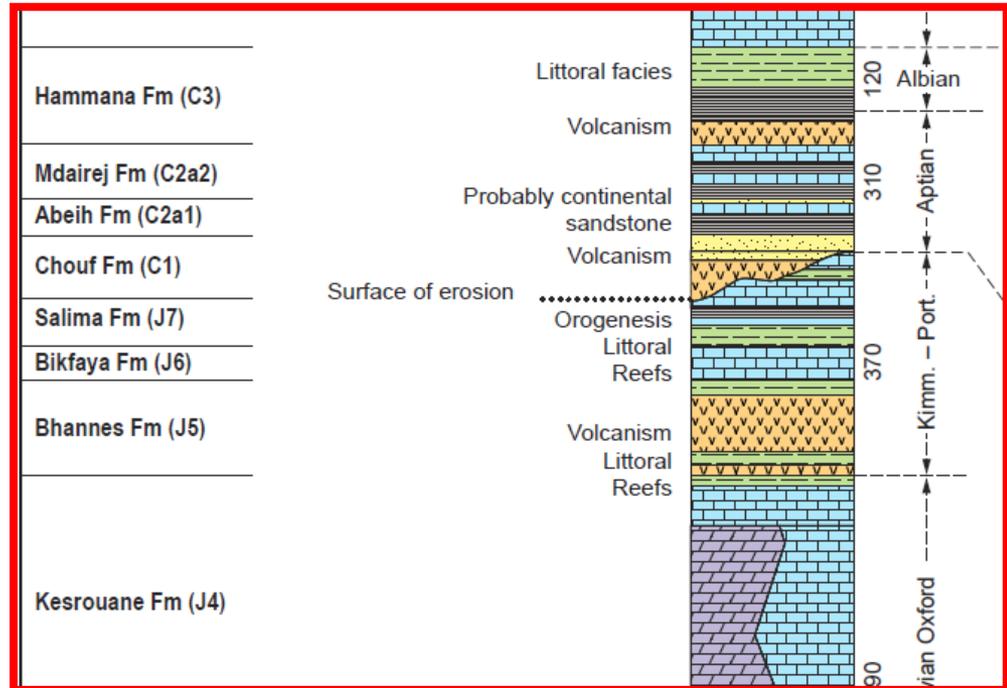
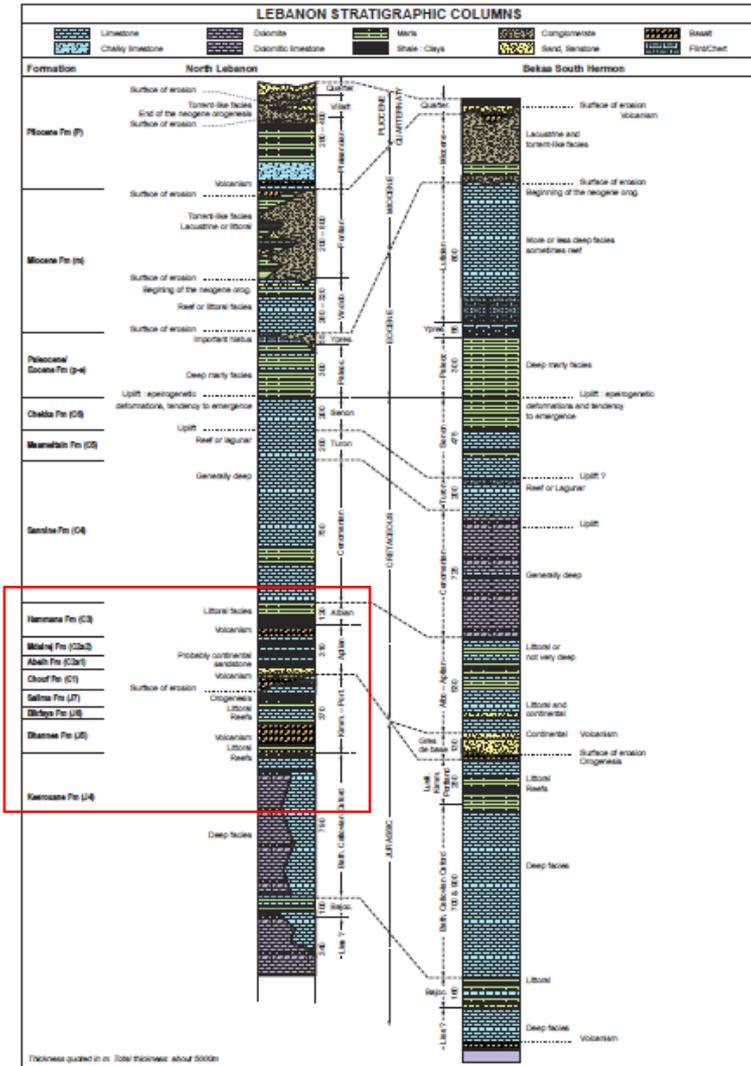
Framework GeoPackage – Blocks on Offer



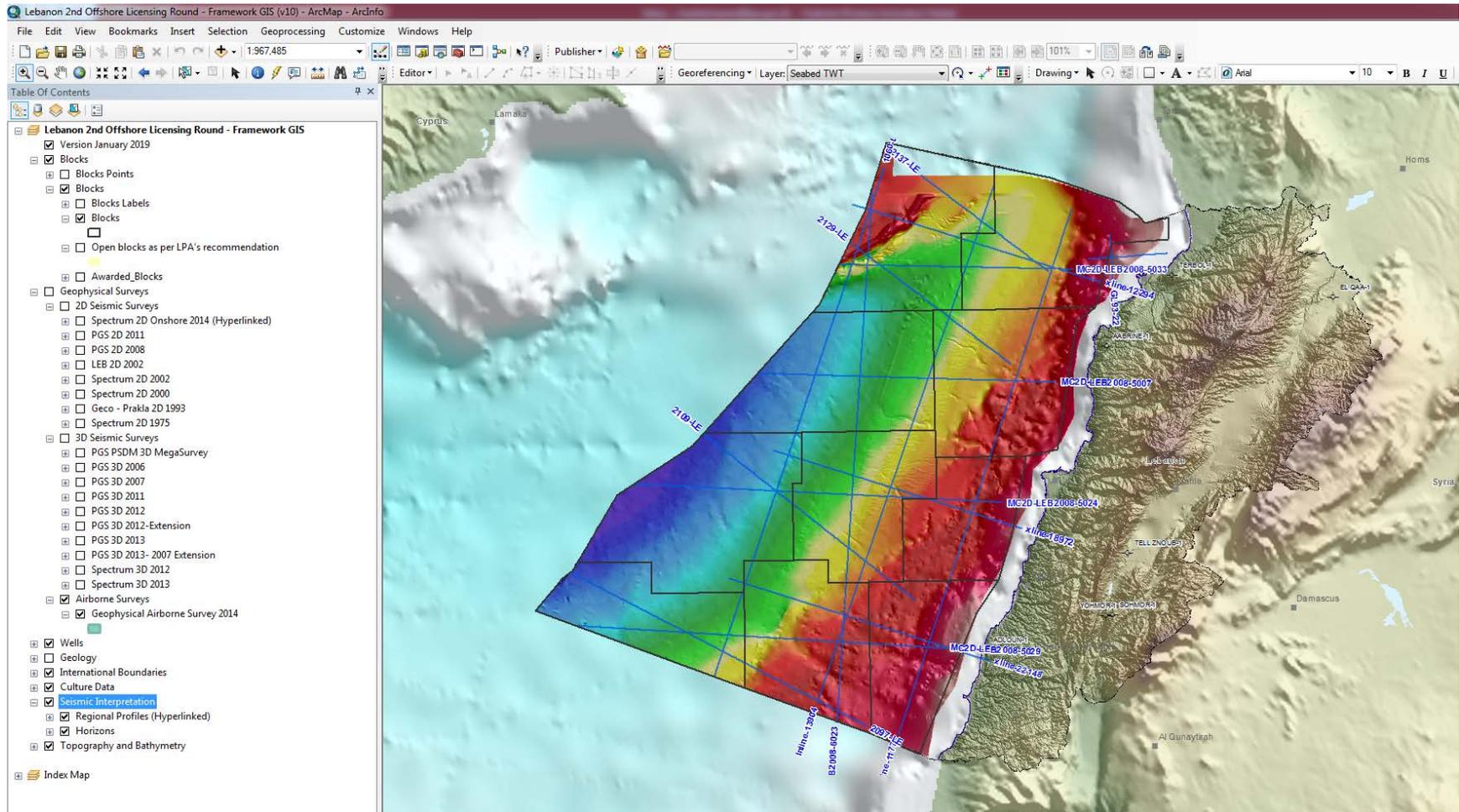
Example Interpretation



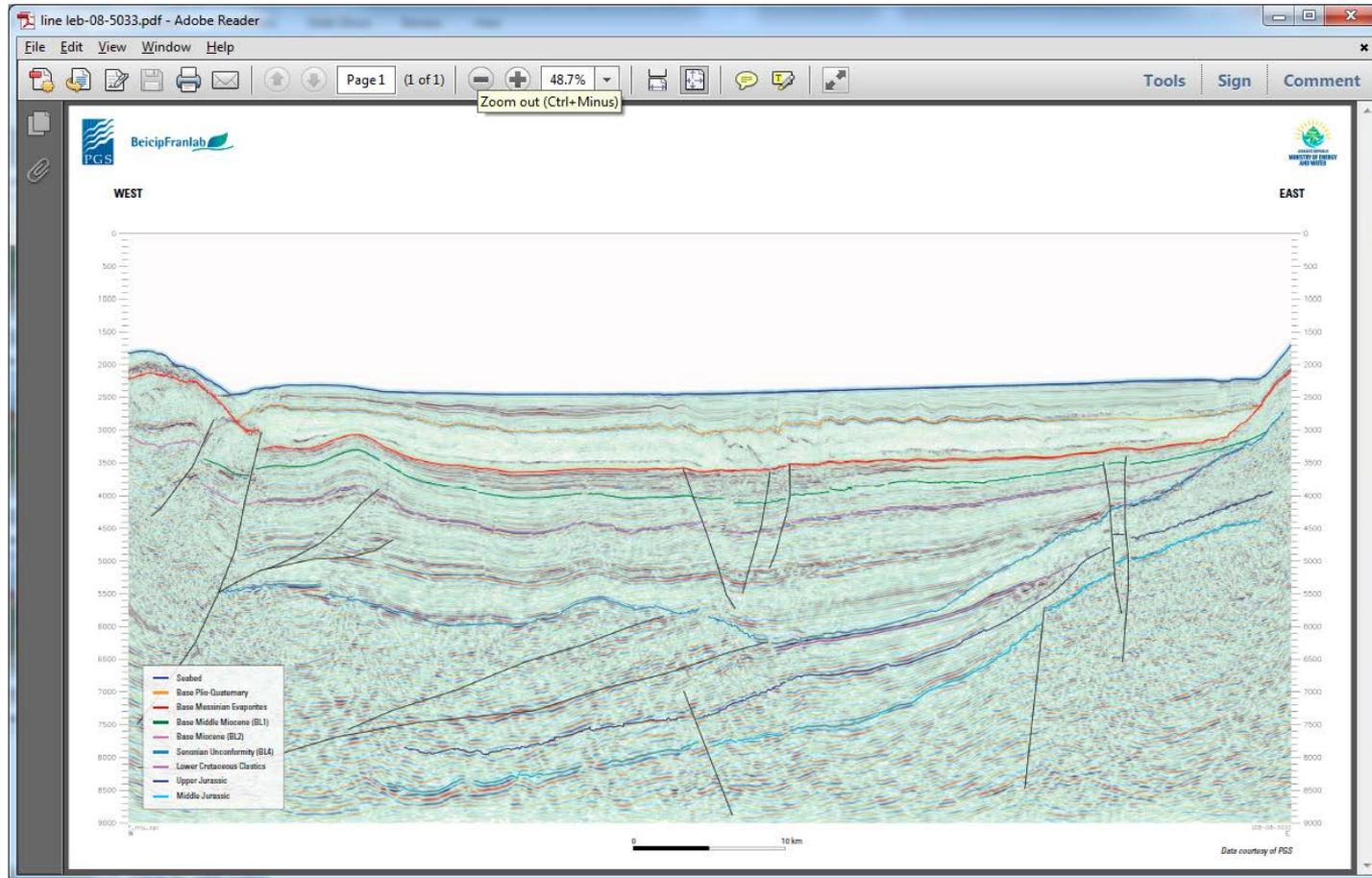
Example - Stratigraphy



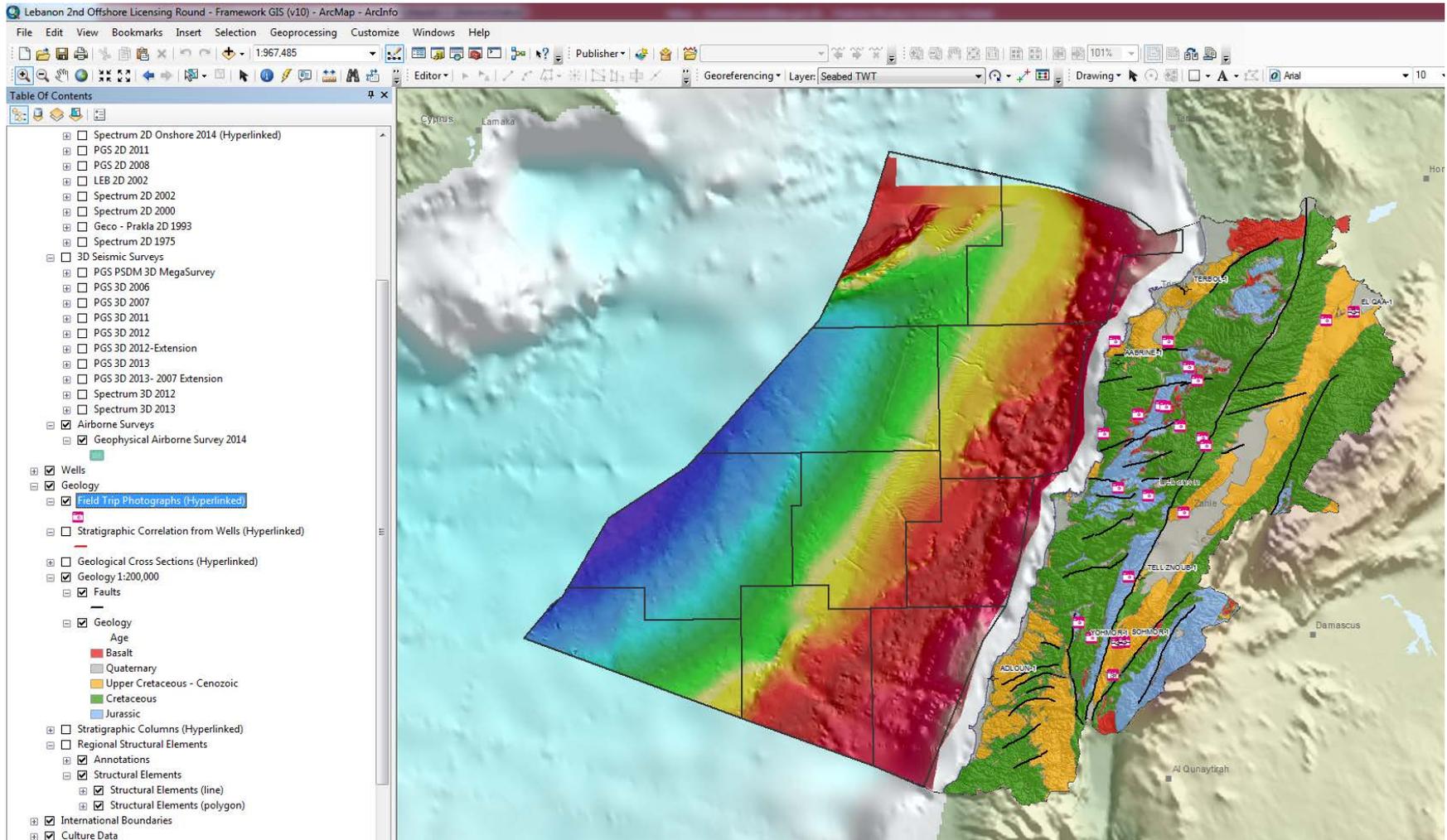
Hyperlinks to regional seismic examples



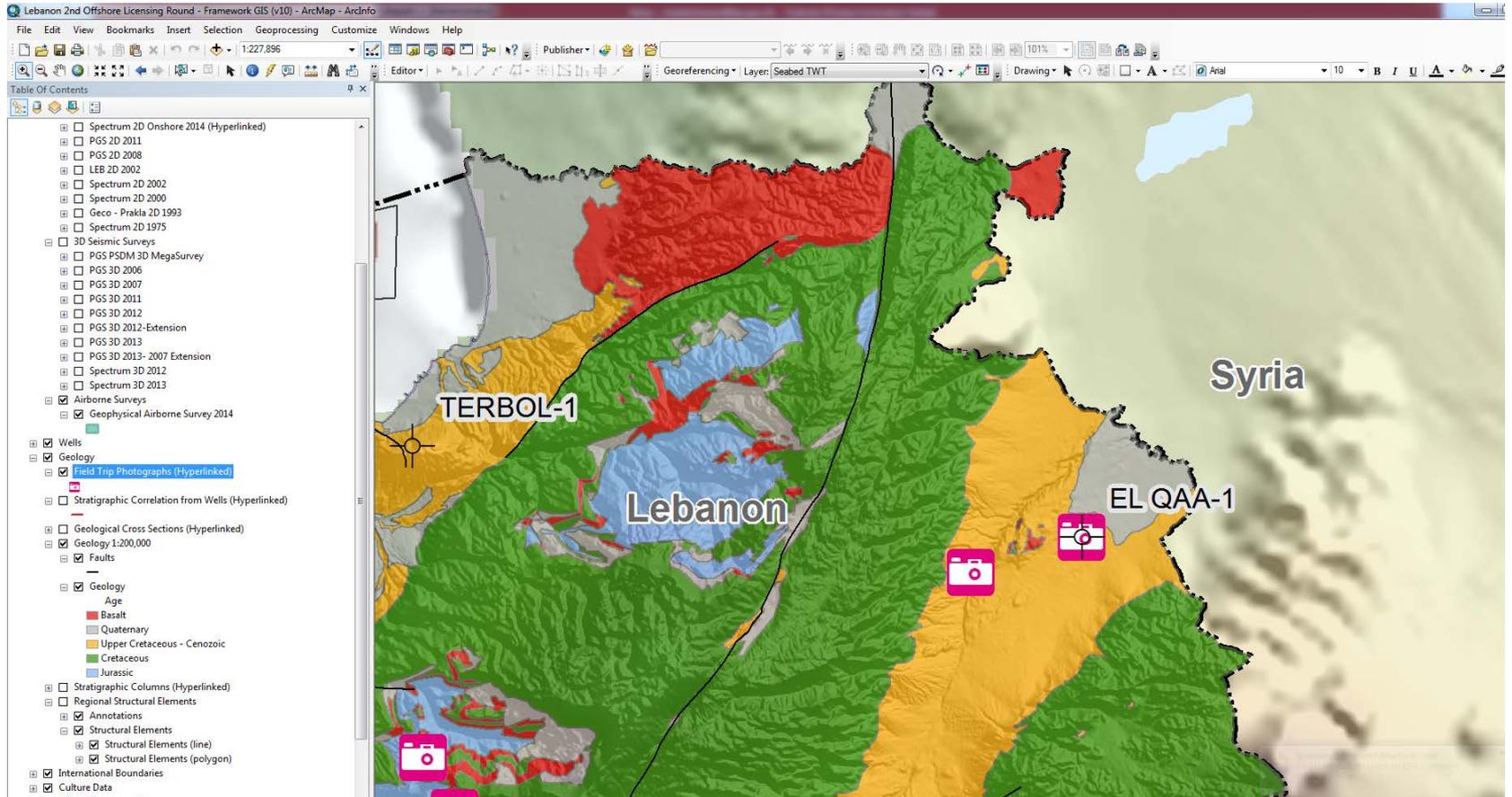
Example seismic line within the GeoPackage



Fieldwork Samples – Overview Map



Fieldwork Samples – Location



Fieldwork Samples – Location Photograph

El Qaa-1.pdf - Adobe Reader

File Edit View Window Help

1 / 1 54.1%

Tools Sign Comment

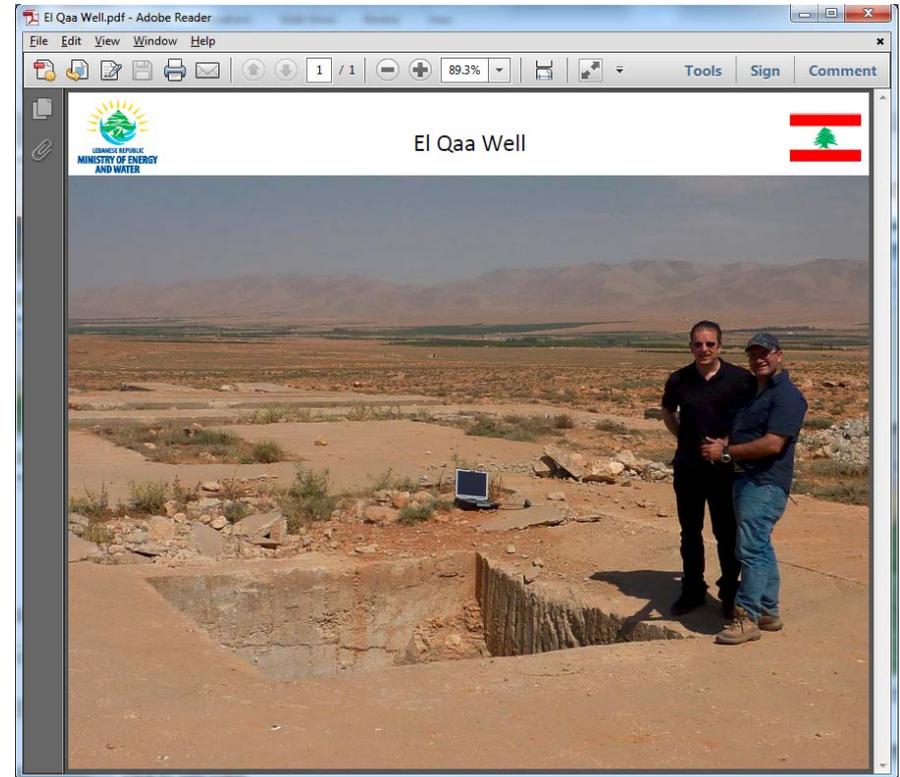
LEBANON WELL SUMMARY SHEET

OPERATOR: Iraq Petroleum Company SPUD DATE: July 1960 WELL: El Qaa-1
 BASIN: Levant COMPLETED: November 1960
 LOCATION: Onshore Lebanon TYPE: Exploration Wildcat
 CO-ORDINATES: 34°22.4407N STATUS: Plugged & Abandoned
 36°27.925E SHOWS: None
 ELEVATION: KB - N/A GL: 649m SCALE: 1:20,000

GEN. ZONE	PERM. UNIT	AGE	Litho-stratigraphy	Thickness (m)	Depth (m)	Lithology	Shows/Markers/Remarks	
								CRETACEOUS
MESOZOIC	TURONIAN	SENOVIAN	CHEKKA FM.	380	+474 +409		Lost circulation	
			MAAMELTAIN FM.	370	+48 0		Sea level Lost circulation	
		SANNINE	SANNINE FM.	820	-321		Lost circulation	
			SANNINE - HAMMANA FMS.	226	-1141			
			MOAIREJ - ABEIH FMS.	276	-1068		Jezzine Cliff Let.	
		JURASSIC	?	SALIMA FM.	>287	-1841		Unconformity or fault
						-1800		TD Upper Jurassic

Note: Well Co-ordinates verified 16 May 2012

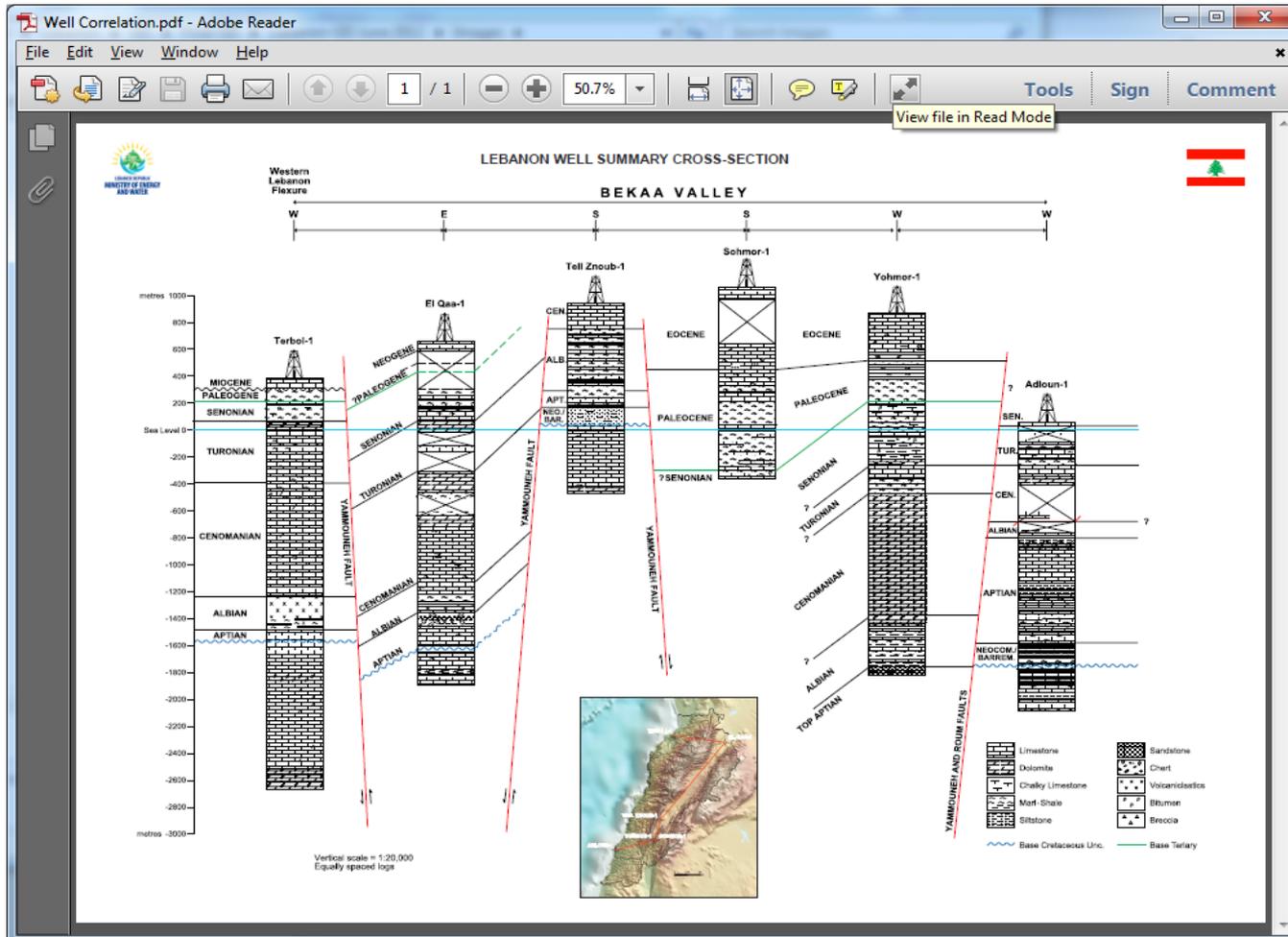
Adapted from Beydloun, 1977



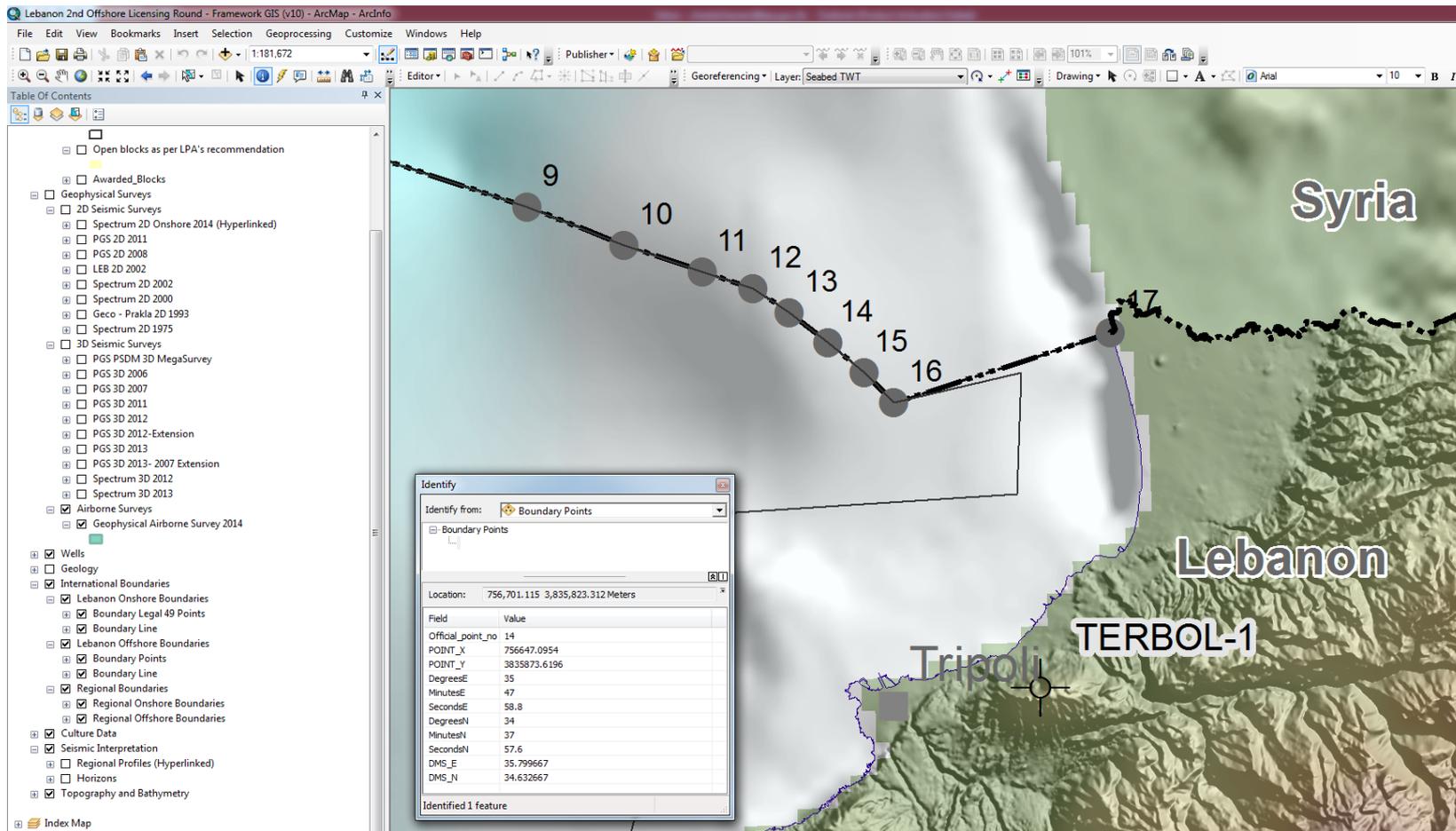
Fieldwork Samples – Outcrop Photograph



Regional Well Correlation



Lebanon International Boundaries





Digital Atlas - GeoPackage

Digital Atlas – GeoPackage



The Digital Atlas Geopackage is included as part of the “Bid Package” which is described in the Tender Protocol, Schedule B of Annex 2 and will be provided by the Petroleum Administration upon receipt of the Retrieval Fee.

Digital Atlas GIS

Contents

REF:	DESCRIPTION - UPDATE 12 MAY 2017	FORMAT
1	Culture	
1.1	Lebanon Shaded Area	ESRI-Digital
1.2	Coastline	ESRI-Digital
1.3	Countries Names	ESRI-Digital
1.4	Cities	ESRI-Digital
1.5	Rivers	ESRI-Digital
1.6	Lakes	ESRI-Digital
1.7	Regional Bathymetry 250m	ESRI-Digital
1.8	Topography	ESRI-Digital
1.9	Gebco - Global Bathymetry	ESRI-Digital
2	International Boundaries	
2.1	Lebanon Onshore Boundaries	ESRI-Digital
2.2	Lebanon Offshore Boundaries	ESRI-Digital
2.3	Regional International Boundaries	ESRI-Digital
3	Contract Areas	
3.1	Blocks	ESRI-Digital
3.2	Blocks in 1st Licensing Round	ESRI-Digital
4	Wells	
4.1	Well Coordinates	Digital
4.2	Well Attributes	Digital
4.3	Well Summary Sheet	Digital
5	Geology (Onshore)	
5.1	Stratigraphic Column	pdf
5.2	Geological Cross Sections (Hyperlinked)	pdf
5.3	Stratigraphic Correlation (Hyperlinked)	pdf
5.4	Faults (200,000 Scale)	ESRI-Digital
5.5	Geology (200,000 Scale)	ESRI-Digital
5.6	Structural Elements (Regional)	ESRI-Digital
6	Geophysical Surveys	
6.1	2D Seismic Surveys	ESRI-Digital
6.2	3D Seismic Surveys	ESRI-Digital
6.3	Airborne Surveys	ESRI-Digital
6.4	Seismic Regional Examples	pdf
6.5	Seismic 1st License Round Block Examples	pdf

7	Seismic Interpretation	
7.1	Regional Seismic Profiles (Hyperlinked)	pdf
7.2	Seabed Horizon (Two Way Time)	ESRI-Digital
7.3	Seabed Horizon (Depth)	ESRI-Digital
7.4	Plio Quaternary TWT	ESRI-Digital
7.5	Plio Quaternary Depth	ESRI-Digital
7.6	Base Messinian TWT	ESRI-Digital
7.7	Base Messinian Depth	ESRI-Digital
7.8	Base Middle Miocene TWT	ESRI-Digital
7.9	Base Middle Miocene Depth	ESRI-Digital
7.10	Base Miocene TWT	ESRI-Digital
7.11	Base Miocene Depth	ESRI-Digital
7.12	Senonian Unconformity TWT	ESRI-Digital
7.13	Senonian Unconformity Depth	ESRI-Digital
7.14	Upper Jurassic TWT	ESRI-Digital
7.15	Upper Jurassic Depth	ESRI-Digital
8	Topography and Bathymetry	
8.1	Bathymetry Contours 250m	ESRI-Digital
8.2	Gebco Bathymetry	ESRI-Digital
8.3	Gebco Topography	ESRI-Digital
8.4	Lebanon Hillshade 50m	ESRI-Digital
8.5	GEBCO Hillshade	ESRI-Digital
9	Presentations & Report / Folders	
9.1	GeoPackage Overview Presentation	ppt - pdf
10	Gravity & Magnetic Data	
10.1	Bouguer Gravity (Global)	ESRI-Digital
10.2	Free Air Gravity (Global)	ESRI-Digital
10.3	World Digital Magnetic Anomaly Map (WDMAM)	ESRI-Digital

Additional information when compared to Framework Digital Atlas shown in yellow

Digital Atlas GeoPackage

This version will be included with the bidding documents (bid package) for the first offshore Licensing Round and provided only to prequalified companies on receipt of the Retrieval Fee.

It contains:

- Application / bidding documents
- Details of the blocks areas on offer
- 10 km Grids of 6 key horizons (from MEW interpretation of 2D seismic)
- representative seismic images through the blocks on offer
- all the information contained within the Framework GeoPackage
- The EIA (Environmental Impact Assessment)
 - Plus Reports (7 volumes pdf)

Digital Atlas GeoPackage

Additional LPA/Beicip Interpretation (shown in bold)

 Regional Seismic Profiles	pdf	(Hyperlinked)
 Block Seismic Profiles	pdf	(Hyperlinked)
 Seabed Horizon	TWT	100m Grid
 Seabed Horizon	Depth	100m Grid
 Plio Quaternary	TWT	10 km Grid
 Plio Quaternary	Depth	10 km Grid
 Base Messinian	TWT	10 km Grid
 Base Messinian	Depth	10 km Grid
 Base Miocene	TWT	10 km Grid
 Base Miocene	Depth	10 km Grid
 Senonian Unconformity	TWT	10 km Grid
 Senonian Unconformity	Depth	10 km Grid
 Upper Jurassic	TWT	10 km Grid
 Upper Jurassic	Depth	10 km Grid



Enhanced Digital Atlas - GeoPackage

Enhanced Digital Atlas - GeoPackage



The Data under the Enhanced Digital Atlas geopackage will be provided to Individual Companies by the Petroleum Administration upon receipt of the Retrieval Fee. It contains enhanced geo-scientific information including Grids of key horizons, Digital Well data, Field Sample analysis, Basin Modelling results, Gravity & Magnetics grids.

Enhanced Digital Atlas GeoPackage

The Enhanced Digital Atlas version is distributed through the LPA.

It contains:

- all the information contained within the Framework GeoPackage.
- all the information contained within the Digital Atlas GeoPackage.

In addition:

- 1 km Grids of 6 key horizons (from interpretation of 2D seismic)
- Well Folder
 - Digital Well Data (Composite, Log Curve, Reference data)
- Field Trip Folder
 - Location / Photographs / Description / Sample Analysis
- Gravity & Magnetics Grids
- Enhance Geo-scientific information
 - Geology / Digital Terrain
- ECL Interpretation Report 2004
 - Comprehensive report including Regional Geology, Interpretation 2D seismic, prospectivity

Companies are invited to view in the Dataroom

Enhanced Digital Atlas GeoPackage

Additional LPA/Beicip Interpretation (shown in bold)

 Regional Seismic Profiles	pdf	(Hyperlinked)
 Block Seismic Profiles	pdf	(Hyperlinked)
 Seabed Horizon	TWT	100m Grid
 Seabed Horizon	Depth	100m Grid
 Plio Quaternary	TWT	1 km Grid
 Plio Quaternary	Depth	1 km Grid
 Base Messinian	TWT	1 km Grid
 Base Messinian	Depth	1 km Grid
 Base Miocene	TWT	1 km Grid
 Base Miocene	Depth	1 km Grid
 Senonian Unconformity	TWT	1 km Grid
 Senonian Unconformity	Depth	1 km Grid
 Upper Jurassic	TWT	1 km Grid
 Upper Jurassic	Depth	1 km Grid

Enhanced Digital Atlas GIS

Contents

REF:	DESCRIPTION - UPDATE 12 MAY 2017	FORMAT
1	Culture	
1.1	Lebanon Shaded Area	ESRI-Digital
1.2	Coastline	ESRI-Digital
1.3	Countries Names	ESRI-Digital
1.4	Cities	ESRI-Digital
1.5	Rivers	ESRI-Digital
1.6	Lakes	ESRI-Digital
1.7	Regional Bathymetry 250m	ESRI-Digital
1.8	Topography	ESRI-Digital
1.9	Gebco - Global Bathymetry	ESRI-Digital
2	International Boundaries	
2.1	Lebanon Onshore Boundaries	ESRI-Digital
2.2	Lebanon Offshore Boundaries	ESRI-Digital
2.3	Regional International Boundaries	ESRI-Digital
3	Contract Areas	
3.1	Blocks	ESRI-Digital
3.2	Blocks in 1st Licensing Round	ESRI-Digital
4	Wells	
4.1	Well Summary Sheet	Digital
4.2	Composite Log	Digital
4.3	Digital Log Curve Data	Digital
4.4	Well CAD	Digital
4.5	Reference Data	Digital
5	Geology (Onshore)	
5.1	Stratigraphic Column	pdf
5.2	Geological Cross Sections (Hyperlinked)	pdf
5.3	Stratigraphic Correlation (Hyperlinked)	pdf
5.4	Faults (200,000 Scale)	ESRI-Digital
5.5	Geology (200,000 Scale)	ESRI-Digital
5.6	Structural Elements (Regional)	ESRI-Digital
5.7	Faults (50,000 Scale)	ESRI-Digital
5.8	Geology (50,000 Scale)	ESRI-Digital
5.9	Field Work Folder	Digital-pdf
6	Geophysical Surveys	
6.1	2D Seismic Surveys	ESRI-Digital
6.2	3D Seismic Surveys	ESRI-Digital
6.3	Airborne Surveys	ESRI-Digital
6.4	Seismic Regional Examples	pdf
6.5	Seismic 1st License Round Block Examples	pdf

7	Seismic Interpretation		
7.1	Regional Seismic Profiles (Hyperlinked)		pdf
7.2	Seabed Horizon (Two Way Time)		ESRI-Digital
7.3	Seabed Horizon (Depth)		ESRI-Digital
7.4	Plio Quaternary TWT		ESRI-Digital
7.5	Plio Quaternary Depth		ESRI-Digital
7.6	Base Messinian TWT		ESRI-Digital
7.7	Base Messinian Depth		ESRI-Digital
7.8	Base Middle Miocene TWT		ESRI-Digital
7.9	Base Middle Miocene Depth		ESRI-Digital
7.10	Base Miocene TWT		ESRI-Digital
7.11	Base Miocene Depth		ESRI-Digital
7.12	Senonian Unconformity TWT		ESRI-Digital
7.13	Senonian Unconformity Depth		ESRI-Digital
7.14	Upper Jurassic TWT		ESRI-Digital
7.15	Upper Jurassic Depth		ESRI-Digital
8	Topography and Bathymetry		
8.1	Bathymetry Contours 250m		ESRI-Digital
8.2	Gebco Bathymetry		ESRI-Digital
8.3	Gebco Topography		ESRI-Digital
8.4	Lebanon Hillshade 50m		ESRI-Digital
8.5	GEBCO Hillshade		ESRI-Digital
8.6	Scanned Topography Maps		ESRI-Digital
8.7	Lebanon Topography Contours 10m		ESRI-Digital

9	Presentations & Report / Folders		
10.1	GeoPackage Overview Presentation		ppt - pdf
10.2	Field Work Folder (includes material not in GIS format)		ppt - pdf
10	Gravity & Magnetic Data		
10.1	Bouguer Gravity (Global)		ESRI-Digital
10.2	Free Air Gravity (Global)		ESRI-Digital
10.3	World Digital Magnetic Anomaly Map (WDMAM)		ESRI-Digital
10.4	MC Data - ECL Report - as per below		ESRI-Digital
10.4.1	Bouguer Gravity (1.80g-cm3) with 50km Residual filter applied		ESRI-Digital
10.4.2	Bouguer Gravity (1.80g-cm3)		ESRI-Digital
10.4.3	Bouguer Gravity (2.00g-cm3) with 50km Residual filter applied		ESRI-Digital
10.4.4	Bouguer Gravity (2.00g-cm3)		ESRI-Digital
10.4.5	Bouguer Gravity (2.20g-cm3) with 50km Residual filter applied		ESRI-Digital
10.4.6	Bouguer Gravity (2.20g-cm3)		ESRI-Digital
10.4.7	Free Air Gravity		ESRI-Digital
10.4.8	Magnetic Anomaly with 60km Residual filter applied		ESRI-Digital
10.4.9	Magnetic Anomaly RTP		ESRI-Digital
10.4.10	Magnetic Anomaly		ESRI-Digital
10.4.11	Lebanon Gravity Onshore		ESRI-Digital
11	Environmental		
11.1	Environmental GIS Database and Report - 7 Volumes		
12	Reference		
12.1	Lebanon general reference listing		Word - pdf
12.2	Reference SMU PhD 1970		pdf
12.3	ECL Interpretation Report 2004 (Comprehensive)		pdf

Additional information supplied as part of the Enhanced Digital Atlas shown in yellow.
Note this also includes the 2004 ECL Report

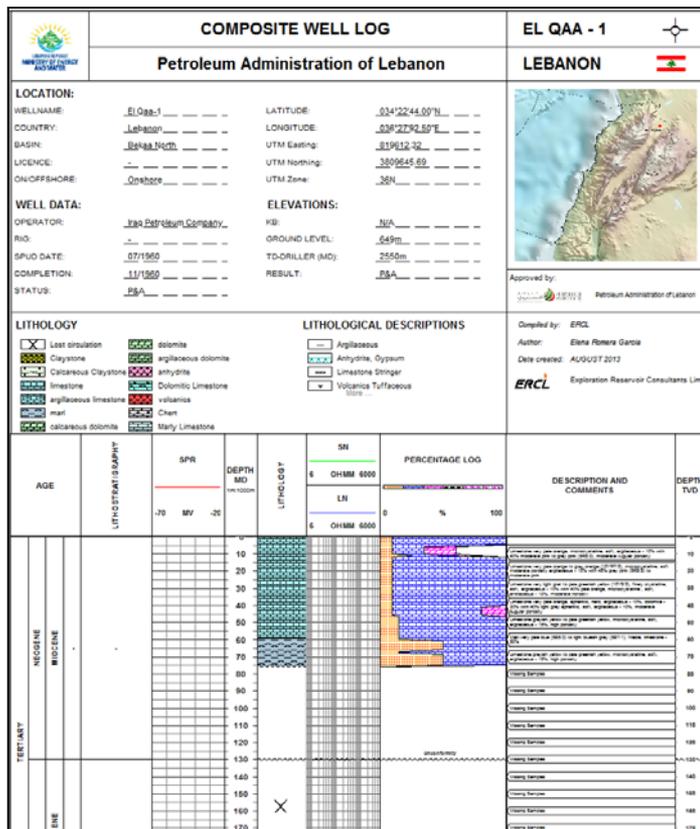
Well Information

- 🌿 Updated Well Summary Sheets
- 🌿 Updated Well Composites
- 🌿 Digital Well Curves / Lithology Information for 4 wells
 - EI QAA-1
 - Tell ZNOUB-1
 - YOHMOR-1
 - TERBOL-1 (limited)
- 🌿 Historic Information for Onshore Wells
 - Reference Documents

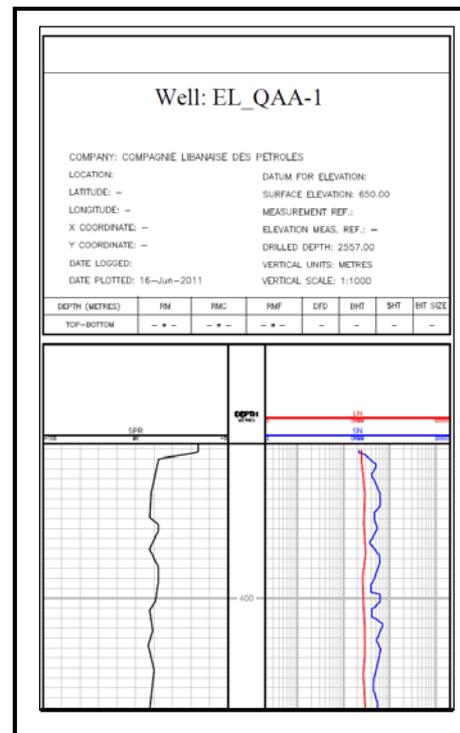
- 📁 1. Well summary sheet
- 📁 2. Composite Log
- 📁 3. Digital Log Curve
- 📁 4. Well CAD
- 📁 5. Reference Data

EL QAA-1

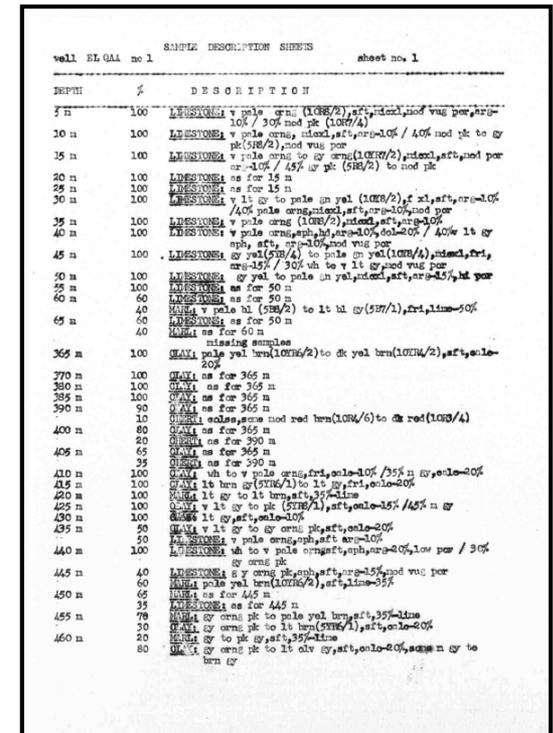
- Log digital curves digitized by Ovation Data from pdf
- 3 log curves: SP, SN and LN.
- Lithological descriptions from the Sample description sheets included in "Subsurface geology and well correlation in North and Central Lebanon".



Finalised Composite Well Log



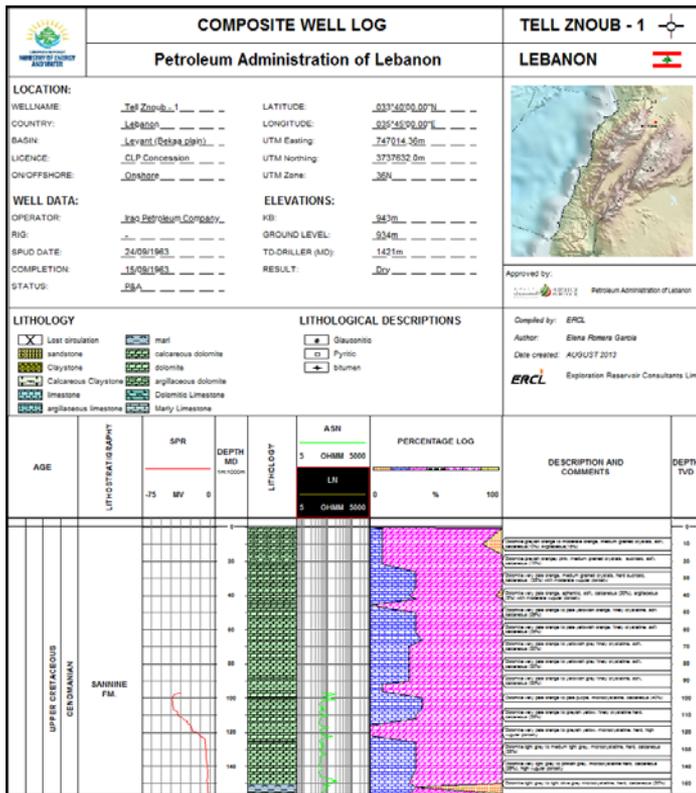
Log curves in pdf for EL Qaa-1



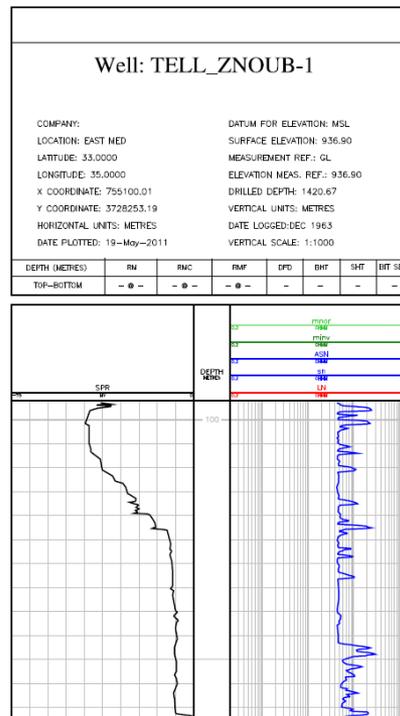
Sample description sheets for EL Qaa-1

TELL ZNOUB-1

- 3 log curves: SP, SN and LN.
- Lithological descriptions from the Sample description sheets included in "Subsurface geology and well correlation in North and Central Lebanon".



Finalised Composite Well Log



Log curves in pdf for Tell ZnouB-1

SAMPLE DESCRIPTION SHEETS		
DEPTH	%	DESCRIPTION
920 m.	100	LIMESTONE: as 936 40% yelsh gy arg-25%
942 m.	100	LIMESTONE: gysh org, sft, hky frac f xl/ some calc. & 40% yelsh gy to gysh org, sft, micxl, arg frac. arg 10%
946 m.	10	MARL: gysh org pk (5YR7/2) to brn gy (5YR4/1), sft, arg 40% line
950 m.	90	LIMESTONE: yelsh gy, sft, f xl even frac arg-10%
952 m.	10	MARL: as for 946m.
954 m.	10	LIMESTONE: as for 950m.
956 m.	10	MARL: as for 946m.
958 m.	10	LIMESTONE: as for 950m.
960 m.	10	MARL: mod brn (5YR3/4), sft, 40% line.
962 m.	70	LIMESTONE: as 950/12% pale brn, sft, micxl even frac arg-10% In thin sect. text is f xl.
966 m.	50	MARL: as for 960
970 m.	80	LIMESTONE: wh to yelsh gy, sft, micxl, arg-10%
972 m.	20	MARL: as for 960
974 m.	80	LIMESTONE: as 966/30% lt brn to gysh org pk (5YR7/2). micxl, arg-20%
976 m.	20	MARL: mod brn (5YR3/4), sft, 40% line.
978 m.	100	LIMESTONE: gysh org, sft, micxl, arg-10%/25% lt brn to gysh org pk arg-20%
982 m.	100	LIMESTONE: as for 976m.
984 m.	100	LIMESTONE: lt brn to gysh org, pk sft, arg-20%/30% gysh org, arg-10%
986 m.	20	MARL: as for 960m.
988 m.	80	LIMESTONE: as 960/30% lt brn to gysh org pk arg-20%
990 m.	20	MARL: as for 960m.
992 m.	80	LIMESTONE: as for 990m.
994 m.	10	MARL: as for 960m.
996 m.	80	LIMESTONE: as for 990m.
998 m.	10	MARL: as for 960m.
1000 m.	70	POOLITE: lt brn (5YR6/4) to pale brn, sft. In thin sect. text is f xl. In thin sect. text is f xl. In thin sect. text is f xl.
1002 m.	30	LIMESTONE: as for 990m. In thin sect. text is f xl. In thin sect. text is f xl. In thin sect. text is f xl.
1004 m.	90	LIMESTONE: lt brn to gysh org, sft, micxl, arg-10%. In thin sect. text is f xl. In thin sect. text is f xl. In thin sect. text is f xl.
1006 m.	10	DOLOMITE: as for 1000m.
1008 m.	90	LIMESTONE: as for 1002m.
1010 m.	10	DOLOMITE: as for 1000m.
1012 m.	90	LIMESTONE: as for 1002m.
1014 m.	10	DOLOMITE: as for 1000m.
1016 m.	90	LIMESTONE: as for 1002m.
1018 m.	25	DOLOMITE: lt brn (5YR6/4) to pale brn, sft, micxl, arg-10%
1020 m.	60	LIMESTONE: gysh org brn to yelsh brn to hd, sft, micxl, arg-20%/25% of plsh gy arg-10%
1022 m.	100	LIMESTONE: gysh org hd, micxl, arg-10%
1024 m.	100	LIMESTONE: oliv gy (5YR4/1) sft, hd, micxl, arg-10%
1026 m.	100	LIMESTONE: lt brn (5YR6/4), hd, micxl, arg-10%
1028 m.	100	LIMESTONE: as for 1190m.

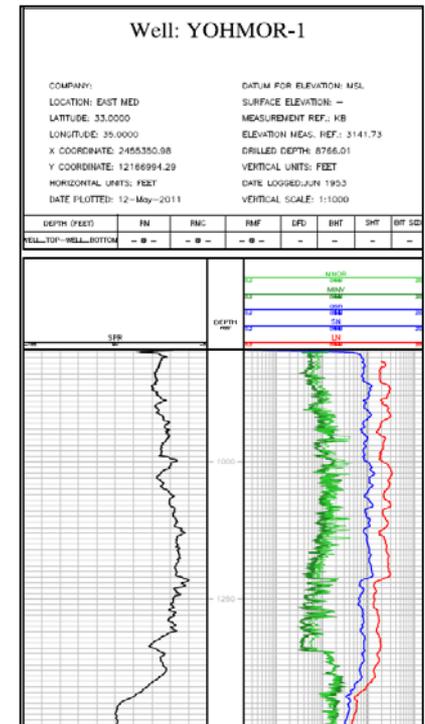
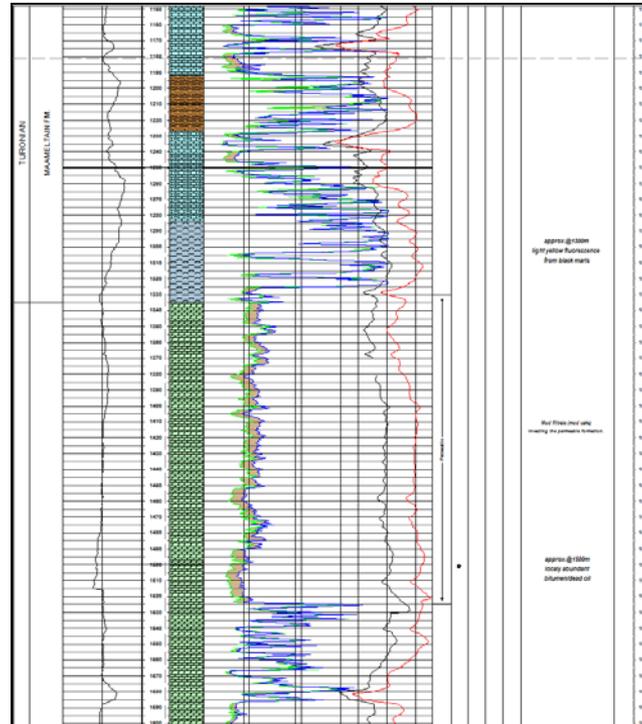
Sample description sheets Tell ZnouB-1

YOHMOR-1

- 1 log curves: SP, SN, LN, MINV, MNOR.
- No sample description sheets included in “Subsurface geology and well correlation in North and Central Lebanon”.
- Not enough log curves and wireline info to conduct a petrophysical analysis.

COMPOSITE WELL LOG		YOHMOR - 1
 Petroleum Administration of Lebanon		LEBANON 
LOCATION: WELLNAME: <u>Yohmor-1</u> LATITUDE: <u>03°12'25.00"N</u> COUNTRY: <u>Lebanon</u> LONGITUDE: <u>035°40'20.00"E</u> BASIN: <u>Levant (Beqaa South)</u> UTM Easting: <u>560835.96</u> LICENCE: UTM Northing: <u>3947802.22</u> ON/OFFSHORE: <u>Onshore</u> UTM Zone: <u>36N</u>		
WELL DATA: OPERATOR: <u>Jraq Petroleum Company</u> KB: <u>958</u> RIG: GROUND LEVEL: <u>955m</u> SPUD DATE: <u>16/02/1953</u> TD-DRILLER (MD): <u>2672m</u> COMPLETION: <u>28/06/1953</u> STATUS: <u>P&A</u> RESULT: <u>Gas shows</u>		
LITHOLOGY 		HC SHOWS <input checked="" type="checkbox"/> Gas <input type="checkbox"/> Oil shows
Compiled by: ERCL Author: Elena Romero Garcia Date created: JULY 2012 		
DEPTH (m) 0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000 2100 2200 2300 2400 2500 2600 2700 2800 2900 3000 3100 3200 3300 3400 3500 3600 3700 3800 3900 4000 4100 4200 4300 4400 4500 4600 4700 4800 4900 5000 5100 5200 5300 5400 5500 5600 5700 5800 5900 6000 6100 6200 6300 6400 6500 6600 6700 6800 6900 7000 7100 7200 7300 7400 7500 7600 7700 7800 7900 8000 8100 8200 8300 8400 8500 8600 8700 8800 8900 9000 9100 9200 9300 9400 9500 9600 9700 9800 9900 10000	LOG CURVES SP SN LN MINV MNOR	CORE AND TESTS TEST NO. DATE TEST TYPE TEST RESULTS

Finalised Composite Well Log



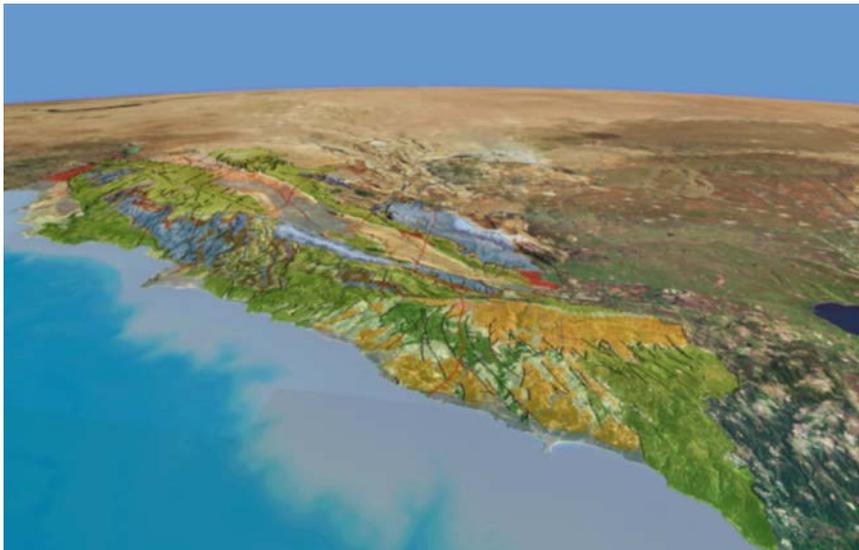
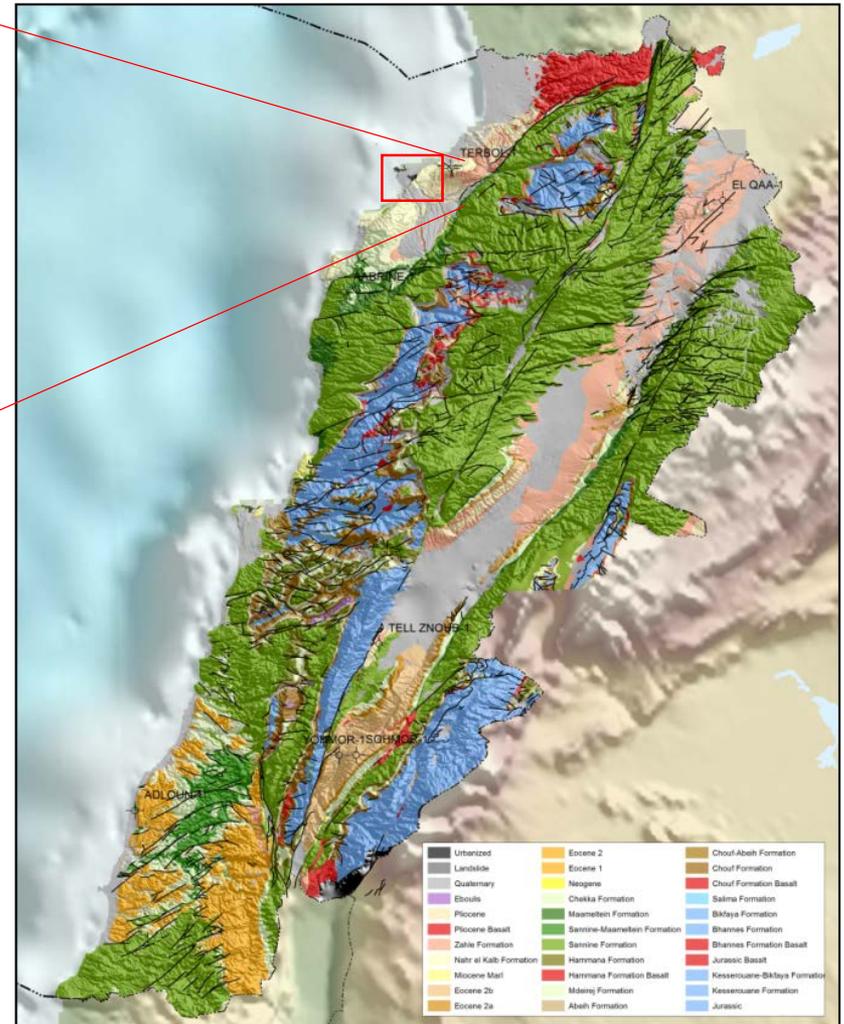
Log curves in pdf for Yohmor-1

TERBOL-1

- No Digital log curves available
- Sample description sheets included in “Subsurface geology and well correlation in North and Central Lebanon”.
- Not enough log curves and wireline info to conduct a petrophysical analysis.
- Not enough information to insert into a Composite Log.

SAMPLE DESCRIPTION SHEETS		
well TERBOL No. 1	sheet No. 18	
DEPTH	%	DESCRIPTION
5870-75 ft	100	MARL: pale yelsh gn (10GY7/2) to mod yelsh gn (10GY6/4) sft lime-55%/ 40% as 5850 ft
5873 ft	100	MARL: pksh gy (5YR8/1) to lt brnsh gy (5YR6/1) sft 65%-lime
5875 ft	100	MARL: pale yelsh gn (10GY7/2) gysh gn (10GY5/2), sft, lime-60%
5877 ft	100	MARL: as 5873 ft
5879 ft	100	MARL: lt brnsh gy (5YR6/1) sft, 65%-lime
5880-85 ft	100	MARL: pale yelsh gn (10GY7/2) to mod yelsh gn (10GY6/4) sft lime-55%/ 40% as 5850 ft
5873-81 ft	100	MARL: lt brnsh gy (5YR6/1) sft lime-65%
5881 ft	100	MARL: as 5879 ft
5890-95 ft	90	LIMESTONE: yelsh gy (5Y8/1), sft, f xl, arg-20%
5900-05 ft	10	MARL: as 5879 ft
5910-15 ft	90	LIMESTONE: as 5890 ft
5910-15 ft	10	MARL: as 5879 ft
5910-15 ft	40	LIMESTONE: wh to yelsh gy, sft, f xl, arg-25%
5920-25 ft	100	MARL: pale gn (10G6/2) to gysh gn (5G5/2) sft lt brn & mod red
5920-25 ft	100	MARL: as 5910 ft
5930-35 ft	100	MARL: as 5910 ft
5940-45 ft	100	LIMESTONE: yelsh gy (5Y8/1), m gr xl, arg-25%
5950-55 ft	100	LIMESTONE: lt gy to yelsh gy sft f xl arg-25%
5960-65 ft	100	LIMESTONE: as 5950/ some as 5940 ft
5970-75 ft	100	LIMESTONE: as above
5980-85 ft	50	LIMESTONE: as above
5987-99 ft	100	MARL: as 5910/ some red (5R5/4) sft, 40%-lime LIMESTONE: pale gnsh yel (10Y8/2) to lt gnsh gy (5GY6/1) sft micxl arg-25%
5990-95 ft	100	LIMESTONE: as 5987 ft
6000-05 ft	100	LIMESTONE: pale gnsh yel (10Y8/12) to lt gnsh gy (5GY6/1) sft micxl arg-25%
6010-15 ft	100	LIMESTONE: lt gnsh (5GY6/1) to yelsh gy (5Y8/1) sft micxl arg-25%
6020-25 ft	100	MARL: mod red (5R5/4) sft, sec calc glauc lime-40%/ 40% dk yelsh orgn (10YR6/6) lime-45%
6030-35 ft	100	MARL: as 6020 ft
6040-45 ft	100	MARL: as 6020 ft
6050-55 ft	100	MARL: mod red (5R5/4), sft, sec calc & glauc lime-40%
6070-75 ft	100	MARL: as 6050 ft
6075-87 ft	100	MARL: dk yelsh orgn (10YR6/6) sft, hky frac, lime-35%
6080-85 ft	100	MARL: mod red (5R5/4) sft, sec calc & glauc lime-40/45% dk yelsh orgn (10YR6/6) lime-45%
6090-95 ft	100	MARL: pale pk (5RP6/2) to gysh orgn pk (5YR7/2), sft, calc- 5%
6100-05 ft	60	MARL: as 6090 ft
6100-05 ft	40	LIMESTONE: yelsh gy to lt gnsh gy (5GY8/1) sft, micxl, arg- 25%
6110-15 ft	60	LIMESTONE: as 6100 ft
6110-15 ft	40	MARL: as 6090 ft
6120-25 ft	100	MARL: pale pk (5RP6/2) to gysh orgn pk (5YR7/2), sft, lime-65%

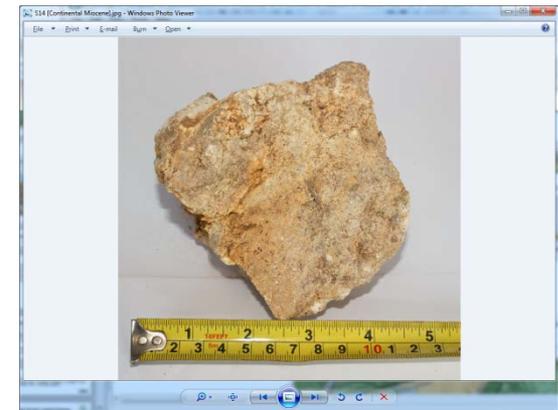
Enhanced – Digital Terrain & Surface Geology



Fieldwork Outcrop Investigation



Fossil Hippopotamus Bone ?



Rock Sample

Fieldwork Sample Analysis

TOC=8-19%; Tmax= 400°C
HI= 410-630 (RockEval)



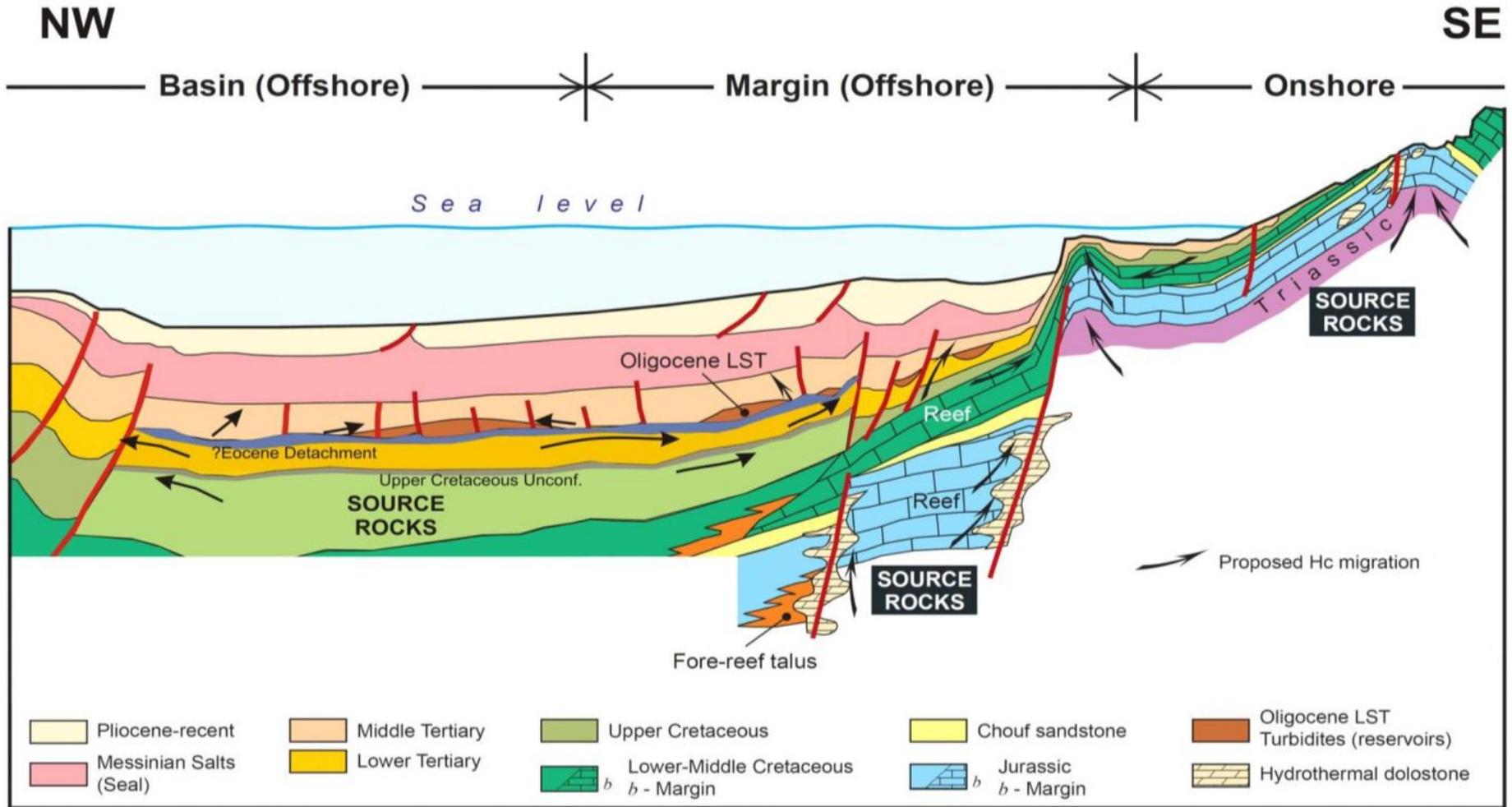
TOC=22%; Tmax= 421°C
HI= 821 (RockEval)



TWO types of asphalts (Al Haddad, 2007):

1. **Asphalt I:** in situ maturation of organic matter, forming immature Kerogen type II, in the rock matrix (i.e. from the Chekka Formation source rocks)
2. **Asphalt II:** is fracture-related and attributed to a deeper, thermogenic source

Conceptual Model – Link Offshore to Onshore



ECL Interpretation Report 2004

EXECUTIVE SUMMARY

The objective of this Study was to evaluate the geology and hydrocarbon prospectivity of the offshore area of the Republic of Lebanon.

In order to achieve this, the following tasks were conducted:

- A synthesis of the regional geology in order to place the offshore Lebanon area into a structural and tectonostratigraphic framework;
- Regional seismic interpretation and mapping of 4744 km of marine 2D seismic data;
- Analysis of the petroleum geology;
- Prospect mapping, deterministic volumetrics and risk assessment.

The offshore Lebanon area has been recognised as a new sedimentary basin, termed the **Lebanese Basin** with a favourable petroleum geology, source rock, reservoir and seal development. This has led to multiple **play development** and the recognition of several viable **petroleum systems** with favourable timing of hydrocarbon charge.

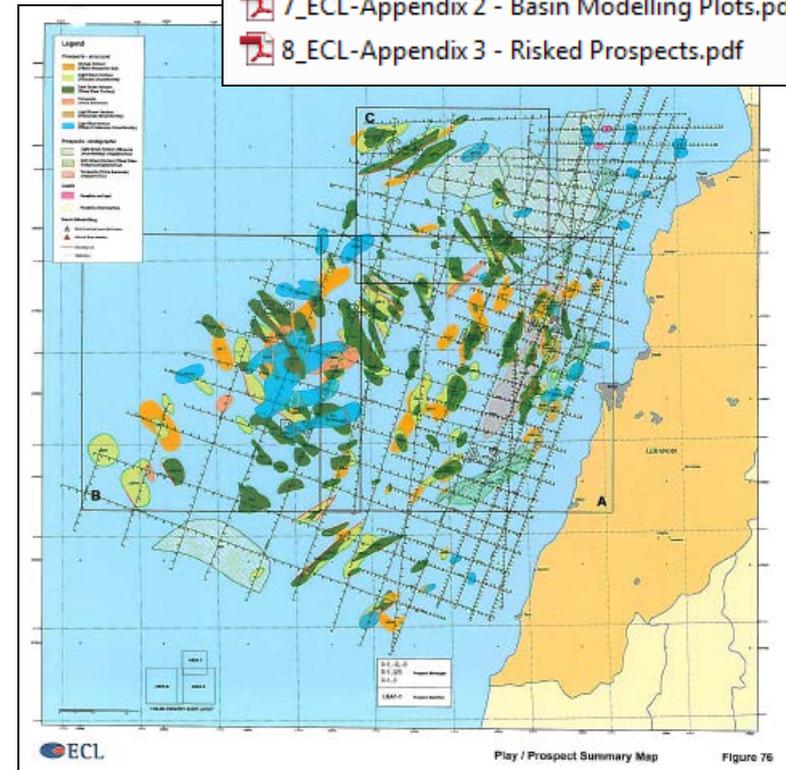
A total of 87 prospects (exceeding 25 km² in areal extent) have been identified.

Probabilistic volumetrics for 12 selected prospects indicate the potential for a total risked, mean STOOIP (Stock Tank Oil Originally In-Place) of 18 billion barrels.

CONCLUDING STATEMENTS

- Offshore Lebanon is petroliferous and highly prospective;
- There is a considerable hydrocarbon resource base;
- Offshore Lebanon will be an attractive area to international petroleum exploration companies.

- 1-ECL_Report_2004.pdf
- 2_ECL-Figures.pdf
- 3_ECL- Map Enclosures-1.pdf
- 4_ECL- Seismic Enclosures 2.pdf
- 6_ECL-Appendix 1 - Velocity Maps.pdf
- 7_ECL-Appendix 2 - Basin Modelling Plots.pdf
- 8_ECL-Appendix 3 - Risked Prospects.pdf





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Thank you

and we look forward to your application in the
Second Lebanese License Round

