

Iraq Oil and Gas Prospects Potential

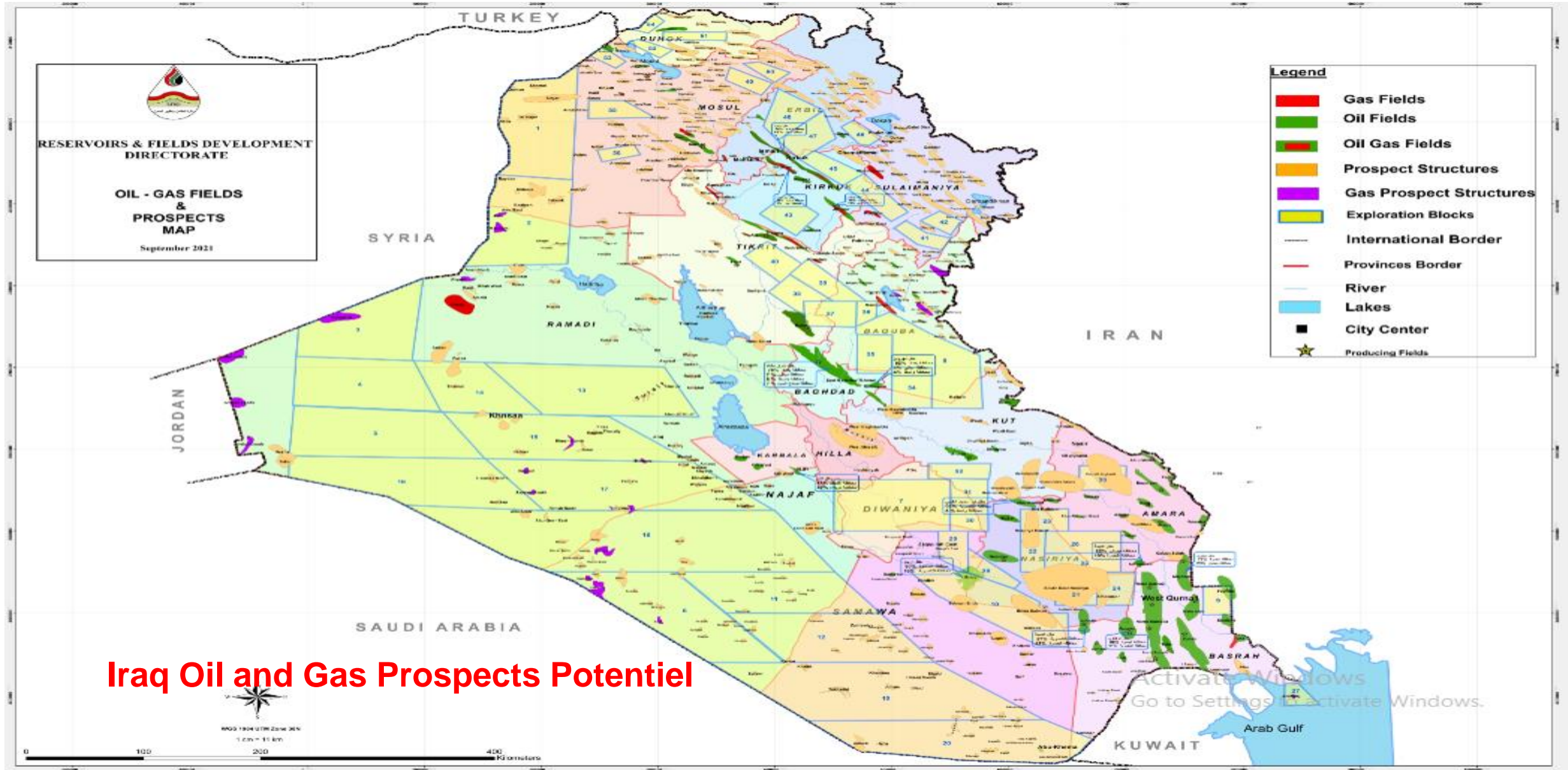
Iraq National Oil Company

Reservoirs and Fields Development Directorate (RFDD)

18.06.2022



Introduction



Introduction

Prospectively of Stratigraphic Traps Potential Resources.

- In 2019 ... OEC studied the existing seismic and detected stratigraphic traps in most parts of Iraq, 38 traps has been highlighted
- In 2020 OEC has approved 22 of these traps and stated that: more exploration efforts are needed to approve the remaining traps
- In 2021 the OEC and RFDD focused on part of stratigraphic traps inside Thi Qar Governate and made an estimation of hydrocarbon resources in these traps
- RFDD and OEC team calculated the volumetrics (preliminary) for the traps (closures) and part of Thi Qar stratigraphic traps

Agenda

- **Introduction**
- **Geology and Geophysics**
- **Reservoir Engineering**
 - **Location of the oil (prospects, leads) traps**
 - **Location of the stratigraphic Prospects**
 - **Analogue fields**
 - **Reservoir properties and fluid parameters**
 - **Hydrocarbon initially in place**
 - **Production profile**
- **Drilling and Completion**
- **Surface Facilities**
- **Cost Estimation**
- **Economics**
- **Portfolio Management and Iraq Proposed Production Strategy**



Geology and Geophysics

➤ Jeribe formation

- composed of light brown-gray limestone and dolomite rock.

➤ Mishrif formation

- The rocks of this reservoir range from mud to reservoir granular rocks formed from large Rudest shells that can be seen with the naked eye.

➤ Mauddud formation

.The formation represented by organic, detrital, sometimes pseudo-oolitic limestone with streaks of shale.

➤ Nahr Umr formation

- This reservoir consists of limestone in the upper part of the reservoir, while in its lower part it consists of sand and shale rocks

➤ Shuaiba formation

- This reservoir consists of medium-hard dolomatic stone with limestone. The sedimentary environment of this formation inner shelf environment.

➤ Zubair formation

- The Zubair reservoir consists of sandy and shale rocks with a layer of limestone on top along the reservoir.

Lithological Column of Southren Part of IRAQ						
PERIOD	EPOCH	Basra	Missan	Nasiriya	Muthana	
TERTIARY	PLIOCENE		Bakhtiary			
	MIOCENE	UPPER	Dibdibba	Upper Fars	Upper Fars	
		MIDDLE	Lower Fars	Lower Fars	Lower Fars	
		LOWER	Ghar	ASMARI Jerebi-Euphrates Upper Kirkuk Lower Kirkuk	Jeribe	
	OLIGOCENE					
	EOCENE		Dammam	Jaddala	Dammam	Dammam
			Rus		Rus	Rus
	PALEOCENE		Umm Er-Radhuma	Aaliji	Umm Er-Radhuma	Umm Er-Radhuma
	CRETACEOUS	UPPER	Tayarat Shiranish	Shiranish	Tayarat Shiranish	Tayarat Shiranish
			Hartha	Hartha	Hartha	Hartha
Sadi			Sadi	Sadi	Safawi	
Tanuma			Tanuma	Tanuma	Sadi	
Khasib			Khasib	Khasib	Tanuma	
Mishrif			Mishrif	Mishrif	Khasib	
Rumaila			Rumaila	Rumaila	Kifl / Mishrif	
Ahmadi			Ahmadi	Ahmadi	Rumaila	
LOWER		Mauddud	Mauddud	Mauddud	Mauddud	
		Nahr Umr	Nahr Umr	Nahr Umr	Nahr Umr	
		Shuaiba	Shuaiba	Shuaiba	Shuaiba	
		Zubair	Zubair	Zubair	Zubair	
		Ratawi	Ratawi	Ratawi	Ratawi	
		Yamama	Yamama	Yamama	Yamama	
Jurassic	UPPER	Gotnia		Gotnia	Gotnia	
		Najmah			Najmah	
		Naokalikan				
	Middle	Sargelu			Sargelu	
	LOWER	Alan			Alan	
		Mus			Mus	
		Adaiyah			Adaiyah	
Butmah				Butmah		
Triassic	Upper	Kurra Chine			Kurra Chine	
	Middle				Geli Khana	
	Lower				Beduh	
Permian					Mirga Mir	
					Chia Zairi	
Total Depth		~ 5400 m	~ 4700 m	~ 3700 m	~ 5500m	

Geology and Geophysics

➤ Yamama formation

- Mainly composed of limestone.
- deposited in alternating oolitic shoal and deep inner shelf environments.

➤ Najma formation

- Consists of this formation of limestone overlapping with clay limestone and is contained on the anhydrite.

➤ Kurra Chine formation

- The formation consists of evaporates with alternation of dolomite and dolomitic limestone which could represent shallow subtidal environment.

➤ Mus formation

- Consists mainly of limestone and dolomite rocks, overlapping with layers of shale

Lithological Column of Southren Part of IRAQ						
PERIOD	EPOCH	Basra	Missan	Nasiriya	Muthana	
TERTIARY	PLIOCENE		Bakhtiary			
	MIOCENE	UPPER	Dibdibba	Upper Fars	Upper Fars	
		MIDDLE	Lower Fars	Lower Fars	Lower Fars	
		LOWER	Ghar	ASMARI Jerebi-Euphrates Upper Kirkuk Lower Kirkuk	Jeribe	
	OLIGOCENE					
	EOCENE	Dammam	Jaddala	Dammam	Dammam	
		Rus		Rus	Rus	
	PALEOCENE	Umm Er-Radhuma	Aaliji	Umm Er-Radhuma	Umm Er-Radhuma	
		Tayarat	Shiranish	Tayarat	Tayarat	
	CRETACEOUS	UPPER	Shiranish	Shiranish	Shiranish	Shiranish
Hartha			Hartha	Hartha	Hartha	
Sadi			Sadi	Sadi	Safawi	
Tanuma			Tanuma	Tanuma	Sadi	
Khasib			Khasib	Khasib	Tanuma	
				Kifi	Khasib	
Mishrif			Mishrif	Mishrif	Kifi / Mishrif	
Rumaila			Rumaila	Rumaila	Rumaila	
Ahmadi			Ahmadi	Ahmadi	Ahmadi	
Mauddud			Mauddud	Mauddud	Mauddud	
LOWER		Nahr Umr	Nahr Umr	Nahr Umr	Nahr Umr	
		Shuaiba	Shuaiba	Shuaiba	Shuaiba	
		Zubair	Zubair	Zubair	Zubair	
		Ratawi	Ratawi	Ratawi	Ratawi	
		Yamama	Yamama	Yamama	Yamama	
		Sulaiy		Sulaiy	Sulaiy	
Jurassic	UPPER	Gotnia		Gotnia	Gotnia	
		Najmah			Najmah	
		Naokalikan				
	Middle	Sargelu			Sargelu	
	LOWER	Alan			Alan	
		Mus			Mus	
Adaiyah				Adaiyah		
	Butmah			Butmah		
Triassic	Upper	Kurra Chine			Kurra Chine	
	Middle				Geli Khana Beduh	
	Lower				Mirga Mir	
Permian					Chia Zairi	

Geology and Geophysics

Gas Target

➤ Lower Fars formation

- This formation is the Miocene in age.
- comprises anhydrite, gypsum and salt, interbedded with limestone and marl.
- Depth approx. 500 m.

➤ Jeribe formation

- This formation is the Lower Miocene in age.
- composed of light brown-gray limestone and dolomite rock.
- Depth approx. 550 m.

➤ Yamama formation

- This formation within Early Cretaceous Sequence.
- Mainly composed of limestone.
- deposited in alternating oolitic shoal and deep inner shelf environments.

Depth approx. 4190 m.



Geology and Geophysics

Gas Target

➤ Khabour formation

- Khabour formation within Paleozoic (Ordovician) Sequence.
- Comprises Mainly of sandstone, and Siltstones, and Shale.
- Depth approx. 3800-4800m.

	Period	Epoch/Age	Formations	Mega-sequences	Tectonic events				
CENOZOIC	QUAT.	HOLOCENE	Recent		Zagros orogeny and Neogene foreland basin development				
		PLEISTOCENE							
	NEOGENE	MIOCENE	PLIOCENE	Bal-Hasan		AP 11			
			L	Mukdadiya Injana					
			M	Fatha					
	E	Dhiban	Jeribe						
	PALEOGENE	OLIGOCENE		Kirkuk Group		AP 10			
			L	Jaddala					
		EOCENE	M	Pila Spi/ Avanah					
			E	Aaliji					
PALEOCENE			Khurmali Sinjar						
MESOZOIC	CRETACEOUS	L	MAASTRICHTIAN	AP 9					
			Shiranish		Tanjero				
		E	BARREMIAN		AP 8				
		HAUT-VALLAN	Garagu						
		BERRIASIAN	Sarmord						
	APTIAN-ALBIAN	Qamchuqa							
	CEN.-LR. TUR.	Dokan							
	JURASSIC	L	KIMMERIDGIAN	Chia Gara	AP 7				
				Gotnia		Barsarin			
				Najmah		Naokelekan			
M		BAJOCIAN-BATH	Sargelu	AP 6					
			TOARCIAN			Alan	Mus	Adaiyah	Sehkanliyan
			SINEMURIAN-HETTANGIAN			Butmah	Sarki		
TRIASSIC	L	NORIAN	Baluti		AP 6				
			CARNIAN			Kurra Chine			
	M	LADINIAN	Geli Khana						
E	OLENEKIAN-INDUAN	Beduh	Mirga Mir						
PALEOZOIC	PERM		Satira Member	Chia Zairi	AP 5				
	CARB.	TOURNAISIAN	Ga'ara		AP 4				
			Harur	Ora					
	U. DEV.	FAMENNIAN?	Kalsta	Chalki	Pirispiki	AP 3			
	SIL.					AP 3			
	ORD.					AP 2			
CAMB.					AP 1				

Khabour



Oil Resources by Provinces - Muthana

No.	Oil Structures	Formation	P50		Pmean		RF(%)
			Oil Resource (MMbbl)	Recoverable Resource (MMbbl)	Oil Resource (MMbbl)	Recoverable Resource (MMbbl)	
1	AL-Mustafa (429)	Najmah	6096	2743	10721	4824	45
2	Zahrawiya (443)	Najmah	2366	1065	4405	1982	45
3	Uhud (409)	Najmah	2217	998	3898	1754	45
4	Husam (413)	Najmah	1909	859	3357	1511	45
5	Sumer (417)	Mishrif	1133	453	2441	976	40
6	Ubaid N. (415)	Najmah	915	412	1610	725	45
7	Lagish (397)	Mishrif	847	339	1571	628	40
8	E. Zaqqura (312)	Mishrif	811	324	1988	795	40
9	Nakheel (384)	Yamama	645	277	1116	480	43
10	Tammam (383)	Yamama	474	204	820	353	43
11	Juhain (399)	Najmah	423	190	745	335	45
12	S. Zaqqura (311)	Mishrif	401	160	983	393	40
13	Warka'a (315)	Mishrif	371	148	899	359	40
14	S. Adaan (379)	Yamama	327	141	969	417	43
15	Muthanna (424)	Najmah	325	146	605	272	45
16	Khidir (330)	Mishrif	316	126	775	310	40
17	Mazin (457)	Najmah	302	136	531	239	45
18	Ubaid (410)	Mishrif	283	113	695	278	40
19	Addan (380)	Yamama	260	112	450	194	43
20	Tanadi S. (377)	Yamama	254	109	441	190	43
21	Khalid (524)	Kurra Chine	222	100	530	239	45
22	Zaqqura (310)	Mishrif	201	80	487	195	40



Oil Resources by Provinces - Muthana

No.	Oil Structures	Formation	P50		Pmean		RF(%)
			Oil Resource (MMbbl)	Recoverable Resource (MMbbl)	Oil Resource (MMbbl)	Recoverable Resource (MMbbl)	
40	Al-Saddah (Salaah) (436)	Yamama	85	37	140	60	43
41	Thurayat (435)	Najmah	78	35	142	64	45
42	Ammar (392)	Yamama	76	33	226	97	43
43	Abu Khema W. (375)	Yamama	76	33	225	97	43
44	Hiteen (416)	Najmah	73	33	129	58	45
45	A-Faisal (439)	Kurra Chine	66	30	157	71	45
46	Hadeer (425)	Najmah	61	27	114	51	45
47	Dhubyan (391)	Yamama	60	26	177	76	43
48	Shiaban (387)	Yamama	53	23	92	40	43
49	Saif (394)	Yamama	37	16	108	46	43
50	Al-Thi'ib (402)	Najmah	34	16	88	40	45
51	AL-Mayle (430)	Kurra chine	34	15	82	37	45
52	Zalal (382)	Yamama	34	15	58	25	43
53	Al-Bint (432)	Mus	29	13	87	39	45
54	Warka'a E. (313)	Mishrif	26	11	64	26	40
55	Haddaniyah (440)	Najmah	19	9	34	15	45
56	E. Ghannami (421)	Mishrif	16	6	38	15	40
57	Busaiya (364)	Mishrif	15	6	28	11	40
58	Tanadi (378)	Mishrif	5	2	16	6	40
59	Khatem (393)	Shuaiba	2	0.5	5	1	30
60	Asawir (516)	Kurra Chine	1	1	3	1	45
TOTAL			24046	10515.5	47438	20656	



Oil Resources by Provinces - Basra

No.0	Oil Structures	Formation	P50		RF(%)
			Oil Resource (MMbbl)	Recoverable Resource (MMbbl)	
1	ABU KHEMA S.	Yamama	3295	1417	43
2	Kuthban (371)	Yamama	31063	1360	43
3	Batin (367)	Yamama	45	19	43
4	West Luhais (337)	Najmah	24.5	11	45
TOTAL			6528.5	2808	

Resources by Provinces - Missan

No.	Oil Structures	Formation	P50		Pmean		RF(%)
			Oil Resource (MMbbl)	Recoverable Resource (MMbbl)	Oil Resource (MMbbl)	Recoverable Resource (MMbbl)	
1	AL SAHAIN	Mishrif	357.2	142.9	777.9	311.2	40
2	Al Gharbi (276)	Kirkuk Group	314.8	141.6	605.3	272.4	45
3	HUWAIZA S.	Mishrif	101.7	40.7	261.4	104.6	40
4	SHIHABI	Jeribe	46.8	18.7	119.7	47.9	40
5	Nesir (275)	Shuaiba	1.2	0.4	3.7	1.1	30
TOTAL			822	344	1768	737	

Reserouces by Provinces – Thi Qar

No.	Oil Structures	Formation	P50		Pmean		RF(%)
			Oil Resource (MMbbl)	Recoverabl e Resource (MMbbl)	Oil Resource (MMbbl)	Recoverabl e Resource (MMbbl)	
1	Ur (328)	Mishrif	1370	548	4298	1719	40
2	West Subbah (333)	Yamama	42	18	91	39	43
3	Hamar (326)	Nahr Umr	37	16	128	57	45
		Zubair	29	15	98	49	50
TOTAL			1477	597	4615	1865	

Total Resources by Provinces - Southern of Iraq

P50		Pmean	
OOIP (MMbbl)	Rec. Reserves(MMbbl)	OOIP (MMbbl)	Rec. Reserves(MMbbl)
28534	12399	60349	26066

Ranking of Resources by Provinces - Southern of Iraq

No.	Oil Structures	Formation	Province	P50		Pmean	
				Oil Resource (MMbbl)	Recoverable Resource (MMbbl)	Oil Resource (MMbbl)	Recoverable Resource (MMbbl)
1	AL-Mustafa (429)	Najmah	Al-Muthana	6096	2743	10721	4824
2	Zahrawiya (443)	Najmah	Al-Muthana	2366	1065	4405	1982
3	Uhud (409)	Najmah	Al-Muthana	2217	998	3898	1754
4	Husam (413)	Najmah	Al-Muthana	1909	859	3357	1511
5	Ur (328)	Mishrif	Thi Qar	1370	548	4298	1719
6	Sumer (417)	Mishrif	Al-Muthana	1133	453	2441	976
7	ABU KHEMA S.	Yamama	Basra	1098	472	3295	1417
8	Kuthban (371)	Yamama	Basra	1068	459	3163	1360
9	Ubaid N. (415)	Najmah	Al-Muthana	915	412	1610	725
10	Lagish (397)	Mishrif	Al-Muthana	847	339	1571	628
11	E. Zaqqura (312)	Mishrif	Al-Muthana	811	324	1988	795
12	Nakheel (384)	Yamama	Al-Muthana	645	277	1116	480
13	Tammam (383)	Yamama	Al-Muthana	474	204	820	353
14	Juhain (399)	Najmah	Al-Muthana	423	190	745	335
15	S. Zaqqura (311)	Mishrif	Al-Muthana	401	160	983	393
16	Warka'a (315)	Mishrif	Al-Muthana	371	148	899	359
17	AL SAHAIN	Mishrif	Missan	357	143	778	311
18	S. Adaan (379)	Yamama	Al-Muthana	327	141	969	417
19	Muthanna (424)	Najmah	Al-Muthana	325	146	605	272
20	Khidir (330)	Mishrif	Al-Muthana	316	126	775	310



Ranking of Resources by Provinces - Southern of Iraq

No.	Oil Structures	Formation	Province	P50		Pmean	
				Oil Resource (MMbbl)	Recoverable Resource (MMbbl)	Oil Resource (MMbbl)	Recoverable Resource (MMbbl)
61	Zalal (382)	Yamama	Al-Muthana	34	15	58	25
62	Hamar (326)	Zubair	Thi Qar	29	15	98	49
63	Al-Bint (432)	Mus	Al-Muthana	29	13	87	39
64	Warka'a E. (313)	Mishrif	Al-Muthana	26	11	64	26
65	Haddaniyah (440)	Najmah	Al-Muthana	19	9	34	15
66	E. Ghannami (421)	Mishrif	Al-Muthana	16	6	38	15
67	Busaiya (364)	Mishrif	Al-Muthana	15	6	28	11
68	Batin (367)	Yamama	Basra	15	6	45	19
69	West Luhais (337)	Najmah	Basra	7.8	3.5	24.5	11.0
70	Tanadi (378)	Mishrif	Al-Muthana	5.1	2	15.7	6.3
71	Khatem (393)	Shuaiba	Al-Muthana	1.5	0.5	4.8	1.4
72	Asawir (516)	Kurra Chine	Al-Muthana	1.3	0.6	3.1	1.4
73	Nesir (275)	Shuaiba	Missan	1.23	0.37	3.70	1.11



Oil Production Profile – South of Iraq

No.	Oil Structures	P50				
		Oil Resource (MMbbl)	Recoverable Resource (MMbbl)	Plateau Oil Rate (bbl/day)	Plateau Period (Years)	No. of Production Wells
1	S. Adaan (379)	327	141	18000	8	8
2	Muthanna (424)	325	146	15200	7	5
3	A-Faisal (439)	66	30	4000	7	2
4	Larsa (400)	128	55	7700	6	6
5	Ur (328)	1370	548	56000	10	28
6	Shawiyah (433)	152	69	9000	7	3
7	Al-Saddah (Salaah) (436)	85	37	6000	5	4
8	Dhahir (428)	127	57	7200	7	4
9	Al-Bint (432)	29	13	2500	1	4
10	Hamar (326)	37	16	2500	5	2
		29	15	2400	4	2
11	West Luhais (337)	8	4	600	4	1
12	West Subbah (333)	42	18	2500	7	1
13	Hadeer (425)	61	27	3400	6	2
14	Tanadi (378)	5	2	500	5	1
15	Zahrawiya (443)	2366	1065	111600	7	36
16	Thurayat (435)	78	35	4500	6	2
17	Hiteen S. (408)	126	57	8000	6	5
18	Lagish (397)	847	339	42000	8	15
19	Bayadir (390)	98	42	6000	7	2



Oil Production Profile - South of Iraq

No.	Oil Structures	P50				
		Oil Resource (MMbbl)	Recoverable Resource (MMbbl)	Plateau Oil Rate (bbl/day)	Plateau Period (Years)	No. of Production Wells
57	Thamiriya (381)	116	50	8000	6	3
58	Lujain (431)	110	50	7500	6	3
59	Shiaban (387)	53	23	3500	6	1
60	Wakass (332)	109	44	8000	6	4
61	Zalal (382)	34	15	2500	6	1
62	Haddaniyah (440)	19	9	1500	6	1
63	Kuthban (371)	1068	459	52000	7	24
64	Al Gharbi (276)	315	142	20000	6	10
65	Abu Khema W. (375)	76	33	5000	6	4
66	HUWAIZA S.	102	41	6000	7	5
67	AL SAHAIN	357	143	20500	8	9
68	SHIHABI	47	19	3000	6	4
69	ABU KHEMA S.	1099	472	69000	8	28
70	AL FURSAN	86	36	6000	7	4
71	HARIS	190	82	13000	7	12
72	ANSAB	94	40	6500	6	6
Total		28534	12399	1.544,650		

Oil Production Profile - South of Iraq

No.	Oil Structures	Pmean				
		Oil Resource (MMbbl)	Recoverable Resource (MMbbl)	Plateau Oil Rate (bbl/day)	Plateau Period (Years)	No. of Production Wells
1	S. Adaan (379)	969	417	45100	10	12
2	Muthanna (424)	605	272	27000	8	8
3	A-Faisal (439)	157	71	8000	8	4
4	Larsa (400)	532	229	29200	8	10
5	Ur (328)	4298	1719	140000	14	50
6	Shawiyah (433)	563	253	31000	8	10
7	Al-Saddah (Salaah) (436)	140	60	8400	6	6
8	Dhahir (428)	237	107	12800	7	8
9	Al-Bint (432)	87	39	7000	6	3
10	Hamar (326)	128	57	8000	6	4
		98	49	6800	6	4
11	West Luhais (337)	25	11	1700	5	1
12	West Subbah (333)	91	39	5000	9	2
13	Hadeer (425)	114	51	6000	7	4
14	Tanadi (378)	16	6	1300	8	1
15	Zahrawiya (443)	4405	1982	191400	9	58
16	Thurayat (435)	142	64	8000	10	4
17	Hiteen S. (408)	301	135	15000	8	8
18	Lagish (397)	1571	628	66500	11	19
19	Bayadir (390)	290	125	18000	8	6
20	AL-Mayle (430)	82	37	6000	5	5

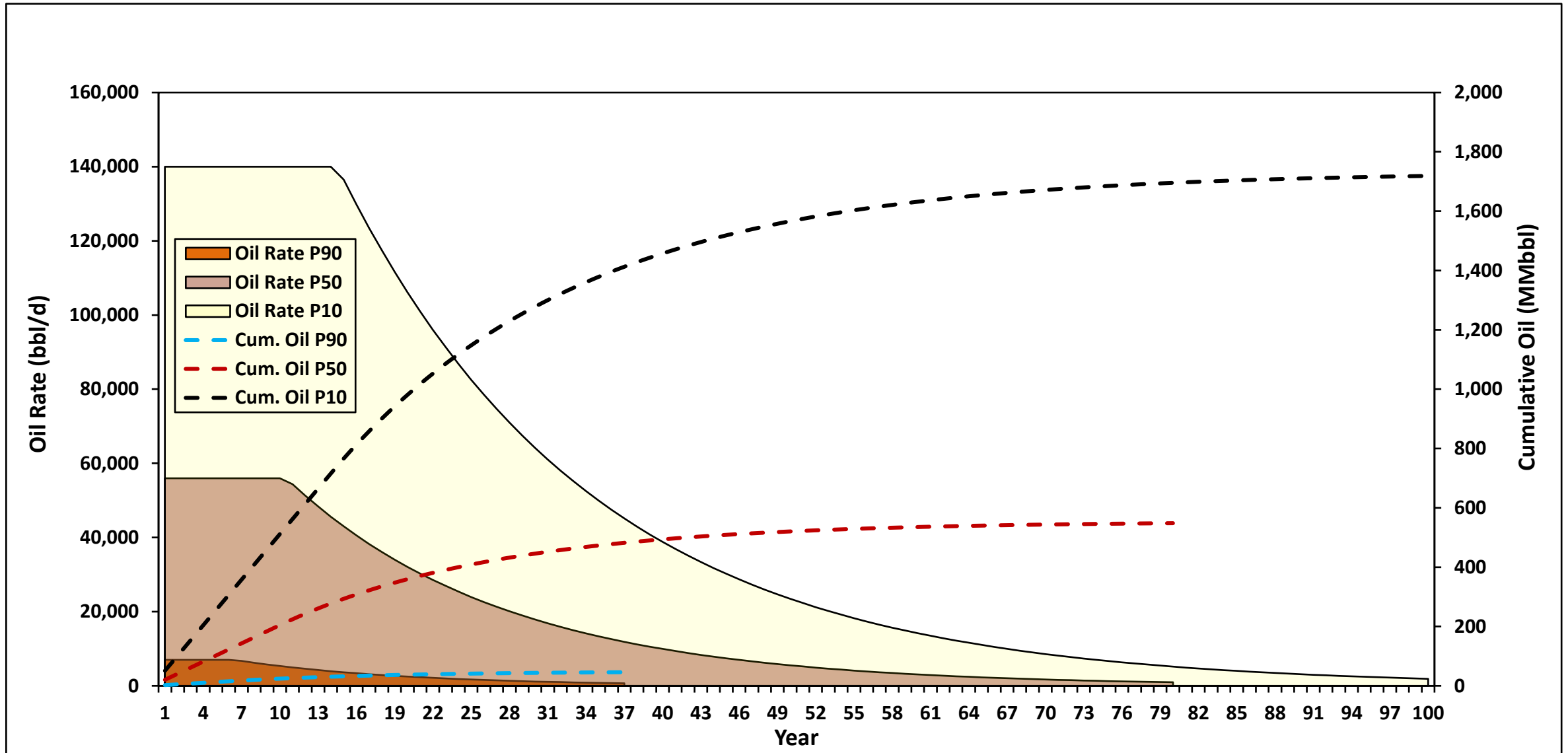


Oil Production Profile - South of Iraq

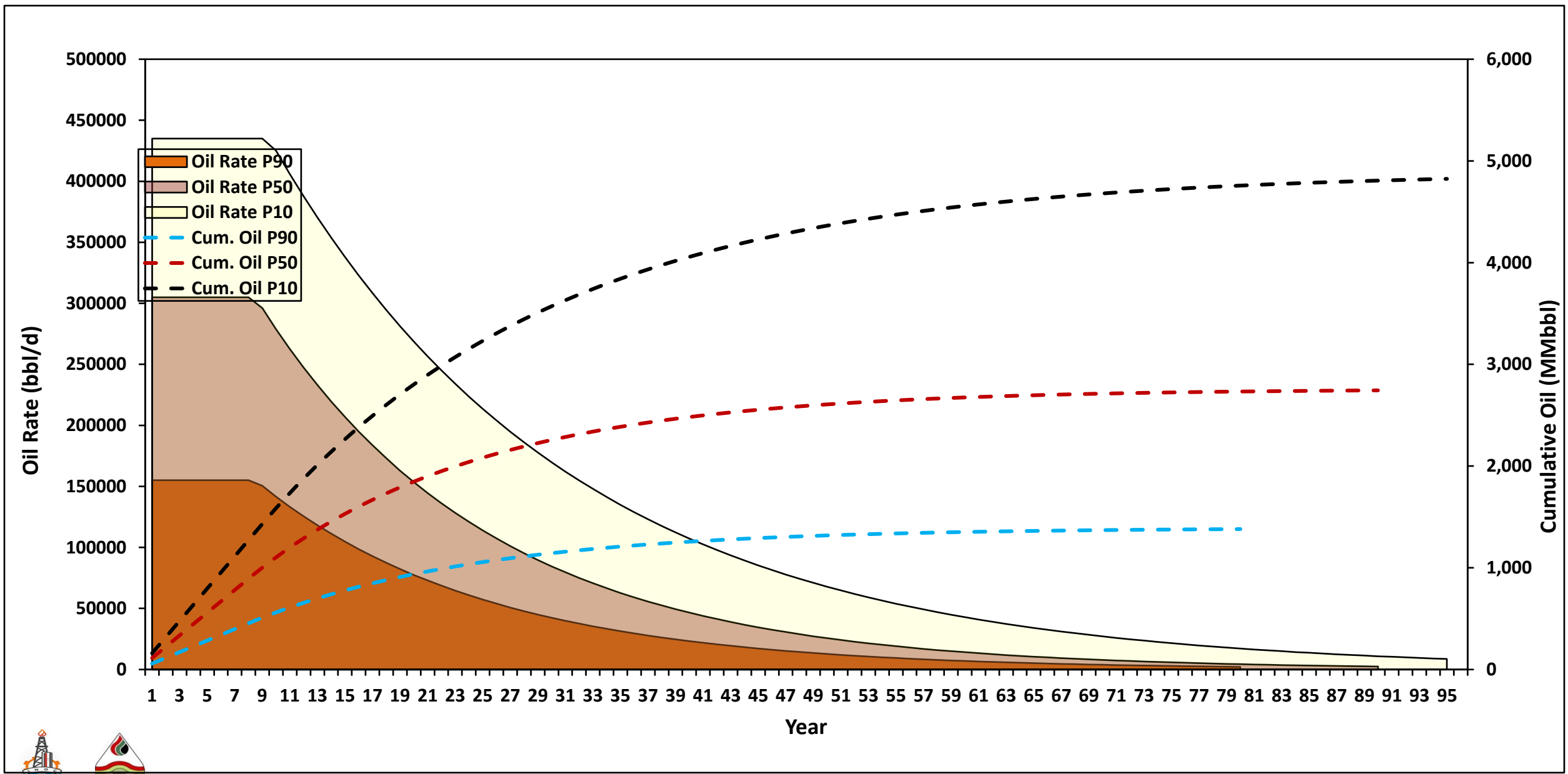
No.	Oil Structures	P _{mean}				
		Oil Resource (MMbbl)	Recoverable Resource (MMbbl)	Plateau Oil Rate (bbl/day)	Plateau Period (Years)	No. of Production Wells
57	Thamiriya (381)	202	87	17000	7	6
58	Lujain (431)	193	87	16000	7	6
59	Shiaban (387)	92	40	7500	7	2
60	Wakass (332)	269	108	16000	8	8
61	Zalal (382)	58	25	5000	7	2
62	Haddaniyah (440)	34	15	3000	7	2
63	Kuthban (371)	3163	1360	155000	8	65
64	Al Gharbi (276)	605	272	30000	8	15
65	Abu Khema W. (375)	225	97	12000	8	6
66	HUWAIZA S.	261	105	12000	9	10
67	AL SAHAIN	778	311	40500	10	16
68	SHIHABI	120	48	7000	7	4
69	ABU KHEMA S.	3295	1417	171000	10	35
70	AL FURSAN	254	109	17000	8	4
71	HARIS	571	246	34000	9	12
72	ANSAB	282	121	19000	8	12
Total		60349	26066	2.950,350		



Oil Production Profile – Ur Prospect – Mishrif Formation



Oil Production Profile – Al-Mustafa Prospect – Najma Formation



Resources by Provinces - al-Anbar

No.	Oil Structures	Formation	P50		Pmean		RF (%)
			Oil Resource (MMbbl)	Recoverable Resource (MMbbl)	Oil Resource (MMbbl)	Recoverable Resource (MMbbl)	
22	Widyan (483)	Kurra chine	14.00	5.040	34.00	12.04	34
23	Abu Jir (499)	Zubair	19.2	7.67	62.0	24.79	40
24	naftan(260)	Zubair	17.6	7.04	63.0	25.38	40
25	Al-Faj (498)	Kurra chine	3.05	1.07	9.14	3.20	35
	Total		7561	2932	16762.7	6480.1	

Resources by Provinces – Nineveh (al-Mosul)

No.	Oil Structures	Formation	P50		Pmean		RF (%)
			Oil Resource (MMbbl)	Recoverable Resource (MMbbl)	Oil Resource (MMbbl)	Recoverable Resource (MMbbl)	
1	Hidhab (210)	Kurra chine	17.900	6.260	42.700	14.930	35
2	Jaddalah (168)	Kurra chine	6.000	2.100	13.000	4.550	35
3	Shihib (470)	Najma	342.7	119.52	681.2	283.43	35
4	Hamdaniya (66)	Jeribe	413.000	144.550	948.900	332.120	35
5	Mityaha S. (213)	Kurra chine	278.370	111.350	835.130	334.050	40
6	Mashora (45)	kurrachaine	170.900	59.810	407.310	142.56	35
7	nerjis(36)	kurrachine	169.200	68.670	403.270	141.140	35
8	Ghalaween-186	Kurra Chine	114	39.9	271	94.85	35
9	Ishkaft (194)	Hartha	76.080	26.630	165.820	58.040	35
10	Gullar(48)	kurrachina	66.4	23.25	158.3	55.420	35
11	bashiqa (64)	Kurra Chine	57.150	20.000	136.200	42.070	35
12	Tel Safrah-172	Kurra Chine	52	23.26	123	55.430	80
13	Tel afar (188)	Kurra Chine	50.440	17.650	120.210	42.070	35
14	Neinewa (90)	Kurra chine	47.000	16.450	113.000	39.550	35
15	hamman Ali(175)	kurrachine	47.860	16.750	114.070	39.920	35
16	Saqar(166)	Kurra Chine	40.880	14.310	97.420	34.100	35
17	Halabiya (184)	Kurra chine	35.000	12.250	82.000	28.700	35
18	Rabia (53)	Kurra chine	36.000	12.600	86.000	30.100	35
19	Ain sifini(61)	kurrachine	31.860	11.150	75.940	26.580	35
20	Hadhar (216)	Kurra chine	30.300	10.610	72.200	25.270	35

Resources by Provinces - Nineveh (al-Mosul)

No.	Oil Structures	Formation	P50		Pmean		RF (%)
			Oil Resource (MMbbl)	Recoverable Resource (MMbbl)	Oil Resource (MMbbl)	Recoverable Resource (MMbbl)	
21	Al-suhail (215)	kurrachine	21.080	7.380	50.250	17.590	35
22	Ashur (79)	Kurra chine	15.500	5.430	36.800	12.880	35
23	Al-Jissah (202)	Kurra chine	14.800	5.180	35.200	12.320	35
24	W. Trthahar (217)	Kurrachaine	8.000	2.800	19.060	6.67	35
25	AL-Waleed(214)	Kurra chine	6.51	2.280	15.51	5.430	35
26	Mizan (170)	Kurra chine	4.700	1.650	11.300	3.960	35
27	Rashidiyah (1101)	Kurra chine	4.100	1.440	9.900	3.470	35
28	Masraj (51)	Kurra chine	3.930	1.380	9.370	3.280	35
29	Ghaith (167)	Kurra chine	3.100	1.090	7.400	2.590	34
30	Rashidiyah (1101)	Galy khana	3.200	1.120	9.600	3.360	36
	Total		2161.480	786.820	5135.610	1896.430	



Resources by Provinces Salah-Eldeen

No.	Oil Structures	Formation	P50		Pmean		RF (%)
			Oil Resource (MMbbl)	Recoverable Resource (MMbbl)	Oil Resource (MMbbl)	Recoverable Resource (MMbbl)	
1	Amir (180)	jeribe	58.92	20.62	135.37	47.38	35
2	w.Tikrit (243)	mishrif	102.49	35.87	202.43	70.85	35
3	SalahALDin(247)	Mushif	127.79	51.11	252.38	10095.00	40
4	Judaida-131	Jeribi	653.30	228.66	1500.95	525.33	35
5	Kifri (124)	Jeribe	227.30	79.56	522.10	182.74	35
6	Dooz (173)	Jeribe	50.00	17.50	103.00	36.05	35
7	Ain Khadhra (163)	Jeribe	81.19	28.42	186.53	65.28	35
8	Haditha E. (339)	Kurra chine	8.47	2.97	20.20	7.07	35
9	Haditha W. (340)	Kurra chine	5.49	1.92	13.09	4.58	35
10	Bir AL-Thahab (182)	Jeribe	70.10	24.54	160.90	56.32	35
11	Ramadhan (147)	Jeribe	52.60	18.52	121.60	42.56	35
12	Bir AL-Thahab (182)	Kurra chine	70.10	24.54	160.90	56.32	35
	Total		1507.75	534.23	3379.45	11189.48	



Resources by Provinces - Kirkuk

No.	Oil Structures	Formation	P50		Pmean		RF ((%))
			Oil Resource (MMbbl)	Recoverable Resource (MMbbl)	Oil Resource (MMbbl)	Recoverable Resource (MMbbl)	
1	Ghadeer (146)	Jeribe	371.500	130.030	853.400	298.690	35
2	Tel Ali (142)	Jeribe	50.000	17.500	103.000	36.050	35
	Total		421.5	147.53	956.4	334.74	

Resources by Provinces - Diyala

No.	Oil Structures	Formation	P50		Pmean		RF (%)
			Oil Resource (MMbbl)	Recoverable Resource (MMbbl)	Oil Resource (MMbbl)	Recoverable Resource (MMbbl)	
1	shakal (118)	Jeribe	268.860	94.090	617.600	216.160	35
2	Sa'diya (124)	Jeribe	189.800	66.430	436.100	152.640	35
3	AL-Wand (122)	Jeribe	101.800	35.630	233.900	81.870	60
4	Habib(115)	lower fars	43.0	17.04	128.0	51.12	40
5	Jalawlaa (156)	Jeribe	34.000	11.900	71.000	24.850	35
	Total		637.5	225.1	1486.6	526.6	

Resources by Provinces - Babylon (al-Hilla)

No.	Oil Structures	Formation	P50		Pmean		RF (%)
			Oil Resource (MMbbl)	Recoverable Resource (MMbbl)	Oil Resource (MMbbl)	Recoverable Resource (MMbbl)	
1	Musaiyib(282)	Khasib	4625.0	1618.00	8903.0	3116.16	35
		Mauddud	2059.0	720.69	3892.0	1362.03	35
		Hartha	10649	5324.5	37764	18882	50
	Total		17333.0	7663.19	50559.0	23360.18	

Resources by Provinces – al-Najaf

No.	Oil Structures	Formation	P50		Pmean		RF (%)
			Oil Resource (MMbbl)	Recoverable Resource (MMbbl)	Oil Resource (MMbbl)	Recoverable Resource (MMbbl)	
23	Shibchah	Zubair	208.0	83.10	623.0	249.00	40
24	Sura - 514	Kurra Chine	340.2	567.38	682	311.17	35
25	Wathab-467	Najma	16.4	427.3	24.5	980.5	35
26	Hira	Yamama	23.5	1297.2	53.6	2416.2	42
27	Ashwairya	Deep	49	17.15	116	40.6	40
28	Fajwa (482)	Kurra chine	539.38	188.78	1175.57	411.45	35
29	Nagibat (521)	Kurra chine	5	2.11	17	7.3186	35
30	Raghad (466)	Najma	208	83.1	623	249	35
31	Shibchah (454)	Zubair	13.400	4.690	31.900	11.170	40
32	Ramdha (412)	Kurra chine	402.400	140.840	959.000	335.650	35
33	Bariq (406)	Najma	1621.080	567.380	3533.140	1236.600	35
34	Kufa (306)	Zubair	3244.050	1297.620	6040.110	2416.040	9
35	Salateen (420)	Najma	825.000	288.750	1966.260	688.190	35
36	Balsam (518)	Kurra chine	740.000	259.000	1301.000	455.350	35
	Total		27362.31	10923.82	53769.17	20998.82	

Resources by Provinces - Wasit (al-Kut)

No.	Oil Structures	Formation	P50		Pmean		RF (%)
			Oil Resource (MMbbl)	Recoverable Resource (MMbbl)	Oil Resource (MMbbl)	Recoverable Resource (MMbbl)	
1	waist E (120)	mishrif	1.07	0.37	2.10	0.74	37
2	Saad	jeribi	284.76	113.90	854.29	341.72	40
3	Saad	Maudud	641.00	224.32	2216.00	775.43	35
4	Suwaira	Khasib	175.40	70.16	312.80	125.12	40
5	Sa'd (107)	Jeribe	284.76	113.90	854.29	341.72	40
6		Mauddud	640.91	224.32	1819.80	636.93	35
7	Suwaira (280)	Khasib	175.40	70.16	312.80	125.12	40
8	Tariq (269)	Jeribe	359.00	125.65	824.70	288.65	35
9	Wasit (271)	Mishrif	3050.06	1220.02	6023.87	2409.55	40
10	Rafidain W. (304)	Mishrif	179.40	71.76	427.58	171.03	40
		Zubair	143.47	64.56	430.41	193.68	45
		Yamama	171.92	68.77	495.13	198.05	40
11	Kut (273)	Mauddud	550.00	192.78	954.80	334.18	35
12	Dijlah (274)	Lower Fars	21.00	7.35	63.10	22.09	35
		Mishrif	81.70	32.68	163.50	65.40	40
13	E. Dujaliah (292)	Khasib	1073.04	429.22	2159.49	755.82	40
	Total		7832.89	3029.92	17914.66	6785.23	

Resources by Provinces – al-Kut

No.	Oil Structures	Formation	P50		Pmean		RF (%)
			Oil Resource (MMbbl)	Recoverable Resource (MMbbl)	Oil Resource (MMbbl)	Recoverable Resource (MMbbl)	
1	Aziziya (281)	Lower Fars	13.6	12.22	92.0	36.66	37
	Total		13.6	12.22	92.0	36.66	



Total Oil Resources by Provinces – M&N

P50		Pmean	
OOIP (MMbbl)	Rec. Reserves(MMbbl)	OOIP (MMbbl)	Rec. Reserves(MMbbl)
66332.816	26547.274	152840.63	72622.04



Ranking of Resources by Provinces - Middle & North of Iraq

No.	Oil Structures	Formation	Province	P50		Pmean	
				Oil Resource (MMbbl)	Recoverable Resource (MMbbl)	Oil Resource (MMbbl)	Recoverable Resource (MMbbl)
121	Hira(287)	yamama	najaf	5.00	2.11	17.00	7.32
122	Hira	Yamama	najaf	5.00	2.11	17.00	7.32
123	Haditha E. (339)	Kurra chine	Salah AL-Din	8.47	2.97	20.20	7.07
124	W. Trthahar (217)	Kurrachaine	mousl	8.000	2.800	19.060	6.67
125	AL-Waleed(214)	Kurra chine	mousl	6.51	2.280	15.51	5.430
126	Jaddalah (168)	Kurra chine	mousl	6.000	2.100	13.000	4.550
127	Haditha W. (340)	Kurra chine	Salah AL-Din	5.49	1.92	13.09	4.58
128	Mizan (170)	Kurra chine	mousl	4.700	1.650	11.300	3.960
129	Rashidiyah (1101)	Kurra chine	mousl	4.100	1.440	9.900	3.470
130	Masraj (51)	Kurra chine	mousl	3.930	1.380	9.370	3.280
131	Ghaith (167)	Kurra chine	mousl	3.100	1.090	7.400	2.590
132	Rashidiyah (1101)	Galy khana	mousl	3.200	1.120	9.600	3.360
133	Al-Faj (498)	Kurra chine	Anbar	3.050	1.070	9.140	3.200
134	waist E (120)	mishrif	Wasit	1.07	0.37	2.10	0.74
	Total			66332.816	26841.06583	152840.637	72622.0447

Oil Production Profile - M&N

No.	Oil Structures	P50				
		Oil Resource (MMbbl)	Recoverable Resource (MMbbl)	Plateau Oil Rate (bbl/d)	Plateau Period (Years)	No. of Production Wells
111	Saad	17.2	224.32	32000	8	13
112	Suwaira	17.54	70.16	8800	8	4
113	Sa'd (107)	284.760	113.900	14000	8	7
114	Sa'd (107)	640.910	224.320	32500	8	13
115	Suwaira (280)	175.400	70.160	8800	8	4
116	Tariq (269)	359.000	125.650	16400	8	8
117	Wasit (271)	3050.060	1220.020	129700	13	42
118	Rafidain W. (304)	179.400	71.760	10000	8	8
119	Rafidain W. (304)	143.470	64.560	8800	8	7
120	Rafidain W. (304)	171.920	68.770	10000	8	8
121	Kut (273)	550.000	192.780	34500	9	22
122	Dijlah (274)	21.000	7.350	1600	5	4
123	Dijlah (274)	81.700	32.680	6100	8	5
124	E. Dujaliah (292)	1073.040	429.220	57500	8	23
125	Amir (180)	58.920	20.620	4000	9	4
126	W.Tikrit (243)	102.490	35.870	8200	5	4
127	SalahALDin(247)	127.8	51.11	8500	8	5
128	Judaida-131	653.3	228.66	36000	9	12
129	Kifri (124)	227.300	79.560	12000	10	6
130	Dooz (173)	50.000	17.500	3600	8	5
131	Ain Khadhra (163)	81.190	28.420	5600	8	5
132	Haditha E. (339)	8.470	2.970	900	5	3
133	Haditha W. (340)	5.490	1.920	600	5	2



Oil Production Profile – M&N

No.	Oil Structures	P50				
		Oil Resource (MMbbl)	Recoverable Resource (MMbbl)	Plateau Oil Rate (bbl/d)	Plateau Period (Years)	No. of Production Wells
134	Bir AL-Thahab (182)	70.10	24.54	5000	7	5
135	Ramadhan (147)	52.60	18.52	3400	8	4
136	Bir AL-Thahab (182)	70.10	24.54	3000	8	2
	Total	66332.81	26841.06	3.059,361		



Oil Production Profile – M&N

No.	Oil Structures	Pmean				
		Oil Resource (MMbbl)	Recoverable Resource (MMbbl)	Plateau Oil Rate (bbl/d)	Plateau Period (Years)	No. of Production Wells
111	Saad	26.65	636.9	72000	8	24
112	Suwaira	20.8	125.4	125000	10	6
113	Sa'd (107)	854.290	341.720	32500	10	13
114	Sa'd (107)	1819.800	636.930	27000	10	24
115	Suwaira (280)	312.800	125.120	15000	10	6
116	Tariq (269)	824.700	288.650	25000	12	10
117	Wasit (271)	6023.870	2409.550	222200	14	65
118	Rafidain W. (304)	427.580	171.030	16500	10	11
119	Rafidain W. (304)	430.410	193.680	19600	10	14
120	Rafidain W. (304)	495.130	198.050	18000	10	12
121	Kut (273)	954.800	334.180	48000	12	35
122	Dijlah (274)	63.100	22.090	3900	8	6
123	Dijlah (274)	163.500	65.400	10500	10	7
124	E. Dujaliah (292)	2159.490	755.820	99000	10	33
125	Amir (180)	135.370	47.380	8000	10	6
126	W.Tikrit (243)	202.430	70.850	13000	7	7
127	SalahALDin(247)	252.4	10095.00	15750	9	7
128	Judaida-131	1500.95	525.33	64600	12	19
129	Kifri (124)	522.100	182.740	23000	12	10
130	Dooz (173)	103.000	36.050	3600	10	7
131	Ain Khadhra (163)	186.530	65.280	11300	10	7
132	Haditha E. (339)	20.200	7.070	1600	7	4
133	Haditha W. (340)	13.090	4.580	1100	7	3

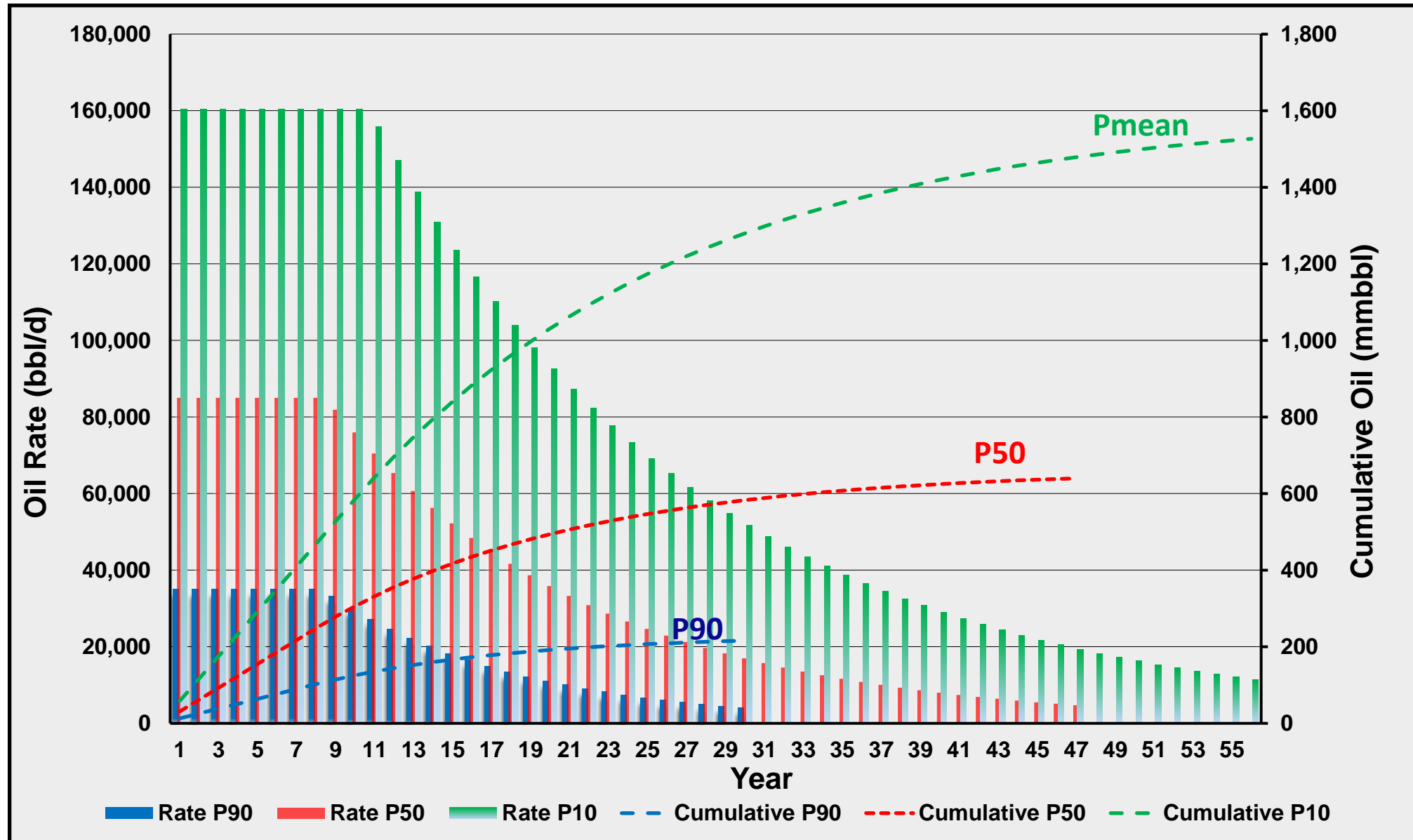


Oil Production Profile – M&N

No.	Oil Structures	Pmean				
		Oil Resource (MMbbl)	Recoverable Resource (MMbbl)	Plateau Oil Rate (bbl/d)	Plateau Period (Years)	No. of Production Wells
134	Bir AL-Thahab (182)	160.900	56.320	9100	10	7
135	Ramadhan (147)	121.600	42.560	6300	10	6
136	Bir AL-Thahab (182)	160.900	56.320	5250	10	3
	Total	152840.63	72622.04	5.615,458		



Oil Production Profile - Abyadh Prospect



Ranking of Gas Resources

Gas Structures	Area (Km ²)	P50	
		Gas Resource (Bscf)	Recoverable Resource (Bscf)
Western Najd	51	30.3	24.2
Khaleel E.	30.37	27.8	22
Jazira S.	12.87	24.6	19.68
Shemal	9.97	24.3	19.44
Raneen	11.63	23.4	19
Haditha	3.22	18.1	14
Al-Waleed	11.13	16.3	13
Mur	3.08	15.1	12
Mileh Tharthar	8.48	14.2	11.37
Khalij	16.6	10.4	8.3
Sayyad S	13.9	7.4	5.9
Hayfa	7.95	7.1	5.68
Al-Qaim	4.6	6.1	5.2
Nuwar	6.85	4.4	3.52
Shulah	5.32	2.4	2
Total		40216	32318



Ranking of Gas Resources

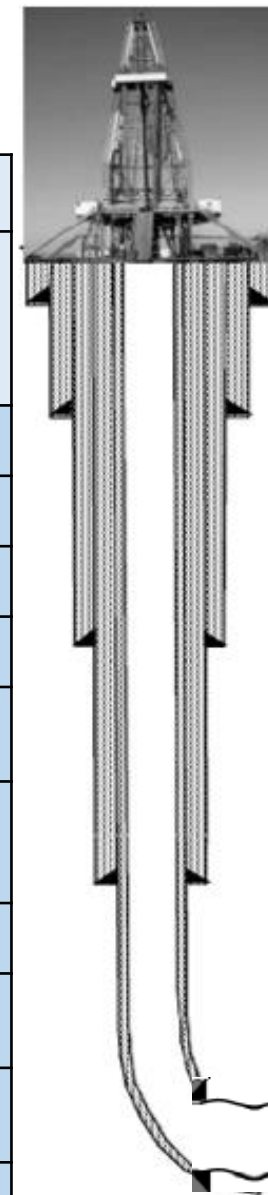
Gas Structures	Area (Km ²)	P _{mean}	
		Gas Resource (Bscf)	Recoverable Resource (Bscf)
Western Najd	51.0	74.3	59.4
Khaleel E.	30.37	73.9	59.1
Raneen	11.63	62.2	50
Jazira S.	12.87	60.4	48.32
Shemal	9.97	59.6	47.68
Haditha	3.22	48.0	38
Mur	3.08	40.1	32
Al-Waleed	11.13	40.0	32
Mileh Tharthar	8.48	37.8	30.23
Khalij	16.6	31.2	24.9
Sayyad S	13.9	18.0	14.4
Hayfa	7.95	17.5	14.00
Al-Qaim	4.6	15.0	12.8
Nuwar	6.85	10.8	8.64
Shulah	5.32	6.3	5
Total		103988	83552

Summary of Resources by Provinces

Province	Probability				RF(%)
	P50		Pmean		
	GIIP (Bscf)	Rec. Reserves (Bscf)	GIIP (Bscf)	Rec. Reserves (Bscf)	
Anbar	24190	19455	62996	50648	80
Najaf	5514	4411	14387	11517	
Diyala	7462	5984	18722	15009	
Nineveh	2662	2158	6845	5546	
Muthana	378	302	1008	806	
Basrah	10	8.3	31	24.9	
Total	40216	32318	103988	83552	

Horizontal well /Casing program

<u>Ajnadin</u> casing information				
Hole Size, in	Casing Size, in	Casing Shoe Depth, m	Grade	Weight, ppf
36	30	36		
26	20	201	K-55	133
17 ½	13 3/8	1357	L-80	68
12 1/4	9 5/8	2200	Q-125	66.4
8 1/2	7	2604 TVD	L-80	32
	Open hole	3003 MD		
Kick off point	2255 m			
Average top of Najmah	2428 m			
Horizontal section	200 m			
Build up rate	5/100 ft			
MD of Build up section	1800 ft – 548 m			



36" hole, 30" casing @ 36 m

26" hole, 20" casing @ 201 m

17 ½" hole, 13 3/8" casing @ 1357 m

12 ¼" hole, 9 5/8" casing @ 2200 m

KOP = +- 2255 m

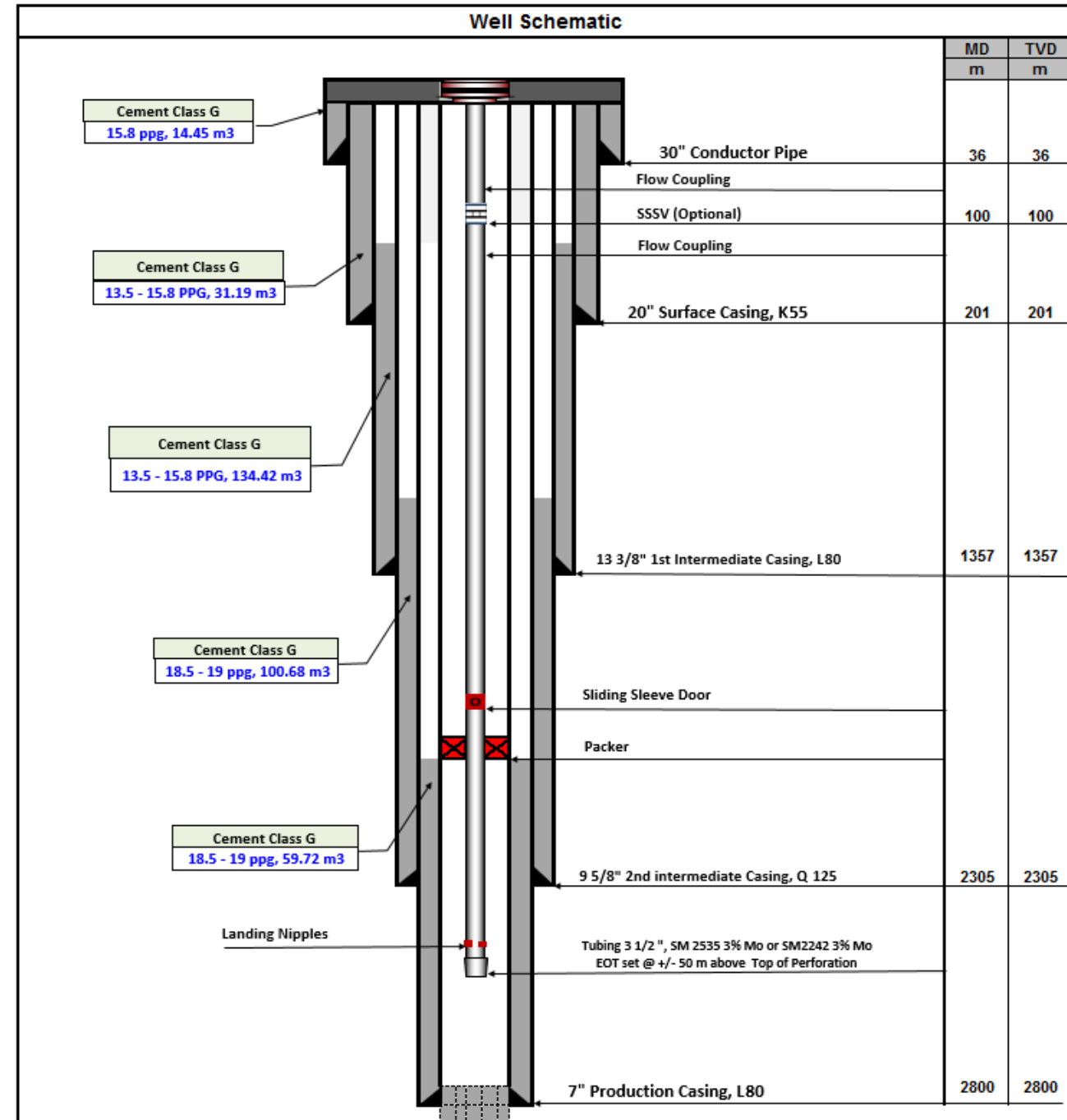
8 ½" hole, 7" casing @ 2604 m, 200 m open hole

Completion String Design

- Vertical Well Design:

The proposed completion string would be as illustrated in the table below & figure:

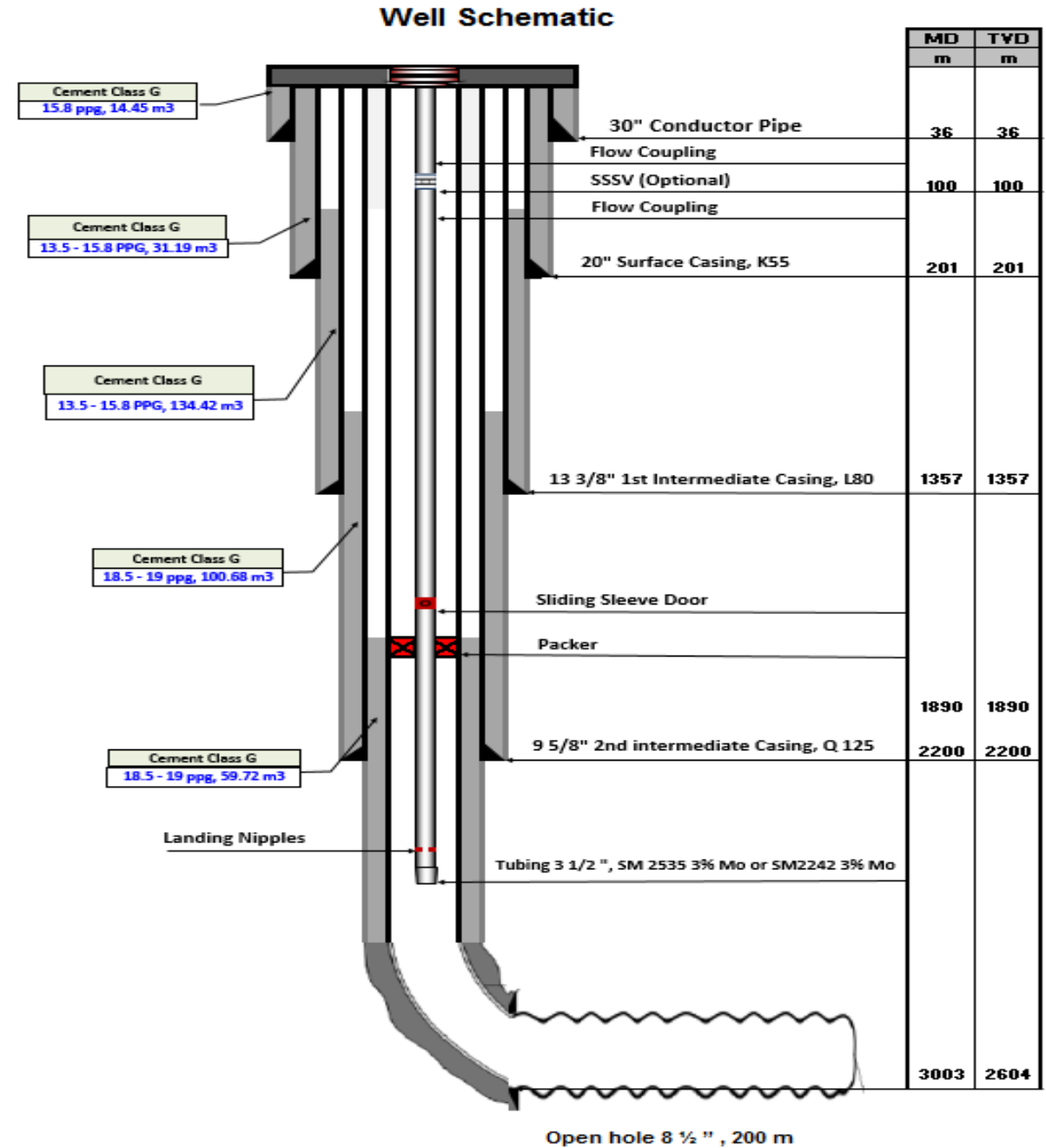
No.	Item	Size (in)	Jts
1	Tubing Hanger	3 1/2	
2	TBG	3 1/2	5
3	Flow Coupling	3 1/2	1
4	SSSV	3 1/2	1
5	Flow Coupling	3 1/2	1
6	TBG	3 1/2	---
7	Sliding Sleeve	3 1/2	1
8	TBG	3 1/2	2
9	Packer	7	1
10	Spacer	3 1/2	1
11	Landing Nipples	3 1/2	1
12	WLEG	3 1/2	1



- Horizontal Well Design:

The proposed completion string would be as illustrated in the figure:

No.	Item	Size (in)	Jts
1	Tubing Hanger	3 1/2	
2	TBG	3 1/2	5
3	Flow Coupling	3 1/2	1
4	SSSV	3 1/2	1
5	Flow Coupling	3 1/2	1
6	TBG	3 1/2	---
7	Sliding Sleeve	3 1/2	1
8	TBG	3 1/2	2
9	Packer	7	1
10	Spacer	3 1/2	1
11	Landing Nipples	3 1/2	1
12	WLEG	3 1/2	1



G. Wellhead and X-Mass Tree Design

- Wellhead Size and Operating Pressure Selection:

30" * 20" * 13 3/8" * 9 5/8" * 7" * 3 1/2" W.P – **XX** Psi.

Wellhead pressure ; To be decided after testing the well.

- Wellhead Grade Selection:

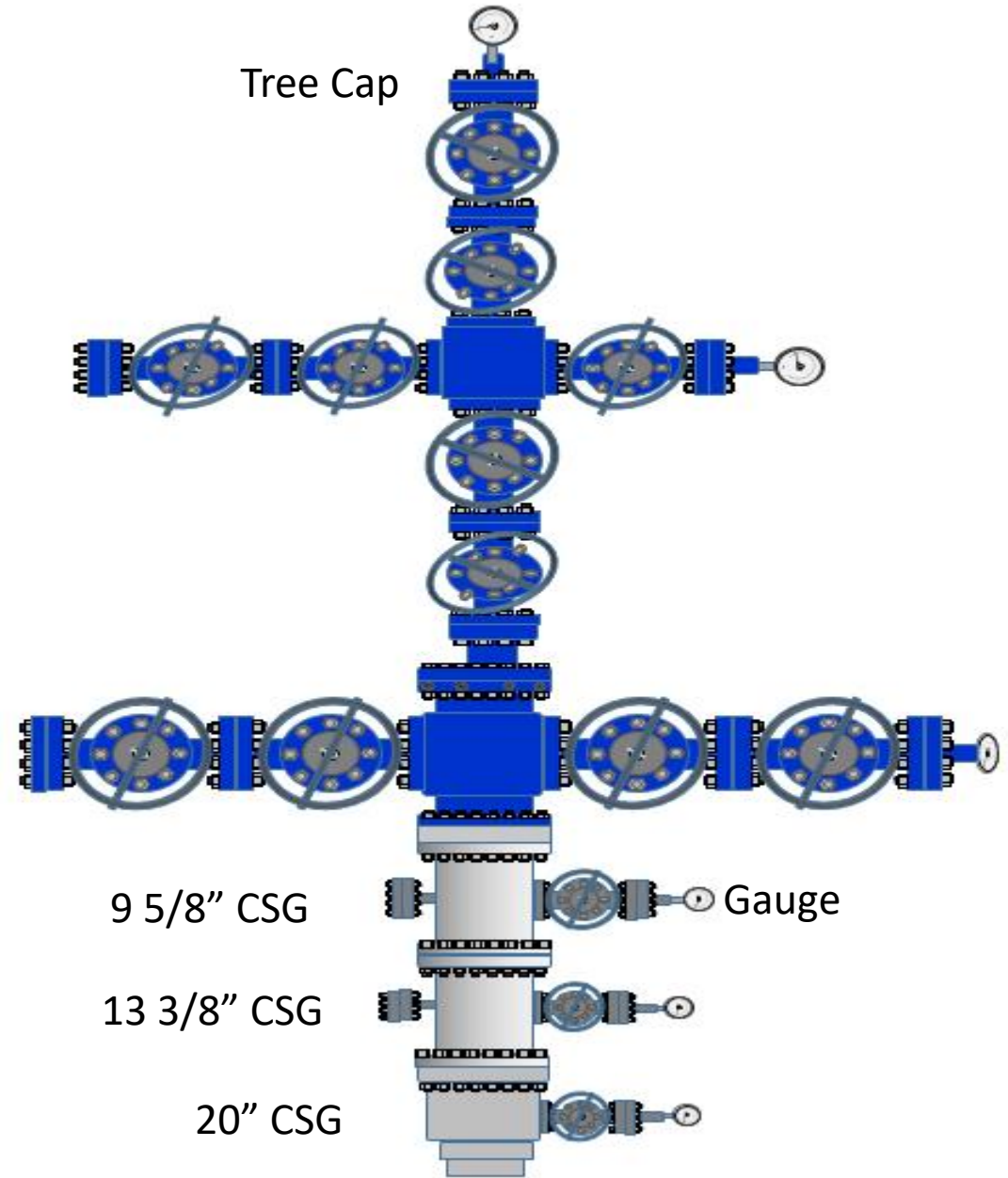
According to API SPEC 6A, the suitable material class of wellhead will select after DST.

Materials	H ₂ S Partial Pressure	Work Environment	CO ₂ Partial Pressure	Corrosion	Others
AA	<0.05 psi	Normal	<7 psi	No	
BB	<0.05 psi	Normal	7 psi~30 psi	Low	
CC	<0.05 psi	Normal	>30 psi	Mid-high	
DD-1.5	≤ 1.5 psi	Acidic	<7 psi	No	
DD-NL	> 1.5 psi	Acidic	<7 psi	No	
EE-1.5	≤ 1.5 psi	Acidic	7 psi~30 psi	Low	pH≥3.5
EE-NL	> 1.5 psi	Acidic	7 psi~30 psi	Low	pH≥3.5
FF-1.5	≤ 1.5 psi	Acidic	>30 psi, ≤200 psi	Mid-high	pH≥3.5
FF-NL	> 1.5 psi	Acidic	>30 psi, ≤200 psi	Mid-high	pH≥3.5
HH-NL	> 1.5 psi	Acidic	>200 psi	High	

- Wellhead Temperature Rating Selection:

According to API SPEC 6A, the suitable temperature rating selection that the equipment can experience in drilling and/or production services would be decided after well modeling.

API Temp. Classification	Temperature (°C)	
	From	To
K	-60	82
L	-46	82
N	-46	60
P	-29	82
S	-18	60
T	-18	82
U	-18	121
V	2	121
X	-18	180
Y	-18	345



Surface Facilities

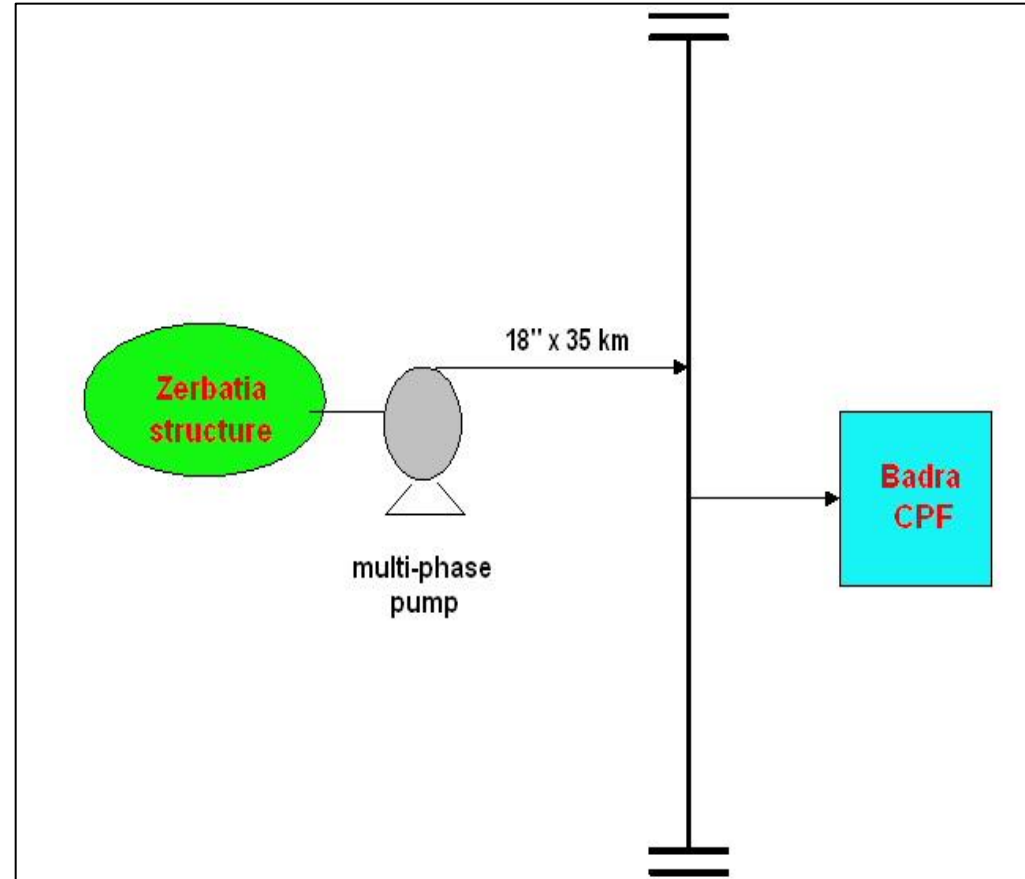
To design surface facilities for oil and gas prospects, we take in consideration; production rate, fluid parameters, location of the Prospects(prospects, leads, etc.) , the distance from the nearest export infrastructure in the region.

Two scenarios were adopted:

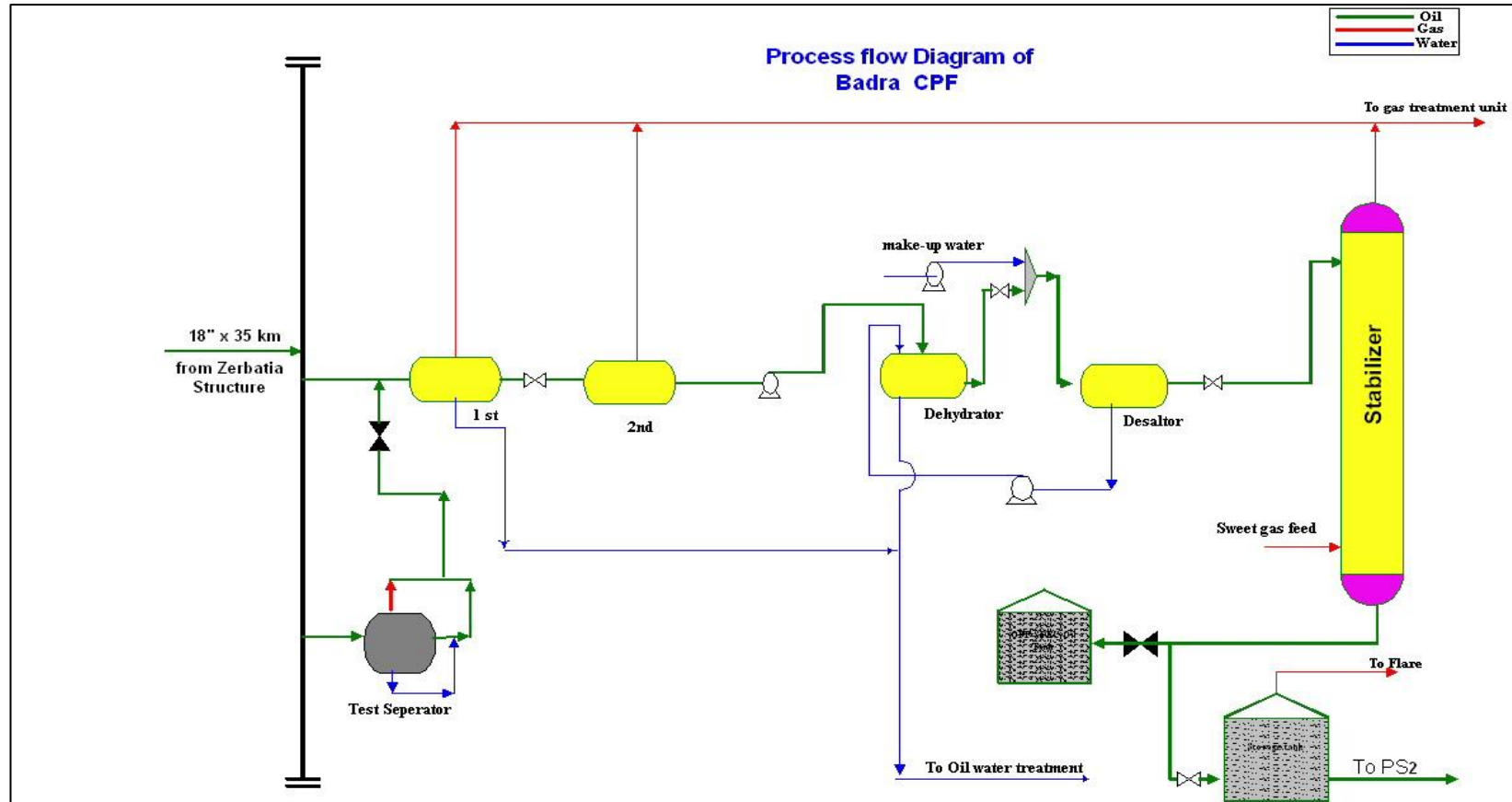
- Construction of simple facilities inside the proposed field (one prospect), then transport the fluid to another field for treatment
- Construction of simple facilities inside the proposed field (many prospects), then transport the fluid to another field for treatment

Surface Facilities

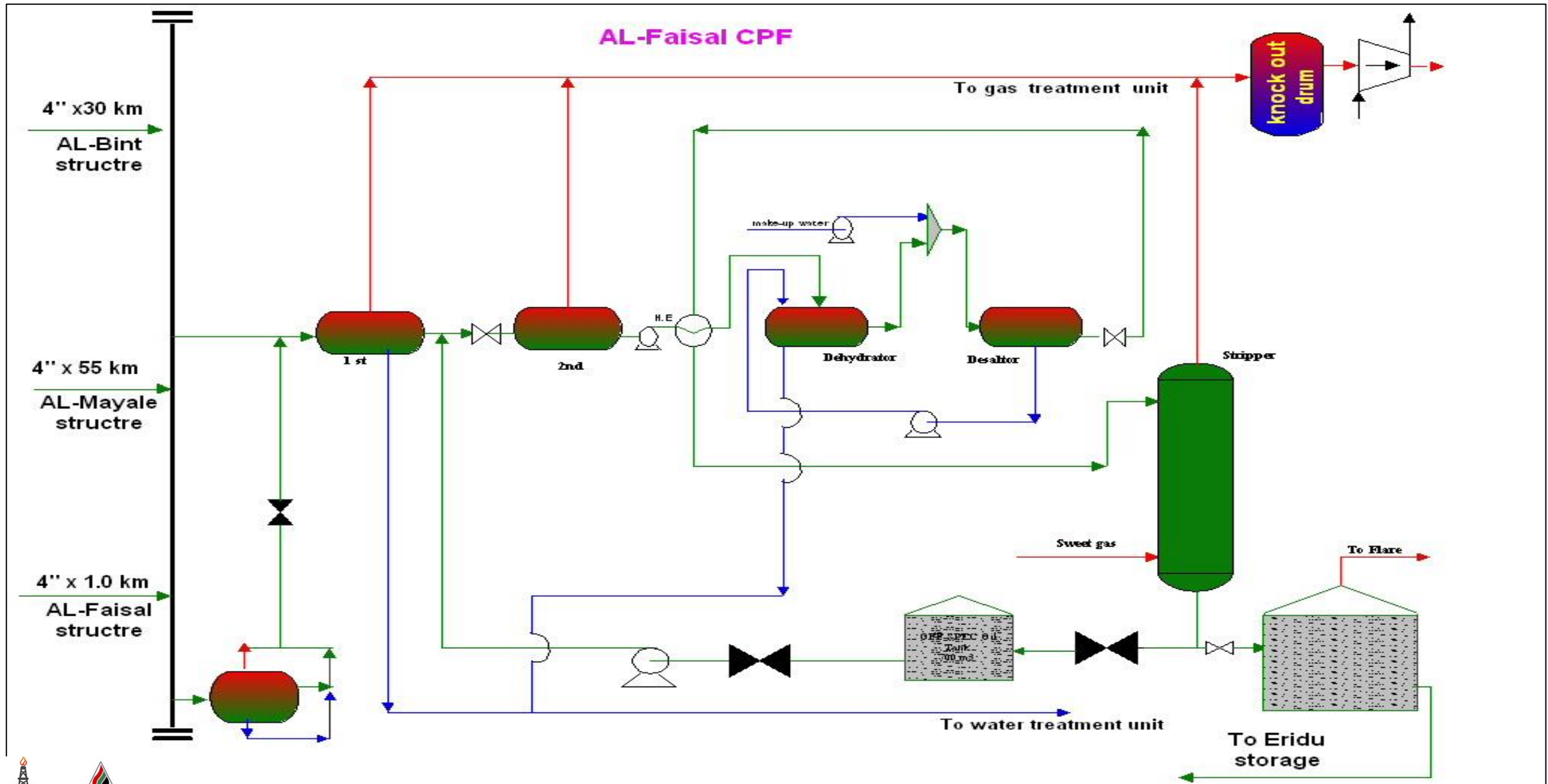
Example of scenario 1 from Zerbatia to Badra field



Surface Facilities



Surface Facilities



Cost Estimation Scenario 1

Activity	Quantity	Cost (\$)
3D Seismic	90Km ²	4,500,000
Exploration well	1	30,000,000
Appraisal well	1	15,000,000
Production Well	46	276,000,000
Multi-phase Pump	120,000 bbl/d	120,000,000
Flow line	138Km	20,000,000
Track line	138Km	48,300,000
SuRFace Facilities	BBL/D	---
Pipe line	35Km	9,975,000
Sub Total		523,475,000
Contingency	20(%)	104,695,000
Total		628,170,000



Cost Estimation Scenario 2

Activity	Quantity	Cost (\$)
3D Seismic	250Km ²	13.000.000
Exploration well	7	210,000,000
Appraisal well	7	105,000,000
Production Well	50	300,000,000
Multi-phase Pump	60,000 bbl/d	60,000,000
Flow line	130Km	20,000,000
Track line	130Km	48,300,000
SuRFace Facilities	80 bbl/d	80.000.000
Pipe line	40 Km	9,975,000
Sub Total		846,275,000
Contingency	20(%)	169,255,000
Total		1.015,530,000



لاحظ اصطفاف القرى باتجاه شمال -

جنوب

وعلاقته مع الخط الزلزالي H-4 والازاحة

الواضحة بين الارتفاع الطبوغرافي

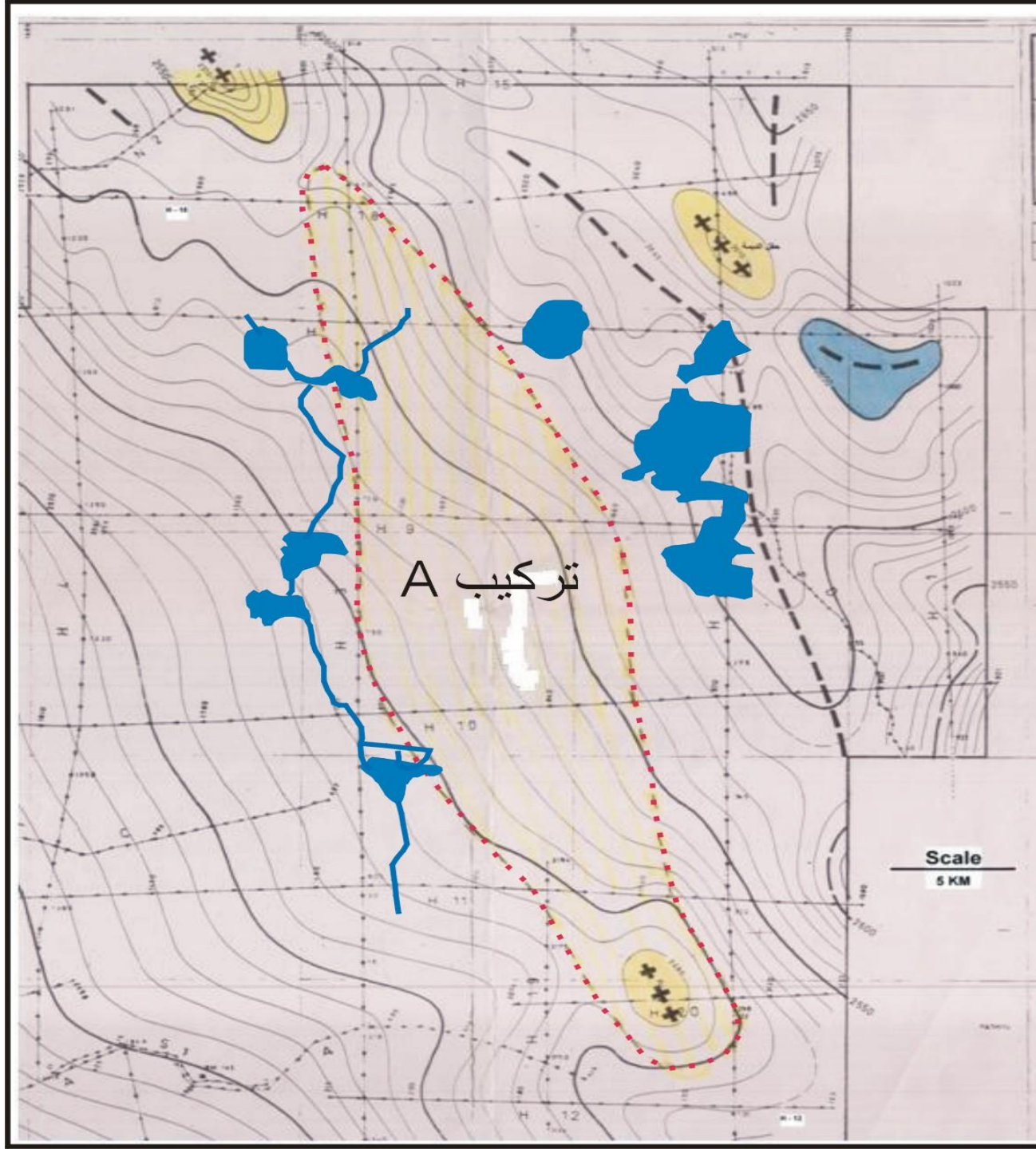
والتحذب

التحت سطحي

Note the villages line up in a north-south direction and the relation to the seismic line H4,



Time map of the third reflector (Gotnia Fm.) Explains the structure of (A) and its extension, note the Lakes around the structure, modified after Irap 1970



Nasiriyah Geology and Geophysics

- The technical team (RFDD, OEC, TOC and PCLD) prepared preliminary systematic study for the areas of interest using the 2D seismic surveys interpretations, analogues reservoir properties and our geological experience. The evaluation of the prospects showing the presence of stratigraphic traps of the Mishrif, Yamama and Zubair formations. It could be the existence of another formation in the cretaceous and Jurassic.

Resources

Region	Formation	OEC_STOOIP (MMbbl)		RFDD_STOOIP (MMbbl)	
		P50	P10	P50	P10
A	Mishrif	8994.9	26984.7	9895.7	28262.6
	Yamama	1785.9	5357.7	1785.9	5357.7
B	Mishrif	5543.3	16629.8	6708.2	18017.9
	Yamama	1607.2	4821.5	1607.2	4821.2
D	Mishrif	9979.6	19959.2	11857.3	26948.4
E	Mishrif	1509.4	4528.3	1992.7	4906.3
	Yamama	2640.3	7920.9	2640.3	7920.9
	Zubair	2505.3	7515.7	2505.3	7515.7
	Total	34565.9	93717.8	38992.6	103751

Reservoir Engineering

Oil production Profile

		P90					P50					P10				
Region	Formation	Plateau	Duration	Cum	Prod wells	Inj wells	Plateau	Duration	Cum	Prod wells	Inj wells	Plateau	Duration	Cum	Prod wells	Inj wells
		Mbb/d	YEAR	MMbbl			Mbb/d	YEAR	MMbbl			Mbb/d	YEAR	MMbbl		
Mishrif formation_oil																
A	Mishrif	50	18	863	42	18	200	21	4553	133	57	500	12	12720	301	129
B		30	18	533	30	12	150	15	3019	95	40	300	20	8109	190	81
D		50	20	958	42	18	225	25	5335	140	60	450	25	12143	279	119
E		30	5	145	28	11	50	20	897	42	18	170	20	2209	100	43
Total		160		2499	142	59	625		13804	410	175	1420		35181	870	372
Yamama formation_oil																
A	Yamama	30	5	152	26	10	50	12	714	42	18	130	19	2143	81	34
B		30	6	137	26	11	50	10	643	42	18	120	20	1929	74	32
E		40	5	225	30	13	70	20	1055	51	21	175	21	3168	105	45
Total		100		515	82	34	170		2413	135	57	425		7240	260	111
Zubair formation_oil																
E	Zubair	30	8	268	28	11	50	21	1252	42	18	130	25	3759	77	33
Total		30		268	28	11	50		1252	42	18	130		3759	77	33

Reservoir Engineering

Gas production Profile

		P90					P50					P10				
Region	Formation	Plateau	Duration	Cum	Prod wells	Inj wells	Plateau	Duration	Cum	Prod wells	Inj wells	Plateau	Duration	Cum	Prod wells	Inj wells
		MMscf/d	Year	Bscf			MMscf/d	Year	Bscf			MMscf/d	Year	Bscf		
Mishrif formation_gas																
A	Mishrif	25	18	431	42	18	100	21	2277	133	57	250	12	6360	301	129
B		15	18	266	30	12	75	15	1509	95	40	150	20	4054	190	81
D		25	20	479	42	18	112.5	25	2668	140	60	225	25	6072	279	119
E		15	5	72	28	11	25	20	448	42	18	85	20	1104	100	43
Total		80		1249	142	59	312.5		6902	410	175	710		17590	870	372
Yamama formation_gas																
A	Yamama	23	5	114	26	10	38	12	536	42	18	98	19	1607	81	34
B		23	6	103	26	11	38	10	482	42	18	90	20	1447	74	32
E		30	5	169	30	13	53	20	792	51	21	131	21	2376	105	45
Total		75		386	82	34	128		1810	135	57	319		5430	260	111
Zubair formation_gas																
E	Zubair	18	8	161	28	11	30	21	751	42	18	78	25	2255	77	33
Total		18		161	28	11	30		751	42	18	78		2255	77	33



Portfolio Management and Iraq Proposed Production Strategy

- Capital, technology and know-how have been the historical key drivers of NOC-IOC partnerships
- Evolution of market fundamentals in recent years has altered the respective roles of NOCs, IOCs and service companies and changed their business models and relationship
- With resource potential and financial strength, producer NOCs have increased their influence, reassessed their motivation and adapted their behaviour in line with a more market-oriented approach traditionally associated with the IOCs
- Partnering in upstream projects with IOCs is no longer a must for most NOCs
- The production sharing agreement that was the main contractual structure of the upstream partnerships between NOCs and IOCs is becoming less attractive to producers
- The service type contract has become an attractive structure from the standpoint of NOCs as it sidesteps controversial policy issues such as booking of reserves and production management

Portfolio Management and Iraq Proposed Production Strategy

- On the other hand, IOCs remain the preferred partners for long-term ventures particularly as development becomes more challenging
- In addition to technology and finance, IOCs bring a package of operational expertise and project management capabilities as well as market knowledge and access
- The relationship between NOCs and IOCs remains important regardless of the partnership structure or the fiscal regime governing the project
- What Iraq needs of fiscal regime?
 - PSA
 - TSC
 - TAC
 - (Profit sharing EDPC kind of PSA)
- In any of the above mentioned contracts, Iraq has to provide the regulations and law ground to reach the target
- **A win-win relationship** is the key ingredient of a successful **NOC-IOC** partnership. Flexibility with IOCs is essential

Portfolio Management and Iraq Proposed Production Strategy

- Build long-term partnerships
- Facilitate whenever appropriate cross-investment throughout the whole value chain in host countries, partners' home countries and in third party countries
- Establish long-term partnerships that are sustainable under any economic situation
- Favour as much as possible dialogue, re-negotiations or mediation to resolve conflicts or disputes
- Build long-term cooperative programmes
- Build long-term partnerships on environmental and operational safety issues
- Undertake joint analysis and studies on producing and consuming countries' regulations, activities and policies related to energy supply and demand

