

Macondo RSDP Pre-drill Review

5 November 2009

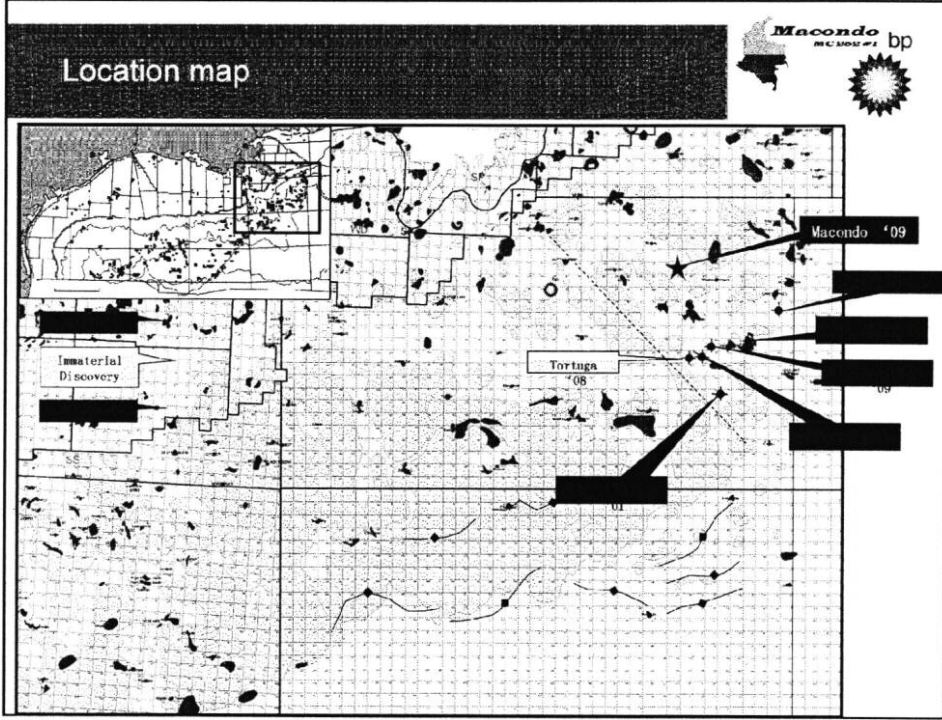


CONFIDENTIAL

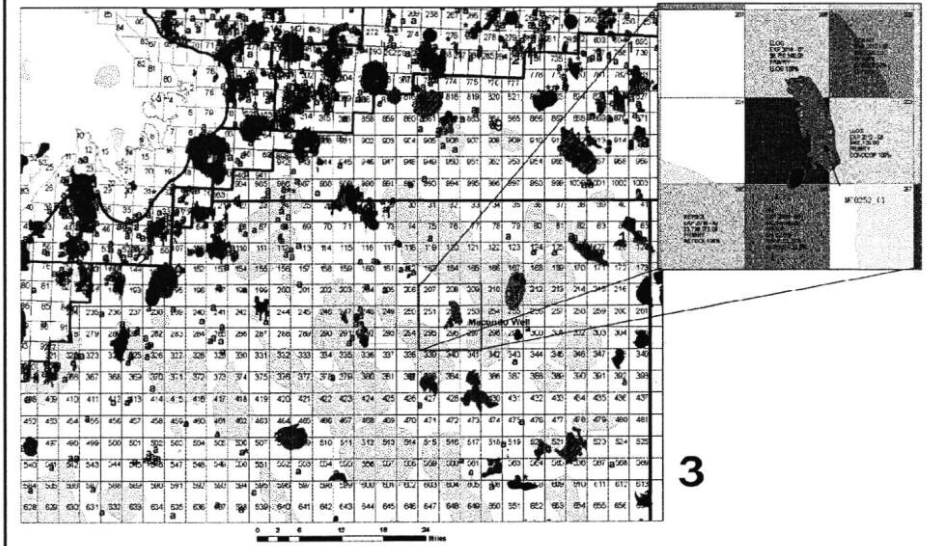
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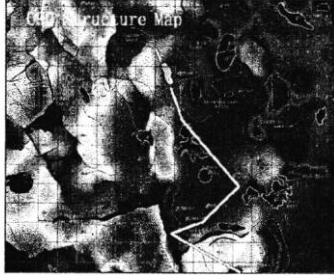
TREX 009283.0001



Macondo MC0252_1 Well Location

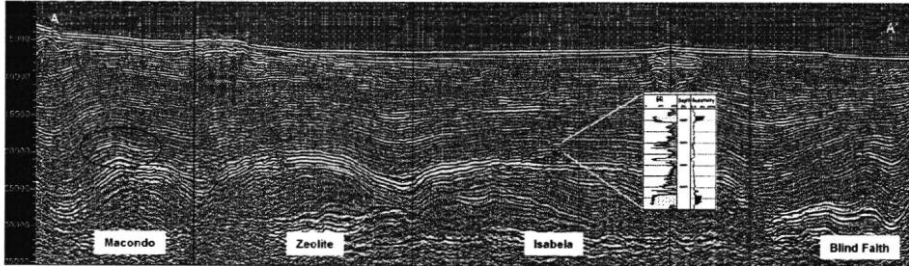


Macondo - Regional Context



- Miocene first carrier bed play
- Far offset response across structural high (stronger than Isabela)
- Near BP infrastructure (NaKika, Pompano and Horn Mountain)
- Successfully acquired March 2008
- Spud ready June 15th, 2009

CCS 205 bbls	
BP	\$34MM
LLOG	\$33.6MM
Noble	\$17.2MM
RedWillow/DeepCult/HoustonEnergy	\$14.1MM
ENI/Newfield/Mariner	\$4.6MM
Anadarko	\$2.1MM









PreSDM_WEM_rmofar_3046_EPT (Macondo – Isabela – Blind Faith)









Risk Matrix: Macondo M56
Fluid type: oil

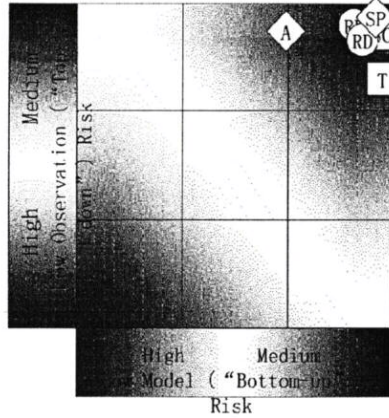








Top Down Observations

-  4-way mapped on spec and proprietary processed PrSDM data; 4-way does not close in time
-  Isabela M55 and M56 shales provide seal; M57 proven regional seal
-  Proven source rock in GoM; Just north of Nakika Fields
-  Amplitude conformance and local RP modeling suggest hydrocarbon signatures
-  AVO signatures indicative of Lithology indicating sand presence
- 

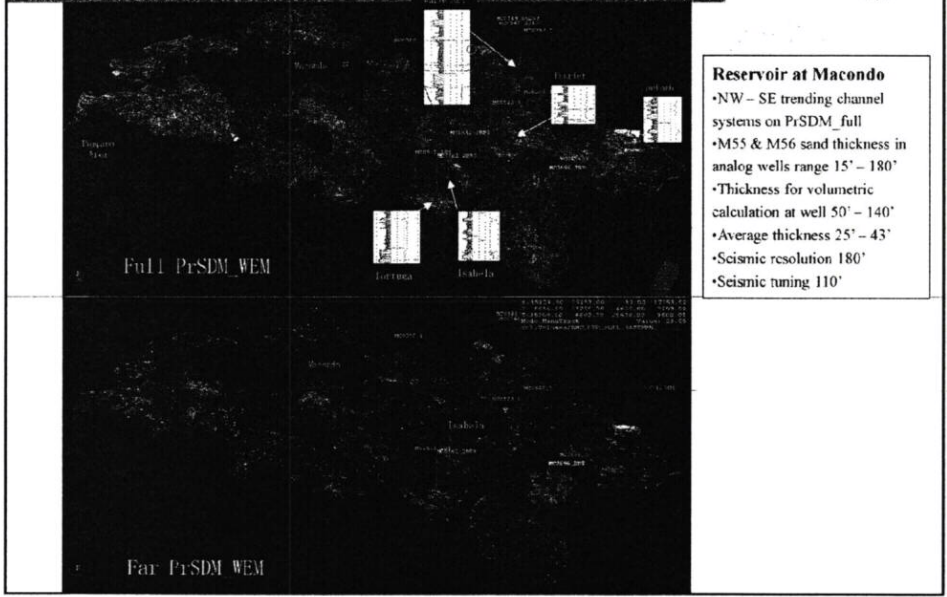
Bottoms Up models

-  4 way structure
-  Column height of 600ft within calculated seal capacity
-  Petroleum systems model suggest source rock is mature
-  Slight defocus at K40
Possible lower perm below M56
-  Eastern MC Wells penetrating below the M57 developed sand packages
-  Established porosity depth/temperature relationship



 Container / Trap Presence	 Source Presence	 Reservoir Presence
 Seal Presence/ Column	 Charge Access	 Reservoir Deliverability

Macondo - Reservoir

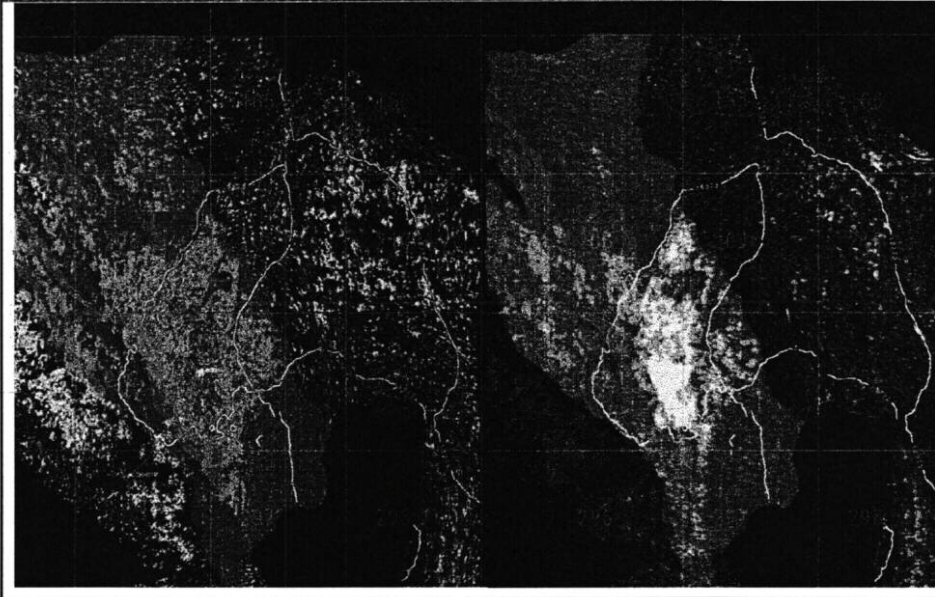


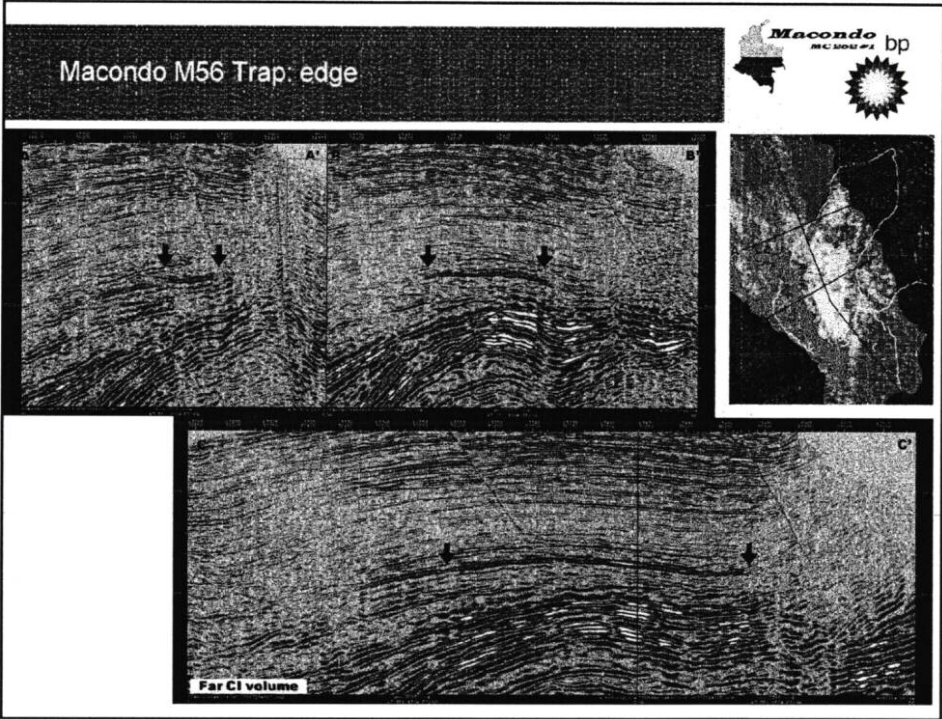
Macondo M56 Trap: Depth Structure



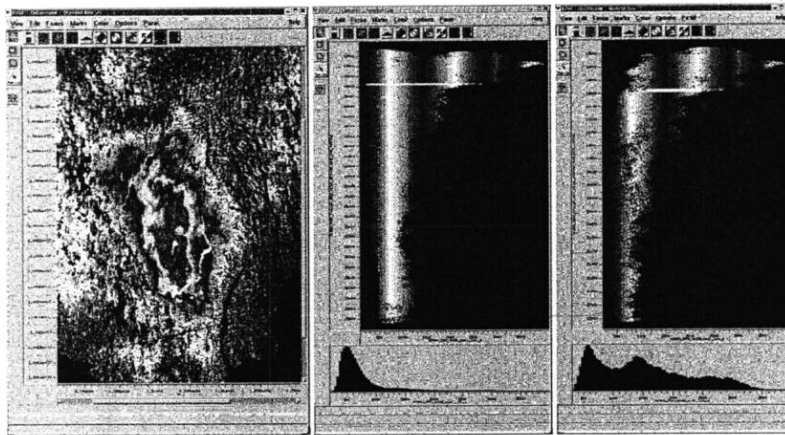
- 4 way closure
- Good image at shallow and deeper sections showing 4-way closure.
- Mapped on WEM, Kirchhoff and beam volumes.
- Spill point 18775 ft TVDSS
- Crest 18,120 ft TVDSS

Macondo M56 Trap: Depositional interpretation



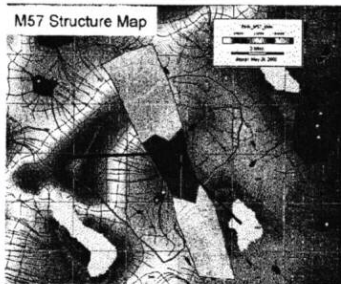
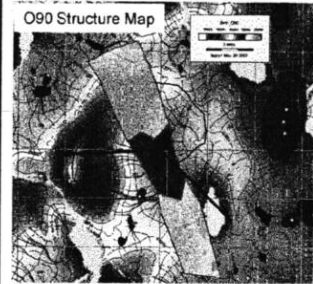
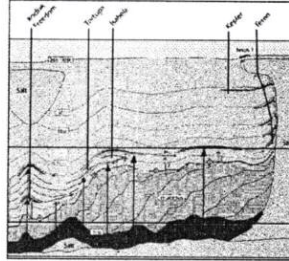
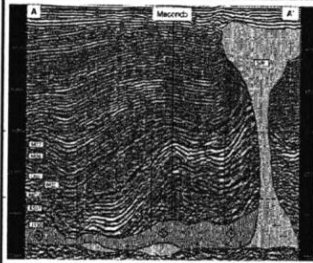


Macondo M56 Amplitude Conformance



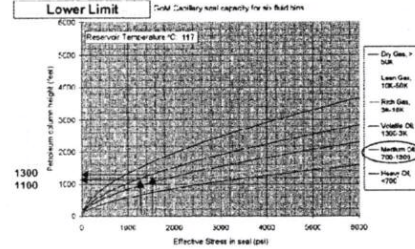
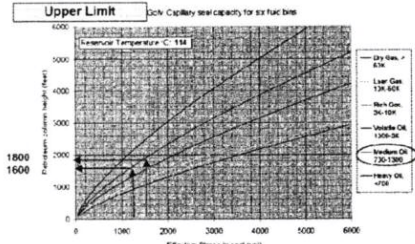
- A/B ~ 2-2.5 (matches modeling); more continuous; main part in block 252
- Brine observed with full stack: type 1 to 2p → More than one sands types?

Macondo – charge access



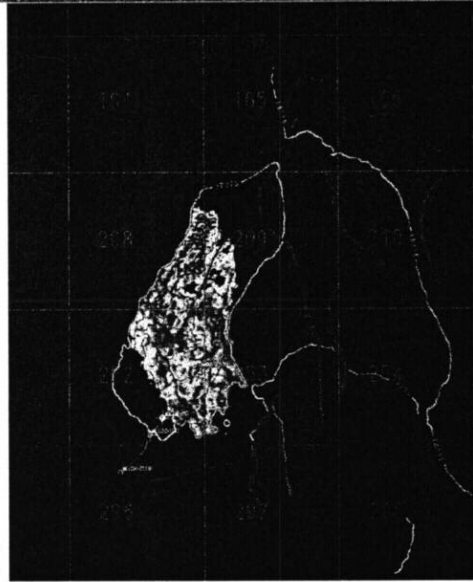
- Charge Description**
- Source rock present and mature across fetch area
 - Deep focus at Macondo (not present at Tortuga and Isabela)
 - Bottom up and top down support for oil
 - API 29-33-37
 - GOR 500-800-1300
 - Primary model for fetch area sufficient for ml volumes;
 - Macondo is likely filled to spill
 - Top down support for hydrocarbons (DHI)
 - Charge access is deemed to be low risk
 - CoF = 20%, for oil in the M56
 - lack of perfect visibility in deep permeability

Effective Stress & Column Height



- M56**
- Max column height (spill point) = 750 feet
 - Seal Capacity = 1300 – 1800
 - M56 should fill to spill if not charge limited
 - *DHI supports fill to spill and no shallower DHI's observed*
- M55**
- Max column height (spill point) = 900 feet
 - Seal Capacity = 1100 – 1600
 - M55 should fill to spill if not charge limited
 - no convincing evidence of well developed M55 reservoir across the structure
 - M56 still likely to have direct access to charge

M56 Net Rock Volume: Most Likely case



Areal Extent		Select From Map
Lines	Y 2005 To Y 2005	Working Set
Traces	Y 2060 To Y 2738	Entire Survey
Distance Between Lines (in World Units)		62.02
Distance Between Traces (in World Units)		41.01
Summed Volume		8.5990e+09
Total Area		3.305e+08
Average Thickness		4.3837e-01

Reservoir at Macondo

- NW - SE trending channel systems
- M55 & M56 sand thickness in analog wells range 15' - 180'
- Thickness for volumetric calculation at well 50' - 140'
- Average thickness 25' - 43'
- Seismic resolution 180' - tuning 110'
 - SNPQ - proven results in Nakika
 - 96 ft at proposed location
 - 10 ft cutoff footprint (noise background)
 - Above Spill
 - Channel edge at SSW and NNE
 - Oil case

Macondo - Fluids



Oil FVF – 1.46 bbl/STB

Visc. – 0.8 cp

– Fluid Properties estimated using correlations from most likely properties:

– API Gravity = 33

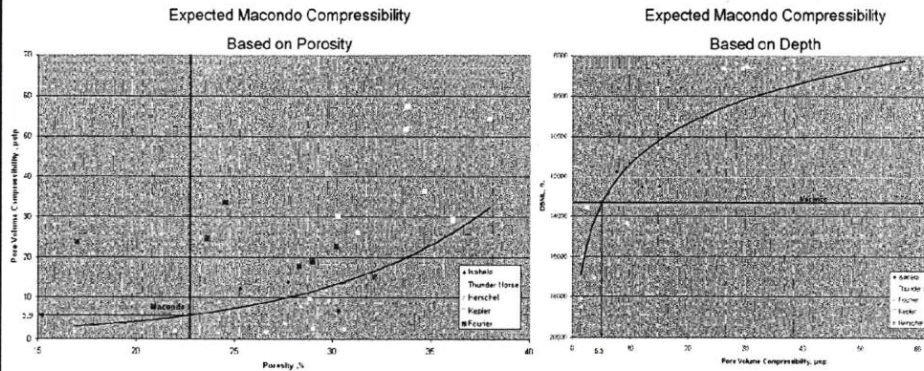
– GOR = 800

– Confirmed against Isabela PVT results (FVF = 1.39 bbl/STB)

– API = 32.8, GOR = 676

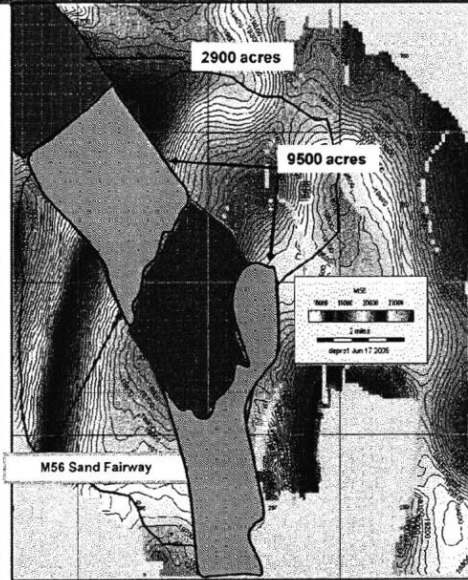
– Predicted FVF = 1.38 using correlations

Macondo RF – Pore Volume Compressibility



- Well developed compressibility trend with porosity and burial depth.
- 5-6 μsip expected at Macondo

**Macondo RF –
Aquifer Size**



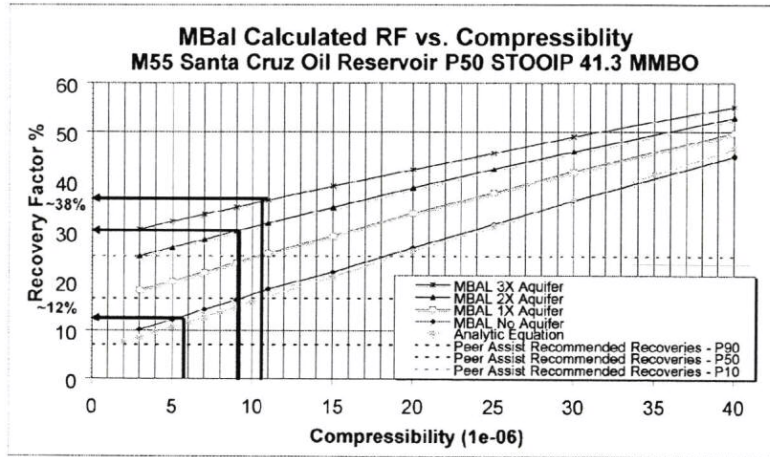
9500 acre Aquifer		
Net Sand Thickness, ft.	Porosity, %	Aquifer Size
44	13	1.5x
44	17	2.0x
66	17	2.9x

12400 acre Aquifer		
Net Sand Thickness, ft.	Porosity, %	Aquifer Size
44	13	1.9x
44	17	2.5x
66	17	3.7x

Macondo Recovery Factor/Core VOI



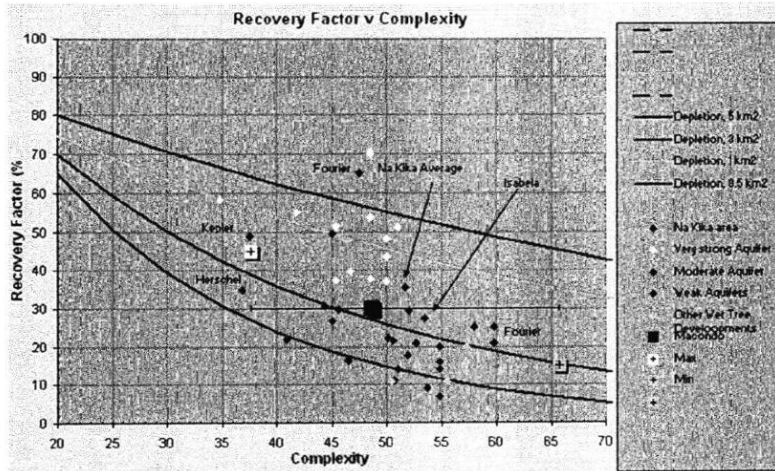
- Pre RVA Estimate: 15% - 30% - 45% based on 6-14-20 μ sip rock
- Update: 12% -30% - 38% 5.7 - 9.1 - 10.4 μ sip rock



Macondo Recovery Factor



GoM Depletion Drive Subsea Developments



Upside potential exists if strong aquifer is present

Macondo - RISK 2000 Inputs



Risk2000: M56 V2.rsk

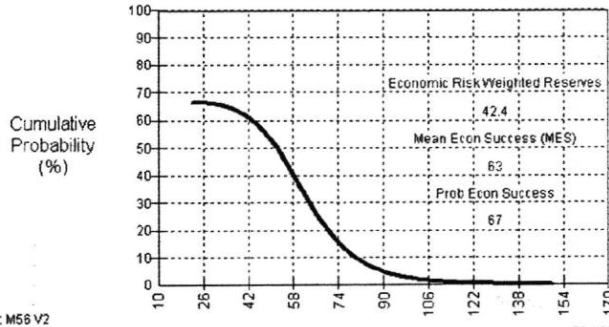
File View Options Tools Help

Macondo_M56_oil		Name	COF	Min	ML	Max	Peak
[-] Properties		Source Failure	26				
[-] Source (Primary)		Degree of Fill			100		10
[-] Trap		Phase Prediction			0		10
[-] Recovery		Fetch Area					
[-] Economic Threshold		UOP oil					
[+] Results		Transformation - oil					
[-] Effective Pore Volume		Trap Volume Failure	10				
[-] Reservoir Volume (oil)		Res. Total Volume		90376	197199	365680	5
[-] Oil in Place		Res. Thickness		25	42	44	5
[-] Recoverable Oil		Res. Area		3639	4498	8697	10
[-] Solution Gas		Res. Shape Factor			1		10
[-] Total Gas and Liquids		Net-to-gross Ratio			100		10
[-] Entitlement Recoverable C		Reservoir Porosity	0	17	23	28	5
[-] Entitlement Solution Gas		Oil Saturation Factor		60	75	80	5
[-] Entitlement Gas and Liquid		Oil Formation Volume F...		1.31	1.46	1.61	5
[-] Failure Modes		Oil Seal Integrity	0		100		10
[-] Quad Plot		Oil Recovery Factor	0	15	30	45	5
		Gas/Oil Ratio		500	800	1300	5

Macondo – Resource Volume



Macondo M56 oil: Total Gas and Liquids




file: M56 V2
 Def: 61.7
 COFs(%): SrcAct(26) Trap(10)

Risk2000 V5.1
 04/09/09 17:31:17 (last save)

Resource Range (mmboe)

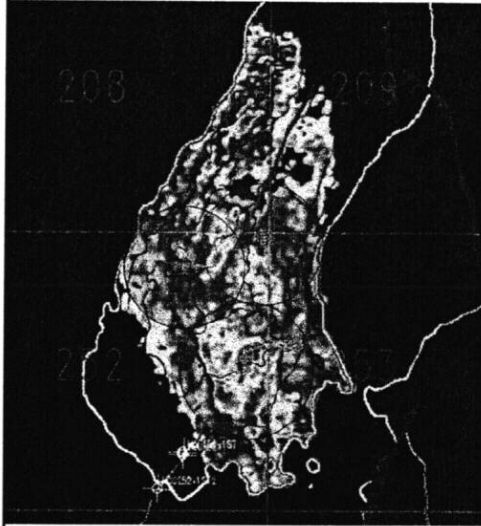
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44	64	86



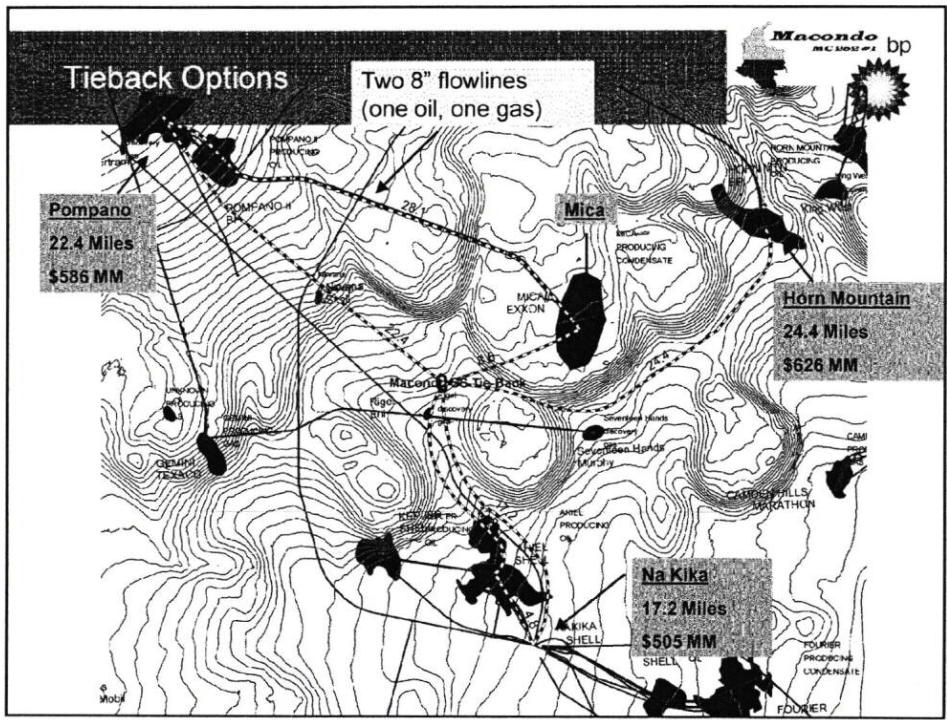
Macondo – Development

Based on appraisal of exploration well only

Macondo - Development Plans



- Three well subsea tie-back.
- Exploration well saved for production
- Average well spacing = 1500 Acres
- Drainage Area = 1000 Acres
- Estimate 80% of prospect resource recoverable from wells on MC 252
- Only 252 volume will be booked
- Recovery per well = 17 mmbob



Final Resource Volume will be based on:



- Open hole logs
 - Acquisition to begin 12/2/09
- Fluid properties
 - Correlations from single stage flash API, GOR
- Little new analysis needed if well results are close to expectations
- Approach to be confirmed with Exploration HoD

bp

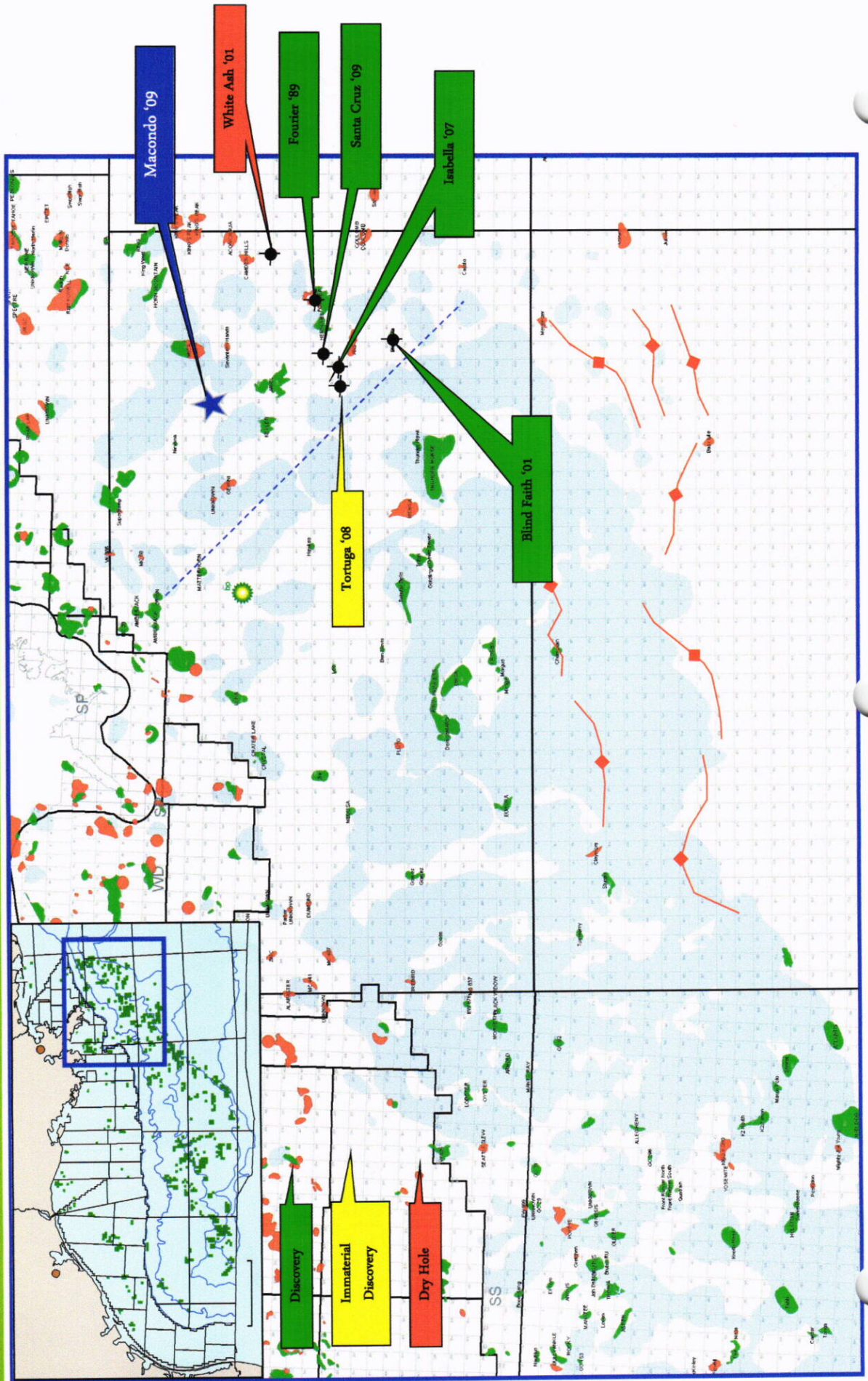


Macondo RSDP Pre-drill Review

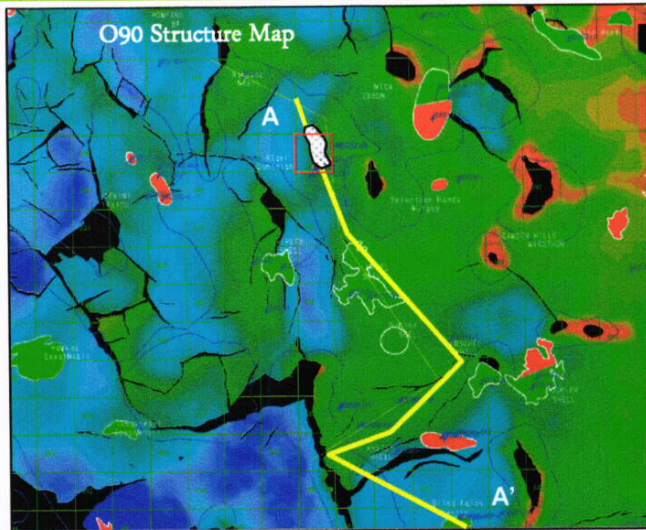
5 November 2009



Location map



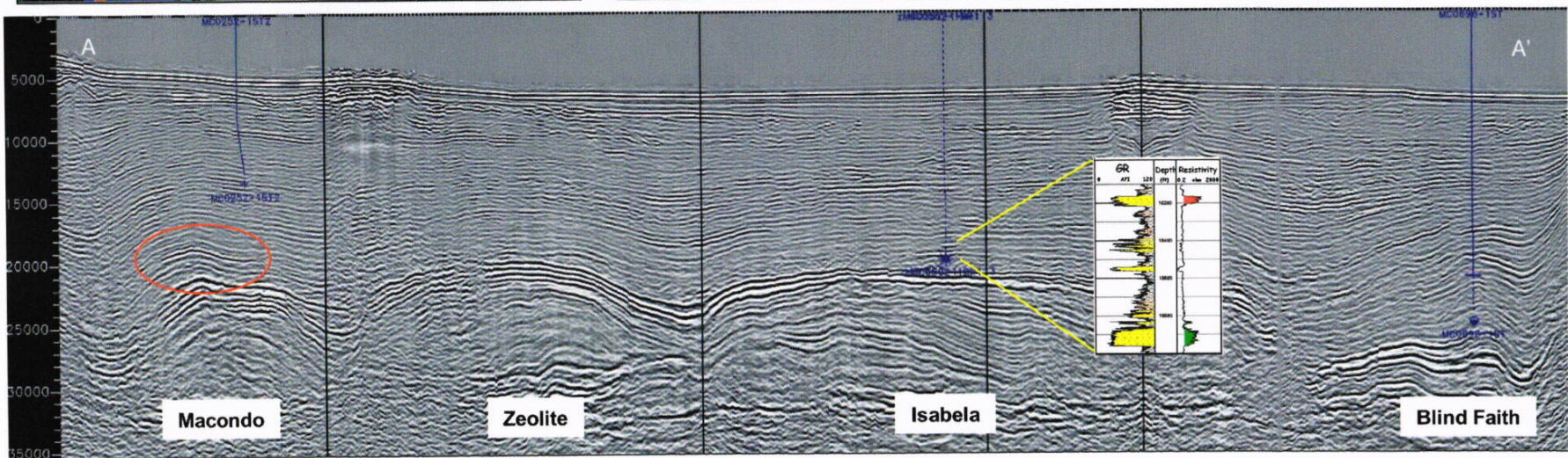
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OCS 206 bids

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LLOG	\$33.6MM
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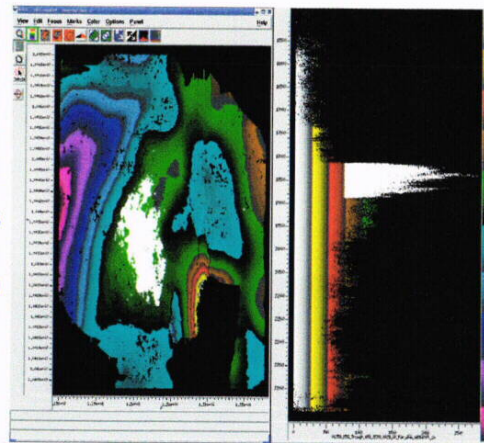
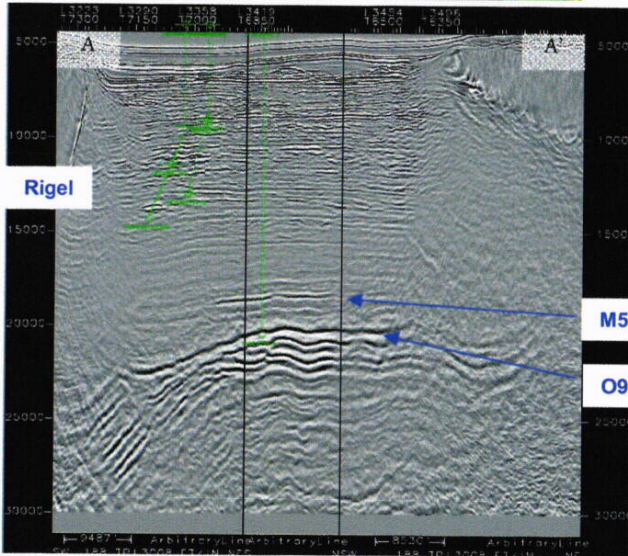
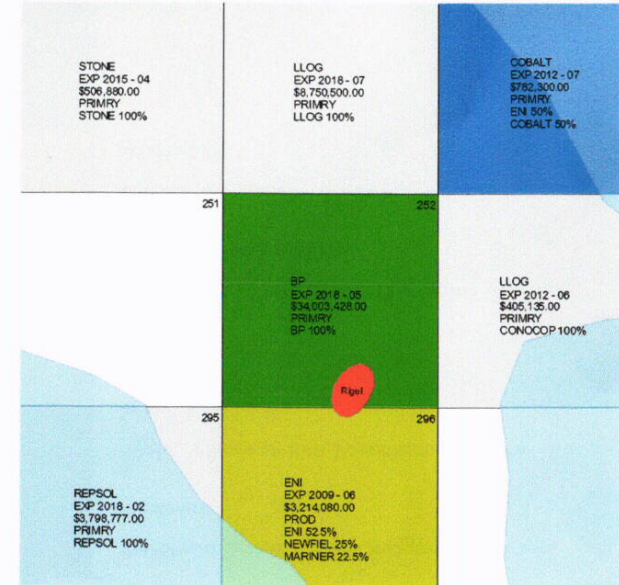
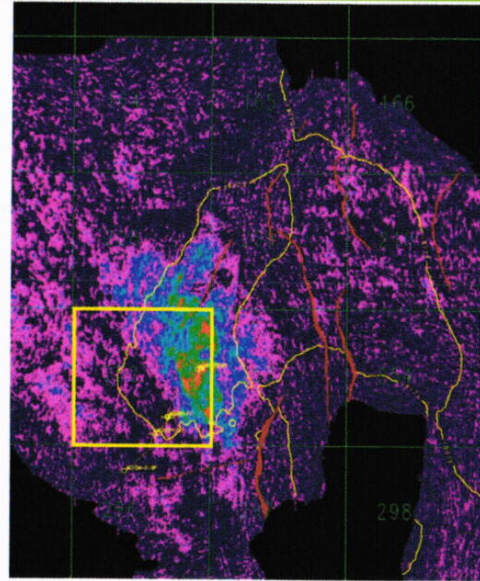
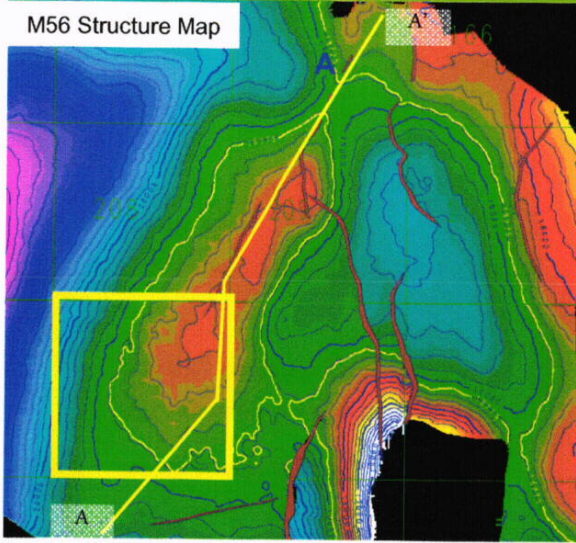


PreSDM_WEM_rmofar_3046_EPT (Macondo – Isabela – Blind Faith)

Macondo M56



M56 Structure Map



Prospect Name:	Macondo
Category:	Prospect
Water depth:	-4913
Trap:	4-way (DHI support)
Target(s):	M56
GDE:	Channel Levee
4-way Structure:	6700 acres
Prospect acres:	4500 acres ML
Unrisked Volume:	44-64-86 mmboe
Critical risks:	Charge Access
Ps:	.67
Recommendation:	drill

Risk Matrix: Macondo M56

Fluid type: oil

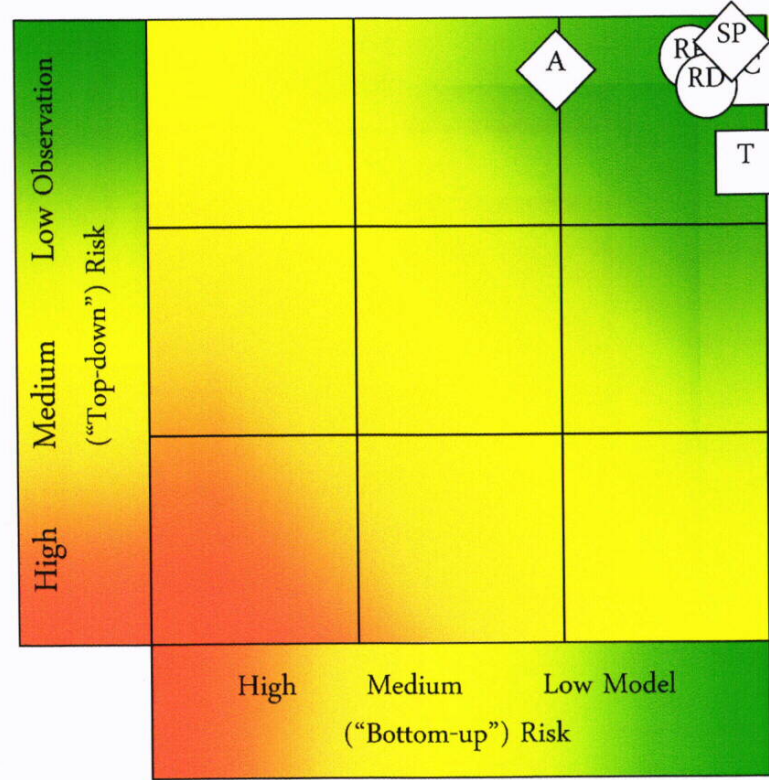


Top Down Observations

- T** 4-way mapped on spec and proprietary processed PrSDM data; 4-way does not close in time
- SC** Isabela M55 and M56 shales provide seal; M57 proven regional seal
- SP** Proven source rock in GoM; Just north of Nakika Fields
- SP** Amplitude conformance and local RP modeling suggest hydrocarbon signatures
- A** AVO signatures indicative of Lithology indicating sand presence
- RP** Porosity and permeability of Santa Cruz and Isabela
- RD**

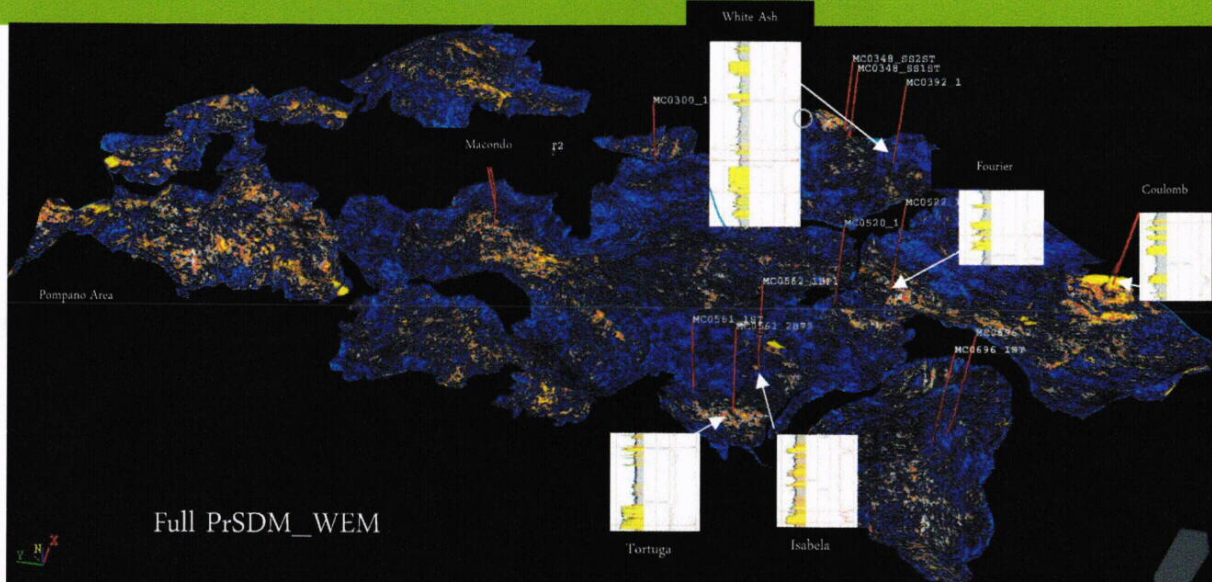
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- T** 4 way structure
- SC** Column height of 600ft within calculated seal capacity
- SP** Petroleum systems model suggest source rock is mature
- A** Slight defocus at K40 Possible lower perm below M56
- RP** Eastern MC Wells penetrating below the M57 developed sand packages
- RD** Established porosity depth/temperature relationship

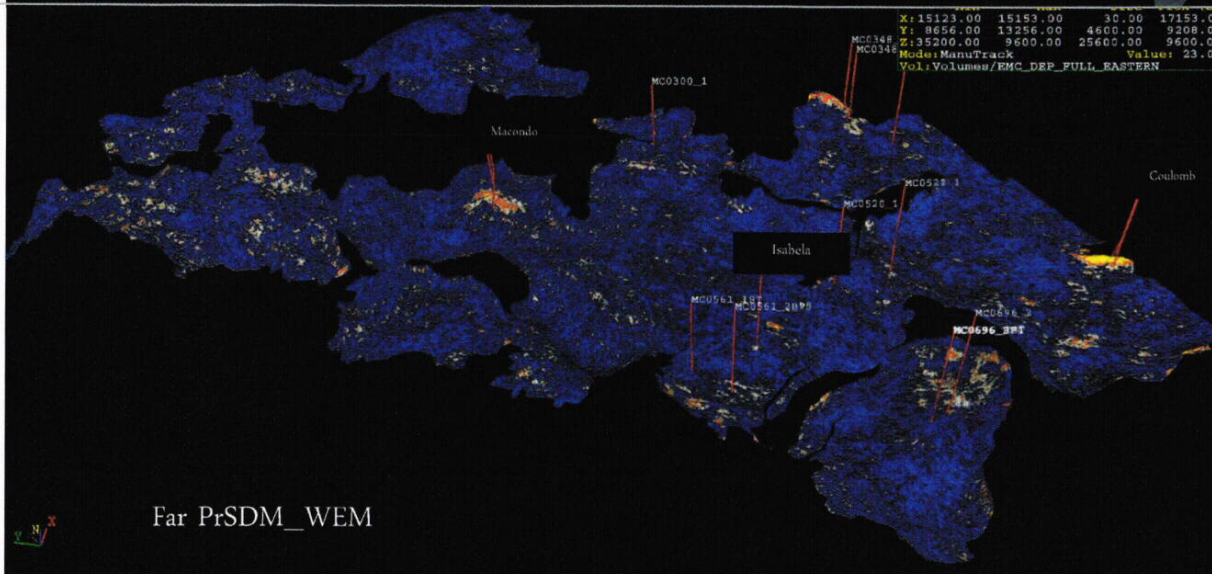


T Container / Trap Presence	SP Source Presence	RP Reservoir Presence
SC Seal Presence/ Column	A Charge Access	RD Reservoir Deliverability

Macondo - Reservoir



Full PrSDM_WEM



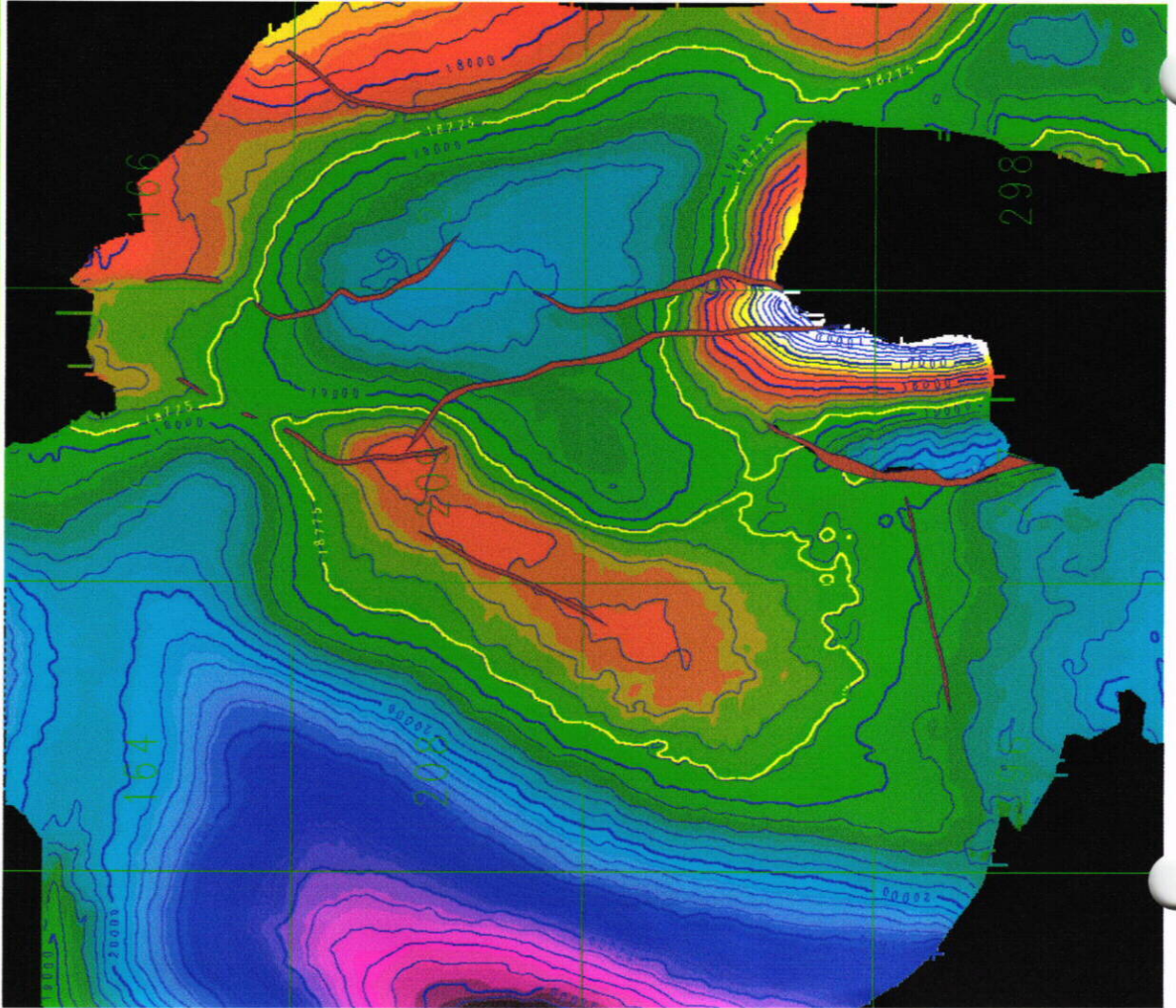
Far PrSDM_WEM

Reservoir at Macondo

- NW – SE trending channel systems on PrSDM_full
- M55 & M56 sand thickness in analog wells range 15' – 180'
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- Average thickness 25' – 43'
- Seismic resolution 180'
- Seismic tuning 110'



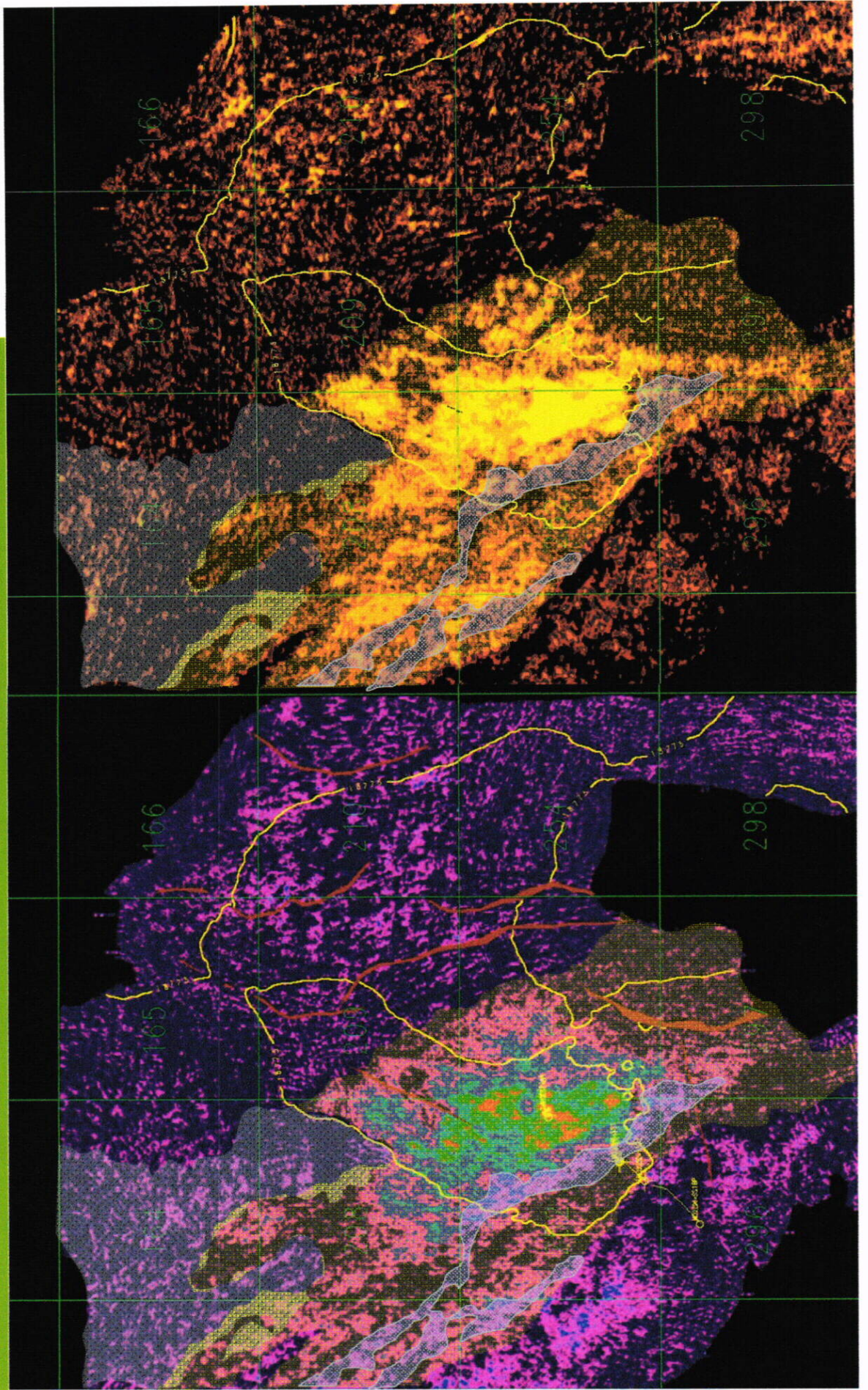
Macondo M56 Trap: Depth Structure



- 4 way closure
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- Crest 18,120 ft TVDSS

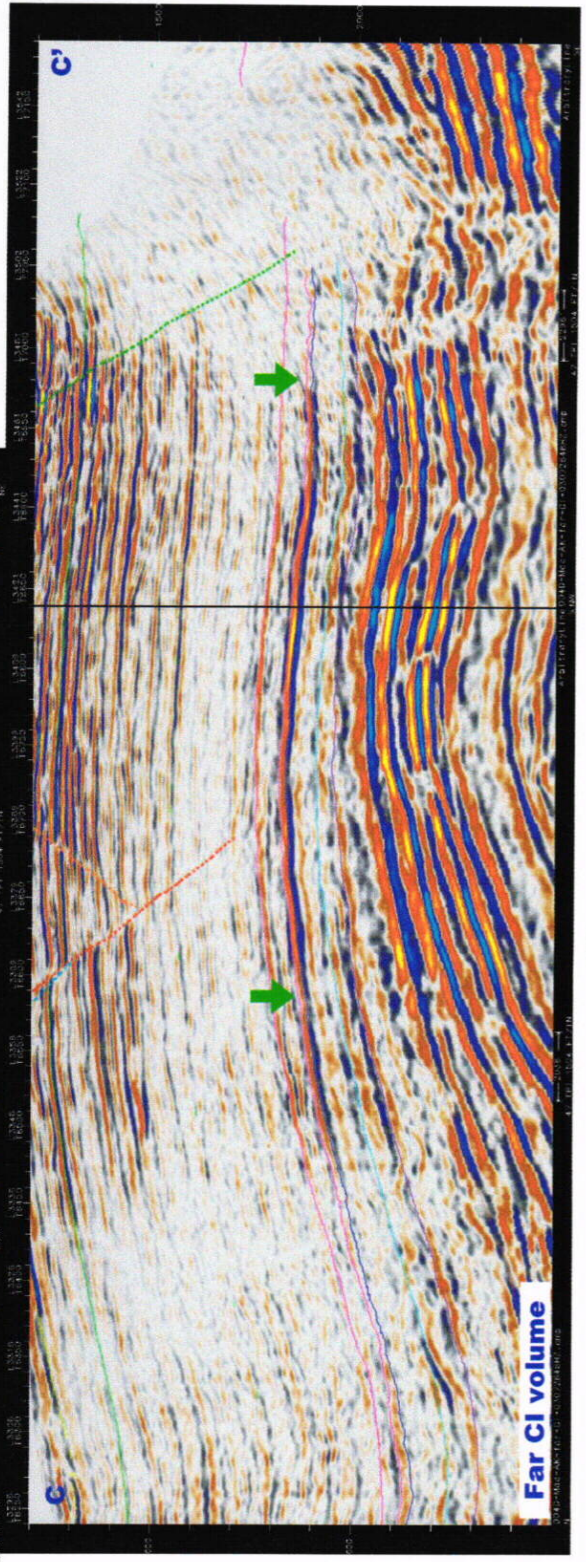
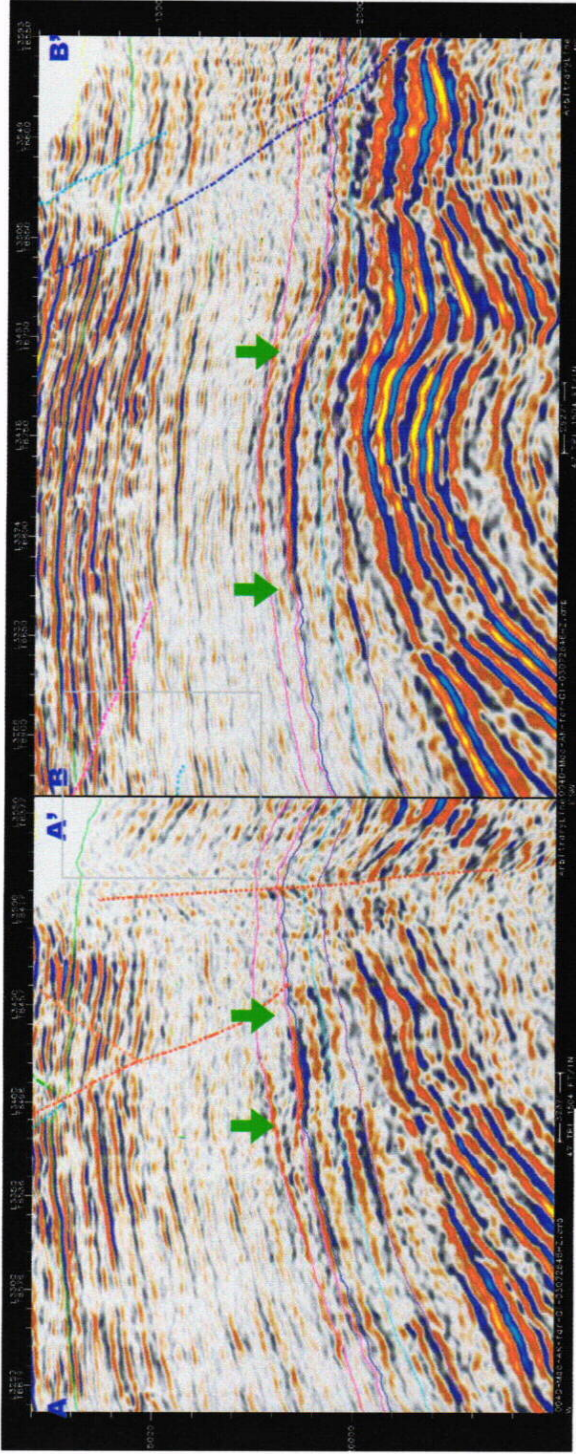
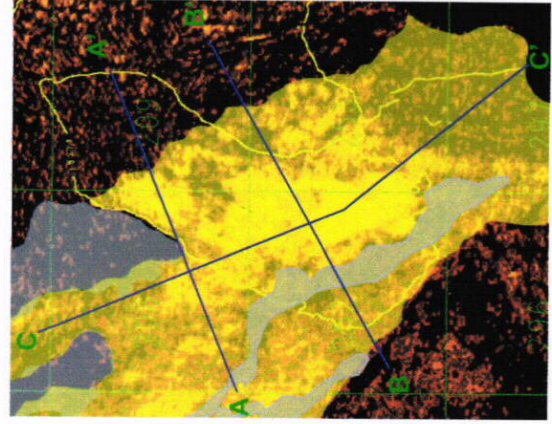


Macondo M56 Trap: Depositional interpretation

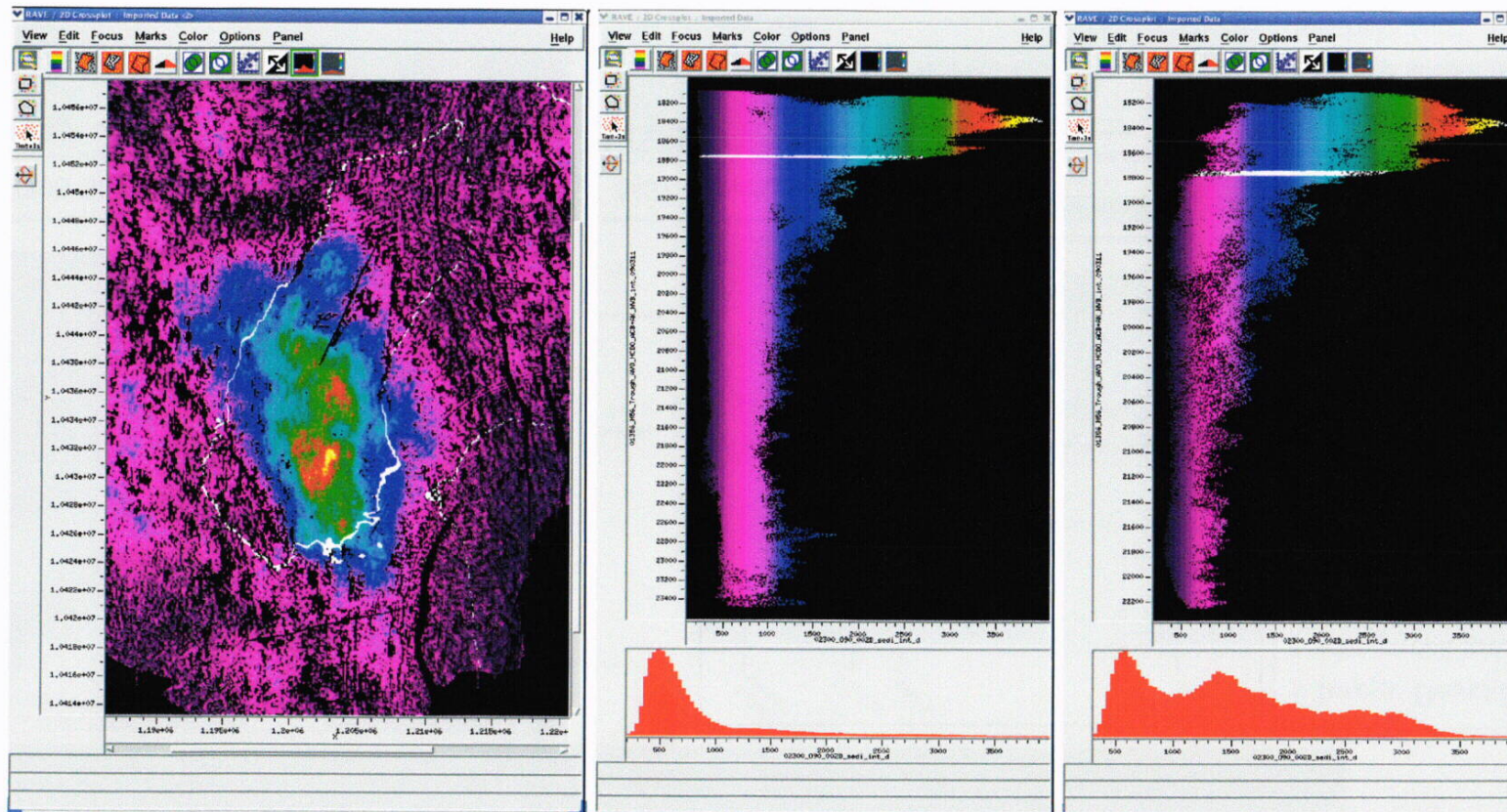




Macondo M56 Trap: edge

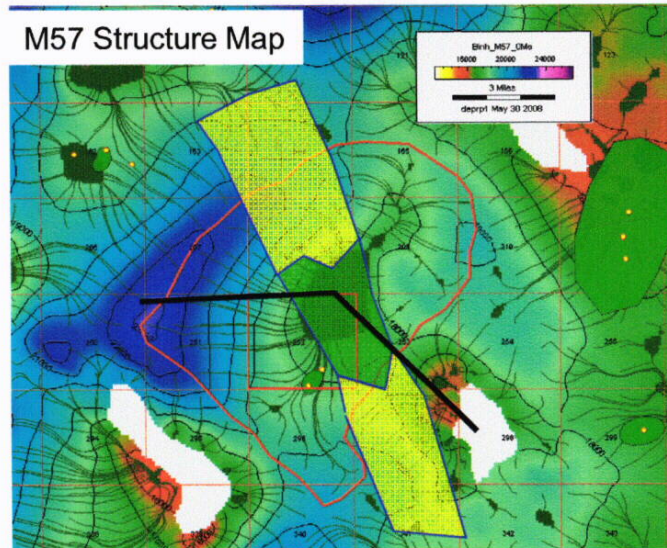
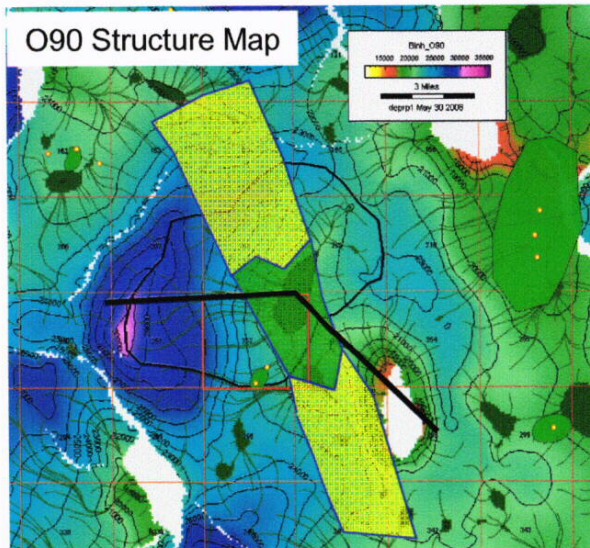
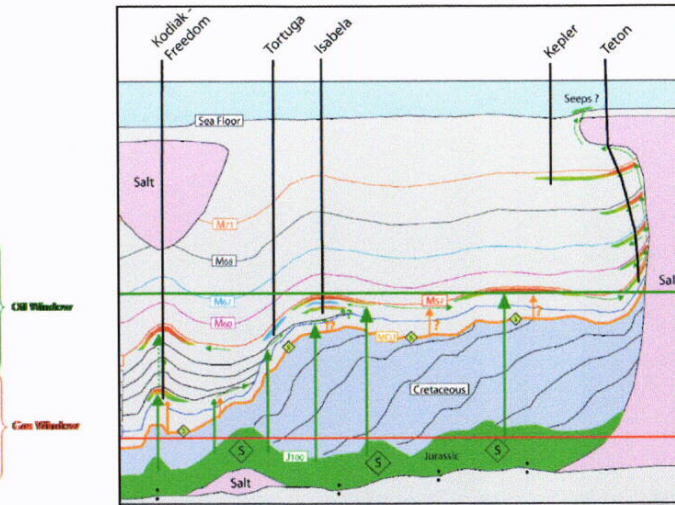
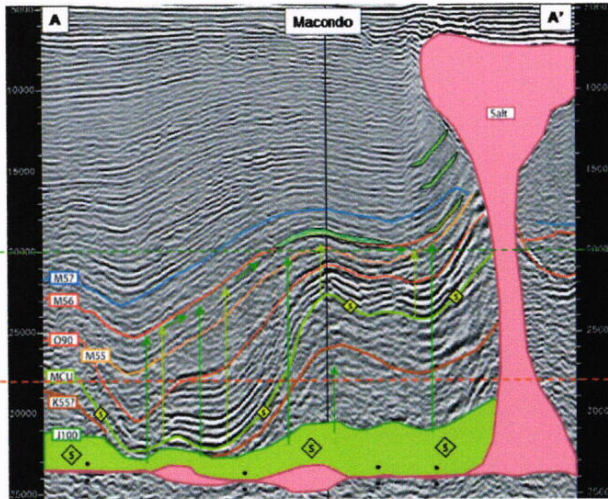


Macondo M56 Amplitude Conformance



- A/B ~ 2-2.5 (maches modeling); more continuous; main part in block 252
- Brine observed with full stack: type 1 to 2p → More than one sands types?

Macondo – charge access



Charge Description

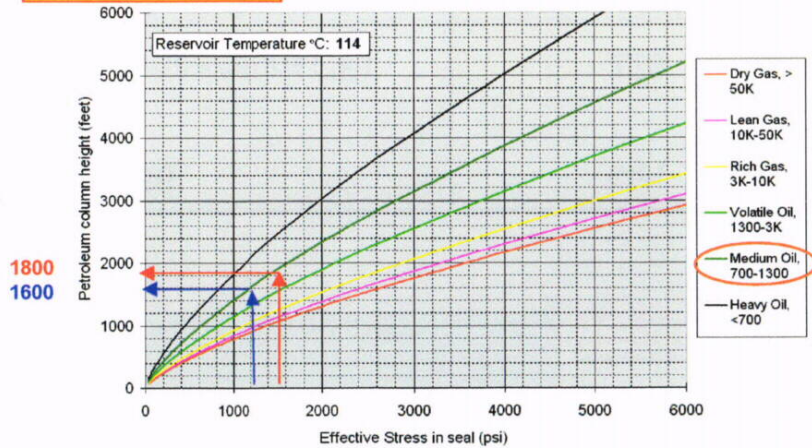
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- Charge access is deemed to be low risk
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 - lack of perfect visibility in deep permeability

Effective Stress & Column Height



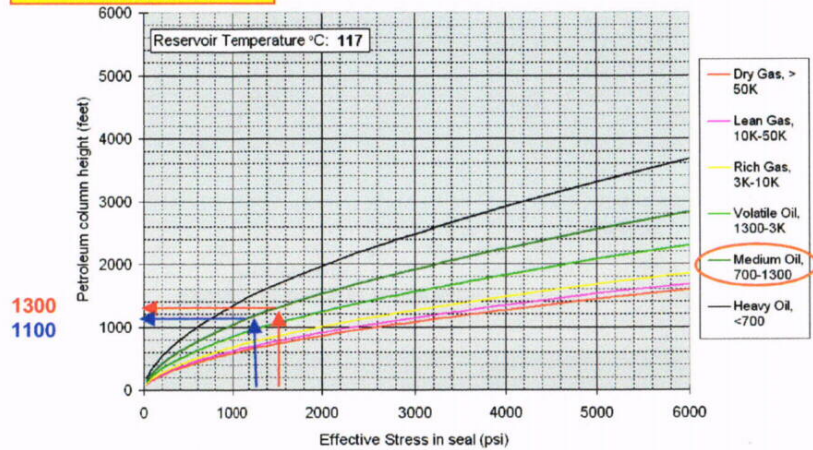
Upper Limit

GoM Capillary seal capacity for six fluid bins



Lower Limit

GoM Capillary seal capacity for six fluid bins



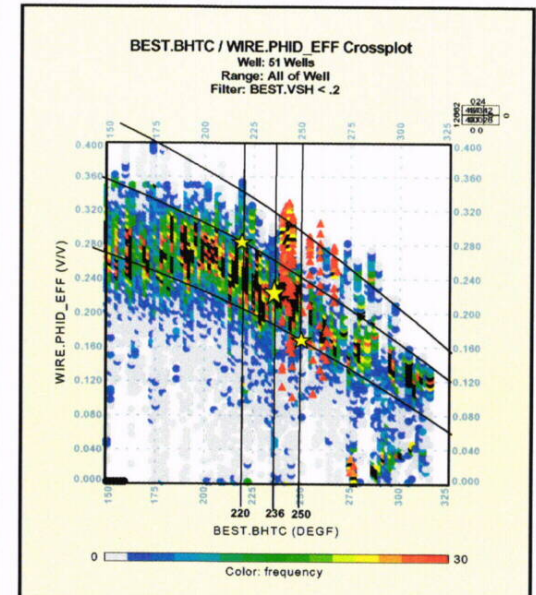
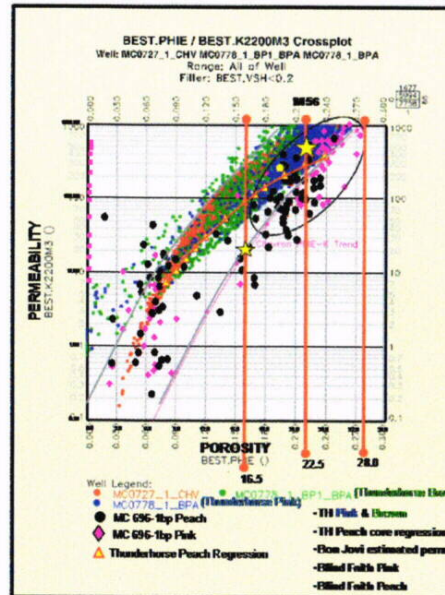
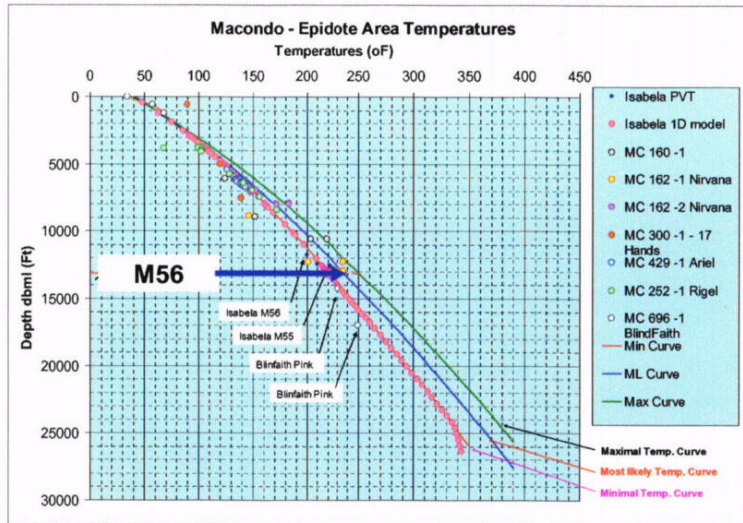
M56

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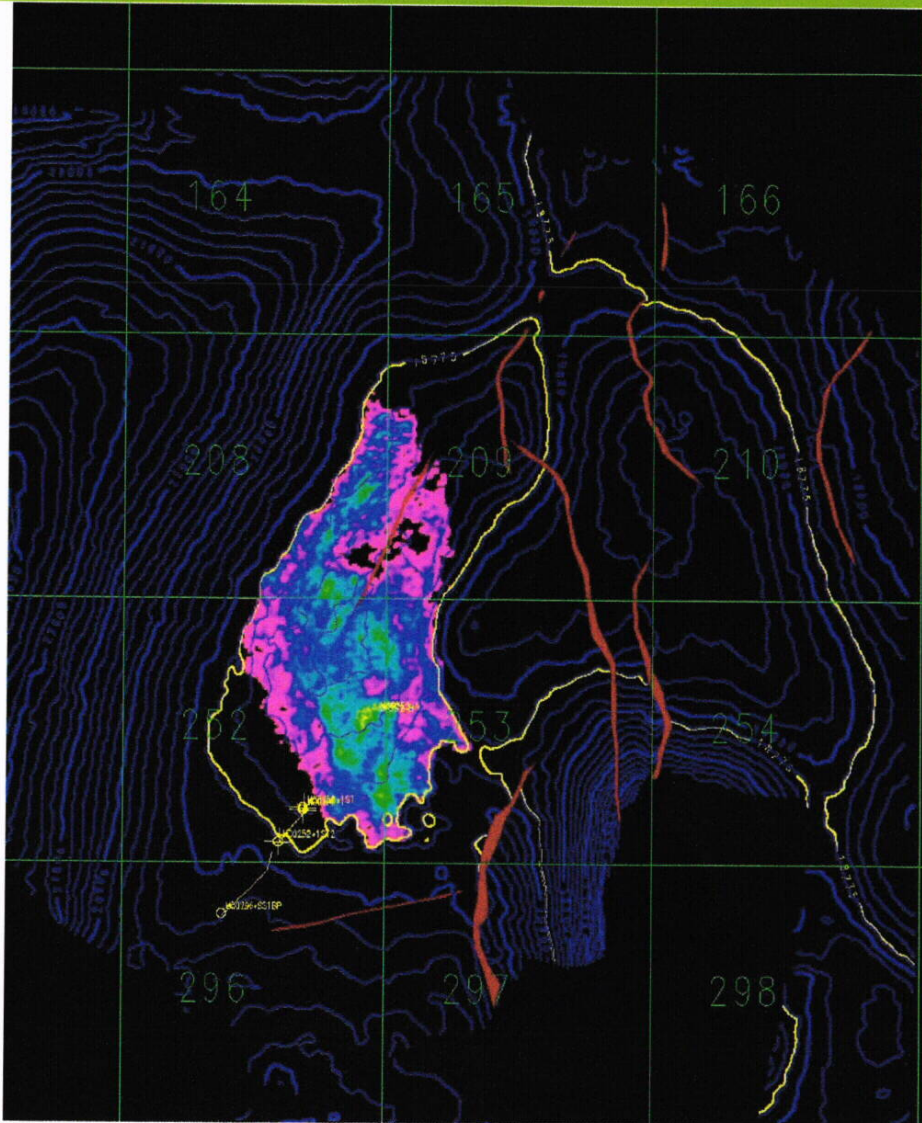
Reservoir Quality



M56	Min	Most likely	Max
Temperature (°F)	220	236	250
Porosity (%)	17	23	28
Permeability (mD)	20	500	1000+

- Enough well control for established temperature, porosity and permeability trends
- Reservoir quality is unlikely to be an issue

M56 Net Rock Volume: Most Likely case



Areal Extent		Select From Map
Lines	▼ 2989 ▲ To ▼ 3905 ▲	Working Set
Traces	▼ 5560 ▲ To ▼ 7638 ▲	Entire Survey
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Total Area		1.9595e+08
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Oil FVF – 1.46 bbl/STB

Visc. – 0.8 cp

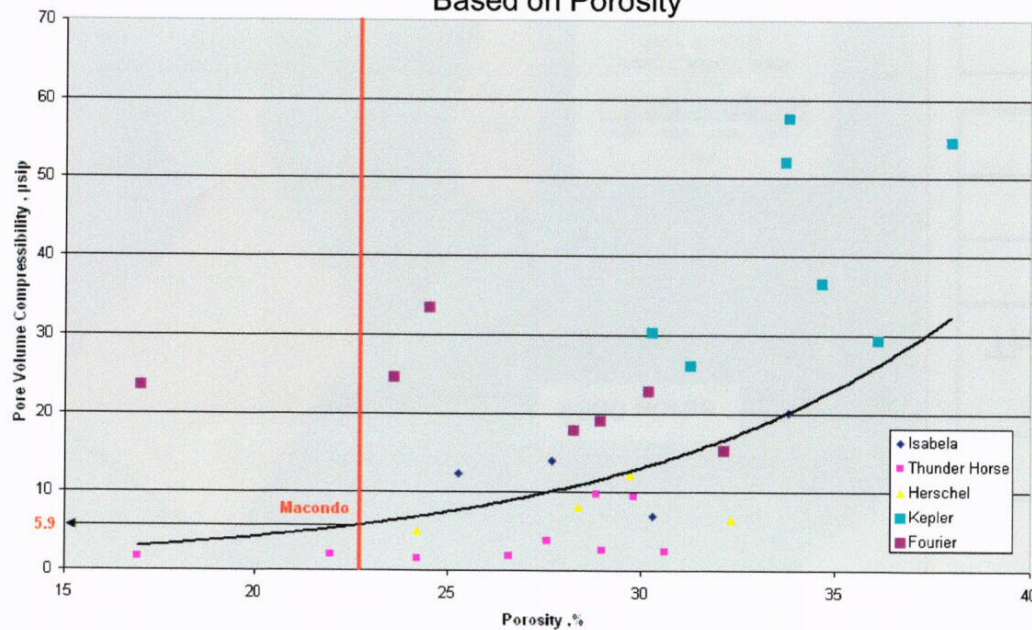
- Fluid Properties estimated using correlations from most likely properties:
 - API Gravity = 33
 - GOR = 800

- Confirmed against Isabela PVT results (FVF = 1.39 bbl/STB)
 - API = 32.8, GOR = 676
 - Predicted FVF = 1.38 using correlations

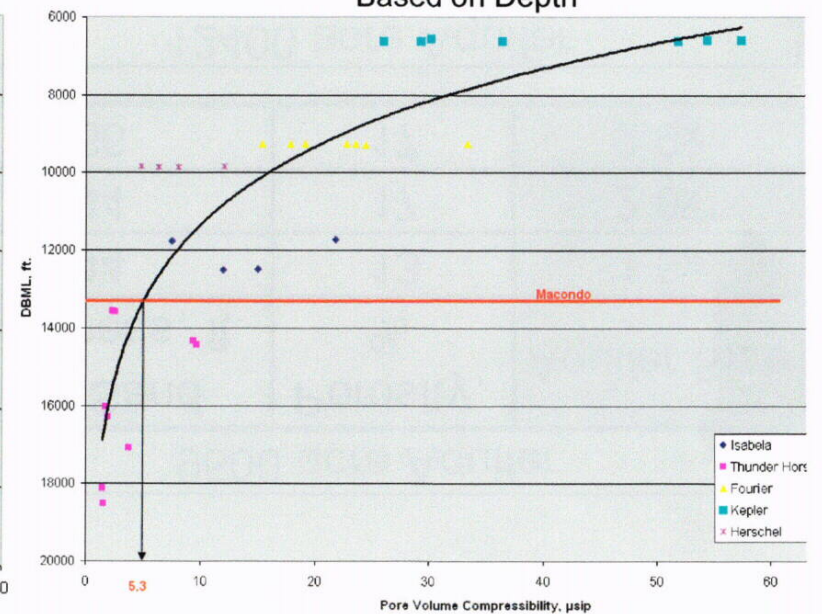
Macondo RF – Pore Volume Compressibility



Expected Macondo Compressibility
Based on Porosity

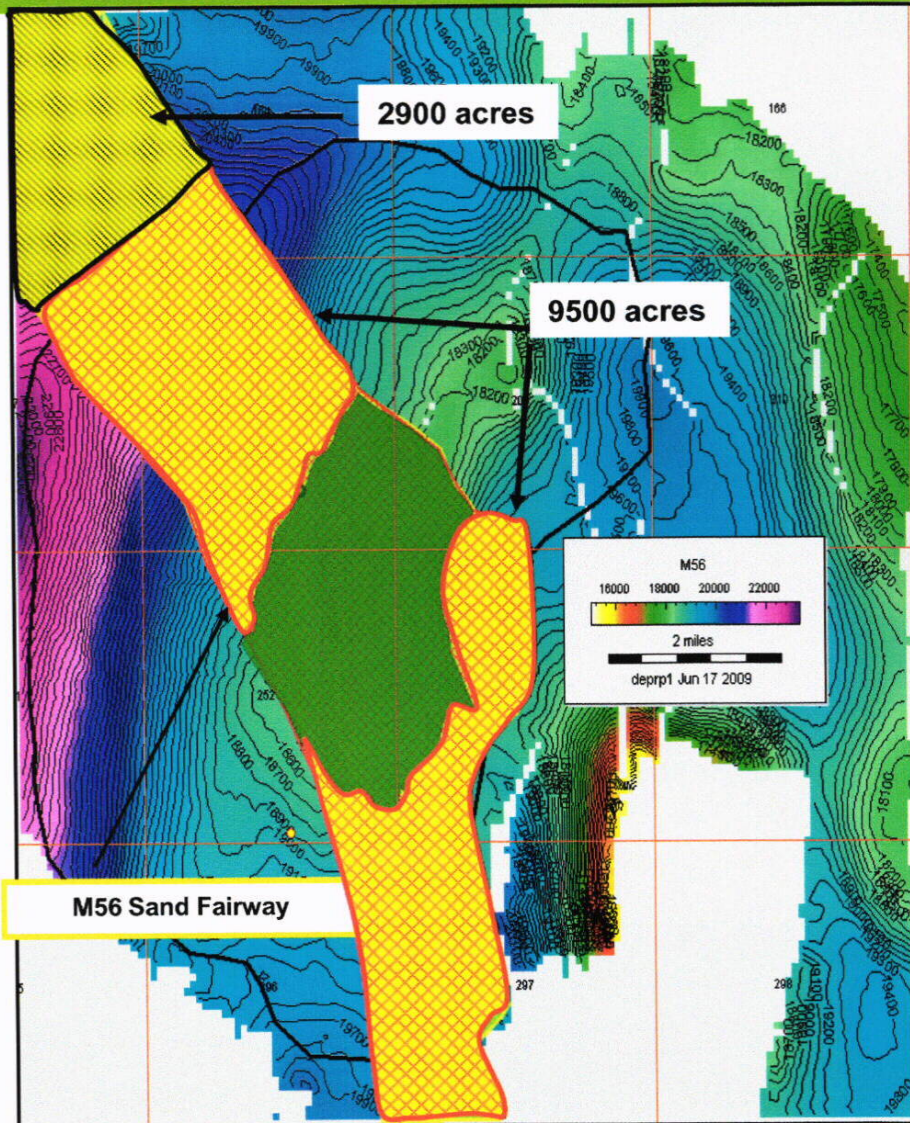


Expected Macondo Compressibility
Based on Depth



- Well developed compressibility trend with porosity and burial depth.
- 5-6 μsip expected at Macondo

Macondo RF – Aquifer Size



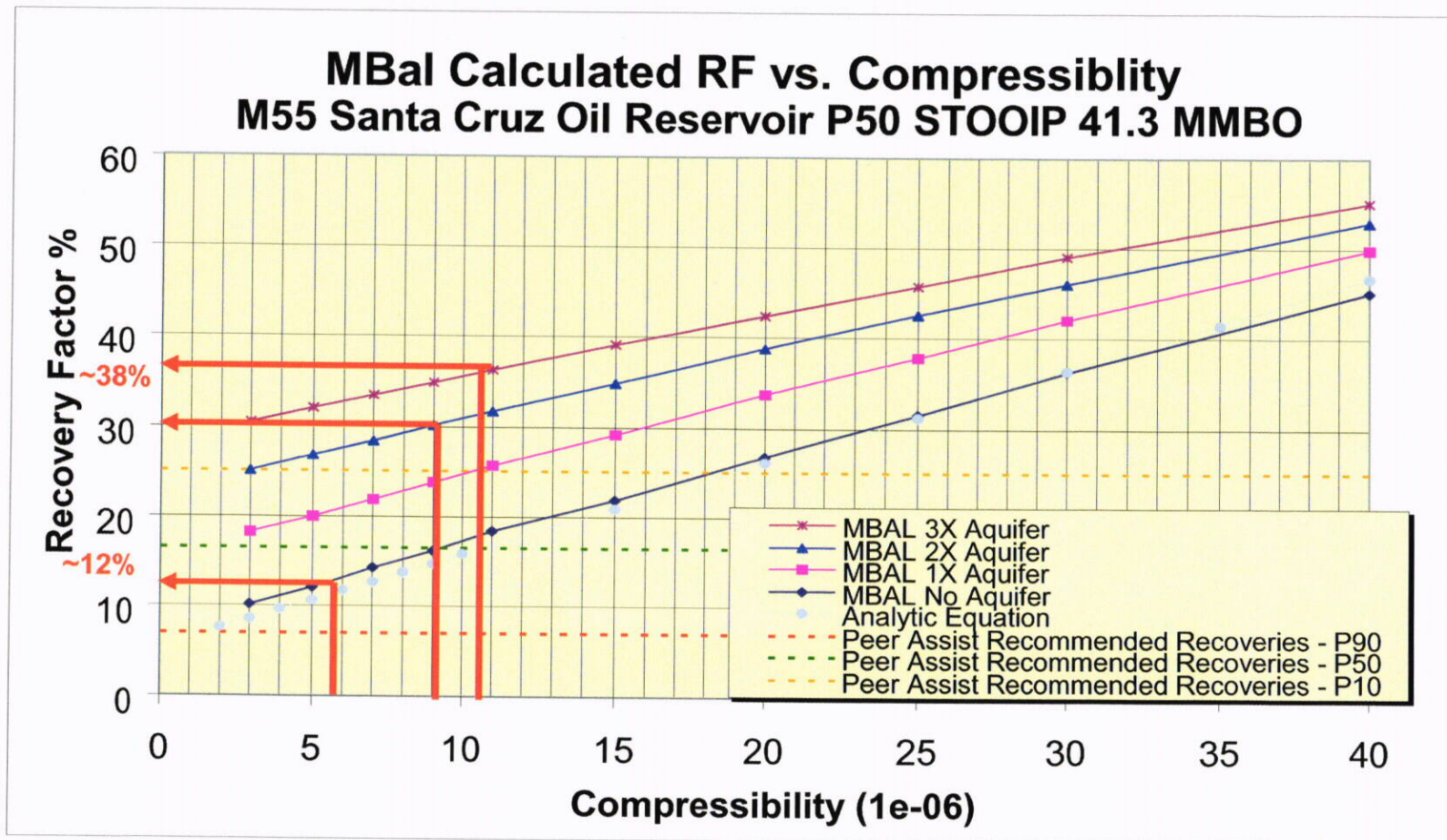
9500 acre Aquifer		
Net Sand Thickness, ft.	Porosity, %	Aquifer Size
44	13	1.5x
44	17	2.0x
66	17	2.9x

12400 acre Aquifer		
Net Sand Thickness, ft.	Porosity, %	Aquifer Size
44	13	1.9x
44	17	2.5x
66	17	3.7x

Macondo Recovery Factor/Core VOI



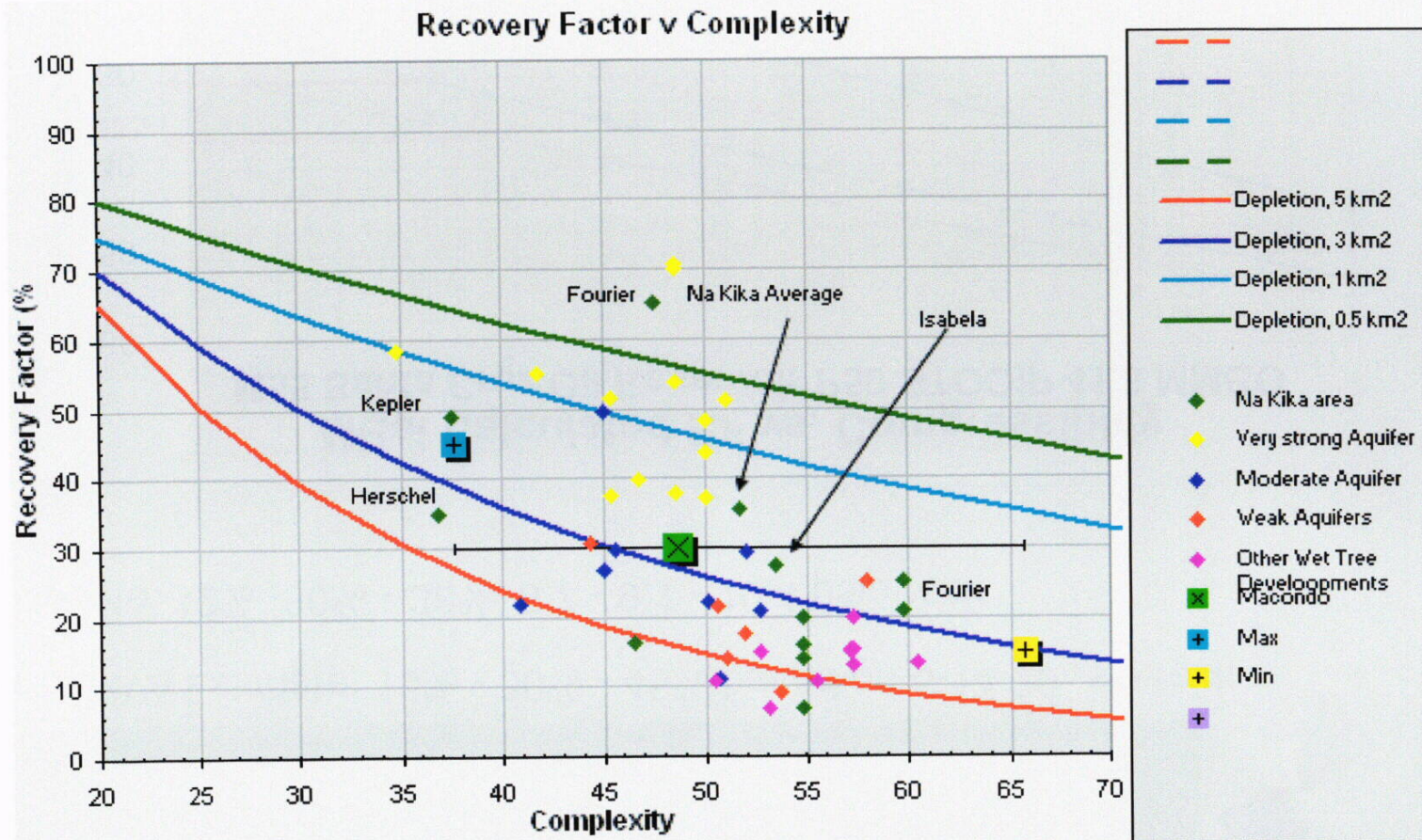
- Pre RVA Estimate: 15% - 30% - 45% based on 6-14-20 μ slip rock
- Update: 12% -30% - 38% 5.7 - 9.1 - 10.4 μ slip rock



Macondo Recovery Factor



GoM Depletion Drive Subsea Developments



Macondo - RISK 2000 Inputs



Risk2000: M56 V2.rsk

File View Options Tools Help

Macondo_M56_oil

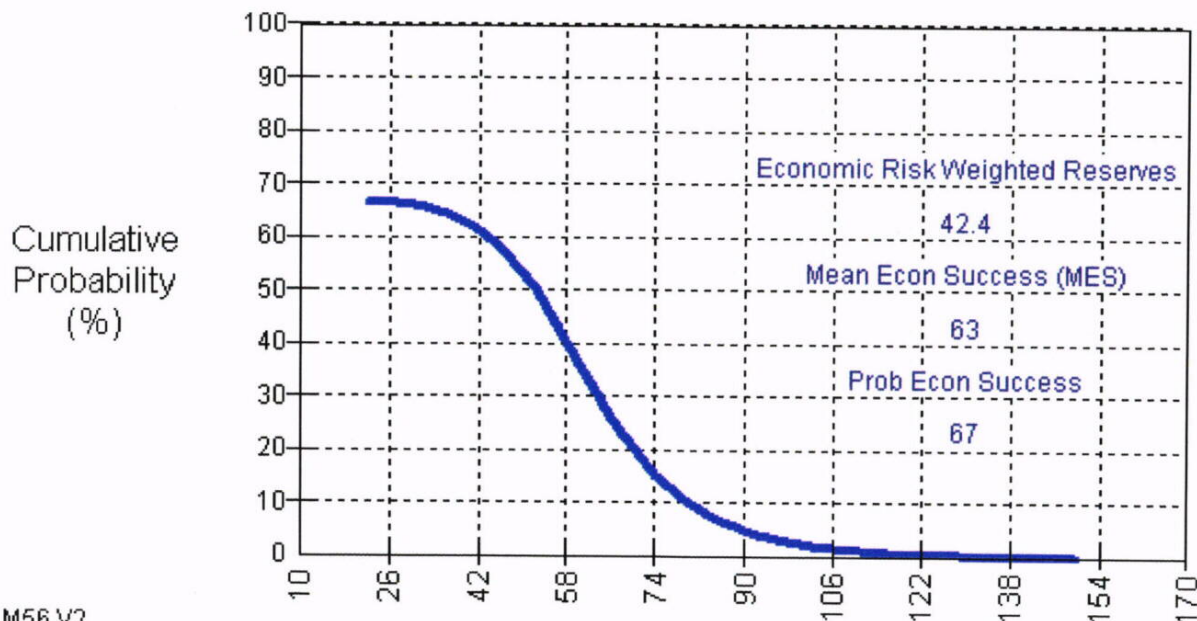
- Properties
- Source (Primary)
- Trap
- Recovery
- Economic Threshold
- Results
 - Effective Pore Volume
 - Reservoir Volume (oil)
 - Oil in Place
 - Recoverable Oil
 - Solution Gas
 - Total Gas and Liquids
 - Entitlement Recoverable C
 - Entitlement Solution Gas
 - Entitlement Gas and Liquid
 - Failure Modes
 - Quad Plot

Name	COF	Min	ML	Max	Peak
Source Failure	26				
Degree of Fill			100		10
Phase Prediction			0		10
Fetch Area					
UGP oil					
Transformation - oil					
Trap Volume Failure	10				
Res. Total Volume		90376	197199	365680	5
Res. Thickness		25	42	44	5
Res. Area		3639	4498	8697	10
Res. Shape Factor			1		10
Net-to-gross Ratio			100		10
Reservoir Porosity	0	17	23	28	5
Oil Saturation Factor		60	75	80	5
Oil Formation Volume F...		1.31	1.46	1.61	5
Oil Seal Integrity	0		100		10
Oil Recovery Factor	0	15	30	45	5
Gas/Oil Ratio		500	800	1300	5

Macondo – Resource Volume



Macondo M56 oil: Total Gas and Liquids



file: M56 V2
 Det: 61.7
 COFs(%): SrcAcc(26) Trap(10)

MMBOE

Risk2000 V5.1
 04/09/09 17:31:17 (last save)

Resource Range (mmboe)

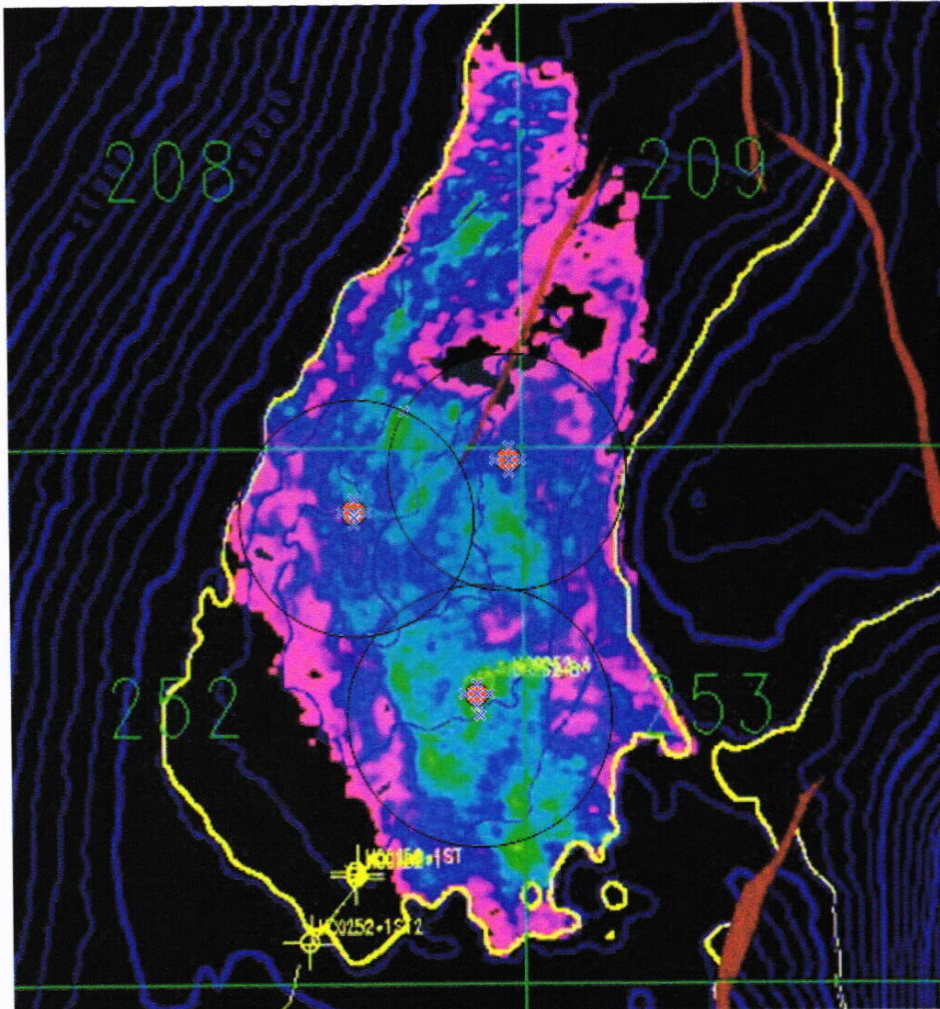
<u>P90</u>	<u>ML</u>	<u>P10</u>
44	64	86



Macondo – Development

Based on appraisal of exploration well only

Macondo - Development Plans



- Three well subsea tie-back.
- Exploration well saved for production
- Average well spacing = 1500 Acres
- Drainage Area = 1000 Acres
- Estimate 80% of prospect resource recoverable from wells on MC 252
- Only 252 volume will be booked
- Recovery per well = 17 mmboe

Tieback Options

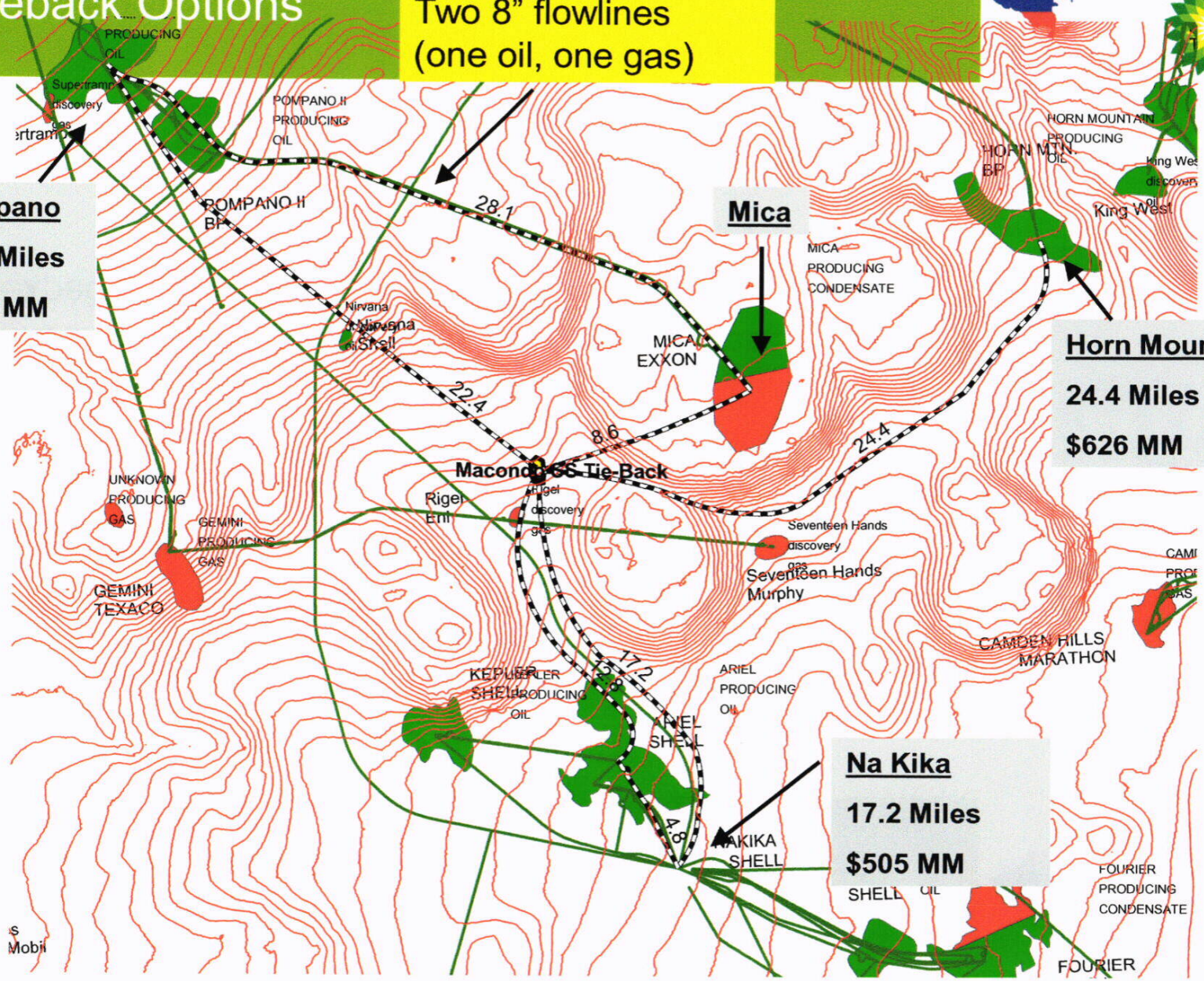
Two 8" flowlines
(one oil, one gas)

Pompano
22.4 Miles
\$586 MM

Mica

Horn Mountain
24.4 Miles
\$626 MM

Na Kika
17.2 Miles
\$505 MM



Mobil

Final Resource Volume will be based on:



- Open hole logs
 - Acquisition to begin 12/2/09
- Fluid properties
 - Correlations from single stage flash API, GOR
- Little new analysis needed if well results are close to expectations
- Approach to be confirmed with Exploration HoD