Macondo

MC 252 #1

Confidential

Pre-Drill Data Package

OCS-G G32306 No.1

60-817-411690000

Mississippi Canyon Block 252

BP Exploration & Production, Inc – Operator

Issue Date: September 03, 2009

Table of Contents

Attachments

Fast Facts

Prospect Name	Macondo
Surface Location Block No.	MC 252
Surface Location OCS Lease No.	OCS – G32306
API Number	60-817-411690000
Bottom Hole Location Block No.	MC 252
Bottom Hole Location OCS Lease No.	OCS – G32306
Well Name	MC0252_01
EP Location Name	MC0252_A
Primary Expiry Date	MC 252 is May , 2018
Extension Expiry Date	N/A
Category (Expl/Appr)	Exploration
Planned Total Depth (MD/TVD/TVSS)	19,649' md / 19649' tvd / -19,560 tvdss
Well Type (Straight/Deviated)	Straight Keeper
EP Submitted to MMS	02/23/2009
EP Approved	04/06/2009
APD Approved	05/22/2009
Security Status	Confidential
Water Depth	4,992 feet
Rig	Marianas
Rotary Table Elevation	89 feet RKB
Target Depth	18,400 ft TVDSS @ wellbore
Target Crest	18,120 ft TVDSS
Net Reservoir Thickness	95 ft
Expected Reservoir Temperature	239° F
Expected Pressure	13,300 psi

Statement of Requirements

BASIC WELL DATA:

Well:	MC0252_1	Date Completed:	29 April, 2009
Block:	MC0252	Well Intent:	Drill
Location/Lease:	OCS-G 32306, Mississippi Canyon Area	Confidentiality:	
Field:	Macondo	BP Working Interests:	100.00%
		Partners: (if known)	

WELL OBJECTIVES:

Primary objective is to evaluate a bright amplitude interval for hydrocarbon bearing sand by drilling to the base of the M56 at 18,580' TVDSS.
Secondary objective is to drill to the base of Miocene section to test for hydrocarbon bearing sands.

Performance & HSSE Targets

The sponsor requires the well to be drilled within the performance contract time of 54 days/10K, and to have no HSE and/or regulatory incidents as per the "No harm to people and the environment" HSE agenda. Sponsor requires the well to be "drill ready" by June 1.

SURFACE LOCATION:

Longitude: (D,M,S)	88,21,57.340W	Latitude: (D,M,S)	28,44,17.277N		
FEL: (ft.)	1036.12	FNL: (ft.)	6943.00'		
Geodetic Datum:	UTM 16N NAD27 CONUS	X: (ft. E)	1,202,803.88'	Y: (ft. N)	10,431,617.00'
Tolerance:	50' radius	Constraints:	0		

TOP TARGET LOC.:

Longitude: (D,M,S)	88,21,57.340W	Latitude: (D,M,S)	28,44,17.277N		
FEL: (ft.)	1036.12	FNL: (ft.)	6943.00'		
Geodetic Datum:	UTM 16N NAD27 CONUS	X: (ft. E)	1,202,803.88'	Y: (ft. N)	10,431,617.00'
Tolerance:	200' radius	Constraints:	0		

WELL INFORMATION:

Water Depth: (ft.)	4,992'	Saved for production:	Yes
Expected TD: (MD ft)	20,200'	Spud Date: (m/y)	June 1, 2009
TVD: (ft.)	20,200'	Critical Timing:	

GEOLOGIC TARGETS:

Seismic Horizon	Age	Lithology	TVDSS	Thickness gross ft	net sand ft	Lat	Long	Referenced Block
M56	13 Ma	Sand	18,400'	130	95	28,44,17.277N	88,21,57.340W	MC0252

RESERVOIR INFORMATION: (List all hydrocarbon reservoirs, even if they are not objectives.)

Age	Porosity (%)	Permeability (md)	Sw (%)	Expected Temperature	Expected Pressure	GOR	Expected Hydrocarbon Type
M57	32%	999	75%	155 deg F	4,700.0 psi	500,000	Gas
M56	23%	500	75%	239 deg F	13,300.0 psi	800	Oil

OFFSET/ANALOGUE WELLS:

Well	Operator	Year Drilled	Prospect Name	Geologic Age @ TD	Comments
MC0292_1BP2	ENI	1999	Rigel	M71	Discovery
MC0296_1_BP1	ENI	2003	Rigel	M56	Discovery
MC0562_1BP1	BP	2007	Isabela	M54	Discovery
MC0519_1	BP	2003	Santa Cruz	M54	Discovery

OTHER SIGNIFICANT ISSUES (Risks, Salt, Faults, Shallow Hazards, Cores, Sidetracks, HP/HT)

1. Hurricane - Moored Rig
2. Narrow PPFG Window
3. Stuck Pipe
4. Gas Kick
5. Shallow Depletion of offset well

Required Attachments

Well Location Plat: included copy/s for EP submission; SL data is correct, TD data needs revision
Structure Map
Geological Cross Section
PPFG/Temp Profile
Geological Prognosis
Proposed Evaluation Program

Additional Attachments - are Optional - however the subsurface team needs to provide maps and cross-sections necessary to show the notional well location and trajectory, subsurface targets and major geological features

Team List:

TITLE	NAME	SIGNATURE	DATE	PHONE #
Lead Geologist	Chuck Bondurant			281-366-7848
Petroleum Systems	Pierre Decret			281-366-6293
Petroleum Systems	Tomeka Searcy			281-366-4553
Geophysicist	Binh Van Nguyen			281-366-4147
Ops Geologist	Jonathan Bellow			281-366-1482
Lead Petrophysicist	Donald Charles			281-366-2554
Lead Drilling Engineer	Mark Hafle			281-366-4237
Drilling Ops	Trent Fleece			[illegible]
Reservoir Engineer	Tanner Gansert			281-366-3025
Tiger Team	Craig Scherschel			281-366-4967
Geophysicist	Chris Casler			281-366-5573
TIGER team	Marty Albertin			281-366-7183

Location

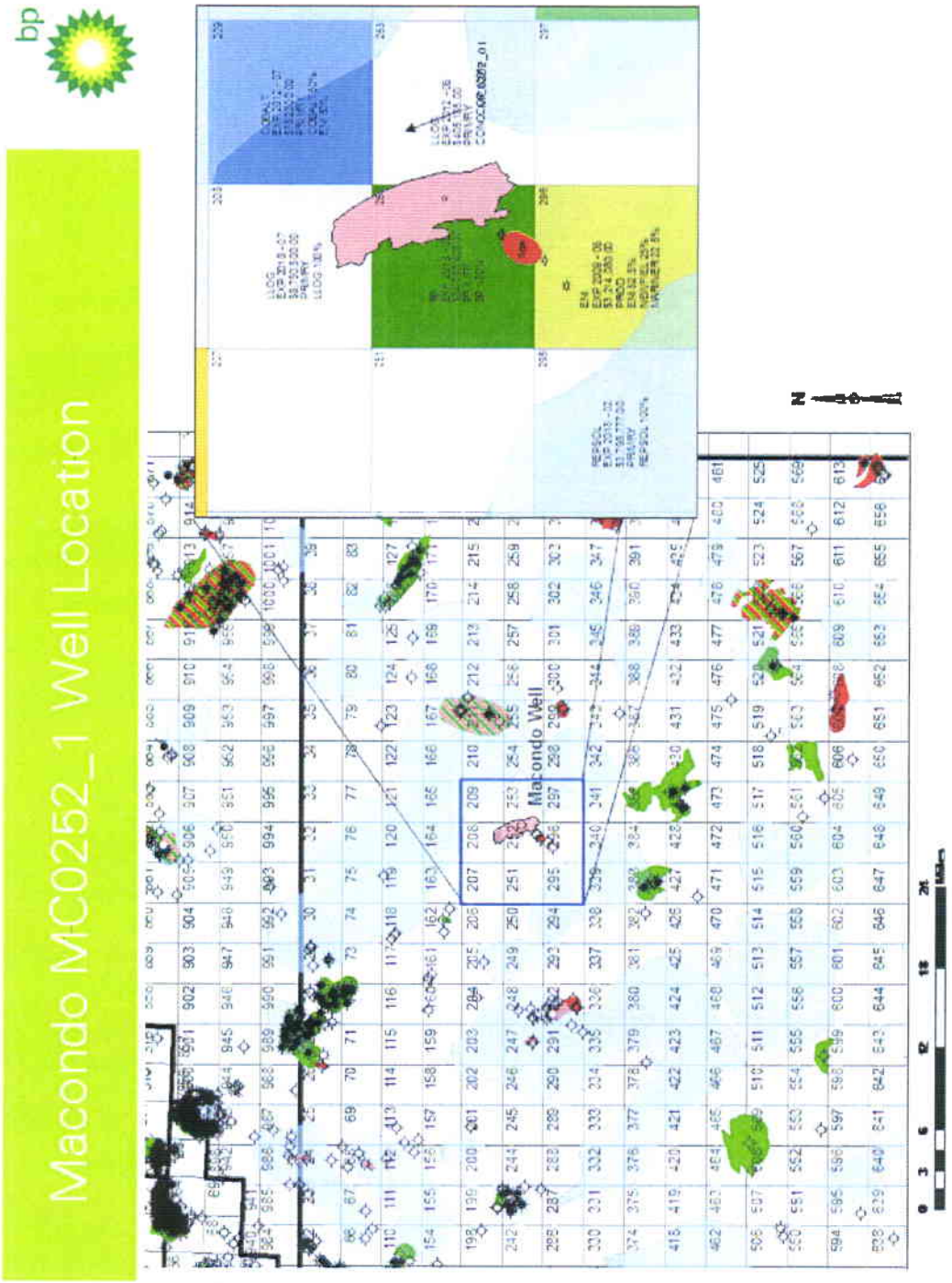


Figure 1 Location Map

Potential Hazards

Potential hazards in the Macondo well are divided into 2 categories – shallow hazards, and overburden hazards. These are defined below:

- Shallow Hazards - above the 22" casing point (8000ft MD/TVD)

  Shallow water flow + shallow gas

- Overburden Hazards – below the 22" casing point

  Permeable sands

Overall Drilling Hazards

Hazard:	**Potential ?**	***Remarks (source, interval, offset wells where present)***	***Attachment***
Shallow Gas	Possible	*Well is targeted to avoid any identified shallow gas zones*	*Figure 2, p.7*
Charged Zones	Yes	*Middle Miocene target sands are expected to be oil or gas charged*	*Appendix B*
Depleted Zones	Possible	*Nearby producing reservoir of Rigel are anticipated to be stratigraphically isolated from the MC0252_1 well location*	*Appendix B*
Overpressure	Possible	*See PP/FG attachment s*	*Appendix D*
Abnormal Temperatures	No	*BHT estimated at ~239° F*	*Appendix C*
H_2S	Not expected	*Temperature is not expected to reach the necessary 300° F for H2S onset. The MC0696_1 (Blindfaith well) and the MC562-1 (Isabela well) encountered no H2S*	*Appendix C*
Faults	Not expected	*No faults appear in the seismic data at the wellbore, but there are faults in the area. It is possible that they exist with throw less than 200'*	*Appendix B*
Injection wells	No		*Appendix A*
Pipelines	No	*Single field flowlines tie-back from Rigel to the Gemini Host are 1 mile south of MC0252_1 (Macondo) well.*	*Appendix A*
Production Facilities	No	*Host Facilities are greater then 17 miles of the surface location*	*Appendix A*
Shipping Lanes	No	*No*	*Appendix A*

Shallow Hazards

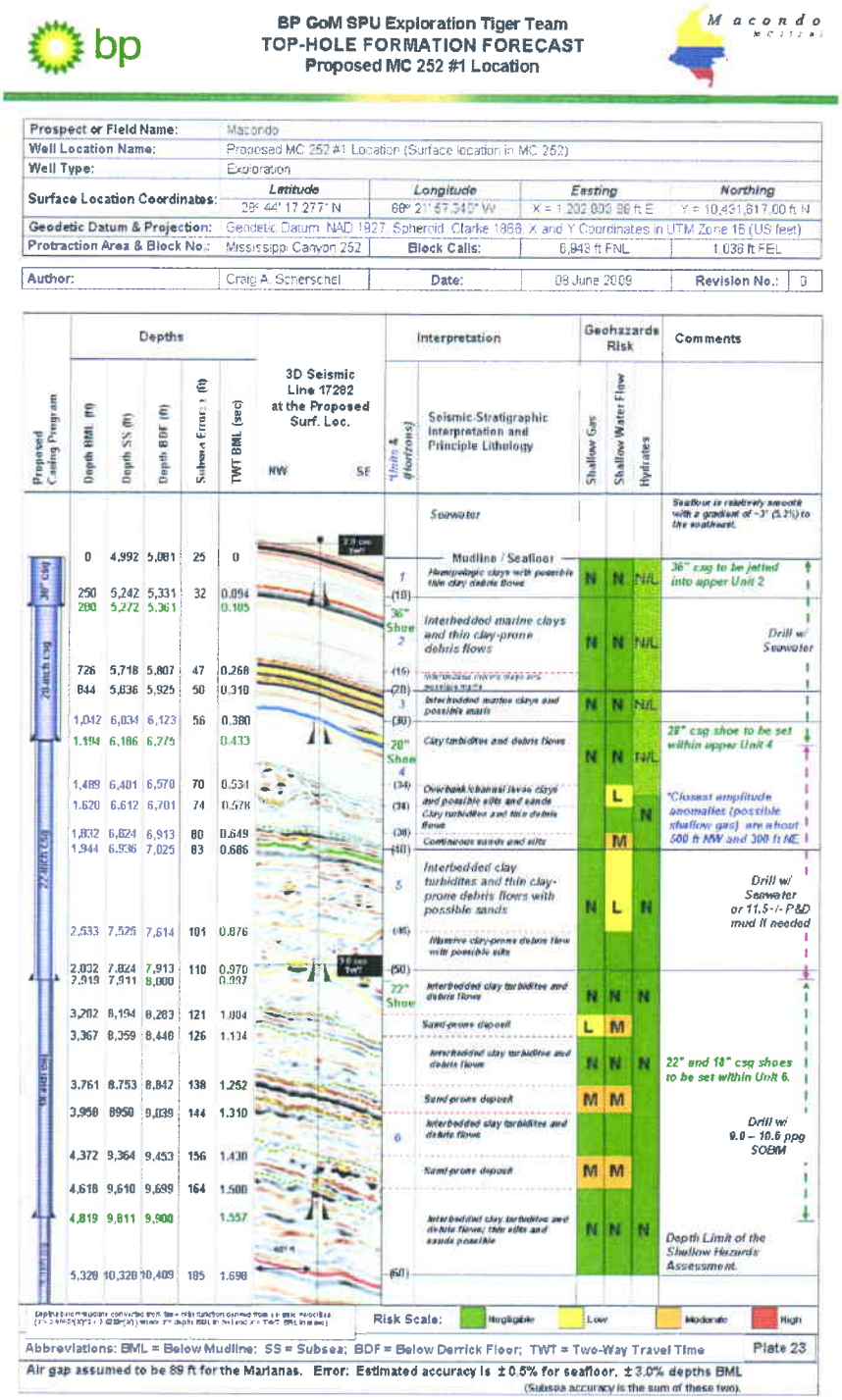


Figure 2. Shallow hazards

Overburden Hazards

For more details see Appendix E (Geologic Prognosis).

The MC0252_1 location was selected for the optimum penetration of the M56 amplitude anomaly. The well also avoids the shallow hazards described in the previous section. However, the well path will penetrate possible minor hazards in the overburden between the base of the 22" casing point (8000ft MD/TVD) and the M56 target amplitude. Such hazards include thin gas sands, the level at which pipe stuck in the MC0252 well (8900ft TVDSS), and the depletion of the Rigel reservoir (MC 296, 10990ft – 11074ft TVDSS). The stuck pipe event at Rigel can be seismically tied to the Macondo well, at approximately 8800ft TVD SS. The producing zone (10990ft TVD SS) of the MC296 (Rigel) well can be seismically tied to the Macondo well at approximately 10700ft TVDSS. If the Rigel sands are laterally extensive enough and reach the Macondo well, they will be reached at approximately 10700ft TVD SS.

Well Location & Data

The Macondo well will be drilled in Mississippi Canyon block 252 and has been given the name MC0252_1 by the MMS. The Macondo well is planned to be drill to 19,560 ft TVD and is designed to be kept as a producing well.

Geodesist Plot

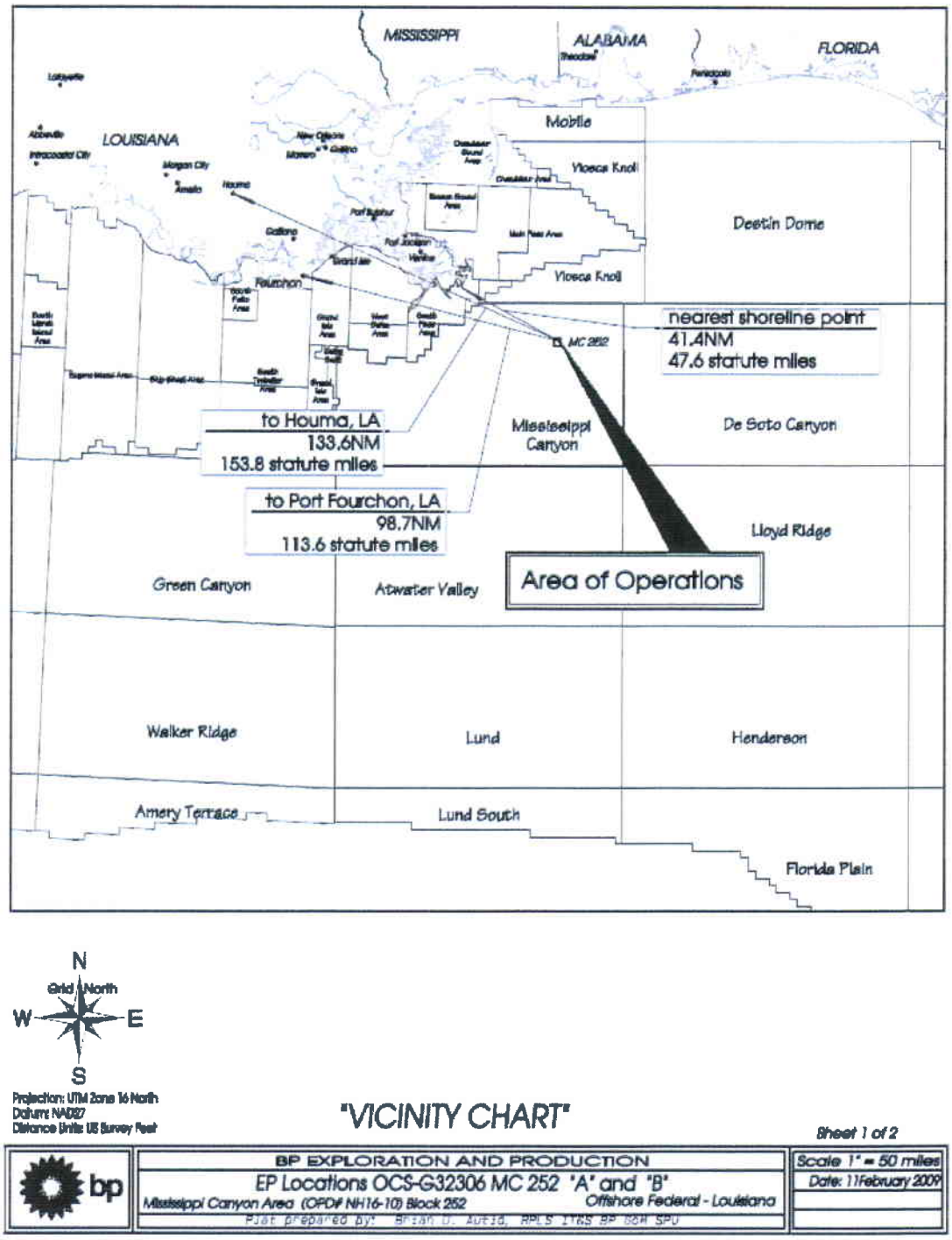
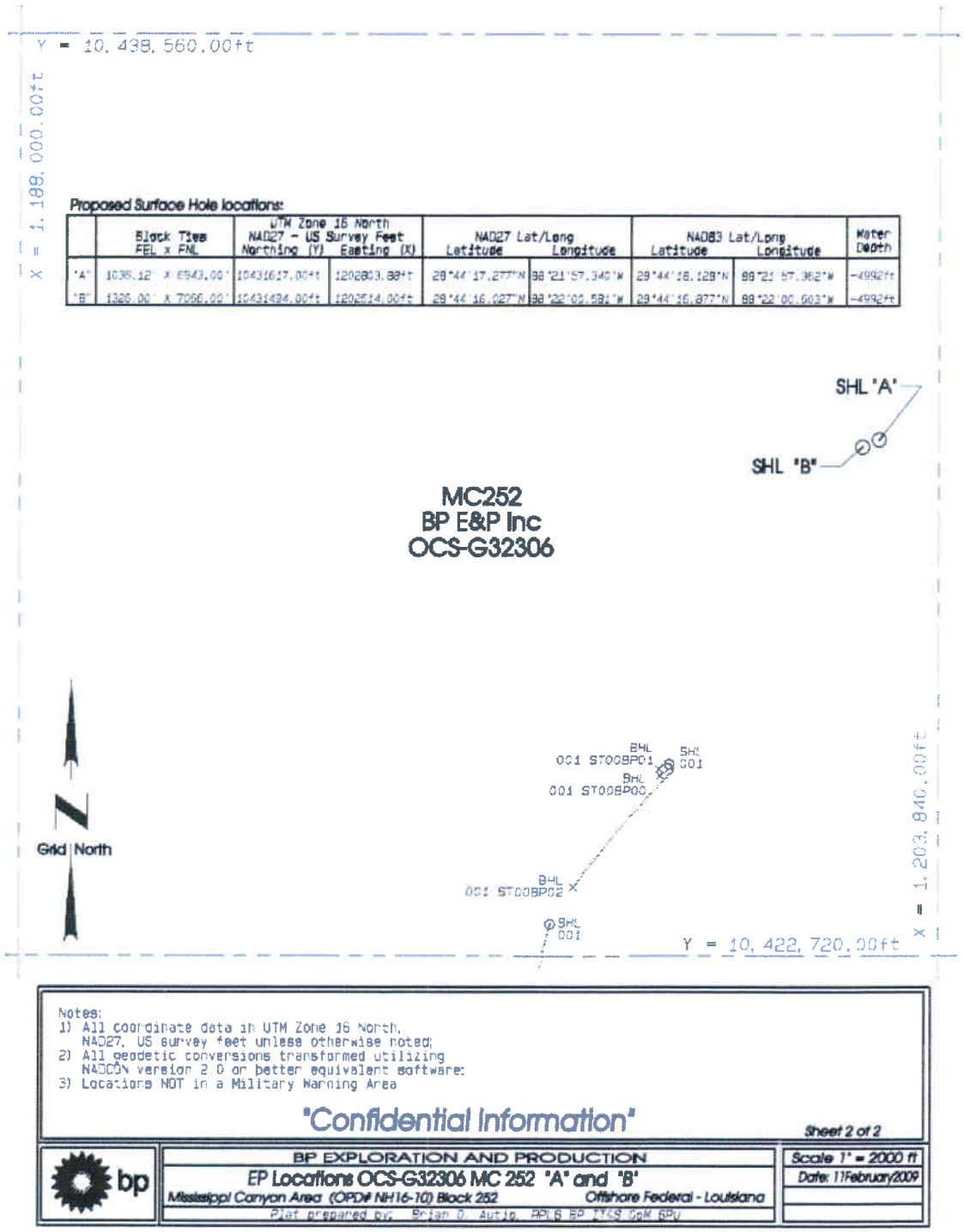


Figure 3. Vicinity chart



	Block Ties FEL x FNL	UTM Zone 16 North NAD27 – US Survey Feet Northing (Y)	Easting (X)	NAD27 Lat/Long Latitude	Longitude	NAD83 Lat/Long Latitude	Longitude	Water Depth
"A"	1036.12' X 6543.00'	10431617.00ft	1202803.88ft	28°44'17.277"N	88°21'57.340"W	28°44'16.128"N	88°21'57.362"W	-4992ft
"B"	1326.00' X 7066.00'	10431494.00ft	1202514.00ft	28°44'16.027"N	88°22'00.581"W	28°44'16.877"N	88°22'00.603"W	-4992ft

Figure 4. Well locations

M56 Structure Map & Target Location

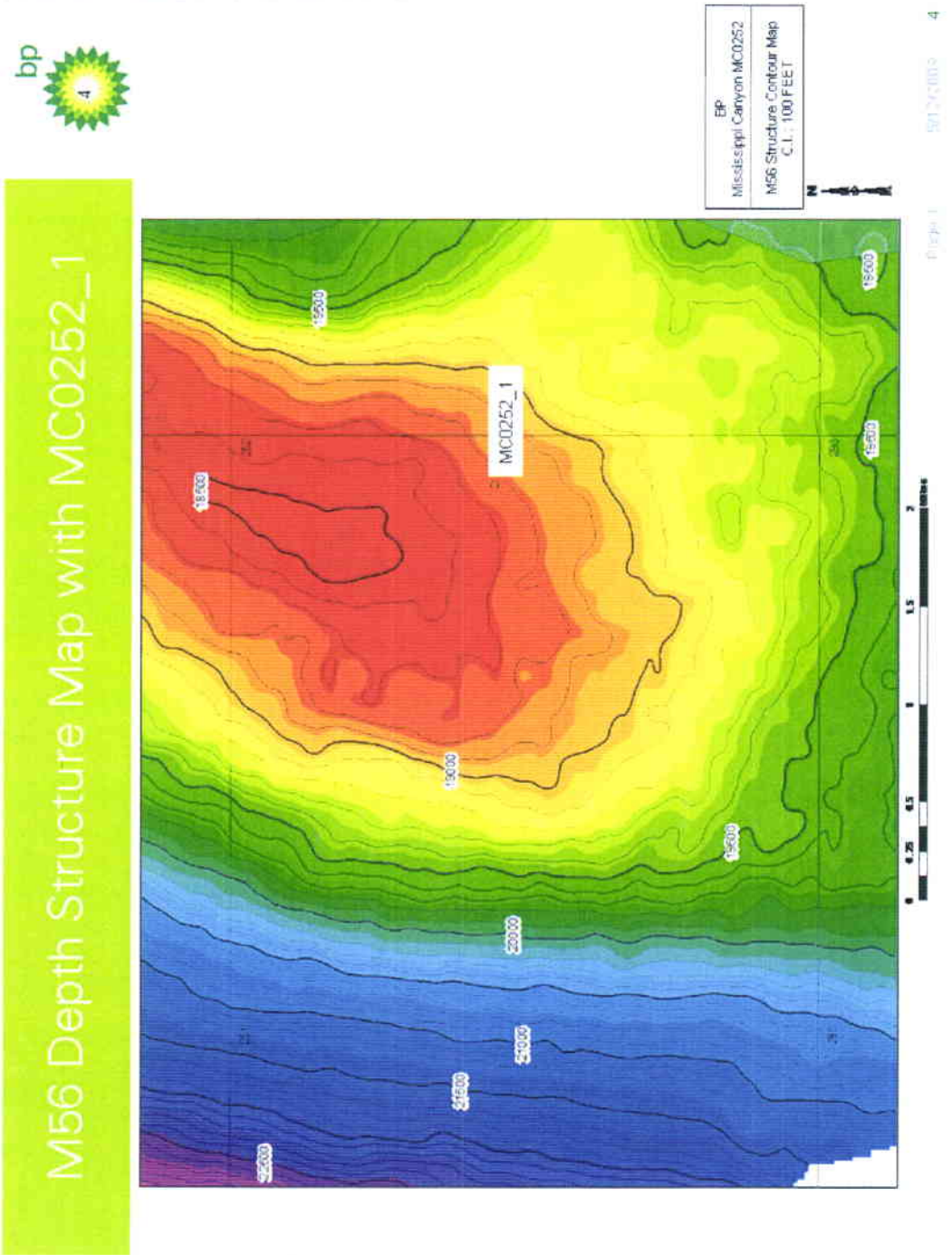


Figure 5. M56 Structure Map

TD Criteria & Guidelines

The Macondo wellbore is sanctioned by the MMS to drill to a depth of 20,200 ft MD/TVD.

Drill to the seismic event (M54) @ 19560 ft TVDSS +/-200 ft (figure 6) or the Paleo benthic foraminifera Robulus L. (M44). If after drilling through the primary objective (M56) there is an onset of pressure that requires a new casing string TD the well.

For planning purposes, the final geological TD is estimated at -19,560 ft TVDSS. Uncertainty on TD is +/- 200 ft based on seismic tie to wellbore.

Guidelines:

1. Operational/pressure/safety issues will dictate when drilling stops for each hole section TD.
2. M56 seismic amplitude must be evaluated completely
3. Do not stop for TD in a show, unless operational/pressure/safety issues require.
4. Absolute depths will be continuously updated as drilling proceeds.

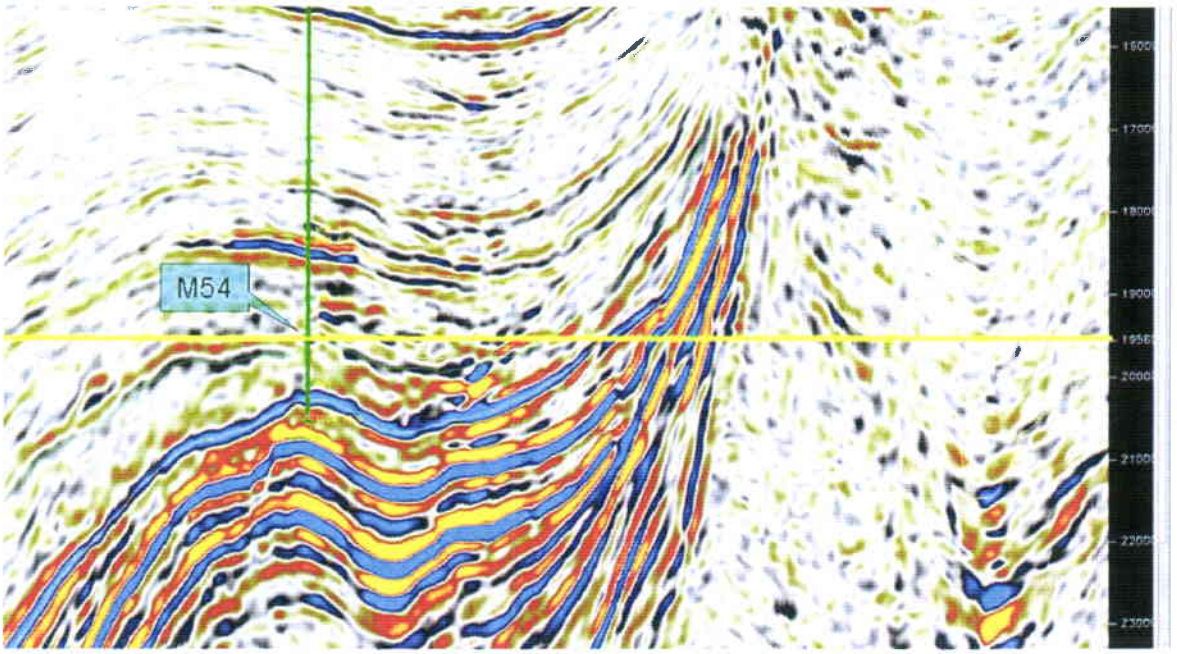


Figure 6. Seismic section with TD (M54) @19560 ft TVDSS

PPFG vs. FG

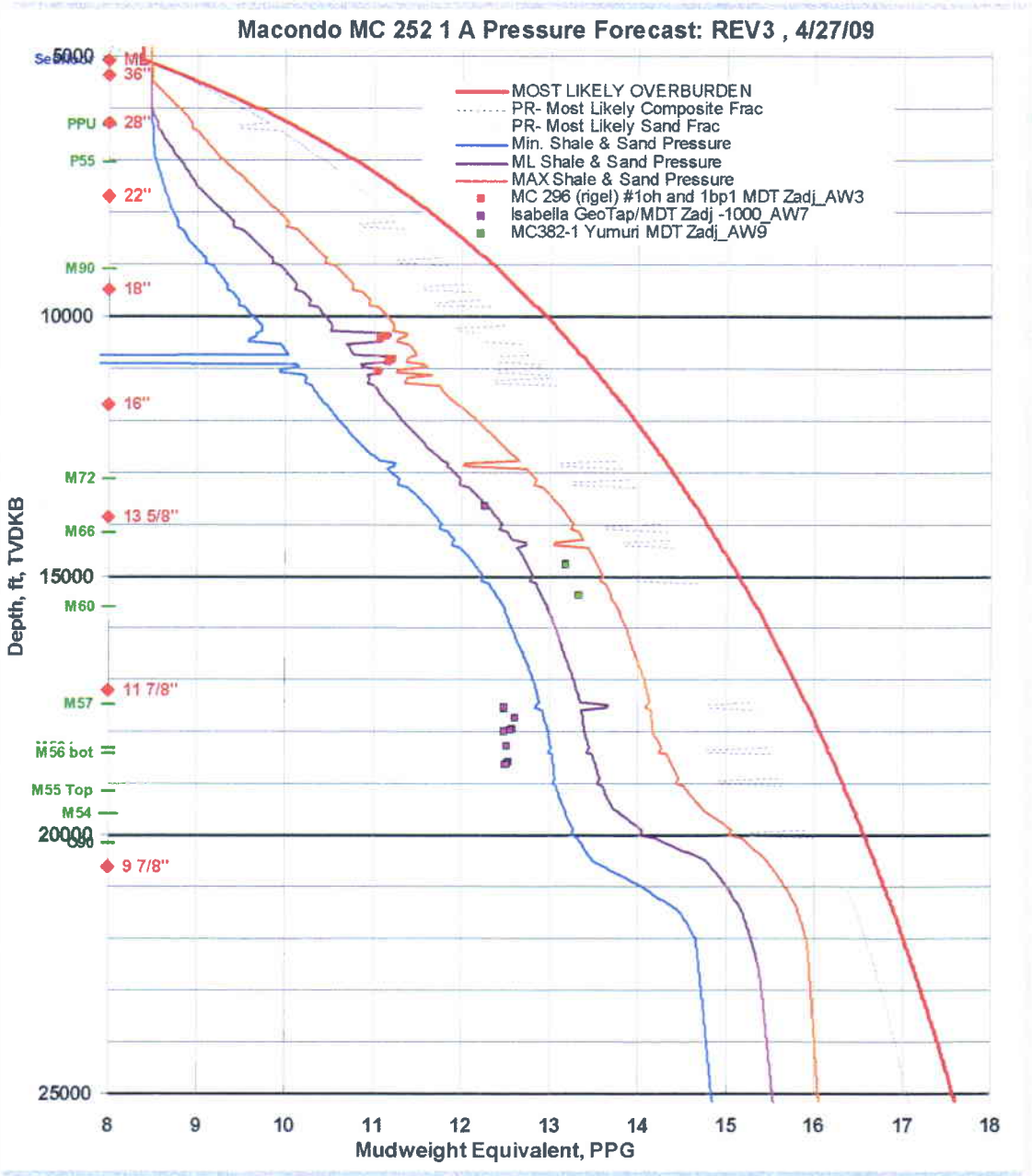
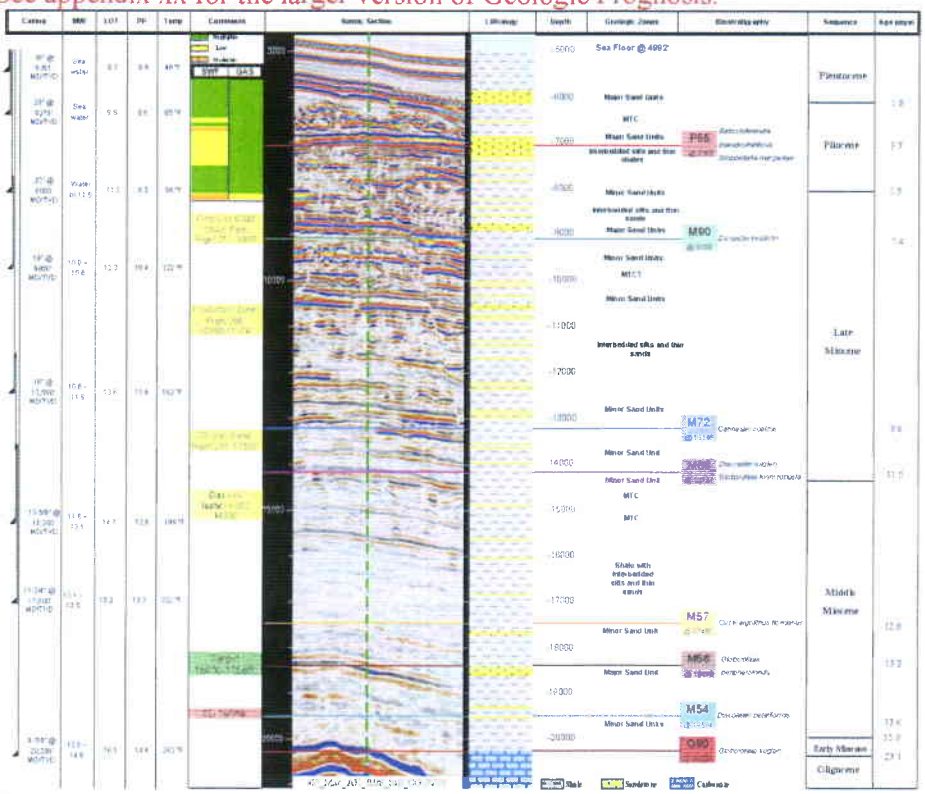


Figure 7. Pressure forecast

Geologic Prognosis

See appendix xx for the larger version of Geologic Prognosis.



Macondo Lithostratigraphy and Drilling Plan, MC0252 well "A"

Figure 8. Lithostratigraphic section and casing program

Predicted Fluid Properties

The M56 reservoir is expected to contain oil phase with a most likely GOR range of 800.

6.5 Charge Parameters

Phase	Oil	API Gravity	32	Sulphur %	15%
H2S %	0%	Nickel ppm	2	Vanadium ppm	1
CO2 %	0%	N2 %	0%	Pyrobitumen risk %	0%

Range	Percentile	P90	P50	P10	comment
Degree of fill %		100%	100%	100%	
GOR/ CGR	bbl/mmscf	500.0	800.0	1300.0	
FVF/ GEF		1.31	1.46	1.61	
Saturation %		60%	75%	80%	

Wellbore Design

Casing Design Schematic

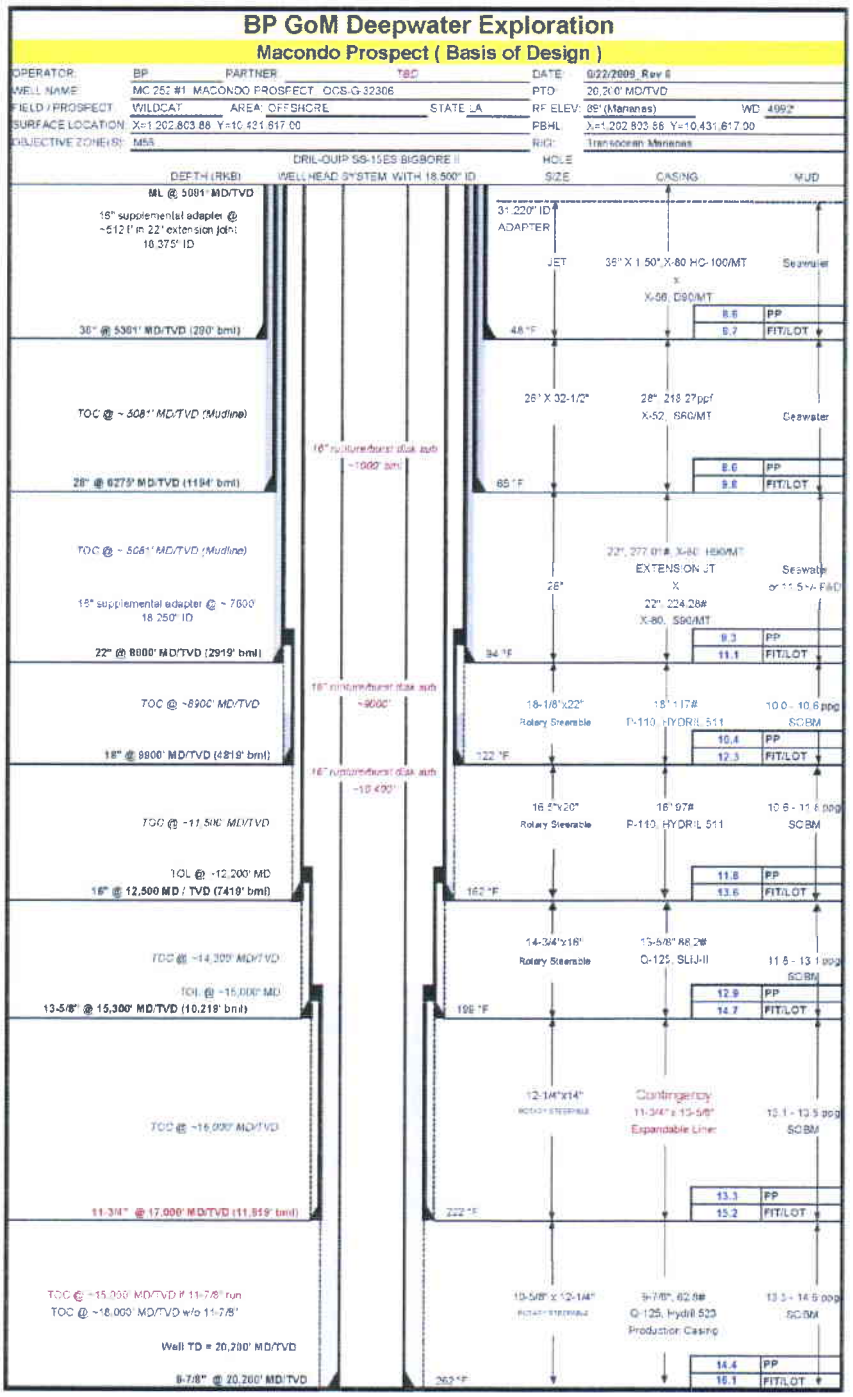


Figure 9. Casing Program

Geoscience at the Wellsite

Wellsite Geologist

BP wellsite geosciences support will be required on the rig starting at the 22" casing shoe (-8000 ft TVDSS) to TD, including all sidetracks, except during casing & whipstock operations. BP representatives will oversee all logging and coring operations

Wellsite Paleontologist

BP Biostratigraphers: Todd Boeisger (Nannofossils), Jason Lundquist (Foraminifera)

Biostratigraphic support for Mississippi Canyon 252-1 (Macondo) will be as follows:

Above the 13 5/8" casing point, samples will be sent via 'hot-shot' for on shore biostratigraphic analyses. Below the 13 5/8" casing point, biostratigraphic support at rig site will be provided for penetration of the expected reservoir interval (M56-M54) and for call of TD of well (M44) - Rob L (Foram) stratigraphic equivalent.

Daily reports of industry level biostratigraphic tops will be provided during the interval of rig site biostratigraphic support. Partners will receive a set of cuttings for their own detailed paleontological analyses.

Logging and Evaluation

Sample Requirements

1.1. Cuttings

- 6 sets bulk wet: One set for **BP,** two sets marked **BP Trade** stored at rig, one set market **BP Rig Set** to be stored at rig, and two sets marked **Partner Set** to be stored at the rig.
- 4 sets rinsed and dried: One for **BP**, two sets marked **BP Trade** stored at rig and one set marked **BP Rig Set** to be stored at the rig.
- Starting from the 22" casing point, begin 30' sampling. Shipping of samples is requested from rig site on first available helicopter, at least every 1000' or weekly and/or at casing points - whichever is sooner. Requests for 10' samples in some intervals and more frequent shipping (even daily or first available transportation) may be requested by the BP Geoscience Team.

1.1.1. Collection Requirements

- For 30' intervals:

> Catch samples at the shakers in 15' intervals and bag into 30' composite intervals.

- For 10' intervals:
  > Catch samples every 10' when advised by **BP** geoscientist.
- The bulk wet samples are to be sealed in ***plastic lined cloth bags, preferably Hubco model Protexoo poly/cotton 5.5 x 10.5.***
- Before shipment, dry samples are to be isolated from wet samples (by use of tightly sealed plastic bags or some other suitable container) to prevent damage to other samples by leaking drilling fluid.
- On completion of the entire well, send **BP Trade** and **BP Rig Set** to:

Fugro Data Solutions, Inc.
3311 South US Hwy. 77
P.O. Box 295
Schulenburg, TX 78956
USA
Tel: 979-562-2777
Fax: 979-562-2776

1.1.2. Labeling

- Label each sample bag, using indelible ink as follows:

BP
Macondo MC 252
OCS-GG32306 No.1
60-817-4XXXXXX
SAMPLE DEPTH INTERVAL (Top and Base in MD from KB).
Date / initials

1.1.3. Cuttings Shipping

- Ship the samples from the rig to BP base in Houma on first available helicopter if possible. Coordinate transport of samples via helicopter with the BP base in Houma prior to sample shipment. Fax notification to Ellington and Associates prior to shipment.
- If samples must be shipped via work/supply boat, coordinate the shipment through the base in Fourchon prior to transport. Fax notification to Ellington & Associates prior to shipment.
- From shore, all samples are to be transported to Ellington & Associates destinations via "hotshot" driver.
- Cuttings designated for **BP** take priority for shipping.
- Ship per the data distribution instructions:
- As cutting samples are transported off the rig, it is requested that the **mudloggers contact the appropriate receiving BP base by voice phone and FAX the them the manifest** . Provide notification on the daily report identifying the sample interval shipped.

Contact Information and Address for Houma is:

Bobby Dougherty or Loren Malachino
(337) 735-5352 Voice
(337) 735-5355 FAX

PHI Heliport, Houma
3622 Thunderbird Road
Houma, LA 70363

Ellington & Associates, Inc
1022 Wirt Rd. Suite 312
Houston, TX 77055
Attention: Bob Ellington
(713) 956-2838

- Post a copy of the cargo manifest in the Drop Box Folder for manifest:

1.2. Shipping of Mud Isotube, and Geochemical Samples

- Collection requirements are described in subsequent sections.
- As requested below, mud, isotube, and geochemical samples should be shipped to:

Geochemical Services Group
Weatherford Laboratories
143 Vision Park Blvd.,
Shenandoah, Texas 77384
Attention: Stephen R. Palmer
[redacted]

Isotubes (flowline gas samples):

ISOTECH Laboratories Inc.
1308 Parkland Court
Champaign, IL 61821
Attention: Steve Pelphrey
(217) 398-3490

- Post a copy of the cargo manifest in the Drop Box Folder for manifest

1.3. Mud Samples

Geochemistry Canned Mud Samples

- Collect geochemistry canned mud samples for **BP** as follows:
  - every 1500'
  - at each change of mud system,

- at beginning of each new hole interval as soon as riser is connected and cuttings return to surface is established
- before each logging and coring run
- every 30' while coring
- **Collect an additional canned mud sample during each show, zone with oil staining/fluorescence, zone of interest.**

- Fill cans 2/3 with mud and add zephrim chloride bactericide to each can before closing. **(Free space in can should be 1/3 of can volume). To obtain meaningful analyses, it is critical not to overfill cans, and to fill cans consistently.** Lids must also be well sealed with at least 4 clips per lid.

- Label each can, using indelible ink as follows:

BP
MC 562
OCS-G-19966 #1
60-817-4111600
SAMPLE DEPTH (MD from KB).
Geochemistry MUD
Initials and date

- Ship geochemistry canned muds for **BP** only to **Baseline Resolution, Inc.** at the address in section 1.2 (see mud and geochemistry samples shipping procedures above)

Base Oil Samples (Geochemistry)

- Collect base oil sample for **BP** only as follows:
  - at the start of the synthetic mud interval and every 1500' thereafter

- Label each can, using indelible ink as follows:

BP
Macondo MC 252
OCS-GG32306 No.1
60-817-4XXXXXX
SAMPLE DEPTH (MD from KB).
Base Oil
Date

- Ship base oil samples for **BP** only to **Baseline Resolution, Inc.** at the address in section 1.2.

Petrophysical Mud Samples

- Viscosity, solids, additives and salinity reported daily on mudlog.
- Collect two (2) bottoms up mud samples of at least one (1) quart each at the time of each wireline logging run. When labeling, specify that this is a bottoms up sample and label mud. Ship **BP** sample to:

BP Samples
Geochemical Services Group

Weatherford Laboratories
143 Vision Park Blvd.,
Shenandoah, Texas 77384
Attention: Stephen R. Palmer
[redacted]

- Collect one (1) bottoms up mud sample of at least one (1) quart at the base of each reservoir pay zone and ship **BP** sample to:

BP Samples
Geochemical Services Group
Weatherford Laboratories
143 Vision Park Blvd.,
Shenandoah, Texas 77384
Attention: Stephen R. Palmer
[redacted]

1.4. Geochemistry Samples

1.4.1. Cuttings Headspace:

- Collect one (1) set of canned cuttings for headspace gas analysis for **BP.**
- Begin collecting headspace cuttings samples upon cuttings returns to surface after setting **22**" csg (~8,000' MD/TVD)
- **90** foot composite samples from **22**"casing to top of 11,000'
- 30 foot composite samples from 8,000' to TD
- Two (2) additional samples through shows, zones with oil staining / fluorescence, and zones of interest shall be taken at 10' sample intervals when ordered by wellsite geologist using his discretion. Note: these should not be composite.
- Fill 1 liter metal cans halfway with cuttings, add ½" water, and add zephrim chloride bactericide to each can before closing. **(Free space in can should be no less than 1/3 of can volume). To obtain meaningful analyses, it is critical not to overfill cans, and to fill cans consistently.** Lids must also be well sealed with at least 4 clips per lid.

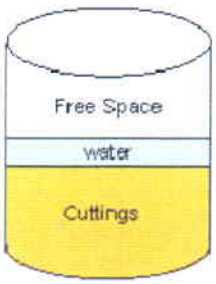


Figure 10. Cartoon of metal can used for sample collection.

- Label each can, using indelible ink as follows:

BP
Macondo MC 252
OCS-GG32306 No.1
60-817-4XXXXXX
SAMPLE DEPTH INTERVAL (Top and Base in MD from KB).
Date / initials

- Ship **BP** cans to **Weatherford Laboratories** at the address listed in section 1.2. Shipping is requested **every 1000' or weekly and/or at casing points** - whichever is sooner. Also ship immediately when ordered by wellsite geologist.
- Cans should be well packed when shipped to prevent damage.
- Should there be any questions, contact **BP** geochemists to **Pierre-Andre Depret** at (281) 366-6293 or pierre-andre.depret@bp.com or **Tomieka Searcy** at (281) 366-4553 or tomieka.searcy@bp.com

1.4.2. Flow Line (Isotubes)

- Isotubes (supplied by Isotech) will be used to collect flowline gas for **BP.**
- Begin collecting flowline gas samples with mud returns to surface after setting 22" csg.
- Collect flowline gas samples every 90' from 22" csg to TD.
- When any gas and/or oil show, zone with oil staining/fluorescence, or zone of interest is encountered, sampling will be taken at 10' increments until such show or zone of interest diminishes to background levels.
- The samples will be housed in the mudlogging unit and will be shipped to Isotech Laboratory, Inc. when 25 sample Isotubes have been collected. This collection/shipping pattern will continue until the well has reached total depth. If instructed, a box of less than 25 samples will be shipped for immediate analysis of critical zones.
- Rack and all unused Isotubes must be sent back to Isotech at end of well.
- Ship Isotubes to:

ISOTECH Laboratories Inc.
1308 Parkland Court
Champaign, IL 61821
Attention: Steve Pelphrey
(217) 398-3490

1.4.3. Petroleum in the Mud:

- Collect samples of all oils/condensate/sheens from both the flowline and mudpit (skim from surface if possible).
- Collect for **BP** only, ship to **Weatherford Laboratories** at the address in section 1.2.

1.4.4. Formation Fluids (if samples are taken via wireline MDT or RFT):

See Attachment 17B

- Should there be any questions regarding the disposition of fluid samples, contact **BP** reservoir engineers, **Tanner Gansert** @ (281)-366-0025 or tanner.gansert@bp.com or **David Epps** @ (281)366-4783 or david.epps@bp.com.

Reservoir Fluid Sample Requirements

Objective:

The Macondo exploration well is different from most exploration wells; it is being designed and drilled as a "keeper" to be used as a producing well in the success case. Therefore, the Fluid Sampling Procedure and Analysis Program has been designed to collect the key data necessary to reach a development project sanction decision. This includes:

- full PVT analysis for each major hydrocarbon zone,
- geochemical analysis of oils and isotopic analysis of gases,
- compositional analysis for flow assurance work, and
- collection of formation waters in contact with hydrocarbon zones for compatibility tests

This procedure has been reviewed by geoscientists, petroleum systems experts, petrophysicists, reservoir engineers, completion engineers, and production, flow assurance, and facility engineers.

Collectively, the requested sampling and procedures should help:

- ensure the collection of low contaminated, high quality MDT samples,
- assess inter-well and intra-well communication,
- reduce reservoir performance uncertainty, and
- aid in the design of the well completion, subsea system and NaKika topside modifications.

Fluid Sampling:

Volume

Acquisition of fluid samples is to be attempted from each hydrocarbon bearing horizon within the Middle Miocene reservoirs. **The M56 reservoir is the primary target for this well**, therefore obtaining high quality samples and analyses is a top priority for this sand. Best estimates suggest that the M56 reservoir is likely to be oil charged with no visible water. The following table summarizes the minimum sampling program for the hydrocarbon bearing and potential water bearing zones for both reservoirs. Through the RVA process, these volumes were confirmed to be sufficient for all fluid analysis and testing needed to make a sanction decision.

Volume	2-3/4 gal	1 gal	450 cc	250 cc
Type			MPSR	SPMC
M56 hydrocarbon	1		1 six pack	2
M56 water		1		

The M56 reservoir could contain multiple pay sands as illustrated in the following comparative logs from the Blind Faith and MC522-1 wells:

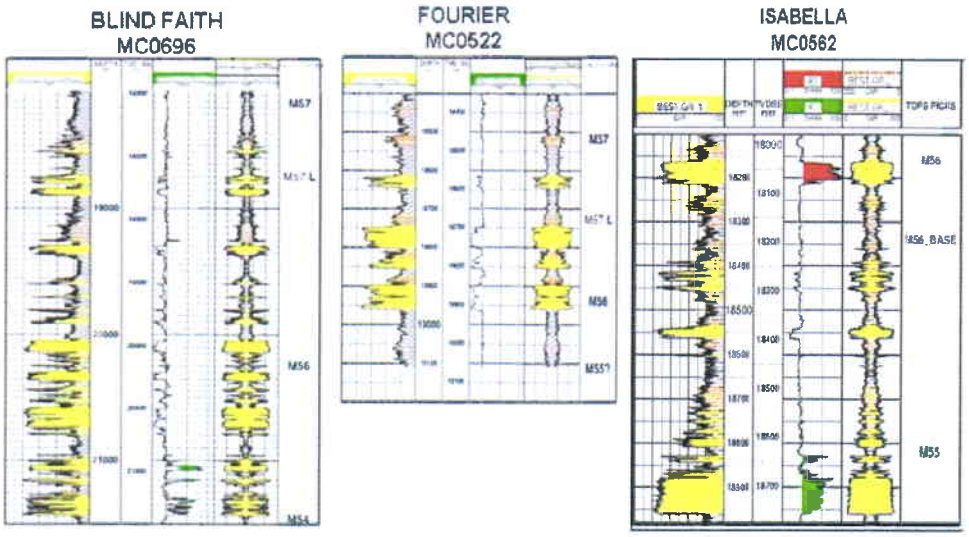


Figure 11. Offset well logs

This sampling procedure requests a **primary and backup sample from each major hydrocarbon bearing sand within the M56 reservoir**.

While every effort will be made to minimize the number of MDT descents (and subsequent cost), obtaining quality samples and full coverage of the M56 pay interval is of primary importance. Based on the sample volume requirements, sample procedure will be optimized for a single descent for fluid sample acquisition. If numerous pay sands are encountered, multiple sample chamber six packs or multiple MDT descents may be required, but must be approved by Exploration Subsurface management. Contact between the Houston, Westlake Office and the Rig will further clarify the number of chambers required on the day.

Quality

Maximum allowable contamination of the fluid in each sample chamber in the desired set must be held to less than 10% synthetic mud contamination (i.e., >90% hydrocarbons) and with at least one chamber with less than 5% synthetic mud contamination (i.e., >95% hydrocarbons). The Houston, Westlake Office will provide real time guidance.

In order to ensure sample contamination is as low as possible, Schlumberger will employ the downhole live fluid analyzer (LFA) and the surface real-time contamination estimation software during MDT sampling to attempt to distinguish drilling mud from the formation hydrocarbons prior to chamber filling. Monitoring of both the methane and color measurements from the downhole LFA sensor is recommended, with an understanding of the asymptotic nature of the clean-up of mud contamination from the sample area. Samples are to be collected once drilling mud contamination is seen from both LFA sensors to be under the maximum allowable levels.

In addition to the downhole LFA, we request that Schlumberger set up an on rig site lab to ensure sample quality before completing sampling operations.

Non–Hydrocarbon Fluid Sampling

At the time of downhole hydrocarbon fluid sampling, collect 1 gallon of whole mud from the rig mud pits and 1 quart (+/-) of base oil for future laboratory work.

Rig Site - Sample Transfer and Analysis

Schlumberger will provide a mobile laboratory service on the rig, and is responsible for:

- Determining the basic quality and volume of fluid samples obtained. The principal components of quality are mud contamination level and basic fluid characteristics: GC, GOR and API fluid density.
- Transferring the fluid samples from the 1.0 and 2-3/4 gallon chambers to DOT approved cylinders. Transfer of sample from the 450 cc MPSR chambers if onsite evaluation is required.
- Preparing the 250 cc SPMC chamber into DOT approved overpacking for shipment back to the laboratory.
- H2S analysis consisting of at least corrosion coupons.
- Shipment of all sample chambers to:

Pencor Laboratories
Attn: Jason LeBlanc
5820 Hwy. 90 East
Broussard, Louisiana 70518-0926
800-234-4205

If, based on rig site analysis, the minimum volume and quality targets have not been met the MDT tool will be re-run, if approved by Exploration Subsurface management and hole conditions are permitting. The chamber configuration for the MDT re-run will be a function of the hole conditions at that time.

Detailed Fluid Sampling and Transfer Protocol

MPSR 450 cc Chambers

The MPSR chambers are to be treated in a different manner depending upon the situation.

Situation 1 is when MPSR sampling occurs from the same sand interval as the large 2 ¾ gallon sample chambers.

Situation 2 is when MPSR sampling is performed on sands that have not been sampled with large sample containers.

Situation 1 - No offshore work
MPSR 450 cc Chambers

1. Collect fluid downhole. Overpressure downhole to MAX overpressure (3600psia).
2. At surface allow MPSRs to cool to ambient temperature. Check and record opening pressure on backside of bottle.
3. DO NOT TRANSFER ANY FLUIDS OUT OF BOTTLES.
4. NO CONTAMINATION OR GOR CHECK.
5. Send directly to Pencor lab for analysis (address above).

Situation 2 - Partial offshore analyses
MPSR 450 cc Chambers

1. Collect fluid downhole. Overpressure downhole to MAX overpressure (3600psia).

2. At surface check and record opening pressure on backside of bottle.
3. On site, heat and rock chambers for a minimum of 6 hours, recommended 12 hours with automated restoration device at reservoir conditions (or up to Schlumberger max of 170 deg. F if reservoir temperature is higher).
4. During restoration and transfer of MPSR chambers PENCOR Data Acquisition Systems will record all pressure measurements. All transfer pressures, temperatures and times will be recorded and reported.
5. Transfer entire contents of LIVE hydrocarbon primary MPSR sample on rig to DOT certified transportable bottles.
6. Perform single stage flash (provides API gravity, GOR, and GC) and oil base contamination calculation on only the sample transferred from the primary MPSR chamber. Leave backup MPSR samples in original chambers.
7. Rinse all chambers transferred on rig with toluene and send post-rinses to shore along with samples. Rinses should be collected in sealable DOT approved containers.
8. Send to Pencor lab for analysis (address above).

SPMC 250-cc Chambers

1. Chambers must be overpressured downhole since they can only overpressure at lab once off rig. Schlumberger MDT engineers confirm it is routine to overpressure all fluids downhole.
2. Schlumberger personnel will prepare the SPMC chamber for shipping to laboratory by placing it into a DOT transportable over packing.
3. SPMC chambers will be transferred and evaluated at the laboratory.

Large Chambers (2 ¾ gallon and 1.0 gallon Hydrocarbon samples)

1. Collect fluid downhole. Overpressure downhole to MAXIMUM overpressure.
2. Check and record opening pressure of backside of chamber.
3. On site, heat and rock chambers for a minimum of 6 hours, recommended 12 hours with automated restoration device at reservoir conditions (or up to Schlumberger max of 170 deg. F if reservoir temperature is higher). If reservoir temperature exceeds Schlumberger's maximum heating temperatures, a waiver must be requested with supporting evidence confirming the use of SLB-approved heating jackets to as close to reservoir temperature as possible.
4. During restoration and transfer of MDT chambers PENCOR Data Acquisition Systems will record all pressure measurements. All transfer pressures, temperatures and times will be recorded and reported.
5. Transfer LIVE hydrocarbon on rig to DOT certified transportable bottles. For PVT and solids analysis, 2 liters (or 3x750cc) of live reservoir fluid for gas, 5x750cc for oil. Bottles need to be made available to transfer this volume live at the absolute minimum. Preferably, all oil will be transferred live. Entire contents will require 5x750 cc cylinders for a 1.0 gallon chamber and 12x750 cc cylinders for a 2.75 gallon chamber.
6. Do single stage flash (provides API gravity, GOR, and GC) and oil base contamination calculation on first cylinder transferred from each large chamber.
7. Rinse all chambers on rig after transfers with toluene and send post-rinses to shore along with samples. Rinses should be transferred in sealable approved DOT containers.
8. Send to Pencor lab for analysis (address above).

Large Chambers (1.0 gallon Water samples)

1. Collect fluid downhole. Overpressure downhole to MAXIMUM overpressure.
2. Check and record opening pressure of backside of chamber.
3. On site, heat and rock chambers for a minimum of 6 hours, with automated restoration device at reservoir conditions (or up to Schlumberger max of 170 deg. F if reservoir temperature is higher).
4. During restoration and transfer of MDT chambers PENCOR Data Acquisition Systems will record all pressure measurements. All transfer pressures, temperatures and times will be recorded and reported.
5. Transfer LIVE water on rig to DOT certified transportable bottles. For live water analysis, 5 cylinders (5x750cc) of live water is requested. Bottles need to be made available to transfer this volume live at the absolute minimum. All water will be transferred live. Entire contents

would require 5x750 cc cylinders for a 1.0 gallon chamber. If entire contents are not transferred live, the remaining water should be bled down and LDPE bottles should be made available to transport the atmospheric water back to the laboratory. Care should be taken to fill the LDPE bottles as full as possible with as little air head space as possible to prevent oxidation.

6. Send to Pencor lab for analysis (address above).

Sampling Depths and Opportunities

MDT fluid sampling depths will be identified after an MDT pressure run across the horizons to be sampled. Objectives of the MDT pressure run will be to establish reservoir pressures in, and fluid gradients across, the various sand bodies from which sampling points in each horizon will be selected. In the event of multiple petroleum gradients within one reservoir the sample depth should be selected within the greatest net pay interval. If sample chamber numbers are available, samples will be taken within the various gradients to confirm fluid and flow characteristic differences.

The Middle Miocene intervals will be the primary targets (specifically, M56). The MDT fluid sampling run will attempt to obtain suitable fluid samples. If the samples obtained do not fulfill the agreed volume and quality targets, then additional MDT run(s) will be considered prior to running the OBMI and sidewall cores.

As contingency for MDT mechanical or electrical failure, Schlumberger will provide tool back-up, and back-up replacement parts for common tool failures. Past experience shows approximately 1 in 12 450cc MPSR samples chambers will have a failure – either not firing open or closed downhole, or loosing seal coming out of the hole. It is highly recommended that all high priority sample intervals contain a minimum of three samples, one 250cc SPMC and two 450cc MPSRs. Schlumberger and Drilling will also be prepared to run the MDT tool as DPC/TLC

Laboratory Analyses - Onshore

Objective

The primary objective of the Analysis Program is to collect the key data necessary to reach a development project sanction decision with just the data collected from the Macondo well. This includes:

- full PVT analysis for each major hydrocarbon zone (OOIP, recovery factor's, potential reserves)
- geochemical analysis of oils and isotopic analysis of gases (PEST models),
- compositional analysis C50+ (flow assurance work, subsea design, topside mods), and
- collection of formation waters in contact with hydrocarbon zones (compatibility tests, completions)

Specific Tests

Black Oil Study (or condensate). ('Live' oil) This includes the following analyses:

- Single Flash Separation to Atmospheric Pressure and Temperature - GOR, density, compositional analysis through C50+, boiling point
- Constant Mass Expansion - phase envelop data, bubble point, dew point etc.
- Differential Liberation - Flash separations from Bubble Point to atmospheric pressure. Includes oil density, volume factor, GOR, evolved fluid density, gas compressibility and solubility.
- Compositional analysis through C12+ Gas; and up to C30+ Oil
- Viscosity - viscosity vs. pressure relationship (at three temperature steps, i.e. 100, 150, Tres)
- Multistage separation @ 1200, 500 and 150 psi (or otherwise determined steps)
- Kinematic and Absolute viscosity at different flowline conditions: 80, 120, 160, 200 °F

Crude Oil Assay - ('Dead' oil) Results include but are not limited to the following (Pencor will deliver partial assay and BP Crude Oil Supply will provide additional assay):

- Yield on crude, Density, Sulfur, Mercaptan sulfur, Acid number, Viscosity, Cloud Point, Pour point, Wax, Wax Melting Point, Total Nitrogen, Basic Nitrogen, Organic Oxygen, Acidity, carbon residue, asphaltene content, nickel, vanadium, aromatics, smoking pt, Freezing point, Aniline point, cetane index, refractive index, hydrogen content, paraffins, naphthenes, Naphthalenes, n-paraffins, color stability, salt, sediment and water.

Geochemical Analysis - ('Dead' oil)
- GC Fingerprinting of reservoir fluid and drilling mud samples
- Biomarkers
- Carbon Isotopes
- SARA

Wax/Asphaltene - ('Live' oil)
- Fluid restoration
- Wax Crystallization Point analysis
- Asphaltene Flocculation Point analysis, to include Asphaltene Recombination Pressure (for facility design)

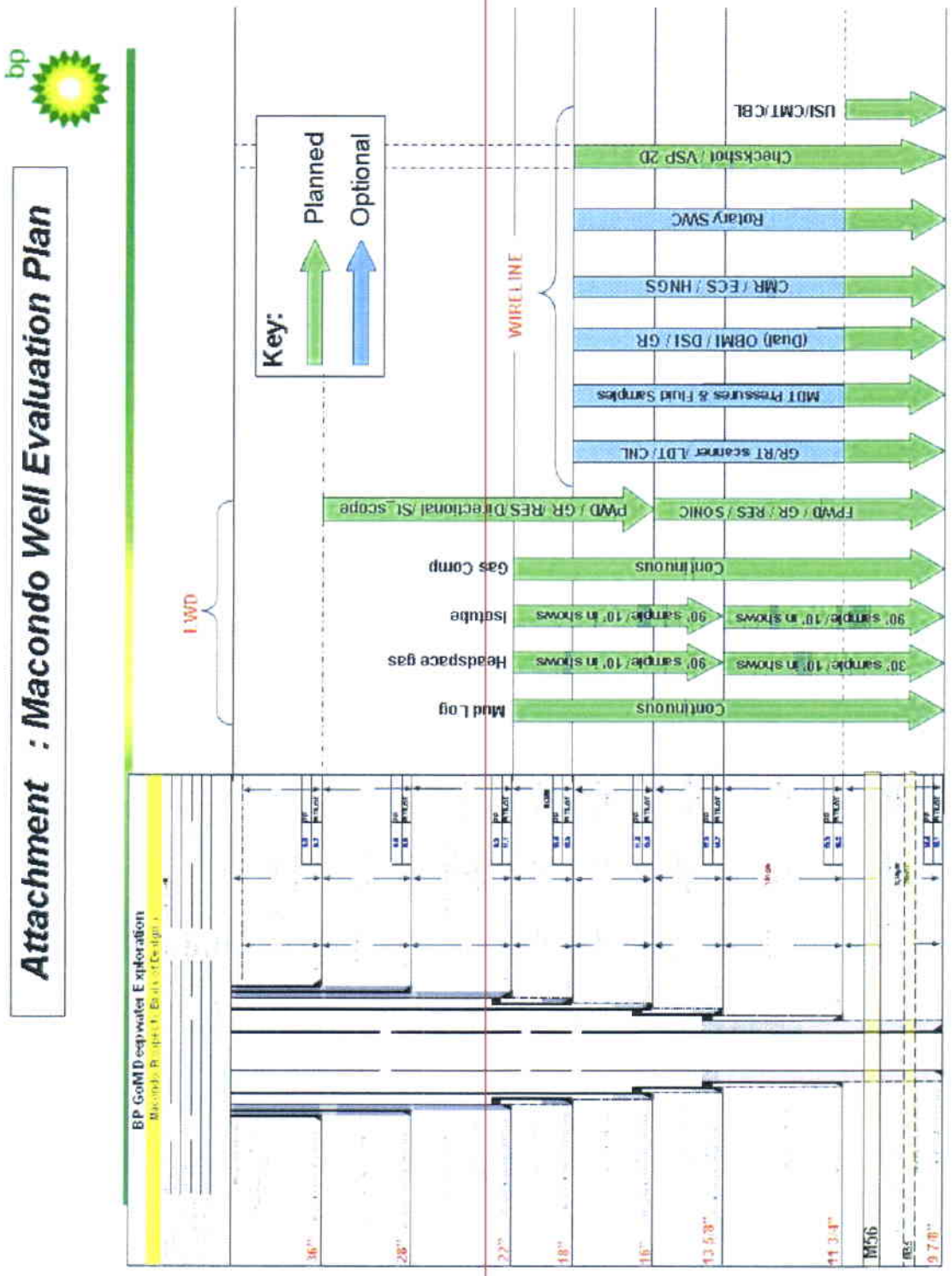
Water Analysis - if obtained (Pencor)
- Bulk property analysis
- Cation and Anion analysis
- Resistivity at ambient and reservoir temperatures
- Dissolved CO_2
- Salinity Concentration (for facility design)

Others
- Compatibility Studies for completion fluids/design
- Inhibitor selection and performance testing
- Production chemicals e.g. demulsifiers
- Completion fluids

Notes:
- It is the asphaltene, wax, nickel and vanadium measurements that require a sample with less than 5% contamination.
- There will be some duplication in measurements made. This will be useful for cross-check and sample analysis validation.
- The mobile laboratory service, equipment and personnel will be supplied by PENCOR (a division of Core Laboratories). Testing and other onshore fluid analysis will be performed by a variety of companies.

Logging Program

Macondo borehole evaluation program.



Attachment : Macondo Evaluation Program
"contingent intermediate logging run"
16" -13 5/8" - 11 3/4" csg @ 9900' – 17000'

Recompletion Prospects – secondary objectives

Case	Objectives	Program
PAY	Porosity, Permeability, Viscosity, Fluid Quality, Reservoir Pressure, Connectivity, Net Sand, Correlation, Structure, Seismic Properties, Oil Shows, Oil Charge	GR /RES /SONIC /FPWD MWD * GR /RT scanner / LDT /CNL MDT for Fluids and Pressures Rotary Sidewall Cores
THIN PAY OR NO PAY	Porosity, Permeability, Viscosity, Fluid Quality, Reservoir Pressure, Connectivity, Net Sand, Correlation, Structure, Seismic Properties, Oil Shows, Oil Charge	GR/RES/SONIC/FPWD MWD Optional GR/AIT/LDT/CNL/DSI Optional MDT for Pressures

* For efficiency of operations – One Wireline run

No prospects have been described in the intermediate hole sections. However, if pay is encountered, the pay case evaluation program described above will only be completed if approved by Exploration Subsurface Management.

Attachment : Macondo Evaluation Program
9 7/8" csg +/- 20,200ft TD logging run

Case	Objectives	Program
THICK PAY >45' Net HC	Porosity, Permeability, Viscosity, Fluid Quality, Reservoir Pressure, Connectivity, Net Sand, Correlation, Structure, Seismic Properties	GR / RES / SONIC / FPWD MWD GR/RT Scanner/LDT/CNL CMR / ECS / HNGS Dual OBMI / DSI /GR MDT for Fluids and Pressures Rotary Sidewall Cores, VSP/Checkshot Optional Full hole core
THIN PAY OR NO PAY <20' Net HC	Porosity, Permeability, Viscosity, Fluid Quality, Reservoir Pressure, Connectivity, Net Sand, Correlation, Structure, Seismic Properties	GR/RES/SONIC/FPWD MWD GR/RT Scanner/LDT/CNL Optional CMR / ECS / HNGS Optional Dual OBMI / DSI /GR Optional MDT for Pressures & fluids Optional Sidewall Cores Checkshot

In the event that 45 ft or more of net hydrocarbon bearing sand is encountered in the primary target, the thick pay evaluation program described above will be completed. If less than 20 ft. of net hydrocarbon bearing sand is penetrated, the thin/no pay evaluation program will be completed. If 20-45 ft of net pay is found, the thick pay evaluation would be completed only with the approval of Exploration Subsurface Management, based on available well data.

VSP/Checkshot Requirements

Scenario	Action
Dry or uneconomic well	Collect a checkshot only with 200 ft spacing
Success case and casing is not and issue and walkaway VSP modeling results not favorable	Collect a checkshot from the water bottom (4992ft TVDSS) to the M75 (12,500ft TVDSS). Collect a 0-offset VSP at 50ft spacing from 12,500ft TVDSS to 19,560ft TVDSS

Whole Core Acquisition

Currently, whole core is not planned to be acquired in this well. However, analysis is underway to evaluate the need for and value of whole core. In the event that whole core is recommended and approved to be taken, a MOC will be completed.

End of Well Data Distribution

To be updated upon partner agreement.

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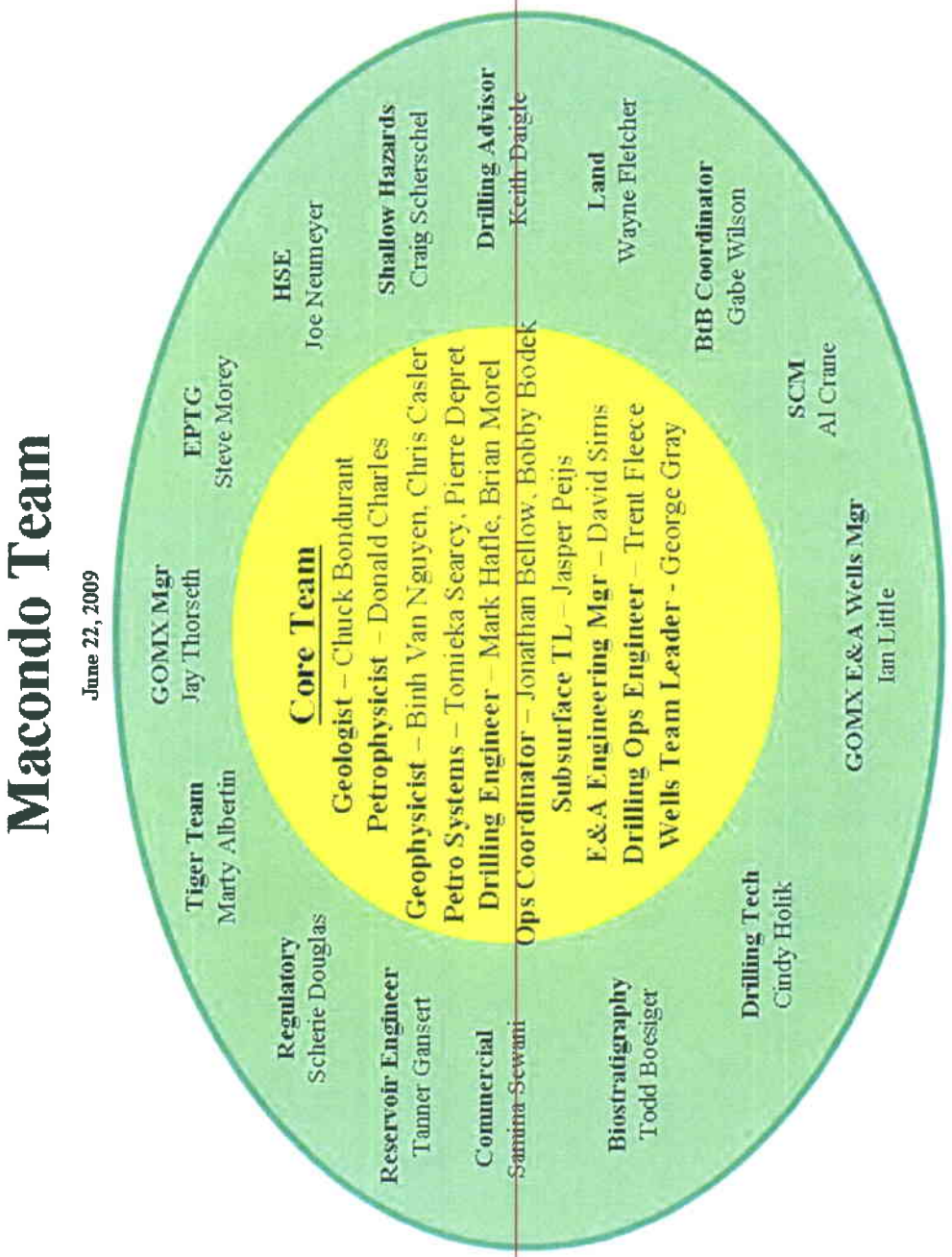
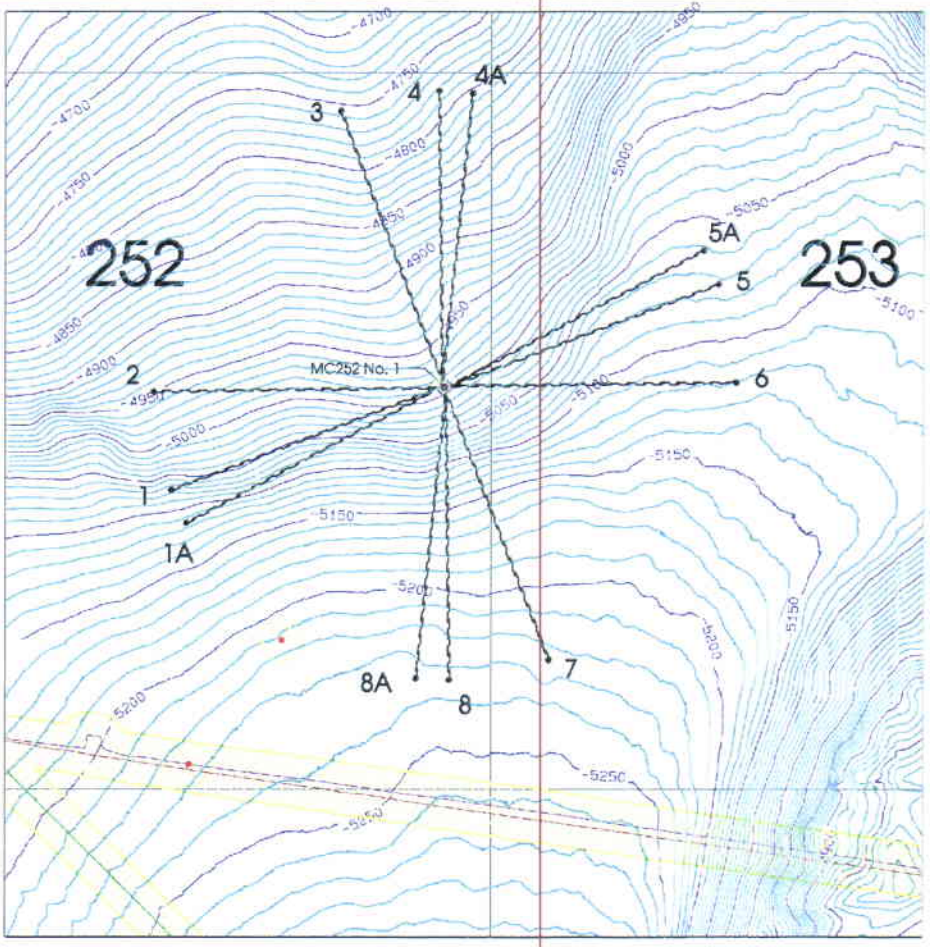
Macondo Team

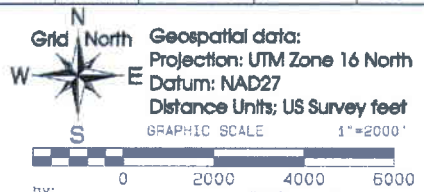


Appendix A. Moring lines, existing wells, and pipelines



AsBuilt Suction Pile Locations - Fugro Chance June 2009

SUCTION ANCHOR Name	ID Number	UTM ZONE 16 NORTH NAD27 – US SURVEY FEET North (Y)	East (X)	Elev	NAD27 LAT/LONG Latitude	Longitude	WGS84 LAT/LONG Latitude	Longitude
Anch 1	T1A262797	10,429,352.44	1,196,745.97	-5076	28°43'54.162"N	88°23'05.099"W	28°43 55.013"N	88°23 05.124"W
Anch 1A	39	10,428,622.92	1,197,070.35	-5115	28°43'46.975"N	88°23'01.360"W	28°43 47.826"N	88°23 01.384"W
Anch 2	40	10,431,519.32	1,196,350.54	-4948	28°44'15.572"N	88°23'09.824"W	28°44 16.423"N	88°23 09.850"W
Anch 3	36	10,437,705.73	1,200,502.25	-4756	28°45'17.306"N	88°22'23.985"W	28°45 18.154"N	88°22 24.009"W
Anch 4	T18263319	10,438,151.92	1,202,668.08	-4763	28°45'21.973"N	88°21'59.483"W	28°45 22.821"N	88°21 59.506"W
Anch 4A	T18263316	10,438,100.89	1,203,432.97	-4804	28°45'21.552"N	88°21'51.107"W	28°45 22.400"N	88°21 51.129"W
Anch 5	38	10,433,875.78	1,208,868.22	-5073	28°44'40.328"N	88°20'49.499"W	28°44 41.177"N	88°20 49.516"W
Anch 5A	T2A24008	10,434,628.85	1,208,536.11	-5081	28°44'47.747"N	88°20'53.326"W	28°44 48.597"N	88°20 53.345"W
Anch 6	35	10,431,712.36	1,209,266.12	-5120	28°44'18.950"N	88°20'44.754"W	28°44 19.800"N	88°20 44.773"W
Anch 7	T18263317	10,425,685.41	1,205,113.88	-5224	28°43'17.614"N	88°21'30.617"W	28°43 18.555"N	88°21 30.636"W
Anch 8	T18263344	10,425,146.41	1,202,916.32	-5234	28°43'13.219"N	88°21'55.244"W	28°43 14.071"N	88°21 55.265"W
Anch 8A	T18263345	10,425,177.43	1,202,180.31	-5234	28°43'13.442"N	88°22'03.515"W	28°43 14.295"N	88°22 03.536"W



Geospatial data:
Projection: UTM Zone 16 North
Datum: NAD27
Distance Units; US Survey feet

by:
Brian D. Autio, RPLS
bp IT&S GoM SPU
Houston, TX
(281) 366-4452
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Bathymetry:
AUV Data C&C Technology
Contour Interval = 10 feet
Spring 2009

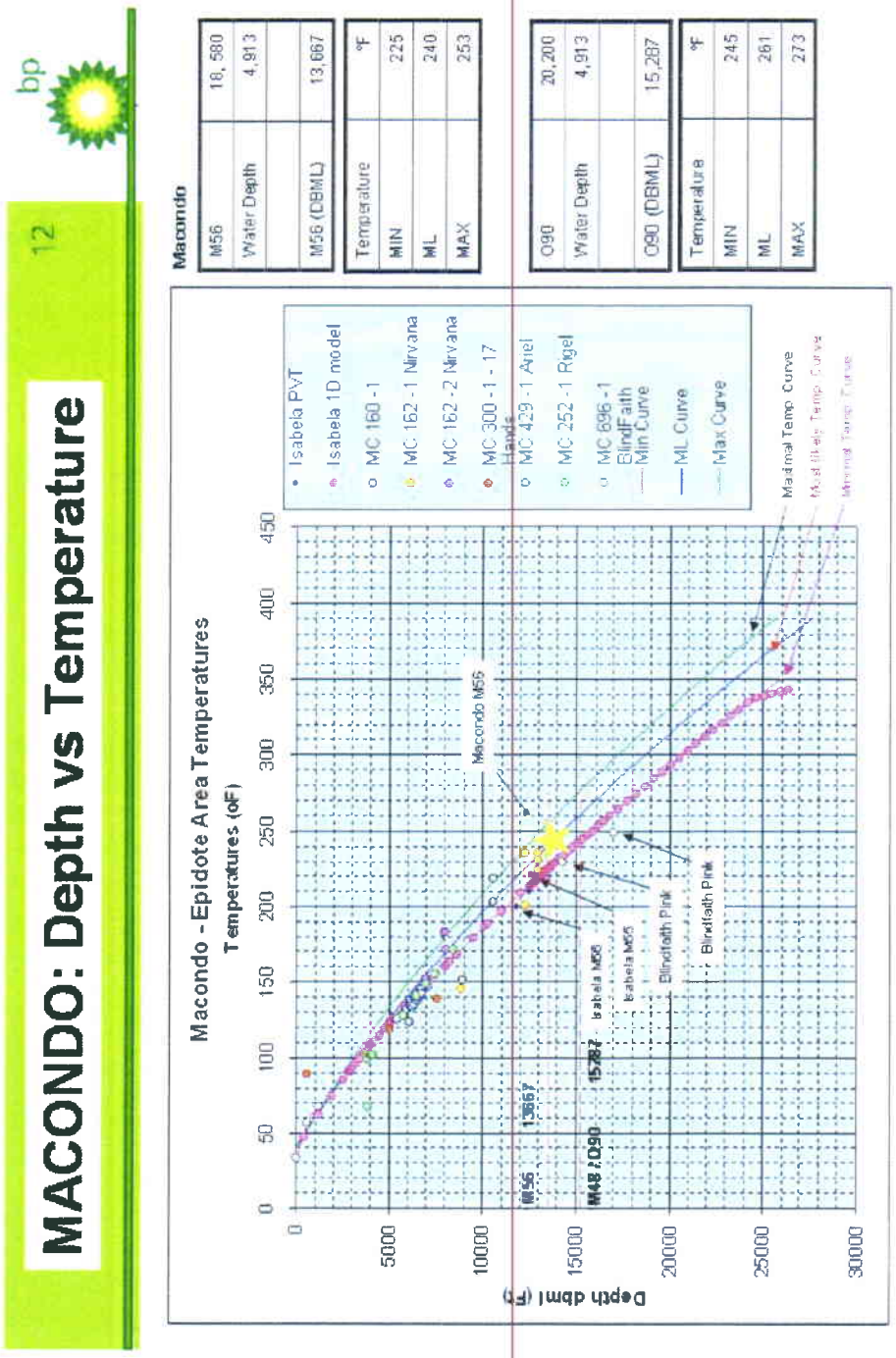
MACUNDO PROSPECT
MC252 Well No. 1
TOI MARIANAS
Mississippi Canyon Area

Date: Rev 22June2009

Appendix B. Offset Rigel wells, potential depleted and charged zones

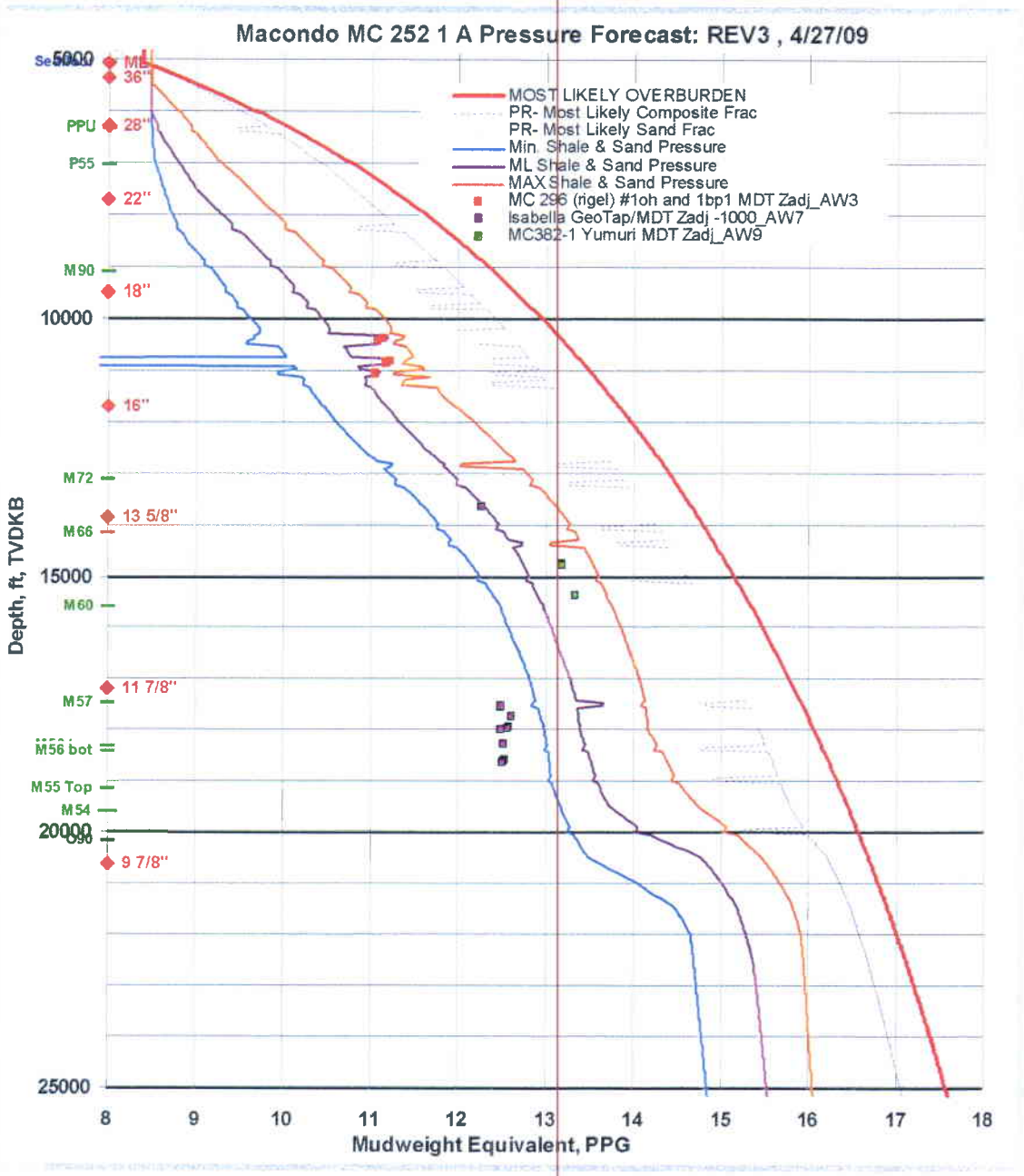
Rigel/Macondo
Well Details

Appendix C. Macondo Temperature prediction



Note: Onset of H2S occurs at approximately 300°F.
The predicted temperatures are well below 300°F.

Appendix D. Macondo Pressure Forecast



Appendix E. Geologic Prognosis