Form MMS 123A/123S - Electronic Version

Application for Permit to Drill a New Well

Lease G16942 **Area/Block** WR 29 **Well Name** A006 **ST** 00 **BP** 00 **Well Type** Exploration
Application Status Approved **Operator** 00078 Chevron U.S.A. Inc.

Pay.gov Amount: $1,959 **Agency Tracking ID:** EWL-APD-11177 **Pay.gov Tracking ID:** 2558NU2E

General Well Information

API Number 608124006600	**Approval Date** 02/16/2012	**Approved By** Amy Wilson
Date of Request 12/22/2011	**Req Spud Date** 03/05/2012	**Kickoff Point** N/A
Water Depth (ft.) 5187	**Drive Size (in)** 36	**Mineral Code** Hydrocarbon
RKB Elevation 92	**Drive Depth (ft.)** 5587	**Subsea BOP** No
Verbal Approval Date	**Verbal Approval By**	

Proposed Well Location

Surface Location

LEASE (OCS) G16942	**Area/Block** WR 29	**Authority** Federal Lease

Entered NAD 27 Data	Calculated NAD 27 Departures	Calculated NAD 27 X-Y Coordinates
Lat: 26.9326625	S 7621	**X** 2448254.991626
Lon: -90.52020806	E 6945	**Y** 9780900.98845

Surface Plan S 7478 **Plan Lease (OCS)** G16942 **Area/Block** WR 29

Bottom Location

LEASE (OCS) G16942	**Area/Block** WR 29

Entered NAD 27 Data	Calculated NAD 27 Departures	Calculated NAD 27 X-Y Coordinates
Lat: 26.9326625	S 7621	**X** 2448254.991626
Lon: -90.52020806	E 6945	**Y** 9780900.98845

Bottom Plan S 7478 **Plan Lease (OCS)** G16942 **Area/Block** WR 29

Approval Comments The wells operational status code needs to be documented on the EOR as Drilling Shut-In (DSI).

Drill with caution due to possible shallow faults and shallow water flow as listed on the BSEE Geological Review. If shallow gas is encountered drilling operations must cease and you must comply with 250.421(c) which dictates immediate setting of conductor casing. At this point the permit would need to be revised to capture this change in setting depth as well as revision of surface casing to allow for adequate cement placement inside the conductor casing.
Be aware that in future deepening of this well, the MASP calculations will need to assume a gas gradient of 0.15psi/ft. This is contrary to the gas gradients calculations presented in the type well package. Please plan accordingly.

Mitigations:

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Lease G16942 **Area/Block** WR 29 **Well Name** A006 **ST** 00 **BP** 00 **Well Type** Exploration
Application Status Approved **Operator** 00078 Chevron U.S.A. Inc.

Geologic Information

H2S Designation Absent	**H2S TVD**

Anticipated Geologic Markers

Name	**Top MD**
Top of Salt	8419

Rig Information

RIG SPECIFICATIONS		**ANCHORS**	No
Rig Name	T.O. DISCOVERER INDIA		
Type	DRILLSHIP	**ID Number**	50820
Function	DRILLING	**Constucted Year**	2010
Shipyard	OKPO S KOREA	**Refurbished Year**	
RATED DEPTHS			
Water Depth	10000	**Drill Depth**	40000
CERTIFICATES			
ABS/DNV	08/23/2015	**Coast Guard**	10/17/2012
SAFE WELDING AREA			
Approval Date	01/19/2012	**District**	2
Remarks			

OMB Control Number 1010-0141
OMB Approval Expires 11/30/2011

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Application for Permit to Drill a New Well

Lease G16942 **Area/Block** WR 29 **Well Name** A006 **ST** 00 **BP** 00 **Well Type** Exploration

Application Status Approved **Operator** 00078 Chevron U.S.A. Inc.

Number	Question	Response	Response Text
1	Will you maintain quantities of mud and mud material (including weight materials and additives) sufficient to raise the entire system mud weight 1/2	YES	
2	If hydrocarbon-based drilling fluids were used, is the drilling rig outfitted for zero discharge and will zero discharge procedures be followed?	YES	
3	If drilling the shallow casings strings riserless, will you maintain kill weight mud on the rig and monitor the wellbore with an ROV to ensure that it	YES	
4	If requesting a waiver of the conductor casing, have you submitted a log to government agency G&G that is with in 500 feet of the proposed bottor	N/A	
5	Will the proposed operation be covered by an EPA Discharge Permit? (please provide permit number in comments for this question)	YES	GMG290132
6	Will all wells in the well bay and related production equipment be shut-in when moving on to or off of an offshore platform, or from well to we	N/A	
7	Is the calculated daily volume possible from an uncontrolled blowout of this well greater than the daily volume included in the worst case discharge	NO	

Form MMS 123A/123S - Electronic Version

Application for Permit to Drill a New Well

Lease G16942 **Area/Block** WR 29 **Well Name** A006 **ST** 00 **BP** 00 **Well Type** Exploration

Application Status Approved **Operator** 00078 Chevron U.S.A. Inc.

Permit Attachments

File Type	File Description	Status

Required Attachments

pdf	Drilling prognosis and summary of drilling, cementing, and mud processes	Attached
pdf	Directional Program	Attached
pdf	Proposed Well Location Plat	Attached
pdf	Engineering Calculation	Attached
pdf	BOP stack certification including statement regarding any modifications made since last certification	Attached
pdf	Proposed Wellbore Schematic	Attached
pdf	BOP & Diverter Schematics with Operating Procedures	Attached
pdf	Blind-shear ram capability and certification	Attached
pdf	Pore pressure (PP), Mud Weight (MW), and Fracture Gradient (FG) Plot	Attached

Optional/Supplemental Attachments

pdf	Type Well Package	Attached
pdf	PE Certifications	Attached
pdf	RP 65-2 Compliance Questionnaire	Attached
pdf	Drill Center Subsea Wellhead Layout	Attached
pdf	PE Certification for Temporary Abandonment	Attached

Contacts Information

Name	Hilal Kurban
Company	00078 Chevron U.S.A. Inc.
Phone Number	832-854-2407
E-mail Address	HKurban@chevron.com
Contact Description	Drilling Engineer

Form MMS 123A/123S - Electronic Version

Application for Permit to Drill a New Well

Lease G16942 **Area/Block** WR 29 **Well Name** A006 **ST** 00 **BP** 00 **Well Type** Exploration

Application Status Approved **Operator** 00078 Chevron U.S.A. Inc.

Name	Debbie Campise
Company	00078 Chevron U.S.A. Inc.
Phone Number	832-854-2617
E-mail Address	cmps@chevron.com
Contact Description	Permit Specialist
Name	Muhammad Saleh
Company	00078 Chevron U.S.A. Inc.
Phone Number	832-854-3696
E-mail Address	mucs@chevron.com
Contact Description	Drilling Superintendent

OMB Control Number 1010-0141
OMB Approval Expires 11/30/2011

Form MMS 123A/123S - Electronic Version

Application for Permit to Drill a New Well

Lease G16942 **Area/Block** WR 29 **Well Name** A006 **ST** 00 **BP** 00 **Well Type** Exploration

Application Status Approved **Operator** 00078 Chevron U.S.A. Inc.

Well Design Information

Interval Number 1 **Type** Casing **Name** Conductor

Section Number	Casing Size (in)	Casing Weight (lb/ft)	Casing Grade	Burst Rating	Collapse Rating (psi)	Depth (ft) MD	Depth (ft) TVD	Pore Pressure (ppg)
1	22.000	328.0	X-80	9545	9457	5331	5331	8.6
2	22.000	224.0	X 80	6364	3873	5847	5847	8.6
3	22.000	170.0	X-60	3580	1820	8972	8972	9.3

GENERAL INFORMATION		PREVENTER INFORMATION		TEST INFORMATION	
Hole Size (in)	26.000	**Type**	No Preventers	**Annular Test (psi)**	0
Mud Weight (ppg)	10.4	**Size (in)**	N/A	**BOP/Diverter Test (psi)**	0
Mud Type Code	Water Base	**Wellhead Rating (psi)**	0	**Test Fluid Weight (ppg)**	0.0
Fracture Gradient (ppg)	12.8	**Annular Rating (psi)**	0	**Casing/Liner Test (psi)**	0
Liner Top Depth (ft)	0.0	**BOP/Diverter Rating (psi)**	0	**Formation Test (ppg)**	0.0
Cement Volume (cu ft)	10916				

PAPERWORK REDUCTION ACT OF 1995 (PRA) STATEMENT: The PRA (44 U.S.C. 3501 et seq. Requires us to inform you that we collect this information to obtain knowledge of equipment and procedures to be used in drilling operations. MMS uses the information to evaluate and approve or disapprove the adequacy of the equipment and/or procedures to safely perform the proposed drilling operation. Responses are mandatory (43 U.S.C. 1334). Proprietary data are covered under 30 CFR 250.196. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB Control Number. Public reporting burden for this form is estimated to average 27 hours per response, including the time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding the burden estimate or any other aspect of this form for the Information Collection Clearance Officer, Mail Stop 4230, Minerals Management Service, 1849

Application for Permit to Drill (APD)

DRILLING PROGRAM
REQUESTED DEPARTURES FROM CFR
GEOLOGIC PROGRAM

OCS-G -16942
Walker Ridge Block 29
Big Foot Drill Center
“Big Foot A-6”

TOI Discoverer India

CHEVRON USA
DEEPWATER EXPLORATION AND PROJECTS

January 23, 2012

TABLE OF CONTENTS

1.0 GENERAL REMARKS

1.1 Pollution Prevention and Control

Pollution and waste disposal in drilling operations shall follow guidelines established in 30 CFR 250.40. Additionally we will follow guidelines concerning discharges that are spelled out in NPDES General Permit No. GMG290132, or as stated in permit

1.2 Minimum Mud Quantities

CHEMICAL	BELOW SURFACE HOLE
Barite	sufficient quantity to maintain well control
*Gel	200 sacks

* During water-based mud use only

1.3 Drilling Mud Components

The drilling mud will contain some or all of the following:

Fresh Water	PHPA (Poly Plus)
Bentonite	Ground Nut Hulls
Barite	Xanthan Gum (Duo-Vis)
Sodium Hydroxide	Defoamer
Lignite	Sodium Bicarb
Desco	Lime
NaCl	SAPP
PAC (PolyPac UL)	

1.4 Mud weight by section

Table of mud weight by Hole Section

Hole Section	Surface MW (ppg)
36”	8.6
26”	8.6 11 PAD 13 PAD

1.5 Shallow Water Flow Hazards

The Big Foot drill center, located in WR 29 is not in an “area known to contain a shallow water flow hazard.” Both an in house and third party, Geoscience Earth and Marine Services, Inc (GEMS) shallow hazard evaluation was performed on the well drill center including the use of offset data from the three (3) previous Big Foot wells, none of which experienced any shallow water flows (Big Foot # 1 (2269 ft), Big Foot # 2 (2313 ft), Big Foot # 3 (6654 ft)). Nevertheless, per 30 CFR 250.415(e), the best practices included in API RP 65 were evaluated and the following will be implemented:

- LWD/PWD Tools will be run in the 26” BHA to identify potential flow hazards..

- An ROV will be used to check for flow at all times during riserless operations.
- A 16 ppg weight drilling fluid will be converted to 10.7 ppg PAD water-based mud (WBM) ~320 ft prior to drilling a salt formation.
- Low fluid loss (12.5 ml fluid loss rate), low gel strength pump-and-dump (PAD) mud will be spotted prior to pulling out of the hole to run casing. 16 ppg heavy mud will be spotted in rathole. The 13 ppg PAD mud weight planned has proven to be a suitable weight in the Big Foot offset wells to ensure hole stability. While drilling regular fluid sweeps will be pumped and ECD's continually monitored to ensure good hole cleaning and avoidance of subjecting the hole to high pressures. In addition a mud hydraulics model will be utilized in planning and during operations.
- Conventional cement slurries will be used for this well to cement the 22" casing.

1.6 Contingency Plans for Moving Rig Off Location in an Emergency

Plans are in place to cover the move off of the rig from location in an emergency. Key documents are as follows:

- The Emergency Evacuation Plan (submitted to the US Coast Guard in Sep. 2011). The Plan covers the Drill Ship MODU "Transocean Discoverer India" to be implemented during the Drilling Operations in Walker Ridge Block 29, Lease OCS-G-16942. (Example: tropical storm evacuation, fires, collisions).
- The Transocean Discoverer India Emergency Response Manual. This document covers events such as hurricanes or adverse weather, shallow gas blowouts and emergency disconnect procedure. Weather and loop current forecasting services are in place to aid long range planning.

These plans are available for review upon request.

1.7 Current Monitoring Plan

Chevron owns six (6) – 75 kHz Acoustic Doppler Current Profile (ADCP) units for use on all of our deepwater MODUs, which monitor ocean currents to a depth of 603 meters / 1,978'.

There will be a bottom current meter at Big Foot location. NTL 2009-G02 require a near bottom current meter (CMD) at this location due to the proximity of Drill Center to the Sigsbee Escarpment.

In addition to the ADCP unit and the bottom current meter, Chevron subscribes to the Eddy Watch™ forecasting service from Horizon Marine. This tool is used by all of our operations to plan for potential emergency station-keeping situations.

http://www.horizonmarine.com/eddywatch/ew_gulf.php

2.0 DRILLING PROCEDURE

2.1 General

1. The Transocean Discoverer India will move to WR 29 Big Foot drill center. On location a ROV (Remote Operated Vehicle) will perform initial sea floor survey per BOEM requirements.

2. Position rig onto the designated location for the well WR 29 Big Foot A-6 OCS-G 16942. Inspect A-6 mud line markers, move rig onto the designated location for A-6.

3. Pick-up and run the 36" casing with 38" LPH installed. Run 26" (or 30") jetting assembly inside 36" casing. ROV to monitor the bit space-out. Install slope indicators. RIH with 36" casing and jetting assembly on drill pipe to mud line. ROV verify and adjust location. Jet to approximately 310' BML leaving 11.7' of stick-up above mud line (LPH). Let 36" casing to soak.

4. Drill 26" hole riserless with seawater to +/- 7750' before switching to PAD mud at 10.7 ppg surface weight. The hole will be drilled to a planed depth of +/- 8972' MD / 3,693' BML with the 11 ppg PAD mud, then spotted with 16 ppg heavy mud in 50 ft rat hole and displaced with 13 ppg PAD mud prior to pulling out of hole (10.4 ppg equivalent mud weight at TD).

5. Run 22" x 1-1/2" wall 328 ppf X-80 H-90D / 22" x 1" wall 224 ppf X-80 S-90 / 22" x ¾" wall 170 ppf X-60 S-60 Dril-Quip connectors on 6-5/8" drill pipe to +/- 8,922' MD / 3,643' BML. Land 18-¾" HPH into 38" LPH, and perform 50k overpull test. Cement 22" casing (200 ft cement plug above the float shoe) and lock down HPH into the LPH.

2.2 Verification of Proper Installation of Casing in the Subsea Wellhead

1. 22" casing: Slack off 50K lbs to latch HPWH into LPH, overpull 50k lbs to confirm latch. After cementing, take 175k lbs overpull to preload the HPWH to 2MM lbs.

2.3 Temporary Abandonment Procedure

1. Run in hole with drill pipe string and tag hard cement top at / above 200 ft float shoe.
2. Displace the well with 11.3 ppg $CaCl_2$ brine with Oxygen scavenger
3. Place temporary abandonment cap on the HPWH with ROV

3.0 DEPARTURES FROM CODE OF FEDERAL REGULATIONS

1. **NTL 2009-2 Ocean Current Monitoring**
   NTL 2009-2 states that current monitoring is required to a depth of 1000 meters. Chevron owns six (6) – 75 kHz Acoustic Doppler Current Profile (ADCP) units for use on all of our deepwater MODUs, which monitor ocean currents to a depth of 603 meters / 1,978'. One of these units will be utilized on this well.

2. **Title 30 CFR Part 250, Section 1721, Paragraph (a): Requirement to file APM to TA**
   Operator requests a waiver from 30 CFR 250.1721 (a). the well will be temporarily abandoned as defined in Section 2.3 Well Design.

3. **30 CFR 250.461 (b) Survey Requirements for Directional Well**
   Due to the height of the Discoverer India derrick, which allows racking stands of Range 3 pipe (+/-140'), in lieu of the normally required 100' survey interval in angle change portions of the hole, directional surveys will be taken at intervals not to exceed 150'. In the event a composite MWD survey is run, a multi shot (or single shot) survey shall not be required at casing points or TD.

4.0 GEOLOGIC PROGRAM LETTER

The WR 29 OCS-G 16942 A-6 well will be drilled in accordance with the following:

1.	**API NUMBER:**	TBD
2.	**SURFACE LOCATION:**	7,621' FSL and 6,945' FEL of Walker Ridge Block 29 X = 2,448,255' Y = 9,780,901' Latitude: N 26° 55' 57.585" Longitude: W 90° 31' 12.749" Geodetic Datum: NAD27 Projection: UTM 15 (North) Grid Units: US Survey Feet
3.	**BOTTOM HOLE LOCATION:**	7,621' FSL and 6,945' FEL of Walker Ridge Block 29 X = 2,448,255' Y = 9,780,901' Latitude: N 26° 55' 57.585" Longitude: W 90° 31' 12.749"
4.	**ANTICIPATED MARKER TOPS:**	Top Salt: 8419' TVD
5.	**TOTAL DEPTH:**	8,972' MD / 8,972' TVD
6.	**WATER DEPTH:**	5,187' subsea
7.	**PRESSURE:**	9.3 ppg
8.	**DRILLING CONTRACTOR:**	TOI Discoverer India
9.	**PARTNERS:**	Chevron (60% W.I.) Statoil (27.5% W.I.) Marubeni (12.5% W.I.)
10.	**CHEVRON CONTACTS:**	*DRILLING ENGINEERING:* Muhammad Saleh (Drilling Superintendent) Office : 832-854-3696 / Cell 281-793-0916 Dan R. Williamson (Lead Drilling Engineer) Office: 832-854-4210 / Cell: 281-455-2407 Hilal Kurban (Drilling Engineer) Office: 832-854-2407 / Cell: 281-74 4513 Ian King (Drilling Manager) Office: 832-854-2640 / Cell: 713-834-7451 *G&G OPERATIONS:* Jim Hawkins (G&G Operations Team Leader) Office: 832-854-4869 / Cell: 281-705-4528 Catherine Coon (G&G Operations Geologist) Office: 832-854-3970

Dennis Woods (G&G Ops Formation Evaluation)
Office: 832-854-3601

BIG FOOT PROJECT TEAM:
Robert McCavitt (Big Foot Project Manager)
Office: 832-854-3985 / Cell: 713-553-9783

Danny Ledet (Snr. Drilling Superintendent)
Office : 832-854-2893/ Cell 281-687-2327

Sue Buller (Big Foot Project Subsurface Manager)
Office: 832-854-4944/ Cell: 713-410-2077

Ricky.Boehme (Big Foot Project Geologist)
Office: 832-854-7043 / Cell: 713-598-5572

John Hohenberger (Big Foot Project Reservoir Engineer)
Office: 832-854-2720/ Cell: 832-454-9086

Doug Hicks, (Big Foot Project Geophysicist)
Office: 832-854-2484 /

11. SECURITY CLASSIFICATION: CLASSIFIED STANDARD from surface to TD

12. GEOLOGIC CLASSIFICATION: Oil production well

13. GEOLOGIC CONCEPT: A-6 will be oil production to be drilled at Big Foot field from the drill center.

14. ESTIMATED SPUD DATE: Feb 15, 2012

15. EVALUATION PROGRAM:

a. Mud Log: Sperry-Sun None in open water section

b. LWD: Schlumberger 5587' to 8972' MD GR/RES/PWD/DIR

c. Wireline Logging: None in open water section

d. Velocity Survey:

e. Directional Services: Schlumberger

f. Wellsite Geologist: Chevron

g. Wellsite Paleontologists: None in open water section

h. Sidewall Cores: None in open water section

i. Conventional Core Acquisition: None in open water section

Engineering calculations are not applicable to the operations proposed under this APD.

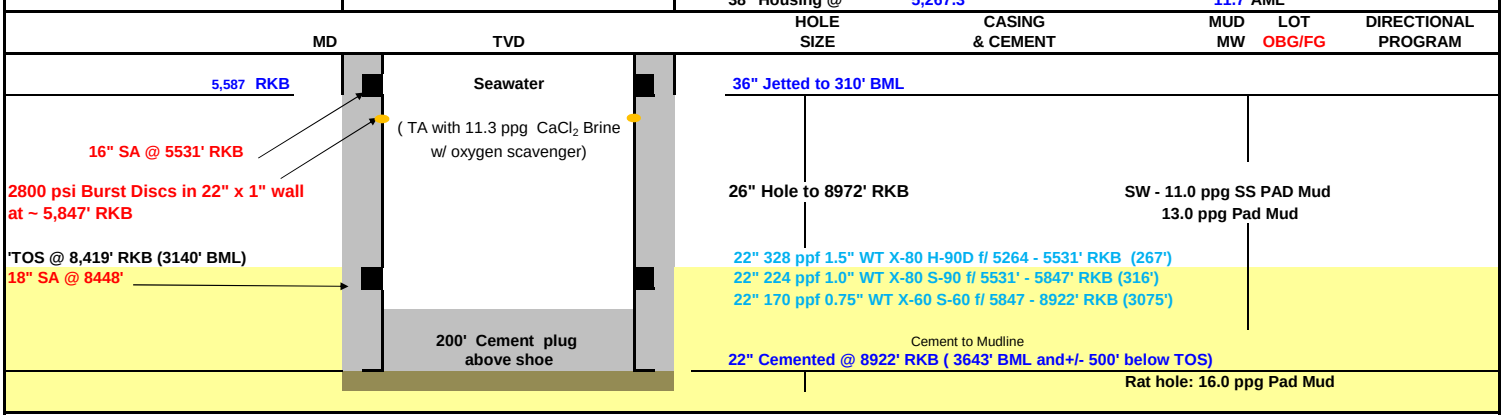
Proposed Well Schematic
Bigfoot Prospect - Open Water Work - Suspended

Well:	WR 29 OCS-G-16942 A-6	**Rig:**	TOI Discoverer India
Mudline Location:	X = 2448255 Y=9780901	**WBS No.**	#
	Long=W 90° 31' 12.75" Lat= N 26° 55' 57.59"	**API Well Number:**	#
BHL Location:	Same as Mudline location		
		KB to MSL (ft):	92
OBJECTIVES:	N/A	**Water Depth (ft):**	5,187
DIRECTIONAL:	Vertical	**KB to ML (ft):**	5,279

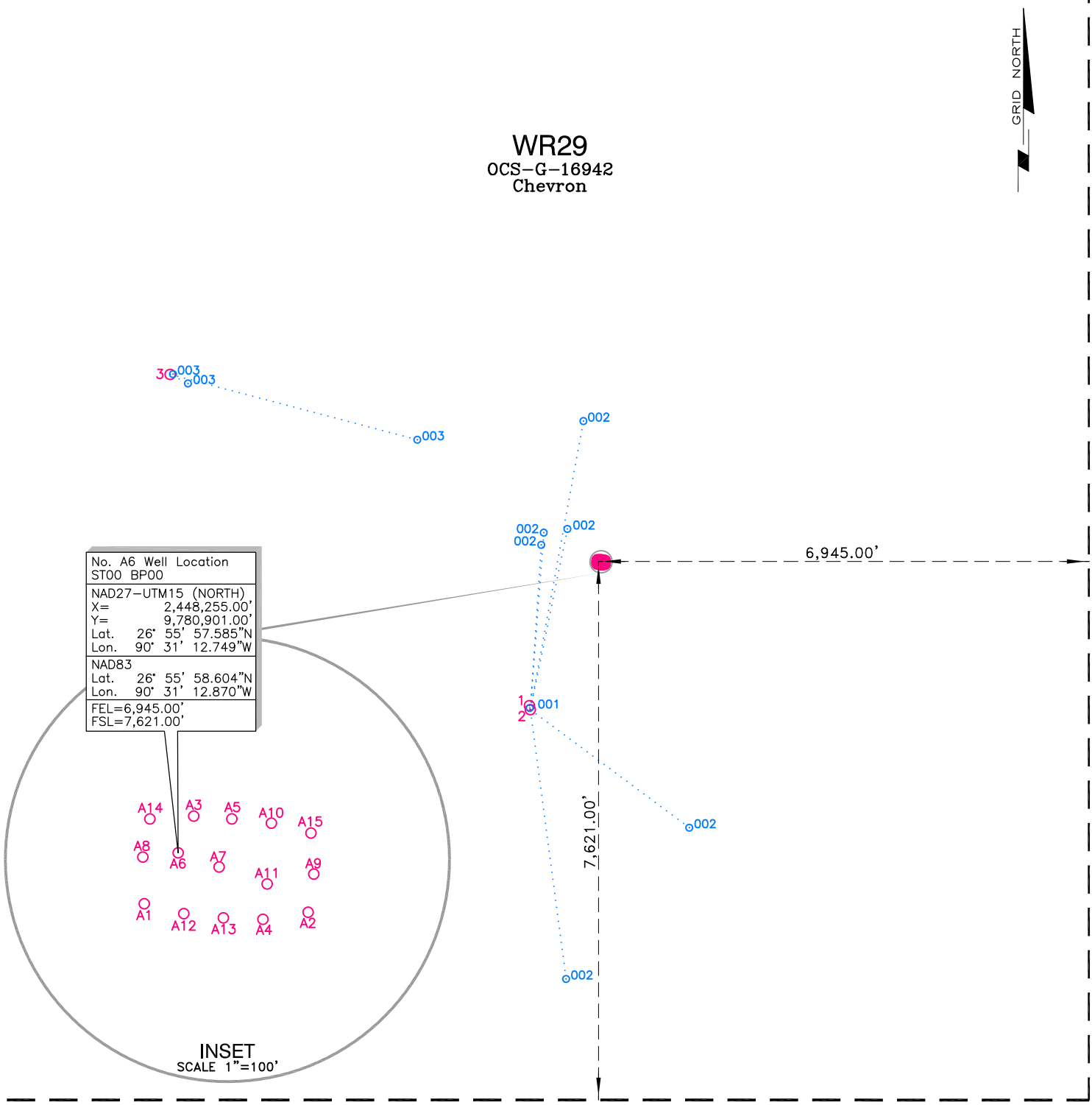
Final Slope Ind Readings : White = deg @ Green =

Composite TA cap installed on well

18-3/4" HPWH @	5,264.0	15.0	AML
38" Housing @	5,267.3	11.7	AML



WR29
OCS-G-16942
Chevron



I HEREBY CERTIFY THAT THE PROPOSED WELL LOCATION IS ACCURATELY REPRESENTED.

DIGITAL COPY
ORIGINAL PLAT SIGNED 10/03/11
ANTHONY L. GRAY RPLS #5789
STATE OF TEXAS

NOTES:

1) SURVEY COORDINATES TRANSFORMED FROM NAD83 (GPS DATUM) TO NAD27 (CHART DATUM) USING NADCON VERSION 2.1.

2) THIS DRAWING IS NOT FOR NAVIGATION. ONLY WELLS IN THE IMMEDIATE VICINITY OF THE SURVEYED WELL ARE SHOWN.

3) BOTTOM HOLE INFORMATION PROVIDED BY CLIENT AND DOES NOT REPRESENT A FUGRO CHANCE FIELD SURVEY.

Printed: 9/30/11

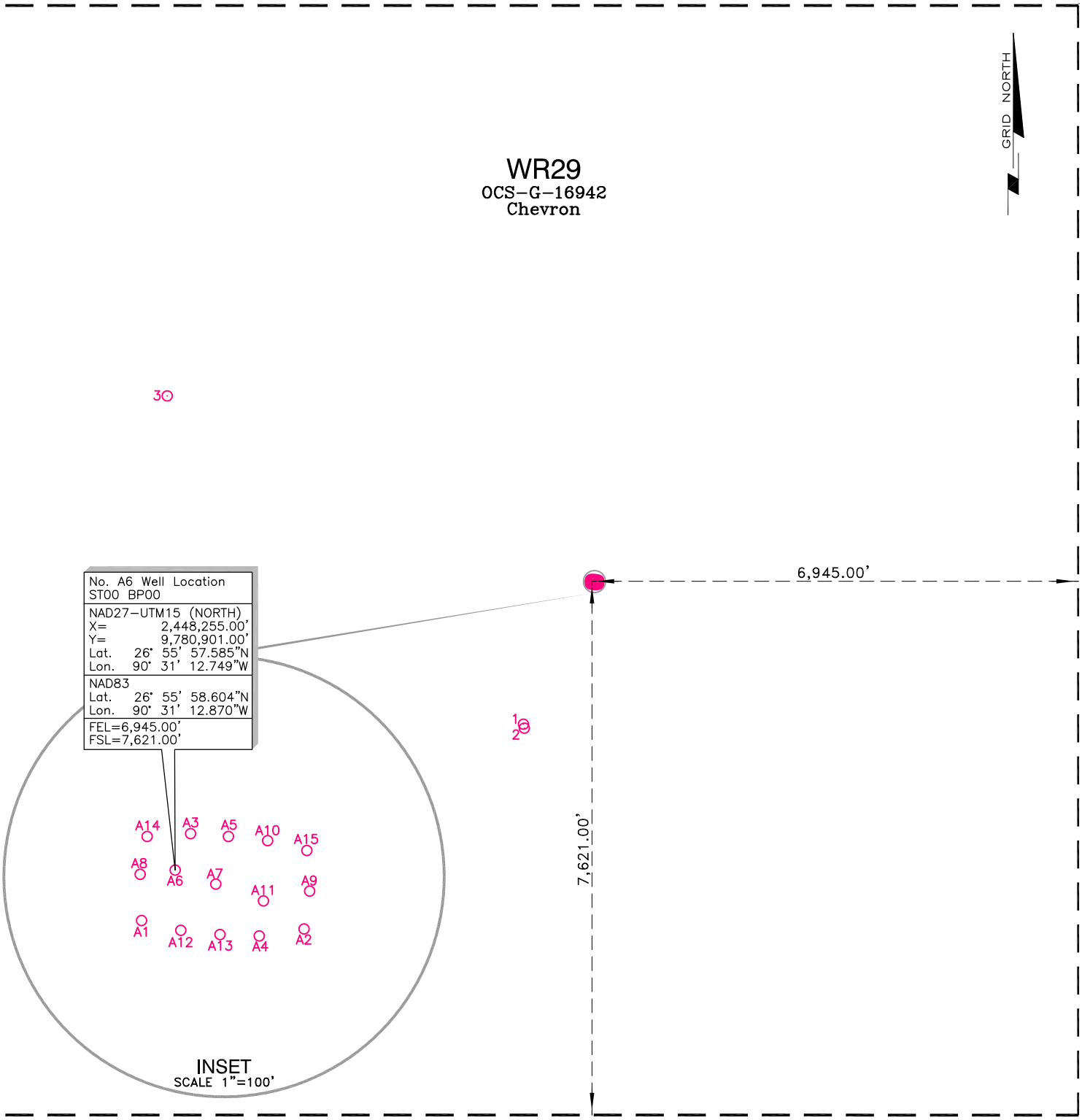
Chevron U.S.A. Inc.

PROPOSED LOCATION
WR29 OCS-G-16942 WELL A6 ST00 BP00

BLOCK 29
WALKER RIDGE AREA
GULF OF MEXICO

FUGRO CHANCE INC.
6100 Hillcroft Houston, Texas 77081 (713) 346-3700

GEODETIC DATUM: NAD27 PROJECTION: U.T.M. 15 (NORTH) GRID UNITS: US SURVEY FEET		SCALE IN FEET 0 2,000'	
Job No.: 11-1405	Date: 9/15/11	Drwn: EA	Chart: 1 Of: 1
Dwgfile: Q:\2011\111405\CAD\11140508			



I HEREBY CERTIFY THAT THE PROPOSED WELL LOCATION IS ACCURATELY REPRESENTED.

DIGITAL COPY
ORIGINAL PLAT SIGNED 10/03/11
ANTHONY L. GRAY RPLS #5789
STATE OF TEXAS

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PUBLIC INFORMATION

Printed: 9/15/11

Chevron U.S.A. Inc.

PROPOSED LOCATION
WR29 OCS-G-16942 WELL A6 ST00 BP00

BLOCK 29
WALKER RIDGE AREA
GULF OF MEXICO

FUGRO CHANCE INC.
6100 Hillcroft Houston, Texas 77081 (713) 346-3700

GEODETIC DATUM: NAD27 PROJECTION: U.T.M. 15 (NORTH) GRID UNITS: US SURVEY FEET		SCALE IN FEET 0 2,000'	
Job No.: 11-1405	Date: 9/15/11	Drwn: EA	Chart: 1 Of: 1
Dwgfile: Q:\2011\111405\CAD\11140508_PI			

Schlumberger

Chevron

WR29 A-6 ST00BP00 Batch Set Rev08 jlt 17Oct11 Proposal Report

(Def Plan)

Report Date:	December 01, 2011 - 04:46 PM	**Survey / DLS Computation:**	Minimum Curvature / Lubinski
Client:	Chevron	**Vertical Section Azimuth:**	260.001 ° (Grid North)
Field:	Walker Ridge Block 29 "Bigfoot"	**Vertical Section Origin:**	0.000 ft, 0.000 ft
Structure / Slot:	Bigfoot OCS-G 16942 A-Platform / Mudline C2-TX	**TVD Reference Datum:**	RKB
Well:	A-6 Texas	**TVD Reference Elevation:**	92.000 ft above MSL
Borehole:	Batch Set - ST00BP00	**Seabed / Ground Elevation:**	5187.000 ft below MSL
UWI / API#:	Unknown / Unknown	**Magnetic Declination:**	0.438 °
Survey Name:	WR29 A-6 ST00BP00 Batch Set Rev08 jlt 17Oct11	**Total Field Strength:**	45950.660 nT
Survey Date:	October 17, 2011	**Magnetic Dip Angle:**	56.615 °
Tort / AHD / DDI / ERD Ratio:	0.000 ° / 0.000 ft / 0.000 / 0.000	**Declination Date:**	October 17, 2011
Coordinate Reference System:	NAD27 Universal Transverse Mercator, Zone 15 North, US Feet	**Magnetic Declination Model:**	BGGM 2011
Location Lat / Long:	N 26° 55' 57.58521", W 90° 31' 12.74890"	**North Reference:**	Grid North
Location Grid N/E Y/X:	N 9780901.000 ftUS, E 2448255.000 ftUS	**Grid Convergence Used:**	1.124 °
CRS Grid Convergence Angle:	1.12377126 °	**Total Corr Mag North->Grid North:**	-0.686 °
Grid Scale Factor:	1.00034855	**Local Coord Referenced To:**	Well Head

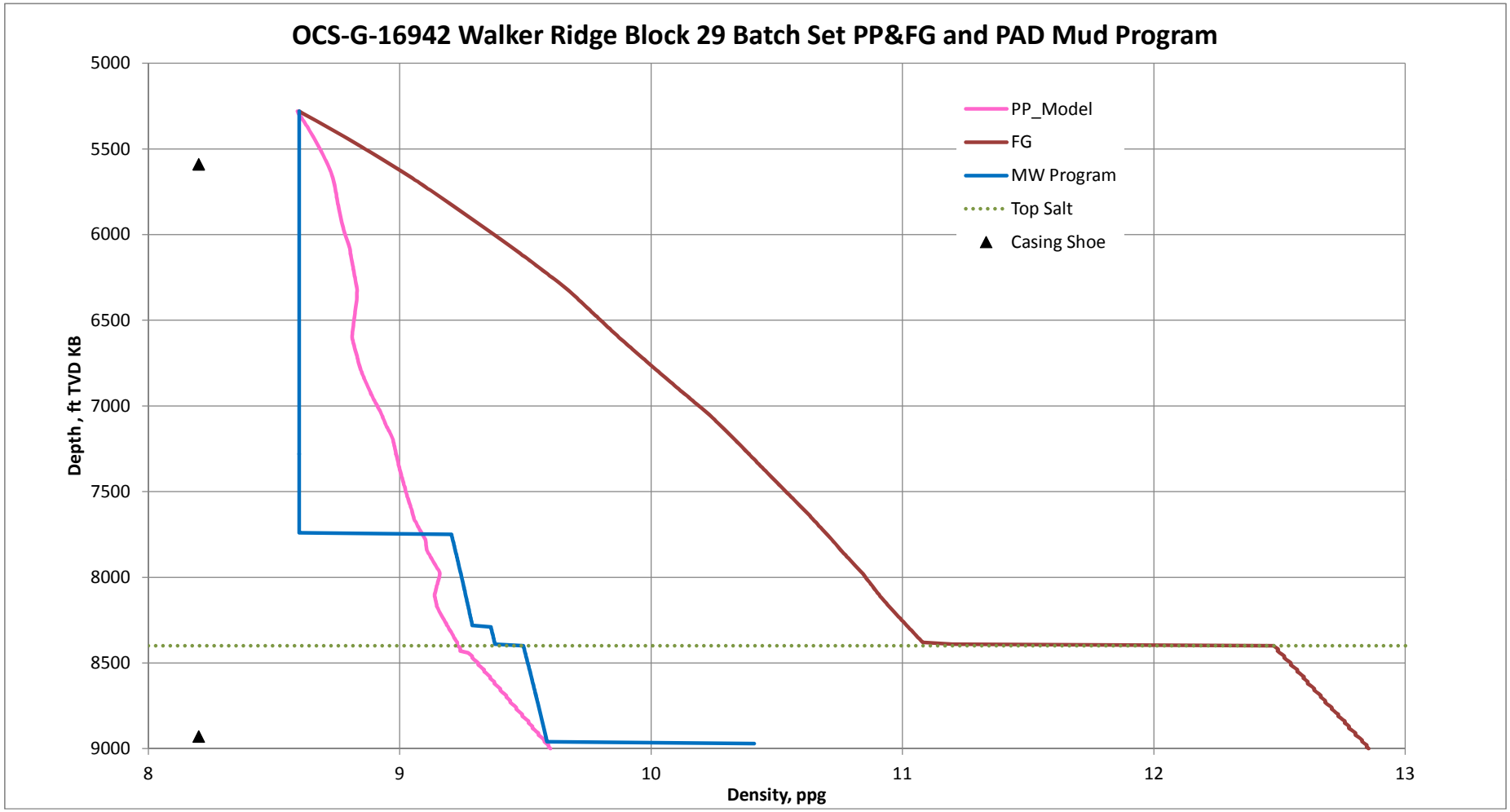
Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVDSS (ft)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
SS Surface Location	0.00	0.00	260.00	-92.00	0.00	0.00	0.00	0.00	N/A	9780901.00	2448255.00	N 26 55 57.59	W 90 31 12.75
Marker MudLine	*5279.00*	*0.00*	*260.00*	*5187.00*	*5279.00*	*0.00*	*0.00*	*0.00*	*0.00*	*9780901.00*	*2448255.00*	*N 26 55 57.59*	*W 90 31 12.75*
36in Conductor	*5589.00*	*0.00*	*260.00*	*5497.00*	*5589.00*	*0.00*	*0.00*	*0.00*	*0.00*	*9780901.00*	*2448255.00*	*N 26 55 57.59*	*W 90 31 12.75*
Top of Salt	*8419.00*	*0.00*	*260.00*	*8327.00*	*8419.00*	*0.00*	*0.00*	*0.00*	*0.00*	*9780901.00*	*2448255.00*	*N 26 55 57.59*	*W 90 31 12.75*
22 in. Casing	*8922.00*	*0.00*	*260.00*	*8830.00*	*8922.00*	*0.00*	*0.00*	*0.00*	*0.00*	*9780901.00*	*2448255.00*	*N 26 55 57.59*	*W 90 31 12.75*
PBHL/TD	8972.00	0.00	260.00	8880.00	8972.00	0.00	0.00	0.00	0.00	9780901.00	2448255.00	N 26 55 57.59	W 90 31 12.75

Survey Type: Def Plan

Survey Error Model: ISCWSA Rev 0 *** 3-D 95.000% Confidence 2.7955 sigma

Survey Program:

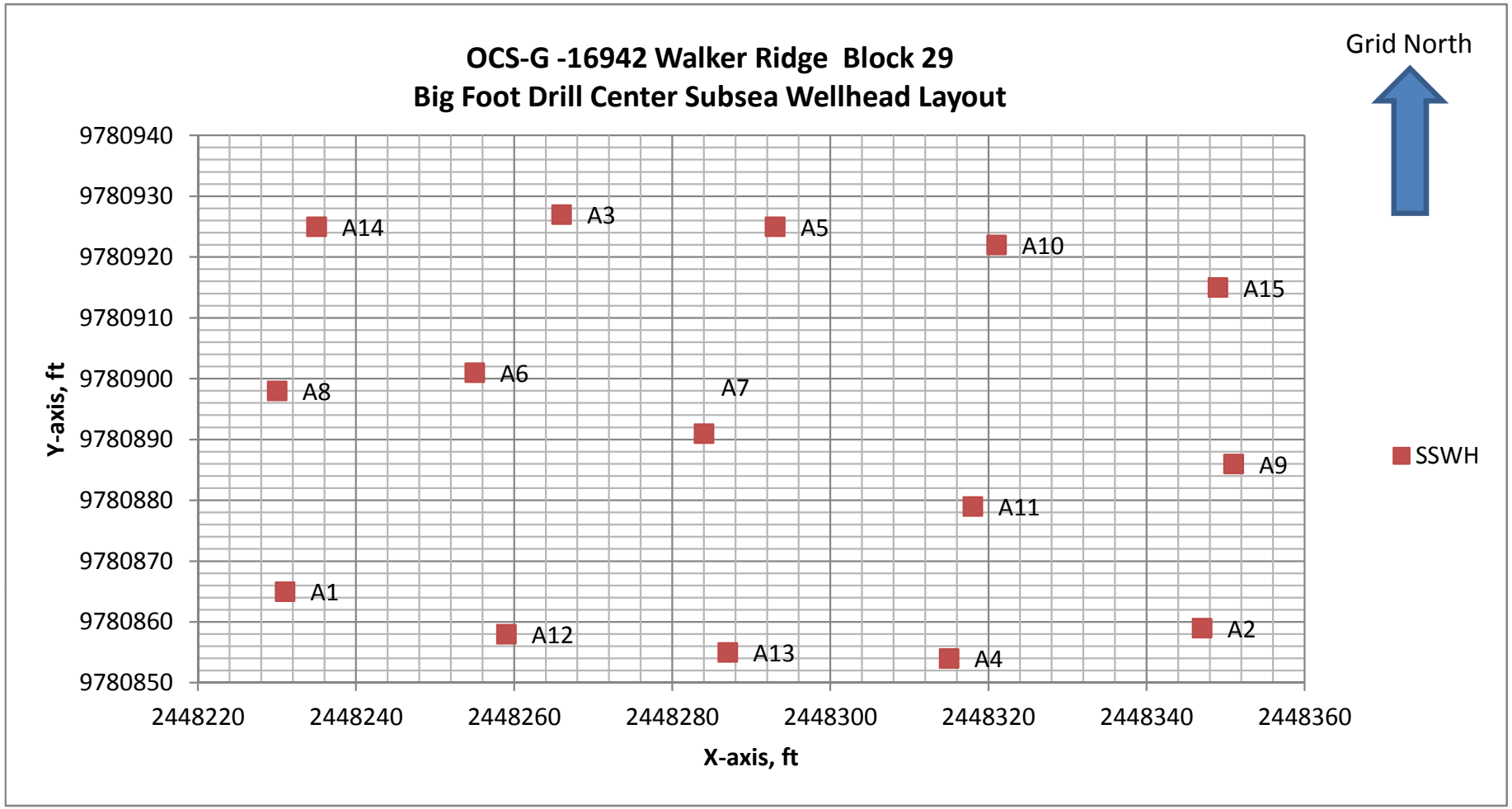
Description	MD From (ft)	MD To (ft)	EOU Freq (ft)	Survey Tool Type	Borehole / Survey
	0.000	5279.000	1/100.000	SLB_MWD-STD-Depth Only	Batch Set - ST00BP00 / WR29 A-6 ST00BP00 Batch Set Rev08 jlt 17Oct11
	5279.000	5579.000	1/100.000	SLB_MWD-STD	Batch Set - ST00BP00 / WR29 A-6 ST00BP00 Batch Set Rev08 jlt 17Oct11
	5579.000	8972.000	1/100.000	SLB_MWD-STD	Batch Set - ST00BP00 / WR29 A-6 ST00BP00 Batch Set Rev08 jlt 17Oct11


OCS-G-16942 Walker Ridge Block 29 Batch Set PP&FG and PAD Mud Program
Depth, ft TVD KB
5000
5500
6000
6500
7000
7500
8000
8500
9000
8
9
10
11
12
13
Density, ppg
PP_Model
FG
MW Program
Top Salt
Casing Shoe

This APD is for batch setting operations. A BOP and diverter will not be utilized.

This APD is for batch setting operations. A BOP will not be utilized.

This APD is for batch setting operations. A BOP will not be utilized.


OCS-G -16942 Walker Ridge Block 29
Big Foot Drill Center Subsea Wellhead Layout
Grid North
SSWH
Y-axis, ft
X-axis, ft
9780940
9780930
9780920
9780910
9780900
9780890
9780880
9780870
9780860
9780850
2448220
2448240
2448260
2448280
2448300
2448320
2448340
2448360
A14
A3
A5
A10
A15
A6
A8
A7
A9
A11
A1
A12
A13
A4
A2

VIKING
ENGINEERING, L.C.
12012 WICKCHESTER, SUITE 260 • HOUSTON, TX 77079 • PHONE 281.870.8455 • FAX: 281.589.2116

January 27, 2012

TBPE #F-4224
VIKING Project #120:118

Chevron USA
1500 Louisiana
Houston, TX 77002
Attention: Mr. Hilal Kurban

Subject: **CASING DESIGN CERTIFICATION** – *revision 1*
Big Foot Prospect - Walker Ridge 29 A-6 (OCS-G-16942)

Dear Mr. Kurban,
Thank you for allowing us to participate in your planning efforts for the subject well. The focus of this letter is to certify that the 22" casing design is compliant with applicable federal government regulations. After a detailed review, ***VIKING Engineering verifies the planned 22" casing is in compliance with CFR 30 §250.420(a)(6) and is appropriate for the purpose for which it is intended under expected wellbore conditions and is appropriate for permitting.***

This certification is applicable for the conditions described by the operator and analyzed by VIKING Engineering as part of the certification process. VIKING's analysis is summarized in the attached Engineering Supplement.

Note: The casing design certification includes a triaxial stress analysis.

Analyzed and certified by:

G. R. "Bob" Moe, P.E.
Texas Professional Engineering License #83855
VIKING Engineering, L.C.

Attachment
Engineering Supplement

SIERRA ENGINEERING, INC.
(281) 448-3858

PROFESSIONAL ENGINEERING CERTIFICATION FOR
United States Department of the Interior
Bureau of Safety and Environmental Enforcement (BSEE)

Operator: **Chevron USA**

Lease: **OCS-G 16942**
Area/Well: **Walker Ridge Block 29 #A6**

I have reviewed the following documents and data, prepared by Chevron USA for the subject well:

- Proposed Wellbore Schematic
- Drilling prognosis
- MASP & Casing test calculations
- Cement Job Design & Simulation
- Mud Program
- BOP Program
- Frac Gradient vs MW vs Pore Pressure curve
- Best Practices for API RP 65-2
- 22" Float Equipment specifications

Based on the review of the above documents and data (collectively the "Criteria"):

I hereby certify the Criteria meets or exceed industry engineering standards and regulatory requirements as set forth in **30 CFR Part 250 Oil and Gas and Sulphur Operations in the Outer Continental Shelf— Increased Safety Measures for Energy Development on the Outer Continental Shelf; Final Rule,** issued October 14, 2010.

I hereby certify that at least two independent tested barriers are planned across each flow path during well drilling operations, as per the requirements of **30 CFR Part 250.420 (a)(6) Oil and Gas and Sulphur Operations in the Outer Continental Shelf— Increased Safety Measures for Energy Development on the Outer Continental Shelf; Final Rule,** issued October 14, 2010.

I hereby certify that the casing dual mechanical barrier requirements referenced in **30 CFR Part 250.420 (b)(3) Oil and Gas and Sulphur Operations in the Outer Continental Shelf— Increased Safety Measures for Energy Development on the Outer Continental Shelf; Final Rule,** issued October 14, 2010 are met or exceeded by application of the Criteria.

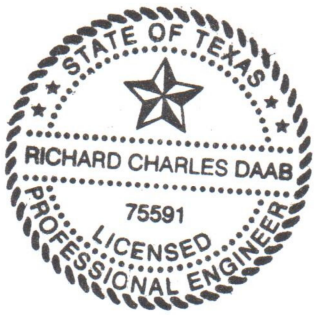
I hereby certify that the cement design is appropriate for the requirements for which it was intended under the expected wellbore conditions as required under **30 CFR Part 250.420 (a)(6) Oil and Gas and Sulphur Operations in the Outer Continental Shelf— Increased Safety Measures for Energy Development on the Outer Continental Shelf; Final Rule,** issued October 14, 2010.

Sierra Engineering hereby certifies the submitted Criteria and subsequent design for BSEE permit purposes only.

Richard Charles Daab, P.E.
Senior Partner
Sierra Engineering
Professional Engineering No. 75591

December 15, 2011
Date

Seal



Sierra Engineering
F-5979

VIKING
ENGINEERING, L.C.
12012 WICKCHESTER, SUITE 260 • HOUSTON, TX 77079 • PHONE 281.870.8455 • FAX: 281.589.2116

December 15, 2011

TBPE #F-4224
VIKING Project #120:118

Chevron USA
1500 Louisiana
Houston, TX 77002
Attention: Mr. Hilal Kurban

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Analyzed and certified by:

G. R. "Bob" Moe, P.E.
Texas Professional Engineering License #83855
VIKING Engineering, L.C.

Attachment
Engineering Supplement

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Lease: **OCS-G 16942**
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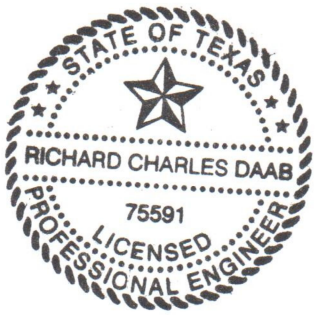
Richard Charles Daab, P.E.
Senior Partner
Sierra Engineering
Professional Engineering No. 75591

December 15, 2011
Date

Seal



Sierra Engineering
F-5979

OCS-G 16942 Walker Ridge Block 29 "Batch Set"
Compliance questions for CFR 30 §250.415(f)

	GENERAL QUESTIONS:	
1	Have you considered the following in your well planning and drilling plan determinations: evaluation for flow potential, site selection, shallow hazards, deeper hazard contingency planning, well control planning for fluid influxes, planning for lost circulation control, regulatory issues and communications plans, planning the well, pore pressure, fracture gradient, mud weight, casing plan, cementing plan, drilling plan, wellbore hydraulics, wellbore cleaning, barrier design, and contingency planning? [API 65-2 1.5]	Yes
2	Have you considered the general well practices while drilling, monitoring and maintaining wellbore stability, curing and preventing lost circulation, and planning and operational considerations? [API 65-2 1.6]	Yes
	FLOW POTENTIAL	
3	Will a pre-spud hazard assessment be conducted for the proposed well site?	Yes
4	List all potential flow zones within the well section to be cemented.	Yes
5	Has the information concerning the type, location, and likelihood of potential flow zones been communicated to key parties (cementing service provider, rig contractor, or 3rd parties)?	Yes
	CRITICAL DRILLING FLUID PARAMETERS	
6	Are fluid densities sufficient to maintain well control without inducing lost circulation?	Yes
	CRITICAL WELL DESIGN PARAMETERS	
7	Will you use a cementing simulation model in the design of this well?	Yes
7a	If yes, how is the output of this simulation model used in your decision-making process?	Describe below
7b	If no, include discussion of why a model is not being used.	N/A
7c	Either way, include the number and placement of centralizers being used.	Describe below
8	Will you ensure the planned top of cement will be 500 feet above the shallowest potential flow zone?	Yes
9	Have you confirmed that the hole diameter is sufficient to provide adequate centralization?	Yes
10	If there are any isolated annuli, how have you mitigated thermal casing pressure build-up.	N/A
11	Will you ensure the well will be stable (no volume gain or losses, drilling fluid density equal in vs. out) before commencing cementing operations?	Yes
12	List all annular mechanical barriers in your design.	Describe below
13	Has the rathole length been minimized or filled with drilling fluid with a density greater than the cement density?	Yes
14a	If you have any liner top packers exposed to the production or intermediate annulus, what is the rating for differential pressure across this packer?	N/A
14b	If you have any liner top packers exposed to the production or intermediate annulus, have you confirmed that your negative test will not exceed this rating?	N/A
15	What type of casing hanger lock-down mechanisms will be used?	Describe below
16	For all intermediate and production casing hangers set in subsea, HP wellhead housing, will you immediately set/energize the lock-down ring prior to performing any negative test?	N/A
17	For all production casing hangers set in subsea, HP wellhead housing, will you set/energize the lock-down sleeve immediately after running the casing and prior to performing any negative test?	N/A
	CRITICAL OPERATIONAL PARAMETERS	
18	Will you have 2 mechanical barriers in addition to cement in your final casing string (or liner if it is your final string)?	Yes
19	Do you plan to nipple down BOP in accordance with the WOC requirements in 30 CFR 250.422 and API RP 65 Part 2 First Edition?	N/A
20	Do you plan on running a cement bond log on the production and intermediate casing/liner prior to conducting the negative test on that string?	N/A
	Are contingency plans in place for the following:	
21	Lost circulation?	Yes
22	Unplanned shut-down?	Yes
23	Unplanned rate change?	Yes
24	Float equipment does not hold differential pressures?	Yes
25	Surface Equipment issues?	Yes
26	Will you monitor the annulus during cementing and WOC time?	Yes
27	If using foam cement, is a risk assessment being conducted and incorporated into cementing plan?	N/A
28	If using foam cement, will the foamer, stabilizer, and nitrogen injection be controlled by an automated process system?	N/A
	CRITICAL MUD REMOVAL PARAMETERS	
28	Have you tested your drilling fluid and cementing fluid programs for compatibility to reduce possible contamination?	Yes
29	Have you considered actual well conditions when determining appropriate cement volumes?	Yes

OCS-G 16942 Walker Ridge Block 29 "Batch Set"
Compliance questions for CFR 30 §250.415(f)

30	Has the spacer been modeled or designed to achieve the best possible mud removal?	Yes
	CRITICAL CEMENT SLURRY PARAMETERS	
31	Have all appropriate cement slurry parameters been considered to ensure the highest probability of isolating all potential flow zones?	Yes
32	Do you plan on circulating bottom up prior to the start of the cement job?	Yes

Additional Information

7a How is the output of this simulation model used in your decision-making process?
Cement job simulation will be used to evaluate well control, potential for induced losses and predict the location of losses. The simulation will be used to optimize pumping rates, centralization requirements, and the effectiveness of mud removal and cement placement.

7c Include the number and placement of centralizers being used.
22 inch Casing - A minimum of 15 centralizers spaced from the shoe to the mudline.

10 If there are any isolated annuli, how have you mitigated thermal casing pressure build-up.
APB simulations using WellCAT were done for the 22" x 16" annulus. A burst disk rated 2800 psi will be installed on 22" casing string to mitigate 22" x 16" annulus pressure build-up.

11 Will you ensure the well will be stable (no volume gain or losses, drilling fluid density equal in vs. out) before commencing cementing operations?
Prior to pulling out of the hole to run casing, the well will be circulated to condition the drilling fluid, remove cuttings and ensure the well is stable. Surge and swab analysis will be completed to optimize the casing running schedule and surge mitigation will be used when warranted.

12 List all annular mechanical barriers in your design.
22" casing will be cemented to Mudline

15 What type of casing hanger lock-down mechanisms will be used?
18 3/4" HPWH will be latched into 38" LPH, will apply 50k lbs overpull to confirm mechanical latch. After cementing, will take 175k lbs overpull to preload the HPWH to 2MM lbs.

26 Will you monitor the annulus during cementing and WOC time?
The well will be monitored during the WOC time by a ROV

OCS-G -16942 Walker Ridge Block 29 Big Foot Typical Well Statement:

OCS-G-16942 Walker Ridge 29 A-6 Well will be representative of the Typical Miocene Formation Well that will be drilled as part of the Big Foot Field Development.

Attached you will find relevant information for the Typical Big Foot Miocene Formation Well (see file "Typical Well Information.pdf"). These attachments are generic in nature and are intended to reflect the Typical Big Foot Field Miocene Formation Well Design.

A completed screening tool will be submitted with deepening requests for Well A-6 in the future.

TYPICAL WELL INFORMATION

OCS-G-16942
WR 29
Big Foot Drill Center

TOI Discoverer India

CHEVRON USA
DEEPWATER EXPLORATION AND PROJECTS

9/06/2011

Proposed Well Schematic
Bigfoot Prospect

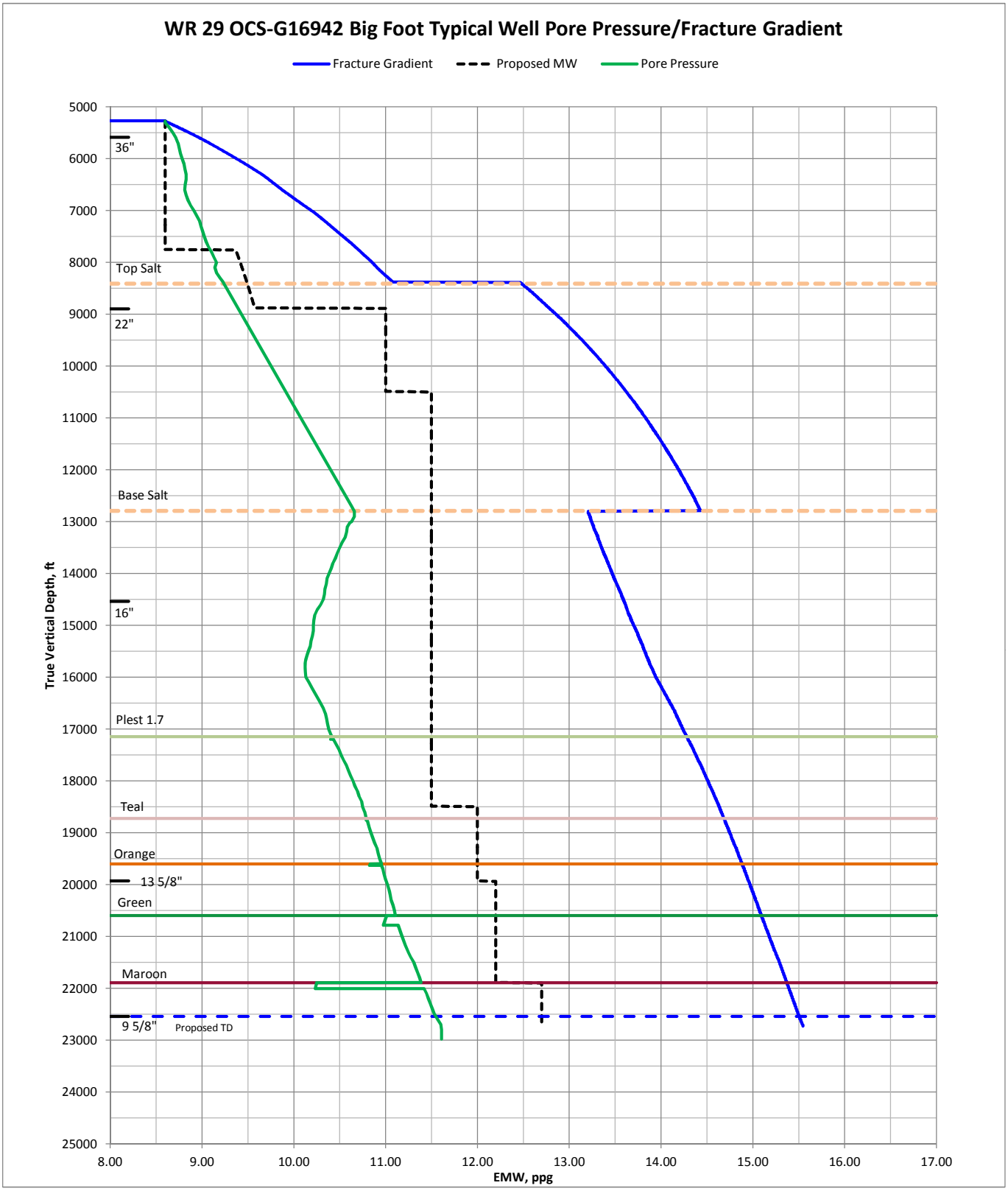
BIG FOOT

Well:	OCS-G-16942 Walker Ridge 29 Typical Well	**Rig:**	TO India w/ MODU KB - MSL :92 ft)
SUBSEA LOCATION:	X = 2448315' Y= 9780854'	**WBS No.**	TBD
	Long = W 90° 31' 12.09" Lat= N 26° 55' 57.10"	**API Well Number:**	TBD
SLOT NUMBER :	B-4		
DEPTH:	DEPTH MD 22,747' TVD 22,542'	**KB to MSL (ft):**	92'
MAXIMUM INC:	11 Deg.	**Water Depth (ft):**	5,187'
OBJECTIVES:	MAROON SAND to ~21,900' TVD	**KB to ML (ft):**	5,279' Last Update: DRW10/18/11,
		18-3/4" HPWH @	5,265' 15' AML
		30" Housing @	5,268' 12' AML

Subsea Wellhead
MUDLINE

CASING & CEMENT	MD	DEPTH TVD	BLM	Hole MD/TVD	HOLE SIZE	*SINGLE GRADIENT* Temp (F)	PP	MUD / MW PPG	LOT / FG PPG	FIT PPG
					Jetted			Sea Water 8.6	N/A	
36 in Conductor	5,589'	5,589'	310'	5589'/ 5589'						
36 in 170' of 2.0" WT X80 -726 ppf	5,438'	5,438'	159'							
36 in 150' of 1" WT X52 - 373.8ppf	5,589'	5,589'	310'							
16" SA @ 5531' RKB	5,531'	5,531'	252'		26 in			Sea Water 11ppg SS DKD 13 ppg PAD Mud		
KOP @ 7000', build @ 0.5 deg to 3 deg at 7600'; tangent to 9500' Az 180										
Top of Salt	8,413'	8,412'	3,133'							
18" Supplemental Adapter	8,448'	8,441'	3,169'							
22" Casing (500' into salt)	8,891'	8,889'	3,610'	8941'/ 8939'		84	10.1			12.7
22" 328 ppf 1.5" WT X-80 H-90D	5,531'	5,531'	252'							
22" 224 ppf 1.0" WT X-80 S-90	5,847'	5,847'	568'							
22" Rupture Disc at 5847' (Rupture @2800 psi)	*5,847'*	*5,847'*	*568'*							
22" 170 ppf 0.75" WT X-60 S-60	8,891'	8,889'	3,610'							
Seal Lube planned from ML to 5531' (all of 1.5" wall)										
KOP @ 9503', build at 1 deg to 10.86 deg at 10408', hold tangent to 21073' Az = 226					16 1/2 x 19 in			SBM 11.0- 11.5 ppg		
Base of Salt	12,845'	12,792'	7,513'							
Top of Cement 16 in	13,345'	13,283'	8,004'							
Liner top 13-5/8in (200' above 16" shoe)	14,426'	14,344'	9,065'							
16" Casing (~1400' below salt)	14,626'	14,540'	9,261'	14,790'/14,702'		115	10.3		13.6	13.0
16.040" 109.61# HPQ125 SLSF	11,000'	10,980'	5,701'							
16.15", 119.23#, HPQ125 SLSF	14,000'	13,926'	8,647'							
16.040" 109.61# HPQ125 SLSF	14,626'	14,540'	9,261'							
Seal Lube planned from Hanger to 10600' MD (200' below the start of tangent)										
Top of Cement 13-5/8 in Liner	16,112'	16,000'	10,721'							
Hold 10.86 deg tangent to below the orange Az 226					14-1/2 x 16-1/2 in			SBM 11.5 - 12.0 ppg		
Liner Top 9-7/8in (200' above 13 5/8" shoe)	19,914'	19,734'	14,455'							
TOC for 9 7/8" liner to TOL										
RA Tag in 13 5/8" at 19,579'.										
13-5/8 in Liner (300' below orange marker)	20,114'	19,930'	14,651'	20,244'/20,058"		164	11		14.9	13.3
13 5/8" 88.2# HPQ125 SLSF	15,093'	15,000'	9,721'							
13 3/4", 98.58#, HPQ125 SLSF	18,148'	18,000'	12,721'							
13 5/8" 88.2# HPQ125 SLSF	20,114'	19,930'	14,651'							
RA Tags in 9 7/8" liner at 22050, 21747, 20594										
Start drop at 1.5 deg at 21073; vertical at 21797 Az 226					12-1/4 in			SBM 12.2- 12.7 ppg		
9-7/8 in Production Liner at TD										
9 7/8", 65.1 #, HC Q125, SLSF										
Total Depth	22,747'	22,542'	17,263'	22,747'/22,542'		187	11.5			

Pleist 1.7 17280'-17330' MD
HC Bearing (WCD)
Teal 18889' - 18917' (MD)
HC Bearing (WCD)
Orange 19807'-19779' MD
HC Bearing (WCD)
Green 20794'- 20981' (MD)
HC Bearing (WCD)
Purple Gray 21947'-22050' (MD)
Water Sand
Swell Packer 22065' - 22085'
Maroon: 22097' - 22210' (MD)
Pay Section (WCD)


WR 29 OCS-G16942 Big Foot Typical Well Pore Pressure/Fracture Gradient
Fracture Gradient
Proposed MW
Pore Pressure
True Vertical Depth, ft
EMW, ppg
5000
6000
7000
8000
9000
10000
11000
12000
13000
14000
15000
16000
17000
18000
19000
20000
21000
22000
23000
24000
25000
8.00
9.00
10.00
11.00
12.00
13.00
14.00
15.00
16.00
17.00
36"
Top Salt
22"
Base Salt
16"
Plest 1.7
Teal
Orange
13 5/8"
Green
Maroon
9 5/8"
Proposed TD

Level 1 - Well Containment Screening Tool

LEVEL 1 - Well Containment Screening Tool (Complete a separate form for each hole section that has potential hydrocarbon flow zones)

Rev 1.18

1) General Well Information

Well Name:	Typical Well
Lease/Block:	Walker Ridge 29
Water Depth (ft):	5,187
RKB to Mudline Depth (ft):	5,279
Location (lat/long):	N 26° 55' 57.10834", W 90° 31' 12.09654"
Planned TD (ft):	22,747/22542 ft -MD/TVD
Planned Spud Date:	October 20, 2011

2) Offset Well Information

	Well	Distance/Direction
1)	**Offset Well 1**	X.X miles SE
2)		
3)		
5)		
6)		

3) Well Design

Wellhead Description	DrilQuip SS-15; 15,000 psi
Capping Stack Description	1 x NOV Ram Preventer; 15,000 psi

User entry

Calculation cell. Do not input data

Casing Plan

Size/Weight/Grade/Connection	Top (ft-TVD)	Bottom (ft-TVD)
36", 552#, X80	5,268	5,589
22", 328#, X80	5,265	5,531
22", 224#, X80	5,531	5,847
22", 170#, X60	5,847	8,889
16.040", 109.60#, HPQ125 SLSF	5,531	10,980
16.15", 119.23#, HPQ125 SLSF	10,980	12,943
16.040", 109.60#, HPQ125 SLSF	12,943	14,540

Screening tool results

5) Formation integrity below deepest exposed shoe	PASS
6A) Burst Integrity	PASS
6B) Trapped annuli check	PASS
6C) Collapse Integrity	PASS

4) Productive Formation Information

HOLE SECTION: 16.5 **SHOE DEPTH(FT-TVD):** 14,540

Name	Depth (ft-TVD)	Reservoir Fluid	Reservoir Pressure (ppg)	Reservoir Pressure (psi)	Assumed fluid gradient for calc (psi/ft)	Mud Line Shut in Pressure (psi)	Shut in ppg @ shoe	Comments
Reservoir 1	17,280	oil	10.4	9,345	0.23	6,585	11.53	Pleist. 1.7
Reservoir 2	18,727	oil	10.8	10,517	0.23	7,424	12.64	Teal
Reservoir 3	19,602	oil	10.8	11,008	0.23	7,714	13.02	Orange
Reservoir 4				-		-	-	
Reservoir 5				-		-	-	
Reservoir 6				-		-	-	
Reservoir 7				-		-	-	

Use standard gradients for Level 1:

Gas = 0.10 psi/ft to 9,000' TVD and 0.15 psi/ft below 11,000' TVD.

Oil/Water/Gas = 0.23 psi/ft

5) Formation Integrity Analysis

Zone of interest	Depth	Frac gradient at depth (ppg)	Max pressure (ppge)	Is shut-in ppge < FG at depth?	Comments
Deepest exposed shoe	14,540	13.60	13.02	YES	casing shoe set below salt
Other (e.g. base of salt or depleted zone)			-	N/A	

<<Insert additional rows as necessary for other zones of interest and copy down formulas - **do NOT delete this line**

6) MECHANICAL INTEGRITY ANALYSIS

6.1 BURST ANALYSIS

Component	Burst Rating (psi)	Depth to Top of Component (ft)	Setting MW, PP or SW (ppg)	Exposed to SW? (above top hanger)	Internal Shut-in Pressure (psi)	External pressure (psi)	Burst Load (psi)	Design Factor	Comments
Capping BOP stack	15,000	5233	8.60	Y	7,704	2,299	5,405	2.77	
LMRP connector	15,000	5234	8.60	Y	7,704	2,300	5,404	2.77	
Drilling BOP stack	15,000	5240	8.60	Y	7,705	2,302	5,403	2.77	
Subsea Wellhead	15,000	5265	8.60	Y	7,711	2,313	5,398	2.77	
22", 328#, X80, H-90D casing	9,545	5268	13.00	Y	7,712	3,499	4,213	2.26	Top of casing just below wellhead
16" SA (Hanger)	10,100	5531	11.50	N	7,772	3,308	4,465	2.26	Casing Hanger
16.040", 109.60#, HPQ125 SLSF	10,100	5450	11.50	N	7,754	3,259	4,494	2.24	Casing immediately below hanger
16.15", 119.23#, HPQ125 SLSF	10,880	10980	11.50	N	9,025	6,566	2,459	4.42	Top of HW Casing
16.040", 109.60#, HPQ125 SLSF	10,100	12943	11.50	N	9,477	7,740	1,737	5.81	X-Over to 16.04"
16.040", 109.60#, HPQ125 SLSF	10,100	13283	11.50	N	9,555	7,943	1,612	6.26	TOC
16.040", 109.60#, HPQ125 SLSF	10,100	14540	10.54	N	9,844	7,969	1,875	5.38	Shoe
					-	-	-		

<<Insert additional rows as necessary for other zones of interest and copy down formulas - **do NOT delete this line**

6.2 TRAPPED ANNULUS SCREENING

Casing / Liner Strings (show all strings exposed to HC flow)	Enter string type	String or liner lap fully cemented?	Liner lap <= 500 ft?	Setting Depth (ft-MD)	Setting Depth (ft-TVD)	Planned TOC (ft-MD)	Planned TOC (ft-TVD)	Previous Shoe Depth (ft-MD)	Max Angle above previous shoe	Idle < 1 year?	Hydraulic Isolation Depth ft-MD	Hydraulic Isolation Depth ft-TVD	Trapped Annulus?
22" Casing	**Surface csg**	**Y**	**N**	8,891	8,889	5,279	5,279	5,589	0	Y	5,279	5,279	NO
16" Casing	**Liner**	**N**	**N**	14,626	14,540	13,345	13,283	8,891	11	Y	13,986	13,912	NO
											-		N/A
											-		N/A

<<Insert additional rows as necessary for other zones of interest and copy down formulas - **do NOT delete this line**

6.3 COLLAPSE ANALYSIS

Component	Collapse rating (psi)	Depth of interest (ft TVD)	Hydraulic Isolation Depth (ft-TVD)	Below HID: Pore Pressure @ Depth (ppg)	Above Hydraulic Isolation Depth: Previous Shoe Depth (ft-TVD)	Fracture Gradient @ Previous Shoe (ppg)	Setting Mud Weight (ppg)	Internal Pressure (psi)	Un-trapped Annulus Calcs: External Pressure (psi)	Collapse Load (psi)	Design Factor	Comments
22" 328# Casing	2200	5,279	5,279	8.59	5,589.00	8.7	13.0	2,306	2,322	16	140.39	HID
22" 328# Casing	2200	5531	5,279	8.66	5,589.00	8.7	13.0	2,364	2,491	127	17.37	16" SA
16" SA (Hanger)	4,670	5531	13,912	8.55	8,889	12.8	11.5	2,364	3,904	1,540	3.03	Hanger
16.040", 109.60#, HPQ125 SLSF	4,670	5450	13,912	8.7	8,889	12.8	11.5	2,345	3,855	1,510	3.09	Casing Immediately Below hanger
16.15", 119.23#, HPQ125 SLSF	5,650	10980	13,912	11.2	8,889	12.8	11.5	3,617	7,162	3,545	1.59	Top of HW Casing
16.040", 109.60#, HPQ125 SLSF	4,670	12943	13,912	10.7	8,889	12.8	11.5	4,069	8,336	4,267	1.09	X-over to 16.04"
16.040", 109.60#, HPQ125 SLSF	4,670	13283	13,912	10.6	8,889	12.8	11.5	4,147	8,540	4,392	1.06	TOC
16.040", 109.60#, HPQ125 SLSF	4,670	14540	13,912	10.3	8,889	12.8	11.5	4,436	7,788	3,351	1.39	Shoe
								-	-	-		
								-	-	-		

<<Insert additional rows as necessary for other zones of interest and copy down formulas - **do NOT delete this line**

LEVEL 1 - Well Containment Screening Tool (Complete a separate form for each hole section that has potential hydrocarbon flow zones)

Rev 1.18

1) General Well Information

Well Name:	Typical Well
Lease/Block:	Walker Ridge 29
Water Depth (ft):	5,187
RKB to Mudline Depth (ft):	5,279
Location (lat/long):	N 26° 55' 57.10834", W 90° 31' 12.09654"
Planned TD (ft):	22,747/22542 ft -MD/TVD
Planned Spud Date:	October 20, 2011

2) Offset Well Information

	Well	Distance/Direction
1)	**Offset Well 1**	X.X miles SE
2)		
3)		
4)		
5)		
6)		

3) Well Design

Wellhead Description	DrilQuip SS-15; 15,000 psi
Capping Stack Description	1 x NOV Ram Preventer; 15,000 psi

Casing Plan

Size/Weight/Grade/Connection	Top (ft-TVD)	Bottom (ft-TVD)
36", 552#, X80	5,268	5,589
22", 328#, X80	5,265	5,531
22", 224#, X80	5,531	5,847
22", 170#, X60	5,847	8,889
16.040", 109.60#, HPQ125 SLSF	5,531	10,980
16.15", 119.23#, HPQ125 SLSF	10,980	12,943
16.040", 109.60#, HPQ125 SLSF	12,943	14,540
13-5/8", 88.2#, Q125, SLSF	14,344	15,000
13-3/4", 98.58#, HP Q125, SLSF	15,000	18,000
13-5/8", 88.2#, Q125, SLSF	18,000	19,930

User entry

Calculation cell. Do not input data

Screening tool results

5) Formation integrity below deepest exposed shoe	PASS
6A) Burst Integrity	PASS
6B) Trapped annuli check	PASS
6C) Collapse Integrity	PASS

4) Productive Formation Information

HOLE SECTION: 12.25 **SHOE DEPTH(FT-TVD):** 19,930

Name	Depth (ft-TVD)	Reservoir Fluid	Reservoir Pressure (ppg)	Reservoir Pressure (psi)	Assumed fluid gradient for calc (psi/ft)	Mud Line Shut in Pressure (psi)	Shut in ppg @ shoe	Comments
Reservoir 1	20,598	oil	11	11,782	0.23	8,259	11.22	Green sand
Reservoir 2	21,891	Oil	10.2	11,611	0.23	7,790	10.77	Maroon
Reservoir 3				-		-	-	
Reservoir 4				-		-	-	
Reservoir 5				-		-	-	
Reservoir 6				-		-	-	
Reservoir 7				-		-	-	

Use standard gradients for Level 1:

Gas = 0.10 psi/ft to 9,000' TVD and 0.15 psi/ft below 11,000' TVD.

Oil/Water/Gas = 0.23 psi/ft

5) Formation Integrity Analysis

Zone of interest	Depth	Frac gradient at depth (ppg)	Max pressure (ppge)	Is shut-in ppge < FG at depth?	Comments
Casing Shoe	19,930	14.95	11.22	YES	
Other (e.g. base of salt or depleted zone)			-	N/A	

<<Insert additional rows as necessary for other zones of interest and copy down formulas - **do NOT delete this line**

6) MECHANICAL INTEGRITY ANALYSIS

6.1 BURST ANALYSIS

Component	Burst Rating (psi)	Depth to Top of Component (ft)	Setting MW, PP or SW (ppg)	Exposed to SW? (above top hanger)	Internal Shut-in Pressure (psi)	External pressure (psi)	Burst Load (psi)	Design Factor	Comments
Capping BOP stack	15,000	5233	8.60	Y	8,248	2,299	5,949	2.52	
LMRP connector	15,000	5234	8.60	Y	8,248	2,300	5,949	2.52	
Drilling BOP stack	15,000	5240	8.60	Y	8,250	2,302	5,948	2.52	
Subsea Wellhead	15,000	5279	8.60	Y	8,259	2,320	5,939	2.52	
22", 328#, X80, H-90D casing	9,545	5268	13.00	Y	8,256	3,499	4,757	2.00	22" at mudline (exposed above 16" hanger)
16" SA (Hanger)	10,100	5531	11.50	N	8,317	3,308	5,009	2.01	Casing Hanger
16.040", 109.60#, HPQ125 SLSF	10,100	5450	11.50	N	8,298	3,259	5,039	2.00	Casing immediately below hanger
16.15", 119.23#, HPQ125 SLSF	10,880	10980	11.50	N	9,570	6,566	3,004	3.62	Top of HW Casing
16.040", 109.60#, HPQ125 SLSF	10,100	12943	11.50	N	10,021	7,740	2,281	4.42	X-Over to 16.04"
16.040", 109.60#, HPQ125 SLSF	10,100	13283	11.50	N	10,100	7,943	2,156	4.68	TOC
16.040", 109.60#, HPQ125 SLSF	10,100	14540	11.50	N	10,389	8,695	1,694	5.96	Shoe
13-5/8" Liner Hanger	9,334	14344	12.00	N	10,344	8,951	1,393	6.70	Liner Hanger
13 5/8"	11,160	14345	12.00	N	10,344	8,951	1,393	8.01	Immediately below hanger
13-5/8" Liner	11,160	15000	12.00	N	10,495	9,360	1,135	9.83	13 5/8" above x-over
13 3/4" liner	12,490	15000	12.00	N	10,495	9,360	1,135	11.00	13 3/4" Above x-over
13 3/4" liner	12,490	17,965	12.00	N	11,176	11,210	(34)	100.00	HID
13 3/4" liner	12,490	18,000	12.00	N	11,185	11,232	(47)	100.00	13 3/4" Above x-over
13 5/8" liner	11,160	18,000	12.00	N	11,185	11,232	(47)	100.00	13 /58" below xover
13 5/8" liner	11,160	19,930	12.00	N	11,628	12,436	(808)	100.00	Shoe

<<Insert additional rows as necessary for other zones of interest and copy down formulas - **do NOT delete this line**

6.2 TRAPPED ANNULUS SCREENING

Casing / Liner Strings (show all strings exposed to HC flow)	Enter string type	String or liner lap fully cemented?	Liner lap <= 500 ft?	Setting Depth (ft-MD)	Setting Depth (ft-TVD)	Planned TOC (ft-MD)	Planned TOC (ft-TVD)	Previous Shoe Depth (ft-MD)	Max Angle above previous shoe	Idle < 1 year?	Hydraulic Isolation Depth ft-MD	Hydraulic Isolation Depth ft-TVD	Trapped Annulus?
22" Casing	**Surface csg**	**Y**	**N**	8,891	8,889	5,279	5,279	5,589	0	Y	5,279	5,279	NO
16" Casing	**Liner**	**N**	**N**	14,626	14,540	13,345	13,283	8,891	11	Y	13,986	13,912	NO
13-5/8" Liner	**Liner**	**N**	**Y**	20,114	19,930	16,112	16,000	14,626	11	Y	18,113	17,965	NO
											-		N/A

<<Insert additional rows as necessary for other zones of interest and copy down formulas - **do NOT delete this line**

6.3 COLLAPSE ANALYSIS

Component	Collapse rating (psi)	Depth of interest (ft TVD)	Hydraulic Isolation Depth (ft-TVD)	Below HID: Pore Pressure @ Depth (ppg)	Above Hydraulic Isolation Depth: Previous Shoe Depth (ft-TVD)	Above Hydraulic Isolation Depth: Fracture Gradient @ Previous Shoe (ppg)	Above Hydraulic Isolation Depth: Setting Mud Weight (ppg)	Internal Pressure (psi)	Un-trapped Annulus Calcs: External Pressure (psi)	Un-trapped Annulus Calcs: Collapse Load (psi)	Un-trapped Annulus Calcs: Design Factor	Comments
22" 328# Casing	2200	5,279	5,279	8.59	5,589.00	8.7	13.0	2,306	2,322	16	140.39	HID
22" 328# Casing	2200	5439	5,279	8.66	5,589.00	8.7	13.0	2,343	2,449	106	20.68	16" SA
16" SA (Hanger)	4,670	5531	13,912	8.55	8,889	12.8	11.5	2,364	3,904	1,540	3.03	Casing
16.040", 109.60#, HPQ125 SLSF	4,670	5450	13,912	8.7	8,889	12.8	11.5	2,345	3,855	1,510	3.09	Casing
16.15", 119.23#, HPQ125 SLSF	5,650	10980	13,912	11.2	8,889	12.8	11.5	3,617	7,162	3,545	1.59	Top of HW Casing
16.040", 109.60#, HPQ125 SLSF	4,670	12943	13,912	10.7	8,889	12.8	11.5	4,069	8,336	4,267	1.09	X-Over to 16.04"
16.040", 109.60#, HPQ125 SLSF	4,670	13283	13,912	10.6	8,889	12.8	11.5	4,147	8,540	4,392	1.06	TOC
16.040", 109.60#, HPQ125 SLSF	4,670	14540	13,912	10.3	8,889	12.8	11.5	4,436	7,788	3,351	1.39	Shoe
13-5/8" Liner Hanger	8380	14344	17,965	10.34	14,540.00	13.6	12.0	4,391	10,138	5,747	1.45	Liner Hanger
13 5/8"	6010	14345	17,965	10.34	14,540.00	13.6	12.0	4,391	10,138	5,747	1.04	Immediately below hanger
13-5/8" Liner	6010	15000	17,965	10.2	14,540.00	13.6	12.0	4,542	10,547	6,005	1.00	13 5/8" above x-over
13 3/4" liner	7910	15000	17,965	10.2	14,540.00	13.6	12.0	4,542	10,547	6,005	1.31	13 3/4" Above x-over
13 3/4" liner	7910	17,965	17,965	10.5	14,540.00	13.6	12.0	5,224	12,397	7,173	1.10	HID
13 3/4" liner	7910	18,000	17,965	10.5	14,540.00	13.6	12.0	5,232	9,828	4,596	1.72	13 3/4" Above x-over
13 5/8" liner	6010	18,000	17,965	10.5	14,540.00	13.6	12.0	5,232	9,828	4,596	1.30	13 /58" below xover
13 5/8" liner	6010	19,930	17,965	11	14,540.00	13.6	12.0	5,676	11,400	5,724	1.04	Shoe
								-	-	-		

<<Insert additional rows as necessary for other zones of interest and copy down formulas - **do NOT delete this line**

Supplemental APD Information Sheet (Casing Design)

1) Operator Name:	Chevron U.S.A Inc	2) Well Name (Proposed):	Typical Well ST00BP00
3) Bottom Hole Lease:	OCS-G-16942	4) Surface Lease:	OCS-G-16942
5) API Number:	TBD	6) Type of Well:	☐ Exploratory ☑ Development
7) H_2S:	☑ Absent ☐ Known ☐ Unknown	8) H_2S Activation Plan Depth (TVD) (ft):	N/A
9) Rig Name:	TOI Discoverer India	10) Subsea BOP:	☑ Yes ☐ No
11) Water Depth (ft):	5187	12) RKB Height (ft):	92
13) Mineral Code:	Hydrocarbon		
14) Drive Pipe Size (in):	36	15) Drive Pipe Depth (ft):	5589
16) Anchors:	☐ Yes ☑ No		

17) Well Design Information

Interval Number: 1 **Type:** Casing **Name:** Conductor

Section Number	Casing Size (in)	Casing Weight (#/ft)	Casing Grade	Burst Rating (psi)	Collapse Rating (psi)	Depth (ft) MD	Depth (ft) TVD	Pore Pressure (ppg)
1	22"	328ppf	X-80	9545	9457	5531	5531	8.60
2	22"	224ppf	X-80	6364	3873	5847	5847	8.60
3	22"	170ppf	X-60	3580	1820	8941	8939	9.40

GENERAL INFORMATION		PREVENTER INFORMATION		TEST INFORMATION	
Hole Size (in)	26	Type	Blowout	Annular Test (psi)	2600
Mud Weight (ppg)	9.6	Size (in)	18.75	BOP Test (psi)	2600
Mud Type Code	Water Base	Wellhead Rating (psi)	15,000	Mud Test Weight (ppg)	8.6
Frac Gradient (ppg)	12.8	Annular Rating (psi)	10,000	Casing/Liner Test (psi)	1300
Liner Top Depth (ft)	0	BOPRating (psi)	15,000	Formation Test (ppg)	13
Cement Volume (ft^3)	10,859				

Interval Number: 2 **Type:** Liner **Name:** Surface

Section Number	Casing Size (in)	Casing Weight (#/ft)	Casing Grade	Burst Rating (psi)	Collapse Rating (psi)	Depth (ft) MD	Depth (ft) TVD	Pore Pressure (ppg)
1	16.04"	109.6ppf	HPQ-125	10100	4670	11000	10980	N/A
2	16.15"	119.23#	HP Q125	10880	5650	14000	13926	N/A
3	16.04"	109.6ppf	HPQ-125	10100	4670	14790	14702	10.30

GENERAL INFORMATION		PREVENTER INFORMATION		TEST INFORMATION	
Hole Size (in)	16 1/2" x 19"	Type	Blowout	Annular Test (psi)	1900
Mud Weight (ppg)	11.5	Size (in)	18.75	BOP Test (psi)	1900
Mud Type Code	Synthetic Base	Wellhead Rating (psi)	15,000	Mud Test Weight (ppg)	11.50
Frac Gradient (ppg)	13.6	Annular Rating (psi)	10,000	Casing/Liner Test (psi)	4100
Liner Top Depth (ft)	5531	BOPRating (psi)	15,000	Formation Test (ppg)	13.00
Cement Volume (ft^3)	966				

Interval Number: 3 **Type:** Liner **Name:** Intermediate

Section Number	Casing Size (in)	Casing Weight (#/ft)	Casing Grade	Burst Rating (psi)	Collapse Rating (psi)	Depth (ft) MD	Depth (ft) TVD	Pore Pressure (ppg)
1	13-5/8"	88.2	HPQ125	11160	6010	15093	15000	10.20
2	13-3/4"	98.58ppf	HPQ125	12490	7910	18148	18000	10.50
3	13-5/8"	88.2ppf	HPQ-125	11150	6010	20244	20058	11.00

GENERAL INFORMATION		PREVENTER INFORMATION		TEST INFORMATION	
Hole Size (in)	14 1/2" x 16 1/2"	Type	Blowout	Annular Test (psi)	1900
Mud Weight (ppg)	12	Size (in)	18.75	BOP Test (psi)	1900
Mud Type Code	Synthetic Base	Wellhead Rating (psi)	15,000	Mud Test Weight (ppg)	12.00
Frac Gradient (ppg)	14.9	Annular Rating (psi)	10,000	Casing/Liner Test (psi)	3700
Liner Top Depth (ft)	14426	BOPRating (psi)	15,000	Formation Test (ppg)	13.30
Cement Volume (ft^3)	2,066				

* NOTE* For additional casing/liner intervals, please submit an additional Form MMS-123S.

Supplemental APD Information Sheet (Casing Design)

1) Operator Name:	Chevron U.S.A Inc	2) Well Name (Proposed):	Typical Well ST00BP00
3) Bottom Hole Lease:	OCS-G-16942	4) Surface Lease:	OCS-G-16942
5) API Number:	TBD	6) Type of Well:	☐ Exploratory ☑ Development
7) H_2S:	☑ Absent ☐ Known ☐ Unknown	8) H_2S Activation Plan Depth (TVD) (ft):	N/A
9) Rig Name:	TOI Discoverer India	10) Subsea BOP:	☑ Yes ☐ No
11) Water Depth (ft):	5187	12) RKB Height (ft):	92
13) Mineral Code:	Hydrocarbon		
14) Drive Pipe Size (in):	36	15) Drive Pipe Depth (ft):	5589
16) Anchors:	☐ Yes ☑ No		

17) Well Design Information

Interval Number: 4 **Type:** Liner **Name:** Production

Section Number	Casing Size (in)	Casing Weight (#/ft)	Casing Grade	Burst Rating (psi)	Collapse Rating (psi)	Depth (ft) MD	Depth (ft) TVD	Pore Pressure (ppg)
1	9-7/8"	65.1#	HC Q125	14410	12900	22747	22542	11.50
		N/A		0	0			
		N/A		0	0			

GENERAL INFORMATION		PREVENTER INFORMATION		TEST INFORMATION	
Hole Size (in)	12.25	Type	Blowout	Annular Test (psi)	2600
Mud Weight (ppg)	12.7	Size (in)	18.75	BOP Test (psi)	2600
Mud Type Code	Synthetic Base	Wellhead Rating (psi)	15,000	Mud Test Weight (ppg)	12.7
Frac Gradient (ppg)	17	Annular Rating (psi)	10,000	Casing/Liner Test (psi)	2900
Liner Top Depth (ft)	19914	BOPRating (psi)	15,000	Formation Test (ppg)	N/A
Cement Volume (ft^3)	1167.92				

Interval Number: 5 **Type:** Liner **Name:** Intermediate

Section Number	Casing Size (in)	Casing Weight (#/ft)	Casing Grade	Burst Rating (psi)	Collapse Rating (psi)	Depth (ft) MD	Depth (ft) TVD	Pore Pressure (ppg)
		N/A		0	0			0.00
		N/A		0	0			
		N/A		0	0			

GENERAL INFORMATION		PREVENTER INFORMATION		TEST INFORMATION	
Hole Size (in)		Type	Blowout	Annular Test (psi)	--
Mud Weight (ppg)		Size (in)	18.75	BOP Test (psi)	--
Mud Type Code		Wellhead Rating (psi)	15,000	Mud Test Weight (ppg)	0.00
Frac Gradient (ppg)		Annular Rating (psi)	10,000	Casing/Liner Test (psi)	0
Liner Top Depth (ft)		BOPRating (psi)	15,000	Formation Test (ppg)	0.00
Cement Volume (ft^3)					

Interval Number: 6 **Type:** Liner **Name:** Production

Section Number	Casing Size (in)	Casing Weight (#/ft)	Casing Grade	Burst Rating (psi)	Collapse Rating (psi)	Depth (ft) MD	Depth (ft) TVD	Pore Pressure (ppg)
		N/A		0	0			14.00
		N/A		0	0			14.00
		N/A		0	0			

GENERAL INFORMATION		PREVENTER INFORMATION		TEST INFORMATION	
Hole Size (in)		Type		Annular Test (psi)	--
Mud Weight (ppg)		Size (in)		BOP Test (psi)	--
Mud Type Code		Wellhead Rating (psi)		Mud Test Weight (ppg)	0.00
Frac Gradient (ppg)		Annular Rating (psi)		Casing/Liner Test (psi)	0
Liner Top Depth (ft)		BOPRating (psi)		Formation Test (ppg)	0.00
Cement Volume (ft^3)					

* NOTE* For additional casing/liner intervals, please submit an additional Form MMS-123S.

Supplemental APD Information Sheet (Casing Design)

1) Operator Name:	Chevron U.S.A Inc	2) Well Name (Proposed):	Typical Well ST00BP00
3) Bottom Hole Lease:	OCS-G-16942	4) Surface Lease:	OCS-G-16942
5) API Number:	TBD	6) Type of Well:	☐ Exploratory ☑ Development
7) H_2S:	☑ Absent ☐ Known ☐ Unknown	8) H_2S Activation Plan Depth (TVD) (ft):	N/A
9) Rig Name:	TOI Discoverer India	10) Subsea BOP:	☑ Yes ☐ No
11) Water Depth (ft):	5187	12) RKB Height (ft):	92
13) Mineral Code:	Hydrocarbon		
14) Drive Pipe Size (in):	36	15) Drive Pipe Depth (ft):	5589
16) Anchors:	☐ Yes ☑ No		

17) Well Design Information

Interval Number: 7 **Type:** Liner **Name:** Production

Section Number	Casing Size (in)	Casing Weight (#/ft)	Casing Grade	Burst Rating (psi)	Collapse Rating (psi)	Depth (ft) MD	Depth (ft) TVD	Pore Pressure (ppg)
		N/A		0	0			
		N/A		0	0			
		N/A		0	0			

GENERAL INFORMATION		PREVENTER INFORMATION		TEST INFORMATION	
Hole Size (in)		Type	Blowout	Annular Test (psi)	--
Mud Weight (ppg)		Size (in)	18.75	BOP Test (psi)	--
Mud Type Code		Wellhead Rating (psi)	15,000	Mud Test Weight (ppg)	0.0
Frac Gradient (ppg)		Annular Rating (psi)	10,000	Casing/Liner Test (psi)	0
Liner Top Depth (ft)		BOPRating (psi)	15,000	Formation Test (ppg)	0.00
Cement Volume (ft^3)					

Interval Number: 8 **Type:** Casing **Name:** Tieback

Section Number	Casing Size (in)	Casing Weight (#/ft)	Casing Grade	Burst Rating (psi)	Collapse Rating (psi)	Depth (ft) MD	Depth (ft) TVD	Pore Pressure (ppg)
		N/A		0	0			
		N/A		0	0			
		N/A		0	0			

GENERAL INFORMATION		PREVENTER INFORMATION		TEST INFORMATION	
Hole Size (in)	N/A	Type	Blowout	Annular Test (psi)	--
Mud Weight (ppg)		Size (in)	18.75	BOP Test (psi)	--
Mud Type Code		Wellhead Rating (psi)	15,000	Mud Test Weight (ppg)	0.00
Frac Gradient (ppg)		Annular Rating (psi)	10,000	Casing/Liner Test (psi)	0
Liner Top Depth (ft)		BOPRating (psi)	15,000	Formation Test (ppg)	0.00
Cement Volume (ft^3)					

Interval Number: 9 **Type:** **Name:**

Section Number	Casing Size (in)	Casing Weight (#/ft)	Casing Grade	Burst Rating (psi)	Collapse Rating (psi)	Depth (ft) MD	Depth (ft) TVD	Pore Pressure (ppg)
		N/A		0	0			
		N/A		0	0			
		N/A		0	0			

GENERAL INFORMATION		PREVENTER INFORMATION		TEST INFORMATION	
Hole Size (in)		Type		Annular Test (psi)	--
Mud Weight (ppg)		Size (in)		BOP Test (psi)	--
Mud Type Code		Wellhead Rating (psi)		Mud Test Weight (ppg)	0.00
Frac Gradient (ppg)		Annular Rating (psi)		Casing/Liner Test (psi)	0
Liner Top Depth (ft)		BOPRating (psi)		Formation Test (ppg)	N/A
Cement Volume (ft^3)					

* NOTE* For additional casing/liner intervals, please submit an additional Form MMS-123S.

Application For Permit to Drill

ENGINEERING CALCULATIONS

OCS-G-16942
WR 29
Big Foot Drill Center
"Big Foot Typical"

TOI Discoverer India

CHEVRON USA
DEEPWATER EXPLORATION AND PROJECTS

10/6/2011

CALCULATION METHOD

For casing and liner tests several pressures are calculated and considered. The first criteria are based on the MMS regulations for 70% of casing burst or the maximum allowable wellhead pressure (MAWP). The second criteria are based on initial and future liner lap pressures or formation integrity/leak off test pressures.

1. 70% of Casing Burst

The burst rating of the subject casing string is correct to mud weight and pore pressure backup at depth. Up to four depths are considered.

$$70\%\ P_b - (\rho_{mud} - \rho_{pore})\ (0.052)\ (TVD)$$

2a. MASP Based on Bottom Hole Pressure

The first method of calculating maximum anticipated surface pressure is the pore pressure at the next casing shoe less the gas/mud gradient to the surface:

$$MASP_{BHP} = BHP - (\gamma_{equiv})\ (TVD_{next})$$

Where the gradient is equivalent to an 80%/20% gas/mud gradient:

$$\gamma_{equiv} = (20\%)\ (\rho_{mud})\ (0.052) + (80\%)\ (\gamma_{gas})$$

For depths greater than 10,000 ft, a 50% gas/mud gradient is used. The average gas gradient is calculated based on the Nagy/Young correlation. The pore pressure at the next casing shoe is:

$$BHP = (\rho_{pore})\ (0.052)\ (TVD_{next})$$

As per previous Chevron development wells, for hole sections that extend below the base salt a 50% oil/mud gradient has been used to calculate MASP.

2a. MASP Based on Fracture Gradient

The second method of calculating maximum anticipated surface pressure is the fracture pressure at the current casing shoe, less the gas gradient to the surface:

$$MASP_{shoe} = Pfrac - (\gamma_{equiv})\ (TVD_{shoe})$$

Where the fracture pressure at the current casing shoe is:

$$P_{frac} = (\rho_{frac})\ (0.052)\ (TVD_{shoe})$$

2b. Maximum Anticipated Wellhead Pressure

The maximum anticipated wellhead pressure is the maximum anticipated surface pressure at the next casing shoe plus the gas/oil/mud gradient from the mud line to the surface:

$$MAWP = MASP + (\gamma_{equiv})\ (TVD_{ML})$$

Where MASP = Minimum of [$MASP_{BHP}$] or [$MASP_{shoe}$]

$$MAWP_{Surf} = MAWP - (\rho_{mud\ csg\ test})\ (0.052)\ (TVD_{ML})$$

3. Liner Lap Test Pressure

The test pressure at the liner top that will exceed the fracture pressure of the previous casing or liner shoe (calculated for each liner):

$$P_{test\ liner} = (\rho_{frac} - \rho_{mud})(0.052)(TVD_{liner}) + (\rho_{frac} - \rho_{mud,\ lap})(0.052)(TVD_{prior\ shoe} - TVD_{liner})$$

4. Future Liner Test Pressure

The test pressure future liners are converted to an equivalent test pressure by correcting for mud weight.

$$P_{test\ future\ liner} = (\rho_{mud\ future} - \rho_{mud})(0.052)(TVD_{liner}) + P_{test\ liner}$$

5. Casing Test Pressure at the Shoe

The test pressure at the shoe is the formation integrity/leak off equivalent mud weight minus the mud gradient difference:

$$P_{test\ shoe} = (\rho_{FIT/LOT} - \rho_{mud})(0.052)(TVD_{shoe})$$

6. Casing Test Pressure

The casing test pressure is based on the maximum of:

1. Minimum of the MAWP or 70% of burst (of the weakest exposed casing/liner):

P_{test1} = Minimum of: [MAWP + 500 psi]

or: [70% P_b - (ρ_{mud} - ρ_{pore}) (0.052) TVD]

2. Maximum of the shoe test or liner lap:

P_{test2} = Maximum of: [$P_{test\ shoe}$ + 200 psi]

or: [$P_{test\ liner}$] or [$P_{test\ future\ liner}$]

$P_{testcsg}$ = Max [P_{test1}, P_{test2}]

Liner pressure tests are based on the maximum of the shoe test or the liner lap.
Test pressures may be decreased if the 70% burst rating of a previously set, yet still exposed, casing or liner is exceeded.

7. Ram Test Pressure at Surface

The ram test pressure at surface is based on the $MAWP_{Surf}$, plus 500 psi:

$$P_{test\ RAM} = MAWP_{Surf} + 500\ psi$$

8. Annular Test Pressure at Surface

The annular test pressure at surface is the lesser of the ram test pressure or 70% of the annular BOP working pressure:

$$P_{test\ ANN} = \text{Minimum of [Ptest RAM or 70\%P}_{ANN\ WP}]$$

All test pressures are rounded to the nearest 100 psi.

Chevron DWEP
Casing Test Pressure Calculations for APD

Block	Well	Field/Prospect	RKB-ML
WR 29	**Typical**	**Big Foot**	**5279**
OCS-G-16942	--		

22" Casing Calculations

Step 1 - 70% of burst rating for casing, corrected for MW & backup

		Burst		(MW - backup)			TVD	
Top of 22"	0.7	9545	*minus*	8.60	8.60	0.052	5,265	**6682 psi**
Top of 22" x 1"	0.7	3580	*minus*	8.60	8.76	0.052	5,847	**2555 psi**
18" Suppl. Adapter.	0.7	3580	*minus*	8.60	9.23	0.052	8,848	**2796 psi**
Btm of 22" x 3/4"	0.7	3580	*minus*	8.60	9.23	0.052	8,889	**2797 psi**

Step 2a - MASP estimation

	TVD/PP @ deepest OH depth				TVD	MW			Gas Grad.		
$MASP_{BHP}$	14,540	10.61	0.052	*minus*	14,540	11.5	50%	0.052	0.283	50%	
								1617 psi			
	TVD/FG @ deepest exposed shoe				TVD_{mud}	MW			TVD_{gas}	Gas Grad.	
$MASP_{shoe}$	14,540	13.6	0.052	*minus*	7,270	11.5	0.052	*minus*	7,270	0.283	
								3878 psi			

MASP	Minimum of $MASP_{BHP}$, $MASP_{shoe}$	**1617 psi**	

Step 2b - MAWP estimation

	MASP		RKB-ML	Gas Grad.		
MAWP	1617 psi	*plus*	5,279	0.283		**3111 psi**

				MW		
$MAWP_{surf}$	3111 psi	*minus*	5,279	8.60	0.052	**750 psi**

P_{test1}

P_{test1}	Minimum of MAWPsurf+500, 70% of burst rating	**1250 psi**

Steps 3-5 - P_{test2}

3. N/A

	(Future MW - MW)			TVD		$P_{test\ liner}$	
4. $P_{test\ 18"\ liner}$	0	0	0.052	8,848	*plus*	0 psi	**0 psi**
	(LOT/FIT - MW)			TVD			
5. $P_{test\ shoe}$	13	11	0.052	8,889	*plus*	200 psi	**1124 psi**

P_{test2}

Maximum of Steps 3-5	**1124 psi**	**w/ 8.6 ppg**
Actual Test Pressure	**1300 psi**	**w/ 8.6 ppg**

Chevron DWEP
Casing Test Pressure Calculations for APD

Block	Well	Field/Prospect	RKB-ML
WR 29	**Typical**	**Big Foot**	**5279**
OCS-G-16942	**--**		

16" Liner Calculations

Step 1 - 70% of burst rating for casing, corrected for MW & backup

		Burst		(MW - backup)			TVD	
Top of Casing	0.7	10100	*minus*	11.50	10.10	0.052	5,439	**6674 psi**
Zone of Interest 1	0.7	0	*minus*	11.50	N/A	0.052	N/A	**N/A**
Zone of Interest 2	0.7	0	*minus*	11.50	N/A	0.052	N/A	**N/A**
Btm of Casing/Shoe	0.7	10100	*minus*	11.50	10.31	0.052	14,540	**6170 psi**

Step 2a - MASP estimation

	TVD/PP @ deepest OH depth				TVD	MW			Gas Grad.	
MASP_{BHP}	23,542	10.95	0.052	*minus*	23,542	12.7	50%	0.052	0.362	50%
								1370 psi		
	TVD/FG @ deepest exposed shoe				TVDmud	MW			TVDgas	Gas Grad.
MASPshoe	19,930	14.95	0.052	*minus*	8,159	12.7	0.052	*minus*	11,771	0.362
								5844 psi		

MASP — Minimum of MASPBHP, MASPshoe — **1370 psi**

Step 2b - MAWP estimation

	MASP		RKB-ML	Gas Grad.		
MAWP	1370 psi	*plus*	5,279	0.362		**3281 psi**
				MW		
MAWPsurf	3281 psi	*minus*	5,279	11.50	0.052	**124 psi**

Ptest1

Ptest1 — Minimum of MAWPsurf+500, 70% of burst rating — **624 psi**

Steps 3-5 - Ptest2

	(FG - MW)			TVD				
3. Ptest liner	12.80	11.50	0.052	5,439	*plus*	500 psi	**1101 psi**	
plus	12.80	11.50	0.052	3,450				
	(Future MW - MW)			TVD		Ptest liner		
4. Ptest future liner	12.00	11.50	0.052	14,540	*plus*	3700	**4078 psi**	*13-5/8" Liner*
Ptest future liner	12.70	11.50	0.052	14,540	*plus*	2900	**3807 psi**	*9-7/8" Liner*
Ptest future liner	0.00	0.00	0.052	14,540	*plus*	0	**0 psi**	*N/A*
Ptest future liner	0.00	0.00	0.052	14,540	*plus*	0	**0 psi**	*N/A*
Ptest future liner	0.00	0.00	0.052	14,540	*plus*	0	**0 psi**	*N/A*
Ptest future liner	0.00	0.00	0.052	14,540	*plus*	0	**0 psi**	*N/A*
Ptest future liner	0.00	0.00	0.052	14,540	*plus*	0	**0 psi**	*N/A*
	(FIT/LOT - MW)							
5. Ptest shoe	13.00	11.50	0.052	14,540	*plus*	200 psi	**1334 psi**	

Ptest2 — Maximum of Steps 3-5 — **4078 psi** **w/ 11.5 ppg**

Actual Test Pressure — **4100 psi** **w/ 11.5 ppg**

Chevron DWEP
Casing Test Pressure Calculations for APD

Block	Well	Field/Prospect	RKB-ML
WR 29	**Typical**	**Big Foot**	**5279**
OCS-G-16942	**--**		

13-5/8" Liner Calculations

Step 1 - 70% of burst rating for casing, corrected for MW & backup

		Burst		(MW - backup)			TVD	
Top of Casing	0.7	11160	*minus*	12.00	10.31	0.052	14,344	**6551 psi**
Zone of Interest 1	0.7	11150	*minus*	12.00	10.12	0.052	15,890	**6252 psi**
Zone of Interest 2	0.7	12490	*minus*	12.00	10.50	0.052	18,000	**7339 psi**
Btm of Casing/Shoe	0.7	11150	*minus*	12.00	11.01	0.052	19,930	**6779 psi**

Step 2a - MASP estimation

	TVD/PP @ deepest OH depth				TVD	MW			Gas Grad.	
$MASP_{BHP}$	22,542	10.95	0.052	*minus*	22,542	12.7	50%	0.052	0.362	50%
								1312 psi		

	TVD/FG @ deepest exposed shoe				TVD_{mud}	MW			TVD_{gas}	Gas Grad.
$MASP_{shoe}$	23,542	15.55	0.052	*minus*	12,271	12.7	0.052	*minus*	11,271	0.362
								6852 psi		

MASP — Minimum of $MASP_{BHP}$, $MASP_{shoe}$ **1312 psi**

Step 2b - MAWP estimation

	MASP		RKB-ML	Gas Grad.		
MAWP	1312 psi	*plus*	5,279	0.362		**3223 psi**
				MW		
$MAWP_{surf}$	3223 psi	*minus*	5,279	12.00	0.052	**-71 psi**

P_{test1}

P_{test1} — Minimum of MAWPsurf+500, 70% of burst rating **429 psi**

Steps 3-5 - P_{test2}

	(FG - MW)			TVD				
3. $P_{test\ liner}$	13.60	12.00	0.052	14,344	*plus*	500 psi	**1710 psi**	
plus	13.60	12.00	0.052	196				
	(Future MW - MW)			TVD		$P_{test\ liner}$		
4. $P_{test\ future\ liner}$	12.70	12.00	0.052	19,930	*plus*	2900.00	**3625 psi**	*9-7/8" Liner*
$P_{test\ future\ liner}$	0.00	0.00	0.052	19,930	*plus*	0.00	**0 psi**	*N/A*
$P_{test\ future\ liner}$	0.00	0.00	0.052	19,930	*plus*	0.00	**0 psi**	*N/A*
$P_{test\ future\ liner}$	0.00	0.00	0.052	19,930	*plus*	0.00	**0 psi**	*N/A*
$P_{test\ future\ liner}$	0.00	0.00	0.052	19,930	*plus*	0.00	**0 psi**	*N/A*
$P_{test\ future\ liner}$	0.00	0.00	0.052	19,930	*plus*	0.00	**0 psi**	*N/A*
	(LOT/FIT - MW)							
5. $P_{test\ shoe}$	13.30	12.20	0.052	19,930	*plus*	200 psi	**1340 psi**	

P_{test2} — Maximum of Steps 3-5 **3625 psi** **w/ 12 ppg**

Actual Test Pressure **3700 psi** **w/ 12 ppg**

Chevron DWEP
Casing Test Pressure Calculations for APD

Block	Well	Field/Prospect	RKB-ML
WR 29	Typical	Big Foot	5279
OCS-G-16942	--		

9-7/8" Liner Calculations

Step 1 - 70% of burst rating for casing, corrected for MW & backup

		Burst		(MW - backup)			TVD	
Top of Casing	0.7	14410	*minus*	12.70	11.01	0.052	19,734	**8353 psi**
Zone of Interest 1	0.7	#N/A	*minus*	12.70	11.01	0.052	19,940	**#N/A**
Zone of Interest 2	0.7	0	*minus*	12.70	N/A	0.052	N/A	**N/A**
Btm of Casing/Shoe	0.7	#N/A	*minus*	12.70	11.61	0.052	23,542	**#N/A**

Step 2a - MASP estimation

	TVD/PP @ deepest OH depth				TVD	MW			Gas Grad.	
$MASP_{BHP}$	22,542	11.54	0.052	*minus*	22,542	12.7	50%	0.052	0.362	50%
								2004 psi		

	TVD/FG @ deepest exposed shoe				TVD_{mud}	MW			TVD_{gas}	Gas Grad.
$MASP_{shoe}$	23,542	15.55	0.052	*minus*	12,271	12.7	0.052	*minus*	11,271	0.362
								6852 psi		

MASP — Minimum of $MASP_{BHP}$, $MASP_{shoe}$ — **2004 psi**

Step 2b - MAWP estimation

	MASP		RKB-ML	Gas Grad.		
MAWP	2004 psi	*plus*	5,279	0.362		**3915 psi**

			MW			
$MAWP_{surf}$	3915 psi	*minus*	5,279	12.70	0.052	**428 psi**

P_{test1}

P_{test1} — Minimum of MAWPsurf+500, 70% of burst rating — **#N/A**

Steps 3-5 - P_{test2}

		(FG - MW)			TVD			
3. $P_{test\ liner}$	14.95	12.70	0.052	19,734	*plus*	500 psi		**2832 psi**
plus	14.95	12.70	0.052	196				

		(Future MW - MW)			TVD		$P_{test\ liner}$		
4. $P_{test\ future\ liner}$	0.00	0.00	0.052	23,542	*plus*	0	**0 psi**	*N/A*
$P_{test\ future\ liner}$	0.00	0.00	0.052	23,542	*plus*	0	**0 psi**	*N/A*
$P_{test\ future\ liner}$	0.00	0.00	0.052	23,542	*plus*	0	**0 psi**	*N/A*
$P_{test\ future\ liner}$	0.00	0.00	0.052	23,542	*plus*	0	**0 psi**	*N/A*
$P_{test\ future\ liner}$	0.00	0.00	0.052	23,542	*plus*	0	**0 psi**	*N/A*

	(LOT/FIT - MW)						
5. $P_{test\ shoe}$	N/A	N/A	0.052	23,542	*plus*	200 psi	**0 psi**

P_{test2}

Maximum of Steps 3-5 — **2832 psi** — **w/ 12.7 ppg**

Actual Test Pressure — **2900 psi** — **w/ 12.7 ppg**

Chevron DWEP
Casing Test Pressure Calculations for APD

Block	Well	Field/Prospect	RKB-ML
WR 29	Typical	Big Foot	5279
OCS-G-16942	--		

N/A Calculations

Step 1 - 70% of burst rating for casing, corrected for MW & backup

		Burst		(MW - backup)			TVD	
Top of Casing	0.7	#N/A	*minus*	0.00	0.00	0.052	0	**#N/A**
Zone of Interest 1	0.7	0	*minus*	0.00	N/A	0.052	N/A	**N/A**
Zone of Interest 2	0.7	0	*minus*	0.00	N/A	0.052	N/A	**N/A**
Btm of Casing/Shoe	0.7	#N/A	*minus*	0.00	0.00	0.052	0	**#N/A**

Step 2a - MASP estimation

	TVD/PP @ deepest OH depth				TVD	MW			Gas Grad.		
$MASP_{BHP}$	0	0	0.052	*minus*	0	0	20%	0.052	0	80%	
								0 psi			

	TVD/FG @ deepest exposed shoe				TVD_{mud}	MW			TVD_{gas}	Gas Grad.
$MASP_{shoe}$	0	0	0.052	*minus*	0	0	0.052	*minus*	0	0
								0 psi		

MASP	Minimum of $MASP_{BHP}$, $MASP_{shoe}$	**0 psi**	

Step 2b - MAWP estimation

	MASP		RKB-ML	Gas Grad.		
MAWP	0 psi	*plus*	5,279	0		**0 psi**

			MW			
$MAWP_{surf}$	0 psi	*minus*	5,279	0.00	0.052	**0 psi**

P_{test1}

P_{test1}	Minimum of MAWPsurf+, 70% of burst rating	**#N/A**	

Steps 3-5 - P_{test2}

		(FG - MW)			TVD				
3. $P_{test\ liner}$	15.55	0.00	0.052	0	*plus*	500 psi	**19536 psi**		
plus	15.55	0.00	0.052	23,542					
		(Future MW - MW)			TVD		$P_{test\ liner}$		
4. $P_{test\ future\ liner}$	0.00	0.00	0.052	0	*plus*	0	**0 psi**	*N/A*	
$P_{test\ future\ liner}$	0.00	0.00	0.052	0	*plus*	0	**0 psi**	*N/A*	
$P_{test\ future\ liner}$	0.00	0.00	0.052	0	*plus*	0	**0 psi**	*N/A*	
$P_{test\ future\ liner}$	0.00	0.00	0.052	0	*plus*	0	**0 psi**	*N/A*	

		(LOT/FIT - MW)						
5. $P_{test\ shoe}$	0.00	0.00	0.052	0	*plus*	200 psi	**200 psi**	

P_{test2}

Maximum of Steps 3-5	**19536 psi**	**w/ 0 ppg**
Actual Test Pressure	**0 psi**	**w/ 0 ppg**

Chevron DWEP
Casing Test Pressure Calculations for APD

Block	Well	Field/Prospect	RKB-ML
WR 29	Typical	Big Foot	5279
OCS-G-16942	--		

N/A Calculations

Step 1 - 70% of burst rating for casing, corrected for MW & backup

		Burst		(MW - backup)			TVD	
Top of Casing	0.7	#N/A	*minus*	0.00	0.00	0.052	0	**#N/A**
Zone of Interest 1	0.7	0	*minus*	0.00	N/A	0.052	N/A	**N/A**
Zone of Interest 2	0.7	0	*minus*	0.00	N/A	0.052	N/A	**N/A**
Btm of Casing/Shoe	0.7	#N/A	*minus*	0.00	0.00	0.052	0	**#N/A**

Step 2a - MASP estimation

	TVD/PP @ deepest OH depth				TVD	MW			Gas Grad.	
$MASP_{BHP}$	0	0	0.052	*minus*	0	0	20%	0.052	0	80%
								0 psi		

	TVD/FG @ deepest exposed shoe				TVD_{mud}	MW			TVD_{gas}	Gas Grad.
$MASP_{shoe}$	0	0	0.052	*minus*	0	0	0.052	*minus*	0	0
								0 psi		

MASP	Minimum of $MASP_{BHP}$, $MASP_{shoe}$	**0 psi**	

Step 2b - MAWP estimation

	MASP		RKB-ML	Gas Grad.		
MAWP	0 psi	*plus*	5,279	0		**0 psi**

			MW			
$MAWP_{surf}$	0 psi	*minus*	5,279	0.00	0.052	**0 psi**

P_{test1}

P_{test1}	Minimum of MAWPsurf+, 70% of burst rating	**#N/A**	

Steps 3-5 - P_{test2}

		(FG - MW)			TVD				
3. $P_{test\ liner}$	0.00	0.00	0.052	0	*plus*	500 psi	**500 psi**		
plus	0.00	0.00	0.052	0					

		(Future MW - MW)			TVD		$P_{test\ liner}$		
4. $P_{test\ future\ liner}$	0.00	0.00	0.052	0	*plus*	0	**0 psi**	*N/A*	
$P_{test\ future\ liner}$	0.00	0.00	0.052	0	*plus*	0	**0 psi**	*N/A*	
$P_{test\ future\ liner}$	0.00	0.00	0.052	0	*plus*	0	**0 psi**	*N/A*	

	(LOT/FIT - MW)							
5. $P_{test\ shoe}$	0.00	0.00	0.052	0	*plus*	200 psi	**200 psi**	

P_{test2}	Maximum of Steps 3-5	**500 psi**	**w/ 0 ppg**
	Actual Test Pressure	**0 psi**	**w/ 0 ppg**

Chevron DWEP
Casing Test Pressure Calculations for APD

Block	Well	Field/Prospect	RKB-ML
WR 29	Typical	Big Foot	5279
OCS-G-16942	--		

N/A Calculations

Step 1 - 70% of burst rating for casing, corrected for MW & backup

		Burst		(MW - backup)			TVD	
Top of Casing	0.7	#N/A	*minus*	0.00	0.00	0.052	0	**#N/A**
Zone of Interest 1	0.7	0	*minus*	0.00	N/A	0.052	N/A	**N/A**
Zone of Interest 2	0.7	0	*minus*	0.00	N/A	0.052	N/A	**N/A**
Btm of Casing/Shoe	0.7	#N/A	*minus*	0.00	0.00	0.052	0	**#N/A**

Step 2a - MASP estimation

	TVD/PP @ deepest OH depth				TVD	MW			Gas Grad.	
$MASP_{BHP}$	0	0	0.052	*minus*	0	0	20%	0.052	0	80%

0 psi

	TVD/FG @ deepest exposed shoe				TVD_{mud}	MW			TVD_{gas}	Gas Grad.
$MASP_{shoe}$	0	0	0.052	*minus*	0	0	0.052	*minus*	0	0

0 psi

MASP — Minimum of $MASP_{BHP}$, $MASP_{shoe}$ — **0 psi**

Step 2b - MAWP estimation

	MASP		RKB-ML	Gas Grad.		
MAWP	0 psi	*plus*	5,279	0		**0 psi**

				MW		
$MAWP_{surf}$	0 psi	*minus*	5,279	0.00	0.052	**0 psi**

P_{test1}

P_{test1} — Minimum of MAWPsurf+, 70% of burst rating — **#N/A**

Steps 3-5 - P_{test2}

	(FG - MW)			TVD			
3. $P_{test\ liner}$	0.00	0.00	0.052	0	*plus*	500 psi	**500 psi**
plus	0.00	0.00	0.052	0			

	(Future MW - MW)			TVD		$P_{test\ liner}$		
4. $P_{test\ future\ liner}$	0.00	0.00	0.052	0	*plus*	0	**0 psi**	*N/A*
$P_{test\ future\ liner}$	0.00	0.00	0.052	0	*plus*	0	**0 psi**	*N/A*

	(LOT/FIT - MW)						
5. $P_{test\ shoe}$	0.00	0.00	0.052	0	*plus*	200 psi	**200 psi**

P_{test2}

Maximum of Steps 3-5 — **500 psi** **w/ 0 ppg**

Actual Test Pressure — **0 psi** **w/ 0 ppg**

Chevron DWEP
Casing Test Pressure Calculations for APD

Block	Well	Field/Prospect	RKB-ML
WR 29	Typical	Big Foot	5279
OCS-G-16942	--		

N/A Calculations

Step 1 - 70% of burst rating for casing, corrected for MW & backup

		Burst		(MW - backup)			TVD	
Top of Casing	0.7	#N/A	*minus*	0.00	0.00	0.052	0	**#N/A**
Zone of Interest 1	0.7	#N/A	*minus*	0.00	0.00	0.052	0	**#N/A**
Zone of Interest 2	0.7	#N/A	*minus*	0.00	0.00	0.052	0	**#N/A**
Btm of Casing/Shoe	0.7	#N/A	*minus*	0.00	0.00	0.052	0	**#N/A**

Step 2a - MASP estimation

	TVD/PP @ deepest OH depth				TVD	MW			Gas Grad.	
$MASP_{BHP}$	0	0	0.052	*minus*	0	0	20%	0.052	0	80%
								0 psi		

	TVD/FG @ deepest exposed shoe				TVD_{mud}	MW			TVD_{gas}	Gas Grad.
$MASP_{shoe}$	0	0	0.052	*minus*	0	0	0.052	*minus*	0	0
								0 psi		

MASP	Minimum of $MASP_{BHP}$, $MASP_{shoe}$	**0 psi**	

Step 2b - MAWP estimation

	MASP		RKB-ML	Gas Grad.		
MAWP	0 psi	*plus*	5,279	0		**0 psi**

			MW			
$MAWP_{surf}$	0 psi	*minus*	5,279	0.00	0.052	**0 psi**

P_{test1}

P_{test1}	Minimum of MAWPsurf+, 70% of burst rating	**#N/A**

Steps 3-5 - P_{test2}

		(FG - MW)			TVD				
3. $P_{test\ liner}$		0.00	0.00	0.052	0	*plus*	500 psi	**500 psi**	
	plus	0.00	0.00	0.052	0				
		(Future MW - MW)			TVD		$P_{test\ liner}$		
4. $P_{test\ future\ liner}$		0.00	0.00	0.052	0	*plus*	0	**0 psi**	*N/A*

	(LOT/FIT - MW)							
5. $P_{test\ shoe}$	0.00	0.00	0.052	0	*plus*	200 psi	**200 psi**	

P_{test2}	Maximum of Steps 3-5	**500 psi**	**w/ 0 ppg**
	Actual Test Pressure	**0 psi**	**w/ 0 ppg**

Chevron DWEP
Casing Test Pressure Calculations for APD

Block	Well	Field/Prospect	RKB-ML
WR 29	Typical	Big Foot	5279
OCS-G-16942	--		

N/A Calculations

Step 1 - 70% of burst rating for casing, corrected for MW & backup

		Burst		(MW - backup)			TVD	
Top of Casing	0.7	0	*minus*	0.00	0.00	0.052	0	**N/A**
Zone of Interest 1	0.7	0	*minus*	0.00	0.00	0.052	0	**N/A**
Zone of Interest 2	0.7	0	*minus*	0.00	0.00	0.052	0	**N/A**
Btm of Casing/Shoe	0.7	0	*minus*	0.00	0.00	0.052	0	**N/A**

Step 2a - MASP estimation

	TVD/PP @ deepest OH depth				TVD	MW			Gas Grad.	
$MASP_{BHP}$	0	0	0.052	*minus*	0	0	20%	0.052	0	80%
								0 psi		

	TVD/FG @ deepest exposed shoe				TVD_{mud}	MW			TVD_{gas}	Gas Grad.
$MASP_{shoe}$	0	0	0.052	*minus*	0	0	0.052	*minus*	0	0
								0 psi		

MASP — Minimum of $MASP_{BHP}$, $MASP_{shoe}$ — **0 psi**

Step 2b - MAWP estimation

	MASP		RKB-ML	Gas Grad.		
MAWP	0 psi	*plus*	5,279	0		**0 psi**

				MW			
$MAWP_{surf}$	0 psi	*minus*	5,279	0.00	0.052		**0 psi**

P_{test1}

P_{test1} — Minimum of MAWPsurf+, 70% of burst rating — **0 psi**

Steps 3-5 - P_{test2}

		(FG - MW)			TVD			
3. $P_{test\ liner}$		0.00	0.00	0.052	0	*plus*	500 psi	**500 psi**
	plus	0.00	0.00	0.052	0			

4. N/A

		(LOT/FIT - MW)						
5. $P_{test\ shoe}$		N/A	0.00	0.052	0	*plus*	200 psi	**0 psi**

P_{test2}

Maximum of Steps 3-5 — **500 psi** **w/ 0 ppg**

Actual Test Pressure — **0 psi** **w/ 0 ppg**

Chevron DWEP
BOP Test Pressure Calculations for APD

Block	Well	Field/Prospect	RKB-ML
WR 29	**Typical**	**Big Foot**	5,279
OCS-G-16942	--		

Stump BOP Test

1 – The minimum stump BOP test pressure will be equivalent to MAWP + 500 psi
2 – The annular BOP(s) will be stump tested to the lesser of the Ram BOP test or 70% of rated working pressure

	MAWP				
$P_{BOPram\ test\ stump}$	3915 psi	*plus*	500 psi	**4500 psi**	(excludes MAWP post-tieback)
$P_{70\%\ Ann.\ WP}$	10000 psi	70%	**7000 psi**		
$P_{BOP\ Ann.\ test\ stump}$			**4500 psi**		

Initial BOP Test on Wellhead

1 – Following latch up, the initial BOP test will be performed with seawater (8.6 ppg)
2 – The surface test pressure will be equivalent to MASP + 500 psi, up to a maximum of 15K psi Pi @ wellhead.
3 – The annular BOP(s) will be tested to the lesser of the Ram BOP test or 70% of rated working pressure at depth

	MASP				
$P_{BOPram\ test\ initial}$	2004 psi	*plus*	500 psi	**2600 psi**	(excludes MASP post-tieback)
$P_{BOP\ Ann.\ test\ initial}$			**2600 psi**		

Subsequent BOP Tests

Method 1: Subsea test will be based on MASP + 500 psi.
Method 2: Subsea test will be based on MAWP + 500 psi, less the hydrostatic equivalent of the MW in the C/K lines.
Surface equipment tests will be based on MASP + 500 psi.

Casing Point	MASP	MAWP	*plus*	*minus MW*	$P_{BOP\ Ann.}$	$P_{BOP\ ram}$	$P_{BOP\ Surf.}$	Method	
22"	N/a - initial BOP test - see above							(choose)	
16"	1370 psi	3281 psi	500 psi	0 psi	**1900 psi**	**1900 psi**	**1900 psi**	◉ 1	○ 2
13-5/8"	1312 psi	3223 psi	500 psi	0 psi	**1900 psi**	**1900 psi**	**1900 psi**	◉ 1	○ 2
9-7/8"	2004 psi	3915 psi	500 psi	0 psi	**2600 psi**	**2600 psi**	**2600 psi**	◉ 1	○ 2
N/A	0 psi	0 psi	500 psi	0 psi	--	--	--	◉ 1	○ 2
N/A	0 psi	0 psi	500 psi	0 psi	--	--	--	◉ 1	○ 2
N/A	0 psi	0 psi	500 psi	0 psi	--	--	--	◉ 1	○ 2
N/A	0 psi	0 psi	500 psi	0 psi	--	--	--	◉ 1	○ 2
N/A	0 psi	0 psi	500 psi	0 psi	--	--	--	◉ 1	○ 2

NOMENCLATURE

BHP	=	Bottom hole pressure, psi
MASP	=	Maximum Anticipated Surface Pressure, psi
$MASP_{BHP}$	=	Maximum Anticipated Surface Pressure based on pore pressure, psi
$MASP_{shoe}$	=	Maximum Anticipated Surface Pressure based on frac pressure, psi
MAWP	=	Maximum Anticipated Wellhead Pressure, psi
$MAWP_{surf}$	=	MAWP Surface Pressure with casing test mud weight, psi
P_b	=	Casing burst pressure, psi
P_{frac}	=	Fracture pressure, psi
P_{test1}	=	Casing test pressure based on criteria 1, psi
P_{test2}	=	Casing test pressure based on criteria 2, psi
$P_{test\ csg}$	=	Casing test pressure, psi
$P_{test\ shoe}$	=	Equivalent casing test pressure at current casing shoe, psi
$P_{test\ liner}$	=	Equivalent casing test pressure at liner top, psi
$P_{test\ ANN}$	=	Annular BOP test pressure at surface, psi
$P_{ANN\ WP}$	=	Annular BOP working pressure, psi
$P_{test\ RAM}$	=	Ram BOP test pressure at surface, psi
TVD_{next}	=	True vertical depth of next casing shoe, ft
TVD_{shoe}	=	True vertical depth of casing shoe, ft
TVD_{liner}	=	True vertical depth of liner top, ft
TVD_{ML}	=	Water depth, ft
γ_{equiv}	=	Equivalent gradient of gas/mud mixture, psi/ft
γ_{gas}	=	Gas gradient, psi/ft
ρ_{mud}	=	Mud weight, lb/gal
ρ_{pore}	=	Equivalent mud weight of pore pressure, lb/gal
ρ_{frac}	=	Fracture pressure expressed as equivalent mud weight, lb/gal
$\rho_{FIT/LOT}$	=	Formation integrity or leak-off test expressed as equivalent mud weight, lb/gal

CASING DESIGN CRITERIA

String	Conductor & Surface Casing				Intermediate Casing/Liner		
Criteria	**Loading**	**Tubular strength**	**Design factor**		**Loading**	**Tubular strength**	**Design factor**
Burst	**1. Gas kick** **Internal**: 80% gas column on top of 20% mud column calculated from OH TD to RKB. If OH > 10,000' a 50/50 gradient will be used. (gas gradient 0.10 psi/ft) **External:** Formation pressure **2. Pressure test** **Internal**: Test pressure plus test fluid column. **External**: formation pressure	**1. Sweet-service*** API burst rating or Heavy-wall burst rating **2. Sour-service**** API burst rating or VME burst rating	**1. Sweet-service** 1.1 **2. Sour-service** 1.2		**1. Gas Kick** **Internal**: 50% gas column on top of 50% mud column calculated from OH TD to RKB (gas gradient by Young-Nagy equation) **External**: formation pressure **2. Pressure test** **Internal**: Test pressure plus test fluid column. **External**: formation pressure **3. Shoe fracture** **Internal**: Frac. Pressure at shoe with mud to surface **External**: formation pressure	**1. Sweet-service*** API burst rating or Heavy-wall burst rating **2. Sour-service**** API burst rating or VME burst rating	**1. Sweet-service** 1.1 **2. Sour-service** 1.2
Collapse	**1. Lost return** **Internal**: Full seawater column to surface, a gradient higher than SW may be used (equivalent to the drilling MW column drop to balance the lowest exposed pore pressure). **External**: Drilling mud **2. Cementing** **Internal**: SW **External**: Cement slurry in place	API collapse rating or approved high collapse rating	1		**1. Lost return** **Internal:** Full seawater column to surface, a gradient higher than SW may be used (equivalent to the drilling MW column drop to balance the lowest exposed pore pressure). **External**: Drilling mud **2. Cementing** **Internal**: Drilling mud **External**: Cement slurry in place	API collapse rating or approved high collapse rating	1 or 0.85 for good cement section
Tension	**1. Running in hole** : Buoyant weight	The lesser of API pipe tension rating or connection tension rating	1.6		**1. Running in hole** : Buoyant weight	The lesser of API pipe tension rating or connection tension rating	1.6
String	**Production Casing/Liner**				**Tubing**		
Criteria	**Loading**	**Tubular strength**	**Design factor**		**Loading**	**Tubular strength**	**Design factor**
Burst	1. **Tubing leak near surface**	**1. Sweet-service***	**1. Sweet-service**		**1. Service Load**	**1. Sweet-service***	1.2

	Internal: Tubing leak pressure from production shut-in **External**: Open hole - formation pressure. Cased hole - mud weight the production liner/casing was run in.	API burst rating or Heavy-wall burst rating **2. Sour-service**** API burst rating or VME burst rating	1.1 **2. Sour-service** 1.2		**Internal:** Max. pressure from production shut in (equal to initial flowing pressure) **External:** Packer fluid	API burst rating or Heavy-wall burst rating **2. Sour-service**** API burst rating or VME burst rating	
Collapse	**1.Fluid Drop** **Internal:** Fluid drop equivalent to abandonment pressure. Internal fluid gradient equal to produced oil or gas gradient. **External:** Drilling mud **2. Cementing** **Internal**: Drilling mud **External**: Cement slurry in place	API collapse rating or approved high collapse rating	1		**1. Full void pipe** **Internal:** Fluid drop equivalent to abandonment pressure. Internal fluid gradient equal to produced oil or gas gradient. **External:** Packer fluid	API collapse rating or approved high collapse rating	1
Tension	**1. Running in hole**: Buoyant weight	The lesser of API pipe tension rating or connection tension rating	1.6		**1. Running in hole:** Buoyant weight	The lesser of API pipe tension rating or connection tension rating	1.6

Appendix – C
Minimum Design Factors

22” Surface Casing

Load	Design Factor	Design Criteria	Failure Cause	MD (ft)	Position	Load Name	Item Name
Burst	1.04*	1.20	User Defined	5847.00	Below	Pressure Test 22"	22 170.20 X60 BD-2800 X60 S...
Collapse	1.26	1.10	User Defined	5531.00	Above	Mud Drop = PP@ Maroon Snd	22 328.30 X80 H-90 D/MT
Tension	2.18	1.40	User Defined	5847.00	Below	Running - Shock Load	22 170.20 X60 BD-2800 X60 S...
Compression	1.22	1.00	User Defined	8890.00	Above	50 bbl Gas Kick - 22747 ft	22 170.16 X60 S-60 QT/MT
VME	1.40	1.25		5531.00	Below	Pressure Test 16"	22 224.50 X80 S-90 D/MT

* Minimum acceptable design factor for burst disk is 1.0.

16” Drilling Liner

Load	Design Factor	Design Criteria	Failure Cause	MD (ft)	Position	Load Name	Item Name
Burst	1.98	1.20	User Defined	8201.10	Above	Pressure Test 16"	16.04 109.61 USSQ125HP SLSF
Collapse	1.23	1.10	User Defined	14625.00	Above	Cementing	16.04 109.61 USSQ125HP SLSF
Tension	2.42	1.40	User Defined	5531.00	Below	Pressure Test 16"	16.04 109.61 USSQ125HP SLSF
Compression	2.26	1.00	User Defined	14625.00	Above	Cementing	16.04 109.61 USSQ125HP SLSF
VME	2.07	1.25		14625.00	Above	Pressure Test 16"	16.04 109.61 USSQ125HP SLSF

13-5/8” Drilling Liner

Load	Design Factor	Design Criteria	Failure Cause	MD (ft)	Position	Load Name	Item Name
Burst	2.25	1.20	User Defined	15000.00	Above	Pressure Test 13-5/8"	13-5/8 88.20 USSQ125HP SLSF
Collapse	1.17	1.10	User Defined	20113.00	Above	Cementing	13-5/8 88.20 USSQ125HP SLSF
Tension	5.55	1.40	User Defined	14426.00	Below	Pressure Test 13-5/8"	13-5/8 88.20 USSQ125HP SLSF
Compression	3.26	1.00	User Defined	20113.00	Above	Mud Drop = PP@ Maroon Snd	13-5/8 88.20 USSQ125HP SLSF
VME	2.32	1.25		19807.10	Above	Pressure Test 9-7/8" Liner	13-5/8 88.20 USSQ125HP SLSF

9-7/8” Production Liner

Load	Design Factor	Design Criteria	Failure Cause	MD (ft)	Position	Load Name	Item Name
Burst	2.43	1.20	User Defined	22210.10	Above	Pressure Test 9-7/8" Liner	9-7/8 65.10 Q125HC SLSF
Collapse	1.91	1.10	User Defined	22746.00	Above	Cementing	9-7/8 65.10 Q125HC SLSF
Tension	25.83	1.40	User Defined	19914.00	Below	Running - Shock Load	9-7/8 65.10 Q125HC SLSF
Compression	2.96	1.00	User Defined	22746.00	Above	Cementing	9-7/8 65.10 Q125HC SLSF
VME	2.44	1.25		22210.10	Above	Pressure Test 9-7/8" Liner	9-7/8 65.10 Q125HC SLSF