



## Application for Permit to Drill

U.S. Department of the Interior  
Bureau of Land Management

### APD Package Report

Date Printed: 06/22/2017 03:35 PM

APD ID: 10400009238

Well Status: AAPD

APD Received Date: 02/03/2017 11:17 AM

Well Name: EK 30 BS2 FEDERAL COM

Operator: MCELVAIN ENERGY INC

Well Number: 2H

#### APD Package Report Contents

- Form 3160-3
- Operator Certification Report
- Application Report
- Application Attachments
  - Operator Letter of Designation: 1 file(s)
  - Well Plat: 1 file(s)
- Drilling Plan Report
- Drilling Plan Attachments
  - Blowout Prevention Choke Diagram Attachment: 1 file(s)
  - Blowout Prevention BOP Diagram Attachment: 1 file(s)
  - Casing Design Assumptions and Worksheet(s): 3 file(s)
  - Hydrogen sulfide drilling operations plan: 1 file(s)
  - Proposed horizontal/directional/multi-lateral plan submission: 1 file(s)
- SUPO Report
- SUPO Attachments
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- PWD Report
- PWD Attachments
  - None

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- Bond Report
- Bond Attachments
  - None

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DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

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FORM APPROVED  
OMB No. 1004-0137  
Expires October 31, 2014

APPLICATION FOR PERMIT TO DRILL OR REENTER

1a. Type of work: <input checked="" type="checkbox"/> DRILL <input type="checkbox"/> REENTER		5. Lease Serial No. NMNM0245247
1b. Type of Well: <input checked="" type="checkbox"/> Oil Well <input type="checkbox"/> Gas Well <input type="checkbox"/> Other <input checked="" type="checkbox"/> Single Zone <input type="checkbox"/> Multiple Zone		6. If Indian, Allottee or Tribe Name
2. Name of Operator MCELVAIN ENERGY INC [22044]		7. If Unit or CA Agreement, Name and No.
3a. Address 1050 17th St #2500 Denver CO 80265		8. Lease Name and Well No. [315044] EK 30 BS2 FEDERAL COM 2H
3b. Phone No. (include area code) (303)893-0933		9. API Well No. 30-025-43883
4. Location of Well (Report location clearly and in accordance with any State requirements.) At surface SESE / 150 FSL / 876 FEL / LAT 32.7118722 / LONG -103.5938972 At proposed prod. zone NWNE / 230 FNL / 1980 FEL / LAT 32.7253389 / LONG -103.5975333		10. Field and Pool, or Exploratory BONE SPRING [21650]
11. Sec., T. R. M. or Blk. and Survey or Area SEC 30 / T18S / R34E / NMP		12. County or Parish LEA
13. State NM		
14. Distance in miles and direction from nearest town or post office* 28 miles	15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any) 150 feet	16. No. of acres in lease 1111.44
17. Spacing Unit dedicated to this well 160	18. Distance from proposed location* to nearest well drilling, completed, 30 feet applied for, on this lease, ft.	19. Proposed Depth 9774 feet / 14862 feet
20. BLM/BIA Bond No. on file FED: COB000010	21. Elevations (Show whether DH, KDB, RT, GL, etc.) 3894 feet	22. Approximate date work will start* 09/28/2017
23. Estimated duration 35 days	24. Attachments	

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No. 1, must be attached to this form:

- Well plat certified by a registered surveyor.
- A Drilling Plan.
- A Surface Use Plan (if the location is on National Forest System Lands, the SUPO must be filed with the appropriate Forest Service Office).
- Bond to cover the operations unless covered by an existing bond on file (see Item 20 above).
- Operator certification
- Such other site specific information and/or plans as may be required by the BLM.

25. Signature (Electronic Submission)	Name (Printed/Typed) Natalia Stallsworth / Ph: (303)857-9999	Date 02/03/2017
Title Regulatory Technician/Permitting Agent		
Approved by (Signature) (Electronic Submission)	Name (Printed/Typed) Cody Layton / Ph: (575)234-5959	Date 06/21/2017
Title Supervisor Multiple Resources		

Application approval does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.  
Conditions of approval, if any, are attached.

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(Continued on page 2)

\*(Instructions on page 2)

APPROVED WITH CONDITIONS

Kz

06/27/2016



## INSTRUCTIONS

**GENERAL:** This form is designed for submitting proposals to perform certain well operations, as indicated on Federal and Indian lands and leases for action by appropriate Federal agencies, pursuant to applicable Federal laws and regulations. Any necessary special instructions concerning the use of this form and the number of copies to be submitted, particularly with regard to local, area, or regional procedures and practices, either are shown below or will be issued by, or may be obtained from local Federal offices.

**ITEM 1:** If the proposal is to redrill to the same reservoir at a different subsurface location or to a new reservoir, use this form with appropriate notations. Consult applicable Federal regulations concerning subsequent work proposals or reports on the well.

**ITEM 4:** Locations on Federal or Indian land should be described in accordance with Federal requirements. Consult local Federal offices for specific instructions.

**ITEM 14:** Needed only when location of well cannot readily be found by road from the land or lease description. A plat, or plats, separate or on the reverse side, showing the roads to, and the surveyed location of, the well, and any other required information, should be furnished when required by Federal agency offices.

**ITEMS 15 AND 18:** If well is to be, or has been directionally drilled, give distances for subsurface location of hole in any present or objective productive zone.

**ITEM 22:** Consult applicable Federal regulations, or appropriate officials, concerning approval of the proposal before operations are started.

## NOTICES

The Privacy Act of 1974 and regulation in 43 CFR 2.48(d) provide that you be furnished the following information in connection with information required by this application.

**AUTHORITY:** 30 U.S.C. 181 et seq., 25 U.S.C. 396; 43 CFR 3160

**PRINCIPAL PURPOSES:** The information will be used to: (1) process and evaluate your application for a permit to drill a new oil, gas, or service well or to reenter a plugged and abandoned well; and (2) document, for administrative use, information for the management, disposal and use of National Resource Lands and resources including (a) analyzing your proposal to discover and extract the Federal or Indian resources encountered; (b) reviewing procedures and equipment and the projected impact on the land involved; and (c) evaluating the effects of the proposed operation on the surface and subsurface water and other environmental impacts.

**ROUTINE USE:** Information from the record and/or the record will be transferred to appropriate Federal, State, and local or foreign agencies, when relevant to civil, criminal or regulatory investigations or prosecution, in connection with congressional inquiries and for regulatory responsibilities.

**EFFECT OF NOT PROVIDING INFORMATION:** Filing of this application and disclosure of the information is mandatory only if you elect to initiate a drilling or reentry operation on an oil and gas lease.

The Paperwork Reduction Act of 1995 requires us to inform you that:

The BLM collects this information to allow evaluation of the technical, safety, and environmental factors involved with drilling for oil and/or gas on Federal and Indian oil and gas leases. This information will be used to analyze and approve applications. Response to this request is mandatory only if the operator elects to initiate drilling or reentry operations on an oil and gas lease. The BLM would like you to know that you do not have to respond to this or any other Federal agency-sponsored information collection unless it displays a currently valid OMB control number.

**BURDEN HOURS STATEMENT:** Public reporting burden for this form is estimated to average 8 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 to U.S. Department of the Interior, Bureau of Land Management (1004-0137), Bureau Information Collection Clearance Officer (WO-630), 1849 C Street, N.W., Mail Stop 401 LS, Washington, D.C. 20240.

## Additional Operator Remarks

### Location of Well

1. SHL: SESE / 150 FSL / 876 FEL / TWSP: 18S / RANGE: 34E / SECTION: 30 / LAT: 32.7118722 / LONG: -103.5938972 ( TVD: 0 feet, MD: 0 feet )  
PPP: NWSW / 1320 FSL / 1950 FEL / TWSP: 18S / RANGE: 34E / SECTION: 30 / LAT: 32.7150889 / LONG: -103.5974028 ( TVD: 9893 feet, MD: 11450 feet )  
PPP: SWSE / 583 FSL / 1951 FEL / TWSP: 18S / RANGE: 34E / SECTION: 30 / LAT: 32.7118722 / LONG: -103.5938972 ( TVD: 9933 feet, MD: 10400 feet )  
BHL: NWNW / 230 FSL / 1980 FEL / TWSP: 18S / RANGE: 34E / SECTION: 30 / LAT: 32.7253389 / LONG: -103.5975333 ( TVD: 9774 feet, MD: 14862 feet )

### BLM Point of Contact

Name: Melissa Agee

Title: Legal Instruments Examiner

Phone: 5752345937

Email: magee@blm.gov

## **Review and Appeal Rights**

A person contesting a decision shall request a State Director review. This request must be filed within 20 working days of receipt of the Notice with the appropriate State Director (see 43 CFR 3165.3). The State Director review decision may be appealed to the Interior Board of Land Appeals, 801 North Quincy Street, Suite 300, Arlington, VA 22203 (see 43 CFR 3165.4). Contact the above listed Bureau of Land Management office for further information.

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## Operator Certification Data Report

06/22/2017

### Operator Certification

*I hereby certify that I, or someone under my direct supervision, have inspected the drill site and access route proposed herein; that I am familiar with the conditions which currently exist; that I have full knowledge of state and Federal laws applicable to this operation; that the statements made in this APD package are, to the best of my knowledge, true and correct; and that the work associated with the operations proposed herein will be performed in conformity with this APD package and the terms and conditions under which it is approved. I also certify that I, or the company I represent, am responsible for the operations conducted under this application. These statements are subject to the provisions of 18 U.S.C. 1001 for the filing of false statements.*

**NAME:** Natalie Stallsworth

**Signed on:** 02/03/2017

**Title:** Regulatory Technician/Permitting Agent

**Street Address:** PO Box 99

**City:** Eastlake

**State:** CO

**Zip:** 80614

**Phone:** (303)857-9999

**Email address:** natalie@permitco-usa.com

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### Field Representative

**Representative Name:**

**Street Address:**

**City:**

**State:**

**Zip:**

**Phone:**

**Email address:**





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## Application Data Report

06/22/2017

APD ID: 10400009238

Submission Date: 02/03/2017

Operator Name: MCELVAIN ENERGY INC

Well Name: EK 30 BS2 FEDERAL COM

Well Number: 2H

Well Type: OIL WELL

Well Work Type: Drill

### Section 1 - General

APD ID: 10400009238

Tie to previous NOS?

Submission Date: 02/03/2017

BLM Office: CARLSBAD

User: Natalie Stallworth

Title: Regulatory

Federal/Indian APD: FED

Is the first lease penetrated for production Federal or Indian? FED

Lease number: NMNM0245247

Lease Acres: 1111.44

Surface access agreement in place?

Allotted?

Reservation:

Agreement in place? NO

Federal or Indian agreement:

Agreement number:

Agreement name:

Keep application confidential? YES

Permitting Agent? YES

APD Operator: MCELVAIN ENERGY INC

Operator letter of designation:

Agent Letter signed\_12-16-2016.PDF

Keep application confidential? YES

### Operator Info

Operator Organization Name: MCELVAIN ENERGY INC

Operator Address: 1050 17th St #2500

Zip: 80265

Operator PO Box:

Operator City: Denver

State: CO

Operator Phone: (303)893-0933

Operator Internet Address: chris.caplis@mcelvain.com

### Section 2 - Well Information

Well in Master Development Plan? NO

Master Development Plan name:

Well in Master SUPO? NEW

Master SUPO name: EK 30 and 31 Multi-pad

Well in Master Drilling Plan? NO

Master Drilling Plan name:

Well Name: EK 30 BS2 FEDERAL COM

Well Number: 2H

Well API Number:

Field/Pool or Exploratory? Field and Pool

Field Name: BONE SPRING

Pool Name:



**Operator Name:** MCELVAIN ENERGY INC

**Well Name:** EK 30 BS2 FEDERAL COM

**Well Number:** 2H

**Is the proposed well in an area containing other mineral resources?** USEABLE WATER

**Describe other minerals:**

**Is the proposed well in a Helium production area?** N **Use Existing Well Pad?** NO **New surface disturbance?**

**Type of Well Pad:** SINGLE WELL

**Multiple Well Pad Name:**

**Number:**

**Well Class:** HORIZONTAL

**Number of Legs:**

**Well Work Type:** Drill

**Well Type:** OIL WELL

**Describe Well Type:**

**Well sub-Type:** EXPLORATORY (WILDCAT)

**Describe sub-type:**

**Distance to town:** 28 Miles

**Distance to nearest well:** 30 FT

**Distance to lease line:** 150 FT

**Reservoir well spacing assigned acres Measurement:** 160 Acres

**Well plat:** EK 30 BS2 Federal COM 2H Plat\_02-01-2017.pdf

**Well work start Date:** 09/28/2017

**Duration:** 35 DAYS

### Section 3 - Well Location Table

**Survey Type:** RECTANGULAR

**Describe Survey Type:**

**Datum:** NAD83

**Vertical Datum:** NAVD88

**Survey number:**

SHL Lag #: 1	<b>STATE:</b> NEW MEXICO	<b>Meridian:</b> NEW MEXICO PRINCIPAL	<b>County:</b> LEA
	<b>Latitude:</b> 32.7118722	<b>Longitude:</b> -103.5938972	
	<b>Elevation:</b> 3894	<b>MD:</b> 0	<b>TVD:</b> 0
	<b>Lease Type:</b> FEDERAL	<b>Lease #:</b> NMNM0245247	
	<b>NS-Foot:</b> 150	<b>NS Indicator:</b> FSL	
	<b>EW-Foot:</b> 876	<b>EW Indicator:</b> FEL	
	<b>Twsp:</b> 18S	<b>Range:</b> 34E	<b>Section:</b> 30
	<b>Aliquot:</b> SESE	<b>Lot:</b>	<b>Tract:</b>

Operator Name: MCELVAIN ENERGY INC

Well Name: EK 30 BS2 FEDERAL COM

Well Number: 2H

KOP Leg #: 1	STATE: NEW MEXICO	Meridian: NEW MEXICO PRINCIPAL	County: LEA
	Latitude: 32.7114664	Longitude: -103.5973619	
	Elevation: -5565	MD: 9542	TVD: 9459
	Lease Type: FEDERAL	Lease #: NMNM0245247	
	NS-Foot: 50	NS Indicator: FSL	
	EW-Foot: 1976	EW Indicator: FEL	
	Twsp: 18S	Range: 34E	Section: 30
	Aliquot: SESE	Lot:	Tract:
PPP Leg #: 1	STATE: NEW MEXICO	Meridian: NEW MEXICO PRINCIPAL	County: LEA
	Latitude: 32.7150889	Longitude: -103.5974028	
	Elevation: -5999	MD: 11450	TVD: 9893
	Lease Type: FEDERAL	Lease #: NMNM116166	
	NS-Foot: 1320	NS Indicator: FSL	
	EW-Foot: 1950	EW Indicator: FEL	
	Twsp: 18S	Range: 34E	Section: 30
	Aliquot: NWSW	Lot:	Tract:
PPP Leg #: 1	STATE: NEW MEXICO	Meridian: NEW MEXICO PRINCIPAL	County: LEA
	Latitude: 32.7118722	Longitude: -103.5938972	
	Elevation: -6039	MD: 10400	TVD: 9933
	Lease Type: FEDERAL	Lease #: NMNM0245247	
	NS-Foot: 583	NS Indicator: FSL	
	EW-Foot: 1951	EW Indicator: FEL	
	Twsp: 18S	Range: 34E	Section: 30
	Aliquot: SWSE	Lot:	Tract:
EXIT Leg #: 1	STATE: NEW MEXICO	Meridian: NEW MEXICO PRINCIPAL	County: LEA
	Latitude: 32.7250667	Longitude: -103.5974278	
	Elevation: -5883	MD: 14765	TVD: 9777
	Lease Type: FEDERAL	Lease #: NMNM116166	
	NS-Foot: 330	NS Indicator: FNL	
	EW-Foot: 1980	EW Indicator: FEL	

**Operator Name:** MCELVAIN ENERGY INC

**Well Name:** EK 30 BS2 FEDERAL COM

**Well Number:** 2H

**Twsp:** 18S

**Range:** 34E

**Section:** 30

**Aliquot:** NWNE

**Lot:**

**Tract:**

**STATE:** NEW MEXICO

**Meridian:** NEW MEXICO PRINCIPAL **County:** LEA

**Latitude:** 32.7253389

**Longitude:** -103.5975333

**BHL**

**Elevation:** -5880

**MD:** 14862

**TVD:** 9774

**Leg #: 1**

**Lease Type:** FEDERAL

**Lease #:** NMNM116166

**NS-Foot:** 230

**NS Indicator:** FNL

**EW-Foot:** 1980

**EW Indicator:** FEL

**Twsp:** 18S

**Range:** 34E

**Section:** 30

**Aliquot:** NWNE

**Lot:**

**Tract:**





**McELVAIN ENERGY, INC.**  
**1050 17TH STREET, SUITE 2500**  
**DENVER, COLORADO 80265**

**CHRIS CAPLIS**  
**VICE PRESIDENT OF DRILLING AND COMPLETION**

**OFFICE: 303-962-6475      FAX: 303-893-0914**  
**E-MAIL: CHRIS.CAPLIS@MCELVAIN.COM**

Bureau of Land Management  
Carlsbad Field Office  
620 E. Greene St.  
Carlsbad, NM 88220

Attn: Minerals Division

Re: All McElvain Energy Inc. wells in New Mexico

Gentlemen:

This letter is to inform you that Permitco Inc. is authorized to act as Agent and to sign documents on behalf of McElvain Energy Inc. when necessary for filing county, state and federal permits including Onshore Order No. 1, Right of Way applications, etc., for the above mentioned well.

It should be understood that Permitco is acting as Agent only in those matters stated above and is not responsible for drilling, completion, production or compliance with regulations.

McElvain Energy Inc. agrees to accept full responsibility for operations conducted in order to drill, complete and produce the above-mentioned well.

Sincerely,

**Chris Caplis**  
**McELVAIN ENERGY, INC.**  
**1050 17TH STREET, SUITE 2500**  
**DENVER, COLORADO 80265**





U.S. Department of the Interior  
BUREAU OF LAND MANAGEMENT

## Drilling Plan Data Report

06/22/2017

APD ID: 10400009238

Submission Date: 02/03/2017

Operator Name: MCELVAIN ENERGY INC

Well Name: EK 30 BS2 FEDERAL COM

Well Number: 2H

Well Type: OIL WELL

Well Work Type: Drill

### Section 1 - Geologic Formations

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ID: Surface formation

Name: RUSTLER

Lithology(ies):

Elevation: 3894

True Vertical Depth: 1669

Measured Depth: 1669

Mineral Resource(s):

NONE

Is this a producing formation? N

ID: Formation 1

Name: TOP SALT

Lithology(ies):

Elevation: 2165

True Vertical Depth: 1729

Measured Depth: 1729

Mineral Resource(s):

NONE

Is this a producing formation? N

ID: Formation 2

Name: YATES

Lithology(ies):

Elevation: 600

True Vertical Depth: 3294

Measured Depth: 3294

Mineral Resource(s):

USEABLE WATER

NATURAL GAS

OIL

Is this a producing formation? N

**Operator Name:** MCELVAIN ENERGY INC

**Well Name:** EK 30 BS2 FEDERAL COM

**Well Number:** 2H

**ID:** Formation 3

**Name:** SEVEN RIVERS

**Lithology(ies):**

**Elevation:** 175

**True Vertical Depth:** 3719

**Measured Depth:** 3719

**Mineral Resource(s):**

NONE

**Is this a producing formation?** N

**ID:** Formation 4

**Name:** QUEEN

**Lithology(ies):**

**Elevation:** -525

**True Vertical Depth:** 4419

**Measured Depth:** 4419

**Mineral Resource(s):**

USEABLE WATER

NATURAL GAS

OIL

**Is this a producing formation?** N

**ID:** Formation 5

**Name:** PENROSE

**Lithology(ies):**

**Elevation:** -785

**True Vertical Depth:** 4679

**Measured Depth:** 4679

**Mineral Resource(s):**

USEABLE WATER

NATURAL GAS

OIL

**Is this a producing formation?** N

**ID:** Formation 6

**Name:** SAN ANDRES

**Lithology(ies):**

**Operator Name:** MCELVAIN ENERGY INC

**Well Name:** EK 30 BS2 FEDERAL COM

**Well Number:** 2H

**Elevation:** -1350

**True Vertical Depth:** 5244

**Measured Depth:** 5244

**Mineral Resource(s):**

USEABLE WATER

NATURAL GAS

OIL

**Is this a producing formation?** N

**ID:** Formation 7

**Name:** DELAWARE

**Lithology(ies):**

**Elevation:** -1575

**True Vertical Depth:** 5469

**Measured Depth:** 5469

**Mineral Resource(s):**

USEABLE WATER

NATURAL GAS

OIL

**Is this a producing formation?** N

**ID:** Formation 8

**Name:** DELAWARE SAND

**Lithology(ies):**

**Elevation:** -1585

**True Vertical Depth:** 5479

**Measured Depth:** 5710

**Mineral Resource(s):**

USEABLE WATER

NATURAL GAS

OIL

**Is this a producing formation?** N

**ID:** Formation 9

**Name:** DELAWARE SAND

**Lithology(ies):**

**Elevation:** -1975

**True Vertical Depth:** 5869

**Measured Depth:** 5869

**Mineral Resource(s):**

**Operator Name:** MCELVAIN ENERGY INC

**Well Name:** EK 30 BS2 FEDERAL COM

**Well Number:** 2H

USEABLE WATER

NATURAL GAS

OIL

**Is this a producing formation?** N

**ID:** Formation 10

**Name:** BONE SPRING

**Lithology(ies):**

**Elevation:** -3776

**True Vertical Depth:** 7670

**Measured Depth:** 7675

**Mineral Resource(s):**

USEABLE WATER

NATURAL GAS

OIL

**Is this a producing formation?** N

**ID:** Formation 11

**Name:** BONE SPRING 1ST

**Lithology(ies):**

**Elevation:** -5064

**True Vertical Depth:** 8958

**Measured Depth:** 8971

**Mineral Resource(s):**

USEABLE WATER

NATURAL GAS

OIL

**Is this a producing formation?** N

**ID:** Formation 12

**Name:** BONE SPRING 2ND

**Lithology(ies):**

**Elevation:** -5614

**True Vertical Depth:** 9508

**Measured Depth:** 9523

**Mineral Resource(s):**

USEABLE WATER

NATURAL GAS



**Operator Name:** MCELVAIN ENERGY INC

**Well Name:** EK 30 BS2 FEDERAL COM

**Well Number:** 2H

OIL

Is this a producing formation? Y

## Section 2 - Blowout Prevention

**Pressure Rating (PSI):** 5M

**Rating Depth:** 6000

**Equipment:** 5000 PSI BOP (see diagram)

**Requesting Variance?** NO

**Variance request:**

**Testing Procedure:** As outlined in Onshore Order #2

**Choke Diagram Attachment:**

Choke\_Manifold\_revised\_5\_22\_17\_05-22-2017.PDF

**BOP Diagram Attachment:**

McElvain 5000 BOP\_01-19-2017.pdf

## Section 3 - Casing

**Operator Name:** MCELVAIN ENERGY INC

**Well Name:** EK 30 BS2 FEDERAL COM

**Well Number:** 2H

**String Type:** INTERMEDIATE

**Other String Type:**

**Hole Size:** 12.25

**Top setting depth MD:** 0

**Top setting depth TVD:** 0

**Top setting depth MSL:** -5999

**Bottom setting depth MD:** 4931

**Bottom setting depth TVD:** 4931

**Bottom setting depth MSL:** -10930

**Calculated casing length MD:** 4931

**Casing Size:** 9.625

**Other Size**

**Grade:** L-80

**Other Grade:**

**Weight:** 40

**Joint Type:** LTC

**Other Joint Type:**

**Condition:** NEW

**Inspection Document:**

**Standard:** API

**Spec Document:**

**Tapered String?:** N

**Tapered String Spec:**

### **Safety Factors**

**Collapse Design Safety Factor:** 1.21

**Burst Design Safety Factor:** 1.84

**Joint Tensile Design Safety Factor type:** DRY

**Joint Tensile Design Safety Factor:** 4.67

**Body Tensile Design Safety Factor type:** DRY

**Body Tensile Design Safety Factor:** 4.67

**Casing Design Assumptions and Worksheet(s):**

EK 30 BS2 Federal COM 2H DP casing design\_01-19-2017.pdf

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**Operator Name:** MCELVAIN ENERGY INC

**Well Name:** EK 30 BS2 FEDERAL COM

**Well Number:** 2H

**String Type:** PRODUCTION

**Other String Type:**

**Hole Size:** 8.5

**Top setting depth MD:** 0

**Top setting depth TVD:** 0

**Top setting depth MSL:** -5999

**Bottom setting depth MD:** 14862

**Bottom setting depth TVD:** 14862

**Bottom setting depth MSL:** -20861

**Calculated casing length MD:** 14862

**Casing Size:** 5.5

**Other Size**

**Grade:** P-110

**Other Grade:**

**Weight:** 17

**Joint Type:** OTHER

**Other Joint Type:** BPN

**Condition:** NEW

**Inspection Document:**

**Standard:** API

**Spec Document:**

**Tapered String?:** N

**Tapered String Spec:**

### **Safety Factors**

**Collapse Design Safety Factor:** 1.54

**Burst Design Safety Factor:** 1.12

**Joint Tensile Design Safety Factor type:** DRY

**Joint Tensile Design Safety Factor:** 3.23

**Body Tensile Design Safety Factor type:** DRY

**Body Tensile Design Safety Factor:** 3.23

**Casing Design Assumptions and Worksheet(s):**

EK 30 BS2 Federal COM 2H DP casing design\_01-19-2017.pdf

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**Operator Name:** MCELVAIN ENERGY INC

**Well Name:** EK 30 BS2 FEDERAL COM

**Well Number:** 2H

**String Type:** CONDUCTOR

**Other String Type:**

**Hole Size:** 26

**Top setting depth MD:** 0

**Top setting depth TVD:** 0

**Top setting depth MSL:** -5999

**Bottom setting depth MD:** 80

**Bottom setting depth TVD:** 80

**Bottom setting depth MSL:** -6079

**Calculated casing length MD:** 80

**Casing Size:** 20.0

**Other Size**

**Grade:** OTHER

**Other Grade:** n/a

**Weight:** 0

**Joint Type:** N/A

**Other Joint Type:**

**Condition:** NEW

**Inspection Document:**

**Standard:** API

**Spec Document:**

**Tapered String?:** N

**Tapered String Spec:**

### **Safety Factors**

**Collapse Design Safety Factor:**

**Burst Design Safety Factor:**

**Joint Tensile Design Safety Factor type:**

**Joint Tensile Design Safety Factor:**

**Body Tensile Design Safety Factor type:**

**Body Tensile Design Safety Factor:**

**Casing Design Assumptions and Worksheet(s):**

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**Operator Name:** MCELVAIN ENERGY INC

**Well Name:** EK 30 BS2 FEDERAL COM

**Well Number:** 2H

**String Type:** SURFACE

**Other String Type:**

**Hole Size:** 17.5

**Top setting depth MD:** 0

**Top setting depth TVD:** 0

**Top setting depth MSL:** -5999

**Bottom setting depth MD:** 1700

**Bottom setting depth TVD:** 1700

**Bottom setting depth MSL:** -7699

**Calculated casing length MD:** 1700

**Casing Size:** 13.375

**Other Size**

**Grade:** J-55

**Other Grade:**

**Weight:** 54.5

**Joint Type:** STC

**Other Joint Type:**

**Condition:** NEW

**Inspection Document:**

**Standard:** API

**Spec Document:**

**Tapered String?:** N

**Tapered String Spec:**

### Safety Factors

**Collapse Design Safety Factor:** 1.42

**Burst Design Safety Factor:** 2.67

**Joint Tensile Design Safety Factor type:** DRY

**Joint Tensile Design Safety Factor:** 5.55

**Body Tensile Design Safety Factor type:** DRY

**Body Tensile Design Safety Factor:** 5.55

**Casing Design Assumptions and Worksheet(s):**

EK 30 BS2 Federal COM 2H DP casing design\_01-19-2017.pdf

### Section 4 - Cement

**Casing String Type:** CONDUCTOR

**Operator Name:** MCELVAIN ENERGY INC

**Well Name:** EK 30 BS2 FEDERAL COM

**Well Number:** 2H

**Stage Tool Depth:**

**Lead**

**Top MD of Segment:** 0

**Bottom MD Segment:** 80

**Cement Type:** Redi-mix

**Additives:** n/a

**Quantity (sks):** 200

**Yield (cu.ff./sk):** 0

**Density:** 0

**Volume (cu.ft.):** 0

**Percent Excess:**

**Casing String Type:** SURFACE

**Stage Tool Depth:**

**Lead**

**Top MD of Segment:** 0

**Bottom MD Segment:** 1200

**Cement Type:** Extendacem

**Additives:** n/a

**Quantity (sks):** 1007

**Yield (cu.ff./sk):** 1.66

**Density:** 13.7

**Volume (cu.ft.):** 1668

**Percent Excess:** 100

**Tail**

**Top MD of Segment:** 1200

**Bottom MD Segment:** 1700

**Cement Type:** Halcem

**Additives:** n/a

**Quantity (sks):** 518

**Yield (cu.ff./sk):** 1.34

**Density:** 14.8

**Volume (cu.ft.):** 694

**Percent Excess:**

**Casing String Type:** INTERMEDIATE

**Stage Tool Depth:**

**Lead**

**Top MD of Segment:** 0

**Bottom MD Segment:** 4400

**Cement Type:** Econocem

**Additives:** n/a

**Quantity (sks):** 919

**Yield (cu.ff./sk):** 1.88

**Density:** 12.9

**Volume (cu.ft.):** 1723

**Percent Excess:** 25

**Tail**

**Top MD of Segment:** 4400

**Bottom MD Segment:** 4931

**Cement Type:** Halcem

**Additives:** n/a

**Quantity (sks):** 156

**Yield (cu.ff./sk):** 1.33

**Density:** 6.37

**Volume (cu.ft.):** 207

**Percent Excess:**

**Casing String Type:** PRODUCTION

Operator Name: MCELVAIN ENERGY INC

Well Name: EK 30 BS2 FEDERAL COM

Well Number: 2H

Stage Tool Depth:

Lead

Top MD of Segment: 4400

Bottom MD Segment: 9523

Cement Type: Neocem

Additives: n/a

Quantity (sks): 462

Yield (cu.ft./sk): 3.17

Density: 11

Volume (cu.ft.): 1465

Percent Excess:

Tail

Top MD of Segment: 9523

Bottom MD Segment: 14863

Cement Type: Versacem

Additives: n/a

Quantity (sks): 1233

Yield (cu.ft./sk): 1.24

Density: 14.5

Volume (cu.ft.): 1529

Percent Excess:

### Section 5 - Circulating Medium

Mud System Type: Closed

Will an air or gas system be Used? NO

Description of the equipment for the circulating system in accordance with Onshore Order #2:

Diagram of the equipment for the circulating system in accordance with Onshore Order #2:

Describe what will be on location to control well or mitigate other conditions: Pit volume totalizer equipment will be on each pit to monitor pit levels.

Describe the mud monitoring system utilized: A trip tank equipped with a PVT will be used to monitor trip volumes. Sufficient mud materials will also be available to combat lost circulation and high torque/drag.

### Circulating Medium Table

Top Depth: 4900

Bottom Depth: 9523

Mud Type: OTHER

Cut Brine

Min Weight (lbs./gal.): 8.8

Max Weight (lbs./gal.): 9.4

Density (lbs/cu.ft.):

Gel Strength (lbs/100 sq.ft.):

PH:

Viscosity (CP):

Filtration (cc):

Salinity (ppm):

Additional Characteristics: viscosity: 28-36, water loss: NC, solids: 1

**Operator Name:** MCELVAIN ENERGY INC

**Well Name:** EK 30 BS2 FEDERAL COM

**Well Number:** 2H

**Top Depth:** 9523

**Bottom Depth:** 14862

**Mud Type:** OTHER

Cut Brine

**Min Weight (lbs./gal.):** 8.8

**Max Weight (lbs./gal.):** 9.4

**Density (lbs/cu.ft.):**

**Gel Strength (lbs/100 sq.ft.):**

**PH:**

**Viscosity (CP):**

**Filtration (cc):**

**Salinity (ppm):**

**Additional Characteristics:** viscosity: 40-50, water loss: 10-15cc, solids: <6

**Top Depth:** 0

**Bottom Depth:** 1700

**Mud Type:** WATER-BASED MUD

**Min Weight (lbs./gal.):** 8.4

**Max Weight (lbs./gal.):** 8.7

**Density (lbs/cu.ft.):**

**Gel Strength (lbs/100 sq.ft.):**

**PH:**

**Viscosity (CP):**

**Filtration (cc):**

**Salinity (ppm):**

**Additional Characteristics:** viscosity: 32-36, water loss: NC, solids: 6

**Top Depth:** 1700

**Bottom Depth:** 1700

**Mud Type:** SALT SATURATED

**Min Weight (lbs./gal.):** 9.8

**Max Weight (lbs./gal.):** 10

**Density (lbs/cu.ft.):**

**Gel Strength (lbs/100 sq.ft.):**

**PH:**

**Viscosity (CP):**

**Filtration (cc):**

**Salinity (ppm):**

**Additional Characteristics:** viscosity: 29-30, water loss: NC, solids: 1

## Section 6 - Test, Logging, Coring

**List of production tests including testing procedures, equipment and safety measures:**

None

**List of open and cased hole logs run in the well:**

CALIPER,GR,OTH,SP

**Other log type(s):**

Density, Leterlog

**Coring operation description for the well:**

None



**Operator Name:** MCELVAIN ENERGY INC

**Well Name:** EK 30 BS2 FEDERAL COM

**Well Number:** 2H

### Section 7 - Pressure

**Anticipated Bottom Hole Pressure:** 4849

**Anticipated Surface Pressure:** 2663.74

**Anticipated Bottom Hole Temperature(F):** 150

**Anticipated abnormal pressures, temperatures, or potential geologic hazards?** NO

**Describe:**

**Contingency Plans geohazards description:**

**Contingency Plans geohazards attachment:**

**Hydrogen Sulfide drilling operations plan required?** YES

**Hydrogen sulfide drilling operations plan:**

H2S\_Contingency\_Plan\_05-22-2017.PDF

### Section 8 - Other Information

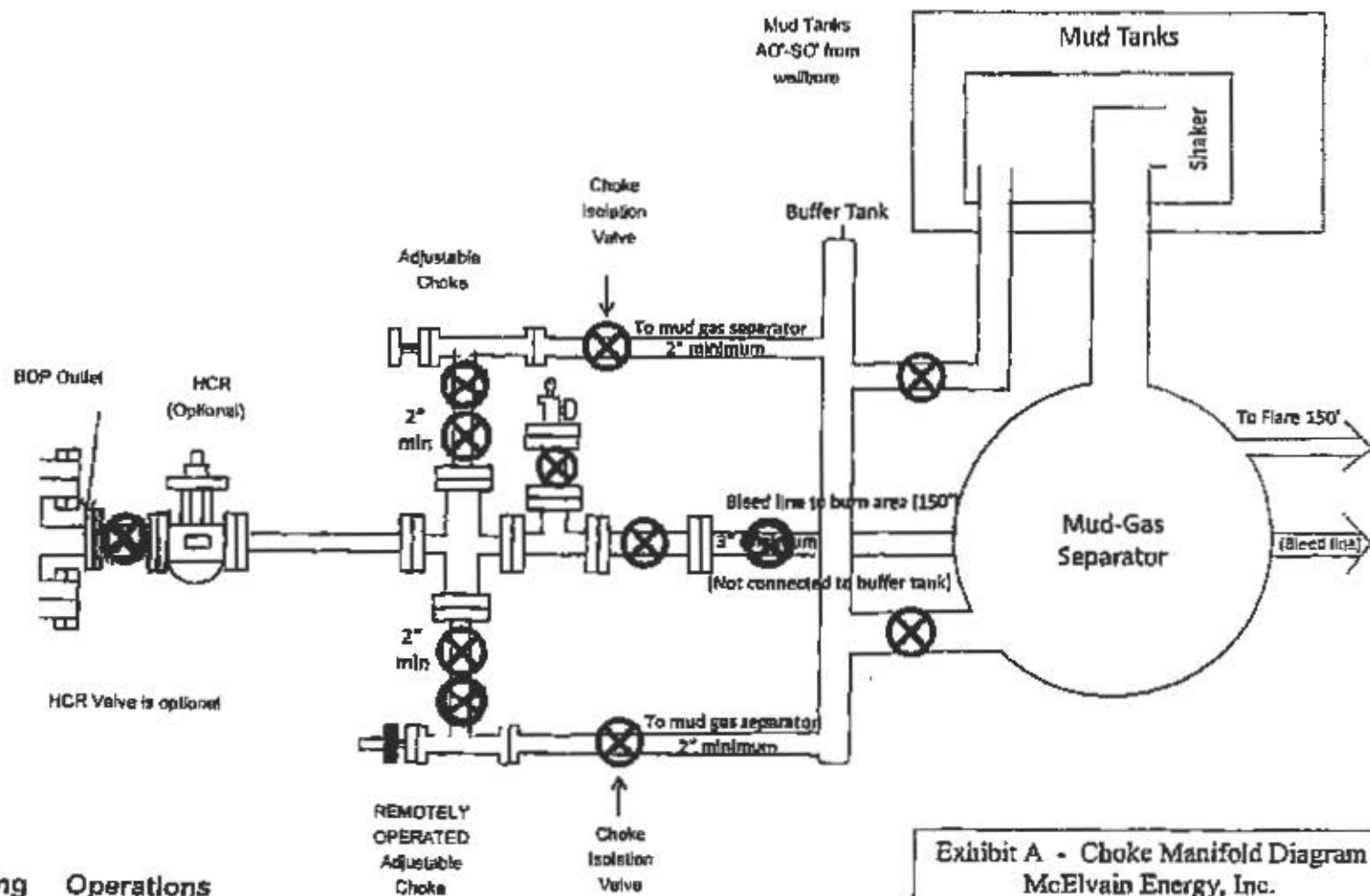
**Proposed horizontal/directional/multi-lateral plan submission:**

EK 30 BS2 Federal COM 2H Directional\_01-19-2017.pdf

**Other proposed operations facets description:**

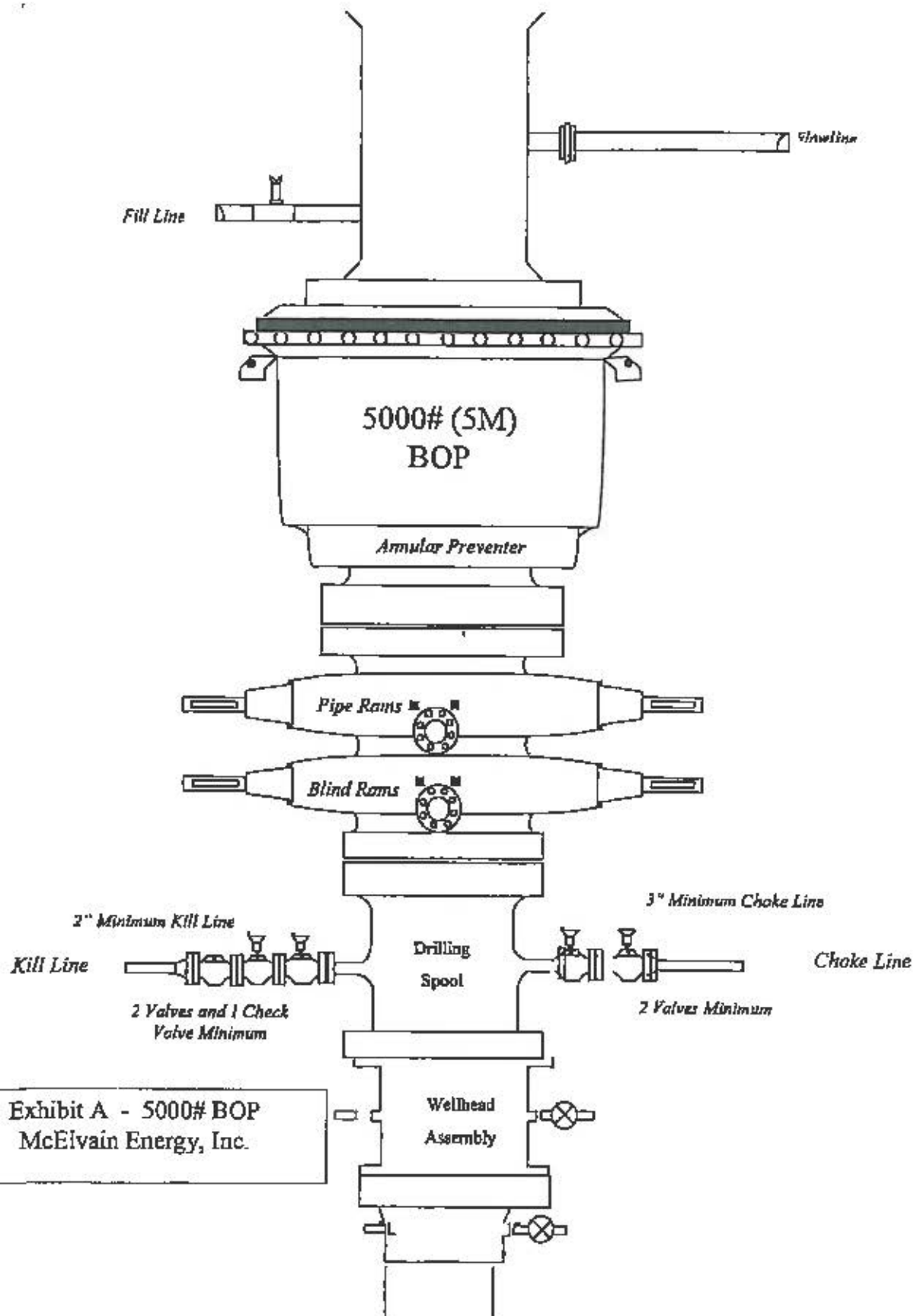
**Other proposed operations facets attachment:**

**Other Variance attachment:**



Drilling Operations  
Choke Manifold

Exhibit A - Choke Manifold Diagram  
McElvain Energy, Inc.



## **EK 30 BS2 Federal Com 2H**

### **Casing Safety Factor Calculations**

Design assumptions are as follows:

- For the surface casing, the design is based on a setting depth of 1,700' MD/TVD in 8.7 ppg fluid and a FG of 0.7 psi/ft per BLM Onshore Order #2.
- For the intermediate casing, the design is based on a setting depth of 4,931' MD/4,900' TVD in a 10.0 ppg fluid (saturated brine) and a FG of 0.74 psi/ft per Hubbert & Willis' graphical determination of FG's.
- For the production casing, the design is based on a setting depth of 14,862' MD/9,774' TVD in a 9.4 ppg fluid (cut brine) and a MASP of 9,500 psi during completions.

### **SURFACE CASING**

13-3/8" 54.5# J-55 STC	Collapse	Burst	Tension (based on STC joint strength)	Make-Up Torque (ft-lbs)	
100%	1,130 psi	2,730 psi	514,000 lbs	Minimum	5,140
70%	791 psi	1,911 psi	359,800 lbs	Optimum Maximum	

#### **Design Factors:**

Burst:  $(FG \times 0.052 \times 1,700') - (0.10 \text{ psi/ft} \times 1,700')$   
 $(13.5 \times 0.052 \times 1,700') - (0.10 \text{ psi/ft} \times 1,700')$  (gas gradient to surface)  
 1,023 psi, MASP  
 $2,730 / 1,023 = \underline{2.67}$

Collapse:  $(MW \times 0.052 \times 1,700') - (MW \times 0.052 \times 1,700' \times (1 - \% \text{ evac}))$   
 $(9.0 \times 0.052 \times 1,700') - (9.0 \times 0.052 \times 1,700' \times 0)$  (100% evacuated)  
 796 psi – 0 psi = 796 psi  
 $1,130 / 796 = \underline{1.42}$

Tension:  $(Wt, \text{ lbs/ft} \times 1,700')$  (wt in air)  
 $(54.5 \text{ lbs/ft} \times 1,700')$   
 92,650 lbs  
 $514,000 / 92,650 = \underline{5.55}$

**INTERMEDIATE CASING**

9-5/8" 40# L-80 BTC	Collapse	Burst	Tension (based on yield strength)	Make-Up Torque (ft-lb)	
100%	3,090 psi	5,750 psi	916,000 lbs	Minimum	Torque pipe la base of triangle
70%	2,163 psi	4,025 psi	641,200 lbs	Optimum Maximum	

**Design Factors:**

Burst:  $(FG \cdot 0.052 \cdot 4,900') - (0.10 \text{ psi/ft} \cdot 4,900')$   
 $(14.2 \cdot 0.052 \cdot 4,900') - (0.10 \text{ psi/ft} \cdot 4,900')$  (gas gradient to surface)  
 3,128 psi, MASP  
 $5,750 / 3,128 = 1.84$

Collapse:  $(MW \cdot 0.052 \cdot 4,900') - (MW \cdot 0.052 \cdot 4,900' \cdot (1 - \% \text{ evac}))$   
 $(10.0 \cdot 0.052 \cdot 4,900') - (10.0 \cdot 0.052 \cdot 4,900' \cdot 0)$  (100% evacuated)  
 2,548 psi – 0 psi = 2,548 psi  
 $3,090 / 2,548 = 1.21$

Tension:  $(Wt, \text{ lbs/ft} \cdot 4,900')$  (wt in air)  
 $(40 \text{ lbs/ft} \cdot 4,900')$   
 196,000 lbs  
 $916,000 / 196,000 = 4.67$

**PRODUCTION CASING**

5-1/2" 17# P-110 BPN	Collapse	Burst	Tension (based on yield strength)	Make-Up Torque (ft-lb)	
100%	7,500 psi	10,640 psi	546,000 lbs	Optimum Maximum	10,000
70%	5,250 psi	7,448 psi	382,200 lbs		11,000

**Design Factors:**

Un-cemented Burst Case:

$(FG \cdot 0.052 \cdot \text{Max. TVD}') - (0.10 \text{ psi/ft} \cdot \text{Max TVD}')$   
 $(17.3 \cdot 0.052 \cdot 9,936') - (0.10 \text{ psi/ft} \cdot 9,936')$  (gas gradient to surface)  
 8,938 psi – 993.6 psi = 7,945 psi  
 $10,640 / 7,945 = 1.34$



EK 30 B2 FEDERAL COM 2H  
BLM Drilling Plan

Injection Down Casing Burst Case:

MASP during stimulation = 9,500 psi (10,640 psi \* 90% = 9,576 psi)

Therefore, 10,640 psi/9,500 psi = 1.12

Collapse: (MW\*0.052\*Max TVD)-(MW\*0.052\*Max TVD\*(1-% evac))

(9.4\*0.052\*9,936)-(9.4\*0.052\*9,936\*0) (100% evacuated)

4,857 psi - 0 psi = 4,857 psi

7,500/4,857 = 1.54

Tension: (Wt, lbs/ft\*Max TVD') (wt in air)

(17 lbs/ft\*9,936')

168,912 lbs

546,000/168,912 = 3.23

## EK 30 BS2 Federal Com 2H

### Casing Safety Factor Calculations

Design assumptions are as follows:

- For the surface casing, the design is based on a setting depth of 1,700' MD/TVD in 8.7 ppg fluid and a FG of 0.7 psi/ft per BLM Onshore Order #2.
- For the intermediate casing, the design is based on a setting depth of 4,931' MD/4,900' TVD in a 10.0 ppg fluid (saturated brine) and a FG of 0.74 psi/ft per Hubbert & Willis' graphical determination of FG's.
- For the production casing, the design is based on a setting depth of 14,862' MD/9,774' TVD in a 9.4 ppg fluid (cut brine) and a MASP of 9,500 psi during completions.

### SURFACE CASING

13-3/8" 54.5# J-55 STC	Collapse	Burst	Tension (based on STC joint strength)	Make-Up Torque (ft-lbs)	
100%	1,130 psi	2,730 psi	514,000 lbs	Minimum	5,140
70%	791 psi	1,911 psi	359,800 lbs	Optimum Maximum	

#### Design Factors:

Burst:  $(FG \times 0.052 \times 1,700') - (0.10 \text{ psi/ft} \times 1,700')$   
 $(13.5 \times 0.052 \times 1,700') - (0.10 \text{ psi/ft} \times 1,700')$  (gas gradient to surface)  
 1,023 psi, MASP  
 $2,730 / 1,023 = 2.67$

Collapse:  $(MW \times 0.052 \times 1,700') - (MW \times 0.052 \times 1,700' \times (1 - \% \text{ evac}))$   
 $(9.0 \times 0.052 \times 1,700') - (9.0 \times 0.052 \times 1,700' \times 0)$  (100% evacuated)  
 796 psi – 0 psi = 796 psi  
 $1,130 / 796 = 1.42$

Tension:  $(Wt, \text{ lbs/ft} \times 1,700')$  (wt in air)  
 $(54.5 \text{ lbs/ft} \times 1,700')$   
 92,650 lbs  
 $514,000 / 92,650 = 5.55$

### INTERMEDIATE CASING

9-5/8" 40# L-80 BTC	Collapse	Burst	Tension (based on yield strength)	Make-Up Torque (ft-lb)	
100%	3,090 psi	5,750 psi	916,000 lbs	Minimum	Torque pipe to base of triangle
70%	2,163 psi	4,025 psi	641,200 lbs	Optimum Maximum	

#### Design Factors:

Burst:  $(FG \times 0.052 \times 4,900') - (0.10 \text{ psi/ft} \times 4,900')$   
 $(14.2 \times 0.052 \times 4,900') - (0.10 \text{ psi/ft} \times 4,900')$  (gas gradient to surface)  
 3,128 psi, MASP  
 $5,750 / 3,128 = 1.84$

Collapse:  $(MW \times 0.052 \times 4,900') - (MW \times 0.052 \times 4,900' \times (1 - \% \text{ evac}))$   
 $(10.0 \times 0.052 \times 4,900') - (10.0 \times 0.052 \times 4,900' \times 0)$  (100% evacuated)  
 2,548 psi – 0 psi = 2,548 psi  
 $3,090 / 2,548 = 1.21$

Tension:  $(Wt, \text{ lbs/ft} \times 4,900')$  (wt in air)  
 $(40 \text{ lbs/ft} \times 4,900')$   
 196,000 lbs  
 $916,000 / 196,000 = 4.67$

### PRODUCTION CASING

5-1/2" 17# P-110 BPN	Collapse	Burst	Tension (based on yield strength)	Make-Up Torque (ft-lb)	
100%	7,500 psi	10,640 psi	546,000 lbs	Optimum Maximum	10,000
70%	5,250 psi	7,448 psi	382,200 lbs		11,000

#### Design Factors:

Un-cemented Burst Case:

$(FG \times 0.052 \times \text{Max. TVD}') - (0.10 \text{ psi/ft} \times \text{Max TVD}')$   
 $(17.3 \times 0.052 \times 9,936') - (0.10 \text{ psi/ft} \times 9,936')$  (gas gradient to surface)  
 8,938 psi – 993.6 psi = 7,945 psi  
 $10,640 / 7,945 = 1.34$

EK 30 BS2 FEDERAL COM 2H  
BLM Drilling Plan

Injection Down Casing Burst Case:

MASP during stimulation = 9,500 psi (10,640 psi \* 90% = 9,576 psi)

Therefore, 10,640 psi/9,500 psi = 1.12

Collapse: (MW\*0.052\*Max TVD)-(MW\*0.052\*Max TVD\*(1-% evac))

(9.4\*0.052\*9,936)-(9.4\*0.052\*9,936\*0) (100% evacuated)

4,857 psi - 0 psi = 4,857 psi

7,500/4,857 = 1.54

Tension: (Wt, lbs/ft\*Max TVD) (wt in air)

(17 lbs/ft\*9,936')

168,912 lbs

546,000/168,912 = 3.23

## EK 30 BS2 Federal Com 2H

### Casing Safety Factor Calculations

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70%	791 psi	1,911 psi	359,800 lbs	Optimum Maximum	

#### Design Factors:

Burst:  $(FG \times 0.052 \times 1,700') - (0.10 \text{ psi/ft} \times 1,700')$   
 $(13.5 \times 0.052 \times 1,700') - (0.10 \text{ psi/ft} \times 1,700')$  (gas gradient to surface)  
 1,023 psi, MASP  
 $2,730 / 1,023 = \underline{2.67}$

Collapse:  $(MW \times 0.052 \times 1,700') - (MW \times 0.052 \times 1,700' \times (1 - \% \text{ evac}))$   
 $(9.0 \times 0.052 \times 1,700') - (9.0 \times 0.052 \times 1,700' \times 0)$  (100% evacuated)  
 796 psi – 0 psi = 796 psi  
 $1,130 / 796 = \underline{1.42}$

Tension:  $(Wt, \text{ lbs/ft} \times 1,700')$  (wt in air)  
 $(54.5 \text{ lbs/ft} \times 1,700')$   
 92,650 lbs  
 $514,000 / 92,650 = \underline{5.55}$



**INTERMEDIATE CASING**

9-5/8" 40# L-80 BTC	Collapse	Burst	Tension (based on yield strength)	Make-Up Torque (ft-lb)	
100%	3,090 psi	5,750 psi	916,000 lbs	Minimum	Torque pipe to base of triangle
70%	2,163 psi	4,025 psi	641,200 lbs	Optimum Maximum	

**Design Factors:**

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 $(14.2 \cdot 0.052 \cdot 4,900') - (0.10 \text{ psi/ft} \cdot 4,900')$  (gas gradient to surface)  
 3,128 psi, MASP  
 $5,750 / 3,128 = 1.84$

Collapse:  $(MW \cdot 0.052 \cdot 4,900') - (MW \cdot 0.052 \cdot 4,900' \cdot (1 - \% \text{ evac}))$   
 $(10.0 \cdot 0.052 \cdot 4,900') - (10.0 \cdot 0.052 \cdot 4,900' \cdot 0)$  (100% evacuated)  
 2,548 psi – 0 psi = 2,548 psi  
 $3,090 / 2,548 = 1.21$

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5-1/2" 17# P-110 BPN	Collapse	Burst	Tension (based on yield strength)	Make-Up Torque (ft-lb)	
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EK 30 BS2 FEDERAL COM 2H  
BLM Drilling Plan

Injection Down Casing Burst Case:

MASP during stimulation = 9,500 psi (10,640 psi \* 90% = 9,576 psi)

Therefore, 10,640 psi/9,500 psi = 1.12

Collapse: (MW\*0.052\*Max TVD')-(MW\*0.052\*Max TVD'\*(1-% evac))

(9.4\*0.052\*9,936')-(9.4\*0.052\*9,936'\*0) (100% evacuated)

4,857 psi - 0 psi = 4,857 psi

7,500/4,857 = 1.54

Tension: (Wt, lbs/ft\*Max TVD') (wt in air)

(17 lbs/ft\*9,936')

168,912 lbs

546,000/168,912 = 3.23