

Well Name: VACA DRAW 20-17 FEDERAL	Well Location: T25S / R33E / SEC 20 / SESW / 32.109742 / -103.596358	County or Parish/State: LEA / NM
Well Number: 10H	Type of Well: CONVENTIONAL GAS WELL	Allottee or Tribe Name:
Lease Number: NMNM026394, NMNM26394	Unit or CA Name:	Unit or CA Number:
US Well Number: 3002544356	Well Status: Approved Application for Permit to Drill	Operator: CIMAREX ENERGY COMPANY

Notice of Intent

Type of Submission: Notice of Intent	Type of Action APD Change
Date Sundry Submitted: 02/21/2021	Time Sundry Submitted: 03:34
Date proposed operation will begin: 03/14/2021	

Procedure Description: Cimarex Energy respectfully requests approval to change BHL, target formation, casing design, and perform offline cementing for the Vaca Draw 20-17 Federal 10H well. Proposed BHL: 100' FNL & 1907' FWL Sec. 17, 25S, 33E Target formation: Bone Spring; Classification: Oil Offline Cmt Procedure: 7" Intermediate Casing 1. Land casing on solid body mandrel hanger 2. Engage pack-off and lock-ring 3. Install BPV 4. Skid rig 5. Check for pressure and remove BPV 6. Circulate down casing, taking returns through casing valves 7. Pump lead and tail cement 8. Displace cement and bump the plug 9. Ensure floats are holding pressure 10. RD cement crew 11. Install BPV and TA cap Please see attached previously approved detailed plan and diagram for review. Additional Attachments C102, BOP/Ck Manifold, Directional Plan, Drilling Plan, Multibowl WH, & OLC plan.

Application

Received by OCD: 3/3/2021 5:45:17 PM

Page 2 of 75

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Section 1 - General

APD ID: 10400013701	Tie to previous NOS?	Submission Date:
BLM Office: CARLSBAD	User:	Title:
Federal/Indian APD: FED	Is the first lease penetrated for production Federal or Indian? FED	
Lease number: NMNM026394	Lease Acres:	
Surface access agreement in place?	Allotted?	Reservation:
Agreement in place? NO	Federal or Indian agreement:	
Agreement number:		
Agreement name:		
Keep application confidential? Y		
Permitting Agent? NO	APD Operator: CIMAREX ENERGY COMPANY	
Operator letter of designation:		

Operator Info

Operator Organization Name: CIMAREX ENERGY COMPANY		
Operator Address: 600 N MARIENFELD STREET ST SUITE 600		
Operator PO Box:		Zip: 79701
Operator City: MIDLAND	State: TX	
Operator Phone: (432)571-7800		
Operator Internet Address: tstathem@cimarex.com		

Section 2 - Well Information

Well in Master Development Plan? NO	Master Development Plan name:	
Well in Master SUPO? NO	Master SUPO name:	
Well in Master Drilling Plan? NO	Master Drilling Plan name:	
Well Name: VACA DRAW 20-17 FEDERAL	Well Number: 10H	Well API Number: 3002544356
Field/Pool or Exploratory? Field and Pool	Field Name: purple sage; wolfcamp (gas)	Pool Name: WILDCAT WOLFCAMP
Is the proposed well in an area containing other mineral resources? USEABLE WATER,NATURAL GAS,OIL		
Is the proposed well in a Helium production area? N	Use Existing Well Pad? NO	New surface disturbance?
Type of Well Pad: MULTIPLE WELL	Multiple Well Pad Name: VACA Number: 2	
Well Class: HORIZONTAL	DRAW SUPER PAD Number of Legs: 1	
Well Work Type: Drill		
Well Type: CONVENTIONAL GAS WELL		
Describe Well Type:		

Received by OCD: 3/3/2021 5:45:17 PM

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Is the proposed well in an area containing other mineral resources? USEABLE WATER,NATURAL GAS,OIL

Well sub-Type: EXPLORATORY (WILDCAT)

Describe sub-type:

Distance to town: 24 Miles

Distance to nearest well: 20 FT

Distance to lease line: 330 FT

Reservoir well spacing assigned acres Measurement: 640 Acres

Well plat: Vaca_Draw_20_17_Fed_10H_C102_Plat_05-05-2017.pdf

Well work start Date: 12/01/2017

Duration: 30 DAYS

Section 3 - Well Location Table

Survey Type: RECTANGULAR

Describe Survey Type:

Datum: NAD83

Vertical Datum: NAVD88

Survey number:

Reference Datum: GROUND LEVEL

Wellbore	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twsp	Range	Section	Aliquot/Lot/Tract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	MD	TVD	Will this well produce from this lease?
SHL Leg #1	330	FSL	2010	FWL	25S	33E	20	Aliquot SESW	32.109742	-103.596358	LEA	NEW MEXICO	NEW MEXICO	F	NMNM026394	3417	0	0	Y
KOP Leg #1	158	FSL	1906	FWL	25S	33E	20	Aliquot SESW	32.109467	-103.596689	LEA	NEW MEXICO	NEW MEXICO	F	NMNM026394	-6516	9940	9933	Y
PPP Leg #1-1	233	FSL	1907	FWL	25S	33E	20	Aliquot SESW	32.10974	-103.59669	LEA	NEW MEXICO	NEW MEXICO	F	NMNM026394	-6807	10254	10224	Y
EXIT Leg #1	100	FNL	1907	FWL	25S	33E	17	Aliquot NENW	32.137581	-103.596679	LEA	NEW MEXICO	NEW MEXICO	F	NMNM026394	-6993	20441	10410	Y

Received by OCD: 3/3/2021 5:45:17 PM

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Wellbore	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twsp	Range	Section	Aliquot/Lot/Tract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	MD	TVD	Will this well produce from this lease?
BHL Leg #1	100	FNL	1907	FWL	25S	33E	17	Aliquot NENW	32.137581	-103.596679	LEA	NEW MEXICO	NEW MEXICO	F	NMNM026394	-6993	20441	10410	Y

Drilling Plan

Section 1 - Geologic Formations

Formation ID	Formation Name	Elevation	True Vertical Depth	Measured Depth	Lithologies	Mineral Resources	Producing Formation
1613443	RUSTLER	3418	984	984		USEABLE WATER	N
1613437	SALADO	2290	1128	1128		NONE	N
1613439	CASTILE	-1269	4687	4687		NONE	N
1613440	BELL CANYON	-1538	4956	4956		NONE	N
1613435	CHERRY CANYON	-2556	5974	5974		NATURAL GAS, OIL	N
1613441	BRUSHY CANYON	-4066	7484	7484		NATURAL GAS, OIL	N
1613442	BONE SPRING	-5622	9040	9040		NATURAL GAS, OIL	N
1613436	BONE SPRING 2ND	-7155	10573	10573		NATURAL GAS, OIL	N
1613438	BONE SPRING 3RD	-8308	11726	11726		NATURAL GAS, OIL	N
1613444	WOLFCAMP	-8778	12196	12196		NATURAL GAS, OIL	Y

Section 2 - Blowout Prevention

Pressure Rating (PSI): 10M

Rating Depth: 11855

Equipment: A BOP consisting of three rams, including one blind ram and two pipe rams and one annular preventer. An accumulator that meets the requirements in Onshore Order #2 for the pressure rating of the BOP stack. A rotating head may be installed as needed. A Kelly clock will be installed and maintained in operable condition and a drill string safety valve in the open position will be available on the rig floor.

Requesting Variance? YES

Variance request: Co-flex line between the BOP and choke manifold. Certification for proposed co-flex hose is attached. The hose is not required by the manufacturer to be anchored. In the event the specific hose is not available, one of equal or higher rating will be used. Variance to include Hammer Union connections on lines downstream of the buffer tank only.

Testing Procedure: A multi-bowl wellhead system will be utilized. After running the 10-3/4" surface casing, a 13 5/8"

Received by OCD: 3/3/2021 5:45:17 PM

Page 5 of 75

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BOP/BOPE system with a minimum working pressure of 10000 psi will be installed on the wellhead system and will be pressure tested to 250 psi low followed by a 10000 psi test. Annular will be tested to 50% of working pressure. The pressure test will be repeated at least every 30 days, as per Onshore Order No. 2. The multi-bowl wellhead will be installed by vendor's representative. A copy of the installation instructions has been sent to the BLM field office. The wellhead will be installed by a third-party welder while being monitored by the wellhead vendor representative. All BOP equipment will be tested utilizing a conventional test plug. Not a cup or J-packer type. A solid steel body pack-off will be utilized after running and cementing the intermediate casing. After installation the pack-off and lower flange will be pressure tested to 10000 psi. The surface casing string will be tested as per Onshore Order No. 2 to at least 0.22 psi/ft or 1500 psi, whichever is greater. The casing string utilizing steel body pack-off will be tested to 70% of casing burst. If well conditions dictate conventional slips will be set and BOPE will be tested to appropriate pressures based on permitted pressure requirements.

Choke Diagram Attachment:

BOP Diagram Attachment:

Pressure Rating (PSI): 5M Rating Depth: 1034

Equipment: Exhibit "E-1". A BOP consisting of three rams, including one blind ram and two pipe rams and one annular preventer. An accumulator that meets the requirements in Onshore Order #2 for the pressure rating of the BOP stack. A rotating head may be installed as needed. A Kelly clock will be installed and maintained in operable condition and a drill string safety valve in the open position will be available on the rig floor.

Requesting Variance? YES

Variance request: Co-flex line between the BOP and choke manifold. Certification for proposed co-flex hose is attached (Please see Exhibit F, F-1, F-2, F-3). The hose is not required by the manufacturer to be anchored. In the event the specific hose is not available, one of equal or higher rating will be used. Variance to include Hammer Union connections on lines downstream of the buffer tank only.

Testing Procedure: A multi-bowl wellhead system will be utilized. After running the 10-3/4" surface casing, a 13 5/8" BOP/BOPE system with a minimum working pressure of 10000 psi will be installed on the wellhead system and will be pressure tested to 250 psi low followed by a 10000 psi test. Annular will be tested to 50% of working pressure. The pressure test will be repeated at least every 30 days, as per Onshore Order No. 2. The multi-bowl wellhead will be installed by vendor's representative. A copy of the installation instructions has been sent to the BLM field office. The wellhead will be installed by a third-party welder while being monitored by the wellhead vendor representative. All BOP equipment will be tested utilizing a conventional test plug. Not a cup or J-packer type. A solid steel body pack-off will be utilized after running and cementing the intermediate casing. After installation the pack-off and lower flange will be pressure tested to 10000 psi. The surface casing string will be tested as per Onshore Order No. 2 to at least 0.22 psi/ft or 1500 psi, whichever is greater. The casing string utilizing steel body pack-off will be tested to 70% of casing burst. If well conditions dictate conventional slips will be set and BOPE will be tested to appropriate pressures based on permitted pressure requirements.

Choke Diagram Attachment:

BOP Diagram Attachment:

Received by OCD: 3/3/2021 5:45:17 PM

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Section 3 - Casing

Casing ID	String Type	Hole Size	Csg Size	Condition	Standard	Tapered String	Top Set MD	Bottom Set MD	Top Set TVD	Bottom Set TVD	Top Set MSL	Bottom Set MSL	Calculated casing length MD	Grade	Weight	Joint Type	Collapse SF	Burst SF	Joint SF Type	Joint SF	Body SF Type
1	SURFACE	14.75	10.75	NEW	API	N	0	1034	0	1034	0	1034	1034	J-55	40.5	BUTT	3.34	6.62	BUOY	15.02	BUOY
2	PRODUCTION	6.75	5.5	NEW	API	N	0	11855	0	11855	0	11855	11855	L-80	20	LT&C	1.15	1.19	BUOY	1.87	BUOY
3	INTERMEDIATE	9.875	7.625	NEW	API	N	0	12479	0	12479	0	12479	12479	L-80	29.7	BUTT	2.48	1.2	BUOY	1.82	BUOY
4	PRODUCTION	6.75	5.0	NEW	API	N	11855	22125	11855	22125	11855	22125	10270	P-110	18	BUTT	1.67	1.69	BUOY	62.45	BUOY

Casing Attachments

Casing ID: 1String Type: SURFACE

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Vaca_Draw_20_17_Fed_10H_Casing_Assumption_20171012111709.pdf

Casing ID: 2String Type: PRODUCTION

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Vaca_Draw_20_17_Fed_10H_Casing_Assumption_20171012111857.pdf

Received by OCD: 3/3/2021 5:45:17 PM

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FEDERAL

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SESW / 32.109742 / -103.596358

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Casing Attachments

Casing ID: 3String Type:INTERMEDIATE

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Vaca_Draw_20_17_Fed_10H_Casing_Assumption_20171012111816.pdf

Casing ID: 4String Type:PRODUCTION

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Vaca_Draw_20_17_Fed_10H_Casing_Assumption_20171012112002.pdf

Section 4 - Cement

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
SURFACE	Lead		0	1034	501	1.72	13.5	690	50	Class C	Bentonite
SURFACE	Tail		0	1034	107	1.34	14.8	143	25	Class C	LCM
PRODUCTION	Lead		0	1185 5	727	1.3	14.2	944	10	50:50 (Poz:H)	Salt, Bentonite, Fluid Loss, Dispersant, SMS
INTERMEDIATE	Lead		0	1247 9	584	6.18	9.2	3608	50	Class C	Extender, Salt, Strength Enhancement, LCM, Fluid Loss, Retarder
INTERMEDIATE	Tail		0	1247 9	207	1.3	14.2	268	25	50:50 (Poz:H)	Salt, Bentonite, Fluid Loss, Dispersant, SMS

Received by OCD: 3/3/2021 5:45:17 PM

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FEDERAL

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WELL

Unit or CA Name:

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String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
PRODUCTION	Lead		1185 5	2212 5	727	1.3	14.2	944	10	50:50 (Poz:H)	Salt, Bentonite, Fluid Loss, Dispersant, SMS

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: Sufficient mud materials will be kept on location at all times in order to combat lost circulation or unexpected kicks. In order to run DSTs, open hole logs, and casing, the viscosity and water loss may have to be adjusted in order to meet these needs.

Describe the mud monitoring system utilized: PVT/Pason/Visual Monitoring

Circulating Medium Table

Top Depth	Bottom Depth	Mud Type	Min Weight (lbs/gal)	Max Weight (lbs/gal)	Density (lbs/cu ft)	Gel Strength (lbs/100 sqft)	PH	Viscosity (CP)	Salinity (ppm)	Filtration (cc)	Additional Characteristics
1034	1247 9	OTHER : Brine Diesel Emulsion	8.5	9							
1247 9	2212 5	OIL-BASED MUD	12	12.5							
0	1034	SPUD MUD	8.3	8.8							

Received by OCD: 3/3/2021 5:45:17 PMPage 9 of 75

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Section 6 - Test, Logging, Coring

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

No DST Planned

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

CNL,DS,GR

Coring operation description for the well:

N/A

Section 7 - Pressure

Anticipated Bottom Hole Pressure: 8041

Anticipated Surface Pressure: 5750

Anticipated Bottom Hole Temperature(F): 191

Anticipated abnormal pressures, temperatures, or potential geologic hazards? YES

Describe:

Lost circulation may be encountered in the Delaware mountain group. Abnormal pressure as well as hole stability issues may be encountered in the Wolfcamp.

Contingency Plans geoharzards description:

Lost circulation material will be available, as well as additional drilling fluid along with the fluid volume in the drilling rig pit system. Drilling fluid can be mixed on location or mixed in vendor mud plant and trucked to location if needed. Sufficient barite will be available to maintain appropriate mud weight for the Wolfcamp interval.

Contingency Plans geohazards attachment:

Hydrogen Sulfide drilling operations plan required? YES

Hydrogen sulfide drilling operations plan:

Vaca_Draw_20_17_Fed_10H_H2S_Plan_05-05-2017.pdf

Section 8 - Other Information

Proposed horizontal/directional/multi-lateral plan submission:

Vaca_Draw_20_17_Fed_10H_Directional_Plan_05-05-2017.pdf

Other proposed operations facets description:

Other proposed operations facets attachment:

Vaca_Draw_20_17_Fed_10H_Flex_Hose_20171012112359.pdf

Vaca_Draw_20_17_Fed_10H_Drilling_Plan_20171012112355.pdf

Vaca_Draw_20_17_Fed_10H_AntiCollision_05-05-2017.pdf

Other Variance attachment:

SUPO

Received by OCD: 3/3/2021 5:45:17 PM

Page 10 of 75

Well Name: VACA DRAW 20-17 FEDERAL	Well Location: T25S / R33E / SEC 20 / SESW / 32.109742 / -103.596358	County or Parish/State: LEA / NM
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Section 1 - Existing Roads

Will existing roads be used? NO

Section 2 - New or Reconstructed Access Roads

Will new roads be needed? YES

New Road Map:

Vaca_Draw_20_17_Fed_10H_Access_Road_ROW_05-05-2017.pdf

New road type: COLLECTOR

Length: 785	Feet	Width (ft.): 30
Max slope (%): 2		Max grade (%): 6

Army Corp of Engineers (ACOE) permit required? NO

ACOE Permit Number(s):

New road travel width: 15

New road access erosion control: The side slopes of any drainage channels or swales that are crossed will be re-contoured to original grade and compacted and mulched as necessary to avoid erosion. Where steeper slopes cannot be avoided, water bars or silt fence will be constructed, mulch/rip-rap applied, or other measures employed as necessary to control erosion. Hay bales, straw waddles or silt fence may also be installed to control erosion as needed. All disturbed areas will be seeded with a mix appropriate for the area unless specified otherwise by the landowner.

New road access plan or profile prepared? NO

New road access plan attachment:

Access road engineering design? NO

Access road engineering design attachment:

Turnout? N

Access surfacing type: GRAVEL

Access topsoil source: ONSITE

Access surfacing type description:

Access onsite topsoil source depth: 6

Offsite topsoil source description:

Onsite topsoil removal process: Push off and stockpile alongside the location.

Access other construction information: The operator will prevent and abate fugitive dust as needed, whether created by vehicular traffic, equipment operations or other events.

Received by OCD: 3/3/2021 5:45:17 PM

Page 11 of 75

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Access miscellaneous information:

Number of access turnouts: Access turnout map:

Drainage Control

New road drainage crossing: CULVERT,LOW WATER,OTHER

Drainage Control comments: To control and prevent potentially contaminated precipitation from leaving the pad site, a perimeter berm and settlement pond will be installed. Contaminated water will be removed from pond, stored in waste tanks, and disposed of at a state approved facility. Standing water or puddles will not be allowed. Drainage ditches would be established and maintained on the pad and along access roads to divert water away from operations. Natural drainage areas disturbed during construction would be re-contoured to near original condition prior to construction. Erosion Control Best Management Practices would be used where necessary and consist of seeding, fiber rolls, water bars, silt fences, and temporary diversion dikes. Areas disturbed during construction that are no longer needed for operations would be obliterated, re-contoured to near original condition prior to construction. Erosion Control Best Management Practices would be used where necessary and consist of seeding, fiber rolls, water bars, silt fences, and temporary diversion dikes. Areas disturbed during construction that are no longer needed for operations would be obliterated, re-contoured, and reclaimed to near original condition to re-establish natural drainage.

Road Drainage Control Structures (DCS) description: N/A

Road Drainage Control Structures (DCS) attachment:

Access Additional Attachments

Section 3 - Location of Existing Wells

Existing Wells Map? YES

Attach Well map:

Vaca_Draw_20_17_Fed_10H_Mile_radius_and_Existing_wells_05-05-2017.pdf

Section 4 - Location of Existing and/or Proposed Production Facilities

Submit or defer a Proposed Production Facilities plan? SUBMIT

Production Facilities description:

Production Facilities map:

Vaca_Draw_20_17_Fed_Battery_Layout_05-05-2017.pdf

Section 5 - Location and Types of Water Supply

Water Source Table

Water source type: MUNICIPAL

Water source use type:	SURFACE CASING
	INTERMEDIATE/PRODUCTION CASING

Source latitude: Source longitude:

Source datum:

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	SURFACE CASING
	INTERMEDIATE/PRODUCTION CASING
Water source permit type:	WATER RIGHT
Permit Number:	
Water source transport method:	TRUCKING PIPELINE
Source land ownership: STATE	
Source transportation land ownership: STATE	
Water source volume (barrels): 5000	Source volume (acre-feet): 0.6444655
Source volume (gal): 210000	

Water source and transportation map:

Vaca_Draw_20_17_Fed_10H_Drlg_water_route_20170908121704.pdf

Water source comments:

New water well? NO

New Water Well Info

Well latitude:	Well Longitude:	Well datum:
Well target aquifer:		
Est. depth to top of aquifer(ft):	Est thickness of aquifer:	
Aquifer comments:		
Aquifer documentation:		
Well depth (ft):	Well casing type:	
Well casing outside diameter (in.):	Well casing inside diameter (in.):	
New water well casing?	Used casing source:	
Drilling method:	Drill material:	
Grout material:	Grout depth:	
Casing length (ft.):	Casing top depth (ft.):	
Well Production type:	Completion Method:	
Water well additional information:		
State appropriation permit:		
Additional information attachment:		

Received by OCD: 3/3/2021 5:45:17 PM

Page 13 of 75

Well Name: VACA DRAW 20-17 FEDERAL	Well Location: T25S / R33E / SEC 20 / SESW / 32.109742 / -103.596358	County or Parish/State: LEA / NM
Well Number: 10H	Type of Well: CONVENTIONAL GAS WELL	Allottee or Tribe Name:
Lease Number: NMNM026394, NMNM26394	Unit or CA Name:	Unit or CA Number:
US Well Number: 3002544356	Well Status: Approved Application for Permit to Drill	Operator: CIMAREX ENERGY COMPANY

Section 6 - Construction Materials

Using any construction materials: YES

Construction Materials description: The drilling and testing operations will be conducted on a watered and compacted native soil grade. Soft spots will be covered with scoria, free of large rocks (3" diameter). Upon completion as a commercial producer the location will be covered with scoria, free of large rocks (3" dia.) from an existing privately owned gravel pit. Caliche will be sued form a pit located in Sec 3-26S-33E, per the Surface Use Agreement we are required to use this pit.

Construction Materials source location attachment:

Section 7 - Methods for Handling Waste

Waste type: GARBAGE

Waste content description: Garbage and trash produced during drilling and completion operations

Amount of waste: 32500 pounds

Waste disposal frequency : Weekly

Safe containment description: n/a

Safe containmant attachment:

Waste disposal type: HAUL TO COMMERCIAL FACILITY **Disposal location ownership:** COMMERCIAL

Disposal type description:

Disposal location description: Windmill Spraying Service hauls trash to Lea County Landfill

Waste type: DRILLING

Waste content description: Drilling Fluids, drill cuttings, water and other waste produced from the well during drilling operations.

Amount of waste: 15000 barrels

Waste disposal frequency : Weekly

Safe containment description: n/a

Safe containmant attachment:

Waste disposal type: HAUL TO COMMERCIAL FACILITY **Disposal location ownership:** COMMERCIAL

Disposal type description:

Disposal location description: Haul to R360 commercial Disposal

Reserve Pit

Reserve Pit being used? NO

Temporary disposal of produced water into reserve pit?

Reserve pit length (ft.) Reserve pit width (ft.)

Reserve pit depth (ft.) Reserve pit volume (cu. yd.)

Is at least 50% of the reserve pit in cut?

Reserve pit liner

Reserve pit liner specifications and installation description

Received by OCD: 3/3/2021 5:45:17 PM

Page 14 of 75

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Cuttings Area

Cuttings Area being used? NO

Are you storing cuttings on location? NO

Description of cuttings location

Cuttings area length (ft.)	Cuttings area width (ft.)
Cuttings area depth (ft.)	Cuttings area volume (cu. yd.)

Is at least 50% of the cuttings area in cut?

WCuttings area liner

Cuttings area liner specifications and installation description

Section 8 - Ancillary Facilities

Are you requesting any Ancillary Facilities?: NO

Ancillary Facilities attachment:

Comments:

Section 9 - Well Site Layout

Well Site Layout Diagram:

Vaca_Draw_20_17_Fed_10H_Wellsite_Layout_05-05-2017.pdf

Comments:

Section 10 - Plans for Surface Reclamation

Type of disturbance: New Surface Disturbance	Multiple Well Pad Name: VACA DRAW SUPER PAD
	Multiple Well Pad Number: 2

Recontouring attachment:

Vaca_Draw_20_17_Fed_10H_Interim_Reclaim_05-05-2017.pdf

Drainage/Erosion control construction: To control and prevent potentially contaminated precipitation from leaving the pad site, a perimeter berm and settlement pond will be installed. Contaminated water will be removed from pond, stored in waste tanks, and disposed of at a state approved facility. Standing water or puddles will not be allowed. Drainage ditches would be established and maintained on the pad and along access roads to divert water away from operations. Natural drainage areas disturbed during construction would be re-contoured to near original condition prior to construction. Erosion Control Best Management Practices would be used where necessary and consist of seeding, fiber rolls, water bars, silt fences, and temporary diversion dikes. Areas disturbed during construction that are no longer needed for operations would be obliterated, re-contoured to near original condition prior to construction. Erosion Control Best Management Practices would be used where necessary and consist of seeding, fiber rolls, water bars, silt fences, and temporary diversion dikes. Areas disturbed during construction that are no longer needed for operations would be obliterated, re-contoured, and reclaimed to near original condition to re-establish natural drainage.

Received by OCD: 3/3/2021 5:45:17 PM

Page 15 of 75

Well Name: VACA DRAW 20-17 FEDERAL	Well Location: T25S / R33E / SEC 20 / SESW / 32.109742 / -103.596358	County or Parish/State: LEA / NM
Well Number: 10H	Type of Well: CONVENTIONAL GAS WELL	Allottee or Tribe Name:
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Drainage/Erosion control reclamation: All disturbed and re-contoured areas would be reseeded according to specifications. Approved seed mixtures would be certified weed free and consist of grasses, forbs, or shrubs similar to the surrounding area. Compacted soil areas may need to be obliterated and reclaimed to near natural conditions by re-contouring all slopes to facilitate and re-establish natural drainage.

Well pad proposed disturbance (acres):	Well pad interim reclamation (acres): 6.903	Well pad long term disturbance (acres): 6.903
Road proposed disturbance (acres):	Road interim reclamation (acres): 0.758	Road long term disturbance (acres): 0.758
Powerline proposed disturbance (acres):	Powerline interim reclamation (acres):	Powerline long term disturbance (acres):
Pipeline proposed disturbance (acres):	Pipeline interim reclamation (acres): 0.4275482	Pipeline long term disturbance (acres): 39.751377
Other proposed disturbance (acres):	Other interim reclamation (acres): 0	Other long term disturbance (acres):
Total proposed disturbance:	Total interim reclamation: 8.088549	4.367
		Total long term disturbance: 51.779377

Disturbance Comments: Gas Lift: 1,588', Flowline: 1,533', SWD: 40,426', Gas Pipeline: 14,172' Temp Fresh water Route: 3,104'

Reconstruction method: After well plugging, all disturbed areas would be returned to the original contour or a contour that blends with the surrounding landform including roads unless the surface owner requests that they be left intact. In consultation with the surface owners it will be determined if any gravel or similar materials used to reinforce an area are to be removed, buried, or left in place during final reclamation. Salvaged topsoil, if any, would be re-spread evenly over the surfaces to be re-vegetated. As necessary, the soil surface would be prepared to provide a seedbed for re-establishment of desirable vegetation. Site preparation may include gouging, scarifying, dozer track-walking, mulching, or fertilizing. Reclamation, Re-vegetation, and Drainage: All disturbed and re-contoured areas would be reseeded using techniques outlined under Phase I and II of this plan or as specified by the land owner. Approved seed mixtures would be certified weed free and consist of grasses, forbs, or shrubs similar to the surrounding area. Compacted soil areas may need to be obliterated and reclaimed to near natural conditions by re-contouring all slopes to facilitate and re-establish natural drainage. **Topsoil redistribution:** Salvaged topsoil, if any, would be re-spread evenly over the surfaces to be re-vegetated.

Soil treatment: As necessary, the soil surface would be prepared to provide a seedbed for re-establishment of desirable vegetation. Site preparation may include gouging, scarifying, dozer track-walking, mulching or fertilizing. **Existing Vegetation at the well pad:**

Existing Vegetation at the well pad attachment:

Existing Vegetation Community at the road:

Existing Vegetation Community at the road attachment:

Existing Vegetation Community at the pipeline:

Existing Vegetation Community at the pipeline attachment:

Existing Vegetation Community at other disturbances:

Existing Vegetation Community at other disturbances attachment:

Non native seed used? NO

Non native seed description:

Seedling transplant description:

Will seedlings be transplanted for this project? NO

Received by OCD: 3/3/2021 5:45:17 PM

Page 16 of 75

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US Well Number: 3002544356	Well Status: Approved Application for Permit to Drill	Operator: CIMAREX ENERGY COMPANY

Seedling transplant description attachment:

Will seed be harvested for use in site reclamation? NO

Seed harvest description:

Seed harvest description attachment:

Seed Management

Seed Table

Seed Summary	
Seed Type	Pounds/Acre

Total pounds/Acre:

Seed reclamation attachment:

Operator Contact/Responsible Official Contact Info

First Name:	Last Name:
Phone:	Email:

Seedbed prep:

Seed BMP:

Seed method:

Existing invasive species? NO

Existing invasive species treatment description:

Existing invasive species treatment attachment:

Weed treatment plan description: N/A

Weed treatment plan attachment:

Monitoring plan description: N/A

Monitoring plan attachment:

Success standards: N/A

Pit closure description: N/A

Pit closure attachment:

Section 11 - Surface Ownership

Received by OCD: 3/3/2021 5:45:17 PM

Page 17 of 75

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US Well Number: 3002544356	Well Status: Approved Application for Permit to Drill	Operator: CIMAREX ENERGY COMPANY

Disturbance type: WELL PAD

Describe:

Surface Owner:

Other surface owner description:

BIA Local Office:

BOR Local Office:

COE Local Office:

DOD Local Office:

NPS Local Office:

State Local Office:

Military Local Office:

USFWS Local Office:

Other Local Office:

USFS Region:

USFS Forest/Grassland:

USFS Ranger District:

Section 12 - Other Information

Right of Way needed? YES

Use APD as ROW? YES

ROW Type(s): 281001 ROW - ROADS,285003 ROW – POWER TRANS,288100 ROW – O&G Pipeline,288101 ROW – O&G Facility Sites,288103 ROW – Salt Water Disposal Pipeline/Facility,288104 ROW – Salt Water Disposal Apln/Fac-FLPMA,289001 ROW- O&G Well Pad,FLPMA (Powerline),Other

ROW Applications

SUPO Additional Information:

Use a previously conducted onsite? YES

Previous Onsite information: Onsite with BLM (Jeff Robertson) and Cimarex (Barry Hunt) on December 8, 2016. 500' X 560' pad (From #2H 190' north, 180' west, 370' south, 320' east). Top soil East. Interim reclamation: All sides. Access road from NW corner of pad, west, to the NE corner of the west pad. Vaca Draw 20-17 Federal off-site battery-Center: 1055 FSL & 1052 FWL, Section 20, T. 25 S., R. 33 E. (450' north/south X 400' east/west pad). Top soil west. Access road from SE corner, south to tie-in at proposed east/west road of Vaca Draw 20-17 Federal East half pad to west half pad.

Other SUPO Attachment

Vaca_Draw_20_17_Fed_Battery_Road_ROW_05-05-2017.pdf

Received by OCD: 3/3/2021 5:45:17 PM

Page 18 of 75

Well Name: VACA DRAW 20-17 FEDERAL	Well Location: T25S / R33E / SEC 20 / SESW / 32.109742 / -103.596358	County or Parish/State: LEA / NM
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US Well Number: 3002544356	Well Status: Approved Application for Permit to Drill	Operator: CIMAREX ENERGY COMPANY

Vaca_Draw_20_17_Fed_Battery_Gas_Sales_ROW_05-05-2017.pdf
Vaca_Draw_20_17_Fed_10H_Public_Access_05-05-2017.pdf
Vaca_Draw_20_17_Fed_Battery_SWD_ROW_05-05-2017.pdf
Vaca_Draw_20_17_Fed_10H_Gas_lift_Flow_line_ROW_05-05-2017.pdf
Vaca_Draw_20_17_Fed_10H_Temp_water_route_05-05-2017.pdf
Vaca_Draw_20_17_Fed_10H_Road_Description_05-05-2017.pdf
Vaca_Draw_20_17_Fed_Battery_Powerline_ROW_05-05-2017.pdf
Vaca_Draw_20_17_Fed_10H_SUPO_05-05-2017.pdf

PWD

Section 1 - General

Would you like to address long-term produced water disposal? NO

Section 2 - Lined Pits

Would you like to utilize Lined Pit PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner: PWD disturbance (acres):

Lined pit PWD on or off channel:

Lined pit PWD discharge volume (bbl/day):

Lined pit specifications:

Pit liner description:

Pit liner manufacturers information:

Precipitated solids disposal:

Decribe precipitated solids disposal:

Precipitated solids disposal permit:

Lined pit precipitated solids disposal schedule:

Lined pit precipitated solids disposal schedule attachment:

Lined pit reclamation description:

Lined pit reclamation attachment:

Received by OCD: 3/3/2021 5:45:17 PM

Page 19 of 75

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Leak detection system description:

Leak detection system attachment:

Lined pit Monitor description:

Lined pit Monitor attachment:

Lined pit: do you have a reclamation bond for the pit?

Is the reclamation bond a rider under the BLM bond?

Lined pit bond number:

Lined pit bond amount:

Additional bond information attachment:

Section 3 - Unlined Pits

Would you like to utilize Unlined Pit PWD options? NO

Produced Water Disposal (PWD) Location:

PWD disturbance (acres): PWD surface owner:

Unlined pit PWD on or off channel:

Unlined pit PWD discharge volume (bbl/day):

Unlined pit specifications:

Precipitated solids disposal:

Decribe precipitated solids disposal:

Precipitated solids disposal permit:

Unlined pit precipitated solids disposal schedule:

Unlined pit precipitated solids disposal schedule attachment:

Unlined pit reclamation description:

Unlined pit reclamation attachment:

Unlined pit Monitor description:

Unlined pit Monitor attachment:

Do you propose to put the produced water to beneficial use?

Beneficial use user confirmation:

Estimated depth of the shallowest aquifer (feet):

Does the produced water have an annual average Total Dissolved Solids (TDS) concentration equal to or less than that of the existing water to be protected?

TDS lab results:

Geologic and hydrologic evidence:

State authorization:

Unlined Produced Water Pit Estimated percolation:

Received by OCD: 3/3/2021 5:45:17 PM

Page 20 of 75

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US Well Number: 3002544356	Well Status: Approved Application for Permit to Drill	Operator: CIMAREX ENERGY COMPANY

Unlined pit: do you have a reclamation bond for the pit?

Is the reclamation bond a rider under the BLM bond?

Unlined pit bond number:

Unlined pit bond amount:

Additional bond information attachment:

Section 4 - Injection

Would you like to utilize Injection PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner: PWD disturbance (acres):

Injection PWD discharge volume (bbl/day):

Injection well mineral owner:

Injection well type:

Injection well number: Injection well name:

Assigned injection well API number? Injection well API number:

Injection well new surface disturbance (acres):

Minerals protection information:

Mineral protection attachment:

Underground Injection Control (UIC) Permit?

UIC Permit attachment:

Section 5 - Surface Discharge

Would you like to utilize Surface Discharge PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner: PWD disturbance (acres):

Surface discharge PWD discharge volume (bbl/day):

Surface Discharge NPDES Permit?

Surface Discharge NPDES Permit attachment:

Surface Discharge site facilities information:

Surface discharge site facilities map:

Section 6 - Other

Would you like to utilize Other PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner: PWD disturbance (acres):

Other PWD discharge volume (bbl/day):

Other PWD type description:

Received by OCD: 3/3/2021 5:45:17 PM

Page 21 of 75

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Lease Number: NMNM026394, NMNM26394	Unit or CA Name:	Unit or CA Number:
US Well Number: 3002544356	Well Status: Approved Application for Permit to Drill	Operator: CIMAREX ENERGY COMPANY

Other PWD type attachment:

Have other regulatory requirements been met?

Other regulatory requirements attachment:

Operator Certification

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:	Signed on: 02/21/2021		
Title:			
Street Address:			
City:	State:	Zip:	
Phone:			
Email address:			

Field Representative

Representative Name:			
Street Address:			
City:	State:	Zip:	
Phone:			
Email address:			

Received by OCD: 3/3/2021 5:45:17 PM

Page 22 of 75

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US Well Number: 3002544356	Well Status: Approved Application for Permit to Drill	Operator: CIMAREX ENERGY COMPANY

NOI Attachments

Procedure Description

- Vaca_Draw_20_17_Fed_10H_Dir_Plan___AC_20210221152641.pdf
- Vaca_Draw_20_17_Fed_10H_BOP_Manifold___WH_20210221152600.pdf
- OLC_7_in_Csg_Vaca_Draw_20210221152522.pdf
- Drill_Plan_Vaca_Draw_20_17_Fed_10H_20210221152441.pdf
- C102_Vaca_Draw_20_17_Fed_10H_20210221152414.pdf

Operator Certification

I certify that the foregoing is true and correct. 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. Electronic submission of Sundry Notices through this system satisfies regulations requiring a submission of Form 3160-5 or a Sundry Notice.

Operator Electronic Signature: STATHEM	Signed on: FEB 21, 2021 03:28 PM
Name: CIMAREX ENERGY COMPANY	
Title: Mngr Regulatory Compliance	
Street Address: 600 N MARIENFELD STREET ST SUITE 600	
City: MIDLAND	State: TX
Phone: (432) 571-7800	
Email address: tstathem@cimarex.com	

Field Representative

Representative Name:		
Street Address:		
City:	State:	Zip:
Phone:		
Email address:		

BLM Point of Contact

BLM POC Name: CHRISTOPHER WALLS	BLM POC Title: Petroleum Engineer
BLM POC Phone: 5752342234	BLM POC Email Address: cwalls@blm.gov
Disposition: Approved	Disposition Date: 03/01/2021
Signature: Chris Walls	

District I
1625 N. French Dr., Hobbs, NM 88240
Phone: (575) 393-6161 Fax: (575) 393-0720
District II
811 S. First St., Artesia, NM 88210
Phone: (575) 748-1283 Fax: (575) 748-9720
District III
1000 Rio Brazos Road, Aztec, NM 87410
Phone: (505) 334-6178 Fax: (505) 334-6170
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

State of New Mexico
Energy, Minerals & Natural Resources Department
OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-102
Revised August 1, 2011
Submit one copy to appropriate
District Office

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

¹ API Number 30-025-44356	² Pool Code 97903	³ Pool Name WC-025 G-08 S253235G; LOWER BONE SPRING
⁴ Property Code 319775	⁵ Property Name VACA DRAW 20-17 FEDERAL	⁶ Well Number 10H
⁷ OGRID No. 215099	⁸ Operator Name CIMAREX ENERGY CO.	⁹ Elevation 3417.1'

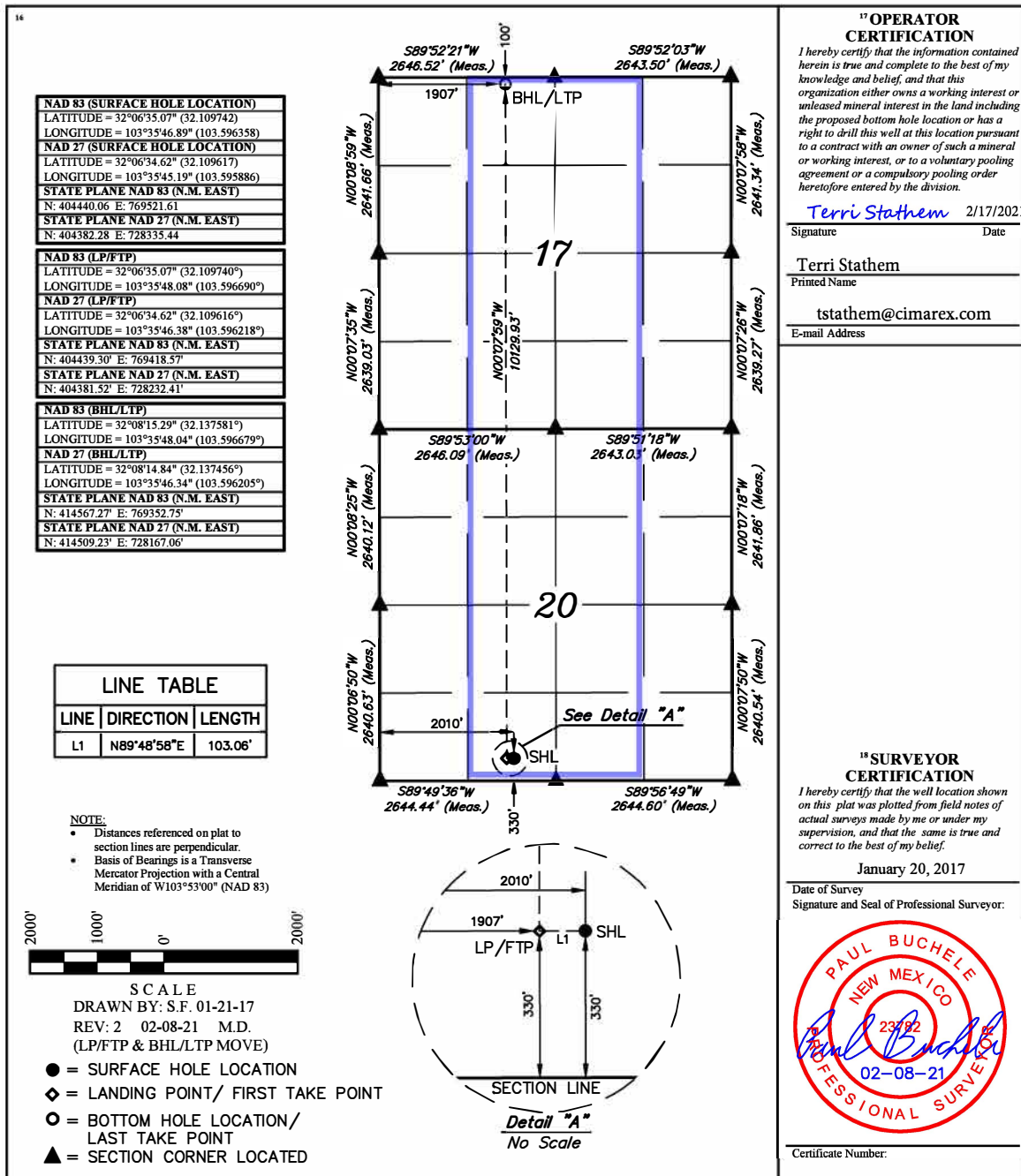
¹⁰ Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
N	20	25S	33E		330	SOUTH	2010	WEST	LEA

¹¹ Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
C	17	25S	33E		100	NORTH	1907	WEST	LEA
¹² Dedicated Acres 640	¹³ Joint or Infill	¹⁴ Consolidation Code	¹⁵ Order No.						

No allowable will be assigned to this completion until all interests have been consolidated or a non-standard unit has been approved by the division.



1. Geological Formations

TVD of target 10,410

Pilot Hole TD N/A

MD at TD 20,441

Deepest expected fresh water

Formation	Depth (TVD) from KB	Water/Mineral Bearing/Target Zone	Hazards
Rustler	984	N/A	
Salado	1128	N/A	
Castille	4687	N/A	
Bell Canyon	4956	N/A	
Cherry Canyon	5974	Hydrocarbons	
Brushy Canyon	7484	Hydrocarbons	
Bone Spring	9040	Hydrocarbons	
2nd Bone Spring Sand	10573	Hydrocarbons	
3rd Bone Spring Sand	11726	Hydrocarbons	
Wolfcamp	12196	Hydrocarbons	
Wolfcamp A1 Shale	12361	Hydrocarbons	

2. Casing Program

Hole Size	Casing Depth From	Casing Depth To	Setting Depth TVD	Casing Size	Weight (lb/ft)	Grade	Conn.	SF Collapse	SF Burst	SF Tension
17 1/2	0	1050	1050	13-3/8"	48.00	H-40/J-55 Hybrid	ST&C	1.63	3.80	6.39
12 1/4	0	4920	4920	9-5/8"	40.00	HCK-55	LT&C	1.45	1.50	2.85
8 3/4	0	9040	9040	7"	26.00	L-80	LT&C	1.28	1.71	1.70
8 3/4	9040	10575	10382	7"	29.00	L-80	BT&C	1.44	1.68	17.37
6	8940	20441	10410	4-1/2"	11.60	P-110	BT&C	1.56	2.20	21.52
BLM Minimum Safety Factor								1.125	1	1.6 Dry 1.8 Wet

TVD was used on all calculations.

All casing strings will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.h

Cimarex Energy Co., Vaca Draw 20-17 Federal 10H

	Y or N
Is casing new? If used, attach certification as required in Onshore Order #1	Y
Does casing meet API specifications? If no, attach casing specification sheet.	Y
Is premium or uncommon casing planned? If yes attach casing specification sheet.	N
Does the above casing design meet or exceed BLM's minimum standards? If not provide justification (loading assumptions, casing design criteria).	Y
Will the intermediate pipe be kept at a minimum 1/3 fluid filled to avoid approaching the collapse pressure rating of the casing?	Y
Is well located within Capitan Reef?	N
If yes, does production casing cement tie back a minimum of 50' above the Reef?	N
Is well within the designated 4 string boundary.	N
Is well located in SOPA but not in R-111-P?	N
If yes, are the first 2 strings cemented to surface and 3rd string cement tied back 500' into previous casing?	N
Is well located in R-111-P and SOPA?	N
If yes, are the first three strings cemented to surface?	N
Is 2nd string set 100' to 600' below the base of salt?	N
Is well located in high Cave/Karst?	N
If yes, are there two strings cemented to surface?	N
(For 2 string wells) If yes, is there a contingency casing if lost circulation occurs?	N
Is well located in critical Cave/Karst?	N
If yes, are there three strings cemented to surface?	N
Is AC Report included?	N

3. Cementing Program

Casing	# Sk	Wt. lb/gal	Yld ft ³ /sack	H ₂ O gal/sk	500# Comp. Strength (hours)	Slurry Description
Surface	509	13.50	1.72	9.15	15.5	Lead: Class C + Bentonite
	136	14.80	1.34	6.32	9.5	Tail: Class C + LCM
Intermediate	932	12.90	1.88	9.65	12	Lead: 35:65 (Poz:C) + Salt + Bentonite
	284	14.80	1.36	6.57	9.5	Tail: Class C + Retarder
Production	320	10.30	3.64	22.18		Lead: Tuned Light + LCM
	106	14.80	1.36	6.57	9.5	Tail: Class C + Retarder
Completion System	732	14.20	1.30	5.86	14:30	Tail: 50:50 (Poz:H) + Salt + Bentonite + Fluid Loss + Dispersant + SMS

Casing String	TOC	% Excess
Surface	0	45
Intermediate	0	50
Production	4720	25
Completion System	10375	10

Cimarex request the ability to perform casing integrity tests after plug bump of cement job.

4. Pressure Control Equipment

A variance is requested for the use of a diverter on the surface casing. See attached for schematic.					
BOP installed and tested before drilling which hole?	Size	Min Required WP	Type		Tested To
12 1/4	13 5/8	2M	Annular	X	100% of working pressure
			Blind Ram		2M
			Pipe Ram		
			Double Ram	X	
			Other		
8 3/4	13 5/8	3M	Annular	X	100% of working pressure
			Blind Ram		3M
			Pipe Ram		
			Double Ram	X	
			Other		
6	13 5/8	5M	Annular	X	100% of working pressure
			Blind Ram		5M
			Pipe Ram	X	
			Double Ram	X	
			Other		

BOP/BOPE will be tested by an independent service company to 250 psi low and the high pressure indicated above per Onshore Order 2 requirements. The System may be upgraded to a higher pressure but still tested to the working pressure listed in the table above. If the system is upgraded all the components installed will be functional and tested.

Pipe rams will be operationally checked each 24 hour period. Blind rams will be operationally checked on each trip out of the hole. These checks will be noted on the daily tour sheets. Other accessories to the BOP equipment will include a Kelly cock and floor safety valve (inside BOP) and choke lines and choke manifold. See attached schematics.

X	Formation integrity test will be performed per Onshore Order #2. On Exploratory wells or on that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.i.				
X	A variance is requested for the use of a flexible choke line from the BOP to Choke Manifold. See attached for specs and hydrostatic test chart.				
	Y	Are anchors required by manufacturer?			

5. Mud Program

Depth	Type	Weight (ppg)	Viscosity	Water Loss
0' to 1050'	Fresh Water	7.83 - 8.33	28	N/C
1050' to 4920'	Brine Water	9.80 - 10.30	30-32	N/C
4920' to 10575'	Cut Brine or OBM	8.50 - 9.00	27-70	N/C
10689' to 20441'	OBM	8.50 - 9.00	50-70	N/C

Sufficient mud materials to maintain mud properties and meet minimum lost circulation and weight increase requirements will be kept on location at all times.

What will be used to monitor the loss or gain of fluid?	PVT/Pason/Visual Monitoring
---	-----------------------------

6. Logging and Testing Procedures

Logging, Coring and Testing	
	Will run GR/CNL from TD to surface (horizontal well – vertical portion of hole). Stated logs run will be in the Completion Report and submitted to the BLM.
	No logs are planned based on well control or offset log information.
	Drill stem test?
	Coring?

Additional Logs Planned	Interval
-------------------------	----------

7. Drilling Conditions

Condition	
BH Pressure at deepest TVD	4871 psi
Abnormal Temperature	No

Hydrogen Sulfide (H₂S) monitors will be installed prior to drilling out the surface shoe. If H₂S is detected in concentrations greater than 100 ppm, the operator will comply with the provisions of Onshore Oil and Gas Order #6. If Hydrogen Sulfide is encountered, measured values and formations will be provided to the BLM.

X	H ₂ S is present
X	H ₂ S plan is attached

8. Other Facets of Operation**9. Wellhead**

A multi-bowl wellhead system will be utilized.

After running the 13-3/8" surface casing, a 13 5/8" BOP/BOPE system with a minimum working pressure of 5000 psi will be installed on the wellhead system and will be pressure tested to 250 psi low followed by a 5000 psi test. Annular will be tested to 100% of working pressure. The pressure test will be repeated at least every 30 days, as per Onshore Order No. 2.

The multi-bowl wellhead will be installed by vendor's representative. A copy of the installation instructions has been sent to the BLM field office.

The wellhead will be installed by a third-party welder while being monitored by the wellhead vendor representative.

All BOP equipment will be tested utilizing a conventional test plug. Not a cup or J-packer type.

A solid steel body pack-off will be utilized after running and cementing the intermediate casing. After installation the pack-off and lower flange will be pressure tested to 5000 psi.

A solid steel body pack-off will be utilized after running and cementing the production casing. After installation the pack-off and lower flange will be pressure tested to 5000 psi.

All casing strings will be tested as per Onshore Order No.2 to at least 0.22 psi/ft or 1,500 whichever is greater and not to exceed 70% of casing burst.

If well conditions dictate conventional slips will be set and BOPE will be tested to appropriate pressures based on permitted pressure requirements.

Drilling 12-1/4" hole
below 13 3/8" Casing

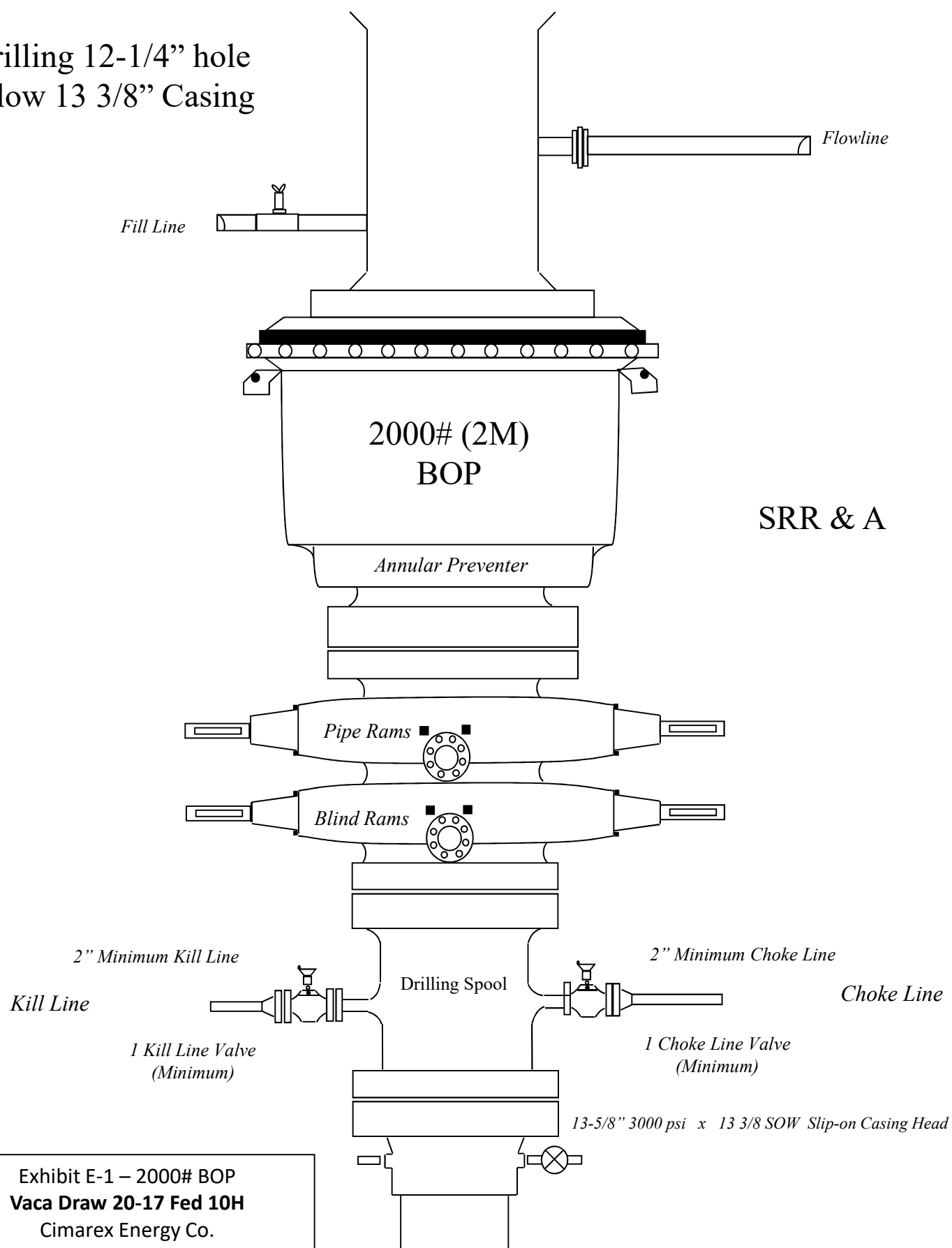


Exhibit E-1 – 2000# BOP
Vaca Draw 20-17 Fed 10H
Cimarex Energy Co.
20-25S-33E
Lea County, NM

Drilling 8-3/4" hole
below 9 5/8" Casing

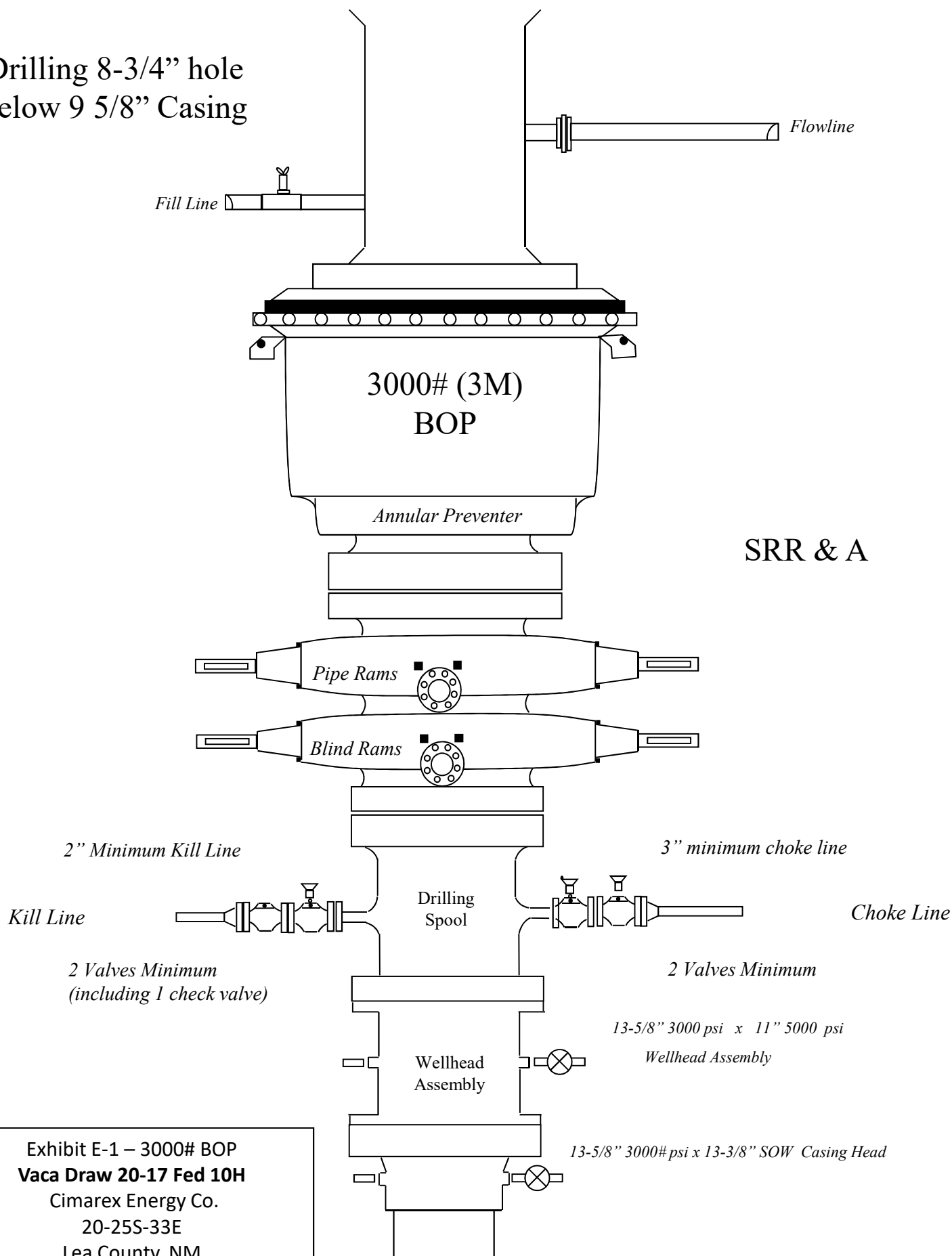


Exhibit E-1 – 3000# BOP
Vaca Draw 20-17 Fed 10H
Cimarex Energy Co.
20-25S-33E
Lea County, NM

Drilling 6" hole below
7" Casing

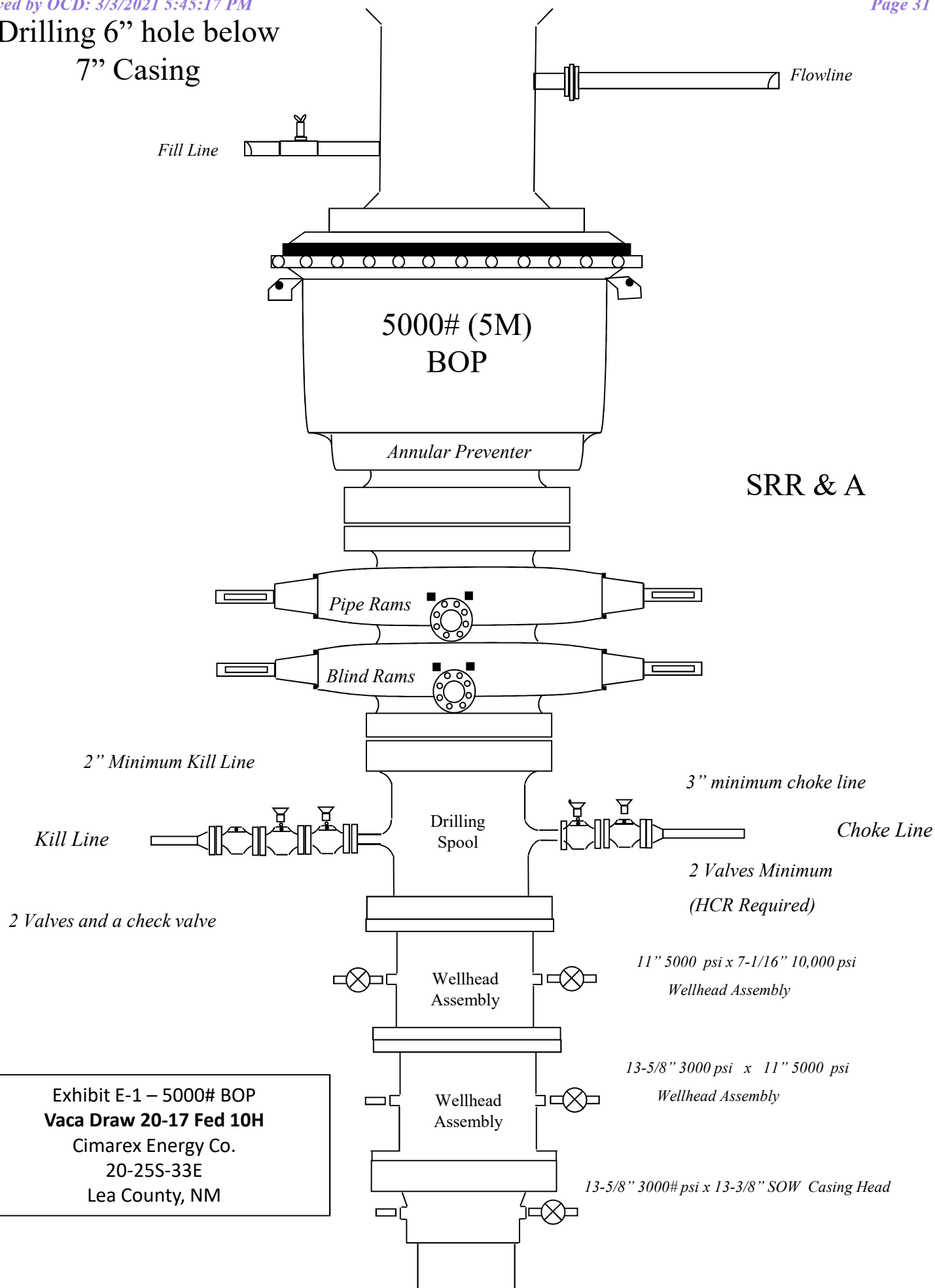


Exhibit E-1 – 5000# BOP
Vaca Draw 20-17 Fed 10H
Cimarex Energy Co.
20-25S-33E
Lea County, NM

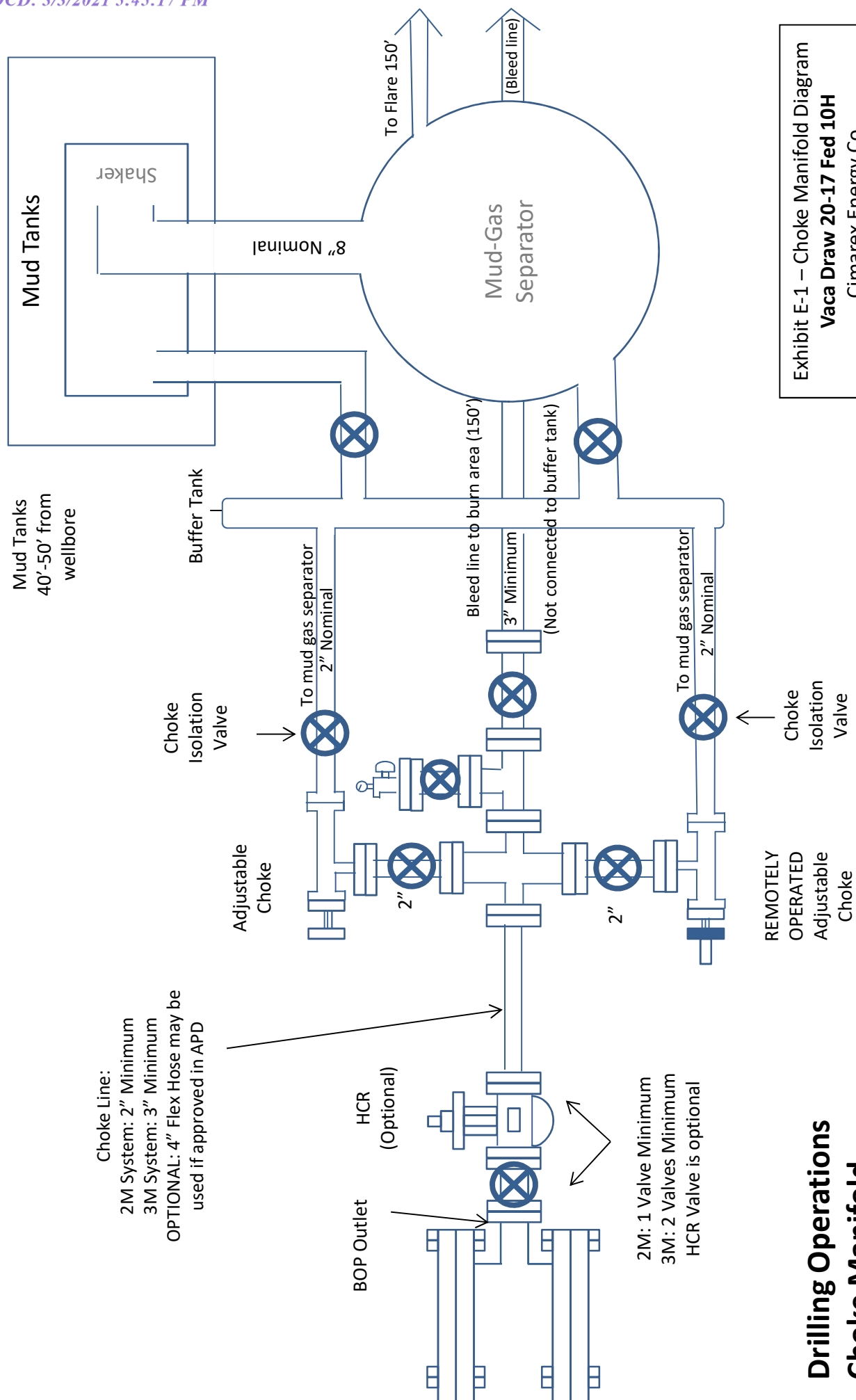
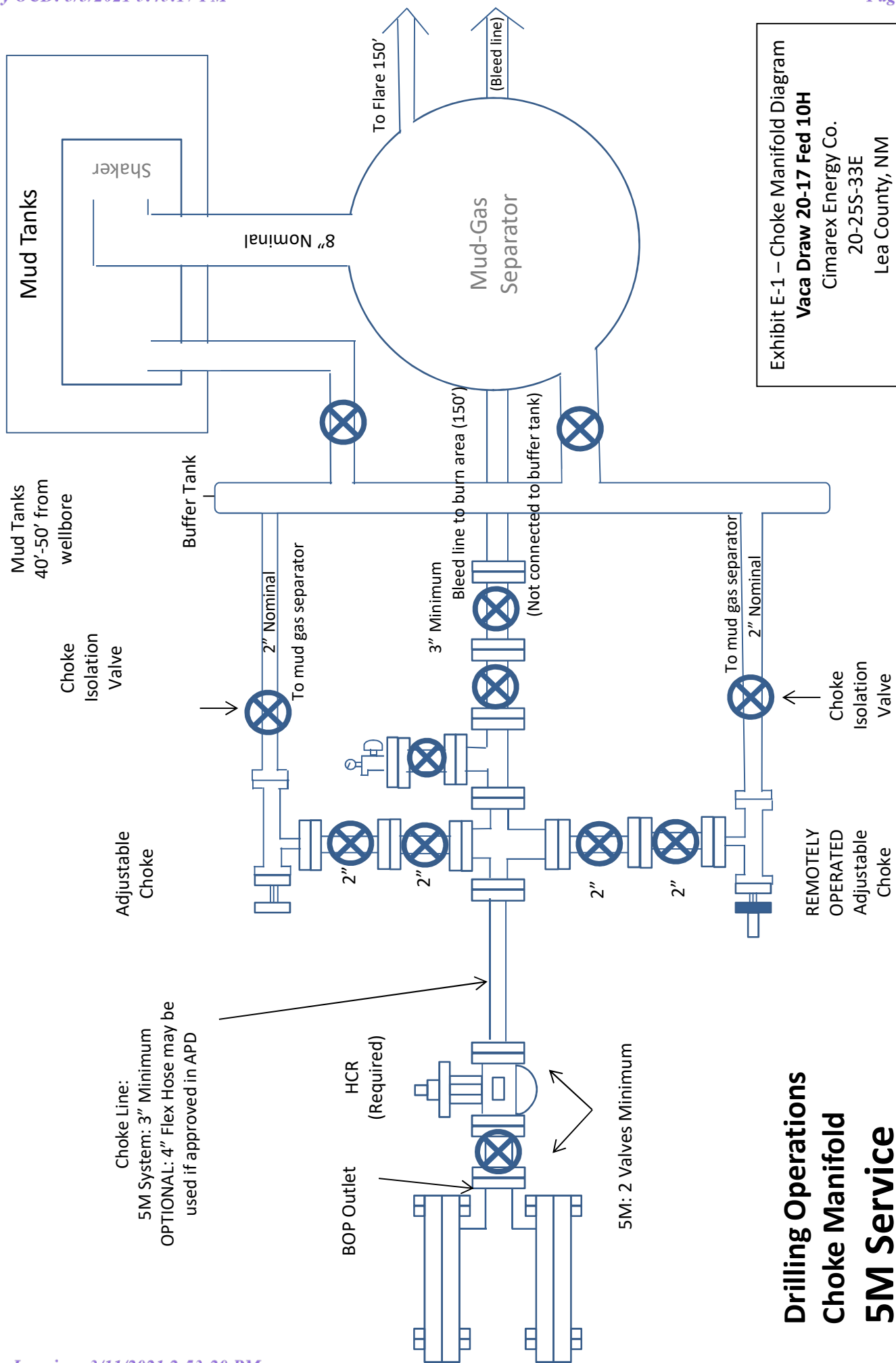
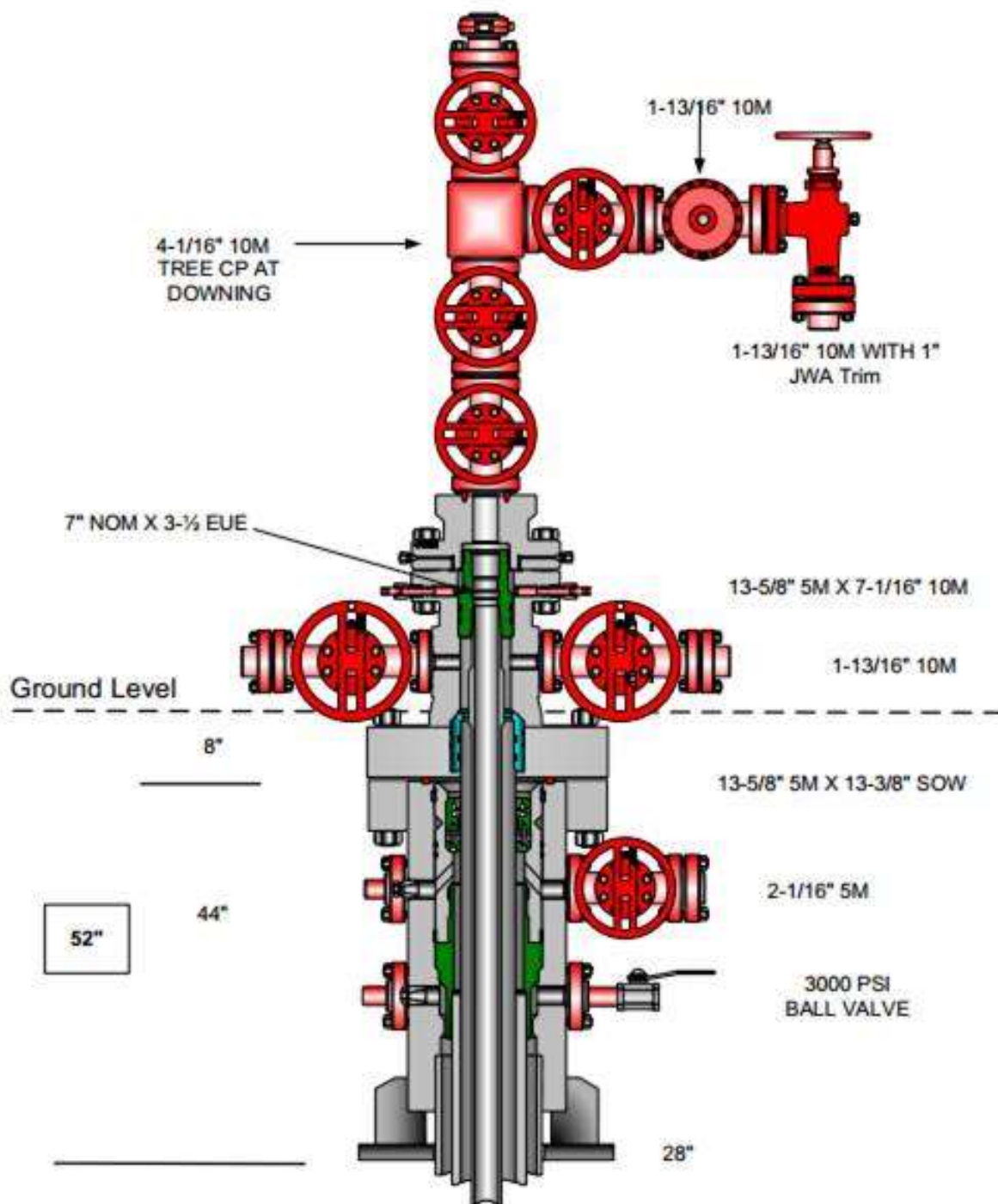


Exhibit E-1 – Choke Manifold Diagram
Vaca Draw 20-17 Fed 10H
 Cimarex Energy Co.
 20-25S-33E
 Lea County, NM

Drilling Operations **Choke Manifold** **2M/3M Service**



Multi-bowl Wellhead Diagram



Multi-bowl Wellhead Diagram
Vaca Draw 20-17 Fed 10H
Cimarex Energy Co.
20-25S-33E
Lea Co., NM



Gravity & Magnetic Parameters		Surface Location		Miscellaneous	
Dip:	59.67°	Lat:	N 32 E 35.07	Spot:	Granny Vics Draw 20-
MagDec:	HOGM 2020	Long:	W 103 35 46.89	Plat:	TWO Ref:
Map:	445°	Grav/Fs:	986.43mgp (9.8665 Based)	Scale Fact:	17 Federal #10H
					Granny Vics Draw 20-17 Federal #10H Ref: 10E1321

[illegible]

Vertical Section (ft) Azim = 359.63° Scale = 1:741.17(ft) Origin = 0N/-S, 0E/-W

EW (ft) Scale = 1:544.64(ft)

Schlumberger

Cimarex Vaca Draw 20-17 Federal #10H Rev1 RM 10Feb21 Proposal Geodetic Report

(Def Plan)

Report Date: February 10, 2021 - 12:48 PM
Client: Cimarex
Field: NM Lea County (NAD 83)
Structure / Slot: Cimarex Vaca Draw 20-17 Federal #10H / Cimarex Vaca Draw 20-17 Federal #10H
Well: Cimarex Vaca Draw 20-17 Federal #10H
Borehole: Original Borehole
UWI / API#: Unknown / Unknown
Survey Name: Cimarex Vaca Draw 20-17 Federal #10H Rev1 RM 10Feb21
Survey Date: February 10, 2021
Tort / AHD / DDI / ERD Ratio: 104.000 ° / 10370.891 ft / 6.326 / 0.996
Coordinate Reference System: NAD83 New Mexico State Plane, Eastern Zone, US Feet
Location Lat / Long: N 32° 6' 35.06593", W 103° 35' 46.88514"
Location Grid N/E Y/X: N 404440.060 ftUS, E 769521.610 ftUS
CRS Grid Convergence Angle: 0.3918 °
Grid Scale Factor: 0.99996873
Version / Patch: 2.10.824.0

Survey / DLS Computation: Minimum Curvature / Lubinski
Vertical Section Azimuth: 359.628 ° (Grid North)
Vertical Section Origin: 0.000 ft, 0.000 ft
TVD Reference Datum: RKB
TVD Reference Elevation: 3440.100 ft above MSL
Seabed / Ground Elevation: 3417.100 ft above MSL
Magnetic Declination: 6.455 °
Total Gravity Field Strength: 998.4304mgn (9.80665 Based)
Gravity Model: GARM
Total Magnetic Field Strength: 47599.234 nT
Magnetic Dip Angle: 59.676 °
Declination Date: February 10, 2021
Magnetic Declination Model: HDGM 2020
North Reference: Grid North
Grid Convergence Used: 0.3918 °
Total Corr Mag North-Grid North: 6.0633 °

Local Coord Referenced To: Structure Reference Point

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
SHL [330' FSL, 2010' FWL]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	404440.06	769521.61	N 32 6 35.07	W 103 35 46.89
Nudge 2°/100' DLS	2500.00	0.00	225.68	2500.00	0.00	0.00	0.00	0.00	404440.06	769521.61	N 32 6 35.07	W 103 35 46.89
Hold Nudge	2850.00	7.00	225.68	2849.13	-14.82	-14.92	-15.28	2.00	404425.14	769506.33	N 32 6 34.92	W 103 35 47.06
Drop to Vertical 2°/100' DLS	3674.01	7.00	225.68	3667.00	-84.51	-85.08	-87.12	0.00	404354.98	769434.49	N 32 6 34.23	W 103 35 47.90
Hold Vertical	4024.01	0.00	225.68	4016.13	-99.33	-100.00	-102.40	2.00	404340.06	769419.21	N 32 6 34.08	W 103 35 48.08
KOP - Build	9940.42	0.00	225.68	9932.54	-99.33	-100.00	-102.40	0.00	404340.06	769419.21	N 32 6 34.08	W 103 35 48.08
12°/100' DLS	10690.42	90.00	359.63	10410.00	378.13	377.45	-105.50	12.00	404817.50	769416.11	N 32 6 38.81	W 103 35 48.08
Landing Point Cimarex Vaca												
Draw 20-17												
Federal #10H - PBHL [100' FNL, 1907' FWL]	20440.72	90.00	359.63	10410.00	10128.43	10127.55	-168.87	0.00	414567.27	769352.75	N 32 8 15.29	W 103 35 48.04

Survey Type: Def Plan

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

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
Description	Part		MD From (ft)	MD To (ft)	EOU Freq (ft)	Hole Size (in)	Casing Diameter (in)	Expected Max Inclination (deg)	Survey Tool Type	Borehole / Survey		
	1		0.000	23.000	1/100.000	17.500	13.375	NAL_MWD_IFR1+MS-Depth Only	Original Borehole / Cimarex Vaca Draw 20-17 Federal #10H Rev1 RM 10Feb21			
	1		23.000	20440.715	1/100.000	17.500	13.375	NAL_MWD_IFR1+MS	Original Borehole / Cimarex Vaca Draw 20-17 Federal #10H Rev1			

Schlumberger

Cimarex Vaca Draw 20-17 Federal #10H Rev1 RM 10Feb21 Proposal Geodetic Report

(Def Plan)

Report Date: February 10, 2021 - 12:47 PM Client: Cimarex Field: NM Lea County (NAD 83) Structure / Slot: Cimarex Vaca Draw 20-17 Federal #10H / Cimarex Vaca Draw 20-17 Federal #10H Well: Cimarex Vaca Draw 20-17 Federal #10H Borehole: Original Borehole UWI / API#: Unknown / Unknown Survey Name: Cimarex Vaca Draw 20-17 Federal #10H Rev1 RM 10Feb21 Survey Date: February 10, 2021 Tort / AHD / DDI / ERD Ratio: 104.000 ° / 10370.891 ft / 6.326 / 0.996 Coordinate Reference System: NAD83 New Mexico State Plane, Eastern Zone, US Feet Location Lat / Long: N 32° 6' 35.06593", W 103° 35' 46.88514" Location Grid N/E Y/X: N 404440.060 ftUS, E 769521.610 ftUS CRS Grid Convergence Angle: 0.3918 ° Grid Scale Factor: 0.99996873 Version / Patch: 2.10.824.0	Survey / DLS Computation: Minimum Curvature / Lubinski Vertical Section Azimuth: 359.628 ° (Grid North) Vertical Section Origin: 0.000 ft, 0.000 ft TVD Reference Datum: RKB TVD Reference Elevation: 3440.100 ft above MSL Seabed / Ground Elevation: 3417.100 ft above MSL Magnetic Declination: 6.455 ° Total Gravity Field Strength: 998.4304mgm (9.80665 Based) Gravity Model: GARM Total Magnetic Field Strength: 47599.234 nT Magnetic Dip Angle: 59.676 ° Declination Date: February 10, 2021 Magnetic Declination Model: HDGM 2020 North Declination: Grid North Grid Convergence Used: 0.3918 ° Total Corr Mag North-Grid North: 6.0633 °
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Local Coord Referenced To: Structure Reference Point

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
SHL [330' FSL, 2010' FWL]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	404440.06	769521.61	N 32 6 35.07	W 103 35 46.89
	100.00	0.00	225.68	100.00	0.00	0.00	0.00	0.00	404440.06	769521.61	N 32 6 35.07	W 103 35 46.89
	200.00	0.00	225.68	200.00	0.00	0.00	0.00	0.00	404440.06	769521.61	N 32 6 35.07	W 103 35 46.89
	300.00	0.00	225.68	300.00	0.00	0.00	0.00	0.00	404440.06	769521.61	N 32 6 35.07	W 103 35 46.89
	400.00	0.00	225.68	400.00	0.00	0.00	0.00	0.00	404440.06	769521.61	N 32 6 35.07	W 103 35 46.89
	500.00	0.00	225.68	500.00	0.00	0.00	0.00	0.00	404440.06	769521.61	N 32 6 35.07	W 103 35 46.89
	600.00	0.00	225.68	600.00	0.00	0.00	0.00	0.00	404440.06	769521.61	N 32 6 35.07	W 103 35 46.89
	700.00	0.00	225.68	700.00	0.00	0.00	0.00	0.00	404440.06	769521.61	N 32 6 35.07	W 103 35 46.89
	800.00	0.00	225.68	800.00	0.00	0.00	0.00	0.00	404440.06	769521.61	N 32 6 35.07	W 103 35 46.89
	900.00	0.00	225.68	900.00	0.00	0.00	0.00	0.00	404440.06	769521.61	N 32 6 35.07	W 103 35 46.89
	1000.00	0.00	225.68	1000.00	0.00	0.00	0.00	0.00	404440.06	769521.61	N 32 6 35.07	W 103 35 46.89
	1100.00	0.00	225.68	1100.00	0.00	0.00	0.00	0.00	404440.06	769521.61	N 32 6 35.07	W 103 35 46.89
	1200.00	0.00	225.68	1200.00	0.00	0.00	0.00	0.00	404440.06	769521.61	N 32 6 35.07	W 103 35 46.89
	1300.00	0.00	225.68	1300.00	0.00	0.00	0.00	0.00	404440.06	769521.61	N 32 6 35.07	W 103 35 46.89
	1400.00	0.00	225.68	1400.00	0.00	0.00	0.00	0.00	404440.06	769521.61	N 32 6 35.07	W 103 35 46.89
	1500.00	0.00	225.68	1500.00	0.00	0.00	0.00	0.00	404440.06	769521.61	N 32 6 35.07	W 103 35 46.89
	1600.00	0.00	225.68	1600.00	0.00	0.00	0.00	0.00	404440.06	769521.61	N 32 6 35.07	W 103 35 46.89
	1700.00	0.00	225.68	1700.00	0.00	0.00	0.00	0.00	404440.06	769521.61	N 32 6 35.07	W 103 35 46.89
	1800.00	0.00	225.68	1800.00	0.00	0.00	0.00	0.00	404440.06	769521.61	N 32 6 35.07	W 103 35 46.89
	1900.00	0.00	225.68	1900.00	0.00	0.00	0.00	0.00	404440.06	769521.61	N 32 6 35.07	W 103 35 46.89
	2000.00	0.00	225.68	2000.00	0.00	0.00	0.00	0.00	404440.06	769521.61	N 32 6 35.07	W 103 35 46.89
	2100.00	0.00	225.68	2100.00	0.00	0.00	0.00	0.00	404440.06	769521.61	N 32 6 35.07	W 103 35 46.89
	2200.00	0.00	225.68	2200.00	0.00	0.00	0.00	0.00	404440.06	769521.61	N 32 6 35.07	W 103 35 46.89
	2300.00	0.00	225.68	2300.00	0.00	0.00	0.00	0.00	404440.06	769521.61	N 32 6 35.07	W 103 35 46.89

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
Nudge 2°/100' DLS	2400.00	0.00	225.68	2400.00	0.00	0.00	0.00	0.00	404440.06	769521.61	N 32 6 35.07	W 103 35 46.89
	2500.00	0.00	225.68	2500.00	0.00	0.00	0.00	0.00	404440.06	769521.61	N 32 6 35.07	W 103 35 46.89
	2600.00	2.00	225.68	2599.98	-1.21	-1.22	-1.25	2.00	404438.84	769520.36	N 32 6 35.05	W 103 35 46.90
	2700.00	4.00	225.68	2699.84	-4.84	-4.86	-4.99	2.00	404435.18	769516.62	N 32 6 35.02	W 103 35 46.94
Hold Nudge	2800.00	6.00	225.68	2799.45	-10.89	-10.98	-11.23	2.00	404429.10	769510.38	N 32 6 34.96	W 103 35 47.02
	2850.00	7.00	225.68	2849.13	-14.82	-14.92	-15.28	2.00	404425.14	769506.33	N 32 6 34.92	W 103 35 47.06
	2900.00	7.00	225.68	2898.76	-19.05	-19.18	-19.64	0.00	404420.88	769501.97	N 32 6 34.88	W 103 35 47.11
	3000.00	7.00	225.68	2998.01	-27.51	-27.69	-28.36	0.00	404412.37	769493.26	N 32 6 34.79	W 103 35 47.22
	3100.00	7.00	225.68	3097.27	-35.96	-36.21	-37.07	0.00	404403.86	769484.54	N 32 6 34.71	W 103 35 47.32
	3200.00	7.00	225.68	3196.52	-44.42	-44.72	-45.79	0.00	404395.34	769475.82	N 32 6 34.63	W 103 35 47.42
	3300.00	7.00	225.68	3295.78	-52.88	-53.24	-54.51	0.00	404386.83	769467.10	N 32 6 34.54	W 103 35 47.52
	3400.00	7.00	225.68	3395.03	-61.34	-61.75	-63.23	0.00	404378.31	769458.38	N 32 6 34.46	W 103 35 47.63
	3500.00	7.00	225.68	3494.28	-69.80	-70.26	-71.95	0.00	404369.80	769449.66	N 32 6 34.38	W 103 35 47.73
	3600.00	7.00	225.68	3593.54	-78.25	-78.78	-80.67	0.00	404361.28	769440.94	N 32 6 34.29	W 103 35 47.83
	3674.01	7.00	225.68	3667.00	-84.51	-85.08	-87.12	0.00	404354.98	769434.49	N 32 6 34.23	W 103 35 47.90
Drop to Vertical 2°/100' DLS	3700.00	6.48	225.68	3692.81	-86.63	-87.21	-89.31	2.00	404352.85	769432.31	N 32 6 34.21	W 103 35 47.93
	3800.00	4.48	225.68	3792.35	-93.26	-93.88	-96.14	2.00	404346.18	769425.48	N 32 6 34.14	W 103 35 48.01
	3900.00	2.48	225.68	3892.16	-97.47	-98.13	-100.48	2.00	404341.94	769421.13	N 32 6 34.10	W 103 35 48.06
	4000.00	0.48	225.68	3992.12	-99.26	-99.93	-102.33	2.00	404340.13	769419.29	N 32 6 34.08	W 103 35 48.08
Hold Vertical	4024.01	0.00	225.68	4016.13	-99.33	-100.00	-102.40	2.00	404340.06	769419.21	N 32 6 34.08	W 103 35 48.08
	4100.00	0.00	225.68	4092.12	-99.33	-100.00	-102.40	0.00	404340.06	769419.21	N 32 6 34.08	W 103 35 48.08
	4200.00	0.00	225.68	4192.12	-99.33	-100.00	-102.40	0.00	404340.06	769419.21	N 32 6 34.08	W 103 35 48.08
	4300.00	0.00	225.68	4292.12	-99.33	-100.00	-102.40	0.00	404340.06	769419.21	N 32 6 34.08	W 103 35 48.08
	4400.00	0.00	225.68	4392.12	-99.33	-100.00	-102.40	0.00	404340.06	769419.21	N 32 6 34.08	W 103 35 48.08
	4500.00	0.00	225.68	4492.12	-99.33	-100.00	-102.40	0.00	404340.06	769419.21	N 32 6 34.08	W 103 35 48.08
	4600.00	0.00	225.68	4592.12	-99.33	-100.00	-102.40	0.00	404340.06	769419.21	N 32 6 34.08	W 103 35 48.08
	4700.00	0.00	225.68	4692.12	-99.33	-100.00	-102.40	0.00	404340.06	769419.21	N 32 6 34.08	W 103 35 48.08
	4800.00	0.00	225.68	4792.12	-99.33	-100.00	-102.40	0.00	404340.06	769419.21	N 32 6 34.08	W 103 35 48.08
	4900.00	0.00	225.68	4892.12	-99.33	-100.00	-102.40	0.00	404340.06	769419.21	N 32 6 34.08	W 103 35 48.08
	5000.00	0.00	225.68	4992.12	-99.33	-100.00	-102.40	0.00	404340.06	769419.21	N 32 6 34.08	W 103 35 48.08
	5100.00	0.00	225.68	5092.12	-99.33	-100.00	-102.40	0.00	404340.06	769419.21	N 32 6 34.08	W 103 35 48.08
	5200.00	0.00	225.68	5192.12	-99.33	-100.00	-102.40	0.00	404340.06	769419.21	N 32 6 34.08	W 103 35 48.08
	5300.00	0.00	225.68	5292.12	-99.33	-100.00	-102.40	0.00	404340.06	769419.21	N 32 6 34.08	W 103 35 48.08
	5400.00	0.00	225.68	5392.12	-99.33	-100.00	-102.40	0.00	404340.06	769419.21	N 32 6 34.08	W 103 35 48.08
	5500.00	0.00	225.68	5492.12	-99.33	-100.00	-102.40	0.00	404340.06	769419.21	N 32 6 34.08	W 103 35 48.08
	5600.00	0.00	225.68	5592.12	-99.33	-100.00	-102.40	0.00	404340.06	769419.21	N 32 6 34.08	W 103 35 48.08
	5700.00	0.00	225.68	5692.12	-99.33	-100.00	-102.40	0.00	404340.06	769419.21	N 32 6 34.08	W 103 35 48.08
	5800.00	0.00	225.68	5792.12	-99.33	-100.00	-102.40	0.00	404340.06	769419.21	N 32 6 34.08	W 103 35 48.08
	5900.00	0.00	225.68	5892.12	-99.33	-100.00	-102.40	0.00	404340.06	769419.21	N 32 6 34.08	W 103 35 48.08
	6000.00	0.00	225.68	5992.12	-99.33	-100.00	-102.40	0.00	404340.06	769419.21	N 32 6 34.08	W 103 35 48.08
	6100.00	0.00	225.68	6092.12	-99.33	-100.00	-102.40	0.00	404340.06	769419.21	N 32 6 34.08	W 103 35 48.08
	6200.00	0.00	225.68	6192.12	-99.33	-100.00	-102.40	0.00	404340.06	769419.21	N 32 6 34.08	W 103 35 48.08
	6300.00	0.00	225.68	6292.12	-99.33	-100.00	-102.40	0.00	404340.06	769419.21	N 32 6 34.08	W 103 35 48.08
	6400.00	0.00	225.68	6392.12	-99.33	-100.00	-102.40	0.00	404340.06	769419.21	N 32 6 34.08	W 103 35 48.08
	6500.00	0.00	225.68	6492.12	-99.33	-100.00	-102.40	0.00	404340.06	769419.21	N 32 6 34.08	W 103 35 48.08
	6600.00	0.00	225.68	6592.12	-99.33	-100.00	-102.40	0.00	404340.06	769419.21	N 32 6 34.08	W 103 35 48.08
	6700.00	0.00	225.68	6692.12	-99.33	-100.00	-102.40	0.00	404340.06	769419.21	N 32 6 34.08	W 103 35 48.08
	6800.00	0.00	225.68	6792.12	-99.33	-100.00	-102.40	0.00	404340.06	769419.21	N 32 6 34.08	W 103 35 48.08
	6900.00	0.00	225.68	6892.12	-99.33	-100.00	-102.40	0.00	404340.06	769419.21	N 32 6 34.08	W 103 35 48.08
	7000.00	0.00	225.68	6992.12	-99.33	-100.00	-102.40	0.00	404340.06	769419.21	N 32 6 34.08	W 103 35 48.08
	7100.00	0.00	225.68	7092.12	-99.33	-100.00	-102.40	0.00	404340.06	769419.21	N 32 6 34.08	W 103 35 48.08
	7200.00	0.00	225.68	7192.12	-99.33	-100.00	-102.40	0.00	404340.06	769419.21	N 32 6 34.08	W 103 35 48.08
	7300.00	0.00	225.68	7292.12	-99.33	-100.00	-102.40	0.00	404340.06	769419.21	N 32 6 34.08	W 103 35 48.08
	7400.00	0.00	225.68	7392.12	-99.33	-100.00	-102.40	0.00	404340.06	769419.21	N 32 6 34.08	W 103 35 48.08

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
KOP - Build 12°/100' DLS	7500.00	0.00	225.68	7492.12	-99.33	-100.00	-102.40	0.00	404340.06	769419.21	N 32° 6' 34.08"	W 103° 35' 48.08"
	7600.00	0.00	225.68	7592.12	-99.33	-100.00	-102.40	0.00	404340.06	769419.21	N 32° 6' 34.08"	W 103° 35' 48.08"
	7700.00	0.00	225.68	7692.12	-99.33	-100.00	-102.40	0.00	404340.06	769419.21	N 32° 6' 34.08"	W 103° 35' 48.08"
	7800.00	0.00	225.68	7792.12	-99.33	-100.00	-102.40	0.00	404340.06	769419.21	N 32° 6' 34.08"	W 103° 35' 48.08"
	7900.00	0.00	225.68	7892.12	-99.33	-100.00	-102.40	0.00	404340.06	769419.21	N 32° 6' 34.08"	W 103° 35' 48.08"
	8000.00	0.00	225.68	7992.12	-99.33	-100.00	-102.40	0.00	404340.06	769419.21	N 32° 6' 34.08"	W 103° 35' 48.08"
	8100.00	0.00	225.68	8092.12	-99.33	-100.00	-102.40	0.00	404340.06	769419.21	N 32° 6' 34.08"	W 103° 35' 48.08"
	8200.00	0.00	225.68	8192.12	-99.33	-100.00	-102.40	0.00	404340.06	769419.21	N 32° 6' 34.08"	W 103° 35' 48.08"
	8300.00	0.00	225.68	8292.12	-99.33	-100.00	-102.40	0.00	404340.06	769419.21	N 32° 6' 34.08"	W 103° 35' 48.08"
	8400.00	0.00	225.68	8392.12	-99.33	-100.00	-102.40	0.00	404340.06	769419.21	N 32° 6' 34.08"	W 103° 35' 48.08"
	8500.00	0.00	225.68	8492.12	-99.33	-100.00	-102.40	0.00	404340.06	769419.21	N 32° 6' 34.08"	W 103° 35' 48.08"
	8600.00	0.00	225.68	8592.12	-99.33	-100.00	-102.40	0.00	404340.06	769419.21	N 32° 6' 34.08"	W 103° 35' 48.08"
	8700.00	0.00	225.68	8692.12	-99.33	-100.00	-102.40	0.00	404340.06	769419.21	N 32° 6' 34.08"	W 103° 35' 48.08"
	8800.00	0.00	225.68	8792.12	-99.33	-100.00	-102.40	0.00	404340.06	769419.21	N 32° 6' 34.08"	W 103° 35' 48.08"
	8900.00	0.00	225.68	8892.12	-99.33	-100.00	-102.40	0.00	404340.06	769419.21	N 32° 6' 34.08"	W 103° 35' 48.08"
	9000.00	0.00	225.68	8992.12	-99.33	-100.00	-102.40	0.00	404340.06	769419.21	N 32° 6' 34.08"	W 103° 35' 48.08"
	9100.00	0.00	225.68	9092.12	-99.33	-100.00	-102.40	0.00	404340.06	769419.21	N 32° 6' 34.08"	W 103° 35' 48.08"
	9200.00	0.00	225.68	9192.12	-99.33	-100.00	-102.40	0.00	404340.06	769419.21	N 32° 6' 34.08"	W 103° 35' 48.08"
	9300.00	0.00	225.68	9292.12	-99.33	-100.00	-102.40	0.00	404340.06	769419.21	N 32° 6' 34.08"	W 103° 35' 48.08"
	9400.00	0.00	225.68	9392.12	-99.33	-100.00	-102.40	0.00	404340.06	769419.21	N 32° 6' 34.08"	W 103° 35' 48.08"
	9500.00	0.00	225.68	9492.12	-99.33	-100.00	-102.40	0.00	404340.06	769419.21	N 32° 6' 34.08"	W 103° 35' 48.08"
FTP [330' FSL, 1907' FWL]	9600.00	0.00	225.68	9592.12	-99.33	-100.00	-102.40	0.00	404340.06	769419.21	N 32° 6' 34.08"	W 103° 35' 48.08"
	9700.00	0.00	225.68	9692.12	-99.33	-100.00	-102.40	0.00	404340.06	769419.21	N 32° 6' 34.08"	W 103° 35' 48.08"
Landing Point	9800.00	0.00	225.68	9792.12	-99.33	-100.00	-102.40	0.00	404340.06	769419.21	N 32° 6' 34.08"	W 103° 35' 48.08"
	9900.00	0.00	225.68	9892.12	-99.33	-100.00	-102.40	0.00	404340.06	769419.21	N 32° 6' 34.08"	W 103° 35' 48.08"
KOP - Build 12°/100' DLS	9940.42	0.00	225.68	9932.54	-99.33	-100.00	-102.40	0.00	404340.06	769419.21	N 32° 6' 34.08"	W 103° 35' 48.08"
	10000.00	7.15	359.63	9991.96	-95.62	-96.29	-102.42	12.00	404343.78	769419.19	N 32° 6' 34.12"	W 103° 35' 48.08"
FTP [330' FSL, 1907' FWL]	10100.00	19.15	359.63	10089.16	-72.91	-73.58	-102.57	12.00	404366.48	769419.04	N 32° 6' 34.34"	W 103° 35' 48.08"
	10200.00	31.15	359.63	10179.52	-30.49	-31.16	-102.85	12.00	404408.90	769418.77	N 32° 6' 34.76"	W 103° 35' 48.08"
Landing Point	10253.83	37.61	359.63	10223.92	-0.11	-0.78	-103.04	12.00	404439.28	769418.57	N 32° 6' 35.07"	W 103° 35' 48.08"
	10300.00	43.15	359.63	10259.08	29.79	29.12	-103.24	12.00	404469.18	769418.37	N 32° 6' 35.36"	W 103° 35' 48.08"
Landing Point	10400.00	55.15	359.63	10324.37	105.29	104.62	-103.73	12.00	404544.68	769417.88	N 32° 6' 36.11"	W 103° 35' 48.08"
	10500.00	67.15	359.63	10372.53	192.72	192.05	-104.30	12.00	404632.10	769417.32	N 32° 6' 36.97"	W 103° 35' 48.08"
Landing Point	10600.00	79.15	359.63	10401.46	288.25	287.58	-104.92	12.00	404727.63	769416.69	N 32° 6' 37.92"	W 103° 35' 48.08"
	10690.42	90.00	359.63	10410.00	378.13	377.45	-105.50	12.00	404817.50	769416.11	N 32° 6' 38.81"	W 103° 35' 48.08"
Landing Point	10700.00	90.00	359.63	10410.00	387.71	387.04	-105.57	0.00	404827.08	769416.05	N 32° 6' 38.90"	W 103° 35' 48.08"
	10800.00	90.00	359.63	10410.00	487.71	487.04	-106.21	0.00	404927.08	769415.40	N 32° 6' 39.89"	W 103° 35' 48.08"
Landing Point	10900.00	90.00	359.63	10410.00	587.71	587.03	-106.86	0.00	405027.07	769414.75	N 32° 6' 40.88"	W 103° 35' 48.08"
	11000.00	90.00	359.63	10410.00	687.71	687.03	-107.51	0.00	405127.07	769414.10	N 32° 6' 41.87"	W 103° 35' 48.08"
Landing Point	11100.00	90.00	359.63	10410.00	787.71	787.03	-108.16	0.00	405227.06	769413.45	N 32° 6' 42.86"	W 103° 35' 48.08"
	11200.00	90.00	359.63	10410.00	887.71	887.03	-108.81	0.00	405327.06	769412.80	N 32° 6' 43.85"	W 103° 35' 48.08"
Landing Point	11300.00	90.00	359.63	10410.00	987.71	987.02	-109.46	0.00	405427.05	769412.15	N 32° 6' 44.84"	W 103° 35' 48.08"
	11400.00	90.00	359.63	10410.00	1087.71	1087.02	-110.11	0.00	405527.05	769411.50	N 32° 6' 45.83"	W 103° 35' 48.08"
Landing Point	11500.00	90.00	359.63	10410.00	1187.71	1187.02	-110.76	0.00	405627.04	769410.85	N 32° 6' 46.82"	W 103° 35' 48.08"
	11600.00	90.00	359.63	10410.00	1287.71	1287.02	-111.41	0.00	405727.04	769410.20	N 32° 6' 47.81"	W 103° 35' 48.08"
Landing Point	11700.00	90.00	359.63	10410.00	1387.71	1387.02	-112.06	0.00	405827.03	769409.55	N 32° 6' 48.80"	W 103° 35' 48.08"
	11800.00	90.00	359.63	10410.00	1487.71	1487.01	-112.71	0.00	405927.02	769408.90	N 32° 6' 49.79"	W 103° 35' 48.08"
Landing Point	11900.00	90.00	359.63	10410.00	1587.71	1587.01	-113.36	0.00	406027.02	769408.25	N 32° 6' 50.78"	W 103° 35' 48.08"
	12000.00	90.00	359.63	10410.00	1687.71	1687.01	-114.01	0.00	406127.01	769407.60	N 32° 6' 51.77"	W 103° 35' 48.08"
Landing Point	12100.00	90.00	359.63	10410.00	1787.71	1787.01	-114.66	0.00	406227.01	769406.95	N 32° 6' 52.76"	W 103° 35' 48.08"
	12200.00	90.00	359.63	10410.00	1887.71	1887.01	-115.31	0.00	406327.00	769406.30	N 32° 6' 53.75"	W 103° 35' 48.08"
Landing Point	12300.00	90.00	359.63	10410.00	1987.71	1987.00	-115.96	0.00	406427.00	769405.65	N 32° 6' 54.74"	W 103° 35' 48.08"
	12400.00	90.00	359.63	10410.00	2087.71	2087.00	-116.61	0.00	406526.99	769405.00	N 32° 6' 55.72"	W 103° 35' 48.08"
Landing Point	12500.00	90.00	359.63	10410.00	2187.71	2187.00	-117.26	0.00	406626.99	769404.35	N 32° 6' 56.71"	W 103° 35' 48.07"

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' '')	Longitude (E/W ° ' '')
	12600.00	90.00	359.63	10410.00	2287.71	2287.00	-117.91	0.00	406726.98	769403.70	N 32° 6' 57.70"	W 103° 35' 48.07"
	12700.00	90.00	359.63	10410.00	2387.71	2387.00	-118.56	0.00	406826.98	769403.05	N 32° 6' 58.69"	W 103° 35' 48.07"
	12800.00	90.00	359.63	10410.00	2487.71	2486.99	-119.21	0.00	406926.97	769402.40	N 32° 6' 59.68"	W 103° 35' 48.07"
	12900.00	90.00	359.63	10410.00	2587.71	2586.99	-119.86	0.00	407026.96	769401.75	N 32° 7' 0.67"	W 103° 35' 48.07"
	13000.00	90.00	359.63	10410.00	2687.71	2686.99	-120.51	0.00	407126.96	769401.10	N 32° 7' 1.66"	W 103° 35' 48.07"
	13100.00	90.00	359.63	10410.00	2787.71	2786.99	-121.16	0.00	407226.95	769400.45	N 32° 7' 2.65"	W 103° 35' 48.07"
	13200.00	90.00	359.63	10410.00	2887.71	2886.98	-121.81	0.00	407326.95	769399.80	N 32° 7' 3.64"	W 103° 35' 48.07"
	13300.00	90.00	359.63	10410.00	2987.71	2986.98	-122.46	0.00	407426.94	769399.15	N 32° 7' 4.63"	W 103° 35' 48.07"
	13400.00	90.00	359.63	10410.00	3087.71	3086.98	-123.11	0.00	407526.94	769398.50	N 32° 7' 5.62"	W 103° 35' 48.07"
	13500.00	90.00	359.63	10410.00	3187.71	3186.98	-123.76	0.00	407626.93	769397.85	N 32° 7' 6.61"	W 103° 35' 48.07"
	13600.00	90.00	359.63	10410.00	3287.71	3286.98	-124.41	0.00	407726.93	769397.20	N 32° 7' 7.60"	W 103° 35' 48.07"
	13700.00	90.00	359.63	10410.00	3387.71	3386.97	-125.06	0.00	407826.92	769396.55	N 32° 7' 8.59"	W 103° 35' 48.07"
	13800.00	90.00	359.63	10410.00	3487.71	3486.97	-125.71	0.00	407926.92	769395.90	N 32° 7' 9.58"	W 103° 35' 48.07"
	13900.00	90.00	359.63	10410.00	3587.71	3586.97	-126.36	0.00	408026.91	769395.25	N 32° 7' 10.57"	W 103° 35' 48.07"
	14000.00	90.00	359.63	10410.00	3687.71	3686.97	-127.01	0.00	408126.90	769394.60	N 32° 7' 11.56"	W 103° 35' 48.07"
	14100.00	90.00	359.63	10410.00	3787.71	3786.97	-127.66	0.00	408226.90	769393.95	N 32° 7' 12.55"	W 103° 35' 48.07"
	14200.00	90.00	359.63	10410.00	3887.71	3886.96	-128.31	0.00	408326.89	769393.30	N 32° 7' 13.54"	W 103° 35' 48.07"
	14300.00	90.00	359.63	10410.00	3987.71	3986.96	-128.96	0.00	408426.89	769392.65	N 32° 7' 14.53"	W 103° 35' 48.07"
	14400.00	90.00	359.63	10410.00	4087.71	4086.96	-129.61	0.00	408526.88	769392.00	N 32° 7' 15.52"	W 103° 35' 48.07"
	14500.00	90.00	359.63	10410.00	4187.71	4186.96	-130.26	0.00	408626.88	769391.35	N 32° 7' 16.51"	W 103° 35' 48.07"
	14600.00	90.00	359.63	10410.00	4287.71	4286.95	-130.91	0.00	408726.87	769390.70	N 32° 7' 17.49"	W 103° 35' 48.07"
	14700.00	90.00	359.63	10410.00	4387.71	4386.95	-131.56	0.00	408826.87	769390.06	N 32° 7' 18.48"	W 103° 35' 48.07"
	14800.00	90.00	359.63	10410.00	4487.71	4486.95	-132.21	0.00	408926.86	769389.41	N 32° 7' 19.47"	W 103° 35' 48.07"
	14900.00	90.00	359.63	10410.00	4587.71	4586.95	-132.86	0.00	409026.86	769388.76	N 32° 7' 20.46"	W 103° 35' 48.07"
	15000.00	90.00	359.63	10410.00	4687.71	4686.95	-133.51	0.00	409126.85	769388.11	N 32° 7' 21.45"	W 103° 35' 48.06"
	15100.00	90.00	359.63	10410.00	4787.71	4786.94	-134.16	0.00	409226.85	769387.46	N 32° 7' 22.44"	W 103° 35' 48.06"
	15200.00	90.00	359.63	10410.00	4887.71	4886.94	-134.81	0.00	409326.84	769386.81	N 32° 7' 23.43"	W 103° 35' 48.06"
	15300.00	90.00	359.63	10410.00	4987.71	4986.94	-135.46	0.00	409426.83	769386.16	N 32° 7' 24.42"	W 103° 35' 48.06"
	15400.00	90.00	359.63	10410.00	5087.71	5086.94	-136.11	0.00	409526.83	769385.51	N 32° 7' 25.41"	W 103° 35' 48.06"
	15500.00	90.00	359.63	10410.00	5187.71	5186.94	-136.76	0.00	409626.82	769384.86	N 32° 7' 26.40"	W 103° 35' 48.06"
	15600.00	90.00	359.63	10410.00	5287.71	5286.93	-137.41	0.00	409726.82	769384.21	N 32° 7' 27.39"	W 103° 35' 48.06"
	15700.00	90.00	359.63	10410.00	5387.71	5386.93	-138.06	0.00	409826.81	769383.56	N 32° 7' 28.38"	W 103° 35' 48.06"
	15800.00	90.00	359.63	10410.00	5487.71	5486.93	-138.71	0.00	409926.81	769382.91	N 32° 7' 29.37"	W 103° 35' 48.06"
	15900.00	90.00	359.63	10410.00	5587.71	5586.93	-139.36	0.00	410026.80	769382.26	N 32° 7' 30.36"	W 103° 35' 48.06"
	16000.00	90.00	359.63	10410.00	5687.71	5686.93	-140.01	0.00	410126.80	769381.61	N 32° 7' 31.35"	W 103° 35' 48.06"
	16100.00	90.00	359.63	10410.00	5787.71	5786.92	-140.66	0.00	410226.79	769380.96	N 32° 7' 32.34"	W 103° 35' 48.06"
	16200.00	90.00	359.63	10410.00	5887.71	5886.92	-141.31	0.00	410326.79	769380.31	N 32° 7' 33.33"	W 103° 35' 48.06"
	16300.00	90.00	359.63	10410.00	5987.71	5986.92	-141.96	0.00	410426.78	769379.66	N 32° 7' 34.32"	W 103° 35' 48.06"
	16400.00	90.00	359.63	10410.00	6087.71	6086.92	-142.61	0.00	410526.77	769379.01	N 32° 7' 35.31"	W 103° 35' 48.06"
	16500.00	90.00	359.63	10410.00	6187.71	6186.91	-143.26	0.00	410626.77	769378.36	N 32° 7' 36.30"	W 103° 35' 48.06"
	16600.00	90.00	359.63	10410.00	6287.71	6286.91	-143.91	0.00	410726.76	769377.71	N 32° 7' 37.29"	W 103° 35' 48.06"
	16700.00	90.00	359.63	10410.00	6387.71	6386.91	-144.56	0.00	410826.76	769377.06	N 32° 7' 38.27"	W 103° 35' 48.06"
	16800.00	90.00	359.63	10410.00	6487.71	6486.91	-145.21	0.00	410926.75	769376.41	N 32° 7' 39.26"	W 103° 35' 48.06"
	16900.00	90.00	359.63	10410.00	6587.71	6586.91	-145.86	0.00	411026.75	769375.76	N 32° 7' 40.25"	W 103° 35' 48.06"
	17000.00	90.00	359.63	10410.00	6687.71	6686.90	-146.51	0.00	411126.74	769375.11	N 32° 7' 41.24"	W 103° 35' 48.06"
	17100.00	90.00	359.63	10410.00	6787.71	6786.90	-147.16	0.00	411226.74	769374.46	N 32° 7' 42.23"	W 103° 35' 48.06"
	17200.00	90.00	359.63	10410.00	6887.71	6886.90	-147.81	0.00	411326.73	769373.81	N 32° 7' 43.22"	W 103° 35' 48.06"
	17300.00	90.00	359.63	10410.00	6987.71	6986.90	-148.46	0.00	411426.73	769373.16	N 32° 7' 44.21"	W 103° 35' 48.06"
	17400.00	90.00	359.63	10410.00	7087.71	7086.90	-149.11	0.00	411526.72	769372.51	N 32° 7' 45.20"	W 103° 35' 48.06"
	17500.00	90.00	359.63	10410.00	7187.71	7186.89	-149.76	0.00	411626.71	769371.86	N 32° 7' 46.19"	W 103° 35' 48.05"
	17600.00	90.00	359.63	10410.00	7287.71	7286.89	-150.41	0.00	411726.71	769371.21	N 32° 7' 47.18"	W 103° 35' 48.05"
	17700.00	90.00	359.63	10410.00	7387.71	7386.89	-151.05	0.00	411826.70	769370.56	N 32° 7' 48.17"	W 103° 35' 48.05"
	17800.00	90.00	359.63	10410.00	7487.71	7486.89	-151.70	0.00	411926.70	769369.91	N 32° 7' 49.16"	W 103° 35' 48.05"
	17900.00	90.00	359.63	10410.00	7587.71	7586.89	-152.35	0.00	412026.69	769369.26	N 32° 7' 50.15"	W 103° 35' 48.05"
	18000.00	90.00	359.63	10410.00	7687.71	7686.88	-153.00	0.00	412126.69	769368.61	N 32° 7' 51.14"	W 103° 35' 48.05"
	18100.00	90.00	359.63	10410.00	7787.71	7786.88	-153.65	0.00	412226.68	769367.96	N 32° 7' 52.13"	W 103° 35' 48.05"

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
	18200.00	90.00	359.63	10410.00	7887.71	7886.88	-154.30	0.00	412326.68	769367.31	N 32 7 53.12	W 103 35 48.05
	18300.00	90.00	359.63	10410.00	7987.71	7986.88	-154.95	0.00	412426.67	769366.66	N 32 7 54.11	W 103 35 48.05
	18400.00	90.00	359.63	10410.00	8087.71	8086.87	-155.60	0.00	412526.67	769366.01	N 32 7 55.10	W 103 35 48.05
	18500.00	90.00	359.63	10410.00	8187.71	8186.87	-156.25	0.00	412626.66	769365.36	N 32 7 56.09	W 103 35 48.05
	18600.00	90.00	359.63	10410.00	8287.71	8286.87	-156.90	0.00	412726.65	769364.71	N 32 7 57.08	W 103 35 48.05
	18700.00	90.00	359.63	10410.00	8387.71	8386.87	-157.55	0.00	412826.65	769364.06	N 32 7 58.07	W 103 35 48.05
	18800.00	90.00	359.63	10410.00	8487.71	8486.87	-158.20	0.00	412926.64	769363.41	N 32 7 59.05	W 103 35 48.05
	18900.00	90.00	359.63	10410.00	8587.71	8586.86	-158.85	0.00	413026.64	769362.76	N 32 8 0.04	W 103 35 48.05
	19000.00	90.00	359.63	10410.00	8687.71	8686.86	-159.50	0.00	413126.63	769362.11	N 32 8 1.03	W 103 35 48.05
	19100.00	90.00	359.63	10410.00	8787.71	8786.86	-160.15	0.00	413226.63	769361.46	N 32 8 2.02	W 103 35 48.05
	19200.00	90.00	359.63	10410.00	8887.71	8886.86	-160.80	0.00	413326.62	769360.81	N 32 8 3.01	W 103 35 48.05
	19300.00	90.00	359.63	10410.00	8987.71	8986.86	-161.45	0.00	413426.62	769360.16	N 32 8 4.00	W 103 35 48.05
	19400.00	90.00	359.63	10410.00	9087.71	9086.85	-162.10	0.00	413526.61	769359.51	N 32 8 4.99	W 103 35 48.05
	19500.00	90.00	359.63	10410.00	9187.71	9186.85	-162.75	0.00	413626.61	769358.86	N 32 8 5.98	W 103 35 48.05
	19600.00	90.00	359.63	10410.00	9287.71	9286.85	-163.40	0.00	413726.60	769358.21	N 32 8 6.97	W 103 35 48.05
	19700.00	90.00	359.63	10410.00	9387.71	9386.85	-164.05	0.00	413826.59	769357.56	N 32 8 7.96	W 103 35 48.05
	19800.00	90.00	359.63	10410.00	9487.71	9486.85	-164.70	0.00	413926.59	769356.91	N 32 8 8.95	W 103 35 48.05
	19900.00	90.00	359.63	10410.00	9587.71	9586.84	-165.35	0.00	414026.58	769356.26	N 32 8 9.94	W 103 35 48.05
	20000.00	90.00	359.63	10410.00	9687.71	9686.84	-166.00	0.00	414126.58	769355.61	N 32 8 10.93	W 103 35 48.05
	20100.00	90.00	359.63	10410.00	9787.71	9786.84	-166.65	0.00	414226.57	769354.96	N 32 8 11.92	W 103 35 48.04
	20200.00	90.00	359.63	10410.00	9887.71	9886.84	-167.30	0.00	414326.57	769354.31	N 32 8 12.91	W 103 35 48.04
	20300.00	90.00	359.63	10410.00	9987.71	9986.83	-167.95	0.00	414426.56	769353.66	N 32 8 13.90	W 103 35 48.04
	20400.00	90.00	359.63	10410.00	10087.71	10086.83	-168.60	0.00	414526.56	769353.01	N 32 8 14.89	W 103 35 48.04
Cimarex Vaca Draw 20-17 Federal #10H - PBHL [100' FNL, 1907' FWL]	20440.72	90.00	359.63	10410.00	10128.43	10127.55	-168.87	0.00	414567.27	769352.75	N 32 8 15.29	W 103 35 48.04

Survey Type: Def Plan

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

Description	Part	MD From (ft)	MD To (ft)	EOU Freq (ft)	Hole Size Casing Diameter (in)	Expected Max Inclination (deg)	Survey Tool Type	Borehole / Survey
	1	0.000	23.000	1/100.000	17.500	13.375	NAL_MWD_IFR1+MS-Depth Only	Original Borehole / Cimarex Vaca Draw 20-17 Federal #10H Rev1 RM 10Feb21
	1	23.000	20440.715	1/100.000	17.500	13.375	NAL_MWD_IFR1+MS	Original Borehole / Cimarex Vaca Draw 20-17 Federal #10H Rev1



Cimarex Vaca Draw 20-17 Federal #10H Rev1 RM 10Feb21 Anti-Collision Summary Report

Analysis Date-24hr Time: February 10, 2021 - 12:49

Client: Cimarex

Field: NM Lea County (NAD 83)

Structure: Cimarex Vaca Draw 20-17 Federal #10H

Slot: Cimarex Vaca Draw 20-17 Federal #10H

Well: Cimarex Vaca Draw 20-17 Federal #10H

Borehole: Original Borehole

Scan MD Range: 0.00ft ~ 20440.72ft

Analysis Method:

Reference Trajectory:

Depth Interval: Every 10.00 Measured Depth (ft)

Rule Set: NAL Procedure: D&M AntiCollision Standard S002

Min Pts: All local minima indicated.

Version / Patch: 2.10.824.0

Database \ Project: US1455VSM3115IDRILLING-NM Lea County 2.10

3D Least Distance

Cimarex Vaca Draw 20-17 Federal #10H Rev1 RM 10Feb21 (Def Plan)

ISCWSA0 3-D 95.000% Confidence 2.7955 sigma, for subject well. For offset wells, error model version is specified with each well respectively.

Trajectory Error Model: Not performed!
Offset Selection Criteria Definitive Surveys - Definitive Plans - Definitive surveys exclude definitive plans
Wellhead distance scan: - All Non-Def Surveys when no Def-Survey is set in a borehole - All Non-Def Plans when no Def-Plan is set in a borehole
Selection filters:

Offset Trajectories Summary

Offset Trajectory	Separation		Allow Dev. (ft)	Sep. Fact.	Controlling Rule	Reference Trajectory		Risk Level		Alert	Status
	Ct-Ct (ft)	MAS (ft)	EOU (ft)			MD (ft)	TVD (ft)	Alert	Minor	Major	

Results highlighted: Sep-Factor separation <= 1.50 ft

Cimarex Vaca Draw 20-17
Federal #1H Rev1 RM
10Feb21 (Def Plan)

20.00	16.26	18.72	3.74	N/A	MAS = 4.96 (m)	0.00	0.00	CtCt<= 15m<15.00			Fail Minor
20.00	16.26	18.71	3.74	N/A	MAS = 4.96 (m)	23.00	23.00				Enter Alert
20.00	20.03	6.22	-0.03	1.50	OSF1.50	2050.00	2050.00		OSF<1.50		WRP
20.00	24.27	3.39	-4.27	1.22	OSF1.50	2500.00	2500.00				MinPts
24.29	24.45	7.56	-0.16	1.49	OSF1.50	2620.00	2619.96		OSF>1.50		Exit Minor
72.65	23.35	56.65	49.30	4.85	OSF1.50	2920.00	2918.61	OSF>5.00			Exit Alert
683.10	68.66	636.90	614.45	15.18	OSF1.50	10050.00	10041.16				MINPT-O-EOU
683.24	68.81	636.94	614.43	15.15	OSF1.50	10070.00	10060.53				MinPt-O-ADP
688.73	70.00	641.64	618.73	15.01	OSF1.50	10230.00	10204.69				MinPt-O-SF
747.95	68.18	702.07	679.77	16.74	OSF1.50	10690.42	10410.00				MinPt-CtCt
747.96	225.46	597.22	522.50	5.00	OSF1.50	16770.00	10410.00	OSF<5.00			Enter Alert
747.96	340.20	520.73	407.76	3.30	OSF1.50	20440.72	10410.00				MinPts

Cimarex Vaca Draw 20-17
Federal #9H Rev1 RM
10Feb21 (Def Plan)

19.99	16.25	18.70	3.74	N/A	MAS = 4.95 (m)	0.00	0.00	CtCt<= 15m<15.00			Warning Alert
19.99	16.25	18.70	3.74	84186.99	MAS = 4.95 (m)	23.00	23.00				Enter Alert
19.99	19.47	6.59	0.53	1.54	OSF1.50	1990.00	1990.00				WRP
20.02	19.66	6.49	0.36	1.53	OSF1.50	2020.00	2020.00				MinPt-CtCt
20.06	19.71	6.49	0.35	1.53	OSF1.50	2030.00	2030.00				MINPT-O-EOU
63.57	20.21	49.67	43.36	4.94	OSF1.50	2630.00	2629.96	OSF>5.00			MinPts
											Exit Alert

Offset Trajectory	Separation		Allow	Sep.	Controlling	Reference Trajectory		Risk Level		Alert	Status
	Ct-Ct (ft)	MAS (ft)	EOU (ft)	Dev. (ft)		MD (ft)	TVD (ft)	Alert	Minor	Major	
	75.17	23.52	59.06	51.65	4.98	OSF1.50	4820.00	4812.12	OSF<5.00		Enter Alert
	75.17	70.59	27.68	4.58	1.60	OSF1.50	9940.42	9932.54			MinPls
	240.34	74.09	190.51	186.24	4.93	OSF1.50	10350.00	10293.70	OSF>5.00		Exit Alert
	614.90	185.54	490.78	429.36	5.00	OSF1.50	16190.00	10410.00	OSF<5.00		Enter Alert
	614.90	315.72	403.98	299.18	2.93	OSF1.50	20440.72	10410.00			MinPls

Cimarex Vaca Draw 20-17
Federal #12H Rev1 RM
10Feb21 (Def Plan)

39.98	32.24	38.70	7.74	N/A	MAS = 9.83 (m)	0.00	0.00	CtCt<=15m<15.00			Enter Alert
39.98	32.24	38.70	7.74	N/A	MAS = 9.83 (m)	23.00	23.00				WRP
39.98	32.24	26.51	7.74	3.18	MAS = 9.83 (m)	2000.00	2000.00				MinPls
40.00	32.24	26.48	7.76	3.17	MAS = 9.83 (m)	2010.00	2010.00				MINPT-O-EOU
40.26	32.24	26.60	8.01	3.15	MAS = 9.83 (m)	2040.00	2040.00				MinPt-O-SF
68.71	32.24	53.83	36.46	4.96	MAS = 9.83 (m)	2410.00	2410.00				Exit Alert
1428.96	61.37	1387.62	1387.58	35.64	OSF1.50	7890.00	7882.12				MinPt-O-SF
1466.99	72.56	1418.19	1394.43	30.85	OSF1.50	10060.00	10050.87				MINPT-O-EOU
1487.15	72.76	1418.22	1394.40	30.77	OSF1.50	10090.00	10079.68				MinPt-O-ADP
1481.15	74.49	1431.06	1406.66	30.32	OSF1.50	10390.00	10318.57				MinPt-O-SF
1594.44	336.91	1369.41	1257.53	7.12	OSF1.50	20440.72	10410.00				MinPls

Final Surveys - Cimarex Vaca
Draw 20-17 Federal #2H MWD
0ft-22179ft (Surcon Corrected)
(Def Survey)

116.60	32.81	115.58	83.79	N/A	MAS = 10.00 (m)	0.00	0.00				Surface
116.60	32.81	115.57	83.79	29824.20	MAS = 10.00 (m)	23.00	23.00				WRP
115.25	32.81	111.47	82.44	41.33	MAS = 10.00 (m)	680.00	680.00				MinPls
117.17	32.81	108.56	84.36	15.31	MAS = 10.00 (m)	1710.00	1710.00				MINPT-O-EOU
106.93	32.81	94.47	74.12	9.26	MAS = 10.00 (m)	2890.00	2888.83				MinPt-O-SF
106.91	32.81	94.45	74.10	9.26	MAS = 10.00 (m)	2900.00	2898.76				MinPls
165.12	32.81	152.17	132.31	13.75	MAS = 10.00 (m)	4420.00	4412.12				MinPls
165.31	32.81	152.09	132.51	13.47	MAS = 10.00 (m)	4480.00	4472.12				MINPT-O-EOU
167.62	32.81	152.37	134.81	11.71	MAS = 10.00 (m)	5020.00	5012.12				MINPT-O-EOU
168.48	32.81	152.35	135.67	11.09	MAS = 10.00 (m)	5280.00	5272.12				MINPT-O-EOU
168.83	32.81	151.12	136.02	10.06	MAS = 10.00 (m)	5680.00	5672.12				MinPls
169.32	32.81	150.17	136.51	9.28	OSF1.50	5990.00	5982.12				MINPT-O-EOU
198.12	44.64	168.02	153.48	6.78	OSF1.50	8560.00	8552.12				MinPt-O-ADP
200.53	46.53	169.17	154.00	6.58	OSF1.50	8860.00	8852.12				MINPT-O-EOU
179.41	54.59	142.68	124.82	5.00	OSF1.50	10090.00	10079.68				Enter Alert
136.55	55.91	98.93	80.64	3.70	OSF1.50	10320.00	10273.38				MinPls
183.21	56.80	145.00	126.41	4.90	OSF1.50	10470.00	10360.02				Exit Alert
1949.21	60.89	1908.29	1888.32	48.78	OSF1.50	12360.00	10410.00				MinPt-CtCt
1947.13	67.35	1901.90	1879.78	43.99	OSF1.50	12590.00	10410.00				MinPt-CtCt
1947.87	69.49	1901.21	1878.37	42.63	OSF1.50	12670.00	10410.00				MINPT-O-EOU
1948.77	70.57	1901.40	1878.20	41.99	OSF1.50	12710.00	10410.00				MinPt-O-ADP
1955.73	87.14	1897.30	1868.58	34.03	OSF1.50	13280.00	10410.00				MinPt-CtCt
1956.33	89.03	1896.65	1867.30	33.31	OSF1.50	13350.00	10410.00				MINPT-O-EOU
1956.98	89.82	1896.78	1867.17	33.03	OSF1.50	13380.00	10410.00				MinPt-O-ADP
1988.16	112.89	1892.57	1855.27	26.37	OSF1.50	14160.00	10410.00				MinPt-CtCt
1973.49	135.39	1882.91	1838.11	22.01	OSF1.50	14920.00	10410.00				MinPt-CtCt
1974.35	149.94	1874.07	1824.42	19.87	OSF1.50	15410.00	10410.00				MINPT-O-EOU
1975.46	153.85	1872.56	1821.61	19.37	OSF1.50	15500.00	10410.00				MINPT-O-EOU
1976.58	155.20	1872.79	1821.38	19.22	OSF1.50	15600.00	10410.00				MinPt-O-ADP

Offset Trajectory	Separation		Allow	Sep.	Controlling	Reference Trajectory		Risk Level		Alert	Status
	Ct-Ct (ft)	MAS (ft)	EOU (ft)	Dev. (ft)	Fact.	Rule	MD (ft)	TVD (ft)	Alert	Minor	Major
1978.19	162.75	1869.36	1815.44	18.33	OSF1.50	OSF1.50	15840.00	10410.00			MinPt-CtCt
1975.66	178.84	1856.11	1796.82	16.65	OSF1.50	OSF1.50	16380.00	10410.00			MinPt-CtCt
1976.35	181.00	1855.36	1795.36	16.46	OSF1.50	OSF1.50	16480.00	10410.00			MINPT-O-EOU
1979.54	188.14	1853.79	1791.41	15.86	OSF1.50	OSF1.50	16700.00	10410.00			MINPT-O-EOU
1980.65	189.50	1853.99	1791.10	15.75	OSF1.50	OSF1.50	16750.00	10410.00			MinPt-O-ADP
1981.50	192.30	1852.97	1789.20	15.53	OSF1.50	OSF1.50	16830.00	10410.00			MinPt-CtCt
1982.11	194.16	1852.34	1787.95	15.38	OSF1.50	OSF1.50	16900.00	10410.00			MINPT-O-EOU
1982.98	195.21	1852.52	1787.78	15.31	OSF1.50	OSF1.50	16940.00	10410.00			MinPt-O-ADP
1988.47	204.28	1851.95	1784.19	14.66	OSF1.50	OSF1.50	17240.00	10410.00			MinPt-CtCt
1985.38	221.32	1837.51	1764.06	13.51	OSF1.50	OSF1.50	17800.00	10410.00			MINPT-O-EOU
1986.25	224.04	1836.57	1762.22	13.35	OSF1.50	OSF1.50	17900.00	10410.00			MinPt-O-ADP
1986.91	224.80	1836.72	1762.11	13.31	OSF1.50	OSF1.50	17930.00	10410.00			MinPt-CtCt
1986.84	242.61	1824.77	1744.23	12.46	OSF1.50	OSF1.50	18420.00	10410.00			MINPT-O-EOU
1987.50	247.09	1822.44	1740.41	12.11	OSF1.50	OSF1.50	18660.00	10410.00			MinPt-CtCt
1971.23	266.86	1792.99	1704.36	11.12	OSF1.50	OSF1.50	19320.00	10410.00			MinPt-CtCt
1948.78	291.79	1753.92	1656.98	10.05	OSF1.50	OSF1.50	20150.00	10410.00			MINPT-O-EOU
1949.37	293.63	1753.29	1655.74	9.99	OSF1.50	OSF1.50	20220.00	10410.00			MinPt-O-ADP
1950.22	294.65	1753.45	1655.56	9.96	OSF1.50	OSF1.50	20280.00	10410.00			MinPt-CtCt
1948.58	300.81	1747.72	1647.78	9.74	OSF1.50	OSF1.50	20440.72	10410.00			MinPts

Cinmarex Vaca Draw 20-17
Federal #31H Rev1 RM
20Feb20 (Def Plan)

719.23	32.81	717.94	686.42	N/A	MAS = 10.00 (m)	0.00	0.00				Warning Alert
719.23	32.81	717.93	686.42	89758.48	MAS = 10.00 (m)	23.00	23.00				Surface
719.23	32.81	702.66	686.42	46.99	MAS = 10.00 (m)	2490.00	2490.00				WRP
718.78	32.81	702.11	685.97	46.65	MAS = 10.00 (m)	2600.00	2599.98				MinPts
687.69	32.81	675.28	654.89	61.81	MAS = 10.00 (m)	3750.00	3742.54				MinPt-O-SF
687.57	32.81	675.15	654.76	61.82	MAS = 10.00 (m)	3780.00	3772.41				MinPt-O-SF
745.61	67.06	700.47	678.55	16.97	OSF1.50	9960.00	9952.11				MinPts
745.70	67.15	700.50	678.55	16.95	OSF1.50	9970.00	9962.10				MINPT-O-EOU
753.84	68.65	707.65	685.19	16.76	OSF1.50	10140.00	10126.36				MinPt-O-ADP
796.08	239.90	635.72	556.18	5.00	OSF1.50	17090.00	10410.00		OSF<5.00		MinPt-O-SF
796.08	345.07	565.59	450.99	3.47	OSF1.50	20440.72	10410.00				Enter Alert
											MinPts

EOG Vaca Draw 20 Federal #1
(Offset) Plugged Inc Only 0ft-
14200ft (Def Survey)

3684.99	32.81	3683.01	3652.18	N/A	MAS = 10.00 (m)	0.00	0.00				Warning Alert
3684.94	32.81	3682.96	3652.13	619445.15	MAS = 10.00 (m)	10.00	10.00				Surface
3684.93	32.81	3682.91	3652.12	114178.15	MAS = 10.00 (m)	23.00	23.00				MinPt-O-SF
3681.70	39.93	3654.41	3641.76	145.43	OSF1.50	800.00	800.00				MinPts
3686.70	130.83	3598.82	3555.87	42.90	OSF1.50	2530.00	2530.00				MinPt-CtCt
3687.91	134.63	3597.50	3553.28	41.68	OSF1.50	2610.00	2609.97				MinPt-CtCt
3689.38	136.39	3597.79	3552.99	41.15	OSF1.50	2650.00	2649.93				MINPT-O-EOU
3820.54	240.84	3659.32	3579.69	23.98	OSF1.50	4700.00	4692.12				MinPt-O-ADP
3818.11	382.98	3562.13	3435.13	15.02	OSF1.50	7430.00	7422.12				MinPt-CtCt
3815.95	452.45	3513.66	3363.50	12.70	OSF1.50	8760.00	8752.12				MinPt-CtCt
1813.24	546.81	1447.65	1266.43	4.99	OSF1.50	13080.00	10410.00		OSF<5.00		Enter Alert
1735.88	547.29	1370.35	1188.58	4.77	OSF1.50	13600.00	10410.00				MinPt-CtCt
1735.88	547.32	1370.34	1188.56	4.77	OSF1.50	13610.00	10410.00				MinPts
1735.94	547.34	1370.39	1188.60	4.77	OSF1.50	13620.00	10410.00				MinPt-O-SF
1819.66	548.01	1453.66	1271.64	4.99	OSF1.50	14150.00	10410.00		OSF>5.00		Exit Alert

Offset Trajectory	Separation		Allow	Sep. Fact.	Controlling Rule	Reference Trajectory		Alert	Risk Level		Alert	Status
	Ct-Ct (ft)	MAS (ft)	EOU (ft)			MD (ft)	TVD (ft)		Minor	Major		

TD

Hankamer Curtis Bass-Federal
#1 (Offset) Plugged Blind Off-
5074ft (Def Survey)

Warning Alert

4486.32	32.81	4484.34	4453.51	N/A	MAS = 10.00 (m)	0.00	0.00				Surface
4486.31	32.81	4482.87	4453.50	3079.39	MAS = 10.00 (m)	23.00	23.00				WRP
4486.31	769.56	3972.60	3716.74	8.76	OSF1.50	2500.00	2500.00				MinPt-CtCt
4611.87	1386.17	3687.09	3225.70	5.00	OSF1.50	4470.00	4462.12	OSF<5.00			Enter Alert
4611.88	1581.38	3556.97	3030.50	4.38	OSF1.50	5100.00	5092.12				MinPts
4925.33	1481.05	3937.30	3444.28	4.99	OSF1.50	6820.00	6812.12	OSF>5.00			Exit Alert
5510.22	417.39	5231.30	5092.83	19.89	OSF1.50	14600.00	10410.00				MinPt-CtCt
5510.41	417.80	5231.22	5092.61	19.87	OSF1.50	14650.00	10410.00				MINPT-O-EOU
5531.60	440.50	5237.27	5091.10	18.91	OSF1.50	15090.00	10410.00				MinPt-O-ADP
7505.34	1123.96	6755.37	6381.38	10.03	OSF1.50	19700.00	10410.00				MinPt-O-SF
8026.70	1192.40	7231.11	6834.31	10.11	OSF1.50	20440.72	10410.00				TD

Final Surveys - Cimarex Vaca
Draw 20-17 Federal #4H MWD
Off-12228ft (Surcon Corrected)
(Def Survey)

Pass

84.85	32.81	82.87	52.04	N/A	MAS = 10.00 (m)	0.00	0.00				MinPts
84.86	32.81	82.88	52.05	17748.68	MAS = 10.00 (m)	23.00	23.00				WRP
84.99	32.81	82.80	52.19	390.63	MAS = 10.00 (m)	90.00	90.00				MINPT-O-EOU
85.19	32.81	82.78	52.39	190.60	MAS = 10.00 (m)	140.00	140.00				MINPT-O-EOU
58.47	32.81	48.02	25.67	6.67	MAS = 10.00 (m)	1860.00	1860.00				MinPts
58.55	32.81	47.98	25.74	6.59	MAS = 10.00 (m)	1880.00	1880.00				MINPT-O-EOU
61.09	32.81	49.84	28.28	6.38	MAS = 10.00 (m)	2000.00	2000.00				MinPt-O-SF
968.54	55.57	930.83	912.97	27.05	OSF1.50	9660.00	9652.12				MinPt-CtCt
968.60	55.76	930.77	912.84	26.96	OSF1.50	9690.00	9682.12				MINPT-O-EOU
968.65	55.82	930.78	912.83	26.93	OSF1.50	9700.00	9692.12				MINPT-O-ADP
958.14	59.35	917.92	898.79	25.00	OSF1.50	10310.00	10266.30				MinPt-CtCt
958.16	59.41	917.90	898.76	24.98	OSF1.50	10320.00	10273.38				MinPts
963.78	60.08	923.07	903.70	24.83	OSF1.50	10440.42	10346.03				MinPt-O-SF
10141.48	66.35	10096.58	10075.12	236.26	OSF1.50	20440.72	10410.00				TD

Final Surveys - Cimarex Vaca
Draw 20-17 Federal #4H ST01
MWD Off-22279ft (Surcon
Corrected) (Def Survey)

Pass

84.85	32.81	83.67	52.04	N/A	MAS = 10.00 (m)	0.00	0.00				MinPts
84.86	32.81	83.68	52.05	17920.45	MAS = 10.00 (m)	23.00	23.00				WRP
84.99	32.81	83.60	52.19	394.40	MAS = 10.00 (m)	90.00	90.00				MINPT-O-EOU
85.19	32.81	83.58	52.39	192.43	MAS = 10.00 (m)	140.00	140.00				MINPT-O-EOU
58.47	32.81	48.86	25.67	6.71	MAS = 10.00 (m)	1860.00	1860.00				MinPts
58.55	32.81	48.82	25.74	6.63	MAS = 10.00 (m)	1880.00	1880.00				MINPT-O-EOU
61.09	32.81	50.69	28.28	6.42	MAS = 10.00 (m)	2000.00	2000.00				MinPt-O-SF
968.54	54.66	931.75	913.88	27.07	OSF1.50	9660.00	9652.12				MinPt-CtCt
968.60	54.85	931.68	913.75	26.97	OSF1.50	9690.00	9682.12				MINPT-O-EOU
968.65	54.92	931.68	913.74	26.94	OSF1.50	9700.00	9692.12				MinPt-O-ADP
958.14	58.43	918.84	899.71	25.02	OSF1.50	10310.00	10266.30				MinPt-CtCt
958.16	58.48	918.82	899.67	24.99	OSF1.50	10320.00	10273.38				MinPts
963.78	59.17	923.98	904.61	24.85	OSF1.50	10440.42	10346.03				MinPt-O-SF
2202.28	100.95	2134.65	2101.33	33.03	OSF1.50	13540.00	10410.00				MinPt-CtCt

Offset Trajectory	Separation		Allow Dev. (ft)	Sep. Fact.	Controlling Rule	Reference Trajectory		Alert	Status
	Ct-Ct (ft)	MAS (ft)	EOU (ft)			MD (ft)	TVD (ft)		
	2201.44	156.11	2097.04	21.28	OSF1.50	15430.00	10410.00	MinPt-CtCt	
	2156.51	205.88	2018.93	15.78	OSF1.50	17110.00	10410.00	MinPt-CtCt	
	2157.10	207.71	2018.30	15.64	OSF1.50	17180.00	10410.00	MINPT-O-EOU	
	2157.93	208.74	2018.44	15.57	OSF1.50	17220.00	10410.00	MinPt-O-ADP	
	2165.48	215.82	2021.27	15.11	OSF1.50	17480.00	10410.00	MinPt-O-ADP	
	2173.52	223.56	2024.15	14.64	OSF1.50	17720.00	10410.00	MinPt-O-ADP	
	2186.33	260.38	2012.42	12.64	OSF1.50	18940.00	10410.00	MinPt-CtCt	
	2189.42	278.71	2003.29	11.82	OSF1.50	19550.00	10410.00	MinPt-CtCt	
	2187.08	291.83	1982.20	11.27	OSF1.50	19990.00	10410.00	MinPt-CtCt	
	2190.41	305.19	1966.62	10.80	OSF1.50	20440.72	10410.00	MinPts	

Final Surveys - Cimarex Vaca
Draw 20-17 Federal #3H MWD
0ft-22454' (Surcon Corrected)
(Def Survey)

	99.96	32.81	98.83	67.15	N/A	MAS = 10.00 (m)	0.00	0.00	Surface	Pass
	99.96	32.81	98.82	67.15	24336.99	MAS = 10.00 (m)	23.00	23.00	WRP	
	99.82	32.81	98.01	67.01	144.71	MAS = 10.00 (m)	190.00	190.00	MINPT-O-EOU	
	99.66	32.81	97.34	66.85	76.38	MAS = 10.00 (m)	310.00	310.00	MinPts	
	99.70	32.81	97.30	66.90	71.50	MAS = 10.00 (m)	330.00	330.00	MINPT-O-EOU	
	103.99	32.81	99.73	71.18	31.76	MAS = 10.00 (m)	770.00	770.00	MinPts	
	102.00	32.81	94.29	69.19	15.10	MAS = 10.00 (m)	1540.00	1540.00	MinPts	
	71.51	32.81	59.57	38.70	6.48	MAS = 10.00 (m)	2660.00	2659.92	MinPt-O-SF	
	71.27	32.81	59.40	38.46	6.48	MAS = 10.00 (m)	2690.00	2689.86	MinPts	
	535.90	56.86	497.65	479.03	14.37	OSF1.50	10340.00	10287.08	MinPts	
	537.00	57.09	498.60	479.91	14.34	OSF1.50	10380.00	10312.60	MinPt-O-SF	
	2209.27	81.84	2154.39	2127.43	40.97	OSF1.50	13000.00	10410.00	MinPt-CtCt	
	2210.24	84.77	2153.40	2125.48	39.55	OSF1.50	13110.00	10410.00	MINPT-O-EOU	
	2211.33	86.09	2153.61	2125.24	38.96	OSF1.50	13160.00	10410.00	MinPt-O-ADP	
	2221.43	96.81	2156.56	2124.62	34.76	OSF1.50	13530.00	10410.00	MINPT-O-EOU	
	2225.10	104.05	2155.41	2121.05	32.37	OSF1.50	13780.00	10410.00	MINPT-O-EOU	
	2226.65	108.09	2154.27	2118.56	31.17	OSF1.50	13910.00	10410.00	MinPt-CtCt	
	2228.43	114.85	2151.54	2113.58	29.34	OSF1.50	14150.00	10410.00	MINPT-O-EOU	
	2229.31	115.89	2151.72	2113.42	29.09	OSF1.50	14190.00	10410.00	MinPt-O-ADP	
	2234.42	120.54	2153.73	2113.86	28.02	OSF1.50	14350.00	10410.00	MinPt-O-ADP	
	2233.52	150.55	2132.82	2082.97	22.39	OSF1.50	15350.00	10410.00	MinPt-CtCt	
	2226.26	167.50	2114.27	2058.76	20.05	OSF1.50	15920.00	10410.00	MINPT-O-EOU	
	2227.65	171.92	2112.71	2055.73	19.54	OSF1.50	16080.00	10410.00	MinPt-CtCt	
	2224.38	183.30	2101.85	2041.08	18.29	OSF1.50	16450.00	10410.00	MinPt-CtCt	
	2225.67	191.34	2097.78	2034.33	17.53	OSF1.50	16720.00	10410.00	MinPt-CtCt	
	2231.04	232.30	2075.84	1998.74	14.46	OSF1.50	18090.00	10410.00	MinPt-CtCt	
	2231.41	243.35	2068.85	1988.06	13.80	OSF1.50	18460.00	10410.00	MinPt-CtCt	
	2227.02	264.93	2050.07	1982.09	12.65	OSF1.50	19180.00	10410.00	MinPt-CtCt	
	2228.07	274.81	2044.53	1953.26	12.20	OSF1.50	19510.00	10410.00	MinPt-CtCt	
	2227.73	299.09	2028.01	1928.64	11.20	OSF1.50	20320.00	10410.00	MinPt-CtCt	
	2225.64	302.99	2023.32	1922.66	11.05	OSF1.50	20440.72	10410.00	MinPts	

Final Surveys - Cimarex Vaca
Draw 20-17 Federal #13H
MWD 0ft-22542ft (Surcon
Corrected) (Def Survey)

	1279.82	32.81	1277.84	1247.01	N/A	MAS = 10.00 (m)	0.00	0.00	MinPts	Pass
	1279.82	32.81	1277.83	1247.01	99679.97	MAS = 10.00 (m)	23.00	23.00	WRP	
	1280.11	32.81	1277.45	1247.30	1869.11	MAS = 10.00 (m)	190.00	190.00	MINPT-O-EOU	
	1091.77	32.81	1078.80	1058.96	92.87	MAS = 10.00 (m)	2600.00	2599.98	MinPt-O-SF	

Offset Trajectory		Separation		Allow Dev. (ft)	Sep. Fact.	Controlling Rule	Reference Trajectory		Risk Level		Alert	Status
Ct-Ct (ft)	MAS (ft)	EOU (ft)	MD (ft)				TVD (ft)	Alert	Minor	Major		
996.37	32.81	984.59	963.56	95.01	MAS = 10.00 (m)	OSF1.50	3190.00	3186.60	MinPt-O-SF			
283.36	56.24	245.07	227.12	7.83		OSF1.50	9630.00	9622.12				MinPt-CtCt
283.58	56.85	244.89	226.73	7.74		OSF1.50	9720.00	9712.12				MINPT-O-EOU
283.81	57.12	244.93	226.68	7.71		OSF1.50	9760.00	9752.12				MinPt-O-ADP
283.50	59.69	242.91	223.82	7.36		OSF1.50	10180.00	10162.19				MinPt-CtCt
283.51	59.74	242.87	223.77	7.36		OSF1.50	10190.00	10170.91				MINPT-O-EOU
283.99	59.75	242.87	223.77	7.35		OSF1.50	10190.42	10171.27				MinPt-O-ADP
2129.69	59.91	243.24	224.07	7.35		OSF1.50	10220.00	10196.41				MinPt-O-SF
2131.89	69.31	2083.16	2060.38	46.74		OSF1.50	12600.00	10410.00				MinPt-CtCt
2133.62	75.33	2081.34	2056.56	42.99		OSF1.50	12820.00	10410.00				MINPT-O-EOU
2153.81	77.51	2081.62	2056.11	41.80	OSF1.50	12900.00	10410.00	MinPt-O-ADP				
2153.81	96.06	2089.45	2057.76	33.97	OSF1.50	13530.00	10410.00	MinPt-CtCt				
2156.11	109.20	2082.98	2046.91	29.87	OSF1.50	13980.00	10410.00	MinPt-CtCt				
2156.08	121.02	2075.08	2035.07	26.93	OSF1.50	14380.00	10410.00	MinPt-CtCt				
2157.63	134.66	2067.54	2022.98	24.20	OSF1.50	14840.00	10410.00	MinPt-CtCt				
2158.28	136.44	2066.99	2021.84	23.89	OSF1.50	14910.00	10410.00	MINPT-O-EOU				
2158.94	137.19	2067.14	2021.74	23.76	OSF1.50	14940.00	10410.00	MinPt-O-ADP				
2140.02	175.42	2022.74	1964.60	18.39	OSF1.50	16210.00	10410.00	MinPt-CtCt				
2139.03	185.00	2015.37	1954.04	17.43	OSF1.50	16530.00	10410.00	MinPt-CtCt				
2139.79	187.35	2014.56	1952.44	17.21	OSF1.50	16620.00	10410.00	MINPT-O-EOU				
2141.21	195.46	2010.58	1945.75	16.51	OSF1.50	16880.00	10410.00	MinPt-CtCt				
2142.29	198.72	2009.48	1943.56	16.24	OSF1.50	17000.00	10410.00	MINPT-O-EOU				
2144.59	201.52	2009.92	1943.08	16.03	OSF1.50	17100.00	10410.00	MinPt-O-ADP				
2136.96	228.41	1984.35	1908.54	14.09	OSF1.50	17980.00	10410.00	MinPt-CtCt				
2124.66	259.02	1951.65	1865.64	12.35	OSF1.50	19000.00	10410.00	MinPt-CtCt				
2124.77	264.42	1948.16	1860.35	12.09	OSF1.50	19180.00	10410.00	MinPt-CtCt				
2117.23	298.36	1917.99	1818.86	10.67	OSF1.50	20310.00	10410.00	MinPt-CtCt				
2116.99	302.42	1915.05	1814.57	10.53	OSF1.50	20440.72	10410.00	MinPts				

Final Surveys - Cimarex Vaca
Draw 20-17 Federal #8H MWD
0ft-22328ft (Surcon Corrected)
(Def Survey)

Horizontal (Across Contour) (Del Survey)										Pass	
1299.81	32.81	1298.68	1267.00		N/A	MAS = 10.00 (m)	0.00	0.00		MinPts	
1299.82	32.81	1298.67	1267.01	103327.95		MAS = 10.00 (m)	23.00	23.00		WRP	
1300.36	32.81	1298.05	1267.55	1101.90		MAS = 10.00 (m)	310.00	310.00		MinPts	
1301.20	32.81	1297.55	1268.40	514.55		MAS = 10.00 (m)	590.00	590.00		MINPT-O-EOU	
1296.00	32.81	1288.03	1263.20	189.29		MAS = 10.00 (m)	1560.00	1560.00		MinPts	
1296.15	32.81	1287.92	1263.34	182.49		MAS = 10.00 (m)	1610.00	1610.00		MINPT-O-EOU	
1236.27	32.81	1223.94	1203.46	110.65		MAS = 10.00 (m)	2600.00	2599.98		MinPt-O-SF	
1145.56	32.81	1134.57	1112.75	117.39		MAS = 10.00 (m)	3220.00	3216.37		MinPt-O-SF	
701.90	49.46	668.28	652.44	22.09		OSF1.50	9090.00	9082.12		MinPt-CtCt	
702.16	50.33	667.96	651.83	21.70		OSF1.50	9220.00	9212.12		MINPT-O-EOU	
703.59	52.20	668.15	651.39	20.93		OSF1.50	9500.00	9492.12		MinPt-O-ADP	
689.02	56.77	660.53	642.25	19.07		OSF1.50	10250.00	10220.88		MinPts	
702.16	57.26	663.36	644.90	18.97		OSF1.50	10340.00	10287.08		MinPt-O-SF	
2057.12	69.25	2010.62	1987.87	45.18		OSF1.50	12510.00	10410.00		MinPt-CtCt	
2058.80	75.98	2007.81	1982.81	41.16		OSF1.50	12760.00	10410.00		MINPT-O-EOU	
2061.67	101.48	1993.68	1960.19	30.76		OSF1.50	13650.00	10410.00		MinPt-CtCt	
2061.40	106.41	1990.13	1954.99	29.32		OSF1.50	13820.00	10410.00		MinPt-CtCt	
2062.72	111.64	1987.97	1951.08	27.95		OSF1.50	14000.00	10410.00		MinPt-CtCt	
2059.45	121.86	1977.89	1937.60	25.55		OSF1.50	14350.00	10410.00		MinPt-CtCt	
2056.83	128.62	1970.76	1928.21	24.16		OSF1.50	14580.00	10410.00		MinPt-CtCt	
2058.81	135.36	1968.25	1923.45	22.97		OSF1.50	14820.00	10410.00		MINPT-O-EOU	

Pass

Offset Trajectory	Separation		Allow Dev. (ft)	Sep. Fact.	Controlling Rule	Reference Trajectory		Risk Level		Alert	Status
	Ct-Ct (ft)	MAS (ft)	EOU (ft)			MD (ft)	TVD (ft)	Alert	Minor	Major	
2059.69	136.41	1988.42	1923.27	22.80	OSF1.50	14860.00	10410.00				MinPt-O-ADP
2060.58	139.46	1967.28	1921.13	22.31	OSF1.50	14950.00	10410.00				MinPt-CtCt
2060.83	145.36	1963.59	1915.47	21.40	OSF1.50	15150.00	10410.00				MinPt-CtCt
2053.62	162.37	1945.04	1891.25	19.08	OSF1.50	15720.00	10410.00				MinPt-CtCt
2054.28	164.47	1944.31	1889.81	18.84	OSF1.50	15800.00	10410.00				MINPT-O-EOU
2054.91	165.23	1944.43	1889.69	18.76	OSF1.50	15830.00	10410.00				MinPt-O-ADP
2095.84	186.04	1971.48	1909.79	16.98	OSF1.50	16520.00	10410.00				MinPt-CtCt
2094.69	192.62	1965.95	1902.07	16.39	OSF1.50	16740.00	10410.00				MinPt-CtCt
2095.30	194.39	1965.38	1900.91	16.24	OSF1.50	16810.00	10410.00				MINPT-O-EOU
2095.96	195.14	1965.54	1900.82	16.19	OSF1.50	16840.00	10410.00				MinPt-O-ADP
2095.96	202.12	1960.89	1893.84	15.62	OSF1.50	17060.00	10410.00				MinPt-CtCt
2080.70	218.59	1934.65	1862.11	14.34	OSF1.50	17610.00	10410.00				MinPt-CtCt
2081.29	222.79	1932.44	1858.51	14.07	OSF1.50	17750.00	10410.00				MinPt-CtCt
2082.14	225.18	1931.69	1856.95	13.92	OSF1.50	17840.00	10410.00				MINPT-O-EOU
2083.26	228.28	1930.74	1854.98	13.74	OSF1.50	17930.00	10410.00				MinPt-CtCt
2083.87	230.39	1929.96	1853.49	13.62	OSF1.50	18010.00	10410.00				MINPT-O-EOU
2084.71	231.42	1930.10	1853.29	13.56	OSF1.50	18050.00	10410.00				MinPt-O-ADP
2079.58	249.91	1912.64	1829.67	12.53	OSF1.50	18650.00	10410.00				MinPt-CtCt
2073.83	260.92	1899.55	1812.91	11.96	OSF1.50	19020.00	10410.00				MinPt-CtCt
2070.15	272.59	1888.10	1797.56	11.43	OSF1.50	19410.00	10410.00				MinPt-CtCt
2050.16	290.58	1896.11	1759.58	10.61	OSF1.50	20010.00	10410.00				MinPt-CtCt
2048.77	300.25	1848.27	1748.52	10.26	OSF1.50	20330.00	10410.00				MinPt-CtCt
2049.74	303.20	1847.27	1746.54	10.17	OSF1.50	20440.00	10410.00				MINPT-O-EOU
2049.75	303.22	1847.27	1746.53	10.17	OSF1.50	20440.72	10410.00				MinPts

Cimarex Vaca Draw 20-17
Federal #30H Rev1 RM
20Feb20 (Def Plan)

Pass									
739.21	32.81	737.92	706.40	N/A	MAS = 10.00 (m)	0.00	0.00		Surface
739.21	32.81	737.91	706.40	83030.99	MAS = 10.00 (m)	23.00	23.00		WRP
739.21	32.81	725.79	706.40	60.80	MAS = 10.00 (m)	1990.00	1990.00		MinPts
739.25	32.81	725.74	706.44	60.37	MAS = 10.00 (m)	2010.00	2010.00		MINPT-O-EOU
773.50	32.81	758.55	740.69	56.49	MAS = 10.00 (m)	2500.00	2500.00		MinPt-O-SF
918.07	32.81	902.71	885.26	65.16	MAS = 10.00 (m)	4000.00	3982.12		MinPt-O-SF
1329.10	43.48	1299.68	1285.62	47.20	MAS = 10.00 (m)	6450.00	6442.12		MinPt-O-SF
1348.49	65.93	1304.11	1282.56	31.26	OSF1.50	9910.00	9902.12		MINPT-O-EOU
1358.55	66.00	1304.12	1282.55	31.23	OSF1.50	9920.00	9912.12		MinPt-O-ADP
1358.80	67.14	1313.61	1291.66	30.92	OSF1.50	10100.00	10089.16		MinPt-O-SF
1466.89	348.80	1233.92	1118.08	6.33	OSF1.50	20440.72	10410.00		MinPts

Cimarex Vaca Draw 20-17
Federal #29H Rev1 RM
20Feb20 (Def Plan)

Pass									
759.23	32.81	757.94	726.42	N/A	MAS = 10.00 (m)	0.00	0.00		Surface
759.23	32.81	757.94	726.42	94759.71	MAS = 10.00 (m)	23.00	23.00		WRP
759.23	32.81	748.95	726.42	84.28	MAS = 10.00 (m)	1490.00	1490.00		MinPts
759.27	32.81	748.90	726.46	83.46	MAS = 10.00 (m)	1510.00	1510.00		MINPT-O-EOU
872.84	32.81	858.86	840.03	68.65	MAS = 10.00 (m)	2500.00	2500.00		MinPt-O-SF
1453.67	48.94	1420.61	1404.72	45.71	OSF1.50	6750.00	6742.12		MinPt-O-SF
1471.20	67.11	1426.03	1404.09	33.50	OSF1.50	9970.00	9962.10		MINPT-O-EOU
1471.33	67.26	1426.06	1404.07	33.42	OSF1.50	9990.00	9982.03		MinPt-O-ADP
1491.46	69.57	1444.66	1421.90	32.74	OSF1.50	10340.00	10287.08		MinPt-O-SF
1597.71	337.89	1372.02	1259.82	7.11	OSF1.50	20440.72	10410.00		MinPts

Offset Trajectory		Separation		Allow	Sep.	Controlling		Reference Trajectory			Risk Level		Alert	Status
Ct-Ct (ft)	MAS (ft)	EOU (ft)	Dev. (ft)	Fact.	Rule	MD (ft)	TVD (ft)	Alert	Minor	Major				
Final Surveys - Cimarex Vaca Draw 20-17 Federal #7H MWD 0ft-22544ft (Surcon Corrected) (Def Survey)														
1319.81	32.81	1318.63	1287.00	N/A	MAS = 10.00 (m)	0.00	0.00				MinPts	Pass		
1319.84	32.81	1318.64	1287.03	88357.43	MAS = 10.00 (m)	23.00	23.00				WRP			
1319.88	32.81	1318.64	1287.07	21326.66	MAS = 10.00 (m)	40.00	40.00				MINPT-O-EQU			
1314.39	32.81	1302.08	1281.58	116.71	MAS = 10.00 (m)	2600.00	2599.98				MinPt-O-SF			
1239.48	32.81	1228.72	1206.67	128.40	MAS = 10.00 (m)	3330.00	3325.55				MinPt-O-SF			
1185.35	32.81	1174.57	1152.54	123.26	MAS = 10.00 (m)	4000.00	3992.12				MinPt-O-SF			
1185.23	32.81	1174.49	1152.42	123.62	MAS = 10.00 (m)	4020.00	4012.12				MINPT-O-EQU			
1185.23	32.81	1174.49	1152.42	123.70	MAS = 10.00 (m)	4024.01	4016.13				MinPts			
1185.82	32.81	1173.98	1153.01	111.15	MAS = 10.00 (m)	4380.00	4372.12				MinPts			
1185.91	32.81	1173.92	1153.10	109.52	MAS = 10.00 (m)	4420.00	4412.12				MINPT-O-EQU			
1179.19	32.81	1165.93	1146.33	97.46	MAS = 10.00 (m)	4720.00	4712.12				MinPts			
1179.22	32.81	1165.91	1146.41	97.15	MAS = 10.00 (m)	4730.00	4722.12				MINPT-O-EQU			
1116.99	39.01	1090.55	1077.97	44.35	OSF1.50	7760.00	7752.12				MinPt-CtCt			
1117.11	39.33	1090.46	1077.78	43.98	OSF1.50	7810.00	7802.12				MINPT-O-EQU			
1117.89	40.65	1090.36	1077.24	42.55	OSF1.50	8010.00	8002.12				MINPT-O-EQU			
1118.25	41.50	1090.16	1076.75	41.65	OSF1.50	8140.00	8132.12				MINPT-O-EQU			
1118.36	41.63	1090.18	1076.72	41.52	OSF1.50	8160.00	8152.12				MinPt-O-ADP			
1142.87	52.80	1107.26	1090.07	33.20	OSF1.50	9850.00	9842.12				MinPt-CtCt			
1142.58	54.83	1105.62	1087.75	31.94	OSF1.50	10180.00	10162.19				MinPt-CtCt			
1142.61	54.95	1105.57	1087.66	31.86	OSF1.50	10200.00	10179.52				MINPT-O-EQU			
1142.65	55.01	1105.58	1087.65	31.83	OSF1.50	10210.00	10188.02				MinPt-O-ADP			
1156.12	56.34	1118.18	1099.77	31.38	OSF1.50	10440.42	10346.03				MinPt-O-SF			
2365.20	69.76	2318.36	2295.44	51.56	OSF1.50	12410.00	10410.00				MINPT-O-EQU			
2366.41	71.23	2318.60	2295.18	50.51	OSF1.50	12470.00	10410.00				MinPt-O-ADP			
2378.02	80.21	2324.21	2297.80	45.00	OSF1.50	12800.00	10410.00				MinPt-O-ADP			
2384.02	85.14	2326.93	2298.88	42.48	OSF1.50	12970.00	10410.00				MINPT-O-EQU			
2385.55	86.99	2327.23	2298.56	41.59	OSF1.50	13040.00	10410.00				MinPt-O-ADP			
2387.80	104.46	2317.83	2283.33	34.60	OSF1.50	13640.00	10410.00				MinPt-CtCt			
2385.02	109.84	2311.47	2275.18	32.85	OSF1.50	13830.00	10410.00				MinPt-CtCt			
2385.53	111.25	2311.03	2274.27	32.44	OSF1.50	13890.00	10410.00				MINPT-O-EQU			
2385.13	114.40	2308.53	2270.73	31.53	OSF1.50	13990.00	10410.00				MinPt-CtCt			
2385.55	115.83	2308.00	2269.72	31.14	OSF1.50	14050.00	10410.00				MINPT-O-EQU			
2386.12	116.54	2308.10	2269.58	30.96	OSF1.50	14080.00	10410.00				MinPt-O-ADP			
2388.79	128.94	2302.50	2259.85	27.99	OSF1.50	14490.00	10410.00				MinPt-CtCt			
2388.41	133.09	2299.35	2255.32	27.11	OSF1.50	14630.00	10410.00				MinPt-CtCt			
2388.75	134.27	2298.91	2254.49	26.87	OSF1.50	14680.00	10410.00				MINPT-O-EQU			
2389.32	134.96	2299.02	2254.36	26.74	OSF1.50	14710.00	10410.00				MinPt-O-ADP			
2418.92	185.05	2295.22	2233.87	19.70	OSF1.50	16390.00	10410.00				MinPt-CtCt			
2416.58	197.51	2284.58	2219.07	18.44	OSF1.50	16810.00	10410.00				MinPt-CtCt			
2417.45	208.92	2277.84	2208.53	17.43	OSF1.50	17190.00	10410.00				MinPt-CtCt			
2413.21	240.29	2252.69	2172.92	15.12	OSF1.50	18240.00	10410.00				MinPt-CtCt			
2413.17	245.39	2249.25	2167.78	14.80	OSF1.50	18410.00	10410.00				MinPt-CtCt			
2412.28	253.80	2242.75	2158.48	14.31	OSF1.50	18690.00	10410.00				MinPt-CtCt			
2414.94	263.12	2239.20	2151.82	13.81	OSF1.50	19000.00	10410.00				MinPt-CtCt			
2414.05	270.31	2233.52	2143.74	13.44	OSF1.50	19240.00	10410.00				MinPt-CtCt			
2409.55	283.16	2220.45	2126.39	12.80	OSF1.50	19670.00	10410.00				MinPt-CtCt			
2408.31	290.40	2214.38	2117.91	12.48	OSF1.50	19910.00	10410.00				MinPt-CtCt			
2411.48	302.47	2209.50	2109.01	11.99	OSF1.50	20310.00	10410.00				MinPt-CtCt			
2411.35	306.48	2206.70	2104.86	11.83	OSF1.50	20440.72	10410.00				MinPts			

Offset Trajectory		Separation		Allow	Sep.	Controlling	Reference Trajectory		Alert	Risk Level		Alert	Status
Ct-Ct (ft)	MAS (ft)	EOU (ft)	Dev. (ft)	Fact.	Rule	MD (ft)	TVD (ft)			Minor	Major		
Final Surveys - Cimarex Vaca Draw 20-17 Federal #43H MWD 0ft-19167ft (Surcon Corrected) (Def Survey)													
1140.31	32.81	1139.02	1107.50	N/A	MAS = 10.00 (m)	0.00	0.00						Surface
1140.29	32.81	1139.00	1107.48	N/A	MAS = 10.00 (m)	23.00	23.00						WRP
1139.24	32.81	1135.58	1106.43	480.67	MAS = 10.00 (m)	570.00	570.00						MinPts
1138.74	32.81	1133.14	1105.93	263.78	MAS = 10.00 (m)	1030.00	1030.00						MinPts
1138.75	32.81	1132.98	1105.95	253.67	MAS = 10.00 (m)	1070.00	1070.00						MINPT-O-EOU
1123.61	32.81	1111.56	1090.80	102.90	MAS = 10.00 (m)	2560.00	2560.00						MinPts
1123.82	32.81	1111.74	1091.01	102.82	MAS = 10.00 (m)	2600.00	2599.98						MinPt-O-SF
1249.72	32.81	1239.40	1216.91	135.99	MAS = 10.00 (m)	4000.00	3992.12						MinPt-O-SF
1246.01	32.81	1234.16	1213.20	116.14	MAS = 10.00 (m)	4490.00	4482.12						MinPts
1227.81	32.81	1234.06	1213.27	114.33	MAS = 10.00 (m)	4530.00	4522.12						MINPT-O-EOU
1210.41	32.81	1211.08	1195.00	78.09	MAS = 10.00 (m)	5630.00	5622.12						MinPts
1210.43	46.07	1179.38	1164.36	40.38	OSF1.50	8860.00	8852.12						MinPt-CtCt
1210.48	46.13	1179.38	1164.34	40.21	OSF1.50	8880.00	8872.12						MINPT-O-EOU
1239.55	48.27	1207.04	1191.29	39.32	OSF1.50	9270.00	9262.12						MinPt-O-ADP
1632.23	47.96	1599.91	1584.27	52.12	OSF1.50	10900.00	10410.00						MinPt-CtCt
1632.29	48.13	1599.86	1584.15	51.94	OSF1.50	10920.00	10410.00						MinPts
1625.63	65.84	1581.41	1559.80	37.58	OSF1.50	11940.00	10410.00						MINPT-O-EOU
1628.95	72.56	1580.25	1556.39	34.12	OSF1.50	12240.00	10410.00						MinPt-CtCt
1607.09	108.49	1534.44	1498.60	22.41	OSF1.50	13600.00	10410.00						MINPT-O-EOU
1607.82	110.83	1533.61	1496.99	21.94	OSF1.50	13700.00	10410.00						MINPT-O-EOU
1610.98	116.69	1532.86	1494.29	20.87	OSF1.50	13910.00	10410.00						MINPT-O-EOU
1604.66	141.23	1510.18	1463.43	17.15	OSF1.50	14750.00	10410.00						MinPt-CtCt
1605.31	143.34	1509.42	1461.96	16.90	OSF1.50	14840.00	10410.00						MINPT-O-EOU
1606.04	146.39	1508.12	1459.65	16.56	OSF1.50	14930.00	10410.00						MinPt-CtCt
1603.35	156.56	1498.65	1446.79	15.45	OSF1.50	15280.00	10410.00						MinPt-CtCt
1605.33	161.50	1497.33	1443.82	14.99	OSF1.50	15470.00	10410.00						MINPT-O-EOU
1608.13	171.99	1493.14	1436.14	14.10	OSF1.50	15810.00	10410.00						MinPt-CtCt
1606.00	186.42	1481.39	1419.58	12.98	OSF1.50	16300.00	10410.00						MinPt-CtCt
1597.60	211.53	1456.26	1386.07	11.37	OSF1.50	17150.00	10410.00						MinPt-CtCt
1598.94	215.42	1455.00	1383.52	11.18	OSF1.50	17300.00	10410.00						MINPT-O-EOU
1601.27	232.36	1446.03	1368.91	10.37	OSF1.50	17850.00	10410.00						MinPt-CtCt
1589.14	266.31	1411.27	1322.83	8.98	OSF1.50	18990.00	10410.00						MinPt-CtCt
1589.50	267.63	1410.75	1321.87	8.94	OSF1.50	19050.00	10410.00						MINPT-O-EOU
1590.01	268.27	1410.84	1321.74	8.92	OSF1.50	19080.00	10410.00						MinPt-O-ADP
1593.84	296.49	1395.86	1297.36	8.09	OSF1.50	20000.00	10410.00						MinPt-CtCt
1594.41	298.38	1395.16	1296.03	8.04	OSF1.50	20080.00	10410.00						MINPT-O-EOU
1595.15	299.30	1395.29	1295.86	8.02	OSF1.50	20120.00	10410.00						MinPt-O-ADP
1606.50	308.69	1400.37	1297.80	7.83	OSF1.50	20440.72	10410.00						MinPts

Final Surveys - Cimarex Vaca Draw 20-17 Federal #44H MWD 0ft-19884ft (Surcon Corrected) (Def Survey)													
1160.28	32.81	1158.99	1127.47	N/A	MAS = 10.00 (m)	0.00	0.00						Surface
1160.25	32.81	1158.97	1127.44	N/A	MAS = 10.00 (m)	23.00	23.00						WRP
1160.20	32.81	1158.06	1127.35	1417.41	MAS = 10.00 (m)	220.00	220.00						MinPts
1160.81	32.81	1155.37	1128.00	279.39	MAS = 10.00 (m)	990.00	990.00						MinPts
1160.80	32.81	1155.01	1127.99	257.54	MAS = 10.00 (m)	1070.00	1070.00						MINPT-O-EOU
1154.66	32.81	1144.26	1121.85	124.54	MAS = 10.00 (m)	2110.00	2110.00						MinPts
1154.77	32.81	1144.17	1121.96	121.84	MAS = 10.00 (m)	2160.00	2160.00						MINPT-O-EOU

Offset Trajectory	Separation		Allow Dev. (ft)	Sep. Fact.	Controlling Rule	Reference Trajectory		Risk Level		Alert	Status
	Ct-Ct (ft)	MAS (ft)	EOU (ft)			MD (ft)	TVD (ft)	Alert	Major		
1162.62	32.81	1150.48	1129.81	105.52	MAS = 10.00 (m)	2600.00	2599.98			MinPt-O-SF	
1453.03	32.81	1442.49	1420.22	154.32	MAS = 10.00 (m)	4000.00	3992.12			MinPt-O-SF	
1819.32	50.45	1785.34	1768.87	55.18	OSF1.50	9400.00	9392.12			MinPt-O-SF	
1814.68	50.68	1780.55	1764.00	54.78	OSF1.50	9460.00	9452.12			MinPt-O-SF	
1788.77	53.09	1753.04	1735.68	51.50	OSF1.50	9820.00	9812.12			MinPt-CtCt	
1788.80	53.16	1753.02	1735.64	51.44	OSF1.50	9830.00	9822.12			MinPts	
1801.99	58.53	1762.62	1743.45	46.97	OSF1.50	10800.00	10410.00			MinPt-CtCt	
1802.07	58.75	1762.56	1743.32	46.80	OSF1.50	10820.00	10410.00			MINPT-O-EOU	
1802.15	58.86	1762.58	1743.30	46.71	OSF1.50	10830.00	10410.00			MinPt-O-ADP	
1792.94	93.52	1730.26	1699.41	29.05	OSF1.50	12630.00	10410.00			MinPt-CtCt	
1793.45	95.21	1729.65	1698.24	28.53	OSF1.50	12710.00	10410.00			MINPT-O-EOU	
1793.78	95.61	1729.72	1698.18	28.42	OSF1.50	12730.00	10410.00			MinPt-O-ADP	
1817.26	108.43	1744.65	1708.84	25.36	OSF1.50	13230.00	10410.00			MINPT-O-EOU	
1818.03	109.33	1744.81	1708.70	25.16	OSF1.50	13270.00	10410.00			MinPt-O-ADP	
1794.87	146.76	1696.70	1648.11	18.46	OSF1.50	14620.00	10410.00			MinPt-CtCt	
1794.31	156.41	1689.71	1637.90	17.31	OSF1.50	14960.00	10410.00			MinPt-CtCt	
1792.22	162.71	1683.41	1629.50	16.61	OSF1.50	15180.00	10410.00			MinPt-CtCt	
1795.55	181.71	1674.08	1613.84	14.89	OSF1.50	15840.00	10410.00			MinPt-CtCt	
1796.07	183.11	1673.67	1612.96	14.78	OSF1.50	15900.00	10410.00			MINPT-O-EOU	
1796.66	183.79	1673.81	1612.87	14.73	OSF1.50	15930.00	10410.00			MinPt-O-ADP	
1798.52	190.42	1671.24	1608.09	14.23	OSF1.50	16140.00	10410.00			MinPt-CtCt	
1798.96	191.84	1670.74	1607.12	14.13	OSF1.50	16200.00	10410.00			MINPT-O-EOU	
1799.51	192.54	1670.82	1606.97	14.08	OSF1.50	16230.00	10410.00			MinPt-O-ADP	
1803.01	201.07	1668.63	1601.94	13.51	OSF1.50	16520.00	10410.00			MINPT-O-EOU	
1779.91	234.98	1622.93	1544.93	11.40	OSF1.50	17680.00	10410.00			MinPt-CtCt	
1780.28	236.15	1622.52	1544.13	11.35	OSF1.50	17710.00	10410.00			MINPT-O-EOU	
1780.82	236.83	1622.61	1544.00	11.32	OSF1.50	17740.00	10410.00			MinPt-O-ADP	
1789.95	251.59	1621.93	1538.40	10.71	OSF1.50	18220.00	10410.00			MinPt-CtCt	
1790.72	253.83	1621.17	1536.89	10.62	OSF1.50	18310.00	10410.00			MINPT-O-EOU	
1799.39	265.32	1622.18	1534.07	10.21	OSF1.50	18700.00	10410.00			MINPT-O-EOU	
1798.49	313.70	1577.03	1472.79	8.56	OSF1.50	20310.00	10410.00			MinPt-CtCt	
1787.17	317.41	1575.24	1469.76	8.47	OSF1.50	20440.72	10410.00			MinPts	
Final Surveys - Cimarex Vaca Draw 20-17 Federal #45H Off- 19226ft (Surcon Corrected) (Def Survey)											
1180.25	32.81	1178.96	1147.44	N/A	MAS = 10.00 (m)	0.00	0.00			Surface	
1180.22	32.81	1178.93	1147.41	478340.58	MAS = 10.00 (m)	23.00	23.00			WRP	
1178.79	32.81	1176.01	1145.98	785.28	MAS = 10.00 (m)	350.00	350.00			MinPts	
1178.87	32.81	1175.95	1146.06	721.91	MAS = 10.00 (m)	380.00	380.00			MINPT-O-EOU	
1184.26	32.81	1178.23	1151.45	241.67	MAS = 10.00 (m)	1160.00	1160.00			MINPT-O-EOU	
1235.15	32.81	1222.92	1202.34	111.19	MAS = 10.00 (m)	2500.00	2500.00			MinPt-O-SF	
1251.40	32.81	1239.03	1218.59	111.27	MAS = 10.00 (m)	2600.00	2599.98			MinPt-O-SF	
1568.45	32.81	1556.96	1535.64	151.28	MAS = 10.00 (m)	4000.00	3992.12			MinPt-O-SF	
2154.65	45.27	2124.13	2109.38	73.00	OSF1.50	8350.00	8342.12			MinPt-O-ADP	
2156.05	47.02	2124.36	2109.03	70.27	OSF1.50	8650.00	8642.12			MINPT-O-EOU	
2156.28	48.49	2123.61	2107.79	68.10	OSF1.50	8890.00	8882.12			MinPt-CtCt	
2156.35	48.68	2123.56	2107.67	67.83	OSF1.50	8920.00	8912.12			MinPts	
2158.74	50.28	2124.89	2108.47	65.71	OSF1.50	9150.00	9142.12			MinPt-CtCt	
2158.77	50.34	2124.86	2108.42	65.62	OSF1.50	9160.00	9152.12			MINPT-O-EOU	
2158.82	50.41	2124.88	2108.41	65.53	OSF1.50	9170.00	9162.12			MinPt-O-ADP	
2194.48	52.67	2159.03	2141.82	63.71	OSF1.50	9590.00	9582.12			MinPt-O-SF	
2383.89	79.61	2330.48	2304.28	45.48	OSF1.50	12050.00	10410.00			MinPt-CtCt	

Final Surveys - Cimarex Vaca
Draw 20-17 Federal #45H Off-
19226ft (Surcon Corrected)
(Def Survey)

Pass

Offset Trajectory	Separation		Allow	Sep.	Controlling	Reference Trajectory		Risk Level		Alert	Status
	Ct-Ct (ft)	MAS (ft)	EOU (ft)			MD (ft)	TVD (ft)	Minor	Major		
	2352.87	128.15	2267.09	27.75	OSF1.50	13900.00	10410.00			MinPt-CtCt	
	2356.20	136.87	2264.61	26.01	OSF1.50	14230.00	10410.00			MINPT-O-EOU	
	2357.80	155.69	2253.66	22.86	OSF1.50	14870.00	10410.00			MinPt-CtCt	
	2346.73	176.75	2228.55	20.02	OSF1.50	15600.00	10410.00			MinPt-CtCt	
	2347.43	178.87	2227.85	19.79	OSF1.50	15690.00	10410.00			MINPT-O-EOU	
	2347.95	179.63	2227.86	19.71	OSF1.50	15720.00	10410.00			MINPT-O-EOU	
	2352.79	187.37	2227.53	18.93	OSF1.50	15990.00	10410.00			MINPT-O-EOU	
	2354.53	189.41	2227.92	18.74	OSF1.50	16070.00	10410.00			MinPt-O-ADP	
	2361.58	202.00	2226.57	17.62	OSF1.50	16490.00	10410.00			MINPT-O-EOU	
	2363.08	203.78	2226.88	17.47	OSF1.50	16560.00	10410.00			MinPt-O-ADP	
	2367.21	209.69	2227.08	17.01	OSF1.50	16750.00	10410.00			MINPT-O-EOU	
	2368.17	210.85	2227.27	16.92	OSF1.50	16800.00	10410.00			MinPt-O-ADP	
	2372.56	221.66	2224.44	16.12	OSF1.50	17140.00	10410.00			MinPt-CtCt	
	2370.90	227.87	2218.65	15.67	OSF1.50	17350.00	10410.00			MinPt-CtCt	
	2372.61	244.27	2209.43	14.62	OSF1.50	17900.00	10410.00			MinPt-CtCt	
	2345.79	260.57	2171.73	13.55	OSF1.50	18450.00	10410.00			MinPt-CtCt	
	2346.15	261.64	2171.38	13.50	OSF1.50	18500.00	10410.00			MINPT-O-EOU	
	2346.67	262.27	2171.49	13.47	OSF1.50	18530.00	10410.00			MinPt-O-ADP	
	2359.71	281.38	2171.79	12.62	OSF1.50	19140.00	10410.00			MinPt-CtCt	
	2358.28	292.46	2162.97	12.13	OSF1.50	19510.00	10410.00			MinPt-CtCt	
	2363.44	305.71	2159.29	11.63	OSF1.50	19980.00	10410.00			MINPT-O-EOU	
	2366.93	309.80	2160.05	11.49	OSF1.50	20130.00	10410.00			MinPt-O-ADP	
	2377.39	318.61	2164.64	11.22	OSF1.50	20440.72	10410.00			MinPt-O-SF	

Cimarex Vaca Draw 20-17

Federal #6H MWD

Final(Surcon Corrected) (Def

Survey)

Pass

1381.12	32.81	1379.14	1348.31	N/A	MAS = 10.00 (m)	0.00	0.00			Surface	
1381.09	32.81	1379.09	1348.29	57179.26	MAS = 10.00 (m)	23.00	23.00			WRP	
1377.48	32.81	1372.42	1344.67	447.49	MAS = 10.00 (m)	720.00	720.00			MinPts	
1378.13	32.81	1372.14	1345.32	343.02	MAS = 10.00 (m)	940.00	940.00			MINPT-O-EOU	
1359.40	32.81	1345.97	1326.59	118.68	MAS = 10.00 (m)	2600.00	2599.98			MinPt-O-SF	
1272.62	32.81	1260.81	1239.82	130.31	MAS = 10.00 (m)	4000.00	3992.12			MinPt-O-SF	
1272.55	32.81	1260.76	1239.74	130.68	MAS = 10.00 (m)	4020.00	4012.12			MINPT-O-EOU	
1272.55	32.81	1260.77	1239.74	130.76	MAS = 10.00 (m)	4024.01	4016.13			MinPts	
1269.02	32.81	1254.79	1236.21	104.19	MAS = 10.00 (m)	4730.00	4722.12			MinPts	
1269.03	32.81	1254.77	1236.23	103.90	MAS = 10.00 (m)	4740.00	4732.12			MINPT-O-EOU	
1321.30	35.37	1297.06	1285.93	59.27	OSF1.50	7130.00	7122.12			MinPt-CtCt	
1321.63	36.31	1296.76	1285.32	57.68	OSF1.50	7280.00	7272.12			MINPT-O-EOU	
1322.60	37.48	1296.95	1285.12	55.81	OSF1.50	7460.00	7452.12			MinPt-O-ADP	
1351.98	47.00	1319.99	1304.98	44.98	OSF1.50	8950.00	8942.12			MinPt-O-SF	
1871.57	48.35	1838.68	1823.23	60.48	OSF1.50	10270.00	10236.56			MinPt-O-SF	
1912.70	55.68	1874.93	1857.03	53.37	OSF1.50	11040.00	10410.00			MinPt-CtCt	
1912.83	56.05	1874.81	1856.78	53.01	OSF1.50	11070.00	10410.00			MINPT-O-EOU	
1912.93	56.18	1874.82	1856.76	52.89	OSF1.50	11080.00	10410.00			MinPt-O-ADP	
1927.35	66.21	1882.55	1861.14	44.96	OSF1.50	11590.00	10410.00			MINPT-O-EOU	
1927.80	66.74	1882.65	1861.06	44.61	OSF1.50	11620.00	10410.00			MinPt-O-ADP	
1915.29	78.54	1862.27	1836.75	37.48	OSF1.50	12130.00	10410.00			MinPt-CtCt	
1915.61	79.46	1861.98	1836.15	37.05	OSF1.50	12180.00	10410.00			MINPT-O-EOU	
1915.92	79.82	1862.04	1836.10	36.88	OSF1.50	12200.00	10410.00			MinPt-O-ADP	
1894.60	107.79	1822.08	1786.81	26.83	OSF1.50	13250.00	10410.00			MinPt-CtCt	
1894.86	108.52	1821.87	1786.36	26.65	OSF1.50	13290.00	10410.00			MINPT-O-EOU	
1895.03	108.70	1821.90	1786.32	26.61	OSF1.50	13300.00	10410.00			MinPt-O-ADP	

Offset Trajectory	Separation		Allow Dev. (ft)	Sep. Fact.	Controlling Rule	Reference Trajectory		Risk Level		Alert	Status
	Ct-Ct (ft)	MAS (ft)	EOU (ft)			MD (ft)	TVD (ft)	Alert	Major		
1914.20	123.16	1831.43	1791.04	23.67	OSF1.50	13800.00	10410.00			MinPt-CtCt	
1913.76	133.06	1824.39	1780.70	21.88	OSF1.50	14150.00	10410.00			MinPt-CtCt	
1912.49	152.32	1810.28	1760.16	19.06	OSF1.50	14820.00	10410.00			MinPt-CtCt	
1913.10	154.49	1809.45	1758.62	18.80	OSF1.50	14910.00	10410.00			MINPT-O-EOU	
1914.07	155.66	1809.64	1758.41	18.66	OSF1.50	14980.00	10410.00			MinPt-O-ADP	
1916.03	165.89	1804.77	1750.13	17.52	OSF1.50	15290.00	10410.00			MinPt-CtCt	
1913.63	183.39	1790.72	1730.25	15.81	OSF1.50	15890.00	10410.00			MinPt-CtCt	
1913.56	192.71	1784.43	1720.85	15.03	OSF1.50	16210.00	10410.00			MinPt-CtCt	
1913.51	197.70	1781.05	1715.81	14.85	OSF1.50	16380.00	10410.00			MinPt-CtCt	
1906.43	239.05	1746.41	1667.38	12.05	OSF1.50	17780.00	10410.00			MinPt-CtCt	
1905.72	311.60	1697.33	1594.12	9.22	OSF1.50	20210.00	10410.00			MinPt-CtCt	
1905.82	311.87	1697.24	1593.95	9.22	OSF1.50	20230.00	10410.00			MinPis	
1907.79	312.56	1698.76	1595.24	9.20	OSF1.50	20300.00	10410.00			MinPt-O-SF	
1919.50	312.72	1710.36	1606.78	9.26	OSF1.50	20440.72	10410.00			TD	

Cimarex Vaca Draw 20-17
Federal #1H Rev0 RM
10Apr17 (Non-Def Plan)

1421.08	32.81	1419.10	1388.27	N/A	MAS = 10.00 (m)	0.00	0.00			Surface	Pass
1421.08	32.81	1419.08	1388.27	103017.20	MAS = 10.00 (m)	23.00	23.00			WRP	
1316.81	89.20	1256.65	1227.61	22.63	OSF1.50	10340.00	10287.08			MinPt-CtCt	
1316.82	89.27	1256.62	1227.56	22.62	OSF1.50	10350.00	10293.70			MINPT-O-EOU	
1316.89	89.34	1256.64	1227.55	22.60	OSF1.50	10360.00	10300.16			MinPt-O-ADP	
1323.58	90.20	1262.78	1233.38	22.48	OSF1.50	10500.00	10372.53			MinPt-O-SF	
10155.21	97.78	10089.36	10057.43	158.97	OSF1.50	20440.72	10410.00			TD	

Cimarex Vaca Draw 20-17
Federal #SH Final
MWD(Surcon Corrected) (Def
Survey)

1401.10	32.81	1399.12	1368.30	N/A	MAS = 10.00 (m)	0.00	0.00			Surface	Pass
1401.09	32.81	1399.09	1368.28	72614.24	MAS = 10.00 (m)	23.00	23.00			WRP	
1399.19	32.81	1395.01	1366.38	634.05	MAS = 10.00 (m)	540.00	540.00			MinPis	
1399.28	32.81	1394.22	1366.47	453.60	MAS = 10.00 (m)	750.00	750.00			MinPis	
1399.51	32.81	1393.87	1366.70	382.13	MAS = 10.00 (m)	870.00	870.00			MINPT-O-EOU	
1401.53	32.81	1392.38	1368.72	195.23	MAS = 10.00 (m)	1650.00	1650.00			MinPis	
1401.61	32.81	1392.25	1368.80	189.52	MAS = 10.00 (m)	1700.00	1700.00			MINPT-O-EOU	
1417.00	32.81	1404.03	1384.19	128.83	MAS = 10.00 (m)	2600.00	2599.98			MinPt-O-SF	
1364.68	32.81	1353.41	1331.87	147.23	MAS = 10.00 (m)	3940.00	3932.13			MinPis	
1365.20	32.81	1353.84	1332.40	145.83	MAS = 10.00 (m)	4000.00	3992.12			MinPt-O-SF	
1373.82	32.81	1360.07	1341.01	116.81	MAS = 10.00 (m)	4700.00	4692.12			MinPis	
1373.89	32.81	1359.98	1341.09	115.26	MAS = 10.00 (m)	4740.00	4732.12			MINPT-O-EOU	
1401.52	32.81	1381.55	1368.71	77.78	MAS = 10.00 (m)	6150.00	6142.12			MinPis	
1401.59	32.81	1381.49	1368.78	77.24	MAS = 10.00 (m)	6180.00	6172.12			MINPT-O-EOU	
1422.81	43.59	1393.10	1379.23	51.22	OSF1.50	8370.00	8362.12			MinPt-CtCt	
1423.37	45.62	1392.29	1377.75	48.85	OSF1.50	8680.00	8672.12			MINPT-O-EOU	
1423.58	45.88	1392.34	1377.70	48.57	OSF1.50	8720.00	8712.12			MinPt-O-ADP	
1430.08	50.37	1395.84	1379.71	44.26	OSF1.50	9400.00	9392.12			MINPT-O-EOU	
1430.14	50.44	1395.85	1379.70	44.21	OSF1.50	9410.00	9402.12			MinPt-O-ADP	
1446.11	52.05	1410.76	1394.07	43.26	OSF1.50	9700.00	9692.12			MinPt-O-SF	
1594.20	64.44	1550.59	1529.77	38.24	OSF1.50	11160.00	10410.00			MinPt-CtCt	
1586.31	75.08	1535.60	1511.23	32.51	OSF1.50	11730.00	10410.00			MinPt-CtCt	
1586.61	75.95	1535.31	1510.65	32.13	OSF1.50	11780.00	10410.00			MINPT-O-EOU	
1586.92	76.30	1535.39	1510.62	31.99	OSF1.50	11800.00	10410.00			MinPt-O-ADP	

Offset Trajectory	Separation		Allow	Sep.	Controlling	Reference Trajectory		Risk Level		Alert	Status
	Ct-Ct (ft)	MAS (ft)	EOU (ft)	Fact.	Rule	MD (ft)	TVD (ft)	Minor	Major		
1584.98	94.72	1521.18	1490.26	25.60	OSF1.50	12570.00	10410.00			MinPt-CtCt	
1585.74	97.19	1520.29	1488.55	24.95	OSF1.50	12680.00	10410.00			MINPT-O-EOU	
1586.50	98.08	1520.45	1488.42	24.73	OSF1.50	12720.00	10410.00			MinPt-O-ADP	
1580.25	119.06	1500.22	1461.19	20.22	OSF1.50	13500.00	10410.00			MinPt-CtCt	
1580.62	120.19	1499.83	1460.43	20.03	OSF1.50	13550.00	10410.00			MINPT-O-EOU	
1581.16	120.86	1499.93	1460.30	19.92	OSF1.50	13580.00	10410.00			MinPt-O-ADP	
1588.94	136.78	1497.10	1452.17	17.66	OSF1.50	14150.00	10410.00			MINPT-O-EOU	
1592.51	142.14	1497.10	1450.38	17.02	OSF1.50	14340.00	10410.00			MINPT-O-EOU	
1580.64	161.77	1472.14	1418.88	14.82	OSF1.50	15020.00	10410.00			MinPt-CtCt	
1581.55	168.07	1468.84	1413.48	14.27	OSF1.50	15240.00	10410.00			MinPt-CtCt	
1573.50	204.78	1436.31	1388.71	11.62	OSF1.50	16500.00	10410.00			MinPt-CtCt	
1578.39	219.39	1431.47	1359.00	10.88	OSF1.50	17010.00	10410.00			MINPT-O-EOU	
1583.11	227.68	1430.67	1355.43	10.51	OSF1.50	17290.00	10410.00			MINPT-O-EOU	
1585.76	233.01	1429.76	1352.76	10.28	OSF1.50	17470.00	10410.00			MINPT-O-EOU	
1588.71	240.06	1428.01	1348.65	10.00	OSF1.50	17710.00	10410.00			MINPT-O-EOU	
1579.39	281.48	1391.08	1297.91	8.47	OSF1.50	19090.00	10410.00			MinPt-CtCt	
1582.05	287.56	1389.68	1294.49	8.30	OSF1.50	19310.00	10410.00			MINPT-O-EOU	
1580.87	298.48	1391.23	1292.40	8.04	OSF1.50	19680.00	10410.00			MinPt-O-ADP	
1584.47	314.89	1373.89	1269.59	7.59	OSF1.50	20210.00	10410.00			MinPt-CtCt	
1584.60	315.21	1373.80	1269.38	7.58	OSF1.50	20230.00	10410.00			MinPtS	
1586.01	315.81	1374.81	1270.19	7.57	OSF1.50	20280.00	10410.00			MinPtO-SF	
1601.14	315.72	1390.00	1285.41	7.65	OSF1.50	20440.72	10410.00			TD	

Cimarex Vaca Draw 20-17
Federal #1H ST01 0ft-21966ft
(Def Survey)

Pass									
1421.07	32.81	1419.94	1388.26	N/A	MAS = 10.00 (m)	0.00	0.00		Surface
1421.03	32.81	1419.87	1388.22	47382.17	MAS = 10.00 (m)	23.00	23.00		WRP
1419.17	32.81	1416.82	1386.37	1162.52	MAS = 10.00 (m)	300.00	300.00		MinPtS
1419.60	32.81	1416.53	1386.79	733.62	MAS = 10.00 (m)	430.00	430.00		MINPT-O-EOU
1467.02	32.81	1454.92	1434.21	133.63	MAS = 10.00 (m)	2600.00	2599.98		MinPtO-SF
1417.48	32.81	1407.24	1384.67	155.83	MAS = 10.00 (m)	3880.00	3872.18		MinPtS
1417.50	32.81	1407.24	1384.69	155.48	MAS = 10.00 (m)	3890.00	3882.17		MINPT-O-EOU
1419.85	32.81	1409.32	1387.04	151.31	MAS = 10.00 (m)	4000.00	3992.12		MINPT-O-SF
1472.03	44.57	1541.94	1527.46	54.24	OSF1.50	8500.00	8492.12		MinPtO-SF
1572.51	45.13	1542.04	1527.38	53.57	OSF1.50	8600.00	8592.12		MinPt-CtCt
1576.75	51.03	1542.35	1525.72	47.37	OSF1.50	9540.00	9532.12		MinPt-CtCt
1561.80	56.22	1523.95	1505.58	42.50	OSF1.50	10340.00	10287.08		MinPt-CtCt
1561.81	56.27	1523.92	1505.54	42.45	OSF1.50	10350.00	10293.70		MinPtS
1592.29	58.37	1553.00	1533.92	41.70	OSF1.50	10670.00	10409.56		MinPtO-SF
2494.25	73.12	2445.13	2421.13	51.95	OSF1.50	12330.00	10410.00		MinPt-CtCt
2491.42	77.99	2439.05	2413.43	48.60	OSF1.50	12520.00	10410.00		MinPt-CtCt
2491.94	79.56	2438.53	2412.38	47.64	OSF1.50	12590.00	10410.00		MINPT-O-EOU
2494.42	89.03	2434.69	2405.39	42.55	OSF1.50	12940.00	10410.00		MinPt-CtCt
2494.93	90.70	2434.09	2404.23	41.76	OSF1.50	13010.00	10410.00		MINPT-O-EOU
2495.71	91.66	2434.22	2404.04	41.33	OSF1.50	13050.00	10410.00		MinPtO-ADP
2511.57	103.06	2442.48	2408.51	36.94	OSF1.50	13450.00	10410.00		MinPt-CtCt
2505.52	112.12	2430.40	2393.40	33.84	OSF1.50	13780.00	10410.00		MinPt-CtCt
2486.39	126.54	2401.66	2359.85	29.73	OSF1.50	14290.00	10410.00		MinPt-CtCt
2487.04	128.52	2400.98	2358.53	29.27	OSF1.50	14370.00	10410.00		MINPT-O-EOU
2487.89	129.50	2401.18	2358.39	29.06	OSF1.50	14410.00	10410.00		MinPtO-ADP
2493.11	139.28	2399.92	2353.89	27.07	OSF1.50	14740.00	10410.00		MINPT-O-EOU
2494.39	140.83	2400.12	2353.58	26.77	OSF1.50	14800.00	10410.00		MinPtO-ADP
2510.81	157.41	2405.50	2353.41	24.09	OSF1.50	15350.00	10410.00		MinPt-CtCt

Offset Trajectory	Separation		Allow Dev. (ft)	Sep. Fact.	Controlling Rule	Reference Trajectory		Risk Level		Alert	Status
	Ct-Ct (ft)	MAS (ft)	EOU (ft)			MD (ft)	TVD (ft)	Alert	Minor		
	2511.15	161.84	2402.87	23.43	OSF1.50	15500.00	10410.00			MinPt-CtCt	
	2512.60	166.19	2401.43	22.82	OSF1.50	15660.00	10410.00			MINPT-O-EOU	
	2493.25	198.04	2360.84	2295.21	OSF1.50	16730.00	10410.00			MinPt-CtCt	
	2493.61	199.24	2360.41	2294.37	OSF1.50	16780.00	10410.00			MINPT-O-EOU	
	2484.17	199.94	2360.50	2294.23	OSF1.50	16810.00	10410.00			MinPt-O-ADP	
	2527.49	222.51	2378.78	2304.99	OSF1.50	17550.00	10410.00			MinPt-CtCt	
	2495.86	248.56	2329.78	2247.31	OSF1.50	18430.00	10410.00			MinPt-CtCt	
	2499.25	261.13	2324.79	2238.12	OSF1.50	18860.00	10410.00			MINPT-O-EOU	
	2501.31	263.60	2325.20	2237.71	OSF1.50	18950.00	10410.00			MinPt-O-ADP	
	2501.79	266.64	2323.65	2235.15	OSF1.50	19030.00	10410.00			MinPt-CtCt	
	2494.98	280.46	2307.63	2214.51	OSF1.50	19490.00	10410.00			MinPt-CtCt	
	2496.11	284.29	2306.21	2211.83	OSF1.50	19630.00	10410.00			MINPT-O-EOU	
	2497.40	286.86	2306.45	2211.54	OSF1.50	19690.00	10410.00			MinPt-O-ADP	
	2499.67	289.72	2306.15	2209.95	OSF1.50	19810.00	10410.00			MINPT-O-EOU	
	2500.25	290.43	2306.26	2209.82	OSF1.50	19840.00	10410.00			MinPt-O-ADP	
	2502.23	302.08	2300.47	2200.15	OSF1.50	20210.00	10410.00			MinPt-CtCt	
	2502.41	302.73	2300.22	2199.68	OSF1.50	20240.00	10410.00			MINPT-O-EOU	
	2502.74	303.14	2300.26	2199.59	OSF1.50	20260.00	10410.00			MinPt-O-ADP	
	2512.89	306.04	2308.48	2206.85	OSF1.50	20440.72	10410.00			MinPt-O-SF	

Cimarex Vaca Draw 20-17
Federal #1H Surcon 0ft-12740
(Def Survey)

Pass										
1421.07	32.81	1419.09	1388.26	N/A	MAS = 10.00 (m)	0.00	0.00			Surface
1421.03	32.81	1419.02	1388.22	47354.16	MAS = 10.00 (m)	23.00	23.00			WRP
1419.17	32.81	1415.97	1386.37	1161.83	MAS = 10.00 (m)	300.00	300.00			MinPts
1419.60	32.81	1415.69	1386.79	733.19	MAS = 10.00 (m)	430.00	430.00			MINPT-O-EOU
1487.02	32.81	1454.07	1434.21	133.56	MAS = 10.00 (m)	2600.00	2599.98			MinPt-O-SF
1417.48	32.81	1406.40	1384.67	155.74	MAS = 10.00 (m)	3890.00	3872.18			MinPts
1417.50	32.81	1406.39	1384.69	155.38	MAS = 10.00 (m)	3890.00	3882.17			MINPT-O-EOU
1419.85	32.81	1408.47	1387.04	151.22	MAS = 10.00 (m)	4000.00	3992.12			MinPt-O-SF
1572.03	45.42	1541.09	1526.61	54.21	OSF1.50	8500.00	8492.12			MINPT-O-EOU
1572.51	45.98	1541.20	1526.53	53.54	OSF1.50	8600.00	8592.12			MinPt-O-ADP
1576.75	51.87	1541.50	1524.87	47.34	OSF1.50	9540.00	9532.12			MinPt-CtCt
1561.80	57.07	1523.10	1504.73	42.47	OSF1.50	10340.00	10287.08			MinPt-CtCt
1561.81	57.12	1523.07	1504.69	42.43	OSF1.50	10350.00	10293.70			MinPts
1592.29	59.22	1552.16	1533.08	41.68	OSF1.50	10670.00	10409.56			MinPt-O-SF
10206.99	71.42	10158.71	10135.57	220.44	OSF1.50	20440.72	10410.00			TD

Cimarex Vaca Draw 20-17
Federal #57H Rev1 RM
09Feb21 (Def Plan)

Pass										
2359.34	32.81	2358.06	2326.53	N/A	MAS = 10.00 (m)	0.00	0.00			Surface
2359.28	32.81	2357.99	2326.46	327735.19	MAS = 10.00 (m)	10.00	10.00			MinPt-O-SF
2359.27	32.81	2357.98	2326.46	N/A	MAS = 10.00 (m)	23.00	23.00			WRP
2359.27	32.81	2342.72	2326.46	154.46	MAS = 10.00 (m)	2500.00	2500.00			MinPts
2359.05	32.81	2342.31	2326.25	152.56	MAS = 10.00 (m)	2540.00	2540.00			MinPt-O-SF
1657.69	69.37	1610.66	1588.32	37.04	OSF1.50	9990.00	9982.03			MinPt-CtCt
1657.86	70.14	1610.32	1587.72	36.62	OSF1.50	10100.00	10089.16			MINPT-O-EOU
1657.98	70.28	1610.35	1587.70	36.55	OSF1.50	10120.00	10107.91			MinPt-O-ADP
1679.75	72.47	1630.70	1607.28	35.81	OSF1.50	10480.00	10364.38			MinPt-O-SF
2698.60	338.45	2472.54	2360.15	12.00	OSF1.50	20440.72	10410.00			MinPts

Offset Trajectory	Separation			Allow Dev. (ft)	Sep. Fact.	Controlling Rule	Reference Trajectory			Alert	Status	
	Ct-Ct (ft)	MAS (ft)	EOU (ft)				MD (ft)	TVD (ft)	Risk Level			Major
Cimarex Vaca Draw 20-17 Federal #58H Rev1 RM 09Feb21 (Def Plan)												
	2379.38	32.81	2378.10	2346.58	N/A	MAS = 10.00 (m)	0.00	0.00			Pass	
	2379.33	32.81	2378.03	2346.52	345376.94	MAS = 10.00 (m)	10.00	10.00		Surface		
	2379.31	32.81	2378.03	2346.50	N/A	MAS = 10.00 (m)	23.00	23.00		MinPt-O-SF WRP		
	2379.31	32.81	2362.76	2346.50	155.76	MAS = 10.00 (m)	2500.00	2500.00		MinPts		
	2379.33	32.81	2362.74	2346.52	155.40	MAS = 10.00 (m)	2510.00	2510.00		MINPT-O-EOU		
	2410.47	32.81	2392.91	2377.67	147.98	MAS = 10.00 (m)	3020.00	3017.86		MinPt-O-SF		
	2409.80	32.81	2394.92	2376.98	177.18	MAS = 10.00 (m)	4000.00	3992.12		MinPt-O-SF		
	2341.61	70.01	2294.49	2271.60	51.13	OSF1.50	9940.42	9932.54		MinPt-CtCt		
	2341.87	71.61	2293.69	2270.27	49.97	OSF1.50	10120.00	10107.91		MINPT-O-EOU		
	2342.08	71.85	2293.73	2270.23	49.80	OSF1.50	10150.00	10135.45		MinPt-O-ADP		
	2382.40	75.30	2331.77	2307.10	48.28	OSF1.50	10650.00	10408.29		MinPt-O-SF		
	3037.39	340.74	2809.80	2696.65	13.42	OSF1.50	20440.72	10410.00		MinPts		
Final Surveys - Cimarex Vaca Draw 20-17 Federal #71H MWD 0ft-19978ft (Surcon Corrected) (Def Survey)												
	2909.10	32.81	2907.81	2876.29	N/A	MAS = 10.00 (m)	0.00	0.00		Surface		Pass
	2909.05	32.81	2907.76	2876.25	516334.61	MAS = 10.00 (m)	10.00	10.00		MinPt-O-SF		
	2909.04	32.81	2907.76	2876.23	N/A	MAS = 10.00 (m)	20.00	20.00		MinPts		
	2909.04	32.81	2907.76	2876.23	N/A	MAS = 10.00 (m)	23.00	23.00		WRP		
	2909.42	32.81	2907.59	2876.61	5359.54	MAS = 10.00 (m)	170.00	170.00		MINPT-O-EOU		
	2906.31	32.81	2900.07	2873.50	587.55	MAS = 10.00 (m)	1060.00	1060.00		MINPT-O-EOU		
	2847.04	32.81	2833.52	2814.23	230.19	MAS = 10.00 (m)	2600.00	2599.98		MinPt-O-SF		
	2845.73	32.81	2832.38	2812.92	233.48	MAS = 10.00 (m)	2690.00	2689.86		MINPT-O-EOU		
	2845.71	32.81	2832.39	2812.90	233.92	MAS = 10.00 (m)	2700.00	2699.84		MinPts		
	2908.96	32.81	2897.33	2876.15	276.91	MAS = 10.00 (m)	3720.00	3712.69		MinPt-O-SF		
	2966.02	32.81	2951.11	2933.21	215.11	MAS = 10.00 (m)	4970.00	4962.12		MINPT-O-EOU		
	2420.45	51.34	2365.57	2369.12	73.49	OSF1.50	9260.00	9252.12		MinPt-O-SF		
	2363.14	55.51	2325.43	2307.64	66.34	OSF1.50	9840.00	9832.12		MinPt-CtCt		
	2363.18	55.57	2325.43	2307.61	66.27	OSF1.50	9850.00	9842.12		MinPts		
	2447.50	66.84	2402.34	2380.66	56.41	OSF1.50	11240.00	10410.00		MinPt-CtCt		
	2448.21	68.96	2401.63	2379.25	54.65	OSF1.50	11380.00	10410.00		MINPT-O-EOU		
	2448.91	71.81	2400.43	2377.10	52.44	OSF1.50	11530.00	10410.00		MinPt-CtCt		
	2421.20	95.33	2357.02	2325.87	38.83	OSF1.50	12600.00	10410.00		MinPt-CtCt		
	2421.61	118.94	2341.70	2302.67	31.00	OSF1.50	13520.00	10410.00		MinPt-CtCt		
	2420.01	141.89	2324.79	2278.11	25.90	OSF1.50	14360.00	10410.00		MinPt-CtCt		
	2420.56	143.63	2324.18	2276.93	25.59	OSF1.50	14440.00	10410.00		MINPT-O-EOU		
	2418.62	153.42	2315.71	2265.19	23.92	OSF1.50	14770.00	10410.00		MinPt-CtCt		
	2418.25	160.25	2310.80	2258.00	22.89	OSF1.50	15010.00	10410.00		MinPt-CtCt		
	2418.96	187.51	2293.33	2231.45	19.53	OSF1.50	15960.00	10410.00		MinPt-CtCt		
	2413.74	198.27	2280.93	2215.46	18.42	OSF1.50	16330.00	10410.00		MinPt-CtCt		
	2414.33	200.07	2280.33	2214.26	18.26	OSF1.50	16410.00	10410.00		MINPT-O-EOU		
	2413.40	223.78	2263.59	2189.62	16.30	OSF1.50	17200.00	10410.00		MinPt-CtCt		
	2414.42	227.84	2261.90	2186.58	16.01	OSF1.50	17360.00	10410.00		MinPt-CtCt		
	2415.64	229.27	2262.17	2186.36	15.92	OSF1.50	17420.00	10410.00		MINPT-O-ADP		
	2421.05	234.06	2264.40	2186.99	15.63	OSF1.50	17590.00	10410.00		MinPt-O-ADP		
	2430.22	246.46	2265.30	2183.76	14.89	OSF1.50	17970.00	10410.00		MinPt-CtCt		
	2430.80	266.93	2252.23	2163.88	13.74	OSF1.50	18660.00	10410.00		MinPt-CtCt		
	2429.90	284.47	2239.64	2145.43	12.89	OSF1.50	19250.00	10410.00		MinPt-CtCt		
	2430.85	295.82	2233.02	2135.03	12.39	OSF1.50	19630.00	10410.00		MinPt-CtCt		

Offset Trajectory	Separation		Allow	Sep.	Controlling	Reference Trajectory		Risk Level		Alert	Status
	Ct-Ct (ft)	MAS (ft)	EOU (ft)	Dev. (ft)	Rule	MD (ft)	TVD (ft)	Alert	Minor	Major	
	2430.74	301.15	2229.36	2129.59	12.17	19810.00	10410.00				MinPt-CtCt
	2431.23	319.95	2217.31	2111.27	11.46	20440.00	10410.00				MinPt-CtCt
	2431.23	319.96	2217.30	2111.28	11.45	20440.72	10410.00				MinPis

Cimarex Vaca Draw 20-17
Federal #59H Rev1 RM
09Feb21 (Def Plan)

2399.38	32.81	2397.40	2366.57	N/A	MAS = 10.00 (m)	0.00	0.00				Surface
2399.32	32.81	2397.34	2366.51	342845.03	MAS = 10.00 (m)	10.00	10.00				MinPt-O-SF
2399.31	32.81	2397.33	2366.50	N/A	MAS = 10.00 (m)	23.00	23.00				WRP
2399.31	32.81	2382.06	2366.50	157.03	MAS = 10.00 (m)	2500.00	2500.00				MinPis
2399.32	32.81	2382.04	2366.51	156.67	MAS = 10.00 (m)	2510.00	2510.00				MINPT-O-EOU
2401.21	32.81	2383.80	2368.40	155.57	MAS = 10.00 (m)	2600.00	2599.98				MinPt-O-SF
2651.51	32.81	2635.43	2618.70	187.92	MAS = 10.00 (m)	4000.00	3992.12				MinPt-O-SF
3025.68	44.32	2995.48	2981.37	107.13	OSF1.50	6830.00	6822.12				MinPt-O-SF
3026.78	68.54	2980.42	2958.23	68.16	OSF1.50	10130.00	10117.18				MINPT-O-EOU
3026.97	68.77	2980.47	2958.21	67.94	OSF1.50	10160.00	10144.46				MinPt-O-ADP
3023.84	76.20	3152.38	3127.65	64.71	OSF1.50	11260.00	10410.00				MinPt-O-SF
3220.59	76.58	3168.88	3144.02	64.72	OSF1.50	11310.00	10410.00				MinPt-O-SF
3700.91	335.98	3476.26	3364.92	16.61	OSF1.50	20440.72	10410.00				MinPis

Final Surveys - Cimarex Vaca
Draw 20-17 Federal #72H
Surveys Off to 1907.3ft (Surcon
Corrected) (Def Survey)

2929.10	32.81	2927.81	2896.29	N/A	MAS = 10.00 (m)	0.00	0.00				Surface
2929.05	32.81	2927.76	2896.24	493717.50	MAS = 10.00 (m)	10.00	10.00				MinPt-O-SF
2929.04	32.81	2927.75	2896.23	N/A	MAS = 10.00 (m)	23.00	23.00				WRP
2926.61	32.81	2920.59	2893.80	618.13	MAS = 10.00 (m)	1080.00	1080.00				MINPT-O-EOU
2907.40	32.81	2894.64	2874.59	250.09	MAS = 10.00 (m)	2560.00	2560.00				MinPis
2907.64	32.81	2894.81	2874.83	248.59	MAS = 10.00 (m)	2600.00	2599.98				MinPt-O-SF
3033.90	32.81	3023.05	3001.10	311.85	MAS = 10.00 (m)	3860.00	3852.21				MinPt-O-SF
3041.66	32.81	3030.77	3008.86	311.49	MAS = 10.00 (m)	3950.00	3942.13				MinPt-O-SF
3044.60	32.81	3033.74	3011.80	312.68	MAS = 10.00 (m)	4000.00	3992.12				MinPt-O-SF
2951.20	32.81	2929.82	2918.39	145.11	MAS = 10.00 (m)	6640.00	6632.12				MinPis
2951.28	32.81	2929.74	2918.47	143.91	MAS = 10.00 (m)	6680.00	6672.12				MINPT-O-EOU
2958.17	38.44	2932.20	2919.73	118.57	OSF1.50	7690.00	7682.12				MinPt-CtCt
2955.38	45.91	2924.43	2909.47	98.74	OSF1.50	8760.00	8752.12				MinPt-CtCt
2955.45	46.10	2924.37	2909.35	98.33	OSF1.50	8790.00	8782.12				MINPT-O-EOU
2955.50	46.17	2924.38	2909.33	98.20	OSF1.50	8800.00	8792.12				MinPt-O-ADP
3056.19	50.83	3021.97	3005.37	92.01	OSF1.50	9710.00	9702.12				MinPt-O-SF
3245.33	58.69	3205.87	3186.64	84.39	OSF1.50	10980.00	10410.00				MinPt-CtCt
3245.49	59.13	3205.73	3186.36	83.75	OSF1.50	11020.00	10410.00				MINPT-O-EOU
3245.68	59.36	3205.77	3186.32	83.43	OSF1.50	11040.00	10410.00				MinPt-O-ADP
3246.84	60.45	3206.22	3186.40	81.88	OSF1.50	11120.00	10410.00				MINPT-O-EOU
3247.07	60.69	3206.28	3186.37	81.55	OSF1.50	11140.00	10410.00				MinPt-O-ADP
3220.20	77.25	3168.37	3142.95	63.32	OSF1.50	12020.00	10410.00				MinPt-CtCt
3219.66	86.70	3161.54	3132.97	56.33	OSF1.50	12430.00	10410.00				MinPt-CtCt
3217.90	107.43	3145.95	3110.47	45.33	OSF1.50	13250.00	10410.00				MinPt-CtCt
3215.47	121.38	3134.23	3094.10	40.05	OSF1.50	13770.00	10410.00				MinPt-CtCt
3219.83	130.45	3132.54	3089.38	37.29	OSF1.50	14130.00	10410.00				MINPT-O-EOU
3222.96	137.22	3131.15	3085.74	35.47	OSF1.50	14370.00	10410.00				MINPT-O-EOU
3223.86	138.32	3131.32	3085.54	35.20	OSF1.50	14420.00	10410.00				MinPt-O-ADP
3230.56	147.17	3132.12	3083.39	33.14	OSF1.50	14730.00	10410.00				MINPT-O-EOU

Offset Trajectory	Separation		Allow Dev. (ft)	Sep. Fact.	Controlling Rule	Reference Trajectory		Risk Level		Alert	Status
	Ct-Ct (ft)	MAS (ft)	EOU (ft)			MD (ft)	TVD (ft)	Alert	Minor		
	3220.34	181.34	3089.11	26.77	OSF1.50	15890.00	10410.00			MinPt-CtCt	
	3221.25	184.14	3098.15	26.37	OSF1.50	16010.00	10410.00			MinPt-O-EOU	
	3204.75	200.83	3070.53	24.05	OSF1.50	16560.00	10410.00			MinPt-CtCt	
	3205.33	202.55	3069.97	23.85	OSF1.50	16640.00	10410.00			MinPt-O-EOU	
	3206.03	203.40	3070.11	23.75	OSF1.50	16680.00	10410.00			MinPt-O-ADP	
	3219.86	213.22	3077.38	22.75	OSF1.50	17010.00	10410.00			MinPt-O-EOU	
	3221.08	214.66	3077.64	22.60	OSF1.50	17070.00	10410.00			MinPt-O-ADP	
	3227.90	242.35	3066.00	20.05	OSF1.50	17970.00	10410.00			MinPt-CtCt	
	3229.03	245.72	3064.89	19.79	OSF1.50	18110.00	10410.00			MinPt-O-EOU	
	3230.88	247.97	3065.23	19.62	OSF1.50	18200.00	10410.00			MinPt-O-ADP	
	3208.47	293.21	3012.67	16.46	OSF1.50	19680.00	10410.00			MinPt-CtCt	
	3213.49	305.73	3009.34	15.81	OSF1.50	20120.00	10410.00			MinPt-O-EOU	
	3213.99	306.31	3009.45	15.79	OSF1.50	20150.00	10410.00			MinPt-O-ADP	
	3228.50	311.90	3020.24	15.57	OSF1.50	20440.72	10410.00			MinPt-O-SF	

Final Surveys - Cimarex Vaca
Draw 20-17 Federal #73H
ST01 Off- 19710ft (Surcon
Corrected) (Def Survey)

2949.09	32.81	2947.81	2916.29	N/A	MAS = 10.00 (m)	0.00	0.00			Surface	Pass
2949.05	32.81	2947.76	2916.24	508235.73	MAS = 10.00 (m)	10.00	10.00			MinPt-O-SF	
2949.04	32.81	2947.75	2916.23	N/A	MAS = 10.00 (m)	23.00	23.00			WRP	
2948.74	32.81	2946.29	2915.94	2528.47	MAS = 10.00 (m)	310.00	310.00			MinPls	
2947.99	32.81	2943.25	2915.19	853.47	MAS = 10.00 (m)	820.00	820.00			MinPls	
2948.19	32.81	2943.08	2915.38	766.03	MAS = 10.00 (m)	920.00	920.00			MINPT-O-EOU	
2965.46	32.81	2952.58	2932.65	252.34	MAS = 10.00 (m)	2600.00	2599.98			MinPt-O-SF	
3060.91	32.81	3049.16	3028.10	288.01	MAS = 10.00 (m)	3460.00	3454.58			MinPt-O-SF	
3104.70	32.81	3093.24	3071.89	300.50	MAS = 10.00 (m)	3790.00	3782.38			MinPt-O-SF	
3138.05	32.81	3125.24	3105.24	288.71	MAS = 10.00 (m)	4480.00	4472.12			MinPt-O-SF	
3139.02	32.81	3125.67	3106.21	256.66	MAS = 10.00 (m)	4690.00	4682.12			MinPls	
3139.10	32.81	3125.59	3106.29	253.51	MAS = 10.00 (m)	4730.00	4722.12			MINPT-O-EOU	
3115.32	35.94	3091.02	3079.38	133.77	OSF1.50	7300.00	7292.12			MinPt-CtCt	
3115.80	36.99	3090.80	3078.81	129.91	OSF1.50	7460.00	7452.12			MINPT-O-EOU	
3116.33	37.78	3090.81	3078.55	127.13	OSF1.50	7580.00	7572.12			MINPT-O-EOU	
3116.61	38.11	3090.86	3078.50	126.01	OSF1.50	7630.00	7622.12			MinPt-O-ADP	
3125.56	46.84	3093.99	3078.72	102.29	OSF1.50	8960.00	8952.12			MinPt-O-SF	
3061.20	51.52	3026.53	3009.68	90.83	OSF1.50	9650.00	9642.12			MinPt-CtCt	
3061.22	51.59	3026.50	3009.63	90.71	OSF1.50	9660.00	9652.12			MINPT-O-EOU	
3061.27	51.65	3026.50	3009.61	90.60	OSF1.50	9670.00	9662.12			MinPt-O-ADP	
3062.23	63.73	3019.41	2998.50	73.18	OSF1.50	11140.00	10410.00			MinPt-CtCt	
3062.35	64.07	3019.31	2998.28	72.79	OSF1.50	11170.00	10410.00			MINPT-O-EOU	
3062.45	64.18	3019.33	2998.27	72.66	OSF1.50	11180.00	10410.00			MinPt-O-ADP	
3069.17	67.51	3023.83	3001.66	69.18	OSF1.50	11370.00	10410.00			MINPT-O-EOU	
3070.22	70.35	3022.98	2999.87	66.37	OSF1.50	11520.00	10410.00			MINPT-O-EOU	
3070.76	71.01	3023.11	2999.77	65.75	OSF1.50	11560.00	10410.00			MinPt-O-ADP	
3073.36	73.58	3023.98	2999.78	63.49	OSF1.50	11690.00	10410.00			MinPt-O-ADP	
3084.48	81.62	3029.74	3002.86	57.36	OSF1.50	12080.00	10410.00			MinPt-O-ADP	
3088.02	90.35	3027.46	2997.67	51.81	OSF1.50	12430.00	10410.00			MinPt-CtCt	
3088.67	92.35	3026.77	2996.32	50.89	OSF1.50	12530.00	10410.00			MINPT-O-EOU	
3089.51	93.37	3026.93	2996.14	50.15	OSF1.50	12580.00	10410.00			MinPt-O-ADP	
3050.81	118.50	2971.48	2932.31	38.93	OSF1.50	13520.00	10410.00			MinPt-CtCt	
3052.73	127.36	2967.50	2925.38	36.22	OSF1.50	13850.00	10410.00			MinPt-CtCt	
3053.46	130.18	2966.36	2923.30	35.44	OSF1.50	13970.00	10410.00			MINPT-O-EOU	
3054.17	131.00	2966.51	2923.17	35.22	OSF1.50	14010.00	10410.00			MinPt-O-ADP	

Offset Trajectory	Separation		Allow	Sep.	Controlling	Reference Trajectory		Risk Level		Alert	Status
	Ct-Ct (ft)	MAS (ft)	EOU (ft)	Dev. (ft)	Fact.	Rule	MD (ft)	TVD (ft)	Alert	Minor	Major
	3060.62	145.16	2963.51	2915.46	31.83	OSF1.50	14490.00	10410.00			MinPt-CtCt
	3061.22	146.87	2962.98	2914.36	31.47	OSF1.50	14570.00	10410.00			MINPT-O-EOU
	3061.75	147.50	2963.09	2914.25	31.34	OSF1.50	14600.00	10410.00			MinPt-O-ADP
	3041.55	163.10	2932.48	2878.44	28.13	OSF1.50	15120.00	10410.00			MinPt-CtCt
	3041.86	164.06	2932.15	2877.79	27.97	OSF1.50	15170.00	10410.00			MINPT-O-EOU
	3042.33	164.63	2932.25	2877.70	27.88	OSF1.50	15200.00	10410.00			MinPt-O-ADP
	3043.51	165.79	2932.66	2877.72	27.69	OSF1.50	15250.00	10410.00			MinPt-O-ADP
	3053.62	175.70	2936.15	2877.91	26.21	OSF1.50	15580.00	10410.00			MINPT-O-EOU
	3054.78	177.10	2936.38	2877.68	26.01	OSF1.50	15640.00	10410.00			MinPt-O-ADP
	3058.77	181.26	2937.60	2877.51	25.44	OSF1.50	15780.00	10410.00			MINPT-O-EOU
	3060.43	183.08	2938.05	2877.35	25.20	OSF1.50	15850.00	10410.00			MinPt-O-ADP
	3069.27	190.10	2942.21	2879.17	24.34	OSF1.50	16100.00	10410.00			MinPt-O-ADP
	3052.79	246.55	2888.09	2806.24	18.64	OSF1.50	17970.00	10410.00			MinPt-CtCt
	3049.66	253.95	2880.03	2795.71	18.08	OSF1.50	18220.00	10410.00			MinPt-CtCt
	3050.18	255.46	2879.55	2794.72	17.97	OSF1.50	18290.00	10410.00			MINPT-O-EOU
	3055.02	261.03	2880.67	2793.98	17.62	OSF1.50	18500.00	10410.00			MinPt-O-ADP
	3068.65	272.70	2886.52	2795.95	16.93	OSF1.50	18900.00	10410.00			MinPt-O-ADP
	3076.12	308.69	2870.00	2767.43	14.99	OSF1.50	20060.00	10410.00			MinPt-CtCt
	3074.48	320.13	2860.73	2754.35	14.45	OSF1.50	20440.72	10410.00			MinPts

Final Surveys - Cimarex Vaca
Draw 20-17 Federal #73H Off-
19583ft (Surcon Corrected)
(Def Survey)

2949.09	32.81	2947.81	2916.29	N/A	MAS = 10.00 (m)	0.00	0.00	Surface
2949.05	32.81	2947.76	2916.24	506235.73	MAS = 10.00 (m)	10.00	10.00	MinPt-O-SF
2949.04	32.81	2947.75	2916.23	N/A	MAS = 10.00 (m)	23.00	23.00	WRP
2948.74	32.81	2946.29	2915.94	2528.47	MAS = 10.00 (m)	310.00	310.00	MinPts
2947.99	32.81	2943.25	2915.19	853.47	MAS = 10.00 (m)	820.00	820.00	MinPts
2948.19	32.81	2943.06	2915.38	766.03	MAS = 10.00 (m)	920.00	920.00	MINPT-O-EOU
2965.46	32.81	2952.58	2932.65	252.34	MAS = 10.00 (m)	2600.00	2599.98	MinPt-O-SF
3060.91	32.81	3049.16	3028.10	288.01	MAS = 10.00 (m)	3460.00	3454.58	MinPt-O-SF
3104.70	32.81	3093.24	3071.89	300.50	MAS = 10.00 (m)	3790.00	3782.38	MinPt-O-SF
3138.05	32.81	3125.24	3105.24	268.71	MAS = 10.00 (m)	4480.00	4472.12	MinPt-O-SF
3139.02	32.81	3125.67	3106.21	256.66	MAS = 10.00 (m)	4690.00	4682.12	MinPts
3139.10	32.81	3125.59	3106.29	253.51	MAS = 10.00 (m)	4730.00	4722.12	MINPT-O-EOU
3115.32	35.94	3091.02	3079.38	133.77	OSF1.50	7300.00	7292.12	MinPt-CtCt
3115.80	36.99	3090.80	3078.81	129.91	OSF1.50	7460.00	7452.12	MINPT-O-EOU
3116.33	37.78	3090.81	3078.55	127.13	OSF1.50	7580.00	7572.12	MINPT-O-EOU
3116.61	38.11	3090.86	3078.50	126.01	OSF1.50	7630.00	7622.12	MinPt-O-ADP
3125.56	46.84	3093.99	3078.72	102.29	OSF1.50	8960.00	8952.12	MinPt-O-SF
3073.22	51.23	3038.73	3021.99	91.79	OSF1.50	9610.00	9602.12	MinPt-CtCt
3073.27	51.36	3038.68	3021.91	91.54	OSF1.50	9630.00	9622.12	MINPT-O-EOU
3073.34	51.43	3038.71	3021.91	91.42	OSF1.50	9640.00	9632.12	MinPt-O-ADP
3120.69	59.61	3080.60	3061.07	79.86	OSF1.50	10890.00	10410.00	MinPt-CtCt
3120.86	60.05	3080.48	3060.80	79.27	OSF1.50	10930.00	10410.00	MINPT-O-EOU
3121.05	60.28	3080.53	3060.77	78.98	OSF1.50	10950.00	10410.00	MinPt-O-ADP
3122.52	76.57	3071.13	3045.94	61.97	OSF1.50	11830.00	10410.00	MinPt-CtCt
3121.89	81.83	3066.99	3040.05	57.93	OSF1.50	12070.00	10410.00	MinPt-CtCt
3116.43	105.78	3045.57	3010.65	44.61	OSF1.50	13050.00	10410.00	MinPt-CtCt
3119.62	117.91	3040.68	3001.72	40.02	OSF1.50	13520.00	10410.00	MINPT-O-EOU
3121.42	120.04	3041.06	3001.39	39.33	OSF1.50	13610.00	10410.00	MinPt-O-ADP
3118.65	126.73	3033.82	2991.92	37.20	OSF1.50	13820.00	10410.00	MinPt-CtCt
3113.91	135.79	3023.04	2978.11	34.65	OSF1.50	14150.00	10410.00	MinPt-CtCt

Offset Trajectory	Separation			Allow Dev. (ft)	Sep. Fact.	Controlling Rule	Reference Trajectory		Risk Level		Alert	Status
	Ct-C1 (ft)	MAS (ft)	EOU (ft)				MD (ft)	TVD (ft)	Alert	Minor	Major	
	3114.48	137.51	3022.48	2976.97	34.22	OSF1.50	14230.00	10410.00				MINPT-O-EOU
	3119.96	148.55	3020.58	2971.40	31.71	OSF1.50	14610.00	10410.00				MinPt-CtCt
	3113.48	165.94	3002.52	2947.55	28.31	OSF1.50	15220.00	10410.00				MinPt-CtCt
	3114.62	175.17	2997.50	2939.45	26.82	OSF1.50	15540.00	10410.00				MinPt-CtCt
	3095.88	214.13	2952.79	2881.75	21.78	OSF1.50	16870.00	10410.00				MinPt-CtCt
	3105.09	238.07	2946.03	2867.01	19.64	OSF1.50	17710.00	10410.00				MINPT-O-EOU
	3109.17	256.11	2938.08	2853.05	18.28	OSF1.50	18290.00	10410.00				MinPt-CtCt
	3116.53	273.98	2933.53	2842.54	17.12	OSF1.50	18920.00	10410.00				MINPT-O-EOU
	3048.99	309.49	2842.32	2739.50	14.82	OSF1.50	20070.00	10410.00				MinPt-CtCt
	3051.64	319.63	2838.21	2732.00	14.36	OSF1.50	20420.00	10410.00				MINPT-O-EOU
	3051.88	319.92	2838.26	2731.96	14.35	OSF1.50	20440.00	10410.00				MinPt-O-ADP
	3051.89	319.93	2838.26	2731.96	14.35	OSF1.50	20440.72	10410.00				MinPt-O-SF



Cimarex Energy Offline Cementing 7" Casing Information for
Sundry Approval Plan REV0



CIMAREX ENERGY CO. NYSE LISTED: XEC

Cementing Operational Workflow

Conventional Cementing		Offline Cementing	
1.	Land casing on fluted mandrel hanger	1.	Land casing on <u>solid body</u> mandrel hanger
2.	Circulate down casing, taking returns through BOP stack	a)	Engage packoff and locking
3.	Pump lead and tail cement	2.	Install BPV
4.	Displace cement and bump the plug	3.	Skid rig
5.	Ensure floats are holding pressure	4.	Check for pressure and remove BPV
6.	RD cement crew	5.	Circulate down casing, taking returns through casing valves
7.	Install packoff to isolate pressure	6.	Pump lead and tail cement
8.	Install BPV and skid rig	7.	Displace cement and bump the plug
		8.	Ensure floats are holding pressure
		9.	RD cement crew
		10.	Install BPV and TA cap

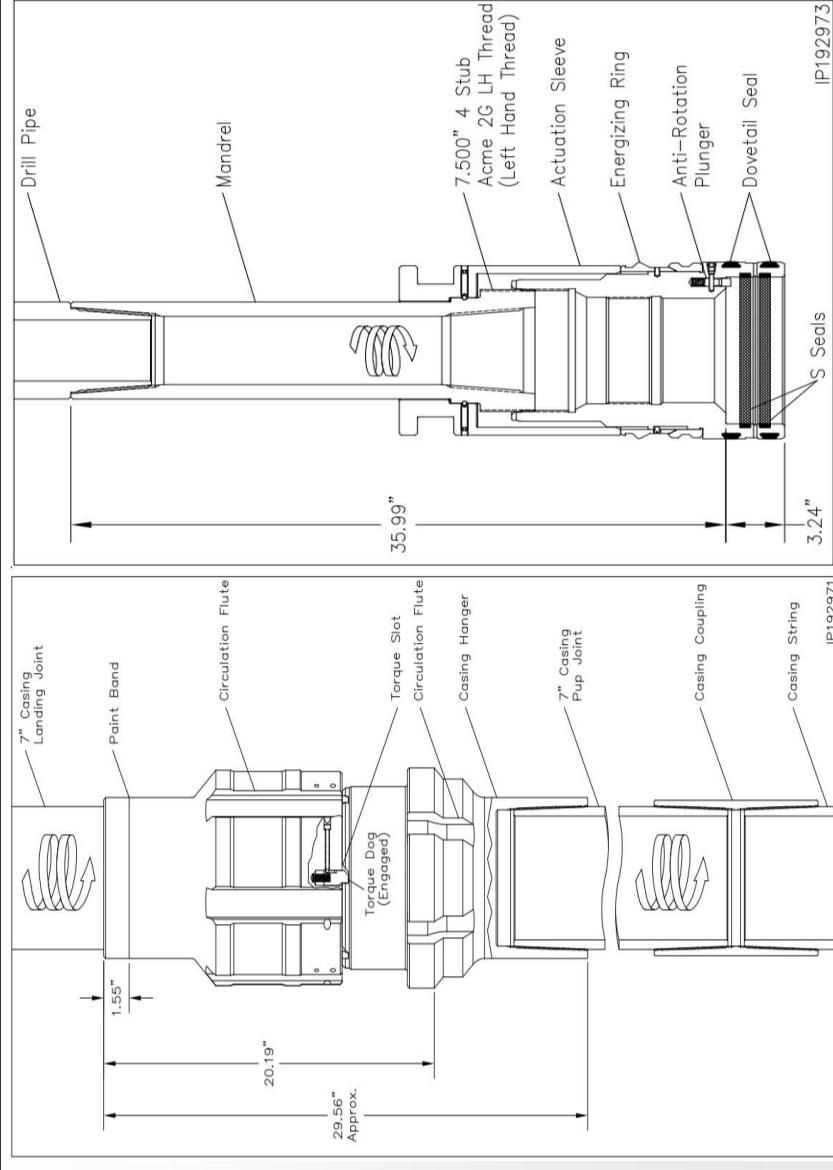


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SLIDE TITLE HERE | 2

Conventional Cementing Equipment-Fluted Mandrel

- Fluted Hanger allows returns up past the hanger body
- Returns throughout cement job flow up through BOP stack and into flowline
- Packoff is installed **after** cement job to isolate pressure above and below hanger
- Lockring engaged during packoff installation

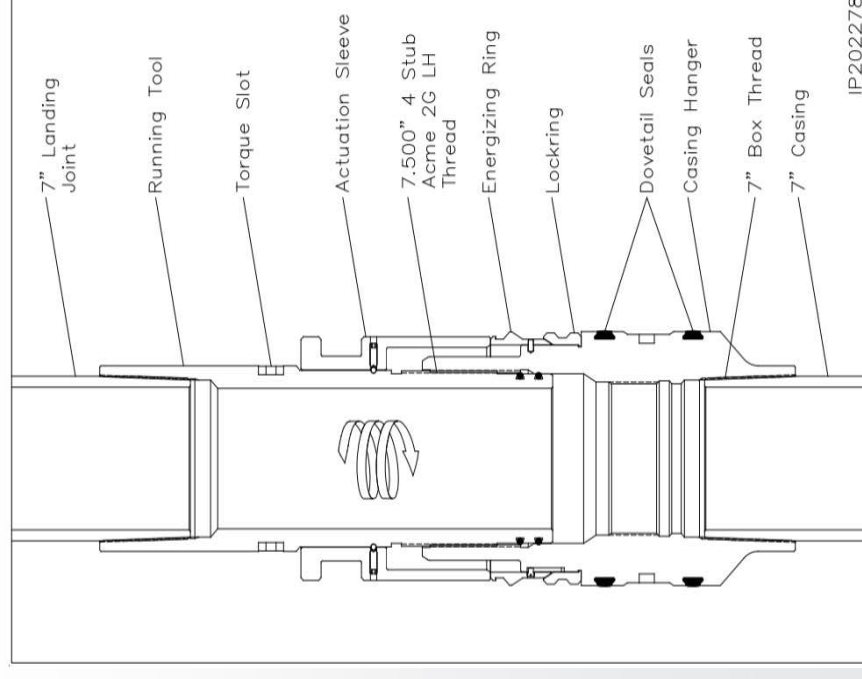


CIMAREX ENERGY CO. NYSE LISTED: XEC

SLIDE TITLE HERE | 3

Offline Cementing Equipment-Solid Body Mandrel Hanger

- Solid Body Mandrel Hanger allows for casing to be landed and pressure isolated in one step, **prior** to cementing
- Lockring is engaged to lock casing in place
- Casing is isolated and returns throughout cement job flow through the casing valves and through flowback iron independent of rig



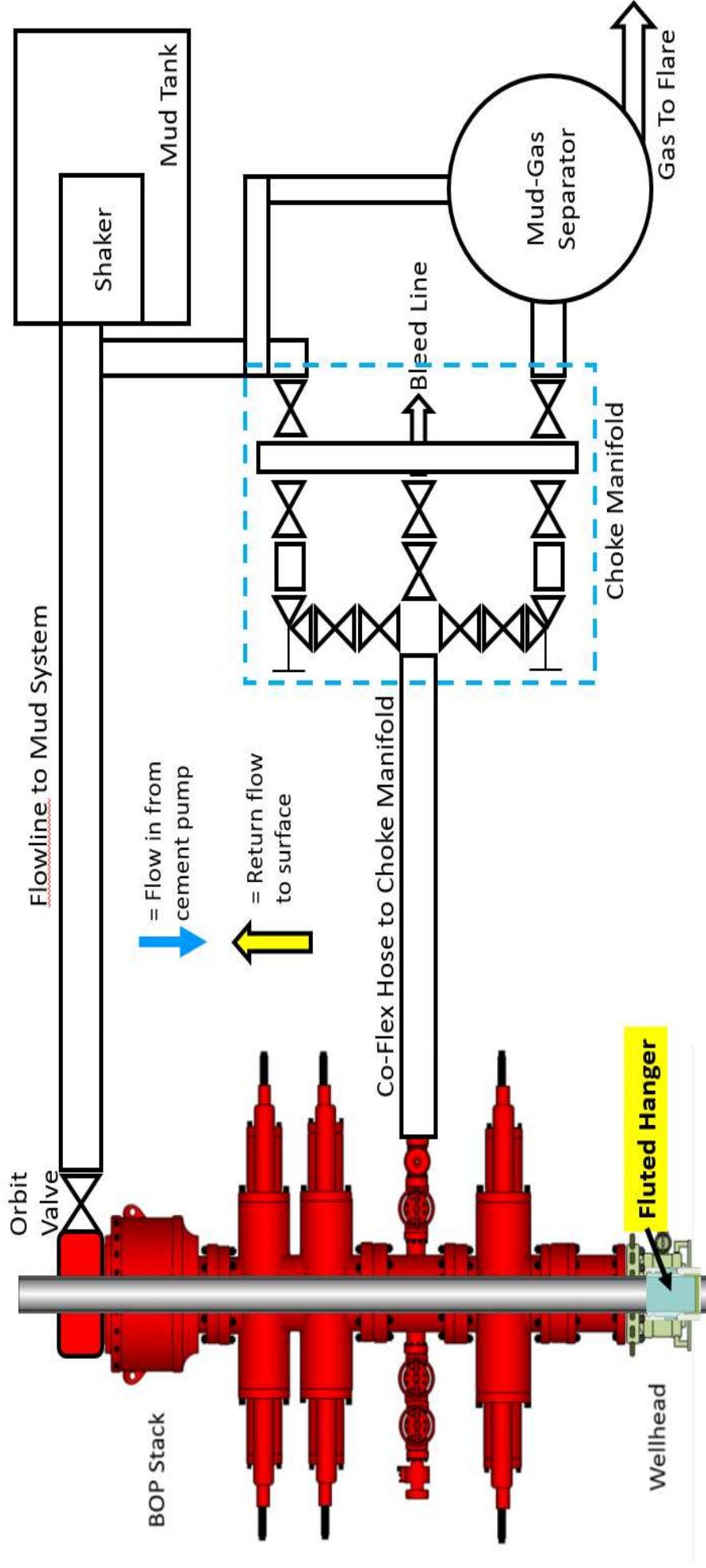
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SLIDE TITLE HERE | 4

Conventional Cementing Flow Diagram

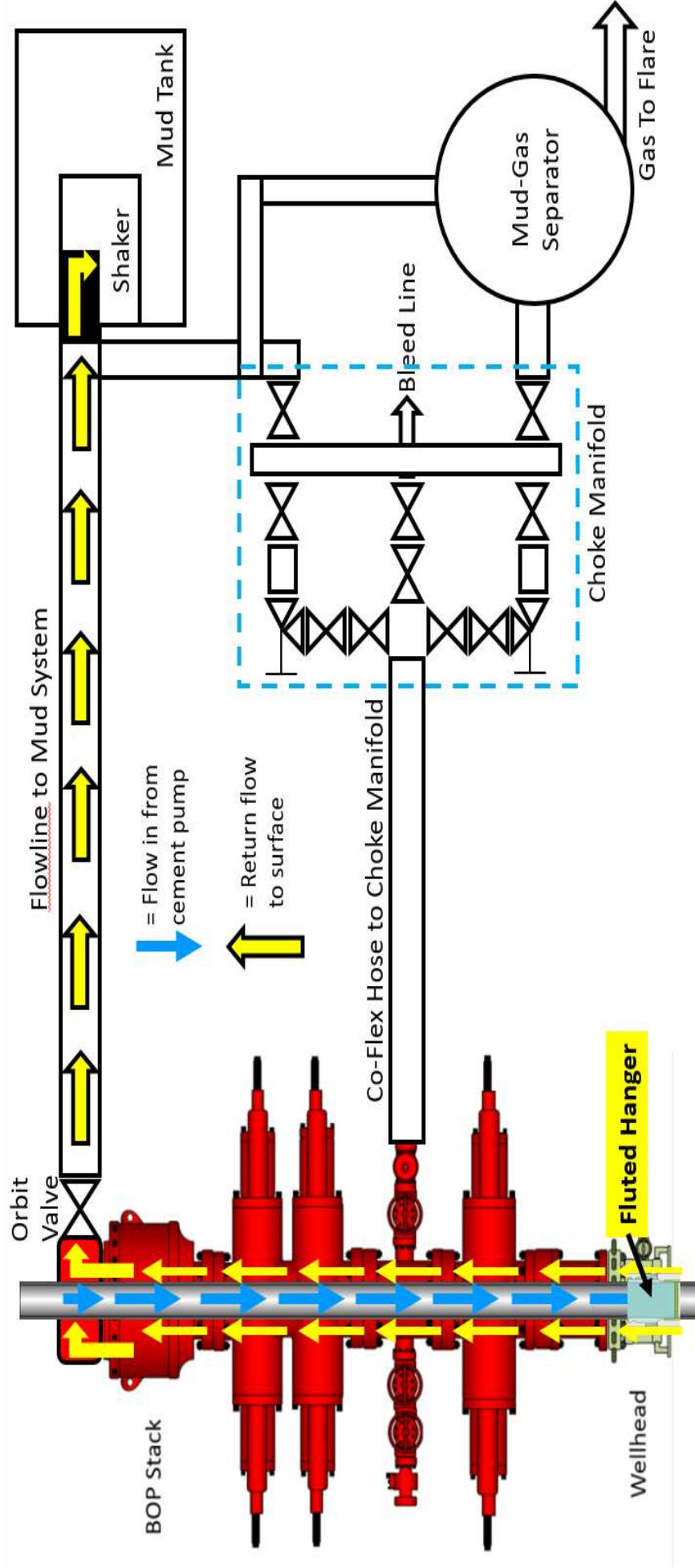


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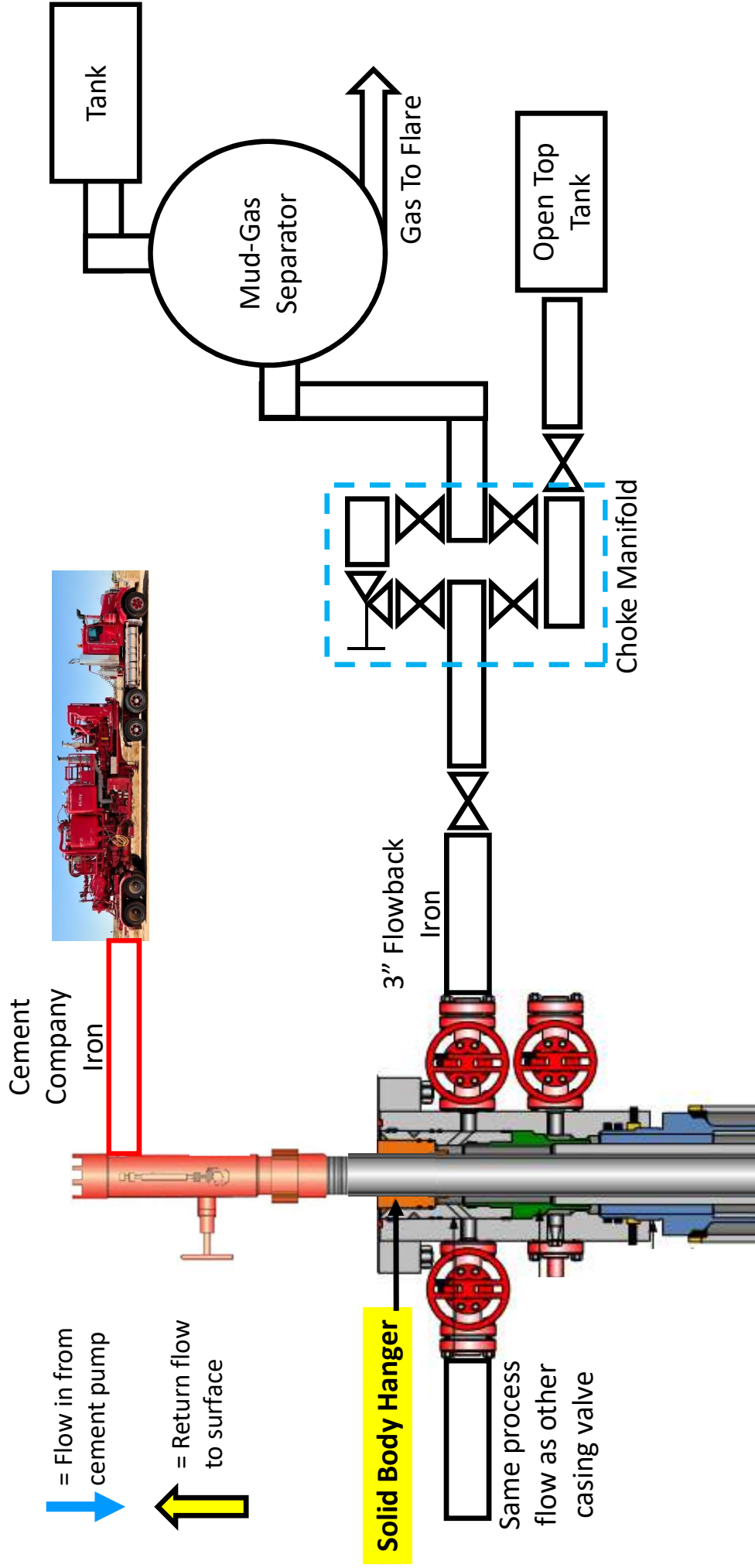
Conventional Cementing Flow Diagram



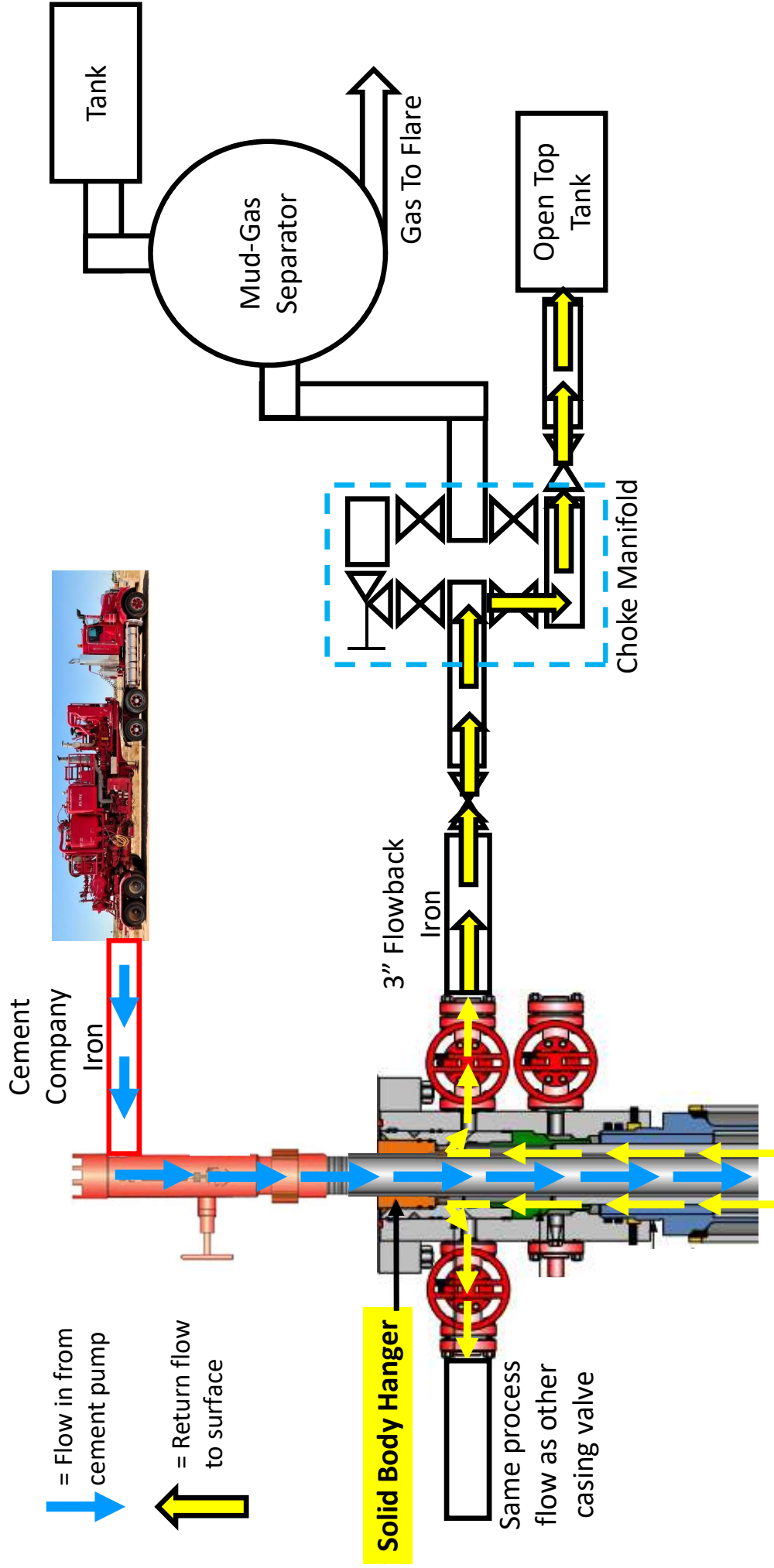
CIMAREX ENERGY CO. NYSE LISTED: XEC

SLIDE TITLE HERE | 6

Offline Cementing -- Intermediate Casing

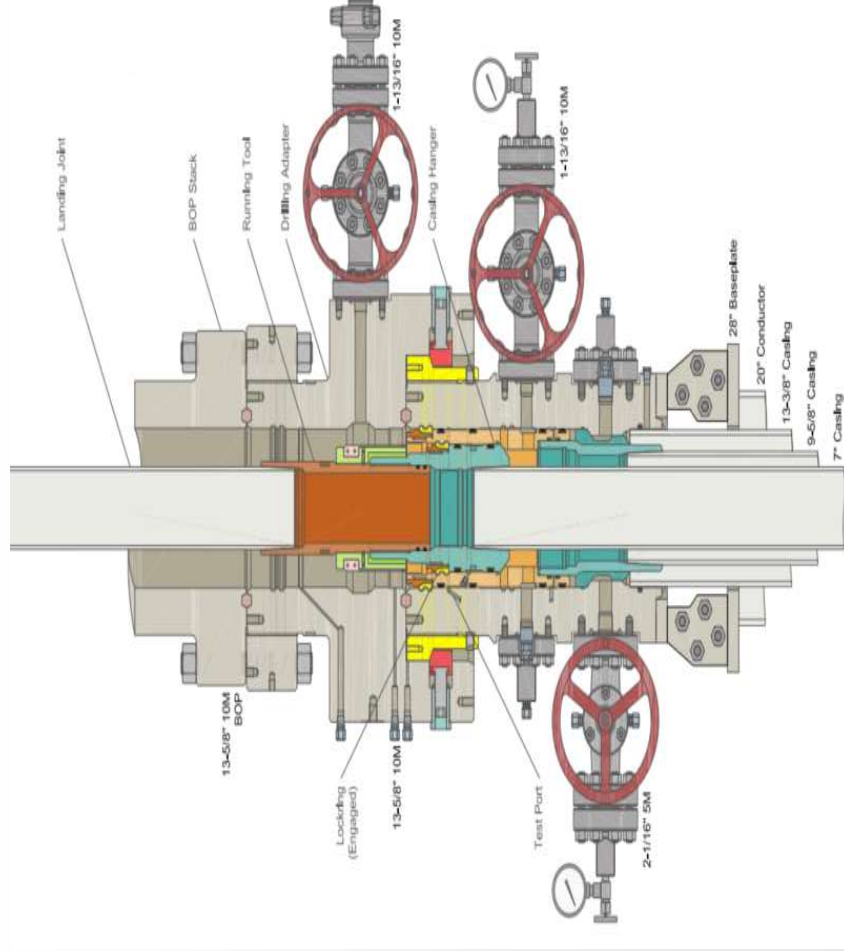


Offline Cementing -- Intermediate Casing



Offline Cementing Progression

- Run 7" casing
- Land 11" nominal x 7" hanger
- Test casing hanger
- Energize 11" nom x 7" hanger lock ring and pull test
- Re-test casing hanger
- Barriers & Procedures after landing casing before setting packoff
 - 10K BOP & 5K Annular-Internal and Annular barrier
 - Kill Weight Fluid in annulus and casing (ensure well is static before setting solid body packoff) Internal and Annular barrier
 - **If well is not static we WILL NOT set solid body packoff.**
 - 10K float collar-Internal Barrier
 - 10k float Shoe-Internal Barrier
 - **After circulating a 1.5 casing capacities to ensure full column of mud and no entrained gas pumps will be shut off and floats checked for flow**

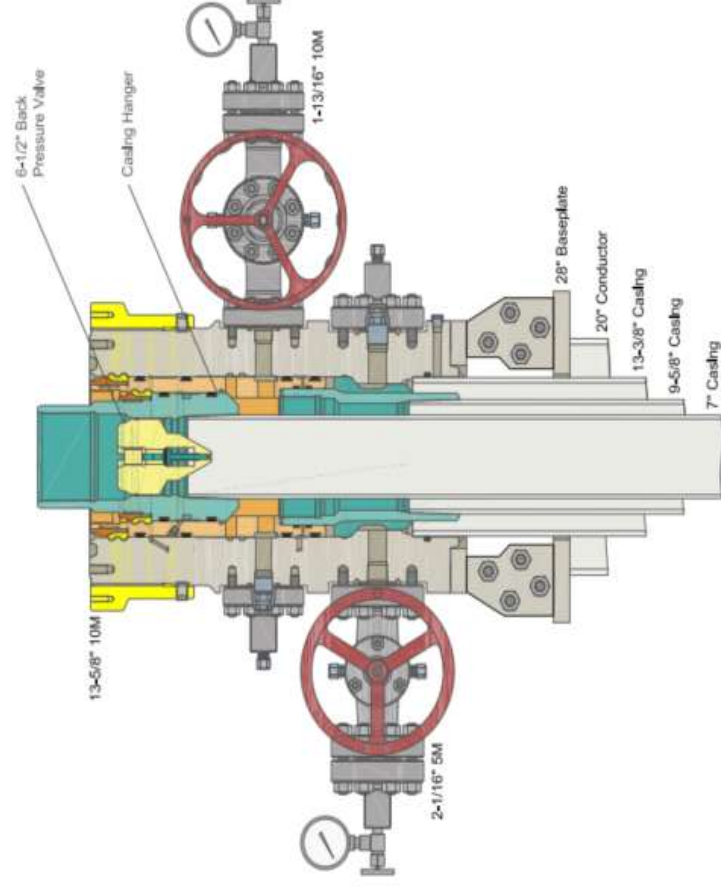


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SLIDE TITLE HERE | 9

Offline Cementing Progression

- Pick up running tool with 6-1/2" nominal Back Pressure valve run into well and set
- Barriers and procedures **BEFORE** removing BOP's
 - Kill weight Fluid in annulus-Annular Barrier
 - Solid Body Packoff-Annular Barrier
 - 10K Float Equipment-Internal Barrier
 - 10K Back pressure valve installed with BOP still on well-Internal Barrier
 - BPV will be tested before it arrives on location by Cactus

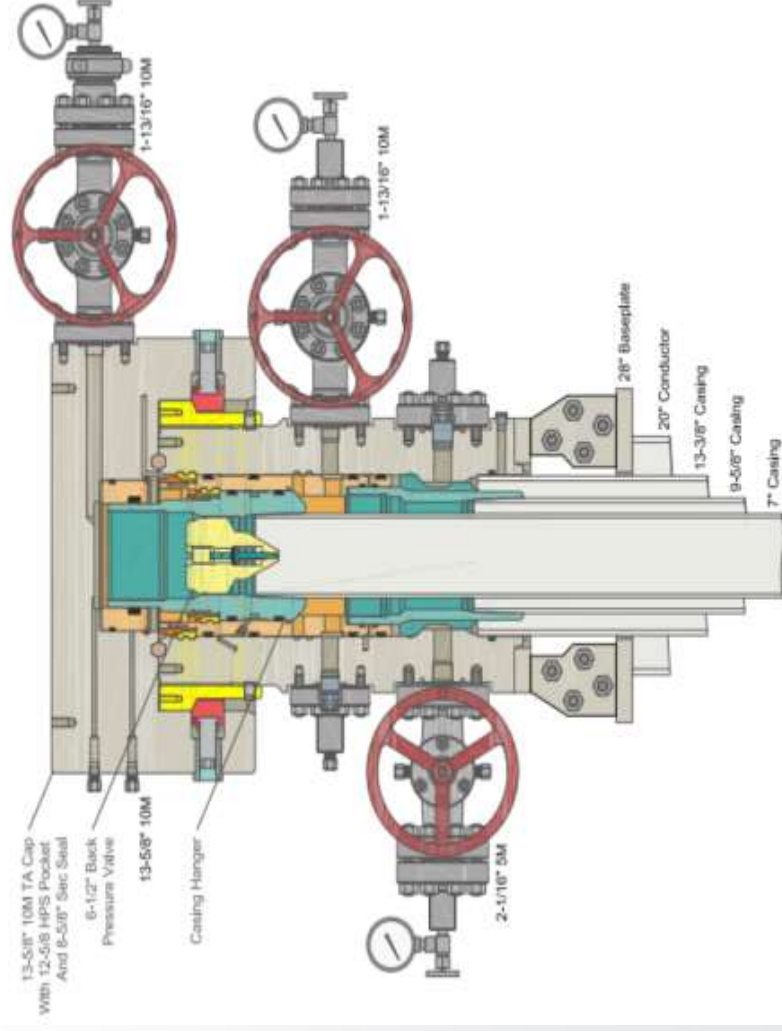


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SLIDE TITLE HERE | 10

Offline Cementing Progression

- Nipple down BOP
- Nipple up TA Cap and test
- Skid Drilling Rig
- Barriers and procedures **AFTER** removing BOP's
 - Kill weight Fluid in annulus-Annular Barrier
 - Solid Body Packoff-Annular Barrier
 - 10K Float Equipment-Internal Barrier
 - 10K Back pressure valve-Internal Barrier
 - 10K rated TA cap with Valve-Internal Barrier

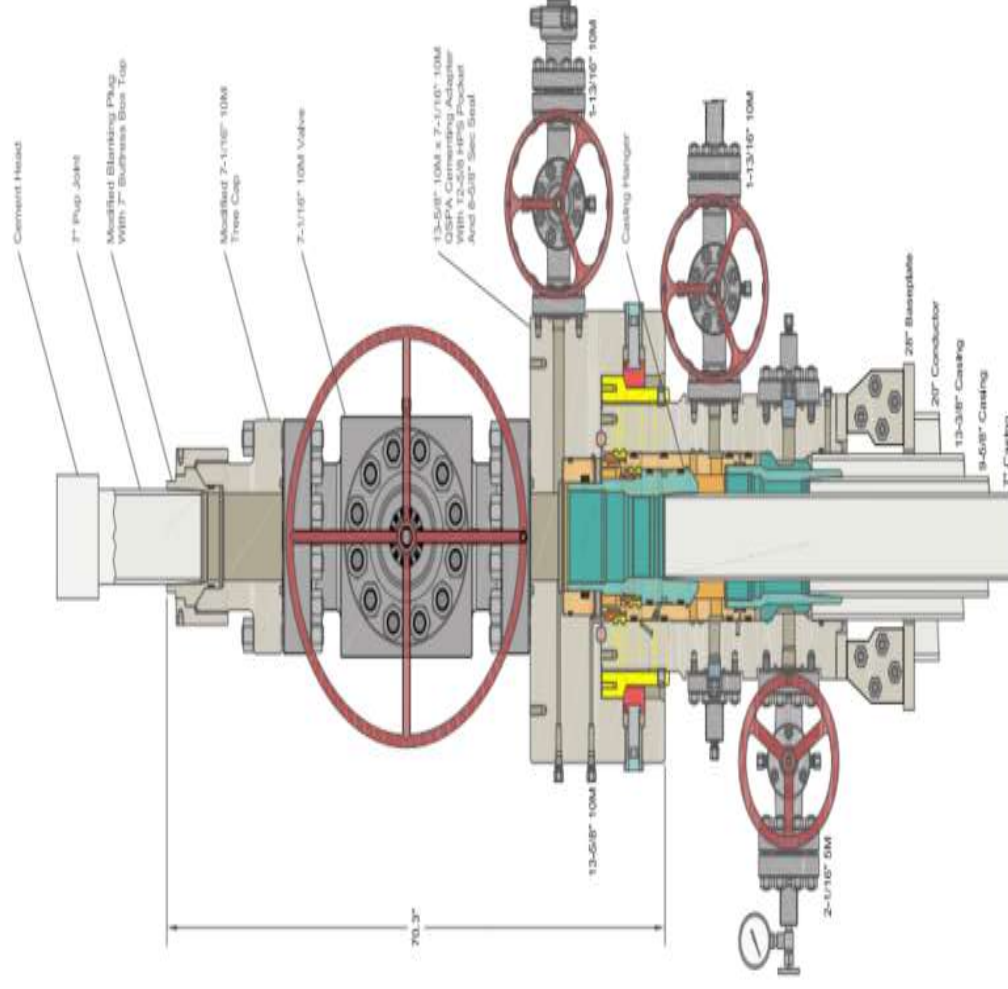


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SLIDE TITLE HERE | 11

Offline Cementing Progression

- Check Pressure on TA Cap and remove
- Install adaptor with Gate valve for off line cementing and test
- Rig up flowback iron independent of rig
- Retrieve Back Pressure Valve
- Shut in well
- Rig up to cement and pump job
- NU 10K TA cap after cement job
- Barriers and procedures before rigging up cementing equipment
 - Address well and ensure no pressure on TA cap
 - Ability to pump into well through casing valves on backside to kill if needed
- Kill weight Fluid in annulus-Annular barrier
- Solid Body Packoff-Annular barrier
- 10K Float Equipment-Internal Barrier
- 10K Back pressure valve-Internal Barrier



CIMAREX ENERGY CO. NYSE LISTED: XEC

SLIDE TITLE HERE | 12

Offline Cementing Risk and COA Compliance

- All testing and breaks tested in accordance with Onshore Order # 2 and COA's
- If no cement to surface, bradenhead squeeze still possible with offline cementing equipment
- Time from skid rig to offline cementing ops typically 24 hours
- **Conditions where we would not Offline Cement**
 - Well is flowing
- All wellhead equipment rated to 10K maintaining APD compliant
 - 10K flowback iron independent of rig circulating system
 - 10K Back Pressure Valve
 - 10K Gate Valve & TA combo for second barrier during operations
 - 10K 1-13/16 Valve coming off TA cap
 - 10K TA Cap



CIMAREX ENERGY CO. NYSE LISTED: XEC

SLIDE TITLE HERE | 13

District I
1625 N. French Dr., Hobbs, NM 88240
Phone:(575) 393-6161 Fax:(575) 393-0720
District II
811 S. First St., Artesia, NM 88210
Phone:(575) 748-1283 Fax:(575) 748-9720
District III
1000 Rio Brazos Rd., Aztec, NM 87410
Phone:(505) 334-6178 Fax:(505) 334-6170
District IV
1220 S. St Francis Dr., Santa Fe, NM 87505
Phone:(505) 476-3470 Fax:(505) 476-3462

State of New Mexico
Energy, Minerals and Natural Resources
Oil Conservation Division
1220 S. St Francis Dr.
Santa Fe, NM 87505

CONDITIONS

Action 19630

CONDITIONS OF APPROVAL

Operator: CIMAREX ENERGY CO. 600 N. Marienfeld Street Suite 600 Midland, TX79701		OGRID: 215099	Action Number: 19630	Action Type: C-103A
OCD Reviewer pkautz		Condition None		