

Well Name: VACA DRAW 20-17 FEDERAL	Well Location: T25S / R33E / SEC 20 / SESW / 32.109742 / -103.596422	County or Parish/State: LEA / NM
Well Number: 9H	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: 3002544360	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: 03:18
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 9H 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 5:52:52 PM

Page 2 of 75

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Section 1 - General

APD ID: 10400013698	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		Zip: 79701
Operator PO Box:		
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: 9H	Well API Number: 3002544360
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 5:52:52 PM

Page 3 of 75

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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_9H_C_102_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	1990	FWL	25S	33E	20	Aliquot SESW	32.109742	-103.596422	LEA	NEW MEXICO	NEW MEXICO	F	NMNM026394	3417	0	0	Y
KOP Leg #1	158	FSL	1906	FWL	25S	33E	20	Aliquot SESW	32.1092609	-103.596689	LEA	NEW MEXICO	NEW MEXICO	F	NMNM026394	-7131	10558	10548	Y
PPP Leg #1-1	330	FSL	1907	FWL	25S	33E	20	Aliquot SESW	32.10974	-103.59669	LEA	NEW MEXICO	NEW MEXICO	F	NMNM026394	-7499	10980	10916	Y
EXIT Leg #1	100	FNL	1907	FWL	25S	33E	17	Aliquot NENW	32.137581	-103.596679	LEA	NEW MEXICO	NEW MEXICO	F	NMNM026394	-7608	21134	11025	Y

Received by OCD: 3/3/2021 5:52:52 PM

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WELL

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NM

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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	-7608	21134	11025	Y

Drilling Plan

Section 1 - Geologic Formations

Formation ID	Formation Name	Elevation	True Vertical Depth	Measured Depth	Lithologies	Mineral Resources	Producing Formation
1613423	RUSTLER	3418	984	984		USEABLE WATER	N
1613417	SALADO	2290	1128	1128		NONE	N
1613419	CASTILE	-1269	4687	4687		NONE	N
1613420	BELL CANYON	-1538	4956	4956		NONE	N
1613415	CHERRY CANYON	-2556	5974	5974		NATURAL GAS, OIL	N
1613421	BRUSHY CANYON	-4066	7484	7484		NATURAL GAS, OIL	N
1613422	BONE SPRING	-5622	9040	9040		NATURAL GAS, OIL	N
1613416	BONE SPRING 2ND	-7155	10573	10573		NATURAL GAS, OIL	N
1613418	BONE SPRING 3RD	-8308	11726	11726		NATURAL GAS, OIL	N
1613424	WOLFCAMP	-8778	12196	12196		NATURAL GAS, OIL	Y

Section 2 - Blowout Prevention

Pressure Rating (PSI): 10M

Rating Depth: 12249

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 5:52:52 PM

Page 5 of 75

Well Name: VACA DRAW 20-17 FEDERAL	Well Location: T25S / R33E / SEC 20 / SESW / 32.109742 / -103.596422	County or Parish/State: LEA / NM
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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 5:52:52 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	12249	0	12249	0	12249	12249	L-80	23	LT&C	1.4	1.24	BUOY	2.13	BUOY
3	INTERMEDIATE	9.875	7.625	NEW	API	N	0	12874	0	12874	0	12874	12874	L-80	29.7	BUTT	2.41	1.16	BUOY	1.76	BUOY
4	PRODUCTION	6.75	5.0	NEW	API	N	12249	22493	12249	22493	12249	22493	10244	P-110	18	BUTT	1.62	1.64	BUOY	64.32	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_9H_Casing_Assumptions_20171012110251.pdf

Casing ID: 2String Type: PRODUCTION

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Vaca_Draw_20_17_Fed_9H_Casing_Assumptions_20171012110641.pdf

Received by OCD: 3/3/2021 5:52:52 PM

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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_9H_Casing_Assumptions_20171012110535.pdf

Casing ID: 4String Type:PRODUCTION

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Vaca_Draw_20_17_Fed_9H_Casing_Assumptions_20171012110733.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	402	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	1224 9	724	1.3	14.2	941	10	50:50 (Poz:H)	Salt, Bentonite, Fluid Loss, Dispersant, SMS
INTERMEDIATE	Lead		0	1287 4	605	6.18	9.2	3735	50	Class C	Extender, Salt, Strength Enhancement, LCM, Fluid Loss, Retarder
INTERMEDIATE	Tail		0	1287 4	207	1.3	14.2	268	25	50:50 (Poz:H)	Salt, Bentonite, Fluid Loss, Dispersant, SMS

Received by OCD: 3/3/2021 5:52:52 PM

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Type of Well: CONVENTIONAL GAS
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		1224 9	2249 3	724	1.3	14.2	941	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	1287 4	OTHER : Brine Diesel Emulsion	8.5	9							
1287 4	2249 3	OIL-BASED MUD	12	12.5							
0	1034	SPUD MUD	8.3	8.8							

Received by OCD: 3/3/2021 5:52:52 PM

Page 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: 8287

Anticipated Surface Pressure: 5861

Anticipated Bottom Hole Temperature(F): 195

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_9H_H2S_Plan_05-05-2017.pdf

Section 8 - Other Information

Proposed horizontal/directional/multi-lateral plan submission:

Vaca_Draw_20_17_Fed_9H_Directional_Plan_05-05-2017.pdf

Other proposed operations facets description:

Other proposed operations facets attachment:

Vaca_Draw_20_17_Fed_9H_Drilling_Plan_20171012111205.pdf

Vaca_Draw_20_17_Fed_9H_Flex_Hose_20171012111208.pdf

Vaca_Draw_20_17_Fed_9H_AntiCollision_05-09-2017.pdf

Other Variance attachment:

SUPO

Received by OCD: 3/3/2021 5:52:52 PM

Page 10 of 75

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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_9H_Access_Road_ROW_05-04-2017.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 5:52:52 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_9H_Mile_radius_and_Existing_wells_05-04-2017.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_05-04-2017.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:	PIPELINE TRUCKING
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_9H_Drlg_water_route_20170908121605.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 5:52:52 PM

Page 13 of 75

Well Name: VACA DRAW 20-17 FEDERAL	Well Location: T25S / R33E / SEC 20 / SESW / 32.109742 / -103.596422	County or Parish/State: LEA / NM
Well Number: 9H	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: 3002544360	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 5:52:52 PM

Page 14 of 75

Well Name: VACA DRAW 20-17 FEDERAL	Well Location: T25S / R33E / SEC 20 / SESW / 32.109742 / -103.596422	County or Parish/State: LEA / NM
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Lease Number: NMNM026394, NMNM26394	Unit or CA Name:	Unit or CA Number:
US Well Number: 3002544360	Well Status: Approved Application for Permit to Drill	Operator: CIMAREX ENERGY COMPANY

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_9H_Wellsite_Layout_05-09-2017.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_9H_Interim_Reclaim_05-04-2017.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 5:52:52 PM

Page 15 of 75

Well Name: VACA DRAW 20-17 FEDERAL	Well Location: T25S / R33E / SEC 20 / SESW / 32.109742 / -103.596422	County or Parish/State: LEA / NM
Well Number: 9H	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: 3002544360	Well Status: Approved Application for Permit to Drill	Operator: CIMAREX ENERGY COMPANY

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 5:52:52 PM

Page 16 of 75

Well Name: VACA DRAW 20-17 FEDERAL	Well Location: T25S / R33E / SEC 20 / SESW / 32.109742 / -103.596422	County or Parish/State: LEA / NM
Well Number: 9H	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: 3002544360	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 5:52:52 PM

Page 17 of 75

Well Name: VACA DRAW 20-17 FEDERAL	Well Location: T25S / R33E / SEC 20 / SESW / 32.109742 / -103.596422	County or Parish/State: LEA / NM
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Lease Number: NMNM026394, NMNM26394	Unit or CA Name:	Unit or CA Number:
US Well Number: 3002544360	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 ApIn/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_05-04-2017.pdf

Received by OCD: 3/3/2021 5:52:52 PM

Page 18 of 75

Well Name: VACA DRAW 20-17 FEDERAL	Well Location: T25S / R33E / SEC 20 / SESW / 32.109742 / -103.596422	County or Parish/State: LEA / NM
Well Number: 9H	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: 3002544360	Well Status: Approved Application for Permit to Drill	Operator: CIMAREX ENERGY COMPANY

Vaca_Draw_20_17_Fed_9H_Road_Description_05-04-2017.pdf
Vaca_Draw_20_17_Fed_9H_Temp_water_route_05-04-2017.pdf
Vaca_Draw_20_17_Fed_9H_Mile_radius_and_Existing_wells_05-04-2017.pdf
Vaca_Draw_20_17_Fed_9H_SUPO_05-04-2017.pdf
Vaca_Draw_20_17_Fed_9H_Gas_lift_Flow_line_ROW_05-04-2017.pdf
Vaca_Draw_20_17_Fed_Battery_Powerline_ROW_05-04-2017.pdf
Vaca_Draw_20_17_Fed_9H_Public_Access_05-04-2017.pdf
Vaca_Draw_20_17_Fed_Battery_Gas_Sales_ROW_05-04-2017.pdf
Vaca_Draw_20_17_Fed_Battery_SWD_ROW_05-04-2017.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 5:52:52 PM

Page 19 of 75

Well Name: VACA DRAW 20-17 FEDERAL	Well Location: T25S / R33E / SEC 20 / SESW / 32.109742 / -103.596422	County or Parish/State: LEA / NM
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Lease Number: NMNM026394, NMNM26394	Unit or CA Name:	Unit or CA Number:
US Well Number: 3002544360	Well Status: Approved Application for Permit to Drill	Operator: CIMAREX ENERGY COMPANY

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 5:52:52 PM

Page 20 of 75

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Lease Number: NMNM026394, NMNM26394	Unit or CA Name:	Unit or CA Number:
US Well Number: 3002544360	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 5:52:52 PM

Page 21 of 75

Well Name: VACA DRAW 20-17 FEDERAL	Well Location: T25S / R33E / SEC 20 / SESW / 32.109742 / -103.596422	County or Parish/State: LEA / NM
Well Number: 9H	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: 3002544360	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 5:52:52 PM

Page 22 of 75

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Lease Number: NMNM026394, NMNM26394	Unit or CA Name:	Unit or CA Number:
US Well Number: 3002544360	Well Status: Approved Application for Permit to Drill	Operator: CIMAREX ENERGY COMPANY

NOI Attachments

Procedure Description

- VacaDraw_20_17_Fed_9_Drill_Plan_20210221151246.pdf
- VacaDraw_20_17_Fed_9_BOP_Manifold___WH_20210221151222.pdf
- Vaca_Draw_20_17_Fed_9H_Dir_Plan___AC_20210221151142.pdf
- OLC_7_in_Csg_Vaca_Draw_20210221151102.pdf
- C102_Vaca_Draw_20_17_Fed_9H_20210221151023.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 03:13 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

30-025-44360	¹ API Number 97903	² Section WC-025 G-08 S253235G, LOWER BONE SPRING
⁴ Property Code 319775	⁵ Property Name VACA DRAW 20-17 FEDERAL	⁶ Well Number 9H
⁷ GRID No. 215099	⁸ Operator Name CIMAREX ENERGY CO.	⁹ Elevation 3417.2'

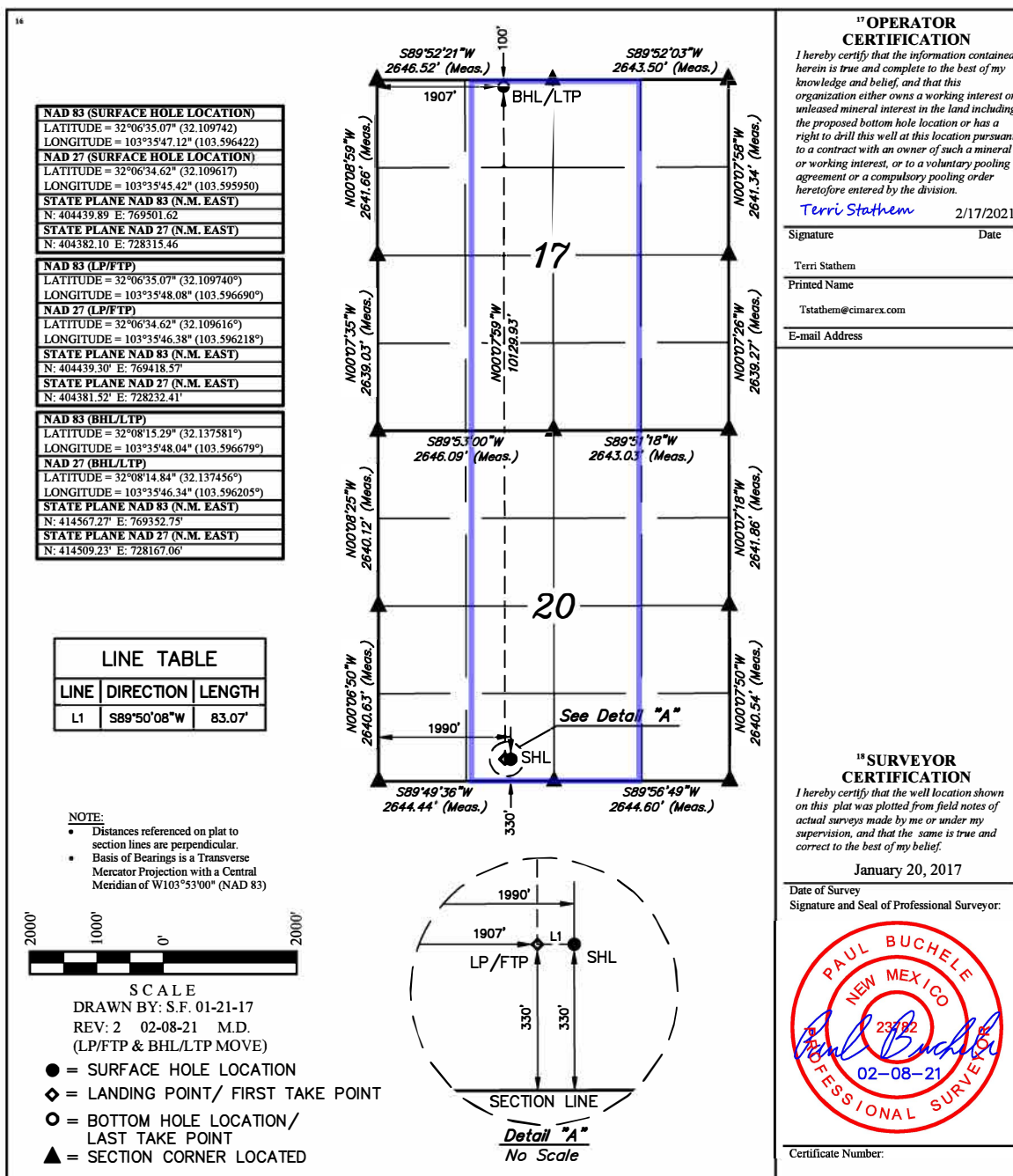
¹⁰Surface Location

UL or lot no. N	Section 20	Township 25S	Range 33E	Lot Idn	Feet from the 330	North/South line SOUTH	Feet from the 1990	East/West line WEST	County LEA
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¹¹Bottom Hole Location If Different From Surface

UL or lot no. C	Section 17	Township 25S	Range 33E	Lot Idn	Feet from the 100	North/South line NORTH	Feet from the 1907	East/West line WEST	County 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 11,025

Pilot Hole TD N/A

MD at TD 21,134

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	1051	1051	13-3/8"	48.00	H-40	ST&C	1.63	3.80	6.38
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	9700	9700	7"	26.00	L-80	LT&C	1.19	1.60	1.60
8 3/4	9700	11200	11012	7"	29.00	P-110	BT&C	1.66	2.18	24.42
6	9558	21134	11025	4-1/2"	11.60	P-110	BT&C	1.47	2.08	21.57
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 9H

	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
	137	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
	288	14.80	1.34	6.32	9.5	Tail: Class C + LCM
Production	358	10.30	3.64	22.18		Lead: Tuned Light + LCM
	107	14.80	1.36	6.57	9.5	Tail: Class C + Retarder
Completion System	737	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	11000	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 1051'	Fresh Water	7.83 - 8.33	28	N/C
1051' to 4920'	Brine Water	9.80 - 10.30	30-32	N/C
4920' to 11200'	Cut Brine or OBM	8.50 - 9.00	27-70	N/C
11308' to 21134'	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	
X	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	5159 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

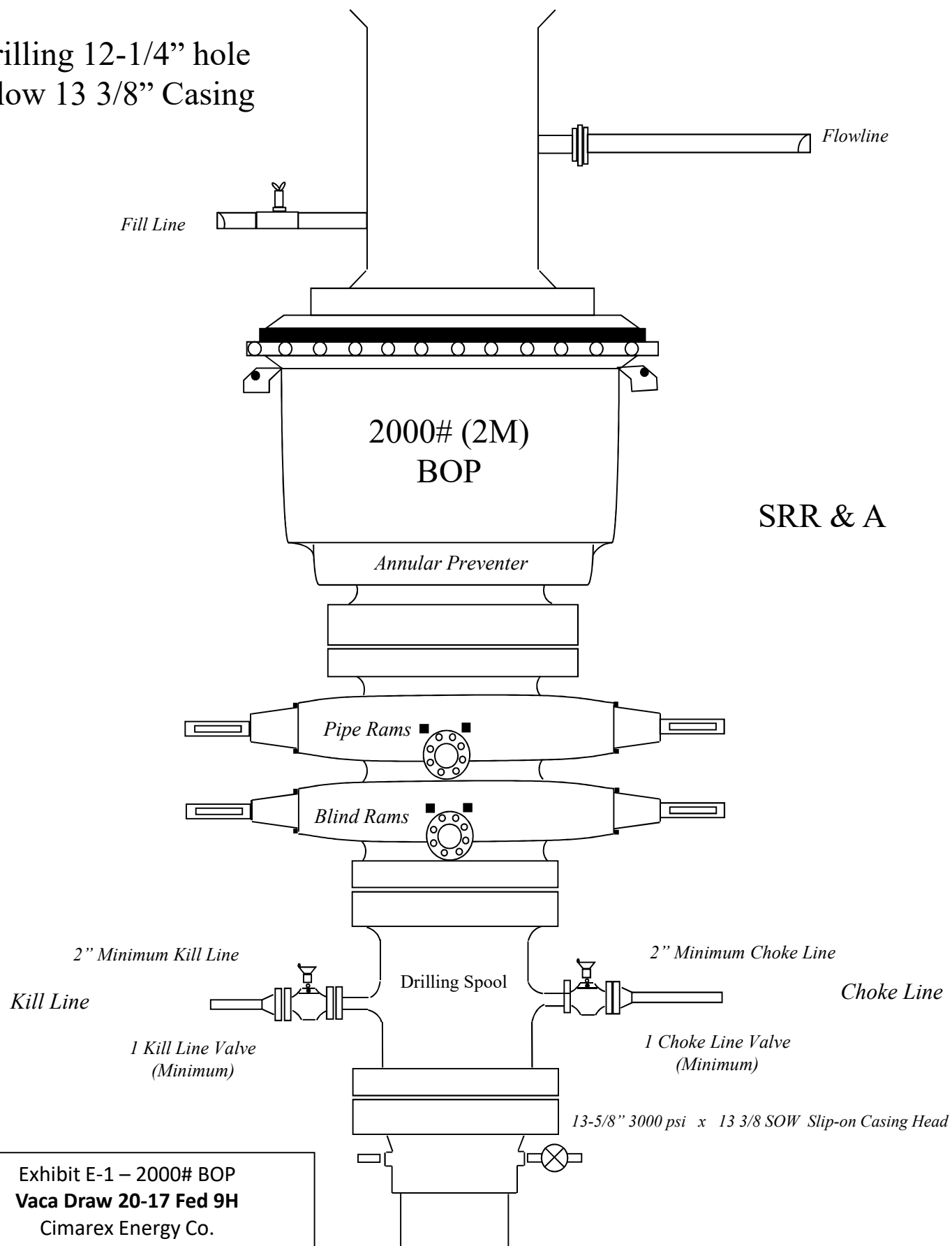


Exhibit E-1 – 2000# BOP
Vaca Draw 20-17 Fed 9H
Cimarex Energy Co.
20-25S-33E
Lea County, NM

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

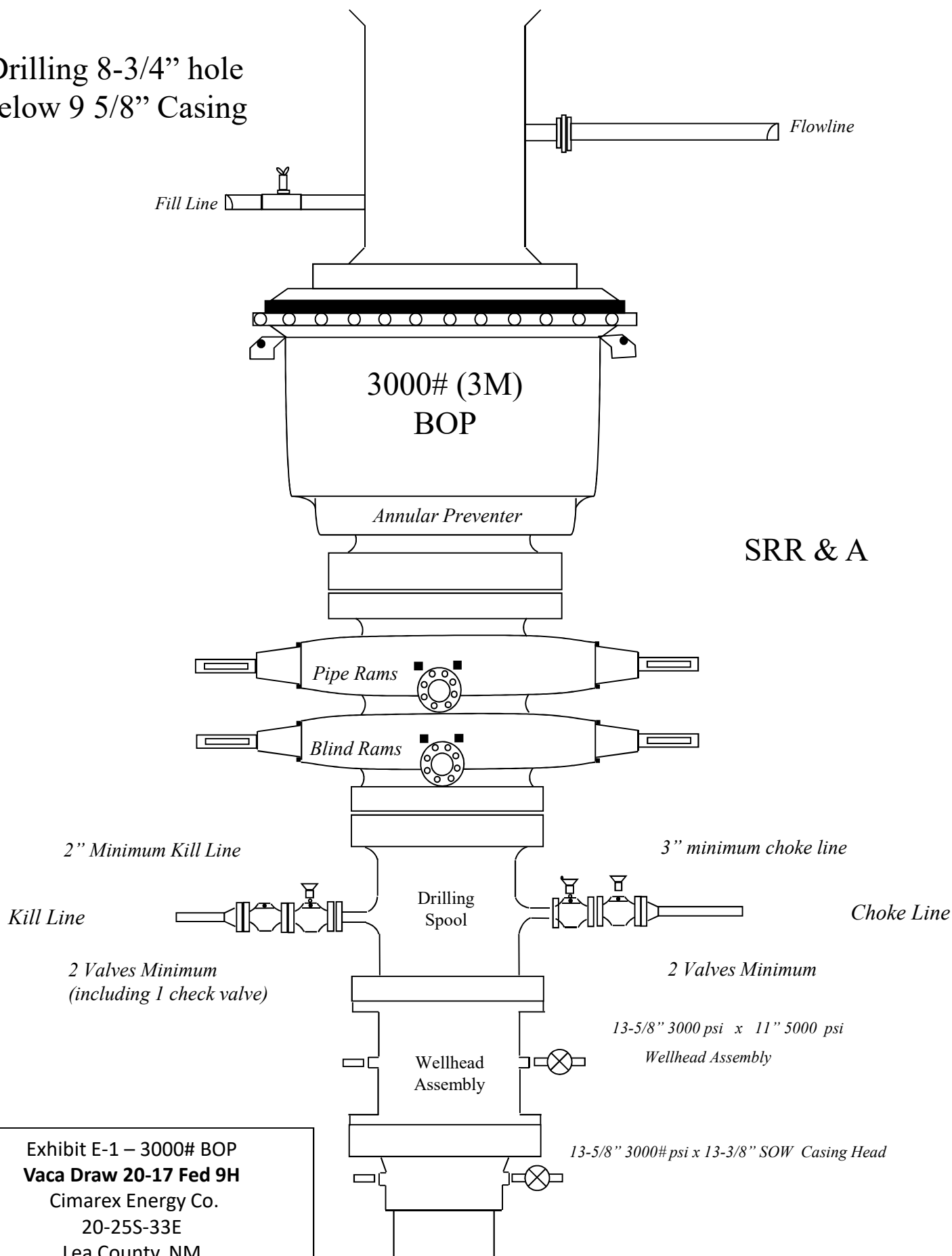


Exhibit E-1 – 3000# BOP
Vaca Draw 20-17 Fed 9H
Cimarex Energy Co.
20-25S-33E
Lea County, NM

Drilling 6" hole below
7" Casing

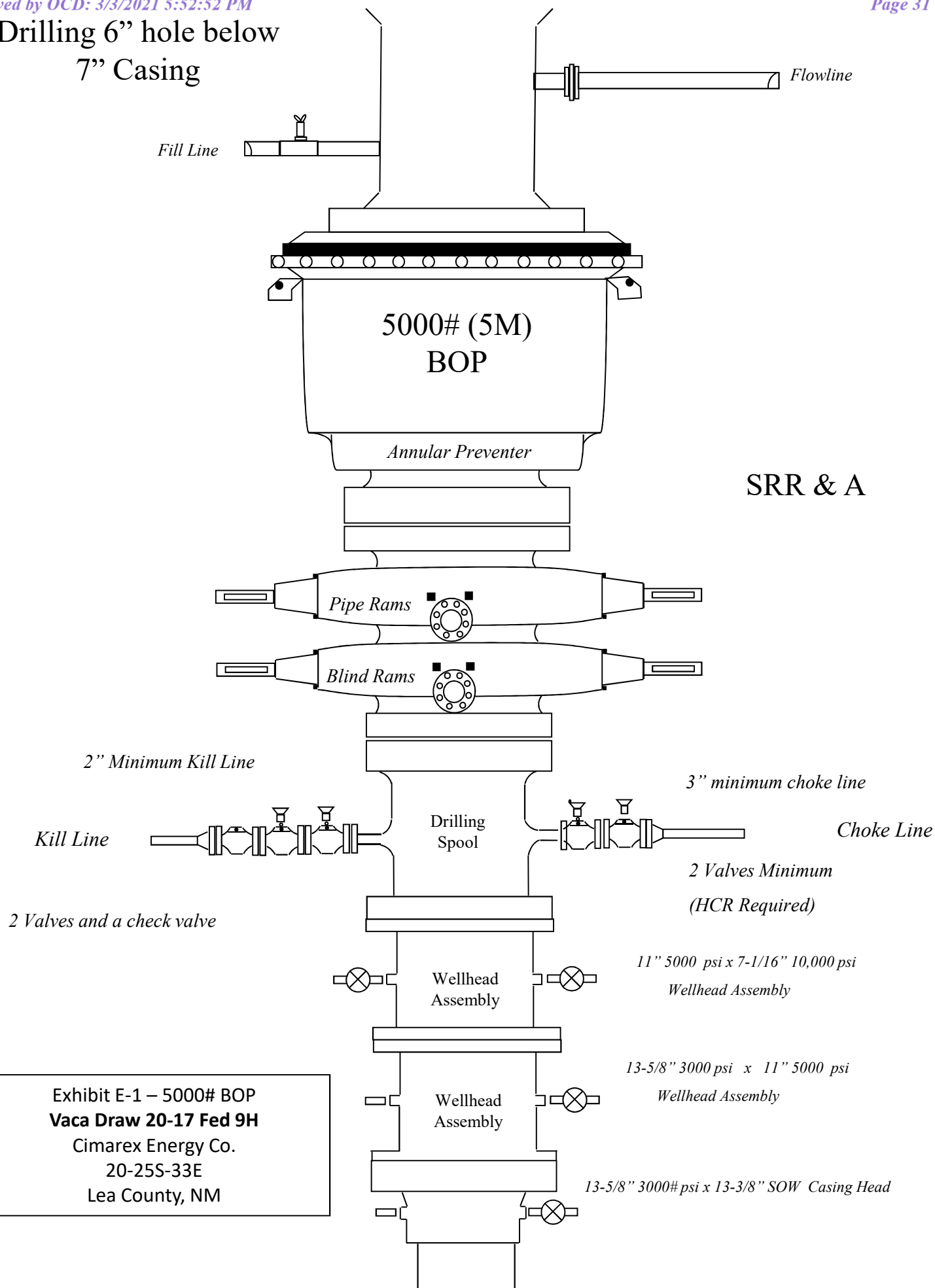


Exhibit E-1 – 5000# BOP
Vaca Draw 20-17 Fed 9H
Cimarex Energy Co.
20-25S-33E
Lea County, NM

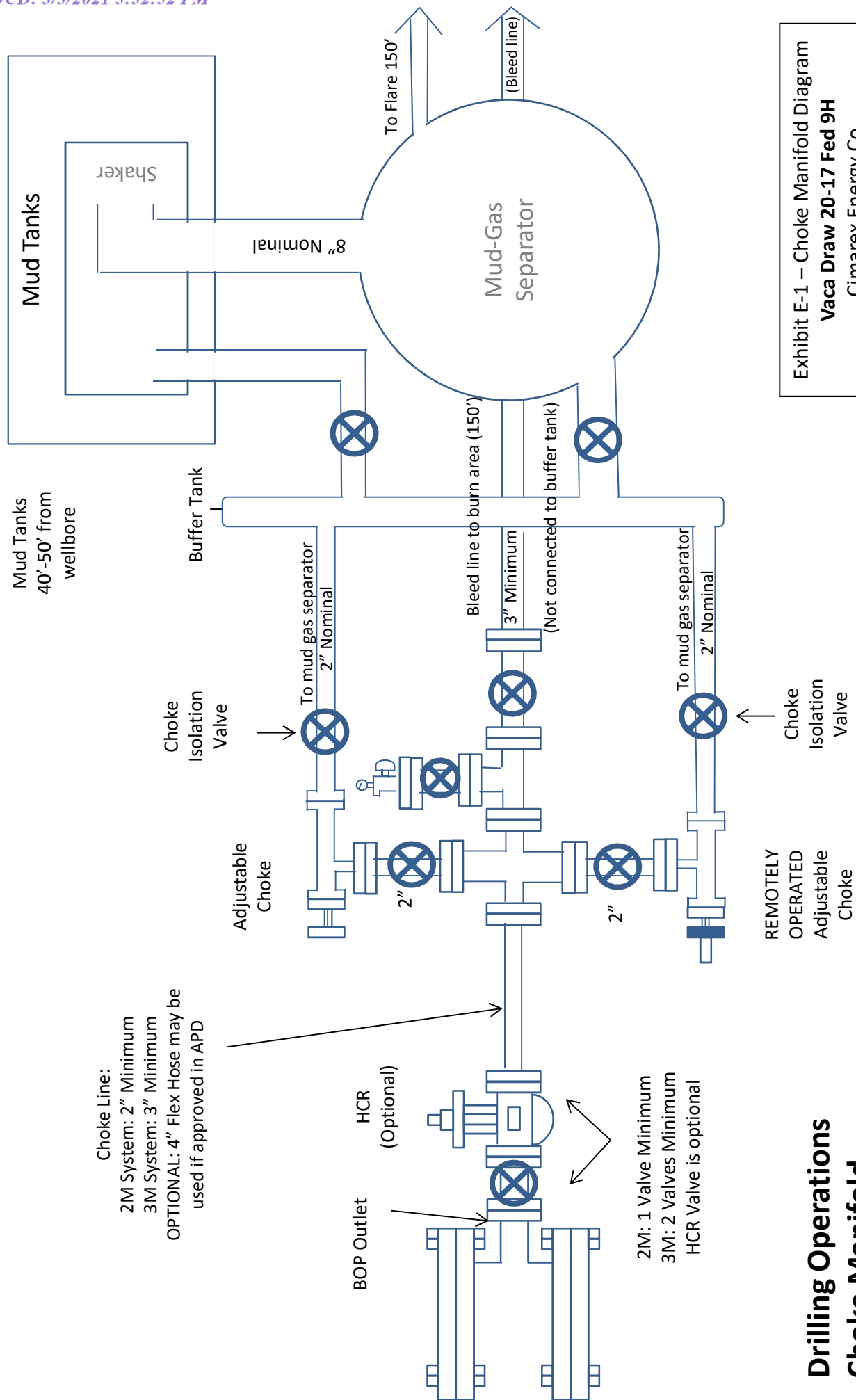
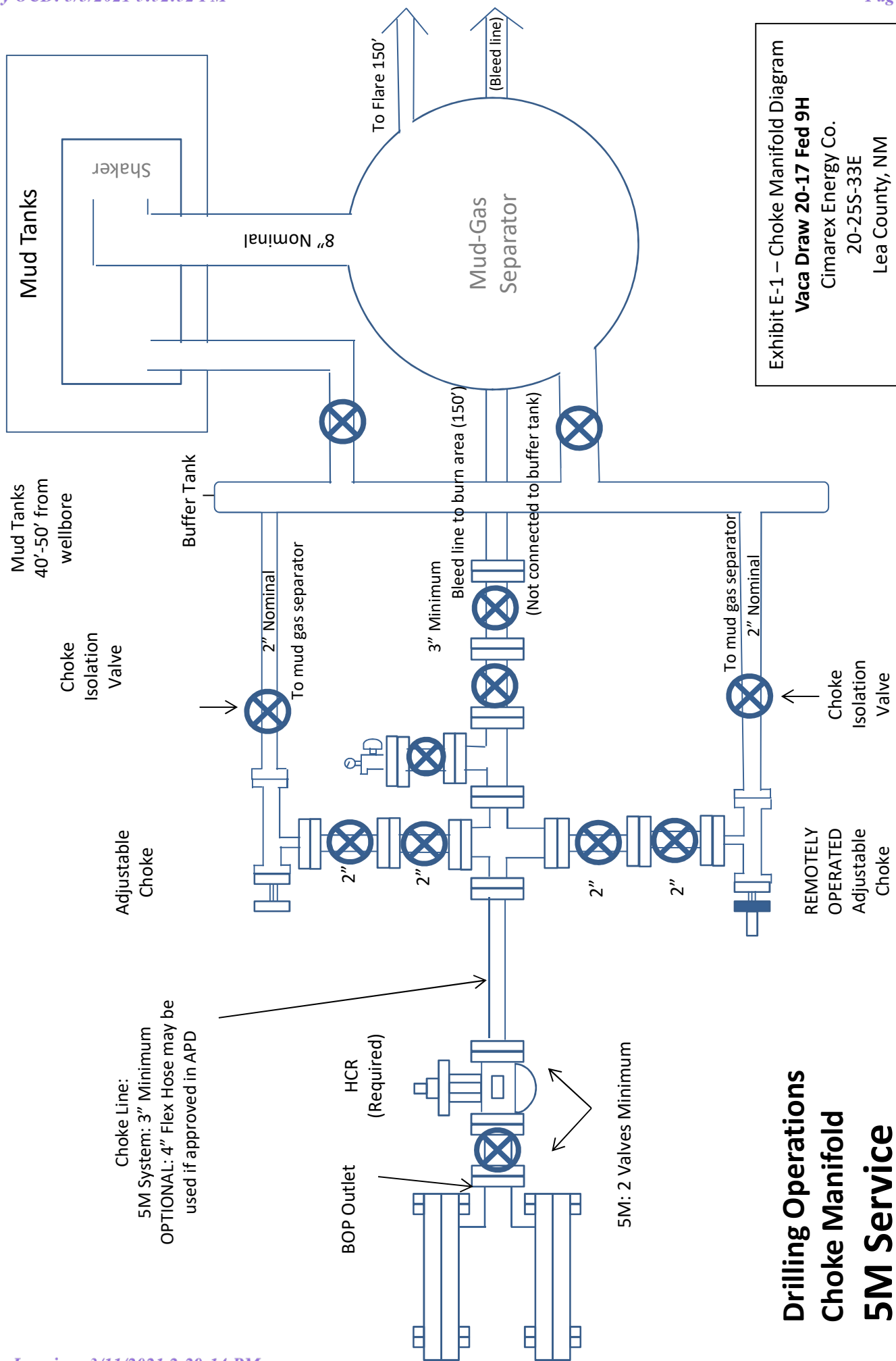
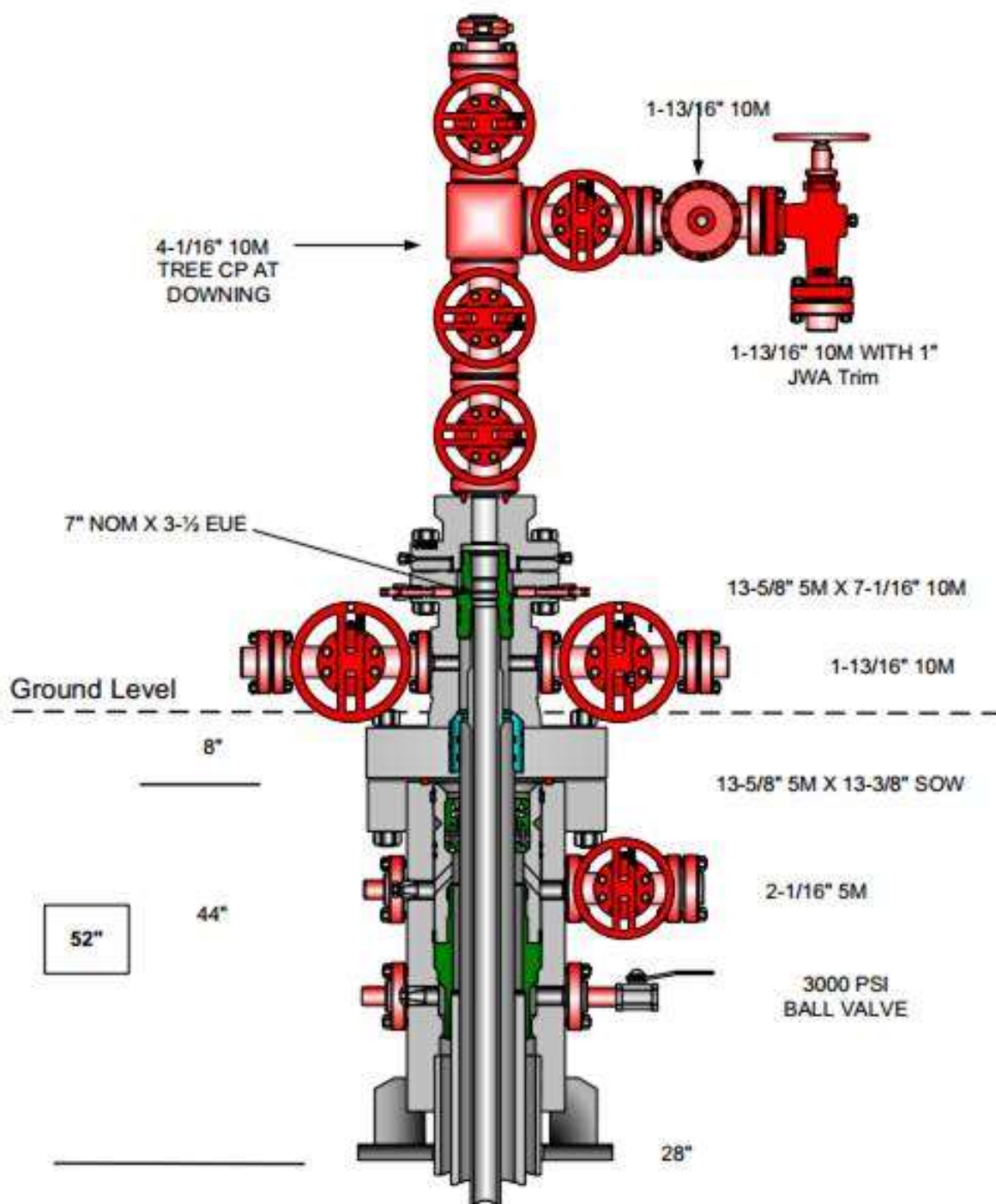


Exhibit E-1 – Choke Manifold Diagram
Vaca Draw 20-17 Fed 9H
 Cimarex Energy Co.
 20-25S-33E
 Lea County, NM

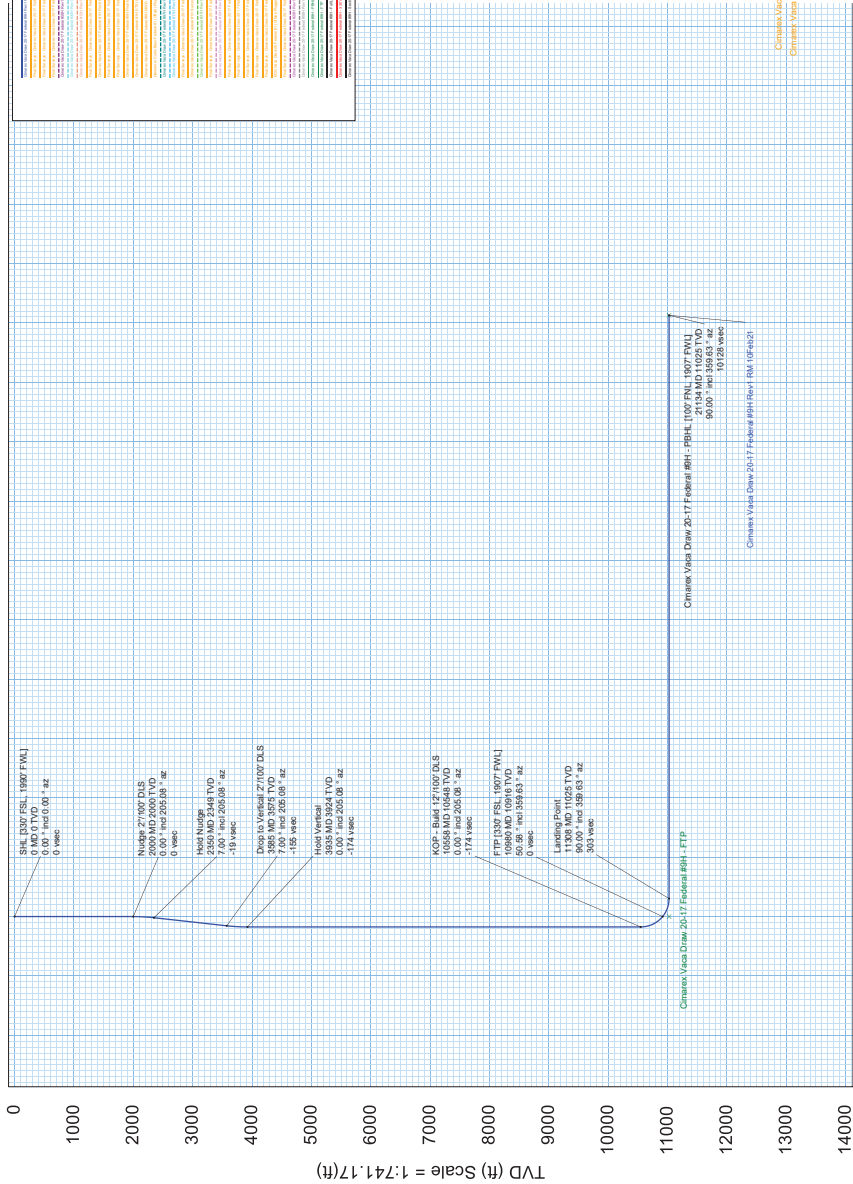


Multi-bowl Wellhead Diagram



Multi-bowl Wellhead Diagram
Vaca Draw 20-17 Fed 9H
Cimarex Energy Co.
20-25S-33E
Lea Co., NM

Borehole:			Well:		Field:			Structure:			
Original Borehole			Cimarex Vaca Draw 20-17 Federal #9H			NM Lea County (NAD 83)			Cimarex Vaca Draw 20-17 Federal #9H		
Gravity & Magnetic Parameters Model: HDGM 2020 MagDec: 6.45°	Dip: 59.67° FS: 47693.239NT	Date: 10-Feb-2021 986.43mgs (9.80665 Based)	Surface Location Lat: N 32 6 35.07 Long: W 103 35 47.12		NAD83 New Mexico State Plane, Eastern Zone, US Feet Northing: 646439.981US Easting: 718901.621US		Grid Conv: 0.3917" Scale Fact: 0.99998872	Microseismic Cimarex Vaca Draw 20-17 Federal #9H Slot: 17 Plan: Cimarex Vaca Draw 20-17 Federal #9H Rev1 RM 10/6/21	RMS 0.04428 above MSL		
CONTROLLED Drawn and checked by 2020/02/21 Copy number 4 of 3 10 Feb 2021 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32											
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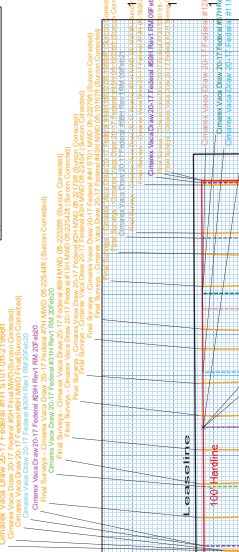
CONTROLLED

Page 1 of 1

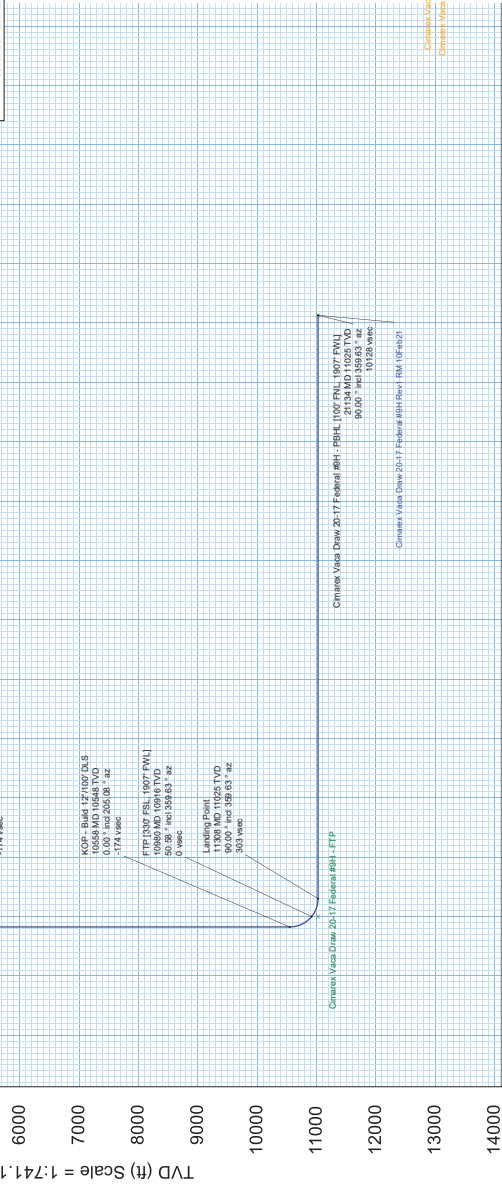
Drawn by: [Signature]

Checked by: [Signature]

Date: 10 Feb 2021



Point	MD	INCL	AZIM	TVD	VSEC	N(+)/S(-)	E(+)/W(-)	DLS
SHL [330° FSL, 1907° FWL]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nudge 27100° DLS	2000.00	0.00	205.08	2000.00	0.00	0.00	0.00	0.00
Hold Nudge	2350.00	7.00	205.08	2340.13	-19.28	-19.34	-8.05	2.00
Drop to Vertical 27100° DLS	3365.08	7.00	205.08	3575.01	-155.16	-155.06	-72.87	0.00
Hold Vertical	3395.08	0.00	205.08	3624.14	-174.46	-175.00	-81.92	2.00
KOP - Build 127100° DLS	10568.48	0.00	205.08	10547.54	-174.46	-175.00	-81.92	0.00
FTP [330° FSL, 1907° FWL]	10960.02	50.58	359.63	10916.41	-0.16	-0.70	-83.05	12.00
Landing Point	11308.48	90.00	359.63	11025.00	303.00	302.45	-85.02	12.00
Cimarex Vaca Draw 20-17 Federal #9H - PSHL [100° FWL, 1907° FWL]	21133.95	90.00	359.63	11028.47	10128.47	10127.72	-148.87	0.00



Schlumberger

Cimarex Vaca Draw 20-17 Federal #9H Rev1 RM 10Feb21 Proposal Geodetic

Report

(Def Plan)

Report Date: February 10, 2021 - 12:13 PM Client: Cimarex Field: NM Lea County (NAD 83) Structure / Slot: Cimarex Vaca Draw 20-17 Federal #9H / Cimarex Vaca Draw 20-17 Federal #9H Well: Cimarex Vaca Draw 20-17 Federal #9H Borehole: Original Borehole UWI / API#: Unknown / Unknown Survey Name: Cimarex Vaca Draw 20-17 Federal #9H Rev1 RM 10Feb21 Survey Date: February 10, 2021 Tort / AHD / DDI / ERD Ratio: 104.000 ° / 10496.160 ft / 6.321 / 0.952 Coordinate Reference System: NAD83 New Mexico State Plane, Eastern Zone, US Feet Location Lat / Long: N 32° 6' 35.06560", W 103° 35' 47.11757" Location Grid N/E Y/X: N 404439.890 ftUS, E 769501.620 ftUS CRS Grid Convergence Angle: 0.3917 ° Grid Scale Factor: 0.99996872 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: 3440.200 ft above MSL Seabed / Ground Elevation: 3417.200 ft above MSL Magnetic Declination: 6.455 ° Total Gravity Field Strength: 998.4304mgm (9.80665 Based) Gravity Model: GARM Total Magnetic Field Strength: 47599.239 nT Magnetic Dip Angle: 59.676 ° Declination Date: February 10, 2021 Magnetic Declination Model: HDGM 2020 North Reference: Grid North Grid Convergence Used: 0.3917 ° Total Corr Mag North-Grid North: 6.0634 °	Local Coord Referenced To: Structure Reference Point
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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, 1990' FWL]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	404439.89	769501.62	N 32 6 35.07	W 103 35 47.12
Nudge 2°/100' DLS	2000.00	0.00	205.08	2000.00	0.00	0.00	0.00	0.00	404439.89	769501.62	N 32 6 35.07	W 103 35 47.12
Hold Nudge	2350.00	7.00	205.08	2349.13	-19.28	-19.34	-9.05	2.00	404420.55	769492.57	N 32 6 34.87	W 103 35 47.22
Drop to Vertical 2°/100' DLS	3585.08	7.00	205.08	3575.01	-155.18	-155.66	-72.87	0.00	404284.23	769428.76	N 32 6 33.53	W 103 35 47.98
Hold Vertical	3935.08	0.00	205.08	3924.14	-174.46	-175.00	-81.92	2.00	404264.90	769419.70	N 32 6 33.34	W 103 35 48.08
KOP - Build	10558.48	0.00	205.08	10547.54	-174.46	-175.00	-81.92	0.00	404264.90	769419.70	N 32 6 33.34	W 103 35 48.08
12°/100' DLS	11308.48	90.00	359.63	11025.00	303.00	302.45	-85.02	12.00	404742.33	769416.60	N 32 6 38.06	W 103 35 48.08
Landing Point Cimarex Vaca												
Draw 20-17												
Federal #9H - PBHL [100' FNL, 1907' FWL]	21133.95	90.00	359.63	11025.00	10128.47	10127.72	-148.87	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	NAL_MWD_IFR1+MS-Depth Only	Draw 20-17 Federal #9H Rev1 RM 10Feb21		
	1		23.000	21133.951	1/100.000	17.500	13.375		NAL_MWD_IFR1+MS	Original Borehole / Cimarex Vaca Draw 20-17 Federal #9H Rev1 RM		



Cimarex Vaca Draw 20-17 Federal #9H Rev1 RM 10Feb21 Proposal Geodetic

Report

(Def Plan)

Report Date: February 10, 2021 - 12:12 PM
Client: Cimarex
Field: NM Lea County (NAD 83)
Structure / Slot: Cimarex Vaca Draw 20-17 Federal #9H / Cimarex Vaca Draw 20-17 Federal #9H
Well: Cimarex Vaca Draw 20-17 Federal #9H
Borehole: Original Borehole
UWI / API#: Unknown / Unknown
Survey Name: Cimarex Vaca Draw 20-17 Federal #9H Rev1 RM 10Feb21
Survey Date: February 10, 2021
Tort / AHD / DDI / ERD Ratio: 104.000 ° / 10496.160 ft / 6.321 / 0.952
Coordinate Reference System: NAD83 New Mexico State Plane, Eastern Zone, US Feet
Location Lat / Long: N 32° 6' 35.06560", W 103° 35' 47.11757"
Location Grid N/E Y/X: N 404439.890 ftUS, E 769501.620 ftUS
CRS Grid Convergence Angle: 0.3917 °
Grid Scale Factor: 0.99996872
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: 3440.200 ft above MSL
Seabed / Ground Elevation: 3417.200 ft above MSL
Magnetic Declination: 6.455 °
Total Gravity Field Strength: 998.4304mgn (9.80665 Based)
Gravity Model: GARM
Total Magnetic Field Strength: 47599.239 nT
Magnetic Dip Angle: 59.676 °
Declination Date: February 10, 2021
Magnetic Declination Model: HDGM 2020
North Reference: Grid North
Grid Convergence Used: 0.3917 °
Total Corr Mag North-Grid North: 6.0634 °

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, 1990' FWL]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	404439.89	769501.62	N 32 6 35.07	W 103 35 47.12
	100.00	0.00	205.08	100.00	0.00	0.00	0.00	0.00	404439.89	769501.62	N 32 6 35.07	W 103 35 47.12
	200.00	0.00	205.08	200.00	0.00	0.00	0.00	0.00	404439.89	769501.62	N 32 6 35.07	W 103 35 47.12
	300.00	0.00	205.08	300.00	0.00	0.00	0.00	0.00	404439.89	769501.62	N 32 6 35.07	W 103 35 47.12
	400.00	0.00	205.08	400.00	0.00	0.00	0.00	0.00	404439.89	769501.62	N 32 6 35.07	W 103 35 47.12
	500.00	0.00	205.08	500.00	0.00	0.00	0.00	0.00	404439.89	769501.62	N 32 6 35.07	W 103 35 47.12
	600.00	0.00	205.08	600.00	0.00	0.00	0.00	0.00	404439.89	769501.62	N 32 6 35.07	W 103 35 47.12
	700.00	0.00	205.08	700.00	0.00	0.00	0.00	0.00	404439.89	769501.62	N 32 6 35.07	W 103 35 47.12
	800.00	0.00	205.08	800.00	0.00	0.00	0.00	0.00	404439.89	769501.62	N 32 6 35.07	W 103 35 47.12
	900.00	0.00	205.08	900.00	0.00	0.00	0.00	0.00	404439.89	769501.62	N 32 6 35.07	W 103 35 47.12
	1000.00	0.00	205.08	1000.00	0.00	0.00	0.00	0.00	404439.89	769501.62	N 32 6 35.07	W 103 35 47.12
	1100.00	0.00	205.08	1100.00	0.00	0.00	0.00	0.00	404439.89	769501.62	N 32 6 35.07	W 103 35 47.12
	1200.00	0.00	205.08	1200.00	0.00	0.00	0.00	0.00	404439.89	769501.62	N 32 6 35.07	W 103 35 47.12
	1300.00	0.00	205.08	1300.00	0.00	0.00	0.00	0.00	404439.89	769501.62	N 32 6 35.07	W 103 35 47.12
	1400.00	0.00	205.08	1400.00	0.00	0.00	0.00	0.00	404439.89	769501.62	N 32 6 35.07	W 103 35 47.12
	1500.00	0.00	205.08	1500.00	0.00	0.00	0.00	0.00	404439.89	769501.62	N 32 6 35.07	W 103 35 47.12
	1600.00	0.00	205.08	1600.00	0.00	0.00	0.00	0.00	404439.89	769501.62	N 32 6 35.07	W 103 35 47.12
	1700.00	0.00	205.08	1700.00	0.00	0.00	0.00	0.00	404439.89	769501.62	N 32 6 35.07	W 103 35 47.12
	1800.00	0.00	205.08	1800.00	0.00	0.00	0.00	0.00	404439.89	769501.62	N 32 6 35.07	W 103 35 47.12
	1900.00	0.00	205.08	1900.00	0.00	0.00	0.00	0.00	404439.89	769501.62	N 32 6 35.07	W 103 35 47.12
Nudge 2"/100'	2000.00	0.00	205.08	2000.00	0.00	0.00	0.00	0.00	404439.89	769501.62	N 32 6 35.07	W 103 35 47.12
DLS	2100.00	2.00	205.08	2099.98	-1.58	-1.58	-0.74	2.00	404438.31	769500.88	N 32 6 35.05	W 103 35 47.13
	2200.00	4.00	205.08	2199.84	-6.30	-6.32	-2.96	2.00	404433.57	769498.66	N 32 6 35.00	W 103 35 47.15

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 ° ' ")
Hold Nudge	2300.00	6.00	205.08	2299.45	-14.17	-14.21	-6.65	2.00	40425.68	769494.97	N 32 6 34.93	W 103 35 47.20
	2350.00	7.00	205.08	2349.13	-19.28	-19.34	-9.05	2.00	404420.55	769492.57	N 32 6 34.87	W 103 35 47.22
	2400.00	7.00	205.08	2398.76	-24.78	-24.86	-11.64	0.00	404415.03	769489.98	N 32 6 34.82	W 103 35 47.25
	2500.00	7.00	205.08	2498.01	-35.79	-35.90	-16.80	0.00	404404.00	769484.82	N 32 6 34.71	W 103 35 47.32
	2600.00	7.00	205.08	2597.27	-46.93	-46.97	-21.97	0.00	404392.96	769479.65	N 32 6 34.60	W 103 35 47.38
	2700.00	7.00	205.08	2696.52	-57.79	-57.97	-27.14	0.00	404381.92	769474.48	N 32 6 34.49	W 103 35 47.44
	2800.00	7.00	205.08	2795.78	-68.80	-69.01	-32.30	0.00	404370.88	769469.32	N 32 6 34.38	W 103 35 47.50
	2900.00	7.00	205.08	2895.03	-79.80	-80.05	-37.47	0.00	404359.85	769464.15	N 32 6 34.28	W 103 35 47.56
	3000.00	7.00	205.08	2994.29	-90.80	-91.08	-42.64	0.00	404348.81	769458.98	N 32 6 34.17	W 103 35 47.62
	3100.00	7.00	205.08	3093.54	-101.81	-102.12	-47.80	0.00	404337.77	769453.82	N 32 6 34.06	W 103 35 47.68
	3200.00	7.00	205.08	3192.79	-112.81	-113.16	-52.97	0.00	404326.74	769448.65	N 32 6 33.95	W 103 35 47.74
	3300.00	7.00	205.08	3292.05	-123.81	-124.19	-58.14	0.00	404315.70	769443.48	N 32 6 33.84	W 103 35 47.80
	3400.00	7.00	205.08	3391.30	-134.82	-135.23	-63.30	0.00	404304.66	769438.32	N 32 6 33.73	W 103 35 47.86
	3500.00	7.00	205.08	3490.56	-145.82	-146.27	-68.47	0.00	404293.63	769433.15	N 32 6 33.62	W 103 35 47.93
	3585.08	7.00	205.08	3575.01	-155.18	-155.66	-72.87	0.00	404284.23	769428.76	N 32 6 33.53	W 103 35 47.98
	3600.00	6.70	205.08	3589.82	-156.79	-157.27	-73.62	2.00	404282.62	769428.00	N 32 6 33.51	W 103 35 47.99
	3700.00	4.70	205.08	3689.32	-165.76	-166.27	-77.83	2.00	404273.63	769423.79	N 32 6 33.43	W 103 35 48.04
	3800.00	2.70	205.08	3789.10	-171.59	-172.12	-80.57	2.00	404267.78	769421.05	N 32 6 33.37	W 103 35 48.07
	3900.00	0.70	205.08	3889.05	-174.27	-174.81	-81.83	2.00	404265.09	769419.79	N 32 6 33.34	W 103 35 48.08
Hold Vertical	3935.08	0.00	205.08	3924.14	-174.46	-175.00	-81.92	2.00	404264.90	769419.70	N 32 6 33.34	W 103 35 48.08
	4000.00	0.00	205.08	3989.05	-174.46	-175.00	-81.92	0.00	404264.90	769419.70	N 32 6 33.34	W 103 35 48.08
	4100.00	0.00	205.08	4089.05	-174.46	-175.00	-81.92	0.00	404264.90	769419.70	N 32 6 33.34	W 103 35 48.08
	4200.00	0.00	205.08	4189.05	-174.46	-175.00	-81.92	0.00	404264.90	769419.70	N 32 6 33.34	W 103 35 48.08
	4300.00	0.00	205.08	4289.05	-174.46	-175.00	-81.92	0.00	404264.90	769419.70	N 32 6 33.34	W 103 35 48.08
	4400.00	0.00	205.08	4389.05	-174.46	-175.00	-81.92	0.00	404264.90	769419.70	N 32 6 33.34	W 103 35 48.08
	4500.00	0.00	205.08	4489.05	-174.46	-175.00	-81.92	0.00	404264.90	769419.70	N 32 6 33.34	W 103 35 48.08
	4600.00	0.00	205.08	4589.05	-174.46	-175.00	-81.92	0.00	404264.90	769419.70	N 32 6 33.34	W 103 35 48.08
	4700.00	0.00	205.08	4689.05	-174.46	-175.00	-81.92	0.00	404264.90	769419.70	N 32 6 33.34	W 103 35 48.08
	4800.00	0.00	205.08	4789.05	-174.46	-175.00	-81.92	0.00	404264.90	769419.70	N 32 6 33.34	W 103 35 48.08
	4900.00	0.00	205.08	4889.05	-174.46	-175.00	-81.92	0.00	404264.90	769419.70	N 32 6 33.34	W 103 35 48.08
	5000.00	0.00	205.08	4989.05	-174.46	-175.00	-81.92	0.00	404264.90	769419.70	N 32 6 33.34	W 103 35 48.08
	5100.00	0.00	205.08	5089.05	-174.46	-175.00	-81.92	0.00	404264.90	769419.70	N 32 6 33.34	W 103 35 48.08
	5200.00	0.00	205.08	5189.05	-174.46	-175.00	-81.92	0.00	404264.90	769419.70	N 32 6 33.34	W 103 35 48.08
	5300.00	0.00	205.08	5289.05	-174.46	-175.00	-81.92	0.00	404264.90	769419.70	N 32 6 33.34	W 103 35 48.08
	5400.00	0.00	205.08	5389.05	-174.46	-175.00	-81.92	0.00	404264.90	769419.70	N 32 6 33.34	W 103 35 48.08
	5500.00	0.00	205.08	5489.05	-174.46	-175.00	-81.92	0.00	404264.90	769419.70	N 32 6 33.34	W 103 35 48.08
	5600.00	0.00	205.08	5589.05	-174.46	-175.00	-81.92	0.00	404264.90	769419.70	N 32 6 33.34	W 103 35 48.08
	5700.00	0.00	205.08	5689.05	-174.46	-175.00	-81.92	0.00	404264.90	769419.70	N 32 6 33.34	W 103 35 48.08
	5800.00	0.00	205.08	5789.05	-174.46	-175.00	-81.92	0.00	404264.90	769419.70	N 32 6 33.34	W 103 35 48.08
	5900.00	0.00	205.08	5889.05	-174.46	-175.00	-81.92	0.00	404264.90	769419.70	N 32 6 33.34	W 103 35 48.08
	6000.00	0.00	205.08	5989.05	-174.46	-175.00	-81.92	0.00	404264.90	769419.70	N 32 6 33.34	W 103 35 48.08
	6100.00	0.00	205.08	6089.05	-174.46	-175.00	-81.92	0.00	404264.90	769419.70	N 32 6 33.34	W 103 35 48.08
	6200.00	0.00	205.08	6189.05	-174.46	-175.00	-81.92	0.00	404264.90	769419.70	N 32 6 33.34	W 103 35 48.08
	6300.00	0.00	205.08	6289.05	-174.46	-175.00	-81.92	0.00	404264.90	769419.70	N 32 6 33.34	W 103 35 48.08
	6400.00	0.00	205.08	6389.05	-174.46	-175.00	-81.92	0.00	404264.90	769419.70	N 32 6 33.34	W 103 35 48.08
	6500.00	0.00	205.08	6489.05	-174.46	-175.00	-81.92	0.00	404264.90	769419.70	N 32 6 33.34	W 103 35 48.08
	6600.00	0.00	205.08	6589.05	-174.46	-175.00	-81.92	0.00	404264.90	769419.70	N 32 6 33.34	W 103 35 48.08
	6700.00	0.00	205.08	6689.05	-174.46	-175.00	-81.92	0.00	404264.90	769419.70	N 32 6 33.34	W 103 35 48.08
	6800.00	0.00	205.08	6789.05	-174.46	-175.00	-81.92	0.00	404264.90	769419.70	N 32 6 33.34	W 103 35 48.08
	6900.00	0.00	205.08	6889.05	-174.46	-175.00	-81.92	0.00	404264.90	769419.70	N 32 6 33.34	W 103 35 48.08
	7000.00	0.00	205.08	6989.05	-174.46	-175.00	-81.92	0.00	404264.90	769419.70	N 32 6 33.34	W 103 35 48.08
	7100.00	0.00	205.08	7089.05	-174.46	-175.00	-81.92	0.00	404264.90	769419.70	N 32 6 33.34	W 103 35 48.08
	7200.00	0.00	205.08	7189.05	-174.46	-175.00	-81.92	0.00	404264.90	769419.70	N 32 6 33.34	W 103 35 48.08
	7300.00	0.00	205.08	7289.05	-174.46	-175.00	-81.92	0.00	404264.90	769419.70	N 32 6 33.34	W 103 35 48.08
	7400.00	0.00	205.08	7389.05	-174.46	-175.00	-81.92	0.00	404264.90	769419.70	N 32 6 33.34	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	205.08	7489.05	-174.46	-175.00	-81.92	0.00	404264.90	769419.70	N 32 6 33.34	W 103 35 48.08
	7600.00	0.00	205.08	7589.05	-174.46	-175.00	-81.92	0.00	404264.90	769419.70	N 32 6 33.34	W 103 35 48.08
	7700.00	0.00	205.08	7689.05	-174.46	-175.00	-81.92	0.00	404264.90	769419.70	N 32 6 33.34	W 103 35 48.08
	7800.00	0.00	205.08	7789.05	-174.46	-175.00	-81.92	0.00	404264.90	769419.70	N 32 6 33.34	W 103 35 48.08
	7900.00	0.00	205.08	7889.05	-174.46	-175.00	-81.92	0.00	404264.90	769419.70	N 32 6 33.34	W 103 35 48.08
	8000.00	0.00	205.08	7989.05	-174.46	-175.00	-81.92	0.00	404264.90	769419.70	N 32 6 33.34	W 103 35 48.08
	8100.00	0.00	205.08	8089.05	-174.46	-175.00	-81.92	0.00	404264.90	769419.70	N 32 6 33.34	W 103 35 48.08
	8200.00	0.00	205.08	8189.05	-174.46	-175.00	-81.92	0.00	404264.90	769419.70	N 32 6 33.34	W 103 35 48.08
	8300.00	0.00	205.08	8289.05	-174.46	-175.00	-81.92	0.00	404264.90	769419.70	N 32 6 33.34	W 103 35 48.08
	8400.00	0.00	205.08	8389.05	-174.46	-175.00	-81.92	0.00	404264.90	769419.70	N 32 6 33.34	W 103 35 48.08
	8500.00	0.00	205.08	8489.05	-174.46	-175.00	-81.92	0.00	404264.90	769419.70	N 32 6 33.34	W 103 35 48.08
	8600.00	0.00	205.08	8589.05	-174.46	-175.00	-81.92	0.00	404264.90	769419.70	N 32 6 33.34	W 103 35 48.08
	8700.00	0.00	205.08	8689.05	-174.46	-175.00	-81.92	0.00	404264.90	769419.70	N 32 6 33.34	W 103 35 48.08
	8800.00	0.00	205.08	8789.05	-174.46	-175.00	-81.92	0.00	404264.90	769419.70	N 32 6 33.34	W 103 35 48.08
	8900.00	0.00	205.08	8889.05	-174.46	-175.00	-81.92	0.00	404264.90	769419.70	N 32 6 33.34	W 103 35 48.08
	9000.00	0.00	205.08	8989.05	-174.46	-175.00	-81.92	0.00	404264.90	769419.70	N 32 6 33.34	W 103 35 48.08
	9100.00	0.00	205.08	9089.05	-174.46	-175.00	-81.92	0.00	404264.90	769419.70	N 32 6 33.34	W 103 35 48.08
	9200.00	0.00	205.08	9189.05	-174.46	-175.00	-81.92	0.00	404264.90	769419.70	N 32 6 33.34	W 103 35 48.08
	9300.00	0.00	205.08	9289.05	-174.46	-175.00	-81.92	0.00	404264.90	769419.70	N 32 6 33.34	W 103 35 48.08
	9400.00	0.00	205.08	9389.05	-174.46	-175.00	-81.92	0.00	404264.90	769419.70	N 32 6 33.34	W 103 35 48.08
FTP [330' FSL, 1907' FWL]	9500.00	0.00	205.08	9489.05	-174.46	-175.00	-81.92	0.00	404264.90	769419.70	N 32 6 33.34	W 103 35 48.08
	9600.00	0.00	205.08	9589.05	-174.46	-175.00	-81.92	0.00	404264.90	769419.70	N 32 6 33.34	W 103 35 48.08
	9700.00	0.00	205.08	9689.05	-174.46	-175.00	-81.92	0.00	404264.90	769419.70	N 32 6 33.34	W 103 35 48.08
	9800.00	0.00	205.08	9789.05	-174.46	-175.00	-81.92	0.00	404264.90	769419.70	N 32 6 33.34	W 103 35 48.08
	9900.00	0.00	205.08	9889.05	-174.46	-175.00	-81.92	0.00	404264.90	769419.70	N 32 6 33.34	W 103 35 48.08
	10000.00	0.00	205.08	9989.05	-174.46	-175.00	-81.92	0.00	404264.90	769419.70	N 32 6 33.34	W 103 35 48.08
	10100.00	0.00	205.08	10089.05	-174.46	-175.00	-81.92	0.00	404264.90	769419.70	N 32 6 33.34	W 103 35 48.08
	10200.00	0.00	205.08	10189.05	-174.46	-175.00	-81.92	0.00	404264.90	769419.70	N 32 6 33.34	W 103 35 48.08
	10300.00	0.00	205.08	10289.05	-174.46	-175.00	-81.92	0.00	404264.90	769419.70	N 32 6 33.34	W 103 35 48.08
	10400.00	0.00	205.08	10389.05	-174.46	-175.00	-81.92	0.00	404264.90	769419.70	N 32 6 33.34	W 103 35 48.08
Landing Point	10500.00	0.00	205.08	10489.05	-174.46	-175.00	-81.92	0.00	404264.90	769419.70	N 32 6 33.34	W 103 35 48.08
	10558.48	0.00	205.08	10547.54	-174.46	-175.00	-81.92	0.00	404264.90	769419.70	N 32 6 33.34	W 103 35 48.08
	10600.00	4.98	359.63	10589.00	-172.66	-173.20	-81.93	12.00	404266.70	769419.69	N 32 6 33.36	W 103 35 48.08
	10700.00	16.98	359.63	10686.99	-153.64	-154.18	-82.06	12.00	404285.71	769419.57	N 32 6 33.55	W 103 35 48.08
	10800.00	28.98	359.63	10778.89	-114.67	-115.21	-82.31	12.00	404324.69	769419.31	N 32 6 33.93	W 103 35 48.08
	10900.00	40.98	359.63	10860.67	-57.44	-57.98	-82.68	12.00	404381.91	769418.94	N 32 6 34.50	W 103 35 48.08
	10980.02	50.58	359.63	10916.41	-0.16	-0.70	-83.05	12.00	404439.19	769418.57	N 32 6 35.06	W 103 35 48.08
	11000.00	52.98	359.63	10928.77	15.54	15.00	-83.15	12.00	404454.89	769418.47	N 32 6 35.22	W 103 35 48.08
	11100.00	64.98	359.63	10980.20	101.08	100.54	-83.71	12.00	404540.43	769417.91	N 32 6 36.07	W 103 35 48.08
	11200.00	76.98	359.63	11012.73	195.45	194.91	-84.32	12.00	404634.79	769417.30	N 32 6 37.00	W 103 35 48.08
Landing Point	11300.00	88.98	359.63	11024.92	294.52	293.97	-84.97	12.00	404733.85	769416.66	N 32 6 37.98	W 103 35 48.08
	11308.48	90.00	359.63	11025.00	303.00	302.45	-85.02	12.00	404742.33	769416.60	N 32 6 38.06	W 103 35 48.08
	11400.00	90.00	359.63	11025.00	394.52	393.97	-85.62	0.00	404833.85	769416.01	N 32 6 38.97	W 103 35 48.08
	11500.00	90.00	359.63	11025.00	494.52	493.97	-86.27	0.00	404933.84	769415.36	N 32 6 39.96	W 103 35 48.08
	11600.00	90.00	359.63	11025.00	594.52	593.97	-86.92	0.00	405033.84	769414.71	N 32 6 40.95	W 103 35 48.08
	11700.00	90.00	359.63	11025.00	694.52	693.96	-87.57	0.00	405133.83	769414.06	N 32 6 41.94	W 103 35 48.08
	11800.00	90.00	359.63	11025.00	794.52	793.96	-88.22	0.00	405233.83	769413.41	N 32 6 42.93	W 103 35 48.08
	11900.00	90.00	359.63	11025.00	894.52	893.96	-88.87	0.00	405333.82	769412.76	N 32 6 43.92	W 103 35 48.08
	12000.00	90.00	359.63	11025.00	994.52	993.96	-89.52	0.00	405433.82	769412.11	N 32 6 44.91	W 103 35 48.08
	12100.00	90.00	359.63	11025.00	1094.52	1093.96	-90.17	0.00	405533.81	769411.46	N 32 6 45.90	W 103 35 48.08
Drilling Office 2.10.824.0	12200.00	90.00	359.63	11025.00	1194.52	1193.95	-90.82	0.00	405633.80	769410.81	N 32 6 46.89	W 103 35 48.08
	12300.00	90.00	359.63	11025.00	1294.52	1293.95	-91.47	0.00	405733.80	769410.16	N 32 6 47.88	W 103 35 48.08
	12400.00	90.00	359.63	11025.00	1394.52	1393.95	-92.12	0.00	405833.79	769409.51	N 32 6 48.87	W 103 35 48.08
	12500.00	90.00	359.63	11025.00	1494.52	1493.95	-92.77	0.00	405933.79	769408.86	N 32 6 49.85	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 ° ' ")
	12600.00	90.00	359.63	11025.00	1594.52	1593.95	-93.42	0.00	406033.78	769408.21	N 32 6 50.84	W 103 35 48.08
	12700.00	90.00	359.63	11025.00	1694.52	1693.94	-94.07	0.00	406133.78	769407.56	N 32 6 51.83	W 103 35 48.08
	12800.00	90.00	359.63	11025.00	1794.52	1793.94	-94.72	0.00	406233.77	769406.91	N 32 6 52.82	W 103 35 48.08
	12900.00	90.00	359.63	11025.00	1894.52	1893.94	-95.37	0.00	406333.77	769406.26	N 32 6 53.81	W 103 35 48.08
	13000.00	90.00	359.63	11025.00	1994.52	1993.94	-96.02	0.00	406433.76	769405.61	N 32 6 54.80	W 103 35 48.08
	13100.00	90.00	359.63	11025.00	2094.52	2093.94	-96.67	0.00	406533.76	769404.96	N 32 6 55.79	W 103 35 48.07
	13200.00	90.00	359.63	11025.00	2194.52	2193.93	-97.32	0.00	406633.75	769404.31	N 32 6 56.78	W 103 35 48.07
	13300.00	90.00	359.63	11025.00	2294.52	2293.93	-97.97	0.00	406733.75	769403.66	N 32 6 57.77	W 103 35 48.07
	13400.00	90.00	359.63	11025.00	2394.52	2393.93	-98.61	0.00	406833.74	769403.01	N 32 6 58.76	W 103 35 48.07
	13500.00	90.00	359.63	11025.00	2494.52	2493.93	-99.26	0.00	406933.73	769402.36	N 32 6 59.75	W 103 35 48.07
	13600.00	90.00	359.63	11025.00	2594.52	2593.93	-99.91	0.00	407033.73	769401.71	N 32 7 0.74	W 103 35 48.07
	13700.00	90.00	359.63	11025.00	2694.52	2693.92	-100.56	0.00	407133.72	769401.06	N 32 7 1.73	W 103 35 48.07
	13800.00	90.00	359.63	11025.00	2794.52	2793.92	-101.21	0.00	407233.72	769400.41	N 32 7 2.72	W 103 35 48.07
	13900.00	90.00	359.63	11025.00	2894.52	2893.92	-101.86	0.00	407333.71	769399.76	N 32 7 3.71	W 103 35 48.07
	14000.00	90.00	359.63	11025.00	2994.52	2993.92	-102.51	0.00	407433.71	769399.11	N 32 7 4.70	W 103 35 48.07
	14100.00	90.00	359.63	11025.00	3094.52	3093.91	-103.16	0.00	407533.70	769398.46	N 32 7 5.69	W 103 35 48.07
	14200.00	90.00	359.63	11025.00	3194.52	3193.91	-103.81	0.00	407633.70	769397.81	N 32 7 6.68	W 103 35 48.07
	14300.00	90.00	359.63	11025.00	3294.52	3293.91	-104.46	0.00	407733.69	769397.16	N 32 7 7.67	W 103 35 48.07
	14400.00	90.00	359.63	11025.00	3394.52	3393.91	-105.11	0.00	407833.69	769396.51	N 32 7 8.66	W 103 35 48.07
	14500.00	90.00	359.63	11025.00	3494.52	3493.91	-105.76	0.00	407933.68	769395.86	N 32 7 9.65	W 103 35 48.07
	14600.00	90.00	359.63	11025.00	3594.52	3593.90	-106.41	0.00	408033.67	769395.21	N 32 7 10.63	W 103 35 48.07
	14700.00	90.00	359.63	11025.00	3694.52	3693.90	-107.06	0.00	408133.67	769394.56	N 32 7 11.62	W 103 35 48.07
	14800.00	90.00	359.63	11025.00	3794.52	3793.90	-107.71	0.00	408233.66	769393.91	N 32 7 12.61	W 103 35 48.07
	14900.00	90.00	359.63	11025.00	3894.52	3893.90	-108.36	0.00	408333.66	769393.26	N 32 7 13.60	W 103 35 48.07
	15000.00	90.00	359.63	11025.00	3994.52	3993.90	-109.01	0.00	408433.65	769392.61	N 32 7 14.59	W 103 35 48.07
	15100.00	90.00	359.63	11025.00	4094.52	4093.89	-109.66	0.00	408533.65	769391.96	N 32 7 15.58	W 103 35 48.07
	15200.00	90.00	359.63	11025.00	4194.52	4193.89	-110.31	0.00	408633.64	769391.31	N 32 7 16.57	W 103 35 48.07
	15300.00	90.00	359.63	11025.00	4294.52	4293.89	-110.96	0.00	408733.64	769390.66	N 32 7 17.56	W 103 35 48.07
	15400.00	90.00	359.63	11025.00	4394.52	4393.89	-111.61	0.00	408833.63	769390.01	N 32 7 18.55	W 103 35 48.07
	15500.00	90.00	359.63	11025.00	4494.52	4493.88	-112.26	0.00	408933.63	769389.36	N 32 7 19.54	W 103 35 48.07
	15600.00	90.00	359.63	11025.00	4594.52	4593.88	-112.91	0.00	409033.62	769388.71	N 32 7 20.53	W 103 35 48.07
	15700.00	90.00	359.63	11025.00	4694.52	4693.88	-113.56	0.00	409133.61	769388.06	N 32 7 21.52	W 103 35 48.06
	15800.00	90.00	359.63	11025.00	4794.52	4793.88	-114.21	0.00	409233.61	769387.41	N 32 7 22.51	W 103 35 48.06
	15900.00	90.00	359.63	11025.00	4894.52	4893.88	-114.86	0.00	409333.60	769386.76	N 32 7 23.50	W 103 35 48.06
	16000.00	90.00	359.63	11025.00	4994.52	4993.87	-115.51	0.00	409433.60	769386.11	N 32 7 24.49	W 103 35 48.06
	16100.00	90.00	359.63	11025.00	5094.52	5093.87	-116.16	0.00	409533.59	769385.46	N 32 7 25.48	W 103 35 48.06
	16200.00	90.00	359.63	11025.00	5194.52	5193.87	-116.81	0.00	409633.59	769384.81	N 32 7 26.47	W 103 35 48.06
	16300.00	90.00	359.63	11025.00	5294.52	5293.87	-117.46	0.00	409733.58	769384.16	N 32 7 27.46	W 103 35 48.06
	16400.00	90.00	359.63	11025.00	5394.52	5393.87	-118.11	0.00	409833.58	769383.51	N 32 7 28.45	W 103 35 48.06
	16500.00	90.00	359.63	11025.00	5494.52	5493.86	-118.76	0.00	409933.57	769382.86	N 32 7 29.44	W 103 35 48.06
	16600.00	90.00	359.63	11025.00	5594.52	5593.86	-119.41	0.00	410033.57	769382.21	N 32 7 30.43	W 103 35 48.06
	16700.00	90.00	359.63	11025.00	5694.52	5693.86	-120.06	0.00	410133.56	769381.56	N 32 7 31.41	W 103 35 48.06
	16800.00	90.00	359.63	11025.00	5794.52	5793.86	-120.71	0.00	410233.55	769380.91	N 32 7 32.40	W 103 35 48.06
	16900.00	90.00	359.63	11025.00	5894.52	5893.86	-121.36	0.00	410333.55	769380.26	N 32 7 33.39	W 103 35 48.06
	17000.00	90.00	359.63	11025.00	5994.52	5993.85	-122.01	0.00	410433.54	769379.61	N 32 7 34.38	W 103 35 48.06
	17100.00	90.00	359.63	11025.00	6094.52	6093.85	-122.66	0.00	410533.54	769378.96	N 32 7 35.37	W 103 35 48.06
	17200.00	90.00	359.63	11025.00	6194.52	6193.85	-123.31	0.00	410633.53	769378.31	N 32 7 36.36	W 103 35 48.06
	17300.00	90.00	359.63	11025.00	6294.52	6293.85	-123.96	0.00	410733.53	769377.66	N 32 7 37.35	W 103 35 48.06
	17400.00	90.00	359.63	11025.00	6394.52	6393.84	-124.61	0.00	410833.52	769377.01	N 32 7 38.34	W 103 35 48.06
	17500.00	90.00	359.63	11025.00	6494.52	6493.84	-125.26	0.00	410933.52	769376.36	N 32 7 39.33	W 103 35 48.06
	17600.00	90.00	359.63	11025.00	6594.52	6593.84	-125.91	0.00	411033.51	769375.72	N 32 7 40.32	W 103 35 48.06
	17700.00	90.00	359.63	11025.00	6694.52	6693.84	-126.56	0.00	411133.51	769375.07	N 32 7 41.31	W 103 35 48.06
	17800.00	90.00	359.63	11025.00	6794.52	6793.84	-127.21	0.00	411233.50	769374.42	N 32 7 42.30	W 103 35 48.06
	17900.00	90.00	359.63	11025.00	6894.52	6893.83	-127.86	0.00	411333.49	769373.77	N 32 7 43.29	W 103 35 48.06
	18000.00	90.00	359.63	11025.00	6994.52	6993.83	-128.51	0.00	411433.49	769373.12	N 32 7 44.28	W 103 35 48.06
	18100.00	90.00	359.63	11025.00	7094.52	7093.83	-129.16	0.00	411533.48	769372.47	N 32 7 45.27	W 103 35 48.06

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	11025.00	7194.52	7193.83	-129.81	0.00	411633.48	769371.82	N 32 7 46.26	W 103 35 48.05
	18300.00	90.00	359.63	11025.00	7294.52	7293.83	-130.46	0.00	411733.47	769371.17	N 32 7 47.25	W 103 35 48.05
	18400.00	90.00	359.63	11025.00	7394.52	7393.82	-131.11	0.00	411833.47	769370.52	N 32 7 48.24	W 103 35 48.05
	18500.00	90.00	359.63	11025.00	7494.52	7493.82	-131.76	0.00	411933.46	769369.87	N 32 7 49.23	W 103 35 48.05
	18600.00	90.00	359.63	11025.00	7594.52	7593.82	-132.41	0.00	412033.46	769369.22	N 32 7 50.22	W 103 35 48.05
	18700.00	90.00	359.63	11025.00	7694.52	7693.82	-133.06	0.00	412133.45	769368.57	N 32 7 51.21	W 103 35 48.05
	18800.00	90.00	359.63	11025.00	7794.52	7793.82	-133.71	0.00	412233.45	769367.92	N 32 7 52.20	W 103 35 48.05
	18900.00	90.00	359.63	11025.00	7894.52	7893.81	-134.36	0.00	412333.44	769367.27	N 32 7 53.18	W 103 35 48.05
	19000.00	90.00	359.63	11025.00	7994.52	7993.81	-135.01	0.00	412433.43	769366.62	N 32 7 54.17	W 103 35 48.05
	19100.00	90.00	359.63	11025.00	8094.52	8093.81	-135.66	0.00	412533.43	769365.97	N 32 7 55.16	W 103 35 48.05
	19200.00	90.00	359.63	11025.00	8194.52	8193.81	-136.31	0.00	412633.42	769365.32	N 32 7 56.15	W 103 35 48.05
	19300.00	90.00	359.63	11025.00	8294.52	8293.80	-136.96	0.00	412733.42	769364.67	N 32 7 57.14	W 103 35 48.05
	19400.00	90.00	359.63	11025.00	8394.52	8393.80	-137.61	0.00	412833.41	769364.02	N 32 7 58.13	W 103 35 48.05
	19500.00	90.00	359.63	11025.00	8494.52	8493.80	-138.26	0.00	412933.41	769363.37	N 32 7 59.12	W 103 35 48.05
	19600.00	90.00	359.63	11025.00	8594.52	8593.80	-138.91	0.00	413033.40	769362.72	N 32 8 0 11	W 103 35 48.05
	19700.00	90.00	359.63	11025.00	8694.52	8693.80	-139.56	0.00	413133.40	769362.07	N 32 8 1 10	W 103 35 48.05
	19800.00	90.00	359.63	11025.00	8794.52	8793.79	-140.21	0.00	413233.39	769361.42	N 32 8 2 09	W 103 35 48.05
	19900.00	90.00	359.63	11025.00	8894.52	8893.79	-140.86	0.00	413333.39	769360.77	N 32 8 3 08	W 103 35 48.05
	20000.00	90.00	359.63	11025.00	8994.52	8993.79	-141.51	0.00	413433.38	769360.12	N 32 8 4 07	W 103 35 48.05
	20100.00	90.00	359.63	11025.00	9094.52	9093.79	-142.16	0.00	413533.38	769359.47	N 32 8 5 06	W 103 35 48.05
	20200.00	90.00	359.63	11025.00	9194.52	9193.79	-142.81	0.00	413633.37	769358.82	N 32 8 6 05	W 103 35 48.05
	20300.00	90.00	359.63	11025.00	9294.52	9293.78	-143.46	0.00	413733.36	769358.17	N 32 8 7 04	W 103 35 48.05
	20400.00	90.00	359.63	11025.00	9394.52	9393.78	-144.11	0.00	413833.36	769357.52	N 32 8 8 03	W 103 35 48.05
	20500.00	90.00	359.63	11025.00	9494.52	9493.78	-144.76	0.00	413933.35	769356.87	N 32 8 9 02	W 103 35 48.05
	20600.00	90.00	359.63	11025.00	9594.52	9593.78	-145.41	0.00	414033.35	769356.22	N 32 8 10 01	W 103 35 48.05
	20700.00	90.00	359.63	11025.00	9694.52	9693.77	-146.05	0.00	414133.34	769355.57	N 32 8 11 00	W 103 35 48.05
	20800.00	90.00	359.63	11025.00	9794.52	9793.77	-146.70	0.00	414233.34	769354.92	N 32 8 11 99	W 103 35 48.04
	20900.00	90.00	359.63	11025.00	9894.52	9893.77	-147.35	0.00	414333.33	769354.27	N 32 8 12 98	W 103 35 48.04
	21000.00	90.00	359.63	11025.00	9994.52	9993.77	-148.00	0.00	414433.33	769353.62	N 32 8 13 96	W 103 35 48.04
	21100.00	90.00	359.63	11025.00	10094.52	10093.77	-148.65	0.00	414533.32	769352.97	N 32 8 14 95	W 103 35 48.04

Cimarex Vaca Draw 20-17												
Federal #9H - PBHL [100' FNL, 1907' FWL]	21133.95	90.00	359.63	11025.00	10128.47	10127.72	-148.87	0.00	414567.27	769352.75	N 32 8 15.29	W 103 35 48.04

Survey Type: Def Plan

Survey Error Model: ISWISA 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 (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 #9H Rev1 RM 10Feb21
	1	23.000	21133.951	1/100.000	17.500	13.375		NAL_MWD_IFR1+MS	Original Borehole / Cimarex Vaca Draw 20-17 Federal #9H Rev1 RM



Cimarex Vaca Draw 20-17 Federal #9H Rev1 RM 10Feb21 Anti-Collision Summary Report

Analysis Date-24hr Time: February 10, 2021 - 12:14

Client: Cimarex
Field: NM Lea County (NAD 83)
Structure: Cimarex Vaca Draw 20-17 Federal #9H
Slot: Cimarex Vaca Draw 20-17 Federal #9H
Well: Cimarex Vaca Draw 20-17 Federal #9H
Borehole: Original Borehole
Scan MD Range: 0.00ft ~ 21133.95ft

Analysis Method: 3D Least Distance
Reference Trajectory: Cimarex Vaca Draw 20-17 Federal #9H Rev1 RM 10Feb21 (Def Plan)
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: US1455VSM3115DRILLING-NM Lea County 2.10

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

Offset Selection Criteria
Wellhead distance scan:
Selection filters:
Not performed!
Definitive Surveys - Definitive Plans - Definitive surveys exclude definitive Plans
- 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

Offset Trajectories Summary

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

Results highlighted: Sep-Factor separation <= 1.50 ft

Cimarex Vaca Draw 20-17 Federal #10H Rev1 RM 10Feb21 (Def Plan)	19.99	16.25	18.71	3.74	N/A	MAS = 4.95 (m)	0.00	0.00	ClCt<= 15m<15.00			Enter Alert
	19.99	16.25	18.70	3.74	N/A	MAS = 4.95 (m)	23.00	23.00				WRP
	20.02	19.56	6.52	0.43	1.54	OSF1.50	2000.00	2000.00				MinPt-CtCt
	20.06	19.66	6.49	0.36	1.53	OSF1.50	2020.00	2020.00				MINPT-O-EOU
	20.06	19.71	6.49	0.35	1.53	OSF1.50	2030.00	2030.00				MinPts
	20.24	20.24	50.51	44.20	5.00	OSF1.50	2640.00	2636.97	OSF>5.00			Exit Alert
	75.17	23.49	59.08	51.68	4.99	OSF1.50	4820.00	4809.05	OSF<5.00			Enter Alert
	75.21	70.56	27.70	4.61	1.60	OSF1.50	9940.00	9929.05				MinPt-CtCt
	75.21	70.66	27.67	4.55	1.60	OSF1.50	9950.00	9939.05				MinPts
	202.65	62.44	160.60	140.21	4.94	OSF1.50	10340.00	10329.05	OSF>5.00			Exit Alert
	614.90	185.44	490.84	429.46	5.00	OSF1.50	18880.00	11025.00	OSF<5.00			Enter Alert
	614.90	315.72	403.98	299.18	2.93	OSF1.50	21133.95	11025.00				MinPts

Warning Alert

Cimarex Vaca Draw 20-17 Federal #11H Rev1 RM 10Feb21 (Def Plan)	39.99	32.25	38.71	7.74	N/A	MAS = 9.83 (m)	0.00	0.00	ClCt<= 15m<15.00			Enter Alert
	39.99	32.25	38.71	7.74	N/A	MAS = 9.83 (m)	23.00	23.00				WRP
	39.99	32.25	26.52	7.74	3.18	MAS = 9.83 (m)	2000.00	2000.00				MinPts
	40.02	32.25	26.49	7.77	3.16	MAS = 9.83 (m)	2020.00	2020.00				MINPT-O-EOU
	40.37	32.25	26.67	8.12	3.15	MAS = 9.83 (m)	2070.00	2069.99				MinPt-O-SF
	65.31	32.25	51.11	33.06	4.96	MAS = 9.83 (m)	2480.00	2478.16	OSF>5.00			Exit Alert
	665.40	40.65	637.88	624.75	25.31	OSF1.50	6650.00	6639.05				MinPt-O-SF
	686.66	65.85	642.33	620.81	15.92	OSF1.50	10280.00	10269.05				MINPT-O-EOU
	686.73	65.93	642.34	620.79	15.90	OSF1.50	10290.00	10279.05				MinPt-O-ADP
	693.64	67.45	648.25	626.20	15.70	OSF1.50	10490.00	10479.05				MinPt-O-SF

Warning Alert

Offset Trajectory	Separation		Allow	Sep. Fact.	Controlling Rule	Reference Trajectory		Risk Level		Alert	Status
	Ct-Ct (ft)	MAS (ft)	EOU (ft)			MD (ft)	TVD (ft)	Minor	Major		
	749.88	69.38	703.20	680.50	16.49	OSF1.50	11380.00	11025.00		MinPt-CtCt	
	749.89	225.94	598.83	523.95	5.00	OSF1.50	17240.00	11025.00	OSF<5.00	Enter Alert	
	749.89	348.08	517.41	401.82	3.24	OSF1.50	21133.95	11025.00		MinPis	

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

Warning Alert

59.97	32.81	58.69	27.17	N/A	MAS = 10.00 (m)	0.00	0.00			Surface	
59.97	32.81	58.69	27.17	N/A	MAS = 10.00 (m)	23.00	23.00			WRP	
59.97	32.81	46.95	27.17	5.00	MAS = 10.00 (m)	1930.00	1930.00		OSF<5.00	Enter Alert	
59.97	32.81	46.51	27.17	4.82	MAS = 10.00 (m)	2000.00	2000.00			MinPis	
60.07	32.81	46.57	27.26	4.81	MAS = 10.00 (m)	2020.00	2020.00			MinPt-O-SF	
62.44	32.81	48.81	29.63	4.96	MAS = 10.00 (m)	2100.00	2099.98		OSF>5.00	Exit Alert	
1430.06	57.91	1391.02	1372.16	37.85	OSF1.50	7890.00	7879.05			MinPt-O-SF	
1466.79	76.30	1415.49	1390.49	29.30	OSF1.50	11270.00	11023.45			MinPt-CtCt	
1466.83	349.08	1233.68	1117.75	6.32	OSF1.50	21133.95	11025.00			MinPis	

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

Warning Alert

100.00	32.81	98.98	67.19	N/A	MAS = 10.00 (m)	0.00	0.00			Surface	
100.00	32.81	98.97	67.19	26586.26	MAS = 10.00 (m)	23.00	23.00			WRP	
98.63	32.81	95.34	65.82	43.11	MAS = 10.00 (m)	570.00	570.00			MinPis	
98.63	32.81	94.89	65.82	35.94	MAS = 10.00 (m)	670.00	670.00			MINPT-O-EOU	
100.58	32.81	92.07	67.77	13.31	MAS = 10.00 (m)	1690.00	1690.00			MinPt-O-SF	
103.14	32.81	92.95	70.33	11.14	MAS = 10.00 (m)	2050.00	2050.00			MinPt-O-SF	
239.83	32.81	230.38	207.02	28.34	MAS = 10.00 (m)	3890.00	3879.06			MinPt-O-SF	
237.72	32.81	227.78	204.91	26.54	MAS = 10.00 (m)	4440.00	4429.05			MinPis	
238.07	32.81	227.51	205.26	24.85	MAS = 10.00 (m)	4590.00	4579.05			MINPT-O-EOU	
238.84	32.81	224.53	206.03	17.90	MAS = 10.00 (m)	5750.00	5739.05			MinPis	
238.82	32.81	223.83	206.01	17.02	MAS = 10.00 (m)	5900.00	5889.05			MINPT-O-EOU	
239.19	32.81	223.58	206.38	16.30	MAS = 10.00 (m)	6040.00	6029.05			MinPis	
261.52	38.68	235.40	222.85	10.38	OSF1.50	8570.00	8559.05			MINPT-O-EOU	
261.74	38.94	235.44	222.80	10.31	OSF1.50	8610.00	8599.05			MinPis	
253.81	48.01	221.46	205.80	8.07	OSF1.50	10020.00	10009.05			MINPT-O-EOU	
254.01	48.46	221.37	205.55	8.00	OSF1.50	10080.00	10069.05			MinPt-CtCt	
254.46	48.98	221.46	205.47	7.93	OSF1.50	10150.00	10139.05			MINPT-O-EOU	
173.17	53.84	136.93	119.33	4.89	OSF1.50	10900.00	10860.67		OSF<5.00	Enter Alert	
133.33	54.61	96.58	78.72	3.70	OSF1.50	11050.00	10956.73			MinPis	
179.12	55.41	141.83	123.70	4.91	OSF1.50	11180.00	11007.82		OSF>5.00	Exit Alert	
1330.21	48.28	1297.70	1281.93	42.16	OSF1.50	12510.00	11025.00			MINPT-O-EOU	
1331.95	50.38	1298.04	1281.58	40.42	OSF1.50	12590.00	11025.00			MinPt-O-ADP	
1335.29	54.54	1298.61	1280.75	37.37	OSF1.50	12750.00	11025.00			MINPT-O-EOU	
1336.61	62.64	1294.53	1273.98	32.50	OSF1.50	13050.00	11025.00			MinPt-CtCt	
1334.55	69.06	1288.18	1265.49	29.38	OSF1.50	13280.00	11025.00			MinPt-CtCt	
1335.32	71.30	1287.46	1264.02	28.46	OSF1.50	13360.00	11025.00			MINPT-O-EOU	
1336.30	72.42	1287.70	1263.88	28.04	OSF1.50	13400.00	11025.00			MinPt-O-ADP	
1343.11	88.50	1283.78	1254.61	23.00	OSF1.50	13960.00	11025.00			MinPt-CtCt	
1343.64	90.49	1282.98	1253.15	22.50	OSF1.50	14030.00	11025.00			MINPT-O-EOU	
1344.32	91.32	1283.11	1252.99	22.30	OSF1.50	14060.00	11025.00			MinPt-O-ADP	
1355.19	109.48	1281.88	1245.71	18.72	OSF1.50	14680.00	11025.00			MinPt-CtCt	
1355.34	114.74	1278.52	1240.60	17.86	OSF1.50	14860.00	11025.00			MinPt-CtCt	
1361.56	152.03	1259.89	1209.54	13.51	OSF1.50	16120.00	11025.00			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	Major	
1362.56	155.45	1288.59	1207.10	13.22	OSF1.50	16240.00	11025.00				MINPT-O-EOU
1363.49	156.57	1258.78	1206.91	13.14	OSF1.50	16280.00	11025.00				MinPt-O-ADP
1365.60	164.25	1255.77	1201.35	12.54	OSF1.50	16530.00	11025.00				MinPt-CtCt
1362.68	180.31	1242.14	1182.36	11.39	OSF1.50	17070.00	11025.00				MinPt-CtCt
1366.24	189.41	1239.64	1176.83	10.87	OSF1.50	17380.00	11025.00				MINPT-O-EOU
1367.40	190.82	1239.86	1176.58	10.80	OSF1.50	17430.00	11025.00				MinPt-O-ADP
1368.66	193.75	1239.16	1174.90	10.64	OSF1.50	17520.00	11025.00				MinPt-CtCt
1369.20	195.44	1238.58	1173.76	10.55	OSF1.50	17580.00	11025.00				MINPT-O-EOU
1370.10	196.54	1238.75	1173.56	10.50	OSF1.50	17620.00	11025.00				MinPt-O-ADP
1375.59	205.86	1238.02	1169.73	10.06	OSF1.50	17930.00	11025.00				MINPT-O-EOU
1372.47	223.05	1223.44	1149.42	9.26	OSF1.50	18500.00	11025.00				MinPt-CtCt
1373.15	225.31	1222.61	1147.84	9.18	OSF1.50	18580.00	11025.00				MINPT-O-EOU
1373.80	226.11	1222.73	1147.69	9.15	OSF1.50	18610.00	11025.00				MinPt-O-ADP
1372.90	241.29	1211.71	1131.60	8.56	OSF1.50	19110.00	11025.00				MinPt-CtCt
1373.82	244.13	1210.73	1129.69	8.47	OSF1.50	19210.00	11025.00				MINPT-O-EOU
1374.60	248.50	1208.61	1126.10	8.32	OSF1.50	19350.00	11025.00				MinPt-CtCt
1358.38	268.59	1178.99	1089.79	7.61	OSF1.50	20020.00	11025.00				MinPt-CtCt
1336.18	293.23	1140.37	1042.96	6.85	OSF1.50	20840.00	11025.00				MinPt-CtCt
1336.78	295.15	1139.68	1041.63	6.81	OSF1.50	20910.00	11025.00				MINPT-O-EOU
1337.45	295.95	1139.82	1041.50	6.80	OSF1.50	20940.00	11025.00				MinPt-O-ADP
1336.64	302.13	1134.90	1034.52	6.65	OSF1.50	21133.95	11025.00				MinPls

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

Warning Alert

699.24	32.81	697.95	666.43	N/A	MAS = 10.00 (m)	0.00	0.00				Surface
699.24	32.81	697.94	666.43	89752.24	MAS = 10.00 (m)	23.00	23.00				WRP
683.15	32.81	668.92	650.34	52.72	MAS = 10.00 (m)	2500.00	2498.01				MinPt-O-SF
675.43	32.81	662.37	642.62	57.35	MAS = 10.00 (m)	2810.00	2805.70				MINPT-O-EOU
675.32	32.81	662.45	642.51	58.26	MAS = 10.00 (m)	2850.00	2845.40				MinPls
733.96	66.94	688.90	667.02	16.74	OSF1.50	10480.00	10469.05				MinPt-CtCt
733.98	67.02	688.88	666.97	16.72	OSF1.50	10490.00	10479.05				MINPT-O-EOU
734.05	67.09	688.88	666.95	16.70	OSF1.50	10500.00	10489.05				MinPt-O-ADP
737.63	67.82	691.99	669.81	16.60	OSF1.50	10610.00	10598.95				MinPt-O-SF
795.35	239.60	635.19	555.75	5.00	OSF1.50	17690.00	11025.00	OSF<5.00			Enter Alert
795.33	347.71	563.10	447.63	3.44	OSF1.50	21133.95	11025.00				MinPls

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

Warning Alert

3693.95	32.81	3691.97	3661.14	N/A	MAS = 10.00 (m)	0.00	0.00				Surface
3693.91	32.81	3691.92	3661.10	616905.43	MAS = 10.00 (m)	10.00	10.00				MinPt-O-SF
3693.89	32.81	3691.88	3661.08	121006.02	MAS = 10.00 (m)	23.00	23.00				MinPls
3690.65	39.94	3663.36	3650.70	145.74	OSF1.50	800.00	800.00				MinPt-CtCt
3701.77	107.39	3629.52	3594.38	52.65	OSF1.50	2040.00	2040.00				MinPt-CtCt
3703.06	111.62	3628.01	3591.46	50.64	OSF1.50	2130.00	2129.96				MINPT-O-EOU
3704.60	113.40	3628.34	3591.20	49.85	OSF1.50	2170.00	2169.90				MinPt-O-ADP
3887.65	240.32	3726.77	3647.33	24.45	OSF1.50	4700.00	4689.05				MinPt-CtCt
3885.21	382.30	3629.68	3502.91	15.32	OSF1.50	7430.00	7419.05				MinPt-CtCt
3883.07	451.22	3581.60	3431.85	12.96	OSF1.50	8750.00	8739.05				MinPt-CtCt
1902.75	574.13	1518.76	1328.62	4.99	OSF1.50	13500.00	11025.00	OSF<5.00			Enter Alert
1725.56	576.39	1340.64	1149.17	4.50	OSF1.50	14300.00	11025.00				MinPt-CtCt
1725.58	576.43	1340.63	1149.15	4.50	OSF1.50	14310.00	11025.00				MinPls
1725.65	576.47	1340.68	1149.18	4.50	OSF1.50	14320.00	11025.00				MinPt-O-SF

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

Exit Alert
TD

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

Warning Alert

Surface
WRP
MinPt-CtCt
Enter Alert
MinPis
Exit Alert
MinPt-CtCt
MINPT-O-EOU
MinPt-O-ADP
MinPt-O-SF
TD

Final Surveys - Cimarex Vaca
Draw 20-17 Federal #4H MWD
0ft-12228ft (Surcon Corrected)
(Def Survey)

Pass

MinPis
WRP
MINPT-O-EOU
MinPis
MINPT-O-EOU
MinPt-O-SF
MinPt-O-SF
MinPt-O-SF
MinPt-CtCt
MINPT-O-EOU
MinPt-O-ADP
MinPis
MinPt-O-SF
TD

Final Surveys - Cimarex Vaca
Draw 20-17 Federal #4H ST01
MWD 0ft-22279ft (Surcon
Corrected) (Def Survey)

Pass

MinPis
WRP
MINPT-O-EOU
MinPis
MINPT-O-EOU
MinPt-O-SF
MinPt-O-SF
MinPt-CtCt
MINPT-O-EOU
MinPt-O-ADP
MinPis
MinPt-O-SF
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)	Minor	Major		
1672.24	105.54	1601.55	1566.70	23.98	OSF1.50	14240.00	11025.00			MinPt-CtCt	
1673.57	159.74	1566.74	1513.82	15.80	OSF1.50	16110.00	11025.00			MinPt-CtCt	
1629.83	210.00	1489.50	1419.83	11.89	OSF1.50	17810.00	11025.00			MinPt-CtCt	
1630.31	211.61	1488.91	1418.71	11.60	OSF1.50	17870.00	11025.00			MINPT-O-EOU	
1630.93	212.40	1489.01	1418.54	11.56	OSF1.50	17900.00	11025.00			MinPt-O-ADP	
1638.14	218.85	1491.91	1419.29	11.27	OSF1.50	18120.00	11025.00			MinPt-O-ADP	
1646.84	227.21	1495.03	1419.62	10.91	OSF1.50	18400.00	11025.00			MinPt-O-ADP	
1656.83	263.99	1480.51	1392.84	9.44	OSF1.50	19630.00	11025.00			MinPt-CtCt	
1658.43	268.58	1479.05	1389.85	9.29	OSF1.50	19790.00	11025.00			MINPT-O-EOU	
1660.77	274.58	1477.38	1386.18	9.10	OSF1.50	19990.00	11025.00			MINPT-O-EOU	
1658.06	295.71	1460.59	1382.35	8.43	OSF1.50	20690.00	11025.00			MinPt-CtCt	
1662.19	308.92	1455.91	1353.27	8.09	OSF1.50	21133.95	11025.00			MinPis	

Final Surveys - Cimarex Vaca
Draw 20-17 Federal #3H MWD
0ft-2245ft (Surcon Corrected)
(Def Survey)

84.84	32.81	83.71	52.03	N/A	MAS = 10.00 (m)	0.00	0.00			MinPis	Pass
84.84	32.81	83.70	52.03	23064.27	MAS = 10.00 (m)	23.00	23.00			WRP	
84.92	32.81	83.11	52.11	122.92	MAS = 10.00 (m)	190.00	190.00			MINPT-O-EOU	
85.08	32.81	82.73	52.27	62.94	MAS = 10.00 (m)	320.00	320.00			MINPT-O-EOU	
87.98	32.81	80.16	55.18	12.83	MAS = 10.00 (m)	1560.00	1560.00			MinPis	
83.66	32.81	73.95	50.86	9.52	MAS = 10.00 (m)	2100.00	2099.98			MinPt-O-SF	
83.62	32.81	73.95	50.81	9.56	MAS = 10.00 (m)	2110.00	2109.97			MINPT-O-EOU	
83.58	32.81	73.99	50.77	9.64	MAS = 10.00 (m)	2130.00	2129.96			MinPis	
283.90	32.81	277.00	251.09	48.11	MAS = 10.00 (m)	3900.00	3889.05			MinPt-O-SF	
580.03	51.32	545.47	528.70	17.27	OSF1.50	10380.00	10369.05			MinPt-CtCt	
580.08	51.51	545.39	528.56	17.20	OSF1.50	10410.00	10399.05			MINPT-O-EOU	
580.18	51.63	545.42	528.54	17.16	OSF1.50	10430.00	10419.05			MinPt-O-ADP	
542.95	55.17	505.83	487.78	15.01	OSF1.50	11040.00	10951.48			MinPis	
544.04	55.39	506.77	488.66	14.98	OSF1.50	11080.00	10971.37			MinPt-O-SF	
1618.52	58.84	1578.96	1559.68	41.94	OSF1.50	12750.00	11025.00			MINPT-O-EOU	
1620.85	84.75	1564.02	1536.10	29.01	OSF1.50	13700.00	11025.00			MinPt-CtCt	
1621.76	87.47	1563.12	1534.30	28.11	OSF1.50	13800.00	11025.00			MINPT-O-EOU	
1622.89	88.82	1563.35	1534.07	27.70	OSF1.50	13850.00	11025.00			MinPt-O-ADP	
1632.69	99.15	1566.27	1533.55	24.93	OSF1.50	14210.00	11025.00			MINPT-O-EOU	
1636.29	106.62	1564.88	1529.66	23.22	OSF1.50	14470.00	11025.00			MINPT-O-EOU	
1637.64	110.51	1563.64	1527.13	22.41	OSF1.50	14600.00	11025.00			MinPt-CtCt	
1639.17	117.07	1560.80	1522.10	21.17	OSF1.50	14830.00	11025.00			MINPT-O-EOU	
1640.04	118.15	1560.94	1521.89	20.98	OSF1.50	14870.00	11025.00			MinPt-O-ADP	
1644.82	122.50	1562.82	1522.32	20.29	OSF1.50	15020.00	11025.00			MinPt-O-ADP	
1644.80	153.71	1542.01	1491.10	16.15	OSF1.50	16070.00	11025.00			MinPt-CtCt	
1637.78	170.03	1524.09	1467.74	14.52	OSF1.50	16620.00	11025.00			MinPt-CtCt	
1639.15	174.29	1522.63	1464.86	14.18	OSF1.50	16770.00	11025.00			MINPT-O-EOU	
1636.16	185.82	1511.95	1450.34	13.27	OSF1.50	17150.00	11025.00			MinPt-CtCt	
1637.41	193.85	1507.85	1443.56	12.73	OSF1.50	17420.00	11025.00			MinPt-CtCt	
1642.86	246.10	1478.47	1396.76	10.05	OSF1.50	19170.00	11025.00			MinPt-CtCt	
1638.67	267.08	1460.29	1371.59	9.23	OSF1.50	19870.00	11025.00			MinPt-CtCt	
1639.78	276.36	1455.22	1363.43	8.93	OSF1.50	20180.00	11025.00			MinPt-CtCt	
1636.51	305.04	1432.82	1331.46	8.07	OSF1.50	21133.95	11025.00			MinPis	

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

										Pass
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Offset Trajectory	Separation		Allow	Sep. Fact.	Controlling Rule	Reference Trajectory		Risk Level		Alert	Status
	Ct-Ct (ft)	MAS (ft)	EOU (ft)			MD (ft)	TVD (ft)	Alert	Minor		
1259.82	32.81	1257.85	1227.02	N/A	MAS = 10.00 (m)	0.00	0.00			MinPis	
1259.83	32.81	1257.84	1227.02	99652.34	MAS = 10.00 (m)	23.00	23.00			WRP	
1280.12	32.81	1257.45	1227.31	1840.01	MAS = 10.00 (m)	190.00	190.00			MINPT-O-EQU	
1141.68	32.81	1130.55	1108.87	114.58	MAS = 10.00 (m)	2100.00	2099.98			MinPt-O-SF	
984.64	32.81	976.32	951.83	139.85	MAS = 10.00 (m)	3100.00	3093.54			MinPt-O-SF	
313.07	50.81	278.46	262.25	9.59	OSF1.50	9710.00	9699.05			MinPt-CtCt	
313.16	51.22	278.28	261.94	9.51	OSF1.50	9770.00	9759.05			MINPT-O-EQU	
313.27	51.35	278.30	261.91	9.49	OSF1.50	9790.00	9779.05			MinPt-O-ADP	
319.14	53.26	282.91	265.88	9.31	OSF1.50	10100.00	10089.05			MinPt-O-SF	
299.08	58.17	259.51	240.91	7.97	OSF1.50	10960.00	10903.38			MinPis	
299.11	58.22	259.52	240.89	7.97	OSF1.50	10970.00	10909.96			MinPt-O-ADP	
299.33	58.27	259.71	241.07	7.96	OSF1.50	10980.00	10916.39			MinPt-O-SF	
1504.53	50.62	1470.48	1453.91	45.44	OSF1.50	12530.00	11025.00			MINPT-O-EQU	
1504.96	51.13	1470.55	1453.83	44.99	OSF1.50	12550.00	11025.00			MinPt-O-ADP	
1522.65	62.06	1480.95	1460.59	37.37	OSF1.50	12960.00	11025.00			MINPT-O-EQU	
1524.26	63.95	1481.29	1460.31	36.29	OSF1.50	13030.00	11025.00			MinPt-O-ADP	
1522.31	71.51	1474.31	1450.80	32.36	OSF1.50	13300.00	11025.00			MinPt-CtCt	
1524.55	77.33	1472.67	1447.22	29.94	OSF1.50	13510.00	11025.00			MINPT-O-EQU	
1526.11	79.26	1472.94	1446.85	29.23	OSF1.50	13580.00	11025.00			MinPt-O-ADP	
1546.15	98.12	1480.41	1448.03	23.86	OSF1.50	14230.00	11025.00			MinPt-CtCt	
1547.96	110.93	1473.68	1437.03	21.11	OSF1.50	14670.00	11025.00			MinPt-CtCt	
1548.23	122.71	1466.09	1425.52	19.07	OSF1.50	15070.00	11025.00			MinPt-CtCt	
1550.48	136.36	1459.25	1414.12	17.17	OSF1.50	15530.00	11025.00			MinPt-CtCt	
1551.03	137.96	1458.73	1413.07	16.97	OSF1.50	15590.00	11025.00			MINPT-O-EQU	
1551.70	138.75	1458.88	1412.96	16.88	OSF1.50	15620.00	11025.00			MinPt-O-ADP	
1532.11	177.03	1413.76	1355.08	13.05	OSF1.50	16900.00	11025.00			MinPt-CtCt	
1531.15	186.88	1406.24	1344.27	12.35	OSF1.50	17230.00	11025.00			MinPt-CtCt	
1531.78	188.78	1405.60	1343.00	12.23	OSF1.50	17300.00	11025.00			MINPT-O-EQU	
1533.51	197.07	1401.80	1336.44	11.72	OSF1.50	17570.00	11025.00			MinPt-CtCt	
1534.54	200.14	1400.78	1334.40	11.55	OSF1.50	17680.00	11025.00			MINPT-O-EQU	
1537.24	203.29	1401.39	1333.96	11.39	OSF1.50	17790.00	11025.00			MinPt-O-ADP	
1529.27	229.70	1375.81	1299.57	10.02	OSF1.50	18660.00	11025.00			MinPt-CtCt	
1517.47	260.90	1343.21	1256.57	8.75	OSF1.50	19700.00	11025.00			MinPt-CtCt	
1517.60	266.02	1339.93	1251.59	8.58	OSF1.50	19870.00	11025.00			MinPt-CtCt	
1509.75	299.94	1309.46	1209.81	7.57	OSF1.50	21000.00	11025.00			MinPt-CtCt	
1509.55	304.03	1306.54	1205.52	7.47	OSF1.50	21133.95	11025.00			MinPis	

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

Pass

1279.82	32.81	1278.69	1247.01	N/A	MAS = 10.00 (m)	0.00	0.00			MinPis	
1279.82	32.81	1278.68	1247.02	103302.56	MAS = 10.00 (m)	23.00	23.00			WRP	
1280.36	32.81	1278.06	1247.56	1084.96	MAS = 10.00 (m)	310.00	310.00			MinPis	
1281.21	32.81	1277.56	1248.40	506.64	MAS = 10.00 (m)	590.00	590.00			MINPT-O-EQU	
1276.01	32.81	1268.04	1243.20	186.37	MAS = 10.00 (m)	1560.00	1560.00			MinPis	
1276.15	32.81	1267.93	1243.35	179.67	MAS = 10.00 (m)	1610.00	1610.00			MINPT-O-EQU	
1284.34	32.81	1254.44	1231.53	144.20	MAS = 10.00 (m)	2100.00	2099.98			MinPt-O-SF	
1122.93	32.81	1115.88	1090.12	192.71	MAS = 10.00 (m)	3230.00	3222.57			MinPt-CtCt	
715.85	43.53	686.22	672.33	25.71	OSF1.50	9120.00	9109.05			MINPT-O-EQU	
716.92	45.65	685.67	671.28	24.50	OSF1.50	9440.00	9429.05			MinPt-O-ADP	
717.39	46.19	685.97	671.20	24.21	OSF1.50	9520.00	9509.05			MinPt-O-ADP	
685.04	55.01	657.73	640.03	19.58	OSF1.50	10950.00	10896.63			MinPis	
695.09	55.06	657.74	640.03	19.56	OSF1.50	10960.00	10903.38			MinPt-O-ADP	

Offset Trajectory	Separation		Allow	Sep. Fact.	Controlling Rule	Reference Trajectory		Risk Level		Alert	Status
	Ct-Ct (ft)	MAS (ft)	EOU (ft)			MD (ft)	TVD (ft)	Alert	Minor		
687.38	55.36	659.85	642.03	19.51	OSF1.50	11020.00	10940.47			MinPt-O-SF	
1490.34	54.19	1453.89	1436.15	41.99	OSF1.50	12450.00	11025.00			MinPt-O-ADP	
1496.45	59.52	1456.44	1436.93	38.32	OSF1.50	12670.00	11025.00			MINPT-O-EOU	
1497.48	60.74	1456.66	1436.74	37.57	OSF1.50	12720.00	11025.00			MinPt-O-ADP	
1492.80	73.14	1443.71	1419.66	31.01	OSF1.50	13200.00	11025.00			MinPt-CtCt	
1494.71	79.84	1441.15	1414.87	28.41	OSF1.50	13450.00	11025.00			MINPT-O-EOU	
1495.81	83.22	1440.01	1412.60	27.27	OSF1.50	13570.00	11025.00			MinPt-CtCt	
1496.96	90.73	1436.15	1406.23	25.00	OSF1.50	13840.00	11025.00			MinPt-CtCt	
1497.46	105.23	1426.98	1392.24	21.53	OSF1.50	14350.00	11025.00			MinPt-CtCt	
1497.14	109.82	1423.60	1387.32	20.62	OSF1.50	14510.00	11025.00			MinPt-CtCt	
1497.85	111.98	1422.87	1385.88	20.23	OSF1.50	14590.00	11025.00			MINPT-O-EOU	
1498.57	115.60	1421.17	1382.97	19.60	OSF1.50	14710.00	11025.00			MinPt-CtCt	
1492.46	132.17	1404.02	1360.29	17.05	OSF1.50	15280.00	11025.00			MinPt-CtCt	
1493.18	136.51	1401.85	1356.67	16.52	OSF1.50	15430.00	11025.00			MinPt-CtCt	
1493.92	138.66	1401.15	1355.26	16.27	OSF1.50	15510.00	11025.00			MINPT-O-EOU	
1495.21	143.21	1399.41	1352.00	15.76	OSF1.50	15660.00	11025.00			MinPt-CtCt	
1495.23	148.49	1395.91	1346.74	15.19	OSF1.50	15840.00	11025.00			MinPt-CtCt	
1490.56	165.22	1360.08	1325.34	13.60	OSF1.50	16400.00	11025.00			MinPt-CtCt	
1491.20	167.11	1379.47	1324.09	13.46	OSF1.50	16470.00	11025.00			MINPT-O-EOU	
1491.86	167.91	1379.58	1323.95	13.40	OSF1.50	16500.00	11025.00			MinPt-O-ADP	
1529.93	190.78	1402.42	1339.15	12.08	OSF1.50	17270.00	11025.00			MinPt-CtCt	
1528.94	195.55	1398.24	1333.39	11.78	OSF1.50	17430.00	11025.00			MinPt-CtCt	
1529.39	196.87	1387.82	1332.52	11.70	OSF1.50	17480.00	11025.00			MINPT-O-EOU	
1530.03	197.64	1397.94	1332.38	11.66	OSF1.50	17510.00	11025.00			MinPt-CtCt	
1529.62	205.36	1392.39	1324.26	11.22	OSF1.50	17760.00	11025.00			MinPt-O-ADP	
1514.21	221.48	1366.23	1292.73	10.29	OSF1.50	18300.00	11025.00			MinPt-CtCt	
1516.23	227.31	1364.36	1288.92	10.04	OSF1.50	18500.00	11025.00			MinPt-CtCt	
1517.12	228.39	1364.53	1288.72	10.00	OSF1.50	18540.00	11025.00			MINPT-O-EOU	
1519.60	232.51	1364.27	1287.09	9.84	OSF1.50	18670.00	11025.00			MinPt-O-ADP	
1520.25	233.31	1364.38	1286.94	9.81	OSF1.50	18700.00	11025.00			MinPt-CtCt	
1510.59	264.20	1334.13	1246.39	8.60	OSF1.50	19720.00	11025.00			MinPt-CtCt	
1485.23	292.60	1289.84	1192.64	7.63	OSF1.50	20670.00	11025.00			MinPt-CtCt	
1485.36	303.21	1282.88	1182.14	7.37	OSF1.50	21020.00	11025.00			MinPt-CtCt	
1486.25	305.97	1281.94	1180.28	7.30	OSF1.50	21120.00	11025.00			MINPT-O-EOU	
1486.52	306.35	1281.96	1180.17	7.30	OSF1.50	21133.95	11025.00			MinPts	

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

Pass

719.22	32.81	717.93	686.41	N/A	MAS = 10.00 (m)	0.00	0.00			Surface	
719.22	32.81	717.92	686.41	82852.89	MAS = 10.00 (m)	23.00	23.00			WRP	
719.22	32.81	705.80	686.41	59.16	MAS = 10.00 (m)	1990.00	1990.00			MinPts	
719.22	32.81	705.75	686.42	58.93	MAS = 10.00 (m)	2000.00	2000.00			MINPT-O-EOU	
720.01	32.81	706.44	687.20	58.51	MAS = 10.00 (m)	2100.00	2099.98			MinPt-O-SF	
1324.63	39.72	1297.72	1284.92	51.65	OSF1.50	6439.05	6439.05			MinPt-O-SF	
1343.96	61.02	1302.85	1282.94	33.71	OSF1.50	9910.00	9899.05			MINPT-O-EOU	
1344.01	61.10	1302.85	1282.92	33.67	OSF1.50	9920.00	9909.05			MinPt-O-ADP	
1358.07	62.59	1315.92	1295.49	33.20	OSF1.50	10160.00	10149.05			MinPt-O-SF	
1597.11	349.95	1363.38	1247.16	6.87	OSF1.50	21133.95	11025.00			MinPts	

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

Pass

Surface

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		
	739.24	32.81	737.95	94896.37	MAS = 10.00 (m)	23.00	23.00			WRP	
	739.24	32.81	728.96	82.06	MAS = 10.00 (m)	1490.00	1490.00			MinPts	
	739.28	32.81	728.91	81.25	MAS = 10.00 (m)	1510.00	1510.00			MINPT-O-EQU	
	773.79	32.81	761.84	72.48	MAS = 10.00 (m)	2000.00	2000.00			MinPt-O-SF	
	1449.78	45.37	1419.11	49.29	OSF1.50	6750.00	6739.05			MinPt-O-SF	
	1486.91	348.49	1234.15	6.33	OSF1.50	21133.95	11025.00			MinPts	
Final Surveys - Cimarex Vaca											
Draw 20-17 Federal #9H MWD											
Ofc-22544ft (Surcon Corrected)											
(Def Survey)											
	1299.82	32.81	1298.64	N/A	MAS = 10.00 (m)	0.00	0.00			MinPts	Pass
	1299.84	32.81	1298.65	87707.80	MAS = 10.00 (m)	23.00	23.00			WRP	
	1299.88	32.81	1298.65	21026.29	MAS = 10.00 (m)	40.00	40.00			MINPT-O-EQU	
	1315.13	32.81	1305.05	145.57	MAS = 10.00 (m)	2000.00	2000.00			MinPt-O-SF	
	1312.77	32.81	1302.68	145.17	MAS = 10.00 (m)	2100.00	2099.98			MinPt-O-SF	
	1220.74	32.81	1213.78	208.35	MAS = 10.00 (m)	3350.00	3341.68			MinPt-O-SF	
	1213.82	32.81	1206.90	208.83	MAS = 10.00 (m)	3440.00	3431.01			MinPt-O-SF	
	1186.05	32.81	1188.80	195.30	MAS = 10.00 (m)	3900.00	3889.05			MinPt-O-SF	
	1194.41	32.81	1187.17	194.93	MAS = 10.00 (m)	4030.00	4019.05			MinPts	
	1194.43	32.81	1187.16	194.25	MAS = 10.00 (m)	4040.00	4029.05			MINPT-O-EQU	
	1194.34	32.81	1185.98	164.98	MAS = 10.00 (m)	4400.00	4389.05			MinPts	
	1194.37	32.81	1185.95	163.47	MAS = 10.00 (m)	4420.00	4409.05			MINPT-O-EQU	
	1186.89	32.81	1177.33	140.70	MAS = 10.00 (m)	4720.00	4709.05			MinPts	
	1188.93	32.81	1177.29	139.60	MAS = 10.00 (m)	4740.00	4729.05			MINPT-O-EQU	
	1124.43	32.94	1102.06	53.16	OSF1.50	7780.00	7769.05			MinPt-CtCt	
	1124.54	33.25	1101.98	52.65	OSF1.50	7830.00	7819.05			MINPT-O-EQU	
	1124.75	33.91	1101.73	51.60	OSF1.50	7930.00	7919.05			MinPt-CtCt	
	1124.97	35.15	1101.12	49.72	OSF1.50	8120.00	8109.05			MinPt-CtCt	
	1125.03	35.34	1101.05	49.44	OSF1.50	8150.00	8139.05			MINPT-O-EQU	
	1125.13	35.47	1101.06	49.25	OSF1.50	8170.00	8159.05			MinPt-O-ADP	
	1149.04	46.45	1117.67	38.04	OSF1.50	9840.00	9829.05			MinPt-CtCt	
	1149.38	47.09	1117.43	37.52	OSF1.50	9940.00	9929.05			MINPT-O-EQU	
	1149.38	47.27	1117.47	37.38	OSF1.50	9970.00	9959.05			MinPt-O-ADP	
	1138.90	53.69	1102.70	32.51	OSF1.50	10940.00	10899.73			MinPt-CtCt	
	1138.92	53.75	1102.69	32.48	OSF1.50	10950.00	10896.63			MinPts	
	1150.93	54.72	1114.09	32.17	OSF1.50	11130.00	10992.03			MinPt-O-SF	
	1849.33	65.61	1805.26	42.90	OSF1.50	12760.00	11025.00			MinPt-CtCt	
	1841.88	72.27	1793.37	38.74	OSF1.50	13020.00	11025.00			MinPt-CtCt	
	1842.45	73.93	1792.84	37.87	OSF1.50	13090.00	11025.00			MINPT-O-EQU	
	1843.69	75.40	1793.09	37.14	OSF1.50	13150.00	11025.00			MinPt-O-ADP	
	1862.87	89.78	1802.66	31.45	OSF1.50	13680.00	11025.00			MinPt-O-ADP	
	1867.06	109.17	1793.96	25.87	OSF1.50	14360.00	11025.00			MinPt-CtCt	
	1862.94	114.19	1786.49	24.67	OSF1.50	14540.00	11025.00			MinPt-CtCt	
	1861.24	118.66	1781.81	23.71	OSF1.50	14700.00	11025.00			MinPt-CtCt	
	1861.69	119.87	1781.44	23.48	OSF1.50	14750.00	11025.00			MINPT-O-EQU	
	1862.08	120.35	1781.52	23.39	OSF1.50	14770.00	11025.00			MinPt-O-ADP	
	1863.90	132.28	1775.39	21.28	OSF1.50	15170.00	11025.00			MinPt-CtCt	
	1864.36	133.80	1774.83	21.04	OSF1.50	15230.00	11025.00			MINPT-O-EQU	
	1864.04	136.69	1772.58	20.59	OSF1.50	15320.00	11025.00			MinPt-CtCt	
	1864.44	137.89	1772.19	20.42	OSF1.50	15370.00	11025.00			MINPT-O-EQU	
	1864.85	138.36	1772.29	20.35	OSF1.50	15390.00	11025.00			MinPt-O-ADP	
	1890.24	200.80	1756.05	14.18	OSF1.50	17500.00	11025.00			MinPt-CtCt	
	1892.16	211.31	1750.96	13.49	OSF1.50	17850.00	11025.00			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	Major	
	1893.90	216.69	1749.11	13.16	OSF1.50	18040.00	11025.00				MINPT-O-EOU
	1898.17	239.03	1728.49	11.89	OSF1.50	18780.00	11025.00				MinPt-CtCt
	1888.08	242.64	1725.99	11.71	OSF1.50	18900.00	11025.00				MinPt-CtCt
	1888.33	247.73	1722.85	11.47	OSF1.50	19070.00	11025.00				MinPt-CtCt
	1888.08	256.75	1716.58	11.07	OSF1.50	19370.00	11025.00				MinPt-CtCt
	1889.68	260.63	1715.60	10.91	OSF1.50	19510.00	11025.00				MINPT-O-EOU
	1890.22	273.85	1707.33	10.39	OSF1.50	19940.00	11025.00				MinPt-CtCt
	1884.95	286.42	1693.72	9.90	OSF1.50	20360.00	11025.00				MinPt-CtCt
	1883.84	293.34	1687.96	9.86	OSF1.50	20590.00	11025.00				MinPt-CtCt
	1884.64	295.71	1667.17	9.59	OSF1.50	20680.00	11025.00				MINPT-O-EOU
	1888.23	306.01	1683.90	9.28	OSF1.50	21010.00	11025.00				MinPt-CtCt
	1887.95	309.82	1661.08	9.16	OSF1.50	21133.95	11025.00				MinPts

Final Surveys - Cimarex Vaca
Draw 20-17 Federal #43H
MWD 0ft-19167ft (Surcon
Corrected) (Def Survey)

1160.28	32.81	1158.99	1127.47	N/A	MAS = 10.00 (m)	0.00	0.00				Surface
1160.26	32.81	1158.97	1127.45	N/A	MAS = 10.00 (m)	23.00	23.00				WRP
1159.21	32.81	1155.56	1126.40	489.10	MAS = 10.00 (m)	570.00	570.00				MinPts
1158.72	32.81	1153.12	1125.91	268.42	MAS = 10.00 (m)	1030.00	1030.00				MinPts
1158.73	32.81	1152.96	1125.92	258.12	MAS = 10.00 (m)	1070.00	1070.00				MINPT-O-EOU
1153.80	32.81	1143.93	1121.00	131.86	MAS = 10.00 (m)	2100.00	2099.98				MinPts
1153.65	32.81	1144.01	1120.84	135.46	MAS = 10.00 (m)	2160.00	2159.92				MinPts
1260.67	32.81	1254.11	1227.86	232.28	MAS = 10.00 (m)	3900.00	3889.05				MinPts
1257.68	32.81	1249.52	1224.87	178.65	MAS = 10.00 (m)	4510.00	4499.05				MinPts
1257.76	32.81	1249.42	1224.97	173.90	MAS = 10.00 (m)	4560.00	4549.05				MINPT-O-EOU
1237.67	32.81	1225.03	1204.86	106.40	MAS = 10.00 (m)	5610.00	5599.05				MinPts
1236.54	32.81	1218.81	1203.73	73.97	MAS = 10.00 (m)	6790.00	6779.05				MinPts
1221.16	39.60	1194.42	1181.56	47.44	OSF1.50	8840.00	8829.05				MinPt-CtCt
1221.19	39.73	1194.37	1181.47	47.29	OSF1.50	8860.00	8849.05				MINPT-O-EOU
1221.24	39.79	1194.38	1181.45	47.21	OSF1.50	8870.00	8859.05				MinPt-CtCt
1246.24	41.65	1218.13	1204.59	45.97	OSF1.50	9210.00	9199.05				MINPT-O-EOU
1256.99	42.03	1228.63	1214.96	45.94	OSF1.50	9280.00	9269.05				MinPt-CtCt
2096.14	40.81	2068.60	2055.34	78.99	OSF1.50	11600.00	11025.00				MINPT-O-EOU
2096.17	40.90	2068.57	2055.28	78.81	OSF1.50	11610.00	11025.00				MinPt-CtCt
2096.24	40.98	2068.58	2055.26	78.64	OSF1.50	11620.00	11025.00				MinPt-CtCt
2089.84	60.24	2049.35	2029.60	52.87	OSF1.50	12650.00	11025.00				MinPt-CtCt
2088.65	104.92	1998.38	1963.74	29.84	OSF1.50	14330.00	11025.00				MinPt-CtCt
2081.27	137.21	1969.47	1924.06	22.69	OSF1.50	15450.00	11025.00				MINPT-O-EOU
2061.94	139.27	1968.79	1922.67	22.36	OSF1.50	15540.00	11025.00				MINPT-O-EOU
2059.97	152.67	1957.86	1907.30	20.36	OSF1.50	15980.00	11025.00				MinPt-CtCt
2061.95	157.58	1956.57	1904.37	19.74	OSF1.50	16170.00	11025.00				MINPT-O-EOU
2064.85	168.00	1952.52	1896.85	18.54	OSF1.50	16500.00	11025.00				MinPt-CtCt
2062.63	182.80	1940.43	1879.82	17.01	OSF1.50	17000.00	11025.00				MinPt-CtCt
2053.71	208.00	1914.71	1845.70	14.87	OSF1.50	17850.00	11025.00				MinPt-CtCt
2055.51	229.80	1901.98	1825.71	13.47	OSF1.50	18580.00	11025.00				MinPt-CtCt
2045.37	262.88	1869.79	1782.49	11.71	OSF1.50	19690.00	11025.00				MinPt-CtCt
2045.89	264.43	1869.28	1781.46	11.64	OSF1.50	19760.00	11025.00				MINPT-O-EOU
2046.62	265.29	1869.43	1781.33	11.61	OSF1.50	19800.00	11025.00				MinPt-CtCt
2050.60	292.58	1855.22	1758.02	10.54	OSF1.50	20680.00	11025.00				MinPt-CtCt
2051.53	295.49	1854.20	1756.03	10.44	OSF1.50	20800.00	11025.00				MINPT-O-EOU
2053.51	297.77	1854.67	1755.74	10.37	OSF1.50	20890.00	11025.00				MinPt-CtCt
2061.31	304.74	1857.82	1756.57	10.17	OSF1.50	21120.00	11025.00				MINPT-O-EOU

Pass

Offset Trajectory	Separation		Allow	Sep. Fact.	Controlling Rule	Reference Trajectory		Risk Level		Alert	Status
	Ct-Ct (ft)	MAS (ft)	EOU (ft)			MD (ft)	TVD (ft)	Minor	Major		
	2061.66	305.23	1857.85	10.16	OSF1.50	21133.95	11025.00			MinPts	

Final Surveys - Cimarex Vaca
Draw 20-17 Federal #44H
MWD 0ft-19884ft (Surcon
Corrected) (Def Survey)

											Pass
1180.24	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	N/A	MAS = 10.00 (m)	23.00	23.00			WRP	
1180.17	32.81	1178.06	1147.36	1442.03	MAS = 10.00 (m)	220.00	220.00			MinPts	
1180.78	32.81	1175.34	1147.97	284.20	MAS = 10.00 (m)	990.00	990.00			MinPts	
1180.76	32.81	1174.98	1147.96	261.97	MAS = 10.00 (m)	1070.00	1070.00			MINPT-O-EQU	
1174.86	32.81	1164.90	1142.05	133.09	MAS = 10.00 (m)	2000.00	2000.00			MinPt-O-SF	
1174.84	32.81	1164.89	1142.03	133.11	MAS = 10.00 (m)	2010.00	2010.00			MINPT-O-EQU	
1451.71	32.81	1444.86	1418.90	253.48	MAS = 10.00 (m)	3900.00	3889.05			MinPts	
1825.98	44.34	1796.08	1781.63	63.19	OSF1.50	9400.00	9389.05			MinPt-O-SF	
1819.57	44.87	1789.32	1774.70	62.21	OSF1.50	9500.00	9489.05			MinPt-O-SF	
1801.77	46.87	1770.18	1754.89	58.91	OSF1.50	9799.05	9799.05			MinPt-CtCt	
1801.81	46.94	1770.18	1754.87	58.83	OSF1.50	9820.00	9809.05			MinPts	
1824.59	48.49	1791.92	1776.10	57.62	OSF1.50	10120.00	10109.05			MinPt-O-SF	
1829.21	48.61	1796.47	1780.60	57.63	OSF1.50	10150.00	10139.05			MinPt-O-SF	
2039.92	52.51	2004.57	1987.40	59.39	OSF1.50	11540.00	11025.00			MinPt-CtCt	
2039.99	52.71	2004.51	1987.28	59.17	OSF1.50	11560.00	11025.00			MINPT-O-EQU	
2040.08	52.81	2004.53	1987.27	59.06	OSF1.50	11570.00	11025.00			MinPt-O-ADP	
2023.85	86.33	1964.63	1935.51	34.74	OSF1.50	13340.00	11025.00			MinPt-CtCt	
2024.21	89.79	1964.02	1934.41	34.17	OSF1.50	13410.00	11025.00			MINPT-O-EQU	
2024.68	90.37	1964.11	1934.31	33.96	OSF1.50	13440.00	11025.00			MinPt-O-ADP	
2043.78	103.64	1974.35	1940.13	29.85	OSF1.50	13940.00	11025.00			MINPT-O-EQU	
2044.72	104.76	1974.55	1939.96	29.54	OSF1.50	13990.00	11025.00			MinPt-O-ADP	
2045.20	105.24	1974.71	1939.96	29.41	OSF1.50	14010.00	11025.00			MinPt-O-ADP	
2010.52	159.03	1904.17	1851.49	19.07	OSF1.50	15900.00	11025.00			MinPt-CtCt	
2011.87	166.30	1900.67	1845.57	18.25	OSF1.50	16150.00	11025.00			MinPt-CtCt	
2012.09	177.36	1893.52	1834.73	17.10	OSF1.50	16530.00	11025.00			MinPt-CtCt	
2012.54	178.70	1893.08	1833.84	16.98	OSF1.50	16590.00	11025.00			MINPT-O-EQU	
2013.08	179.36	1893.18	1833.72	16.92	OSF1.50	16620.00	11025.00			MinPt-CtCt	
2015.05	186.15	1890.64	1828.92	16.32	OSF1.50	16830.00	11025.00			MinPt-O-ADP	
2015.56	187.75	1890.07	1827.81	16.18	OSF1.50	16900.00	11025.00			MinPt-CtCt	
2019.86	197.89	1887.61	1821.97	15.38	OSF1.50	17250.00	11025.00			MINPT-O-EQU	
1996.92	231.14	1842.49	1765.77	13.01	OSF1.50	18360.00	11025.00			MinPt-CtCt	
1997.39	232.49	1842.07	1764.90	12.94	OSF1.50	18420.00	11025.00			MINPT-O-EQU	
1997.95	233.15	1842.19	1764.80	12.90	OSF1.50	18450.00	11025.00			MinPt-O-ADP	
2004.58	248.12	1838.82	1756.44	12.16	OSF1.50	18930.00	11025.00			MinPt-CtCt	
2006.09	251.44	1838.13	1754.65	12.01	OSF1.50	19060.00	11025.00			MINPT-O-EQU	
2008.41	309.15	1801.99	1699.27	9.77	OSF1.50	20980.00	11025.00			MinPt-CtCt	
2009.16	313.52	1799.82	1695.64	9.64	OSF1.50	21133.95	11025.00			MinPts	

Final Surveys - Cimarex Vaca
Draw 20-17 Federal #45H 0ft-
19226ft (Surcon Corrected)
(Def Survey)

											Pass
1200.22	32.81	1198.93	1167.41	N/A	MAS = 10.00 (m)	0.00	0.00			Surface	
1200.19	32.81	1198.90	1167.38	489677.91	MAS = 10.00 (m)	23.00	23.00			WRP	
1198.76	32.81	1195.97	1165.95	798.63	MAS = 10.00 (m)	350.00	350.00			MinPts	
1198.84	32.81	1195.92	1166.03	734.20	MAS = 10.00 (m)	380.00	380.00			MINPT-O-EQU	
1204.23	32.81	1198.21	1171.42	245.75	MAS = 10.00 (m)	1160.00	1160.00			MINPT-O-EQU	

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)	Alert	Minor	Major	
1220.93	32.81	1211.00	1188.12	138.64	MAS = 10.00 (m)	2100.00	2099.98				MinPt-O-SF
1437.69	32.81	1430.05	1404.88	220.73	MAS = 10.00 (m)	3250.00	3242.42				MinPt-O-SF
1574.20	32.81	1565.84	1541.40	217.51	MAS = 10.00 (m)	3980.00	3969.05				MinPt-O-SF
2160.94	39.51	2134.26	2121.42	84.17	OSF1.50	8350.00	8339.05				MinPt-O-ADP
2162.34	41.19	2134.54	2121.15	80.70	OSF1.50	8650.00	8639.05				MINPT-O-EOU
2162.73	42.43	2134.11	2120.30	78.30	OSF1.50	8860.00	8849.05				MinPt-CtCt
2162.77	42.62	2134.02	2120.15	77.95	OSF1.50	8890.00	8879.05				MINPT-O-EOU
2162.88	42.75	2134.04	2120.13	77.72	OSF1.50	8910.00	8899.05				MinPt-O-ADP
2216.81	47.01	2185.13	2169.80	72.28	OSF1.50	9640.00	9629.05				MinPt-O-SF
2716.11	75.58	2665.38	2640.53	54.62	OSF1.50	12760.00	11025.00				MinPt-CtCt
2677.16	127.00	2592.16	2550.17	31.87	OSF1.50	14680.00	11025.00				MinPt-CtCt
2680.86	137.47	2588.87	2543.39	29.46	OSF1.50	15050.00	11025.00				MINPT-O-EOU
2677.35	152.09	2575.62	2525.26	26.57	OSF1.50	15530.00	11025.00				MinPt-CtCt
2671.87	173.38	2555.94	2498.49	23.24	OSF1.50	16260.00	11025.00				MinPt-CtCt
2672.59	175.69	2555.12	2496.90	22.94	OSF1.50	16380.00	11025.00				MINPT-O-EOU
2679.21	185.16	2555.43	2494.06	21.82	OSF1.50	16690.00	11025.00				MINPT-O-EOU
2681.11	187.43	2555.82	2493.63	21.57	OSF1.50	16780.00	11025.00				MinPt-O-ADP
2687.90	199.62	2554.48	2488.29	20.29	OSF1.50	17180.00	11025.00				MINPT-O-EOU
2689.56	201.62	2554.81	2487.94	20.10	OSF1.50	17280.00	11025.00				MinPt-O-ADP
2693.50	207.66	2554.71	2485.83	19.54	OSF1.50	17450.00	11025.00				MINPT-O-EOU
2694.22	208.54	2554.85	2485.63	19.47	OSF1.50	17490.00	11025.00				MinPt-O-ADP
2698.98	219.53	2552.29	2479.45	18.52	OSF1.50	17830.00	11025.00				MinPt-CtCt
2697.13	225.76	2546.28	2471.37	18.00	OSF1.50	18040.00	11025.00				MinPt-CtCt
2700.46	239.50	2540.46	2460.96	16.98	OSF1.50	18500.00	11025.00				MinPt-CtCt
2671.79	259.45	2498.48	2412.34	15.50	OSF1.50	19170.00	11025.00				MinPt-CtCt
2672.13	260.45	2498.15	2411.68	15.44	OSF1.50	19220.00	11025.00				MINPT-O-EOU
2673.05	261.50	2498.38	2411.55	15.39	OSF1.50	19270.00	11025.00				MinPt-O-ADP
2681.55	278.20	2495.74	2403.34	14.51	OSF1.50	19790.00	11025.00				MinPt-CtCt
2682.11	289.61	2488.69	2392.49	13.94	OSF1.50	20170.00	11025.00				MinPt-CtCt
2688.25	304.58	2484.86	2383.67	13.28	OSF1.50	20700.00	11025.00				MINPT-O-EOU
2692.46	309.51	2485.79	2382.96	13.09	OSF1.50	20880.00	11025.00				MinPt-O-ADP
2700.36	316.79	2488.83	2383.58	12.82	OSF1.50	21133.95	11025.00				MinPt-O-SF
Cinmarex Vaca Draw 20-17											
Federal #6H MWD											
Final(Surcon Corrected) (Def Survey)											
1361.15	32.81	1359.17	1328.34	N/A	MAS = 10.00 (m)	0.00	0.00				Surface
1361.12	32.81	1359.12	1328.32	57097.46	MAS = 10.00 (m)	23.00	23.00				WRP
1357.50	32.81	1352.45	1324.69	441.00	MAS = 10.00 (m)	720.00	720.00				MinPts
1358.15	32.81	1352.16	1325.34	338.04	MAS = 10.00 (m)	940.00	940.00				MINPT-O-EOU
1354.80	32.81	1344.02	1321.99	153.75	MAS = 10.00 (m)	2100.00	2099.98				MinPt-O-SF
1295.06	32.81	1286.94	1262.25	212.17	MAS = 10.00 (m)	3210.00	3202.72				MinPt-O-SF
1285.37	32.81	1277.72	1252.56	228.12	MAS = 10.00 (m)	3610.00	3599.75				MinPt-O-SF
1284.78	32.81	1277.14	1251.97	228.53	MAS = 10.00 (m)	3700.00	3689.32				MinPts
1283.73	32.81	1275.40	1250.92	203.16	MAS = 10.00 (m)	3960.00	3949.05				MinPt-O-SF
1283.64	32.81	1275.29	1250.83	202.59	MAS = 10.00 (m)	4020.00	4009.05				MinPts
1283.67	32.81	1275.23	1250.86	199.93	MAS = 10.00 (m)	4060.00	4049.05				MINPT-O-EOU
1279.70	32.81	1269.16	1246.89	150.11	MAS = 10.00 (m)	4730.00	4719.05				MinPts
1279.73	32.81	1269.13	1246.92	149.14	MAS = 10.00 (m)	4750.00	4739.05				MINPT-O-EOU
1331.93	32.81	1311.64	1299.12	73.44	MAS = 10.00 (m)	7120.00	7109.05				MinPts
1332.25	32.81	1311.51	1299.44	70.93	MAS = 10.00 (m)	7280.00	7269.05				MINPT-O-EOU
1367.35	41.00	1339.36	1326.35	52.43	OSF1.50	8990.00	8979.05				MinPt-O-SF
2028.66	42.88	1999.42	1985.79	74.33	OSF1.50	10450.00	10439.05				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		
2334.08	49.25	2300.58	2284.83	74.00	OSF1.50	11740.00	11025.00			MinPt-CtCt	
2334.21	49.64	2300.45	2284.56	73.39	OSF1.50	11770.00	11025.00			MINPT-O-EOU	
2334.41	49.91	2300.48	2284.51	73.00	OSF1.50	11790.00	11025.00			MinPt-O-ADP	
2341.42	54.17	2304.65	2287.25	67.23	OSF1.50	12020.00	11025.00			MinPt-O-ADP	
2346.15	58.17	2306.70	2287.97	62.57	OSF1.50	12190.00	11025.00			MINPT-O-EOU	
2347.45	60.05	2306.76	2287.40	60.59	OSF1.50	12270.00	11025.00			MINPT-O-EOU	
2347.94	60.63	2306.86	2287.31	60.00	OSF1.50	12300.00	11025.00			MinPt-O-ADP	
2340.98	73.77	2291.15	2287.22	48.87	OSF1.50	12830.00	11025.00			MinPt-CtCt	
2341.36	74.90	2290.77	2286.47	48.12	OSF1.50	12890.00	11025.00			MINPT-O-EOU	
2341.83	75.46	2290.86	2286.37	47.76	OSF1.50	12920.00	11025.00			MinPt-O-ADP	
2321.24	103.76	2251.41	2217.48	34.18	OSF1.50	13940.00	11025.00			MinPt-CtCt	
2321.54	104.67	2251.11	2216.88	33.88	OSF1.50	13990.00	11025.00			MINPT-O-EOU	
2321.86	105.03	2251.18	2216.83	33.77	OSF1.50	14010.00	11025.00			MinPt-O-ADP	
2336.12	129.78	2248.94	2206.34	27.40	OSF1.50	14850.00	11025.00			MinPt-CtCt	
2333.93	149.25	2233.77	2184.68	23.75	OSF1.50	15520.00	11025.00			MinPt-CtCt	
2334.80	151.87	2232.88	2182.93	23.34	OSF1.50	15630.00	11025.00			MINPT-O-EOU	
2336.62	162.69	2227.50	2173.93	21.79	OSF1.50	15980.00	11025.00			MinPt-CtCt	
2334.71	176.25	2216.55	2158.46	20.08	OSF1.50	16440.00	11025.00			MinPt-CtCt	
2335.45	188.53	2209.10	2146.92	18.76	OSF1.50	16860.00	11025.00			MinPt-CtCt	
2335.75	193.85	2205.85	2141.90	18.24	OSF1.50	17040.00	11025.00			MinPt-CtCt	
2329.37	236.59	2170.98	2092.77	14.88	OSF1.50	18480.00	11025.00			MinPt-CtCt	
2338.52	266.20	2160.39	2072.31	13.26	OSF1.50	19470.00	11025.00			MinPt-CtCt	
2328.38	309.02	2121.71	2019.36	11.37	OSF1.50	20900.00	11025.00			MinPt-CtCt	
2328.43	309.28	2121.58	2019.15	11.36	OSF1.50	20920.00	11025.00			MINPT-O-EOU	
2328.51	309.40	2121.59	2019.11	11.35	OSF1.50	20930.00	11025.00			MinPt-O-ADP	
2331.24	310.26	2123.74	2020.98	11.33	OSF1.50	21020.00	11025.00			MinPt-O-SF	
2339.66	310.72	2131.86	2028.94	11.36	OSF1.50	21133.95	11025.00			TD	

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

1401.11	32.81	1399.13	1368.30	N/A	MAS = 10.00 (m)	0.00	0.00	Surface	Pass
1401.11	32.81	1399.11	1368.30	103232.39	MAS = 10.00 (m)	23.00	23.00	WRP	
1316.81	91.68	1255.01	1225.13	22.00	OSF1.50	11050.00	10956.73	MinPt-CtCt	
1316.82	91.73	1254.99	1225.09	21.99	OSF1.50	11058.48	10961.03	MINPT-O-EOU	
1316.82	91.73	1254.99	1225.09	21.99	OSF1.50	11060.00	10961.79	MinPt-O-ADP	
1321.18	92.32	1258.97	1228.86	21.91	OSF1.50	11170.00	11005.06	MinPt-O-SF	
10155.21	99.42	10088.27	10055.79	156.30	OSF1.50	21133.95	11025.00	TD	

Cimarex Vaca Draw 20-17
Federal #5H Final
MWD(Surcon Corrected) (Def
Survey)

1381.13	32.81	1379.15	1348.32	N/A	MAS = 10.00 (m)	0.00	0.00	Surface	Pass
1381.12	32.81	1379.12	1348.31	72622.51	MAS = 10.00 (m)	23.00	23.00	WRP	
1379.22	32.81	1375.04	1346.41	624.98	MAS = 10.00 (m)	540.00	540.00	MinPls	
1379.31	32.81	1374.25	1346.50	447.12	MAS = 10.00 (m)	750.00	750.00	MinPls	
1379.54	32.81	1373.90	1346.73	376.67	MAS = 10.00 (m)	870.00	870.00	MINPT-O-EOU	
1381.56	32.81	1372.41	1348.75	192.44	MAS = 10.00 (m)	1650.00	1650.00	MinPls	
1381.64	32.81	1372.28	1348.84	186.82	MAS = 10.00 (m)	1700.00	1700.00	MINPT-O-EOU	
1387.98	32.81	1377.37	1355.17	160.60	MAS = 10.00 (m)	2000.00	2000.00	MinPt-O-SF	
1390.14	32.81	1379.51	1357.33	160.47	MAS = 10.00 (m)	2100.00	2099.98	MinPt-O-SF	
1386.59	32.81	1358.49	1332.78	267.06	MAS = 10.00 (m)	3250.00	3242.42	MINPT-O-EOU	
1385.57	32.81	1358.51	1332.76	269.14	MAS = 10.00 (m)	3270.00	3262.27	MinPls	

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)	Minor	Major		
1367.56	32.81	1360.71	1334.75	280.73	MAS = 10.00 (m)	3550.00	3540.19			MinPt-O-SF	
1373.66	32.81	1365.99	1340.85	240.81	MAS = 10.00 (m)	3900.00	3889.05			MinPt-O-SF	
1383.55	32.81	1373.49	1350.75	170.96	MAS = 10.00 (m)	4730.00	4719.05			MinPts	
1383.59	32.81	1373.46	1350.78	169.56	MAS = 10.00 (m)	4750.00	4739.05			MINPT-O-EOU	
1412.02	32.81	1386.04	1379.21	100.76	MAS = 10.00 (m)	6180.00	6149.05			MinPts	
1412.07	32.81	1396.02	1379.26	100.17	MAS = 10.00 (m)	6180.00	6169.05			MINPT-O-EOU	
1433.46	37.36	1407.89	1396.09	60.68	OSF1.50	8370.00	8359.05			MinPt-CtCt	
1433.51	38.14	1407.42	1395.37	59.38	OSF1.50	8490.00	8479.05			MinPt-CtCt	
1433.94	39.52	1406.93	1394.42	57.22	OSF1.50	8700.00	8689.05			MINPT-O-EOU	
1434.10	39.71	1406.97	1394.39	56.94	OSF1.50	8730.00	8719.05			MinPt-O-ADP	
1440.31	44.11	1410.24	1396.20	51.21	OSF1.50	9400.00	9389.05			MINPT-O-EOU	
1440.36	44.18	1410.25	1396.18	51.13	OSF1.50	9410.00	9399.05			MinPt-O-ADP	
1462.67	46.07	1431.30	1416.61	49.70	OSF1.50	9750.00	9739.05			MinPt-O-SF	
1816.69	47.53	1764.34	1769.15	59.75	OSF1.50	10770.00	10752.20			MinPt-O-SF	
1834.71	47.89	1802.12	1786.82	59.88	OSF1.50	10820.00	10796.17			MinPt-CtCt	
1862.04	56.82	1823.50	1805.22	50.87	OSF1.50	11810.00	11025.00			MINPT-O-EOU	
1862.31	57.58	1823.26	1804.72	50.19	OSF1.50	11860.00	11025.00			MinPt-O-ADP	
1862.67	58.04	1823.32	1804.63	49.78	OSF1.50	11890.00	11025.00			MinPt-CtCt	
1854.09	69.74	1806.94	1784.35	41.00	OSF1.50	12450.00	11025.00			MINPT-O-EOU	
1854.48	70.84	1806.59	1783.64	40.35	OSF1.50	12510.00	11025.00			MinPt-O-ADP	
1854.96	71.43	1806.68	1783.53	40.02	OSF1.50	12540.00	11025.00			MinPt-CtCt	
1851.53	90.25	1790.70	1761.28	31.43	OSF1.50	13280.00	11025.00			MINPT-O-EOU	
1853.08	95.40	1788.83	1757.69	29.72	OSF1.50	13490.00	11025.00			MinPt-CtCt	
1843.14	115.17	1765.70	1727.97	24.40	OSF1.50	14200.00	11025.00			MINPT-O-EOU	
1843.48	116.23	1765.33	1727.25	24.18	OSF1.50	14250.00	11025.00			MinPt-O-ADP	
1844.00	116.86	1765.43	1727.14	24.05	OSF1.50	14280.00	11025.00			MINPT-O-EOU	
1850.10	132.57	1761.06	1717.53	21.23	OSF1.50	14890.00	11025.00			MinPt-O-ADP	
1851.35	134.06	1761.32	1717.29	21.00	OSF1.50	15730.00	11025.00			MinPt-CtCt	
1845.20	158.86	1738.63	1686.34	17.62	OSF1.50	15950.00	11025.00			MinPt-CtCt	
1845.38	165.24	1734.56	1680.14	16.94	OSF1.50	17190.00	11025.00			MinPt-CtCt	
1838.17	201.66	1703.07	1636.51	13.79	OSF1.50	17600.00	11025.00			MINPT-O-EOU	
1841.66	213.77	1698.49	1627.89	13.03	OSF1.50	19750.00	11025.00			MinPt-CtCt	
1842.56	216.54	1697.54	1626.02	12.87	OSF1.50	17710.00	11025.00			MINPT-O-EOU	
1844.93	277.75	1659.11	1567.19	10.02	OSF1.50	20020.00	11025.00			MinPt-CtCt	
1847.99	285.17	1657.21	1562.81	9.78	OSF1.50	20370.00	11025.00			MinPt-O-ADP	
1855.99	295.55	1658.30	1560.44	9.47	OSF1.50	20900.00	11025.00			MinPt-CtCt	
1851.74	312.13	1642.99	1539.60	8.95	OSF1.50	20920.00	11025.00			MINPT-O-EOU	
1851.81	312.41	1642.87	1539.39	8.94	OSF1.50	20930.00	11025.00			MinPt-O-ADP	
1851.92	312.54	1642.90	1539.38	8.94	OSF1.50	20990.00	11025.00			MinPt-O-SF	
1853.75	313.12	1644.34	1540.63	8.93	OSF1.50	21133.95	11025.00			TD	
1866.01	313.24	1656.53	1552.77	8.98	OSF1.50						
Cimarex Vaca Draw 20-17											
Federal #1H ST01 0ft-2 1966ft											
(Def Survey)											
						Pass					
1401.10	32.81	1399.97	1368.29	N/A	MAS = 10.00 (m)	0.00	0.00			Surface	
1401.06	32.81	1399.90	1368.25	47318.07	MAS = 10.00 (m)	23.00	23.00			WRP	
1399.20	32.81	1396.85	1366.39	1146.24	MAS = 10.00 (m)	300.00	300.00			MinPts	
1399.63	32.81	1396.57	1366.82	723.30	MAS = 10.00 (m)	430.00	430.00			MINPT-O-EOU	
1430.30	32.81	1420.40	1397.49	163.02	MAS = 10.00 (m)	2000.00	2000.00			MinPt-O-SF	
1432.45	32.81	1422.54	1399.64	163.15	MAS = 10.00 (m)	2100.00	2099.98			MinPt-O-SF	
1424.73	32.81	1417.72	1391.92	241.81	MAS = 10.00 (m)	2890.00	2885.10			MINPT-O-EOU	
1424.68	32.81	1417.79	1391.87	247.29	MAS = 10.00 (m)	2950.00	2944.66			MinPts	
1421.08	32.81	1414.93	1388.28	282.16	MAS = 10.00 (m)	3350.00	3341.68			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		
1421.50	32.81	1415.36	1388.69	283.89	MAS = 10.00 (m)	3460.00	3450.86				MinPt-O-SF	
1421.86	32.81	1415.74	1389.06	284.29	MAS = 10.00 (m)	3550.00	3540.19				MinPt-O-SF	
1426.31	32.81	1419.56	1393.50	253.71	MAS = 10.00 (m)	3900.00	3889.05				MinPt-O-SF	
1580.95	38.51	1554.91	1542.45	63.40	OSF1.50	8500.00	8489.05				MINPT-O-EOU	
1581.37	38.99	1555.01	1542.39	62.61	OSF1.50	8590.00	8579.05				MinPt-O-ADP	
1585.67	44.90	1555.35	1540.76	54.30	OSF1.50	9550.00	9539.05				MinPt-CtCt	
1554.46	54.35	1517.85	1500.11	43.78	OSF1.50	11040.00	10951.48				MinPt-CtCt	
1554.47	54.41	1517.82	1500.06	43.73	OSF1.50	11050.00	10956.73				MINPT-O-EOU	
1554.52	54.46	1517.84	1500.06	43.69	OSF1.50	11058.48	10961.03				MinPt-O-ADP	
1589.36	56.70	1551.19	1532.67	42.87	OSF1.50	11380.00	11025.00				MinPt-O-SF	
1596.03	56.93	1557.70	1539.10	42.87	OSF1.50	11410.00	11025.00				MinPt-O-SF	
2038.76	64.26	1995.55	1974.50	48.42	OSF1.50	12450.00	11025.00				MinPt-CtCt	
2039.05	65.25	1995.18	1973.80	47.68	OSF1.50	12500.00	11025.00				MINPT-O-EOU	
2039.56	65.85	1995.28	1973.71	47.24	OSF1.50	12530.00	11025.00				MinPt-O-ADP	
2044.75	73.49	1995.38	1971.26	42.36	OSF1.50	12850.00	11025.00				MinPt-CtCt	
2044.63	77.64	1992.49	1966.99	40.07	OSF1.50	13020.00	11025.00				MinPt-CtCt	
2041.83	82.68	1986.34	1959.15	37.54	OSF1.50	13220.00	11025.00				MinPt-CtCt	
2042.48	88.54	1983.08	1953.94	35.03	OSF1.50	13450.00	11025.00				MinPt-CtCt	
2044.16	94.70	1980.65	1949.46	32.75	OSF1.50	13690.00	11025.00				MINPT-O-EOU	
2044.78	95.42	1980.79	1949.36	32.51	OSF1.50	13720.00	11025.00				MinPt-O-ADP	
2032.23	130.69	1944.73	1901.54	23.52	OSF1.50	14990.00	11025.00				MinPt-CtCt	
2032.88	132.70	1944.04	1900.19	23.16	OSF1.50	15070.00	11025.00				MINPT-O-EOU	
2038.48	142.48	1943.12	1896.00	21.62	OSF1.50	15410.00	11025.00				MINPT-O-EOU	
2040.02	144.39	1943.38	1895.63	21.35	OSF1.50	15480.00	11025.00				MinPt-O-ADP	
2057.03	161.37	1949.07	1895.66	19.25	OSF1.50	16050.00	11025.00				MinPt-CtCt	
2059.03	169.60	1945.58	1889.42	18.32	OSF1.50	16340.00	11025.00				MINPT-O-EOU	
2060.61	171.51	1945.90	1889.11	18.13	OSF1.50	16410.00	11025.00				MinPt-O-ADP	
2039.07	201.88	1904.11	1837.19	15.23	OSF1.50	17430.00	11025.00				MinPt-CtCt	
2039.50	203.11	1903.72	1836.39	15.14	OSF1.50	17480.00	11025.00				MINPT-O-EOU	
2039.89	203.59	1903.79	1836.31	15.11	OSF1.50	17500.00	11025.00				MinPt-O-ADP	
2077.43	215.95	1933.09	1861.48	14.50	OSF1.50	17940.00	11025.00				MinPts	
2073.15	226.00	1922.11	1847.15	13.82	OSF1.50	18240.00	11025.00				MinPt-CtCt	
2037.91	252.01	1869.52	1785.90	12.18	OSF1.50	19120.00	11025.00				MinPt-CtCt	
2039.55	258.02	1867.15	1781.52	11.90	OSF1.50	19330.00	11025.00				MINPT-O-EOU	
2042.50	263.45	1866.50	1779.06	11.67	OSF1.50	19510.00	11025.00				MINPT-O-EOU	
2044.36	265.67	1866.87	1778.68	11.59	OSF1.50	19590.00	11025.00				MinPt-O-ADP	
2042.35	283.66	1852.86	1758.69	10.84	OSF1.50	20170.00	11025.00				MinPt-CtCt	
2043.56	287.83	1851.29	1755.73	10.69	OSF1.50	20320.00	11025.00				MINPT-O-EOU	
2044.90	289.43	1851.57	1755.47	10.63	OSF1.50	20380.00	11025.00				MinPt-O-ADP	
2047.30	293.22	1851.44	1754.08	10.51	OSF1.50	20500.00	11025.00				MINPT-O-EOU	
2047.71	293.70	1851.53	1754.01	10.49	OSF1.50	20520.00	11025.00				MinPt-O-ADP	
2050.07	305.59	1845.97	1744.49	10.09	OSF1.50	20900.00	11025.00				MinPt-CtCt	
2050.25	306.25	1845.71	1744.01	10.07	OSF1.50	20930.00	11025.00				MINPT-O-EOU	
2050.41	306.45	1845.73	1743.96	10.07	OSF1.50	20940.00	11025.00				MinPt-O-ADP	
2056.10	308.38	1850.13	1747.71	10.03	OSF1.50	21060.00	11025.00				MinPt-O-SF	
2063.07	309.07	1856.65	1754.00	10.04	OSF1.50	21133.95	11025.00				TD	

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

1401.10	32.81	1399.12	1368.29	N/A	MAS = 10.00 (m)		0.00	0.00				Surface
1401.06	32.81	1399.05	1368.25	47289.68	MAS = 10.00 (m)		23.00	23.00				WRP
1399.20	32.81	1396.00	1366.39	1145.55	MAS = 10.00 (m)		300.00	300.00				MinPts
1399.63	32.81	1395.72	1366.82	722.87	MAS = 10.00 (m)		430.00	430.00				MINPT-O-EOU

Offset Trajectory	Separation		Allow	Sep. Fact.	Controlling Rule	Reference Trajectory		Risk Level		Alert	Status
	Ct-Ct (ft)	MAS (ft)	EOU (ft)			MD (ft)	TVD (ft)	Minor	Major		
	1430.30	32.81	1419.55	1397.49	MAS = 10.00 (m)	2000.00	2000.00			MinPt-O-SF	
	1432.45	32.81	1421.69	1399.64	MAS = 10.00 (m)	2100.00	2099.98			MinPt-O-SF	
	1424.73	32.81	1416.87	1391.92	MAS = 10.00 (m)	2890.00	2885.10			MINPT-O-EOU	
	1424.68	32.81	1416.94	1391.87	MAS = 10.00 (m)	2950.00	2944.66			MinPts	
	1421.09	32.81	1414.08	1388.28	MAS = 10.00 (m)	3350.00	3341.68			MinPts	
	1421.50	32.81	1414.51	1388.69	MAS = 10.00 (m)	3460.00	3450.86			MinPt-O-SF	
	1421.86	32.81	1414.89	1389.06	MAS = 10.00 (m)	3550.00	3540.19			MinPt-O-SF	
	1426.31	32.81	1418.72	1393.50	MAS = 10.00 (m)	3900.00	3889.05			MinPt-O-SF	
	1580.95	39.35	1554.06	1541.60	OSF1.50	8500.00	8489.05			MINPT-O-EOU	
	1581.37	39.84	1554.16	1541.54	OSF1.50	8590.00	8579.05			MinPt-O-ADP	
	1585.67	45.75	1554.50	1539.91	OSF1.50	9550.00	9539.05			MinPt-CtCt	
	1554.46	55.20	1517.00	1499.26	OSF1.50	11040.00	10951.48			MinPt-CtCt	
	1554.47	55.26	1516.98	1499.21	OSF1.50	11050.00	10956.73			MINPT-O-EOU	
	1554.52	55.31	1516.98	1499.21	OSF1.50	11058.48	10961.03			MinPt-O-ADP	
	1589.36	57.55	1550.34	1531.82	OSF1.50	11380.00	11025.00			MinPt-O-SF	
	1596.03	57.78	1556.85	1538.25	OSF1.50	11410.00	11025.00			MinPt-O-SF	
	10210.02	71.03	10162.01	10138.99	OSF1.50	21133.95	11025.00			TD	

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

2379.33	32.81	2378.04	2346.52	N/A	MAS = 10.00 (m)	0.00	0.00			Surface	Pass
2379.27	32.81	2377.98	2346.46	329481.84	MAS = 10.00 (m)	10.00	10.00			MinPt-O-SF	
2379.26	32.81	2377.97	2346.45	N/A	MAS = 10.00 (m)	23.00	23.00			WRP	
2379.26	32.81	2365.85	2346.45	196.15	MAS = 10.00 (m)	2000.00	2000.00			MinPts	
2379.29	32.81	2365.81	2346.48	195.09	MAS = 10.00 (m)	2020.00	2020.00			MINPT-O-EOU	
2399.33	32.81	2385.04	2366.52	184.49	MAS = 10.00 (m)	2540.00	2537.71			MinPt-O-SF	
1657.69	70.71	1609.76	1586.98	36.33	OSF1.50	10830.00	10804.65			MinPt-CtCt	
1657.75	70.90	1609.70	1586.85	36.23	OSF1.50	10860.00	10829.41			MinPts	
1675.59	72.56	1626.47	1603.03	35.69	OSF1.50	11150.00	10998.94			MinPt-O-SF	
2245.61	344.48	2015.53	1901.13	9.81	OSF1.50	21133.95	11025.00			MinPts	

Cimarex Vaca Draw 20-17
Federal #58H Rev1 RM
09Feb21 (Def Plan)

2399.37	32.81	2398.08	2366.56	N/A	MAS = 10.00 (m)	0.00	0.00			Surface	Pass
2399.31	32.81	2398.02	2366.51	347024.30	MAS = 10.00 (m)	10.00	10.00			MinPt-O-SF	
2399.30	32.81	2398.01	2366.49	N/A	MAS = 10.00 (m)	23.00	23.00			WRP	
2399.30	32.81	2385.88	2366.49	197.78	MAS = 10.00 (m)	2000.00	2000.00			MinPts	
2399.33	32.81	2385.85	2366.52	196.72	MAS = 10.00 (m)	2020.00	2020.00			MINPT-O-EOU	
2448.12	32.81	2432.70	2415.31	173.15	MAS = 10.00 (m)	3030.00	3024.06			MinPt-O-SF	
2341.61	73.50	2292.15	2288.10	48.67	OSF1.50	10830.00	10804.65			MinPt-CtCt	
2341.68	73.73	2292.07	2287.95	48.51	OSF1.50	10860.00	10829.41			MINPT-O-EOU	
2341.81	73.88	2292.10	2287.93	48.41	OSF1.50	10880.00	10845.30			MinPt-O-ADP	
2373.16	76.41	2321.79	2296.75	47.36	OSF1.50	11290.00	11024.64			MinPt-O-SF	
2688.17	346.90	2456.48	2341.28	11.66	OSF1.50	21133.95	11025.00			MinPts	

Final Surveys - Cimarex Vaca
Draw 20-17 Federal #71H
MWD 0ht-19978ft (Surcon
Corrected) (Def Survey)

2929.09	32.81	2927.80	2896.28	N/A	MAS = 10.00 (m)	0.00	0.00			Surface	Pass
2929.04	32.81	2927.75	2896.23	517224.57	MAS = 10.00 (m)	10.00	10.00			MinPt-O-SF	
2929.03	32.81	2927.74	2896.22	N/A	MAS = 10.00 (m)	20.00	20.00			MinPts	
2929.03	32.81	2927.74	2896.22	N/A	MAS = 10.00 (m)	23.00	23.00			WRP	

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		
2929.41	32.81	2927.58	2896.60	5398.20	MAS = 10.00 (m)		170.00	170.00				MINPT-O-EOU
2926.29	32.81	2920.06	2893.49	591.59	MAS = 10.00 (m)		1060.00	1060.00				MINPT-O-EOU
2890.46	32.81	2879.43	2857.65	292.28	MAS = 10.00 (m)		2100.00	2099.98				MinPt-O-SF
2887.56	32.81	2876.89	2854.75	303.32	MAS = 10.00 (m)		2290.00	2289.50				MINPT-O-EOU
2887.54	32.81	2876.90	2854.74	303.92	MAS = 10.00 (m)		2300.00	2299.45				MinPts
2897.93	32.81	2888.77	2865.12	361.04	MAS = 10.00 (m)		3310.00	3301.97				MinPt-O-SF
2970.81	32.81	2959.41	2938.00	289.33	MAS = 10.00 (m)		4970.00	4959.05				MINPT-O-EOU
2425.09	45.47	2394.12	2379.62	83.60	OSF1.50	OSF1.50	9270.00	9259.05				MinPt-O-SF
2370.44	49.45	2336.76	2320.99	75.08	OSF1.50	OSF1.50	9830.00	9819.05				MinPt-CtCt
2370.45	49.51	2336.73	2320.94	74.98	OSF1.50	OSF1.50	9840.00	9829.05				MINPT-O-EOU
2370.49	49.57	2336.73	2320.92	74.88	OSF1.50	OSF1.50	9850.00	9839.05				MinPt-O-ADP
2408.18	51.42	2373.27	2356.76	72.89	OSF1.50	OSF1.50	10280.00	10269.05				MinPt-O-SF
2601.64	53.14	2565.88	2548.50	74.85	OSF1.50	OSF1.50	11310.00	11025.00				MINPT-O-EOU
2601.70	53.22	2565.88	2548.48	74.74	OSF1.50	OSF1.50	11320.00	11025.00				MinPt-O-ADP
2613.29	61.54	2571.94	2551.75	64.71	OSF1.50	OSF1.50	11950.00	11025.00				MinPt-CtCt
2613.08	67.15	2567.99	2545.93	59.22	OSF1.50	OSF1.50	12260.00	11025.00				MinPt-CtCt
2580.13	90.30	2519.60	2489.83	43.31	OSF1.50	OSF1.50	13280.00	11025.00				MinPt-CtCt
2581.51	115.15	2504.42	2466.36	33.90	OSF1.50	OSF1.50	14230.00	11025.00				MinPt-CtCt
2578.13	138.13	2485.72	2440.00	28.19	OSF1.50	OSF1.50	15060.00	11025.00				MinPt-CtCt
2576.16	149.80	2475.97	2426.36	25.96	OSF1.50	OSF1.50	15470.00	11025.00				MinPt-CtCt
2575.14	157.56	2469.77	2417.58	24.66	OSF1.50	OSF1.50	15740.00	11025.00				MinPt-CtCt
2576.78	183.57	2454.07	2393.21	21.16	OSF1.50	OSF1.50	16640.00	11025.00				MinPt-CtCt
2571.42	194.38	2441.51	2377.05	19.94	OSF1.50	OSF1.50	17010.00	11025.00				MinPt-CtCt
2571.92	195.87	2441.02	2376.06	19.79	OSF1.50	OSF1.50	17080.00	11025.00				MINPT-O-EOU
2572.62	196.71	2441.15	2375.91	19.71	OSF1.50	OSF1.50	17120.00	11025.00				MinPt-O-ADP
2572.04	218.52	2426.03	2353.52	17.73	OSF1.50	OSF1.50	17830.00	11025.00				MinPt-CtCt
2573.28	224.60	2423.22	2348.68	17.25	OSF1.50	OSF1.50	18060.00	11025.00				MINPT-O-EOU
2574.49	226.05	2423.46	2348.44	17.15	OSF1.50	OSF1.50	18120.00	11025.00				MinPt-O-ADP
2579.50	230.95	2425.21	2348.56	16.82	OSF1.50	OSF1.50	18290.00	11025.00				MinPt-O-ADP
2588.09	242.22	2426.28	2345.87	16.09	OSF1.50	OSF1.50	18630.00	11025.00				MinPt-CtCt
2590.09	259.74	2416.60	2330.35	15.01	OSF1.50	OSF1.50	19220.00	11025.00				MinPt-CtCt
2590.10	264.53	2413.42	2325.57	14.74	OSF1.50	OSF1.50	19380.00	11025.00				MinPt-CtCt
2589.67	281.52	2401.67	2308.16	13.84	OSF1.50	OSF1.50	19950.00	11025.00				MinPt-CtCt
2593.38	316.87	2381.80	2276.51	12.31	OSF1.50	OSF1.50	21133.95	11025.00				MinPts
Cinmarex Vaca Draw 20-17 Federal #59H Rev1 RM 09Feb21 (Def Plan)												
2419.37	32.81	2417.39	2386.56	N/A	MAS = 10.00 (m)		0.00	0.00				Surface
2419.31	32.81	2417.32	2386.50	344529.82	MAS = 10.00 (m)		10.00	10.00				MinPt-O-SF
2419.29	32.81	2417.32	2386.49	N/A	MAS = 10.00 (m)		23.00	23.00				WRP
2419.26	32.81	2405.19	2386.49	199.39	MAS = 10.00 (m)		2000.00	2000.00				MinPts
2419.33	32.81	2405.16	2386.52	198.32	MAS = 10.00 (m)		2020.00	2020.00				MINPT-O-EOU
2438.57	32.81	2423.70	2405.76	188.91	MAS = 10.00 (m)		2520.00	2517.86				MinPt-O-SF
2642.53	32.81	2628.63	2609.72	221.50	MAS = 10.00 (m)		3900.00	3889.05				MinPt-O-SF
3026.30	40.08	2998.93	2986.23	119.08	OSF1.50	OSF1.50	6830.00	6819.05				MinPt-O-SF
3026.50	69.39	2979.58	2957.11	67.30	OSF1.50	OSF1.50	10820.00	10796.17				MinPt-CtCt
3026.57	69.67	2979.46	2956.90	67.03	OSF1.50	OSF1.50	10860.00	10829.41				MINPT-O-EOU
3026.68	69.81	2979.48	2956.87	66.89	OSF1.50	OSF1.50	10880.00	10845.30				MinPt-O-ADP
3202.78	76.82	3150.91	3125.96	64.15	OSF1.50	OSF1.50	11950.00	11025.00				MinPt-O-SF
3384.85	341.30	3156.65	3043.55	14.95	OSF1.50	OSF1.50	21133.95	11025.00				MinPts

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		
Final Surveys - Cimarex Vaca Draw 20-17 Federal #72H Surveys Off to 19073ft (Surcon Corrected) (Def Survey)											
2949.09	32.81	2947.80	2916.28	N/A	MAS = 10.00 (m)	0.00	0.00				Surface
2949.04	32.81	2947.75	2916.23	494857.11	MAS = 10.00 (m)	10.00	10.00				MinPt-O-SF
2949.03	32.81	2947.74	2916.22	N/A	MAS = 10.00 (m)	23.00	23.00				WRP
2946.60	32.81	2940.58	2913.79	622.36	MAS = 10.00 (m)	1060.00	1060.00				MINPT-O-EOU
2934.91	32.81	2924.50	2902.11	316.37	MAS = 10.00 (m)	2100.00	2099.98				MinPis
3043.32	32.81	3035.62	3010.51	463.25	MAS = 10.00 (m)	3860.00	3849.06				MinPt-O-SF
3053.73	32.81	3046.26	3020.92	481.59	MAS = 10.00 (m)	4070.00	4059.05				MinPt-O-SF
2958.23	32.81	2940.87	2925.42	181.44	MAS = 10.00 (m)	6640.00	6629.05				MinPis
2958.32	32.81	2940.80	2925.51	179.63	MAS = 10.00 (m)	6680.00	6669.05				MINPT-O-EOU
2965.61	32.81	2943.73	2932.81	142.21	MAS = 10.00 (m)	7690.00	7679.05				MinPis
2962.60	39.80	2935.72	2922.80	114.64	OSF1.50	8760.00	8749.05				MinPt-CtCt
2962.65	39.99	2935.65	2922.67	114.09	OSF1.50	8790.00	8779.05				MINPT-O-EOU
2962.70	40.05	2935.65	2922.65	113.91	OSF1.50	8800.00	8789.05				MinPt-O-ADP
3095.64	45.35	3065.07	3050.29	104.72	OSF1.50	9840.00	9829.05				MinPt-O-SF
3390.60	47.87	3348.35	3332.73	108.21	OSF1.50	10640.00	10628.66				MinPt-O-SF
3501.12	54.51	3464.44	3446.61	98.15	OSF1.50	11700.00	11025.00				MinPt-CtCt
3501.31	55.61	3463.91	3445.70	96.13	OSF1.50	11780.00	11025.00				MinPt-CtCt
3501.55	56.32	3463.67	3445.23	94.89	OSF1.50	11840.00	11025.00				MINPT-O-EOU
3501.86	56.69	3463.74	3445.17	94.27	OSF1.50	11870.00	11025.00				MinPt-O-ADP
3467.94	86.02	3410.27	3381.93	61.16	OSF1.50	13250.00	11025.00				MinPt-CtCt
3462.20	105.00	3391.87	3357.20	49.92	OSF1.50	13980.00	11025.00				MinPt-CtCt
3461.07	117.53	3382.39	3343.54	44.53	OSF1.50	14440.00	11025.00				MinPt-CtCt
3461.86	119.93	3381.58	3341.93	43.64	OSF1.50	14550.00	11025.00				MINPT-O-EOU
3469.16	134.29	3379.30	3334.86	39.02	OSF1.50	15070.00	11025.00				MINPT-O-EOU
3470.08	135.40	3379.48	3334.67	38.71	OSF1.50	15120.00	11025.00				MinPt-O-ADP
3481.64	157.09	3376.58	3324.55	33.45	OSF1.50	15870.00	11025.00				MINPT-O-EOU
3468.07	178.50	3348.74	3289.57	29.30	OSF1.50	16580.00	11025.00				MinPt-CtCt
3453.50	198.14	3321.09	3255.37	26.27	OSF1.50	17250.00	11025.00				MinPt-CtCt
3454.13	200.04	3320.44	3254.09	26.02	OSF1.50	17340.00	11025.00				MINPT-O-EOU
3454.83	200.88	3320.58	3253.95	25.92	OSF1.50	17380.00	11025.00				MinPt-O-ADP
3468.14	210.76	3327.30	3257.38	24.79	OSF1.50	17710.00	11025.00				MINPT-O-EOU
3469.36	212.20	3327.56	3257.16	24.63	OSF1.50	17770.00	11025.00				MinPt-O-ADP
3474.49	240.10	3314.09	3234.38	21.79	OSF1.50	18670.00	11025.00				MinPt-CtCt
3475.85	243.97	3312.88	3231.88	21.45	OSF1.50	18830.00	11025.00				MINPT-O-EOU
3477.95	246.49	3313.30	3231.46	21.24	OSF1.50	18930.00	11025.00				MinPt-O-ADP
3457.27	290.73	3263.12	3166.54	17.89	OSF1.50	20370.00	11025.00				MinPt-CtCt
3461.81	303.57	3259.10	3158.24	17.16	OSF1.50	20820.00	11025.00				MINPT-O-EOU
3462.28	304.14	3259.19	3158.13	17.13	OSF1.50	20850.00	11025.00				MinPt-O-ADP
3475.22	309.80	3268.36	3165.42	16.88	OSF1.50	21133.95	11025.00				MinPt-O-SF

Final Surveys - Cimarex Vaca Draw 20-17 Federal #73H ST01 Off- 19719ft (Surcon Corrected) (Def Survey)												
2969.08	32.81	2967.80	2936.27	N/A	MAS = 10.00 (m)	0.00	0.00					Surface
2969.04	32.81	2967.74	2936.23	507.292.08	MAS = 10.00 (m)	10.00	10.00					MinPt-O-SF
2969.02	32.81	2967.74	2936.22	N/A	MAS = 10.00 (m)	23.00	23.00					WRP
2968.73	32.81	2966.28	2935.92	2545.62	MAS = 10.00 (m)	310.00	310.00					MinPis
2967.98	32.81	2963.24	2935.17	859.25	MAS = 10.00 (m)	820.00	820.00					MinPis
2968.18	32.81	2963.05	2935.37	771.21	MAS = 10.00 (m)	920.00	920.00					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		
2978.11	32.81	2988.00	2945.30	331.47	MAS = 10.00 (m)	2100.00	2099.98			MinPt-O-SF	
3023.66	32.81	3014.64	2990.85	383.31	MAS = 10.00 (m)	2810.00	2805.70			MinPt-O-SF	
3030.62	32.81	3021.59	2997.81	383.61	MAS = 10.00 (m)	2900.00	2895.03			MinPt-O-SF	
3084.64	32.81	3075.97	3051.83	408.94	MAS = 10.00 (m)	3470.00	3460.78			MinPt-O-SF	
3115.24	32.81	3106.63	3082.43	416.52	MAS = 10.00 (m)	3790.00	3779.12			MinPt-O-SF	
3119.86	32.81	3111.39	3087.05	425.29	MAS = 10.00 (m)	3900.00	3889.05			MinPt-O-SF	
3142.79	32.81	3133.28	3109.98	374.79	MAS = 10.00 (m)	4480.00	4469.05			MinPt-O-SF	
3143.52	32.81	3133.68	3110.71	360.50	MAS = 10.00 (m)	4700.00	4689.05			MinPis	
3143.59	32.81	3133.62	3110.78	355.29	MAS = 10.00 (m)	4740.00	4729.05			MINPT-O-EOU	
3119.46	32.81	3099.22	3086.66	162.26	MAS = 10.00 (m)	7300.00	7289.05			MinPis	
3119.95	32.81	3098.98	3087.14	156.36	MAS = 10.00 (m)	7470.00	7459.05			MINPT-O-EOU	
3120.43	32.81	3098.98	3087.62	152.71	MAS = 10.00 (m)	7580.00	7569.05			MINPT-O-EOU	
3129.02	40.70	3101.54	3088.31	118.24	OSF1.50	8970.00	8959.05			MinPt-O-SF	
3069.95	45.23	3039.47	3024.72	104.04	OSF1.50	9640.00	9629.05			MinPt-CtCt	
3089.98	45.36	3039.41	3024.62	103.73	OSF1.50	9660.00	9649.05			MINPT-O-EOU	
3070.04	45.43	3039.43	3024.61	103.58	OSF1.50	9670.00	9659.05			MinPt-O-ADP	
3204.98	60.70	3164.19	3144.29	80.49	OSF1.50	11870.00	11025.00			MinPt-CtCt	
3205.12	61.06	3164.08	3144.06	80.00	OSF1.50	11900.00	11025.00			MINPT-O-EOU	
3205.33	61.31	3164.12	3144.01	79.67	OSF1.50	11920.00	11025.00			MinPt-O-ADP	
3204.41	65.64	3160.33	3136.78	74.32	OSF1.50	12130.00	11025.00			MinPt-CtCt	
3204.93	67.12	3159.85	3137.81	72.67	OSF1.50	12220.00	11025.00			MINPT-O-EOU	
3205.49	67.79	3159.97	3137.70	71.95	OSF1.50	12260.00	11025.00			MinPt-O-ADP	
3207.91	70.17	3160.80	3137.73	69.52	OSF1.50	12380.00	11025.00			MinPt-O-ADP	
3211.92	74.37	3162.01	3137.55	65.63	OSF1.50	12580.00	11025.00			MinPt-O-ADP	
3216.68	76.26	3164.18	3138.42	62.42	OSF1.50	12750.00	11025.00			MINPT-O-EOU	
3217.77	79.47	3164.46	3136.30	61.48	OSF1.50	12810.00	11025.00			MinPt-O-ADP	
3218.13	86.23	3158.98	3129.90	55.31	OSF1.50	13150.00	11025.00			MinPt-CtCt	
3219.36	90.02	3158.38	3128.70	54.21	OSF1.50	13240.00	11025.00			MINPT-O-EOU	
3181.19	90.81	3158.49	3128.55	53.74	OSF1.50	13280.00	11025.00			MinPt-O-ADP	
3181.61	115.76	3103.69	3065.43	41.56	OSF1.50	14200.00	11025.00			MinPt-CtCt	
3182.10	116.89	3103.35	3064.72	41.16	OSF1.50	14280.00	11025.00			MINPT-O-EOU	
3182.69	117.45	3103.47	3064.65	40.97	OSF1.50	14290.00	11025.00			MinPt-O-ADP	
3183.21	126.14	3098.26	3056.54	38.13	OSF1.50	14580.00	11025.00			MinPt-CtCt	
3183.70	128.13	3097.46	3055.08	37.54	OSF1.50	14670.00	11025.00			MINPT-O-EOU	
3183.70	128.73	3097.56	3054.98	37.37	OSF1.50	14700.00	11025.00			MinPt-O-ADP	
3189.18	143.04	3093.49	3046.14	33.67	OSF1.50	15180.00	11025.00			MinPt-CtCt	
3189.76	144.69	3092.96	3045.06	33.28	OSF1.50	15280.00	11025.00			MINPT-O-EOU	
3190.27	145.31	3093.07	3044.96	33.15	OSF1.50	15290.00	11025.00			MinPt-O-ADP	
3189.50	161.14	3061.75	3008.37	29.68	OSF1.50	15810.00	11025.00			MinPt-CtCt	
3189.86	162.27	3061.35	3008.37	29.47	OSF1.50	15870.00	11025.00			MINPT-O-EOU	
3170.16	162.64	3061.41	3007.52	29.41	OSF1.50	15890.00	11025.00			MinPt-O-ADP	
3173.17	165.96	3062.20	3007.21	28.84	OSF1.50	16020.00	11025.00			MinPt-O-ADP	
3180.25	174.60	3063.53	3005.65	27.47	OSF1.50	16300.00	11025.00			MINPT-O-EOU	
3181.20	175.71	3063.73	3005.49	27.30	OSF1.50	16350.00	11025.00			MinPt-O-ADP	
3184.17	179.49	3064.18	3004.68	26.75	OSF1.50	16470.00	11025.00			MINPT-O-EOU	
3186.27	182.03	3064.59	3004.24	26.39	OSF1.50	16570.00	11025.00			MinPt-O-ADP	
3183.78	188.17	3068.01	3005.61	25.59	OSF1.50	16790.00	11025.00			MinPt-CtCt	
3181.88	209.65	3051.79	2982.24	22.94	OSF1.50	17470.00	11025.00			MinPt-CtCt	
3178.75	244.90	3015.15	2993.84	19.54	OSF1.50	18660.00	11025.00			MinPt-CtCt	
3175.19	252.39	3006.60	2922.80	18.94	OSF1.50	18910.00	11025.00			MinPt-CtCt	
3175.73	254.06	3006.03	2921.67	18.82	OSF1.50	18990.00	11025.00			MINPT-O-EOU	
3176.22	254.80	3006.03	2921.42	18.77	OSF1.50	19020.00	11025.00			MINPT-O-EOU	
3183.15	262.88	3007.56	2920.26	18.23	OSF1.50	19310.00	11025.00			MinPt-O-ADP	

Offset Trajectory	Separation		Allow	Sep. Fact.	Controlling Rule	Reference Trajectory		Risk Level		Alert	Status
	Ct-Ct (ft)	MAS (ft)	EOU (ft)			MD (ft)	TVD (ft)	Alert	Minor		
3192.75	271.41	3011.49	2921.34	17.70	OSF1.50	19600.00	11025.00			MinPt-O-ADP	
3200.25	306.94	2995.30	2893.31	15.68	OSF1.50	20740.00	11025.00			MinPt-CtCt	
3188.86	318.75	2986.03	2880.11	15.10	OSF1.50	21133.95	11025.00			MinPls	
Final Surveys - Cimarex Vaca Draw 20-17 Federal #73H Off- 19583ft (Surcon Corrected) (Def Survey)											
2969.08	32.81	2967.80	2936.27	N/A	MAS = 10.00 (m)	0.00	0.00			Surface	
2969.04	32.81	2967.74	2936.23	507.292.08	MAS = 10.00 (m)	10.00	10.00			MinPt-O-SF	
2969.02	32.81	2967.74	2936.22	N/A	MAS = 10.00 (m)	23.00	23.00			WRP	
2968.73	32.81	2966.28	2935.92	2545.62	MAS = 10.00 (m)	310.00	310.00			MinPls	
2967.98	32.81	2963.24	2935.17	859.25	MAS = 10.00 (m)	820.00	820.00			MinPls	
2968.18	32.81	2963.05	2935.37	771.21	MAS = 10.00 (m)	920.00	920.00			MINPT-O-EOU	
2978.11	32.81	2968.00	2945.30	331.47	MAS = 10.00 (m)	2100.00	2099.98			MinPt-O-SF	
3023.66	32.81	3014.64	2990.85	383.31	MAS = 10.00 (m)	2810.00	2805.70			MinPt-O-SF	
3030.62	32.81	3021.59	2997.81	383.61	MAS = 10.00 (m)	2900.00	2895.03			MinPt-O-SF	
3084.64	32.81	3075.97	3051.83	408.94	MAS = 10.00 (m)	3470.00	3460.78			MinPt-O-SF	
3115.24	32.81	3106.63	3082.43	416.52	MAS = 10.00 (m)	3790.00	3779.12			MinPt-O-SF	
3119.86	32.81	3111.39	3087.05	425.29	MAS = 10.00 (m)	3900.00	3889.05			MinPt-O-SF	
3142.79	32.81	3133.28	3109.98	374.79	MAS = 10.00 (m)	4480.00	4469.05			MinPt-O-SF	
3143.52	32.81	3133.68	3110.71	360.50	MAS = 10.00 (m)	4700.00	4689.05			MinPls	
3143.59	32.81	3133.62	3110.76	355.29	MAS = 10.00 (m)	4740.00	4729.05			MINPT-O-EOU	
3119.46	32.81	3099.22	3086.66	162.26	MAS = 10.00 (m)	7300.00	7289.05			MinPls	
3119.95	32.81	3098.98	3087.14	156.36	MAS = 10.00 (m)	7470.00	7459.05			MINPT-O-EOU	
3120.43	32.81	3098.98	3087.62	152.71	MAS = 10.00 (m)	7580.00	7569.05			MINPT-O-EOU	
3129.02	40.70	3101.54	3088.31	118.24	OSF1.50	8970.00	8959.05			MinPt-O-SF	
3080.85	44.84	3050.61	3036.00	105.42	OSF1.50	9590.00	9579.05			MinPt-CtCt	
3080.89	44.98	3050.58	3035.91	105.09	OSF1.50	9610.00	9599.05			MINPT-O-EOU	
3080.95	45.05	3050.58	3035.90	104.93	OSF1.50	9620.00	9609.05			MinPt-O-ADP	
3187.68	49.65	3154.24	3138.03	98.30	OSF1.50	10470.00	10459.05			MinPt-O-SF	
3307.71	55.97	3270.05	3251.74	90.26	OSF1.50	11620.00	11025.00			MinPt-CtCt	
3307.91	56.55	3269.87	3251.36	89.33	OSF1.50	11670.00	11025.00			MINPT-O-EOU	
3308.11	56.78	3269.91	3251.33	88.97	OSF1.50	11690.00	11025.00			MinPt-O-ADP	
3284.57	106.22	3213.42	3178.35	46.82	OSF1.50	13860.00	11025.00			MinPt-CtCt	
3284.07	112.57	3208.69	3171.50	44.15	OSF1.50	14090.00	11025.00			MinPt-CtCt	
3285.56	117.13	3207.13	3168.43	42.43	OSF1.50	14280.00	11025.00			MINPT-O-EOU	
3282.42	123.95	3199.44	3158.47	40.04	OSF1.50	14500.00	11025.00			MinPt-CtCt	
3277.96	133.35	3188.73	3144.62	37.15	OSF1.50	14840.00	11025.00			MinPt-CtCt	
3278.60	135.30	3188.06	3143.31	36.61	OSF1.50	14930.00	11025.00			MINPT-O-EOU	
3275.89	163.73	3166.40	3112.16	30.19	OSF1.50	15910.00	11025.00			MinPt-CtCt	
3277.37	167.94	3165.07	3109.43	29.44	OSF1.50	16080.00	11025.00			MINPT-O-EOU	
3277.62	174.19	3161.15	3103.43	28.38	OSF1.50	16270.00	11025.00			MinPt-CtCt	
3258.99	209.53	3118.96	3049.46	23.44	OSF1.50	17470.00	11025.00			MinPt-CtCt	
3269.83	254.88	3099.57	3014.95	19.31	OSF1.50	19000.00	11025.00			MinPt-CtCt	
3212.40	305.64	3008.30	2906.76	15.81	OSF1.50	20690.00	11025.00			MinPt-CtCt	
3213.40	309.05	3007.02	2904.35	15.64	OSF1.50	20830.00	11025.00			MINPT-O-EOU	
3220.60	317.63	3008.51	2902.97	15.25	OSF1.50	21133.95	11025.00			MinPls	



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

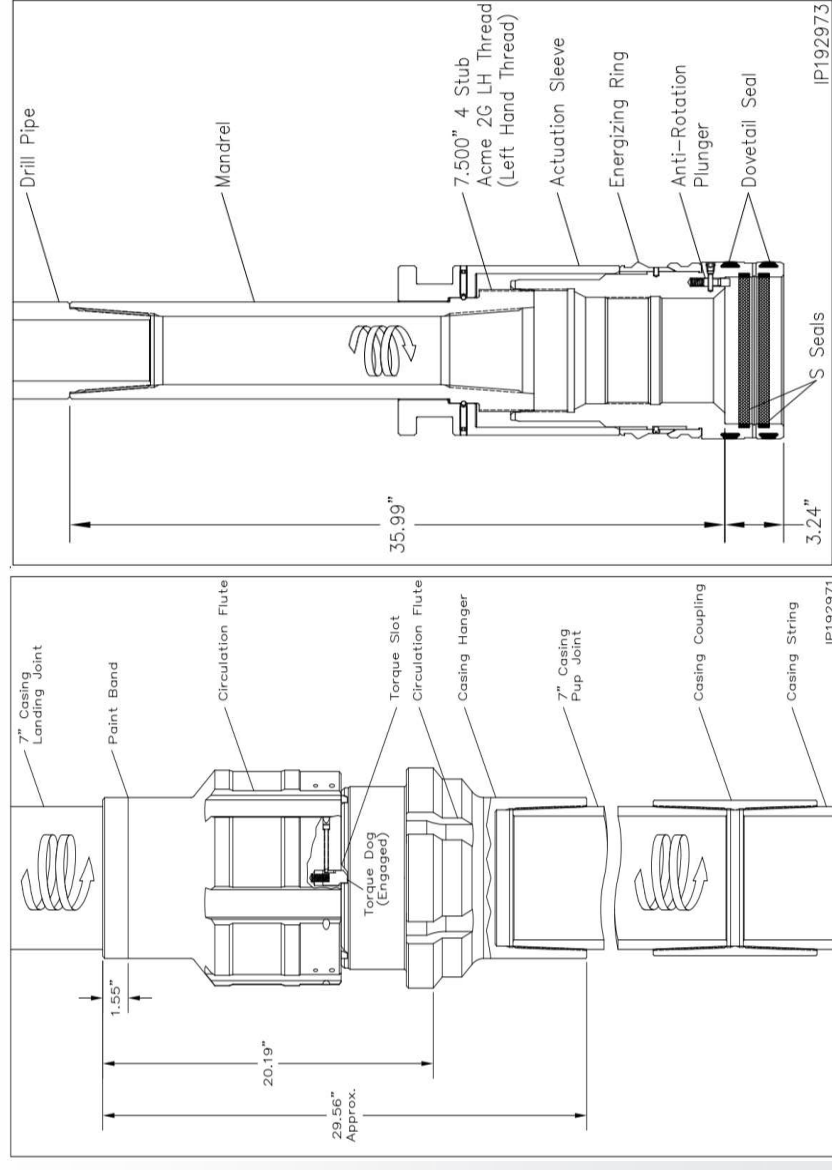


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SLIDE TITLE HERE | 2

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

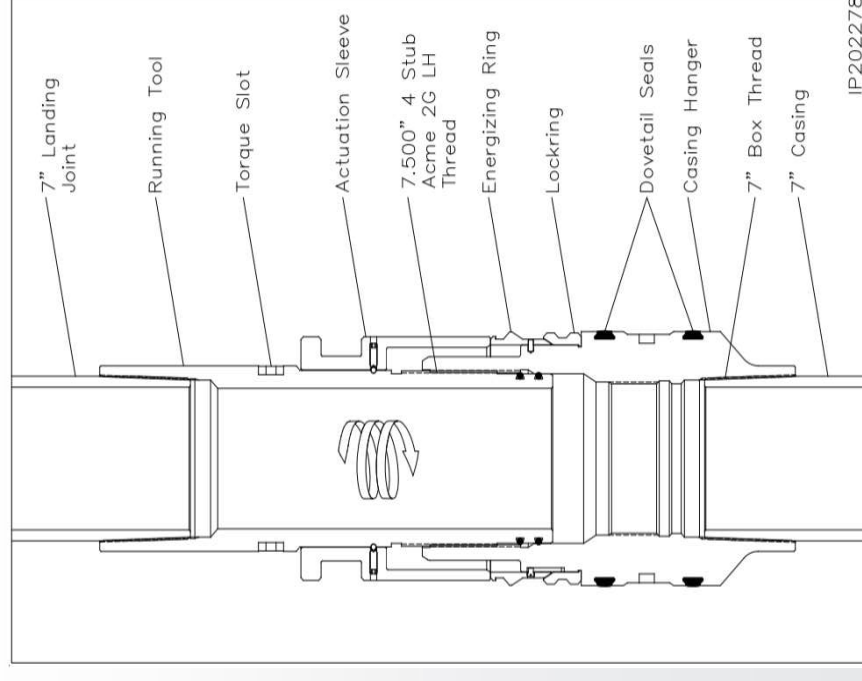


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Offline Cementing Equipment-Solid Body Mandrel Hanger

- 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



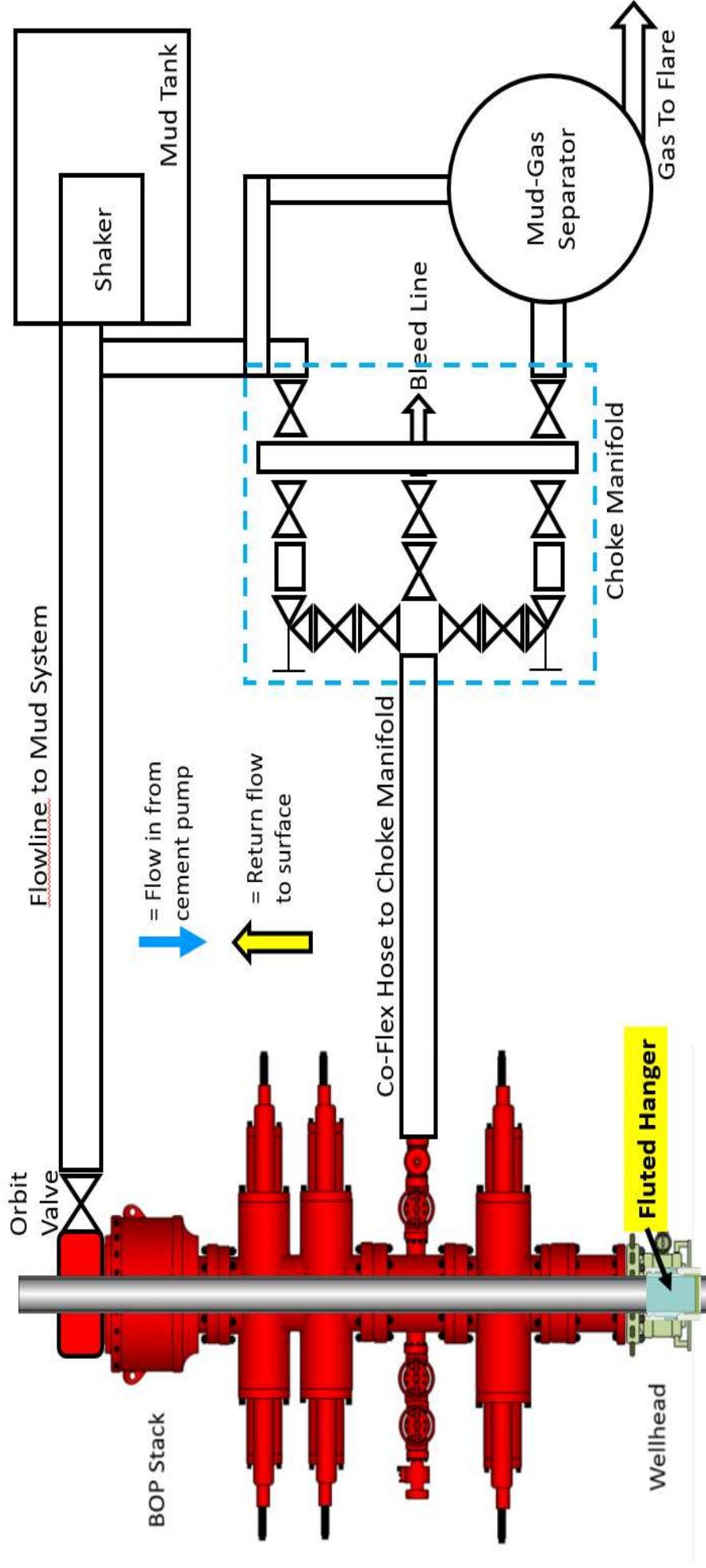
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Conventional Cementing Flow Diagram

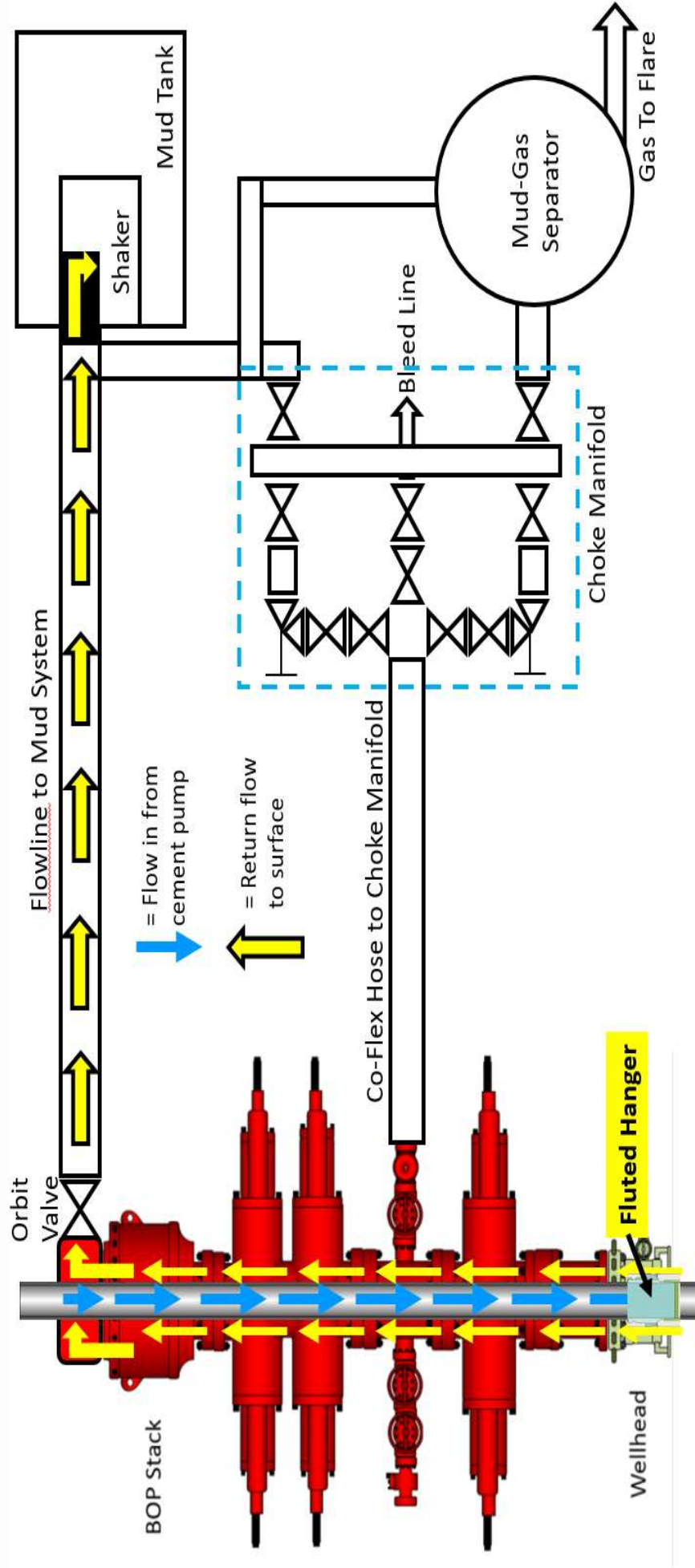


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Conventional Cementing Flow Diagram

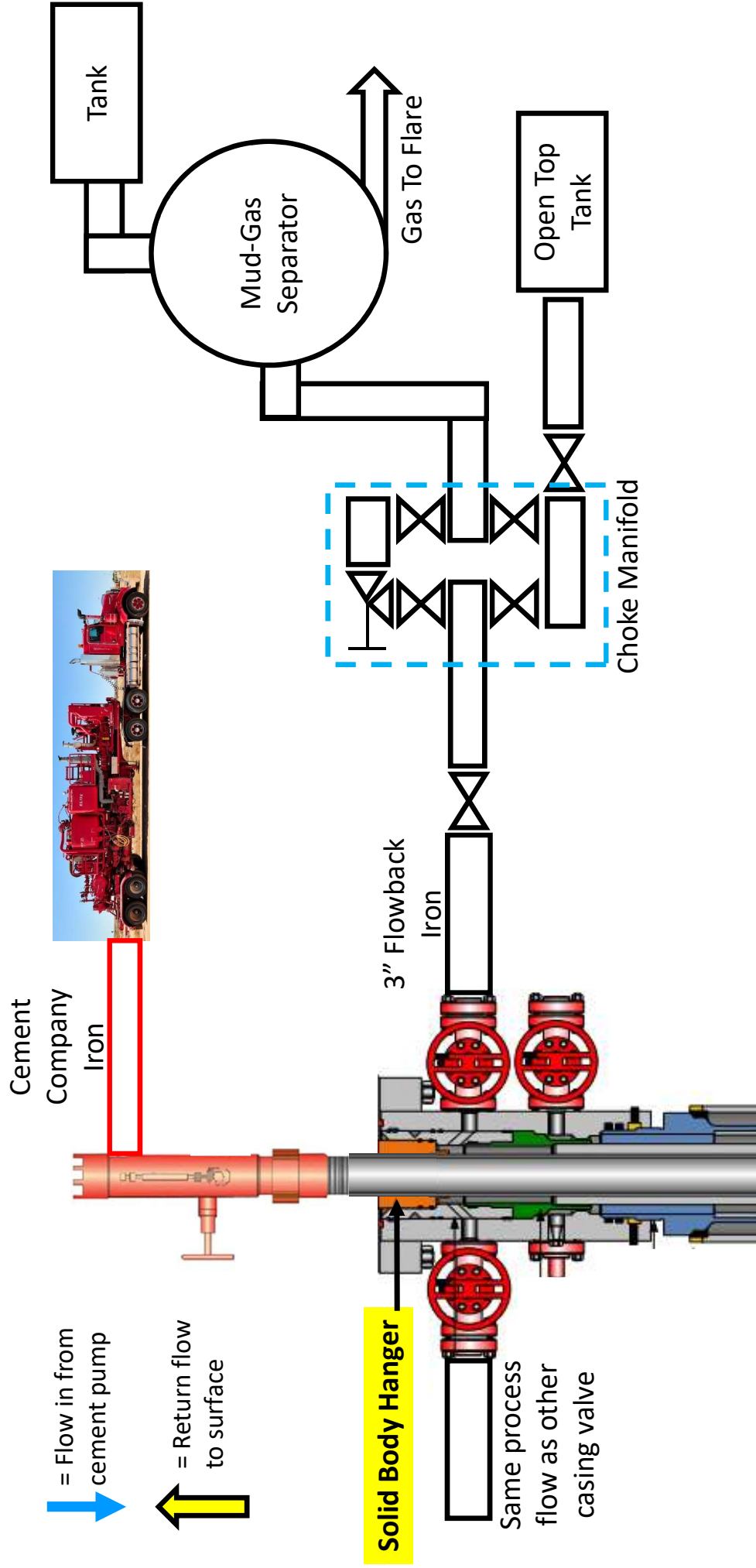


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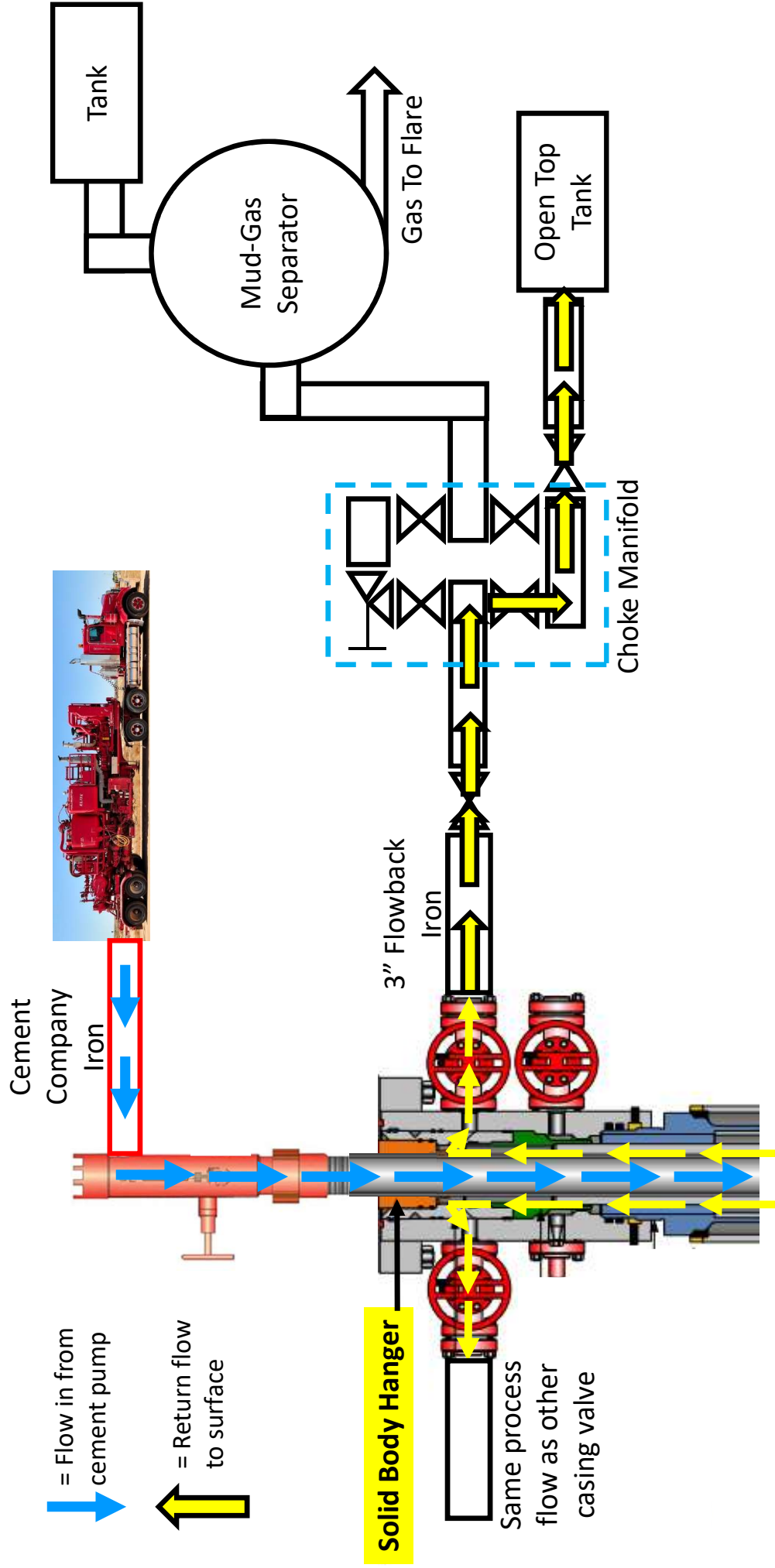


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Offline Cementing -- Intermediate Casing

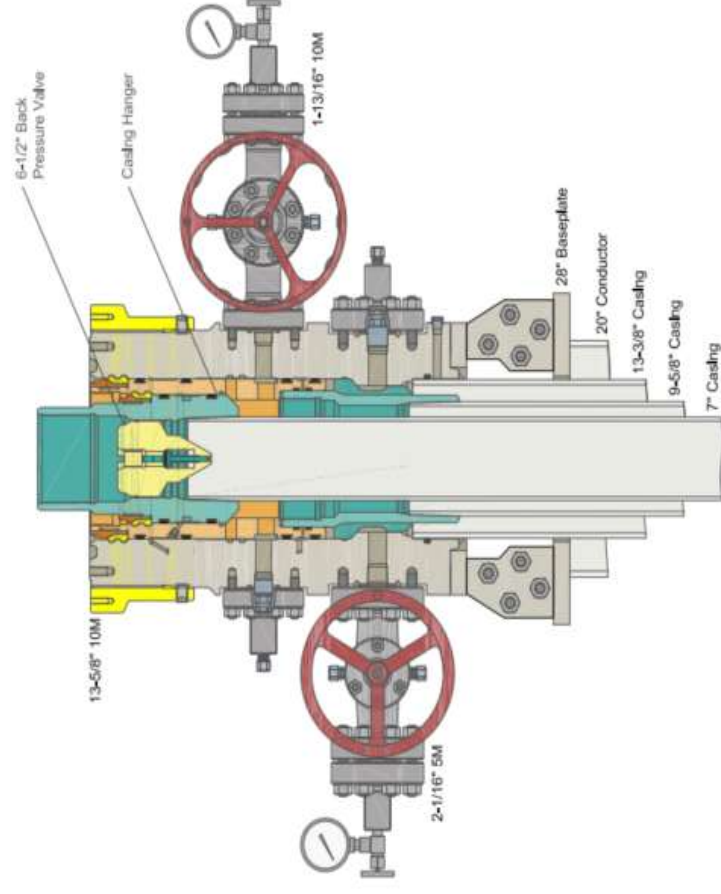


Offline Cementing -- Intermediate Casing



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

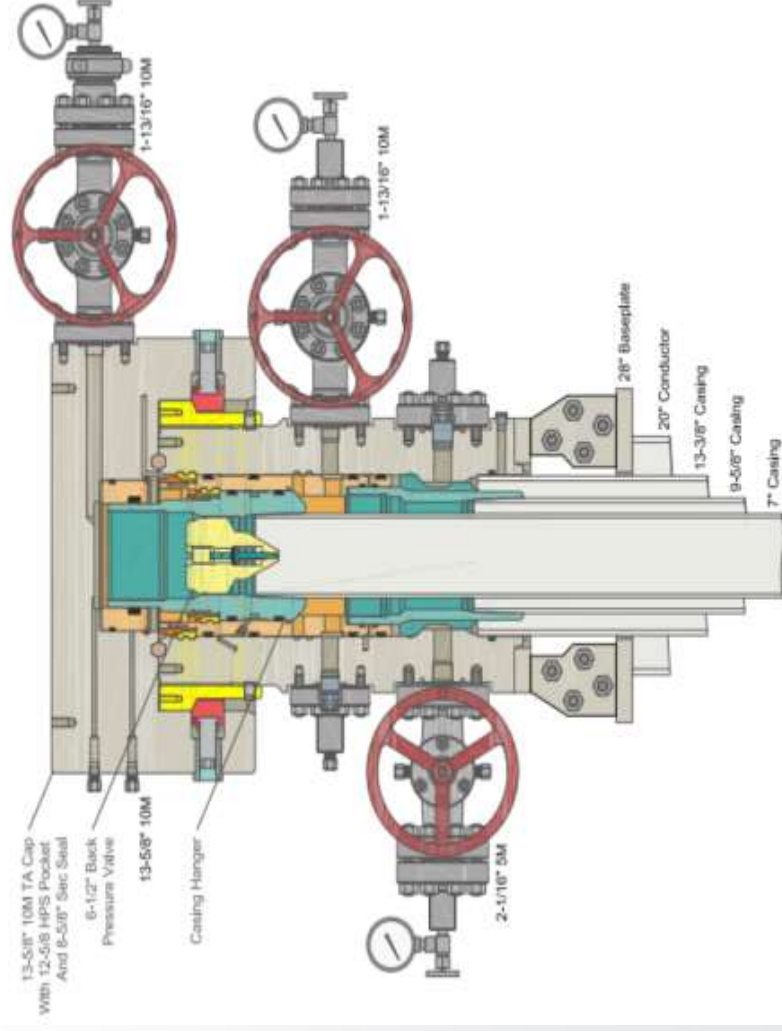


CIMAREX ENERGY CO. NYSE LISTED: XEC

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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

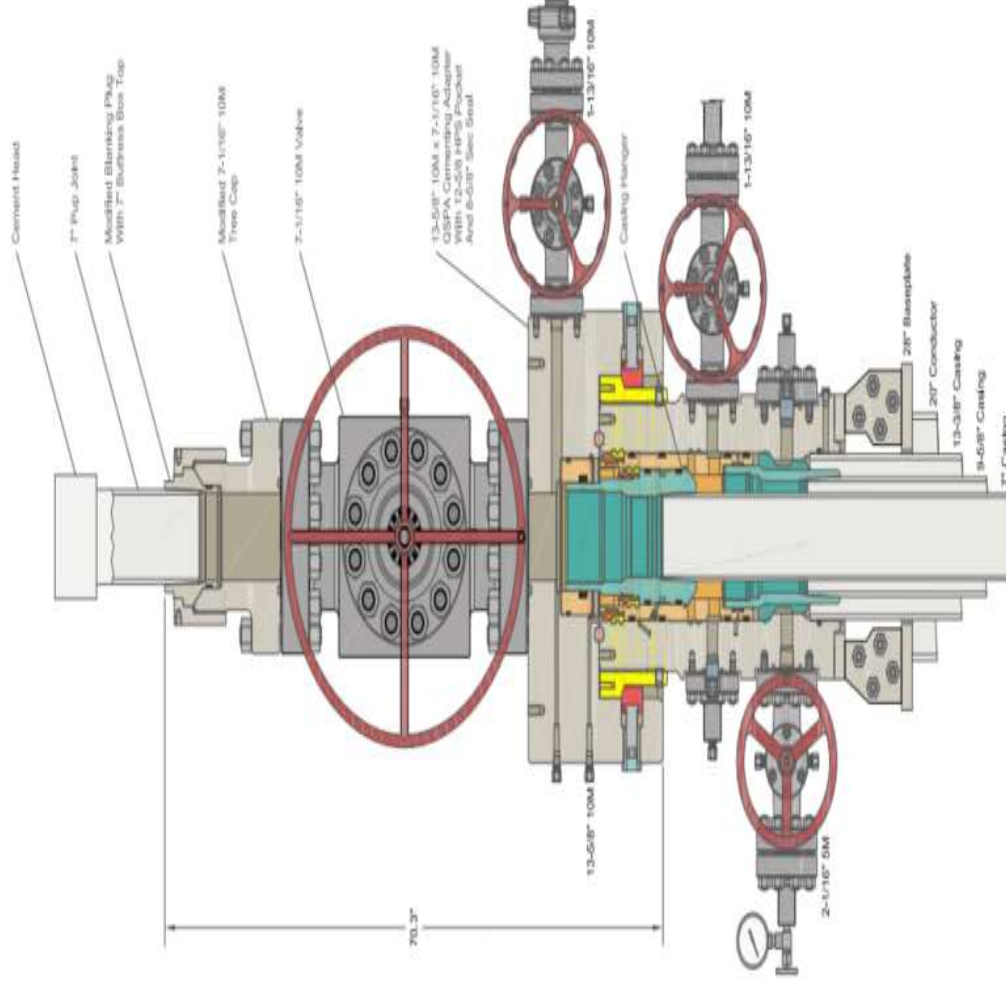


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SLIDE TITLE HERE | 11

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



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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



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Energy, Minerals and Natural Resources
Oil Conservation Division
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CONDITIONS

Action 19629

CONDITIONS OF APPROVAL

Operator: CIMAREX ENERGY CO. Suite 600 Midland, TX79701	600 N. Marienfeld Street	OGRID: 215099	Action Number: 19629	Action Type: C-103A
OCD Reviewer pkautz	Condition None			