APD ID: 10400017578 **Submission Date:** 08/02/2017

Operator Name: LEGACY RESERVES OPERATING LP

Well Name: LEA UNIT **Well Number:** 61H

Well Type: OIL WELL **Well Work Type:** Drill

Highlighted data reflects the most recent changes

Show Final Text

Section 1 - Geologic Formations

Formation ID	Formation Name	Elevation	True Vertical Depth	Measured Depth	Lithologies	Mineral Resources	Producing Formation
17697	---	3676	0	0	OTHER : Quaternary	USEABLE WATER	No
15330	RUSTLER ANHYDRITE	1994	1680	1680	ANHYDRITE	NONE	No
17718	TOP SALT	1954	1720	1720	SALT	NONE	No
17723	BOTTOM SALT	524	3150	3150	SALT	NONE	No
17740	CAPITAN REEF	524	3150	3150		USEABLE WATER	No
17740	CAPITAN REEF	-1036	4710	4710		USEABLE WATER	No
15314	SAN ANDRES	-1036	4710	4710	LIMESTONE	NATURAL GAS,OIL	No
17760	DELAWARE SAND	-1992	5666	5666	SANDSTONE	NATURAL GAS,OIL	No
17721	BONE SPRING LIME	-4531	8205	8205	LIMESTONE	NATURAL GAS,OIL	No
17769	AVALON SAND	-5086	8760	8760	SHALE	NATURAL GAS,OIL	No
15338	BONE SPRING 1ST	-5827	9501	9513		NATURAL GAS,OIL	No

Section 2 - Blowout Prevention

Pressure Rating (PSI): 5M **Rating Depth:** 11000

Equipment: Legacy Reserves plans to use a 13-5/8" 5000-psi working pressure BOP system consisting of a double ram BOP with one ram being pipe and one ram being blind, a 5000-psi annular type preventer, a 5000-psi choke manifold and 80 gallon accumulator with floor, five remote operating stations and an auxiliary power system. A rotating head will be utilized as needed. A drill string safety valve in the open position will be available on the rig floor. A mud gas separator will be available for use if needed. A 3M BOP will be used to drill from the surface casing shoe (~1800') to the intermediate casing shoe (~5600'). The BOP will be a 5M system, however the "A" section wellhead will be a 3M wellhead (see attached BOP Diagram). The BOP unit will be hydraulically operated. The BOP will be operated at least once per day while drilling and the blind rams will be operated when out of hole during trips. No abnormal pressure or temperature is expected while drilling.
Requesting Variance? YES

Variance request: Legacy Reserves requests a variance to use a co-flex hose. (See BOP attachment)

Operator Name: LEGACY RESERVES OPERATING LP

Well Name: LEA UNIT **Well Number:** 61H

Testing Procedure: The BOPs will be tested by an independent service company to 250 psi low and 5000 psi high.

Choke Diagram Attachment:

Lea_61H_Choke_08-02-2017.pdf

BOP Diagram Attachment:

Lea_61H_BOP_08-02-2017.pdf

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	Body SF
1	SURFACE	17.5	13.375	NEW	API	Y	0	1800	0	1800	3677		1800	J-55	54.5	STC	3.08	3.54	DRY	5.66	DRY	5.66
2	INTERMEDIATE	12.25	9.625	NEW	API	Y	0	3901	0	3901	3677		3901	J-55	40	LTC	1.24	1.82	DRY	3.12	DRY	3.12
3	INTERMEDIATE	12.25	9.625	NEW	API	Y	3901	5600	3901	5600			1699	HCK-55	40	LTC	1.28	2.03	DRY	3.33	DRY	3.33
4	PRODUCTION	8.75	5.5	NEW	API	Y	0	17510	0	9800	3677		17510	P-110	20	OTHER - BTC	1.55	1.29	DRY	3.06	DRY	3.06

Casing Attachments

Casing ID: 1 **String Type:** SURFACE

Inspection Document:

Spec Document:

Tapered String Spec:

Lea_61H_Casing_Design_Assumption_Surface_08-02-2017.docx

Casing Design Assumptions and Worksheet(s):

Lea_61H_Casing_Design_Assumption_Surface_08-02-2017.docx

Casing Attachments

Casing ID: 2 **String Type:** INTERMEDIATE

Inspection Document:

Spec Document:

Tapered String Spec:

Lea_61H_Intermediate_Cement_Specs_DVTools_08-02-2017.docx

Casing Design Assumptions and Worksheet(s):

Lea_61H_Casing_Design_Assumption_Intermediate_08-02-2017.docx

Casing ID: 3 **String Type:** INTERMEDIATE

Inspection Document:

Spec Document:

Tapered String Spec:

Lea_61H_Intermediate_Cement_Specs_DVTools_08-02-2017.docx

Casing Design Assumptions and Worksheet(s):

Lea_61H_Casing_Design_Assumption_Intermediate_08-02-2017.docx

Casing ID: 4 **String Type:** PRODUCTION

Inspection Document:

Spec Document:

Tapered String Spec:

Lea_61H_Casing_Design_Assumption_Production_08-02-2017.docx

Casing Design Assumptions and Worksheet(s):

Lea_61H_Casing_Design_Assumption_Production_08-02-2017.docx

Section 4 - Cement

Operator Name: LEGACY RESERVES OPERATING LP

Well Name: LEA UNIT **Well Number:** 61H

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
SURFACE	Lead		0	1800	1100	1.93	13.5	2123	75	Class C	4% bwoc bentonite II + 2% bwoc Calcium Chloride + 0.25 lbs/sack Cello Flake + 0.005% bwoc Static Free + 0.005 gps FP-6L
SURFACE	Tail		0	1800	200	1.34	14.8	268	75	Class	1.5% bwoc Calcium Chloride + 0.005 lbs/sack Static Free + 0.005 gps FP-6L
INTERMEDIATE	Lead		0	5600	1400	2.13	12.5	2982	80	Paz (fly ash) Class C	4% bwoc bentonite II + 5% bwoc MPA-5 + 0.25% bwoc FL- 52 + 5 lbs/sack LCM-1 +0.125 lbs/sk cello flake + 0.005 lbs/sk defoamer + 0.005 gpsFP-6L + 1.2% bwoc Sodium Metasilicate + 5% bwow Sodium Chloride
INTERMEDIATE	Tail		0	5600	200	1.33	14.8	266	80	Class C	none
INTERMEDIATE	Lead		3901	5600	1400	2.13	12.5	2982	80	Poz (fly ash) Clas	4% bwoc bentonite II + 5% bwoc MPA-5 + 0.25% bwoc FL- 52 + 5 lbs/sack LCM-1 +0.125 lbs/sk cello flake+ 0.005 lbs/sk defoamer + 0.005 gpsFP-6L + 1.2% bwoc Sodium Metasilicate + 5% bwow Sodium Chloride
INTERMEDIATE	Tail		3901	5600	200	1.33	14.8	266	80	Class C	none
PRODUCTION	Lead		0	17510	1600	2.38	11.9	3808	80	Poz (fly ash) Class H cement	10% bwoc bentonite II + 5% bwow sodium chloride + 5 pps LCM-1 + 0.005 lbs/sk Static Free + 0.005 gps FP-6L
PRODUCTION	Tail		0	17510	1700	1.62	13.2	2754	20	Poz (fly ash) Class H cement	CSE-2 + 4% bwow sodium chloride + 3 pps LCM- 1 + 0.6% bwoc FL-25 + 0.005 gps FP-6L + 0.005% bwoc Static Free

Operator Name: LEGACY RESERVES OPERATING LP

Well Name: LEA UNIT **Well Number:** 61H

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.

Describe the mud monitoring system utilized: A Pason PVT system will be rigged up prior to spudding this well. A volume monitoring system that measures, calculates, and displays readings from the mud system on the rig to alert the rig crew of impending gas kicks and lost circulation. In order to effectively run casing, the mud viscosity and fluid loss properties may be adjusted.

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
5600	9800	OTHER : Fresh water/brine	8.4	8.6							
1800	5600	OTHER : Brine water	9.8	10							
0	1800	SPUD MUD	8.4	8.9							
9800	17510	OTHER : Fresh water/brine	8.9	9.1							

Operator Name: LEGACY RESERVES OPERATING LP

Well Name: LEA UNIT **Well Number:** 61H

Section 6 - Test, Logging, Coring

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

Mud logging, H2S plan, BOP and choke plans all in place for testing, equipment, safety

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

MUDLOG

Coring operation description for the well:

No open hole logs, DST's or cores are planned.

Section 7 - Pressure

Anticipated Bottom Hole Pressure: 4312 **Anticipated Surface Pressure:** 2156

Anticipated Bottom Hole Temperature(F): 162

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

Describe:

Contingency Plans geoharzards description:

Contingency Plans geohazards attachment:

Hydrogen Sulfide drilling operations plan required? YES

Hydrogen sulfide drilling operations plan:

Lea_61H_H2S_Plan_08-02-2017.pdf

Section 8 - Other Information

Proposed horizontal/directional/multi-lateral plan submission:

Lea_61H_Horizontal_Dilling_Plan_08-02-2017.pdf

Other proposed operations facets description:

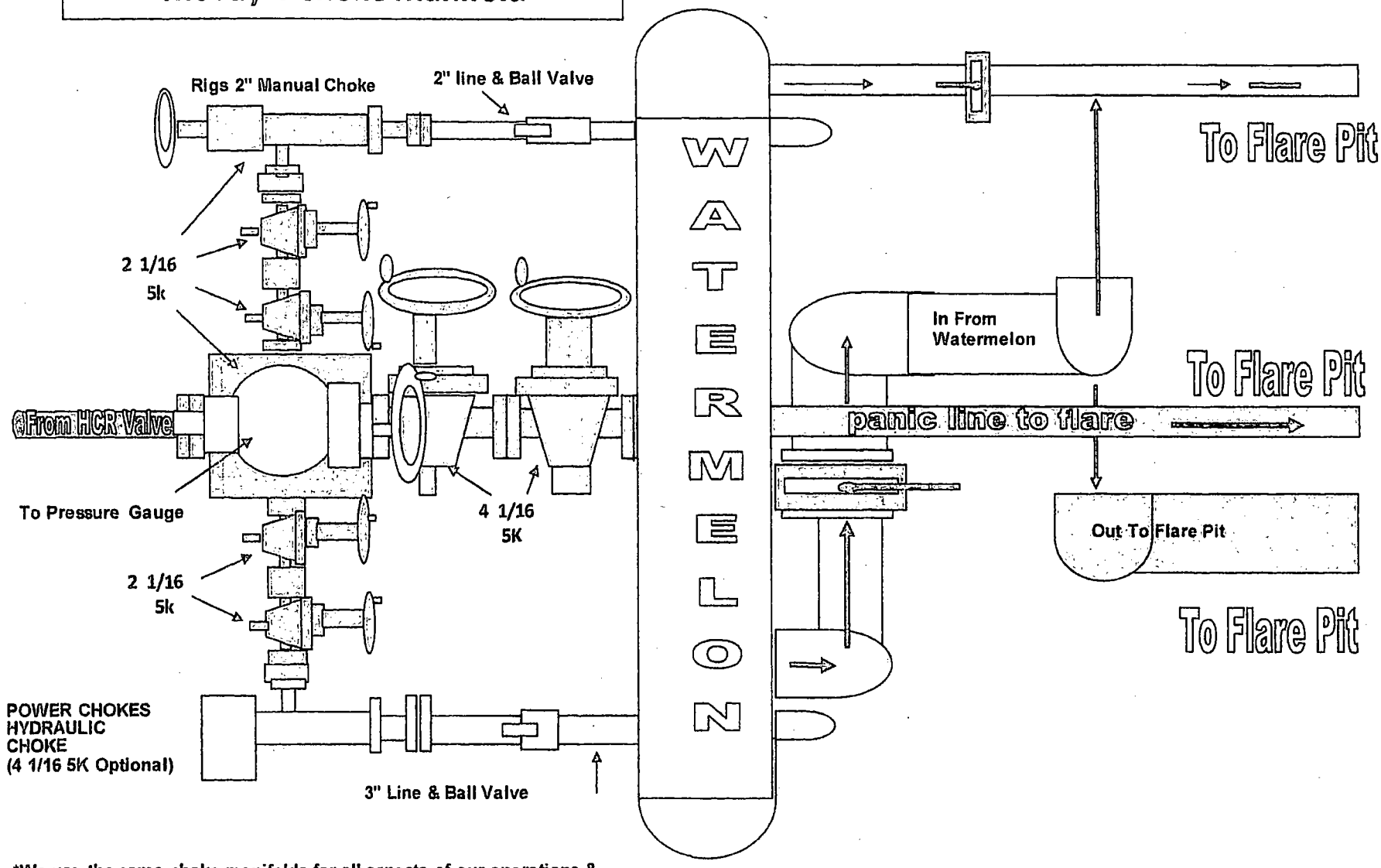
Legacy may use 1 or 2 DV tools in cementing the intermediate casing. See Other Facets attachment.

Other proposed operations facets attachment:

Lea_61H_Intermediate_Cement_Specs_DVTools_08-02-2017.docx

Other Variance attachment:

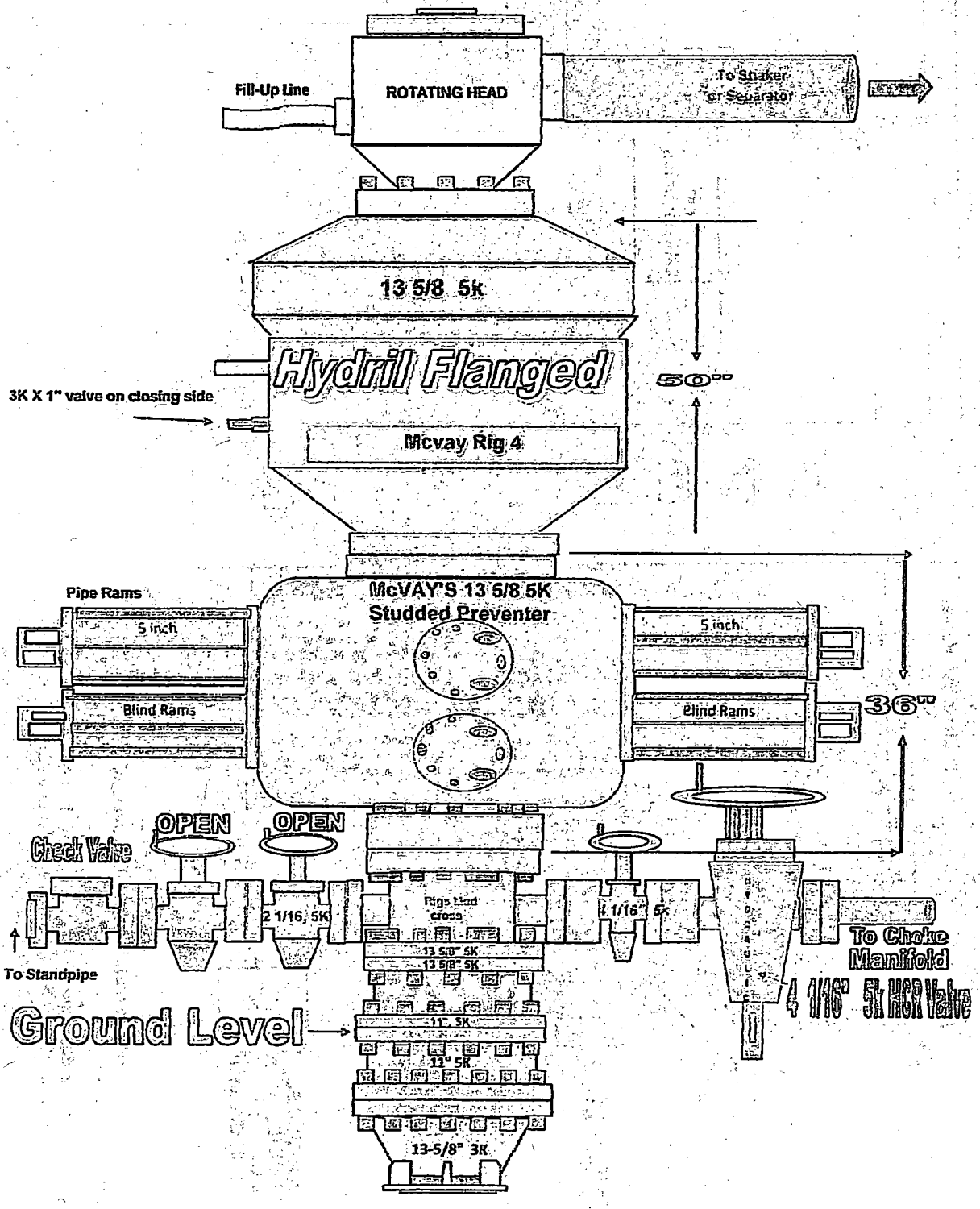
McVay 4 Choke Manifold



*We use the same choke manifolds for all aspects of our operations & all are rated to 10K;

* All connections downstream from BOP thru chokes Are Flanged, All connections downstream from chokes are Flanged .

McVay Rig 4


Fill-Up Line
ROTATING HEAD
To Shaker
er Separator
13 5/8 5k
Hydril Flanged
3K X 1" valve on closing side
Mcvay Rig 4
50"
Pipe Rams
5 inch
Blind Rams
McVAY'S 13 5/8 5K
Studded Preventer
5 inch
Blind Rams
36"
OPEN
OPEN
Check Valve
2 1/16, 5K
4 1/16" 5K
To Choke
Manifold
To Standpipe
Ground Level
11" 5K
11" 5K
13-5/8" 3K
4 1/16" 5K HCR Valve