

# **VERDAD RESOURCES**

**WATTENBERG FIELD**

**1N-65W-30 JOHNSON PAD**

**JOHNSON 1N-65W-30-1S**

**Wellbore #1**

**Design #1**

## **Anticollision Summary Report**

**05 February, 2018**

# Hewlett-Packard

## Anticollision Summary Report

<b>Company:</b>	VERDAD RESOURCES	<b>Local Co-ordinate Reference:</b>	Well JOHNSON 1N-65W-30-1S
<b>Project:</b>	WATTENBERG FIELD	<b>TVD Reference:</b>	RKB = 20' @ 5020.00usft (RIG)
<b>Reference Site:</b>	1N-65W-30 JOHNSON PAD	<b>MD Reference:</b>	RKB = 20' @ 5020.00usft (RIG)
<b>Site Error:</b>	0.00 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	JOHNSON 1N-65W-30-1S	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	3.28 usft	<b>Output errors are at</b>	2.45 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	EDM 5000.14 Single User Db
<b>Reference Design:</b>	Design #1	<b>Offset TVD Reference:</b>	Offset Datum

<b>Reference</b>	Design #1		
<b>Filter type:</b>	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
<b>Interpolation Method:</b>	MD Interval 100.00usft	<b>Error Model:</b>	ISCWSA
<b>Depth Range:</b>	Unlimited	<b>Scan Method:</b>	Closest Approach 3D
<b>Results Limited by:</b>	Maximum center-center distance of 5,000.00 usft	<b>Error Surface:</b>	Pedal Curve
<b>Warning Levels Evaluated at:</b>	2.45 Sigma	<b>Casing Method:</b>	Added to Error Values

<b>Survey Tool Program</b>	<b>Date</b>	2/5/2018		
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
0.00	1,700.00	Design #1 (Wellbore #1)	ISCWSA REV 2 MWD	Fixed:v2:standard declination
1,700.00	18,065.94	Design #1 (Wellbore #1)	ISCWSA REV 2 MWD	Fixed:v2:standard declination

<b>Summary</b>						
Site Name Offset Well - Wellbore - Design	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
<b>1N-65W-19 Offsets</b>						
APOLLO #1 - VESSELS P/A Well - No Surveys	17,206.79	7,365.00	4,157.76	3,672.59	8.570	CC
APOLLO #1 - VESSELS P/A Well - No Surveys	17,300.00	7,365.00	4,158.81	3,672.13	8.545	ES
APOLLO #1 - VESSELS P/A Well - No Surveys	17,600.00	7,365.00	4,176.31	3,685.56	8.510	SF
APOLLO #1A - VESSELS D/A Well - No Surveys	17,362.77	4,891.00	3,982.46	3,661.75	12.418	CC
APOLLO #1A - VESSELS D/A Well - No Surveys	17,400.00	4,891.00	3,982.64	3,661.46	12.400	ES
APOLLO #1A - VESSELS D/A Well - No Surveys	17,800.00	4,891.00	4,006.39	3,680.72	12.302	SF
DECHANT #1-19 - XOG PR Well - No Surveys	13,771.73	7,376.00	1,435.42	1,029.74	3.538	CC, ES
DECHANT #1-19 - XOG PR Well - No Surveys	13,800.00	7,376.00	1,435.70	1,029.92	3.538	SF
ELLS XX #19-4D - Kerr McGee SI Well - No Surveys	13,812.76	7,349.00	4,138.35	3,732.68	10.201	CC
ELLS XX #19-4D - Kerr McGee SI Well - No Surveys	13,900.00	7,349.00	4,139.27	3,732.17	10.168	ES
ELLS XX #19-4D - Kerr McGee SI Well - No Surveys	14,300.00	7,349.00	4,166.93	3,754.15	10.095	SF
<b>1N-65W-30 JOHNSON PAD</b>						
JOHNSON 01N-65W-30-10H - Wellbore #1 - Design #1	200.00	201.00	180.10	172.53	23.794	CC, ES
JOHNSON 01N-65W-30-10H - Wellbore #1 - Design #1	18,065.94	17,744.50	1,998.64	1,508.36	4.077	SF
JOHNSON 01N-65W-30-11H - Wellbore #1 - Design #1	200.00	201.00	199.98	192.42	26.422	CC, ES
JOHNSON 01N-65W-30-11H - Wellbore #1 - Design #1	18,065.94	17,768.13	2,354.75	1,864.42	4.802	SF
JOHNSON 01N-65W-30-2S - Wellbore #1 - Design #1	886.87	891.13	20.01	11.09	2.243	CC
JOHNSON 01N-65W-30-2S - Wellbore #1 - Design #1	18,065.94	17,901.64	175.01	-124.20	0.585	Level 1, ES, SF
JOHNSON 01N-65W-30-3H - Wellbore #1 - Design #1	200.00	200.00	40.05	32.48	5.292	CC
JOHNSON 01N-65W-30-3H - Wellbore #1 - Design #1	18,065.94	17,857.45	362.57	-89.25	0.802	Level 1, ES, SF
JOHNSON 01N-65W-30-4H - Wellbore #1 - Design #1	200.00	200.00	59.94	52.37	7.919	CC
JOHNSON 01N-65W-30-4H - Wellbore #1 - Design #1	300.00	300.95	59.96	52.31	7.837	ES
JOHNSON 01N-65W-30-4H - Wellbore #1 - Design #1	18,065.94	17,806.85	679.72	199.79	1.416	Level 3, SF
JOHNSON 01N-65W-30-5H - Wellbore #1 - Design #1	200.00	200.00	80.11	72.54	10.584	CC
JOHNSON 01N-65W-30-5H - Wellbore #1 - Design #1	300.00	301.20	80.15	72.50	10.476	ES
JOHNSON 01N-65W-30-5H - Wellbore #1 - Design #1	18,065.94	17,931.66	897.01	405.39	1.825	SF
JOHNSON 01N-65W-30-6H - Wellbore #1 - Design #1	200.00	200.00	99.99	92.42	13.211	CC, ES
JOHNSON 01N-65W-30-6H - Wellbore #1 - Design #1	18,065.94	17,826.61	1,006.24	519.42	2.067	SF
JOHNSON 01N-65W-30-7H - Wellbore #1 - Design #1	200.00	200.00	120.16	112.59	15.876	CC, ES
JOHNSON 01N-65W-30-7H - Wellbore #1 - Design #1	18,065.94	17,737.19	1,336.37	848.51	2.739	SF
JOHNSON 01N-65W-30-8N - Verdad PR Well - Actual BH	226.96	222.59	139.89	132.33	18.486	CC, ES
JOHNSON 01N-65W-30-8N - Verdad PR Well - Actual BH	12,500.00	11,877.00	2,124.13	1,898.95	9.433	SF
JOHNSON 01N-65W-30-9H - Wellbore #1 - Design #1	200.00	200.00	159.93	152.36	21.131	CC, ES
JOHNSON 01N-65W-30-9H - Wellbore #1 - Design #1	18,065.94	17,900.91	1,965.92	1,474.12	3.997	SF

# Hewlett-Packard

## Anticollision Summary Report

<b>Company:</b>	VERDAD RESOURCES	<b>Local Co-ordinate Reference:</b>	Well JOHNSON 1N-65W-30-1S
<b>Project:</b>	WATTENBERG FIELD	<b>TVD Reference:</b>	RKB = 20' @ 5020.00usft (RIG)
<b>Reference Site:</b>	1N-65W-30 JOHNSON PAD	<b>MD Reference:</b>	RKB = 20' @ 5020.00usft (RIG)
<b>Site Error:</b>	0.00 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	JOHNSON 1N-65W-30-1S	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	3.28 usft	<b>Output errors are at</b>	2.45 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	EDM 5000.14 Single User Db
<b>Reference Design:</b>	Design #1	<b>Offset TVD Reference:</b>	Offset Datum

Summary						
Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
1N-65W-30 Offsets						
GILMORE #1-30 - ARLIAN INC P/A Well - No Surveys	11,642.52	7,371.00	1,673.12	1,316.69	4.694	CC, ES
GILMORE #1-30 - ARLIAN INC P/A Well - No Surveys	11,700.00	7,371.00	1,674.11	1,317.31	4.692	SF
LEHL #1 - DEM P/A Well - No Surveys	9,145.14	7,387.00	853.01	551.12	2.826	CC, ES, SF
Lehl 30-7 - XOG Planned Well - Planned IPT Surveys	7,908.46	12,534.19	2,660.02	2,524.86	19.681	CC, ES
Lehl 30-7 - XOG Planned Well - Planned IPT Surveys	13,100.00	7,863.47	2,737.88	2,586.76	18.117	SF
1N-65W-31 Offsets						
Lochbuie 2A-31H - CPR Planned Well - Planned CPR We	7,180.41	7,099.15	56.17	14.11	1.336	Level 3, CC, ES
Lochbuie 2A-31H - CPR Planned Well - Planned CPR We	7,200.00	7,109.54	58.53	14.30	1.323	Level 3, SF
Lochbuie 2B-31H - CPR Planned Well - Planned CPR We	4,859.30	4,778.57	118.64	81.66	3.208	CC, ES, SF
Lochbuie 2C-31H - CPR Planned Well - Planned CPR W	3,961.59	3,895.91	221.74	191.89	7.428	CC
Lochbuie 2C-31H - CPR Planned Well - Planned CPR W	4,000.00	3,933.35	221.90	191.88	7.390	ES
Lochbuie 2C-31H - CPR Planned Well - Planned CPR W	4,100.00	4,030.83	223.88	193.48	7.365	SF
Lochbuie 2D-31H - CPR Planned Well - Planned CPR W	3,531.57	3,458.56	408.55	381.87	15.315	CC
Lochbuie 2D-31H - CPR Planned Well - Planned CPR W	3,600.00	3,525.24	408.84	381.63	15.024	ES
Lochbuie 2D-31H - CPR Planned Well - Planned CPR W	4,300.00	4,214.82	441.85	410.12	13.927	SF
Lochbuie 2E-31H - CPR Planned Well - Planned CPR We	2,826.66	2,787.76	354.28	331.95	15.866	CC, ES
Lochbuie 2E-31H - CPR Planned Well - Planned CPR We	3,100.00	3,047.33	364.49	340.41	15.136	SF
Lochbuie 2F-31H - CPR Planned Well - Planned CPR We	2,481.84	2,453.94	398.47	377.88	19.352	CC
Lochbuie 2F-31H - CPR Planned Well - Planned CPR We	2,500.00	2,470.83	398.53	377.80	19.222	ES
Lochbuie 2F-31H - CPR Planned Well - Planned CPR We	2,800.00	2,749.69	415.39	392.67	18.287	SF
Lochbuie 2G-31H - CPR Planned Well - Planned CPR W	2,204.29	2,187.64	417.20	397.56	21.237	CC, ES
Lochbuie 2G-31H - CPR Planned Well - Planned CPR W	2,500.00	2,458.23	433.92	412.26	20.031	SF
Lochbuie 2H-31H - CPR Planned Well - Planned CPR W	2,065.57	2,053.19	435.56	416.53	22.890	CC
Lochbuie 2H-31H - CPR Planned Well - Planned CPR W	2,100.00	2,083.98	435.83	416.52	22.571	ES
Lochbuie 2H-31H - CPR Planned Well - Planned CPR W	2,300.00	2,262.83	448.02	427.27	21.589	SF
1N-66W-13 Offsets						
AZUL 13-24HZ - Kerr McGee Planned Well - Planned AP	13,233.17	13,115.59	241.73	37.30	1.182	Level 2, CC, ES, SF

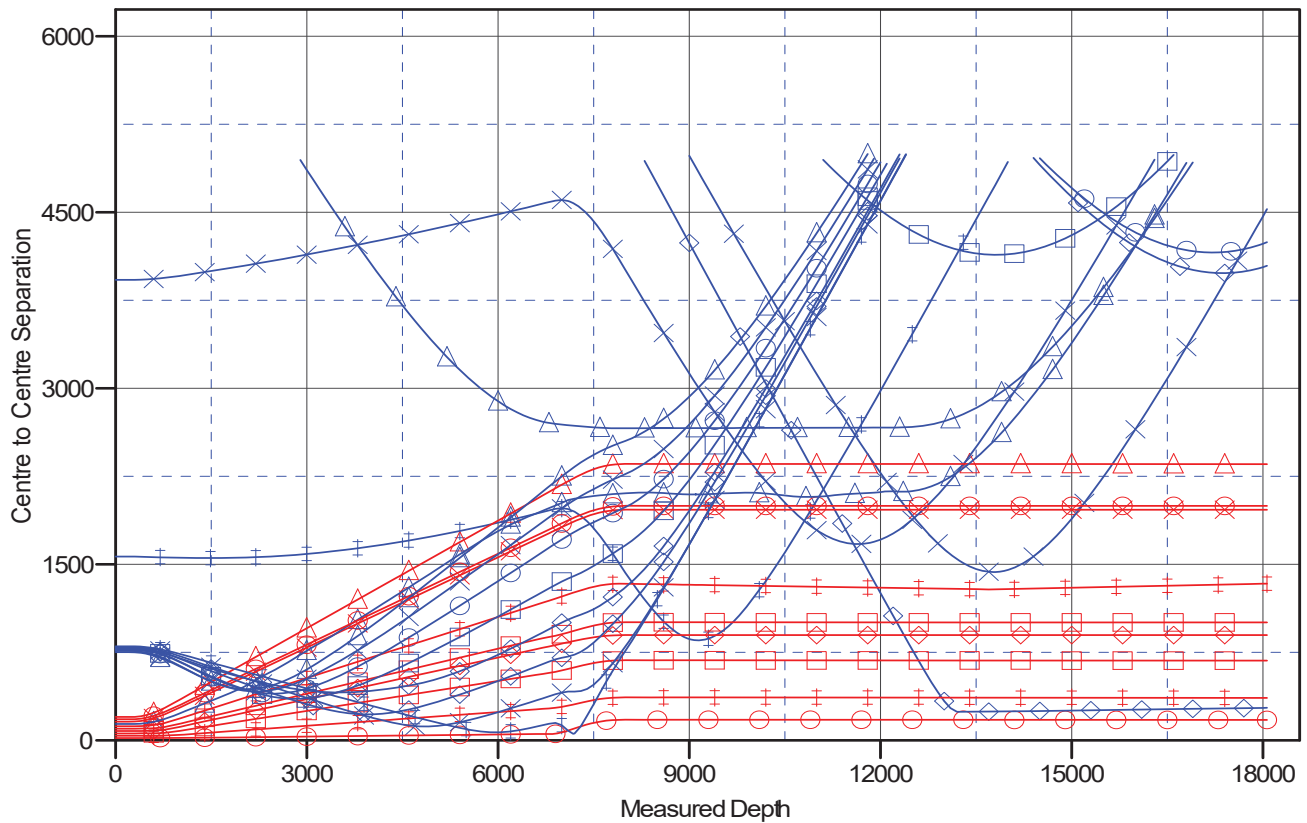
**Hewlett-Packard**  
Anticollision Summary Report

<b>Company:</b>	VERDAD RESOURCES	<b>Local Co-ordinate Reference:</b>	Well JOHNSON 1N-65W-30-1S
<b>Project:</b>	WATTENBERG FIELD	<b>TVD Reference:</b>	RKB = 20' @ 5020.00usft (RIG)
<b>Reference Site:</b>	1N-65W-30 JOHNSON PAD	<b>MD Reference:</b>	RKB = 20' @ 5020.00usft (RIG)
<b>Site Error:</b>	0.00 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	JOHNSON 1N-65W-30-1S	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	3.28 usft	<b>Output errors are at</b>	2.45 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	EDM 5000.14 Single User Db
<b>Reference Design:</b>	Design #1	<b>Offset TVD Reference:</b>	Offset Datum

Reference Depths are relative to RKB = 20' @ 5020.00usft (RIG)  
Offset Depths are relative to Offset Datum  
Central Meridian is -105.500000

Coordinates are relative to: JOHNSON 1N-65W-30-1S  
Coordinate System is US State Plane 1983, Colorado Northern Zone  
Grid Convergence at Surface is: 0.51°

## Ladder Plot



### LEGEND

AZUL 1324H2, Kerr McGee Planned Well, Planned APC Survey V0  
Lehi307, XOG Planned Well, Planned PT Survey V0  
GLMORE#1-30, ARJANNCPA Well, No Survey V0  
LEHL #1 DEM PIA Well, No Survey V0  
ELLSX0819-4D, Kerr McGee SW Well, No Survey V0  
DECHW#1-19, XOG PR Well, No Survey V0  
APOLLO #1A, VESSEL SDA Well, No Survey V0  
JOHNSON1N65W-30-11H Wellbore #1, Design #1 V0

JOHNSON1N65W-30-7H Wellbore #1, Design #1 V0  
JOHNSON1N65W-30-6H Wellbore #1, Design #1 V0  
JOHNSON1N65W-30-8N, Verdard PR Well, Actual BHS Survey V0  
JOHNSON1N65W-30-10H Wellbore #1, Design #1 V0  
JOHNSON1N65W-30-5H Wellbore #1, Design #1 V0  
JOHNSON1N65W-30-3H Wellbore #1, Design #1 V0  
JOHNSON1N65W-30-4H Wellbore #1, Design #1 V0  
JOHNSON1N65W-30-2S Wellbore #1, Design #1 V0

Lochbue2D-31H, CRR Planned Well, Planned CRR Well, Not Actual Survey V0  
Lochbue2E-31H, CRR Planned Well, Planned CRR Well, Not Actual Survey V0  
Lochbue2G-31H, CRR Planned Well, Planned CRR Well, Not Actual Survey V0  
Lochbue2F-31H, CRR Planned Well, Planned CRR Well, Not Actual Survey V0  
Lochbue2H-31H, CRR Planned Well, Planned CRR Well, Not Actual Survey V0  
Lochbue2C-31H, CRR Planned Well, Planned CRR Well, Not Actual Survey V0  
Lochbue2B-31H, CRR Planned Well, Planned CRR Well, Not Actual Survey V0  
Lochbue2A-31H, CRR Planned Well, Planned CRR Well, Not Actual Survey V0

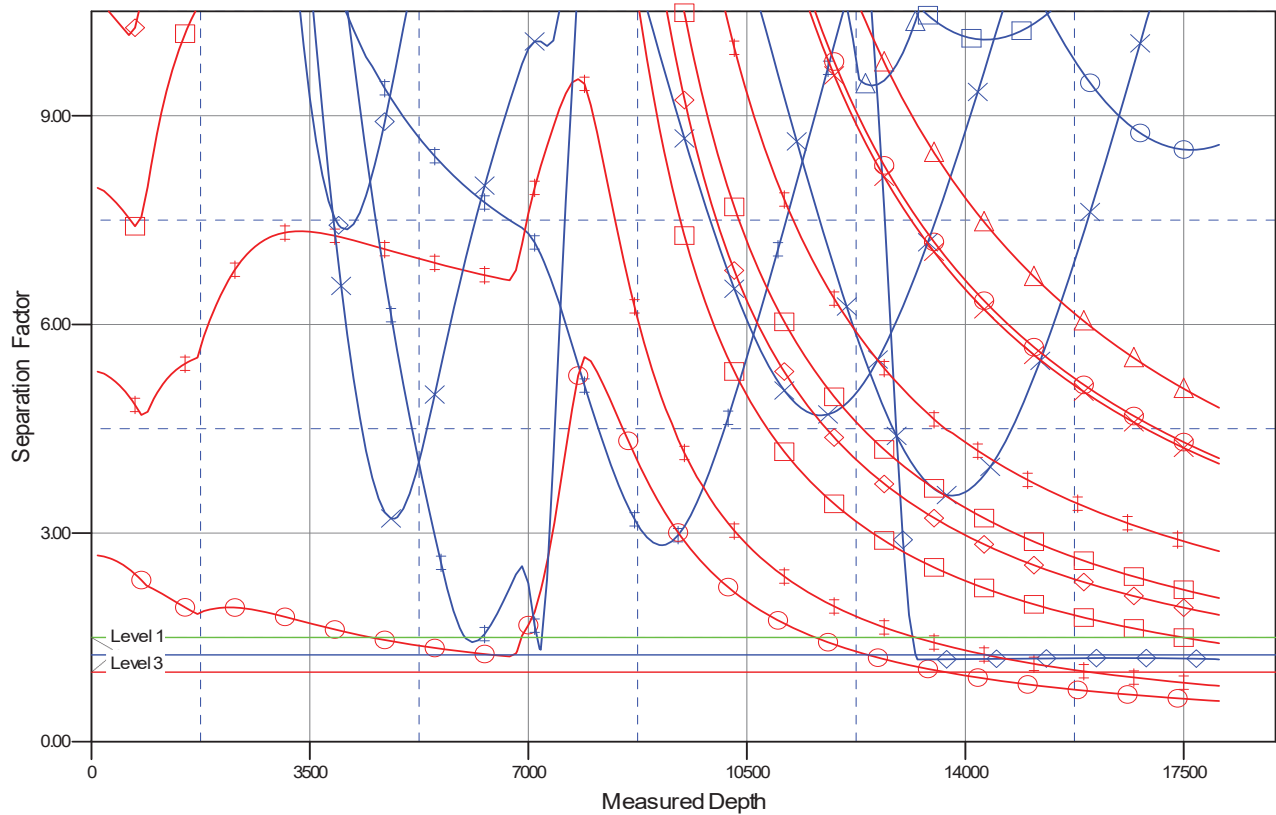
**Hewlett-Packard**  
Anticollision Summary Report

<b>Company:</b>	VERDAD RESOURCES	<b>Local Co-ordinate Reference:</b>	Well JOHNSON 1N-65W-30-1S
<b>Project:</b>	WATTENBERG FIELD	<b>TVD Reference:</b>	RKB = 20' @ 5020.00usft (RIG)
<b>Reference Site:</b>	1N-65W-30 JOHNSON PAD	<b>MD Reference:</b>	RKB = 20' @ 5020.00usft (RIG)
<b>Site Error:</b>	0.00 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	JOHNSON 1N-65W-30-1S	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	3.28 usft	<b>Output errors are at</b>	2.45 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	EDM 5000.14 Single User Db
<b>Reference Design:</b>	Design #1	<b>Offset TVD Reference:</b>	Offset Datum

Reference Depths are relative to RKB = 20' @ 5020.00usft (RIG)  
Offset Depths are relative to Offset Datum  
Central Meridian is -105.500000

Coordinates are relative to: JOHNSON 1N-65W-30-1S  
Coordinate System is US State Plane 1983, Colorado Northern Zone  
Grid Convergence at Surface is: 0.51°

## Separation Factor Plot



### LEGEND

AZLL 1324H-Z, Kerr McGee Planned Well, Planned APC Survey V0  
Lehl 307, XOG Planned Well, Planned PT Survey V0  
GLMORE#1-30, ARL INNCPA Well, No Surveys V0  
LEHL #1, DEM PIA Well, No Surveys V0  
ELLSX0919-4D, Kerr McGee SW Well, No Surveys V0  
DECHW191-19, XOG PR Well, No Surveys V0  
APOLLO #1A, VESSEL SDA Well, No Surveys V0  
APOLLO #1A, VESSEL SDA Well, No Surveys V0  
JOHNSON1N65W-30-11H Wellbore #1, Design #1 V0

JOHNSON1N65W-30-7H Wellbore #1, Design #1 V0  
JOHNSON1N65W-30-6H Wellbore #1, Design #1 V0  
JOHNSON1N65W-30-6H Wellbore #1, Design #1 V0  
JOHNSON1N65W-30-8N, Verdad PR Well, Actual BHS Survey V0  
JOHNSON1N65W-30-10H Wellbore #1, Design #1 V0  
JOHNSON1N65W-30-5H Wellbore #1, Design #1 V0  
JOHNSON1N65W-30-3H Wellbore #1, Design #1 V0  
JOHNSON1N65W-30-4H Wellbore #1, Design #1 V0  
JOHNSON1N65W-30-2S Wellbore #1, Design #1 V0

Lochbue2D-31H, CRR Planned Well, Planned CRR Well, Not Actual Survey V0  
Lochbue2E-31H, CRR Planned Well, Planned CRR Well, Not Actual Survey V0  
Lochbue2G-31H, CRR Planned Well, Planned CRR Well, Not Actual Survey V0  
Lochbue2F-31H, CRR Planned Well, Planned CRR Well, Not Actual Survey V0  
Lochbue2H-31H, CRR Planned Well, Planned CRR Well, Not Actual Survey V0  
Lochbue2C-31H, CRR Planned Well, Planned CRR Well, Not Actual Survey V0  
Lochbue2B-31H, CRR Planned Well, Planned CRR Well, Not Actual Survey V0  
Lochbue2A-31H, CRR Planned Well, Planned CRR Well, Not Actual Survey V0