



Directional Survey Certification

2948 I-70 Business Loop
Grand Junction, CO 81504
(970)-245-9447 Fax (970)-245-9454

Operator	TEP Rocky Mountain, LLC.
Well Name & No.	SR 423-12
County & State	Garfield County, CO
SDI Job No.	OP.005952
Rig	H&P 318

I, Mel Mireles Jr., having personal knowledge of all the facts, hereby certify that the attached directional survey run from a measured depth of 122 feet to a measured depth of 9,484 feet is true and correct as determined from all available records.

A handwritten signature in black ink, appearing to read 'Mel Mireles Jr.', written over a horizontal line.

Signature

15-Dec-17

Date

Mel Mireles Jr.

Grand Junction Assistant Well Planner
Scientific Drilling - Colorado District

Company:	TEP Rocky Mountain LLC	Local Co-ordinate Reference:	Well SR 423-12 - Slot SR 423-12 (A4)
Project:	Garfield County, CO NAD83	TVD Reference:	WELL @ 7478.00usft (Original Well Elev)
Site:	SR 23-12 Pad	MD Reference:	WELL @ 7478.00usft (Original Well Elev)
Well:	SR 423-12	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Grand Junction District

Project	Garfield County, CO NAD83		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Central Zone		

Site		SR 23-12 Pad				
Site Position:		Northing:	1,597,713.40	usft	Latitude:	39.4511965
From:	Map	Easting:	2,340,229.70	usft	Longitude:	-107.8367194
Position Uncertainty:		0.00	usft	Slot Radius:	13.20	in
					Grid Convergence:	-1.47 °

Well		SR 423-12 - Slot SR 423-12 (A4)				
Well Position	+N/-S	0.00 usft	Northing:	1,597,692.40 usft	Latitude:	39.4511395
	+E/-W	0.00 usft	Easting:	2,340,237.90 usft	Longitude:	-107.8366885
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	7,478.00 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	11/18/2017	9.22	65.65	51,646

Design	OH				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	284.73	

Survey Program	Date	12/14/2017			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
122.00	1,045.00	Survey #1 - Gyro MWD Survey (OH)	SDI Gyro MWD 104	SDI Gyro MWD Error Model Ver 1.0.4	
659.00	1,045.00	Survey #2 - Surface MWD Survey (OH)	SDI MWD	SDI MWD - Standard ver 1.0.1	
1,182.00	9,484.00	Survey #3 - Production MWD Survey (OH)	SDI MWD	SDI MWD - Standard ver 1.0.1	

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
122.00	0.26	164.44	122.00	-0.27	0.07	-0.14	0.21	0.21	0.00	
First SDI Gyro MWD Survey										
214.00	2.20	292.50	213.98	0.21	-1.50	1.50	2.58	2.11	139.20	
307.00	4.22	293.12	306.83	2.23	-6.30	6.66	2.17	2.17	0.67	
399.00	6.07	285.38	398.45	4.85	-14.10	14.87	2.14	2.01	-8.41	
492.00	6.33	279.93	490.91	7.04	-23.89	24.90	0.69	0.28	-5.86	
584.00	6.77	280.55	582.31	8.91	-34.22	35.36	0.48	0.48	0.67	

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Well:	SR 423-12	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Grand Junction District

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
Last SDI Gyro MWD Survey									
659.00	7.22	283.05	656.75	10.78	-43.16	44.48	0.72	0.60	3.33
First SDI Surface MWD Survey									
754.00	7.70	282.77	750.95	13.54	-55.18	56.81	0.51	0.51	-0.29
849.00	8.01	285.26	845.06	16.69	-67.77	69.79	0.48	0.33	2.62
943.00	8.60	288.14	938.07	20.60	-80.77	83.35	0.77	0.63	3.06
1,045.00	8.88	290.91	1,038.89	25.78	-95.37	98.79	0.50	0.27	2.72
Last SDI Surface MWD Survey									
1,182.00	9.74	290.75	1,174.08	33.66	-116.09	120.83	0.63	0.63	-0.12
First SDI Production MWD Survey									
1,276.00	9.57	291.52	1,266.75	39.35	-130.79	136.50	0.23	-0.18	0.82
1,371.00	8.61	286.40	1,360.56	44.25	-144.96	151.45	1.32	-1.01	-5.39
1,465.00	8.72	286.43	1,453.48	48.25	-158.54	165.60	0.12	0.12	0.03
1,559.00	8.68	287.38	1,546.40	52.39	-172.15	179.81	0.16	-0.04	1.01
1,654.00	8.07	282.15	1,640.39	55.93	-185.51	193.63	1.03	-0.64	-5.51
1,749.00	8.01	281.78	1,734.46	58.69	-198.51	206.90	0.08	-0.06	-0.39
1,843.00	7.82	283.39	1,827.56	61.51	-211.14	219.84	0.31	-0.20	1.71
1,938.00	7.91	283.79	1,921.67	64.56	-223.77	232.84	0.11	0.09	0.42
2,032.00	7.97	285.25	2,014.77	67.82	-236.34	245.82	0.22	0.06	1.55
2,126.00	7.91	284.32	2,107.86	71.13	-248.90	258.80	0.15	-0.06	-0.99
2,221.00	7.91	283.26	2,201.96	74.25	-261.59	271.87	0.15	0.00	-1.12
2,315.00	7.88	285.88	2,295.07	77.49	-274.09	284.78	0.38	-0.03	2.79
2,409.00	7.91	286.78	2,388.18	81.12	-286.48	297.69	0.14	0.03	0.96
2,504.00	7.21	284.23	2,482.35	84.48	-298.52	310.18	0.82	-0.74	-2.68
2,598.00	7.12	287.66	2,575.62	87.69	-309.78	321.90	0.47	-0.10	3.65
2,693.00	6.77	284.49	2,669.92	90.88	-320.82	333.38	0.55	-0.37	-3.34
2,787.00	6.60	288.01	2,763.28	93.94	-331.32	344.31	0.47	-0.18	3.74
2,882.00	6.35	287.73	2,857.68	97.22	-341.51	355.01	0.27	-0.26	-0.29
2,977.00	6.16	289.15	2,952.11	100.50	-351.33	365.34	0.26	-0.20	1.49
3,071.00	5.90	288.79	3,045.59	103.71	-360.67	375.19	0.28	-0.28	-0.38
3,165.00	5.67	289.34	3,139.11	106.80	-369.63	384.63	0.25	-0.24	0.59
3,260.00	5.68	290.10	3,233.65	109.97	-378.47	393.99	0.08	0.01	0.80
3,354.00	5.39	283.66	3,327.21	112.61	-387.13	403.04	0.73	-0.31	-6.85
3,448.00	4.97	284.73	3,420.83	114.69	-395.36	411.52	0.46	-0.45	1.14
3,543.00	4.66	285.28	3,515.49	116.75	-403.06	419.50	0.33	-0.33	0.58
3,637.00	4.40	284.93	3,609.20	118.69	-410.23	426.92	0.28	-0.28	-0.37
3,732.00	4.52	286.70	3,703.91	120.70	-417.33	434.31	0.19	0.13	1.86
3,826.00	4.34	286.53	3,797.63	122.78	-424.29	441.56	0.19	-0.19	-0.18
3,921.00	4.22	285.64	3,892.36	124.74	-431.10	448.65	0.14	-0.13	-0.94
4,015.00	4.22	284.93	3,986.11	126.57	-437.77	455.57	0.06	0.00	-0.76
4,109.00	4.28	288.76	4,079.85	128.59	-444.44	462.52	0.31	0.06	4.07
4,204.00	5.53	277.08	4,174.50	130.29	-452.34	470.60	1.68	1.32	-12.29
4,298.00	5.72	277.20	4,268.05	131.44	-461.48	479.73	0.20	0.20	0.13
4,393.00	5.23	275.37	4,362.62	132.44	-470.49	488.70	0.55	-0.52	-1.93

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Well:	SR 423-12	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Grand Junction District

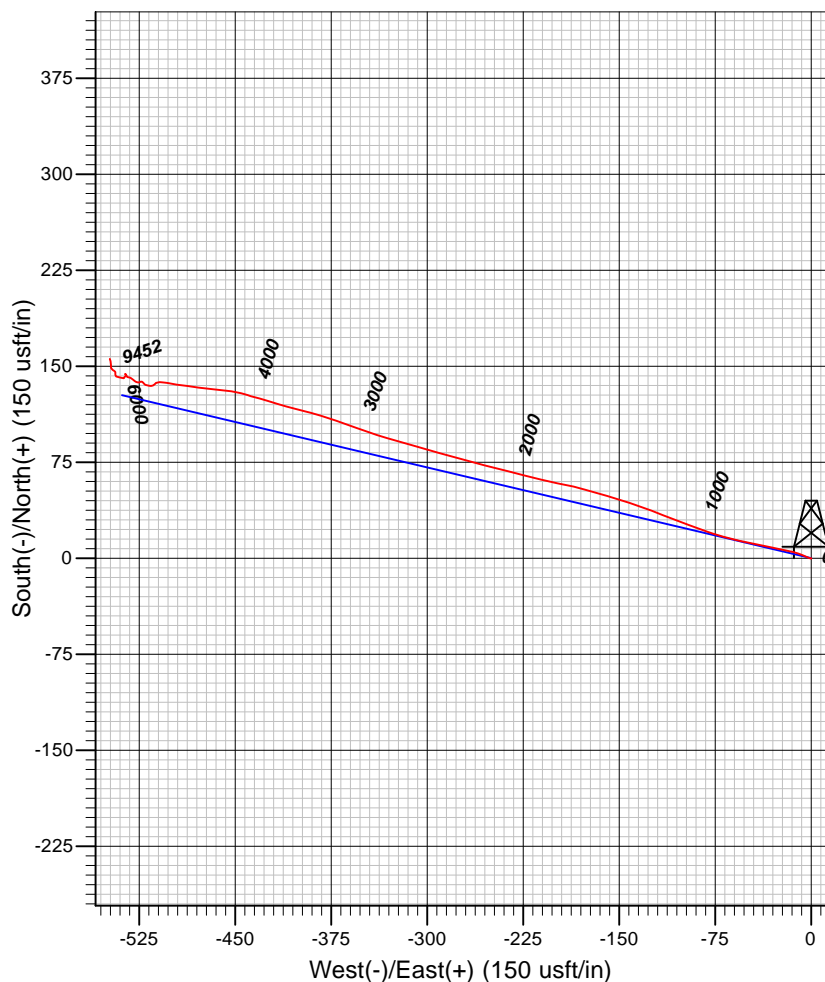
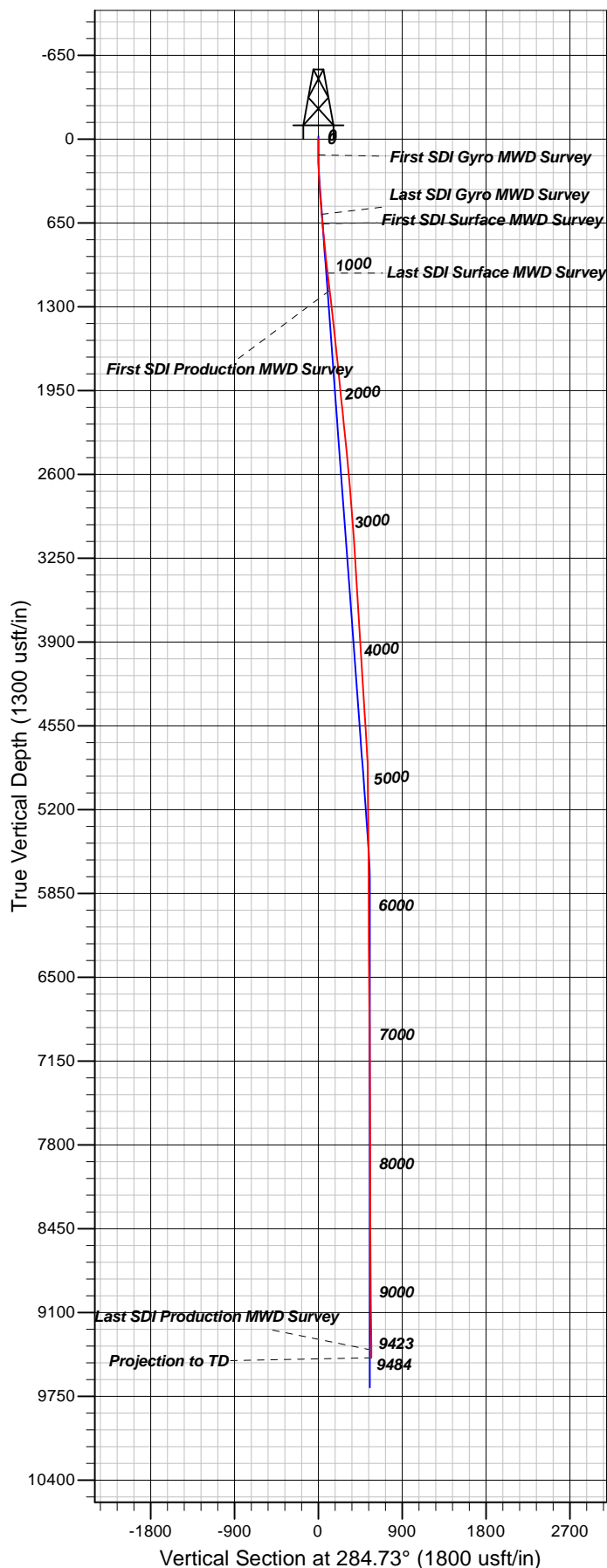
Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,487.00	5.10	277.68	4,456.24	133.39	-478.89	497.07	0.26	-0.14	2.46
4,582.00	5.27	277.58	4,550.85	134.53	-487.40	505.59	0.18	0.18	-0.11
4,676.00	4.84	277.64	4,644.48	135.63	-495.61	513.81	0.46	-0.46	0.06
4,771.00	4.34	281.34	4,739.18	136.87	-503.11	521.37	0.61	-0.53	3.89
4,865.00	2.77	268.68	4,832.99	137.52	-508.87	527.11	1.86	-1.67	-13.47
4,959.00	1.03	227.90	4,926.94	136.90	-511.76	529.75	2.23	-1.85	-43.38
5,054.00	0.89	230.04	5,021.93	135.85	-512.96	530.65	0.15	-0.15	2.25
5,149.00	0.94	238.53	5,116.92	134.97	-514.19	531.61	0.15	0.05	8.94
5,244.00	0.87	267.57	5,211.90	134.53	-515.58	532.84	0.48	-0.07	30.57
5,339.00	0.88	288.79	5,306.89	134.74	-516.99	534.26	0.34	0.01	22.34
5,434.00	1.11	278.78	5,401.88	135.11	-518.59	535.90	0.30	0.24	-10.54
5,529.00	0.76	286.83	5,496.87	135.44	-520.10	537.45	0.39	-0.37	8.47
5,624.00	0.77	325.36	5,591.86	136.15	-521.07	538.56	0.53	0.01	40.56
5,719.00	0.91	314.92	5,686.85	137.20	-521.97	539.70	0.22	0.15	-10.99
5,813.00	0.26	295.66	5,780.84	137.82	-522.69	540.55	0.71	-0.69	-20.49
5,860.20	0.22	287.88	5,828.05	137.90	-522.87	540.75	0.11	-0.08	-16.48
SR 423-12 BTV									
5,907.00	0.19	277.30	5,874.84	137.93	-523.03	540.92	0.11	-0.07	-22.61
6,002.00	0.17	265.63	5,969.84	137.94	-523.33	541.20	0.04	-0.02	-12.28
6,096.00	0.37	246.56	6,063.84	137.81	-523.75	541.57	0.23	0.21	-20.29
6,190.00	0.38	262.81	6,157.84	137.65	-524.33	542.10	0.11	0.01	17.29
6,285.00	0.50	246.59	6,252.84	137.45	-525.03	542.72	0.18	0.13	-17.07
6,379.00	0.62	278.69	6,346.83	137.36	-525.91	543.55	0.35	0.13	34.15
6,473.00	0.62	281.33	6,440.83	137.54	-526.91	544.56	0.03	0.00	2.81
6,568.00	0.62	302.90	6,535.82	137.92	-527.84	545.56	0.24	0.00	22.71
6,662.00	0.70	312.53	6,629.82	138.58	-528.69	546.56	0.15	0.09	10.24
6,757.00	0.70	307.17	6,724.81	139.33	-529.58	547.61	0.07	0.00	-5.64
6,851.00	0.79	314.38	6,818.80	140.13	-530.50	548.70	0.14	0.10	7.67
6,946.00	1.14	292.14	6,913.79	140.94	-531.85	550.21	0.53	0.37	-23.41
7,040.00	0.62	266.83	7,007.78	141.27	-533.22	551.62	0.68	-0.55	-26.93
7,135.00	0.72	307.72	7,102.77	141.60	-534.21	552.66	0.50	0.11	43.04
7,229.00	0.79	338.02	7,196.76	142.56	-534.92	553.59	0.43	0.07	32.23
7,323.00	0.70	314.99	7,290.75	143.57	-535.57	554.47	0.33	-0.10	-24.50
7,418.00	0.28	129.38	7,385.75	143.83	-535.80	554.76	1.03	-0.44	183.57
7,512.00	0.26	158.46	7,479.75	143.49	-535.54	554.42	0.15	-0.02	30.94
7,606.00	0.18	106.16	7,573.75	143.25	-535.32	554.15	0.22	-0.09	-55.64
7,701.00	0.35	195.81	7,668.75	142.93	-535.26	554.01	0.41	0.18	94.37
7,795.00	0.29	228.22	7,762.75	142.50	-535.51	554.14	0.20	-0.06	34.48
7,889.00	0.38	222.63	7,856.75	142.11	-535.90	554.42	0.10	0.10	-5.95
7,983.00	0.37	217.68	7,950.75	141.64	-536.30	554.69	0.04	-0.01	-5.27
8,078.00	0.20	224.06	8,045.74	141.28	-536.60	554.89	0.18	-0.18	6.72
8,172.00	0.35	189.04	8,139.74	140.87	-536.76	554.94	0.23	0.16	-37.26
8,267.00	0.27	266.70	8,234.74	140.58	-537.03	555.12	0.41	-0.08	81.75
8,361.00	0.59	282.61	8,328.74	140.67	-537.72	555.82	0.36	0.34	16.93

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Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Grand Junction District

Survey									
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8,456.00	0.88	288.54	8,423.73	141.01	-538.89	557.03	0.32	0.31	6.24
8,550.00	0.95	276.56	8,517.72	141.33	-540.35	558.52	0.22	0.07	-12.74
8,644.00	1.06	278.25	8,611.70	141.54	-541.98	560.16	0.12	0.12	1.80
8,739.00	0.66	325.72	8,706.70	142.12	-543.16	561.45	0.82	-0.42	49.97
8,833.00	0.81	351.00	8,800.69	143.22	-543.57	562.12	0.38	0.16	26.89
8,928.00	1.14	6.41	8,895.67	144.82	-543.57	562.53	0.44	0.35	16.22
9,022.00	1.23	298.03	8,989.66	146.23	-544.36	563.65	1.42	0.10	-72.74
9,117.00	1.35	308.99	9,084.63	147.41	-546.13	565.66	0.29	0.13	11.54
9,211.00	1.20	2.78	9,178.61	149.09	-546.94	566.87	1.24	-0.16	57.22
9,305.00	1.49	357.62	9,272.59	151.29	-546.94	567.44	0.33	0.31	-5.49
9,400.00	1.32	344.87	9,367.56	153.58	-547.28	568.34	0.37	-0.18	-13.42
9,423.00	1.49	342.06	9,390.55	154.12	-547.44	568.64	0.80	0.74	-12.22
Last SDI Production MWD Survey									
9,484.00	1.49	342.06	9,451.53	155.63	-547.93	569.49	0.00	0.00	0.00
Projection to TD - SR 423-12 PBHL									

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
122.00	122.00	-0.27	0.07	First SDI Gyro MWD Survey
584.00	582.31	8.91	-34.22	Last SDI Gyro MWD Survey
659.00	656.75	10.78	-43.16	First SDI Surface MWD Survey
1,045.00	1,038.89	25.78	-95.37	Last SDI Surface MWD Survey
1,182.00	1,174.08	33.66	-116.09	First SDI Production MWD Survey
9,423.00	9,390.55	154.12	-547.44	Last SDI Production MWD Survey
9,484.00	9,451.53	155.63	-547.93	Projection to TD

Checked By: _____ Approved By: _____ Date: _____



Well Details: SR 423-12

TVD Reference: WELL @ 7478.00usft (Original Well Elev) Level: 7478.00
 +N/-S +E/-W Northing Easting Latitude Longitude Slot
 0.00 0.00 1597692.40 2340237.90 39.4511394 -107.8366884SR 423-12 (A4)

REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well SR 423-12 - Slot SR 423-12 (A4), True North
 Vertical (TVD) Reference: WELL @ 7478.00usft (Original Well Elev)
 Section (VS) Reference: Slot - SR 423-12 (A4)(0.00N, 0.00E)
 Measured Depth Reference: WELL @ 7478.00usft (Original Well Elev)
 Calculation Method: Minimum Curvature

PROJECT DETAILS: Garfield County, CO NAD83

Geodetic System: US State Plane 1983
 Datum: North American Datum 1983
 Ellipsoid: GRS 1980
 Zone: Colorado Central Zone

System Datum: Mean Sea Level

Plan: OH

18:14, December 14 2017
 Created By: Mel Mireles Jr.