

# Pipeline Inspection Report



**T.D. Williamson**  
Pipeline Performance™

Company Name

**Hiland Crude, LLC**

Project Name

**East Camp Creek to Camp Creek**

Pipe Size

**8"**

Inspection Date(s)

**Sep 16, 2013**

Report Date(s)

**Nov 22, 2013**

TDW Regional Office

**TDW Services, Inc.**





# Executive Summary - GMFL Inspection

## RUN INFORMATION

Hiland Crude, LLC  
 Heber Briceno

East Camp Creek to Camp Creek  
 8" Crude

	Launcher	Receiver
<b>Location:</b>	East Camp Creek	Camp Creek
<b>Date/Time:</b>	9/16/2013 1:12:15 PM	9/16/2013 5:14:58 PM
<b>Stationing:</b>	0+00	692+70
<b>GPS - LAT:</b>	47.91828864	47.92106029
<b>GPS - LONG:</b>	-103.3468885	-103.563172
<b>Duration of run - Hours:</b>	4.05	<b>Average Velocity:</b> 4.80 ft/sec
<b>Pipeline Length:</b>	69,893.00 ft	<b>Maximum Velocity:</b> 6.24 ft/sec
<b>On-site Representative:</b>	Eric Johnson	<b>Data Analyst:</b> Ben Stehling
<b>Contact:</b>	Heber Briceno	<b>Tool Tracking By:</b> TDW Pipeline Services

## INSPECTION FINDINGS

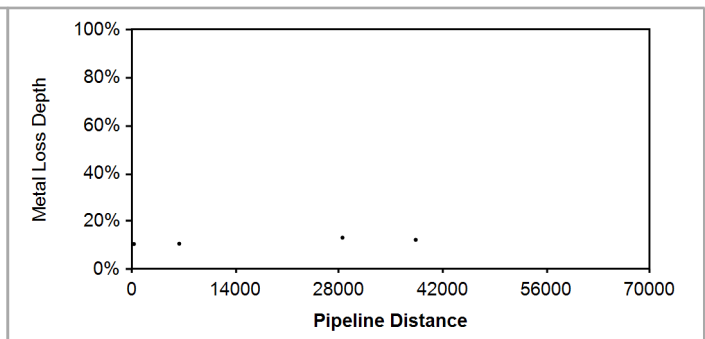
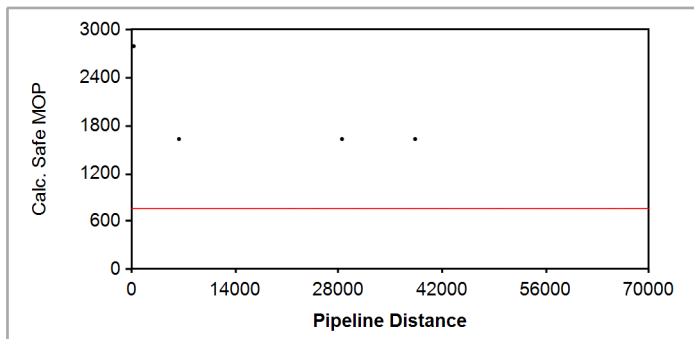
**Current Established Maximum**

**Criteria Used:** ASME B31G: Modified

**Operating Pressure of Pipeline:** 750 psi

**Defect Interaction Rule:** 1 inch between pits

<b>Welds Detected:</b> 1,585	<b>Valves Detected:</b> 8	<b>Fittings Detected:</b> 2	<b>Markers Detected:</b> 11	<b>Gains Detected:</b> 0
<b>Casings Detected:</b> 0	<b>Tees Detected:</b> 11	<b>Flanges Detected:</b> 17	<b>Repairs Detected:</b> 0	<b>Deformations Detected:</b> 1
<b>P' &lt; P*:</b> 0	<b>M/L pits:</b> 4	<b>M/L grouping:</b> 4		
<b>Internal groups:</b> 0	<b>External groups:</b> 4			



\* The number of anomalies where P' (calculated safe max. pressure for an anomaly) is less than P (current established maximum pressure of pipeline) - see ASME B31G

## INSPECTION DETAILS

A total of 4 metal loss groups (0 Internal/4 External) were detected on the inspection survey, of which the deepest is reported at 13%. Using an established maximum operating pressure of 750 psi, 0 of the metal loss features appear to be pressure reducing.

Inspection data was obtained for the full length (69,893 feet / 13.24 miles) of the survey. The quality of the inspection data is satisfactory for a comprehensive assessment of this pipeline segment.

The inspection tool for this project included TDW XYZ Mapping module consisting of a high resolution Inertial Measurement Unit (IMU). The precision navigation data recorded by the IMU along with survey data supplied for specified control points and AGM locations provides a calculation of X, Y and Z coordinates for all objects and features listed in this report. The reported Latitude and Longitude are in NAD83 datum format. Z coordinates are Orthometric heights reported in feet. The final accuracy of reported coordinates is dependent upon the accuracy of the survey points and distance between these points, as well as uniform tool speed; however, the Survey Data Provided for AGM/Control Points for this run is not at the required Sub-Centimeter accuracy level as specified in the document: XYZ Survey Data Requirements (D1902 Rev D).



# Executive Summary - Deformation

## RUN INFORMATION

Hiland Crude, LLC  
 Heber Briceno

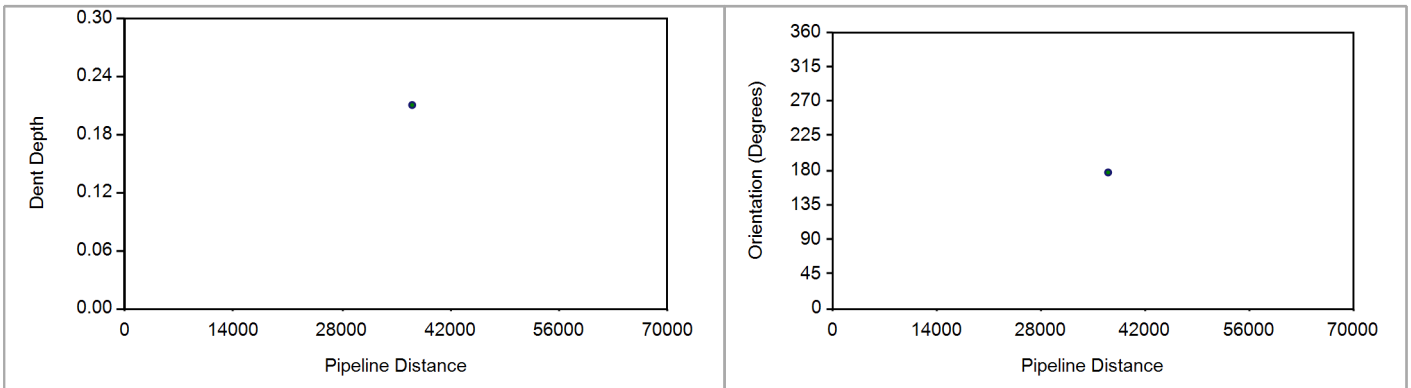
East Camp Creek to Camp Creek  
 8" Crude

	Launcher	Receiver
<b>Location:</b>	East Camp Creek	Camp Creek
<b>Date/Time:</b>	9/15/2013 7:04:38 PM	9/15/2013 10:46:50 PM
<b>Stationing:</b>	0+00	692+70
<b>GPS - LAT:</b>	47.91828864	47.92106029
<b>GPS - LONG:</b>	-103.3468885	-103.563172

**Duration of run - Hours:** 3.7      **Average Velocity:** 5.21 ft/sec      **Tool Tracking By:** TDW Pipeline Services  
**Pipeline Length:** 69,478.00 ft      **Maximum Velocity:** 6.52 ft/sec  
**On-site Representative:** Eric Johnson      **Data Analyst:** Ben Stehling

## INSPECTION FINDINGS

**Deformations Detected:** 1      **Ovalities Detected:** 0      **Expansions Detected:** 0      **Heavy Weld Detected:** 0      **Valves Detected:** 8



## INSPECTION DETAILS

Inspection data was obtained for the full length (69,478 feet / 13.16 miles) of the survey. The quality of the inspection data is satisfactory for a comprehensive assessment of this pipeline segment.

A total of 1 deformation (1 dent) was detected on the inspection survey which is reported at 0.21 inch.



# Metal Loss - Immediate Prioritized Repairs

ID#	Distance (ft)	Depth	Length	Width	Orientation	PSI (P')	% of Est. psi (P'/P)	Latitude	Longitude	Altitude
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Nothing found in this pipeline inspection meets the criteria for Immediate Repair conditions relating to METAL LOSS.

Metal Loss - Immediate Prioritized Repairs



## Metal Loss - 180 Day Prioritized Repairs

ID#	Distance (ft)	Depth	Length	Width	Orientation	PSI (P')	% of Est. psi (P'/P)	Latitude	Longitude	Altitude
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Nothing in the inspection meets the criteria for 180 Day Repair conditions relating to METAL LOSS.

Metal Loss - 180 Day Prioritized Repairs



## Dent - Immediate Prioritized Repairs

ID#	Distance (ft)	Depth (in)	Depth (%)	Orientation	Metal Loss	On a Weld	Ovality	Description
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Nothing found in the pipeline inspection meets the criteria for Immediate Repair conditions relating to DENTS.

Dent - Immediate Prioritized Repairs



## Dent - 60 Day Prioritized Repairs

ID#	Distance (ft)	Depth (in)	Depth (%)	Orientation	Metal Loss	On a Weld	Ovality	Description
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Nothing in the inspection meets of the criteria for 60 Day Repair conditions relating to DENTS.

Dent - 60 Day Prioritized Repairs



## Dent - 180 Day Prioritized Repairs

ID#	Distance (ft)	Depth (in)	Depth (%)	Orientation	Metal Loss	On a Weld	Ovality	Description
-----	---------------	------------	-----------	-------------	------------	-----------	---------	-------------

Nothing in the inspection meets of the criteria for 180 Day Repair conditions relating to DENTS.

Dent - 180 Day Prioritized Repairs



# Metal Loss Summary

## DEFINITIONS

This Metal Loss Summary Report provides information regarding indicated anomalies found in this inspection. Anomalies detected during the inspection are sized and assigned a length, width, and depth. The specified formula for determining remaining-strength of the anomaly is then applied to the predicted sizes. The predicted size accuracy is described in the contract specifications.

The Metal Loss Summary Report is a listing of metal loss indications in the pipeline, sorted first by the calculated safe maximum operating pressure (P') ascending, then by depth descending. As an aid in locating these anomalies, the upstream and downstream references are included, as well as distances from the defect to the reference.

<b>ID#</b>	Each location is automatically assigned a number in the software. This number is provided to assist the user of PIGTRAP software to more easily find any given defect.
<b>Dist.</b>	Given in either feet or meters, based on contractual agreements, this is the absolute distance from launch.
<b>Depth</b>	Predicted depth of the defect as a percentage of nominal wall.
<b>Length</b>	Predicted length of the defect, reported in either inches or millimeters.
<b>Width</b>	Predicted width of the defect, reported in either inches or millimeters.
<b>ID/OD</b>	Determination whether the defect exists on the inside (INT) or outside (EXT) surface of the pipe.
<b>Orientation: Deg / O'Clock</b>	Orientation is reported in degrees and o'clock (0 degrees/12:00 at top of pipe) as viewed looking downstream.
<b>P'</b>	Based on the specified formula for determining remaining-strength, it is the predicted safe maximum allowable pressure for the defect (P').
<b>% Est. Press. (P'/P)</b>	Percent of maximum established pressure, this is calculated by dividing the calculated safe pressure of the defect (P') by the current established maximum operating pressure of the pipeline (P). For TDW reporting, P is either established MOP provided by the customer or the calculated pressure rating for the pipe (P). Percentages less than 100% are considered pressure reducing.
<b>Aboveground References</b>	The name of the closest upstream and downstream references, usually either an AGM or a Valve.
<b>Distance from Defect</b>	The distance to the upstream and downstream reference listed in the previous column. Used for locating defects in the field.

See Appendix C for Dig Sheet Preparation



## Metal Loss Summary

ID#	Dist (ft)	Depth	Length	Width	ID/OD	Orientation Deg O'clock	P'	% Est. Press. (P'/P)	Above-Ground References	Distance from Defect	
40000002	28,454.2	13.2%	0.90	0.46	EXT	235	7:45	1632.2	100.0	U/S: AGM 050, Sta. 276+86, AGM is 26' D/S of Rd C/L -- Han #102	983.21
										D/S: AGM 060, Sta. 320+49, AGM is in fence line -- Han #114	3550.79
40000003	38,352.4	12.3%	2.72	1.84	EXT	353	11:45	1632.2	100.0	U/S: AGM 060, Sta. 320+49, AGM is in fence line -- Han #114	6347.32
										D/S: AGM 070, Sta. 423+34, AGM is 95' D/S of Rd C/L -- Han #102	4150.42
40000001	6,394.0	10.7%	0.86	0.57	EXT	291	9:30	1632.2	100.0	U/S: Launch Riser, Ground Enter -- Survey Point	6339.67
										D/S: Valve	493.40
40000000	268.5	10.6%	1.23	0.90	EXT	45	1:30	2795.5	100.0	U/S: Launch Riser, Ground Enter -- Survey Point	214.15
										D/S: Valve	6618.91

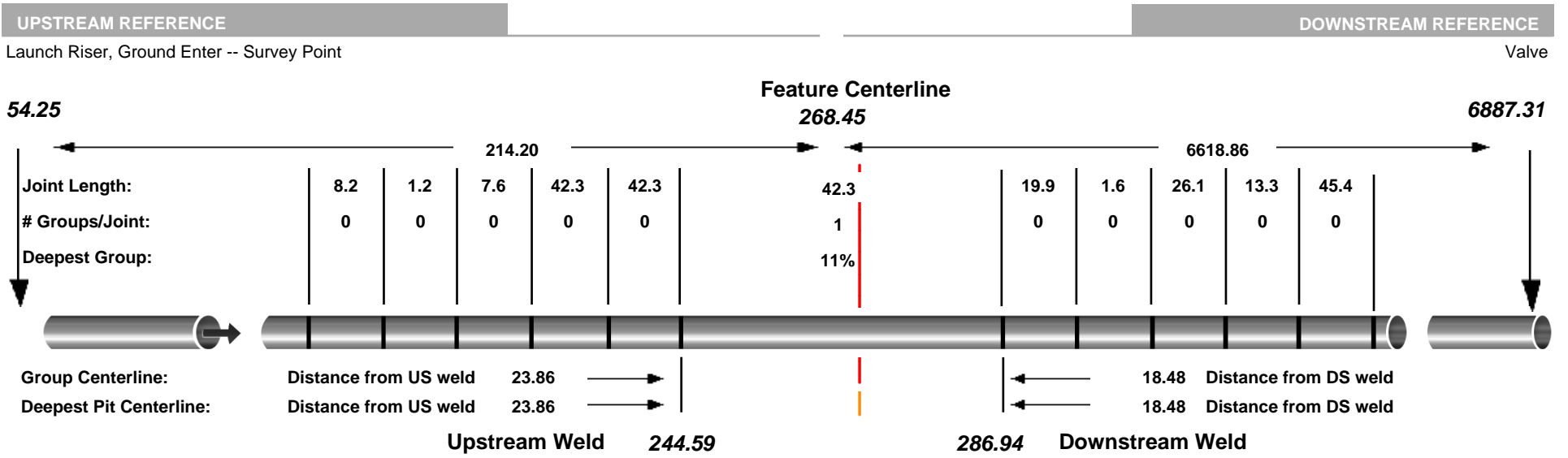
Metal Loss Summary

This report shows a maximum of 100 metal loss groups.

Type	Number
Metal Loss	4



# GROUP - Dig Site Information Report

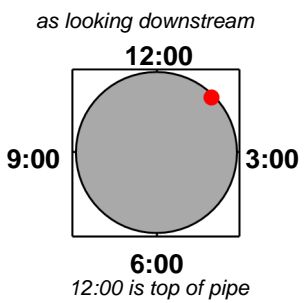


Dig Site Report

## Feature Information

ID:	40000000	Distance from Launcher:	268.45	<b>Feature Description</b>
Time:	3337.82	Orientation on Pipe Wall:	1:30	<b>Metal Loss - EXTERNAL</b>
Latitude:	47.91838220	Longitude:	-103.34790247	Wall Thickness: 0.322
				Altitude: 2418.081

## Feature Orientation



Upstream Locations		Downstream Locations	
117.16	Bend right - 35 deg., 3D	38.41	Bend left - 45 deg., 3D
207.34	Bend up - 45 deg., 3D	3922.45	Bend left - 36 deg., 3D
219.04	Bend down - 45 deg., 3D	6618.86	Valve
219.81	Flange	9104.53	Bend right - 10 deg., 129D
221.29	Tee at 270 deg.	9764.11	Bend right-up - 45 deg., 3D

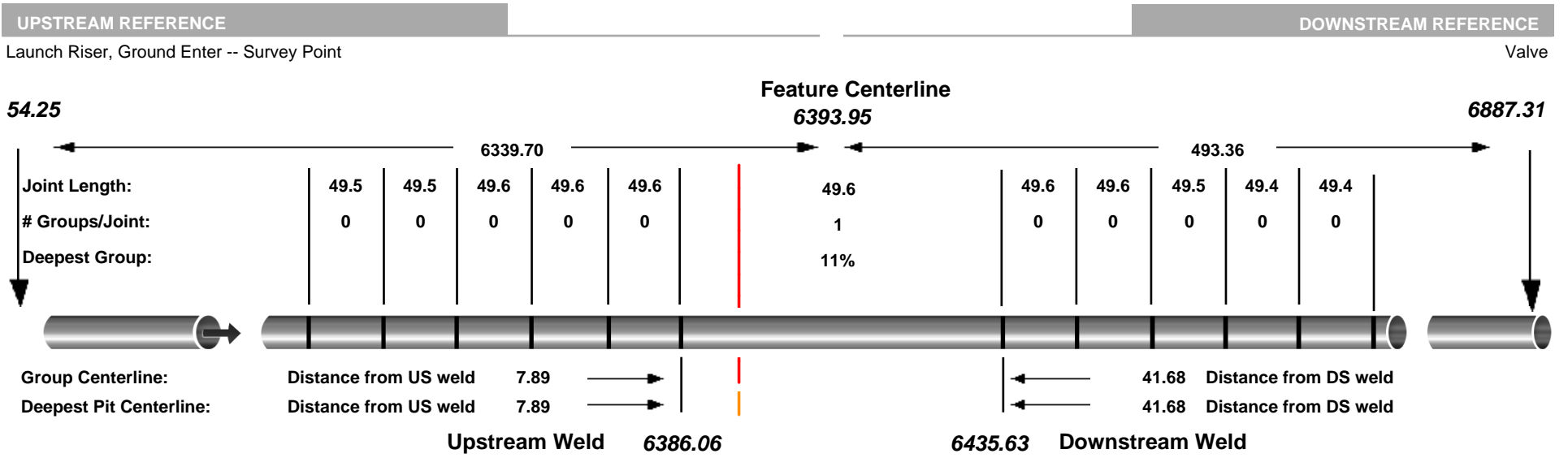
(relative distance from Feature Centerline)

**GROUP**  
 Depth: 11%  
 Length: 1.227  
 Width: 0.897  
 ERF: 0.268  
 Safe Operating Pressure: 2796 psi

1. Measurements on this sheet are in ft / in      2. All numbers in italics are Distance from Launch



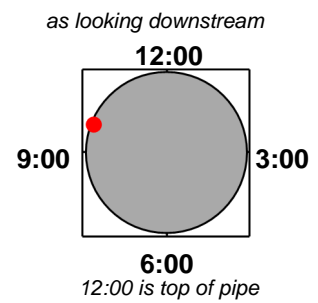
# GROUP - Dig Site Information Report



## Feature Information

ID:	<b>40000001</b>	Distance from Launcher:	<b>6393.95</b>	<u>Feature Description</u>
Time:	<b>4617.61</b>	Orientation on Pipe Wall:	<b>9:30</b>	<b>Metal Loss - EXTERNAL</b>
Latitude:	<b>47.91164210</b>	Longitude:	<b>-103.36764100</b>	Wall Thickness: <b>0.188</b>
				Altitude: <b>2367.951</b>

## Feature Orientation



**GROUP**  
 Depth: **11%**  
 Length: **0.858**  
 Width: **0.569**  
 ERF: **0.460**

Safe Operating Pressure: **1632 psi**

Upstream Locations		Downstream Locations	
2203.05	Bend left - 36 deg., 3D	493.36	Valve
6087.09	Bend left - 45 deg., 3D	2979.03	Bend right - 10 deg., 129D
6242.66	Bend right - 35 deg., 3D	3638.61	Bend right-up - 45 deg., 3D
6332.84	Bend up - 45 deg., 3D	3656.66	Bend right - 17 deg., 74D
6344.54	Bend down - 45 deg., 3D	6430.25	Bend left - 12 deg., 78D

(relative distance from Feature Centerline)

1. Measurements on this sheet are in ft / in      2. All numbers in italics are Distance from Launch



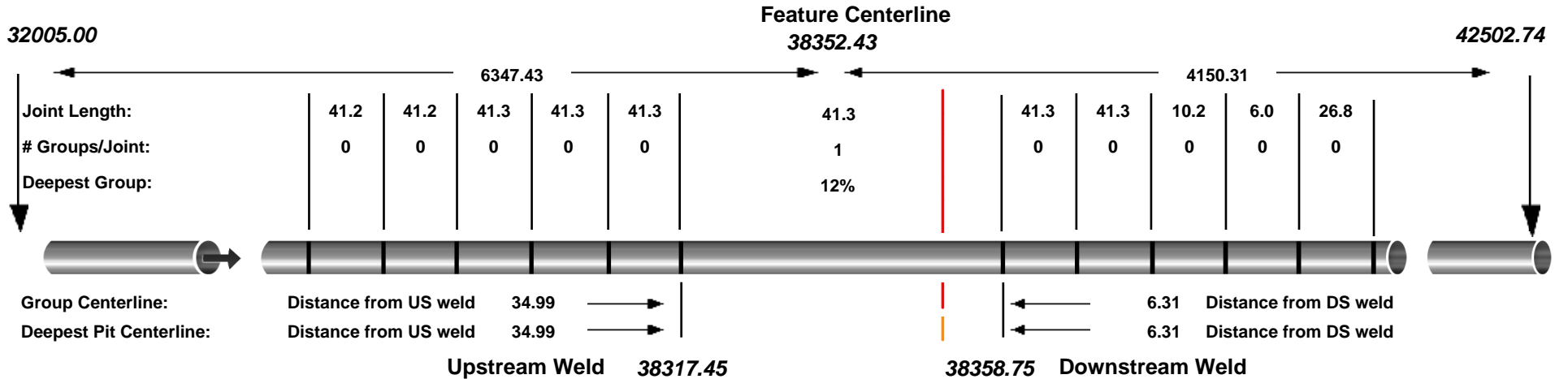
# GROUP - Dig Site Information Report

## UPSTREAM REFERENCE

AGM 060, Sta. 320+49, AGM is in fence line -- Han #114

## DOWNSTREAM REFERENCE

AGM 070, Sta. 423+34, AGM is 95' D/S of Rd C/L -- Han #102

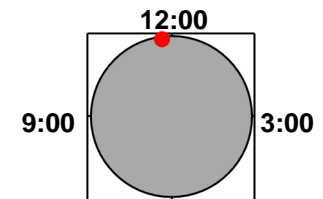


## Feature Information

ID:	40000003	Distance from Launcher:	38352.43	<u>Feature Description</u>
Time:	11257.49	Orientation on Pipe Wall:	11:45	<b>Metal Loss - EXTERNAL</b>
Latitude:	47.88404497	Longitude:	-103.46282108	Wall Thickness: 0.188
				Altitude: 2325.981

## Feature Orientation

as looking downstream



12:00 is top of pipe

### GROUP

Depth: 12%  
 Length: 2.723  
 Width: 1.841  
 ERF: 0.460

Safe Operating Pressure: 1632 psi

Upstream Locations		Downstream Locations	
2014.58	Bend right - 13 deg., 76D	653.27	Bend right - 22 deg., 116D
2151.18	Bend right - 16 deg., 72D	697.78	Bend right - 16 deg., 94D
2210.09	Bend right - 13 deg., 98D	4217.04	Bend left - 25 deg., 1.5D
7518.27	Bend left - 45 deg., 1.5D	4224.15	Bend left - 25 deg., 1.5D
8217.39	Tee at 270 deg.	6116.35	Bend right-up - 38 deg., 1.5D

(relative distance from Feature Centerline)

1. Measurements on this sheet are in ft / in

2. All numbers in italics are Distance from Launch





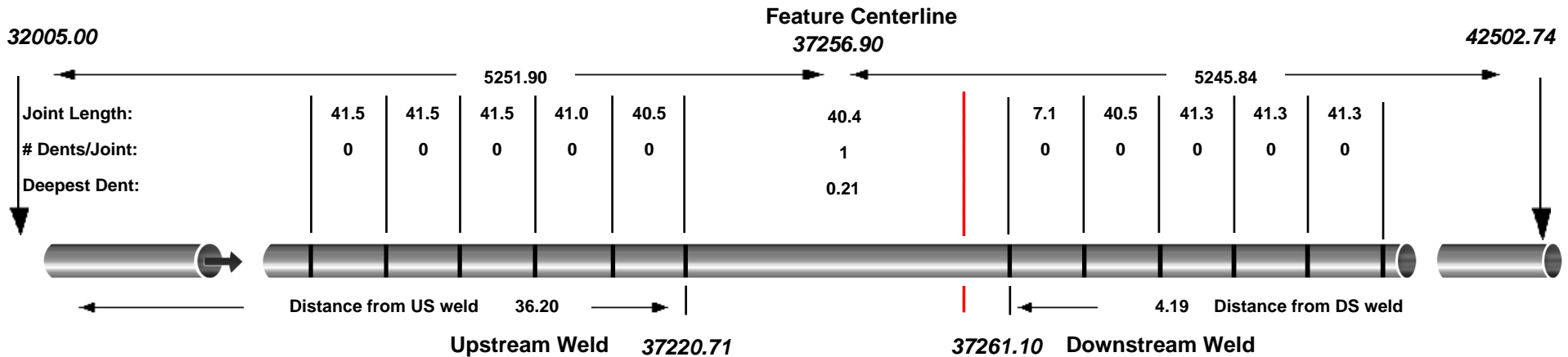
# DENT - Dig Site Information Report

## UPSTREAM REFERENCE

AGM 060, Sta. 320+49, AGM is in fence line -- Han #114

## DOWNSTREAM REFERENCE

AGM 070, Sta. 423+34, AGM is 95' D/S of Rd C/L -- Han #102

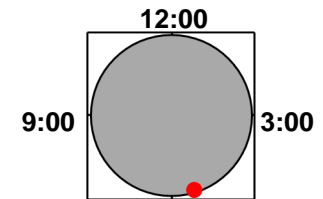


## Feature Information

ID:	14000000	Distance from Launcher: 37256.90	<b>Feature Description</b>
Time:	11021.73	Orientation on Pipe Wall: 5:15	<b>DENT</b>
Latitude:	47.88390018	Longitude: -103.45841717	Wall Thickness: 0.188
Altitude:			Altitude: 2310.784
Additional Information:	<b>TDW Correlated Deformation</b>		

## Feature Orientation

as looking downstream



12:00  
6:00  
12:00 is top of pipe

**DENT**  
Depth: 0.21

Upstream Locations		Downstream Locations	
919.05	Bend right - 13 deg., 76D	1748.80	Bend right - 22 deg., 116D
1055.65	Bend right - 16 deg., 72D	1793.31	Bend right - 16 deg., 94D
1114.56	Bend right - 13 deg., 98D	5312.57	Bend left - 25 deg., 1.5D
6422.74	Bend left - 45 deg., 1.5D	5319.68	Bend left - 25 deg., 1.5D
7121.86	Tee at 270 deg.	7211.88	Bend right-up - 38 deg., 1.5D

(relative distance from Feature Centerline)

1. Measurements on this sheet are in ft / in

2. All numbers in italics are Distance from Launch



# Charts

CHARTS

Charts

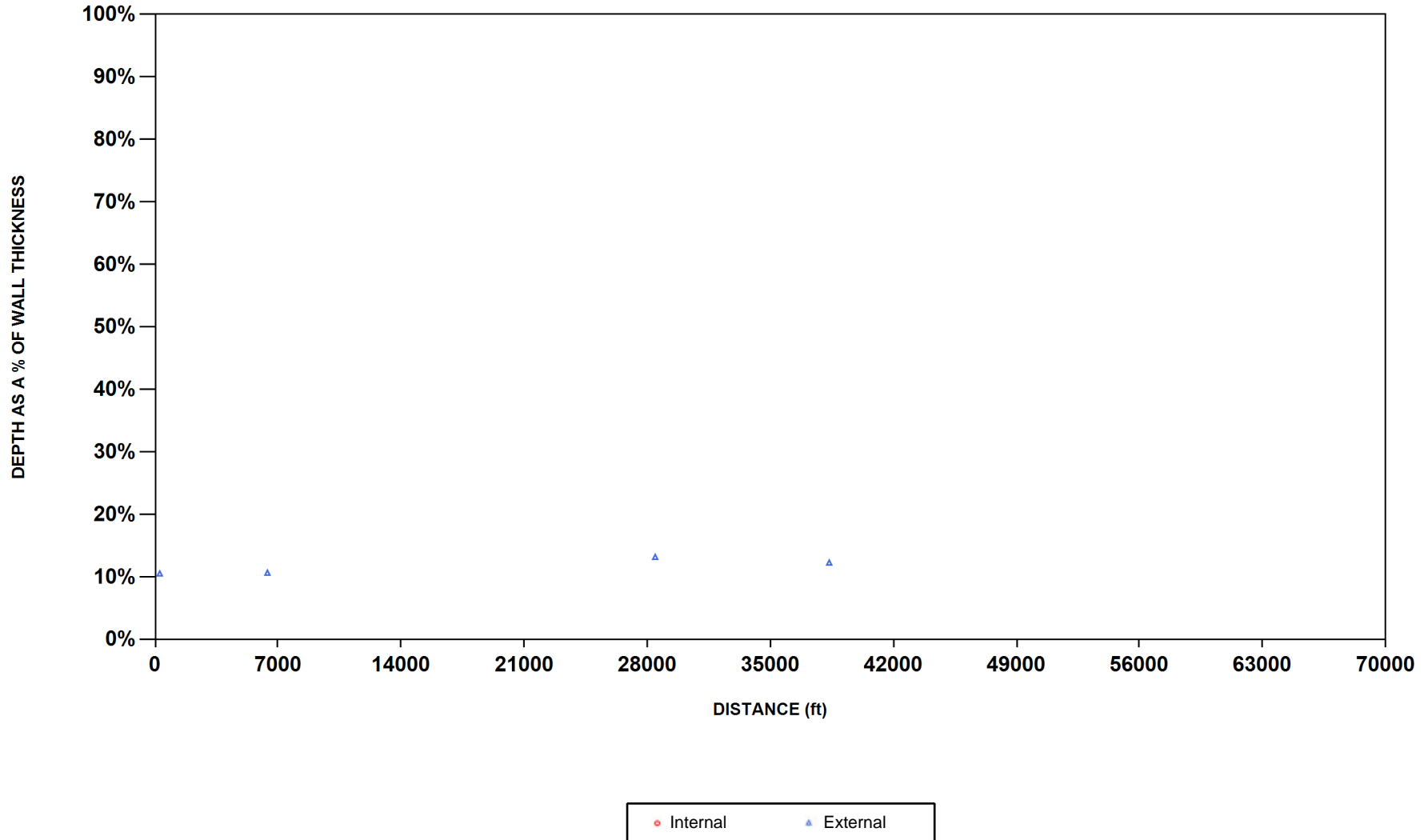
The Pipeline Summary report provides an overview of the pipeline condition.

The following charts are utilized in this report:

<b>Metal Loss Depth</b>	This chart highlights the predicted depths of defects as a percentage of wall thickness compared to distance. Areas of concentrated metal loss are easily detected as defects group.
<b>Metal Loss Orientation</b>	The distance from launch is plotted against the orientation of the defect. Orientation is based on 360° in a circle, with 0° or 360° marking the top of the pipe (180° the bottom). Displaying the orientation of defects around the circumference of the pipeline may aid in determining the type of corrosion mechanism present. For example, the majority of defects along the bottom of the pipe might indicate internal channel corrosion.
<b>Metal Loss - Calculated Safe Max. Operating Pressure</b>	The calculated safe maximum operating pressure of each defect is plotted compared to distance.
<b>Velocity - MFL</b>	Displays the speed of the tool relative to distance during the inspection. The specified contractual velocity of the inspection tool is 10 feet per second. If the tool exceeds this speed, the data collected by the tool may be degraded.
<b>Defect Depth Histogram</b>	Displays the total number of defects (pressure reducing groups/defects and non-pressure reducing groups /defects (where $P' < P$ )) by predicted depth of the defect as a percentage of nominal wall.
<b>Dent Depth</b>	This chart highlights the predicted depths of deformations in inches or mm compared to distance.
<b>Dent Orientation</b>	The distance from launch is plotted against the orientation of the deformation indications. Orientation is based on 360° in a circle, with 0° or 360° marking the top of the pipe (180° the bottom).
<b>Velocity - DEF</b>	Displays the speed of the tool relative to distance during the inspection. The specified contractual velocity of the inspection tool is 10 feet per second. If the tool exceeds this speed, the data collected by the tool may be degraded.



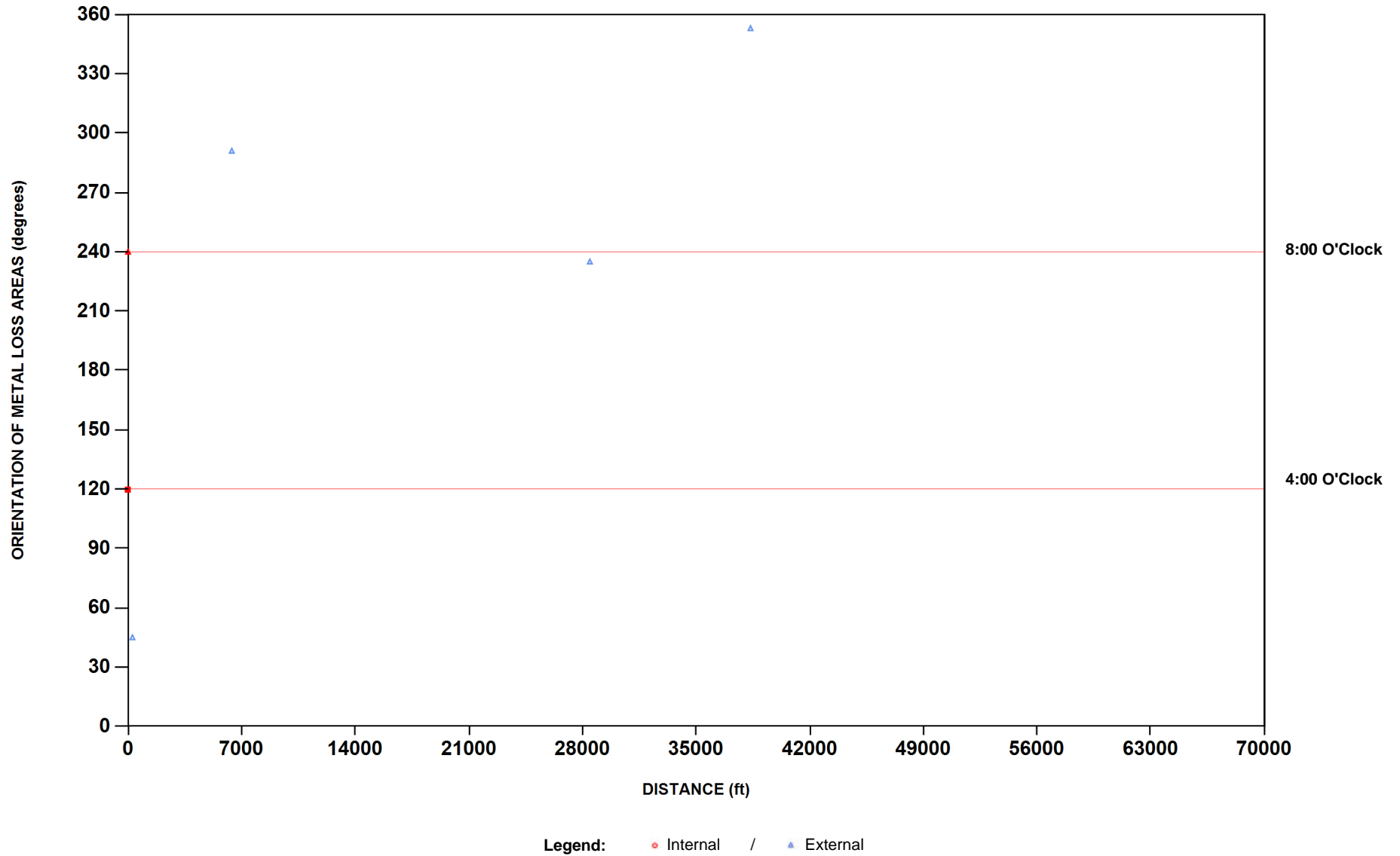
# Metal Loss Depth Graph



Metal Loss Depth Graph



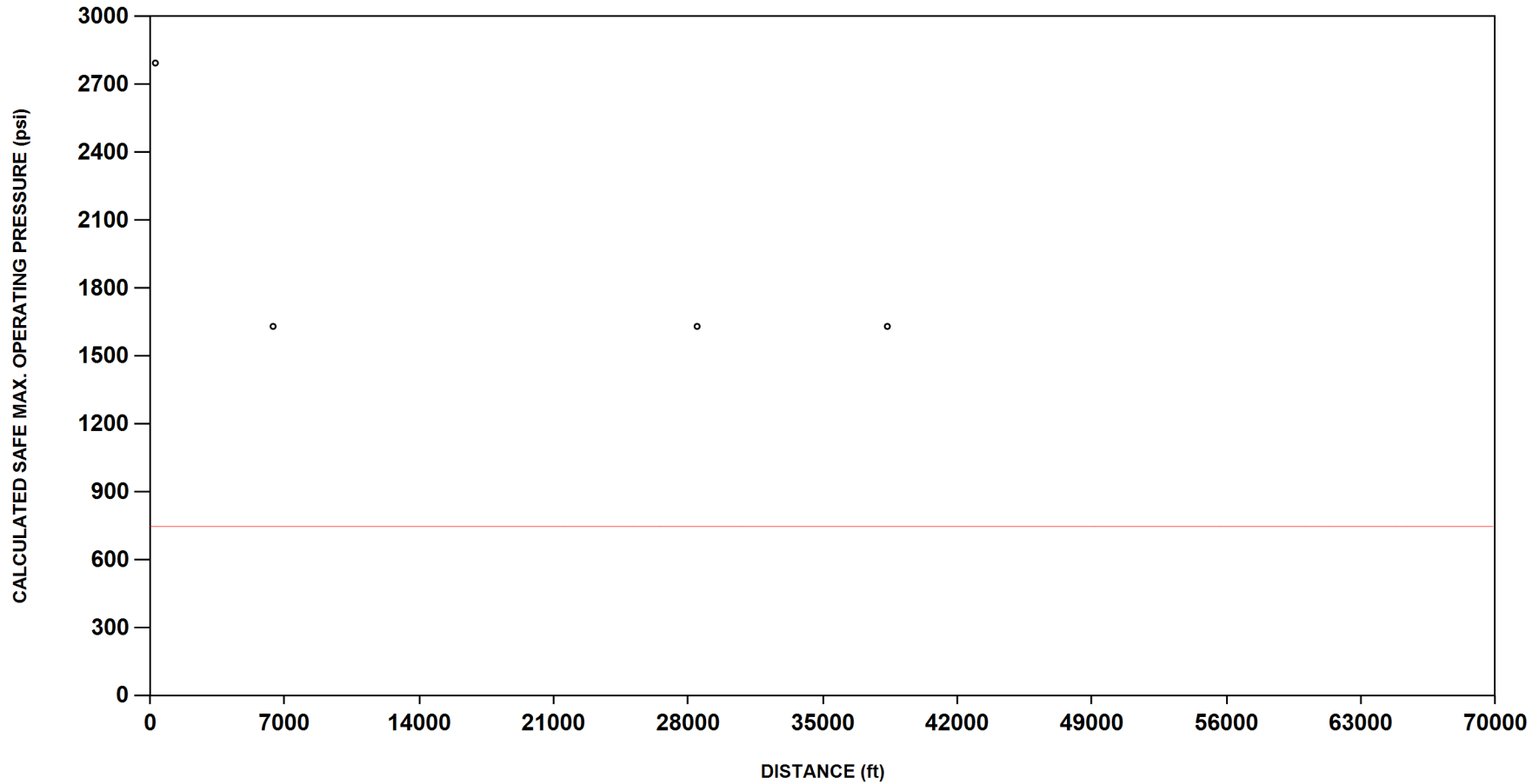
# Metal Loss Orientation Graph



Metal Loss Orientation Graph



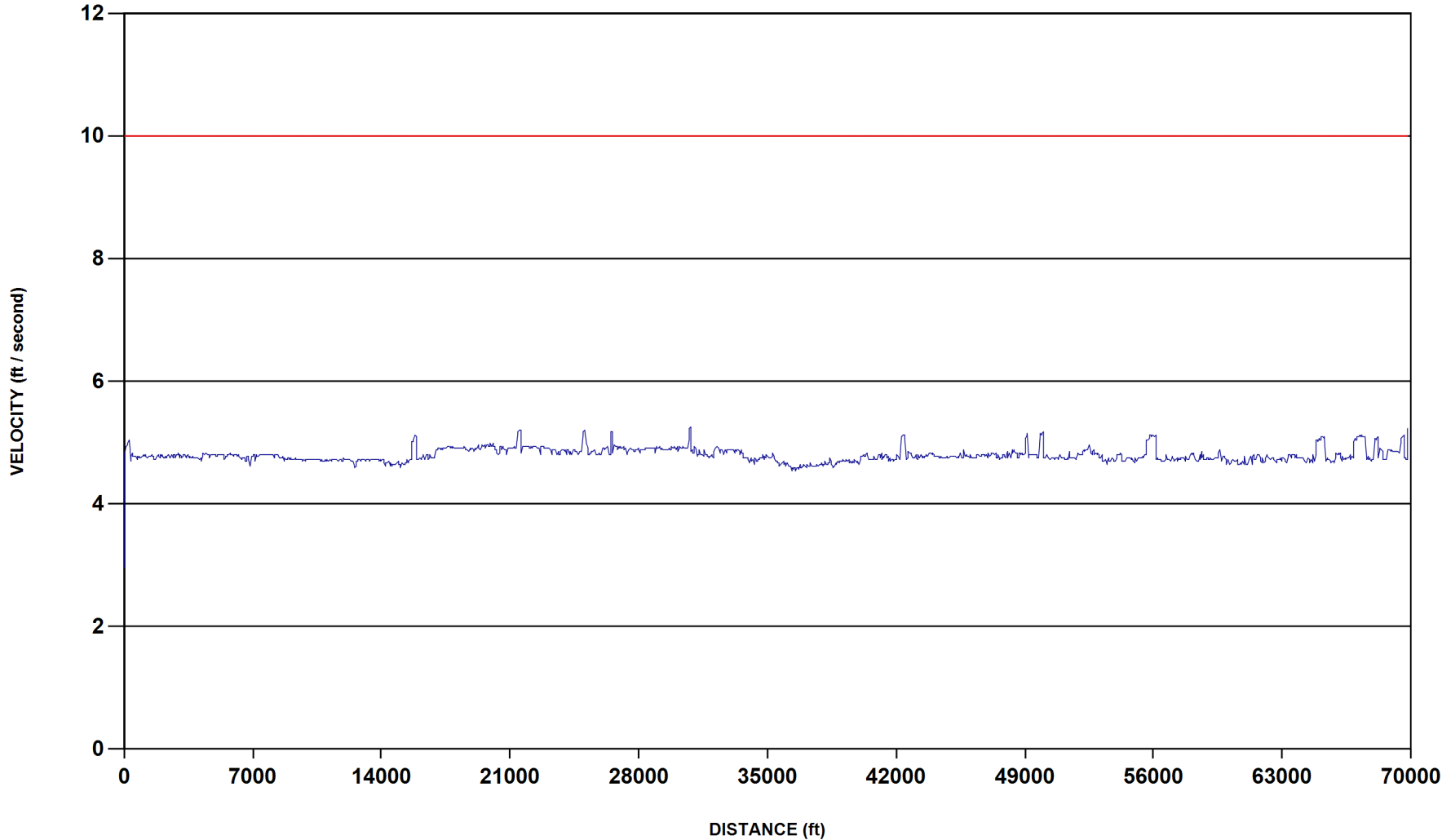
# Metal Loss - Calculated Safe Max. Operating Pressure Graph



Metal Loss - Calculated Safe Max. Operating Pressure Graph



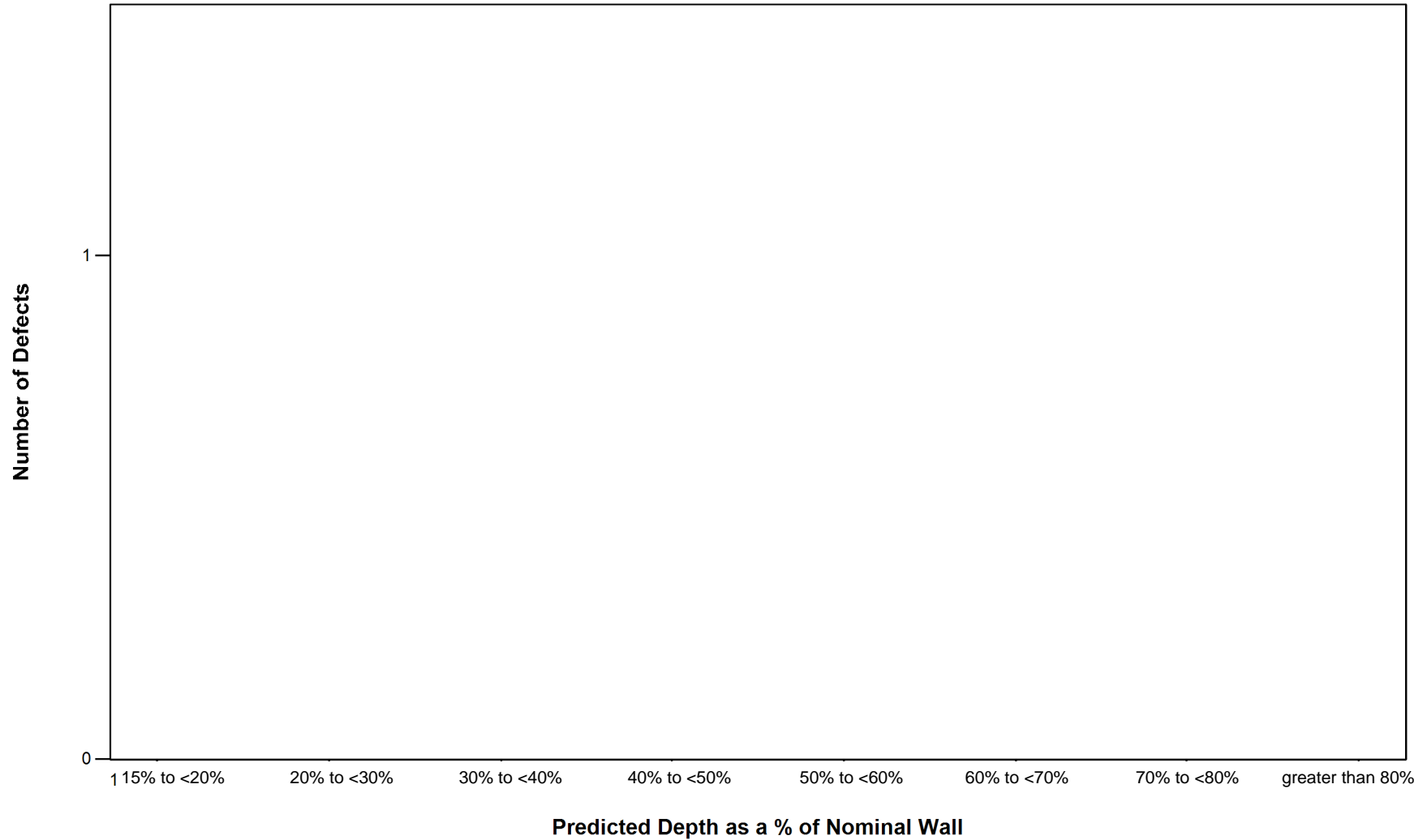
# Velocity Graph - MFL



Velocity Graph - MFL



# Defect Depth Histogram



Defect Depth Histogram

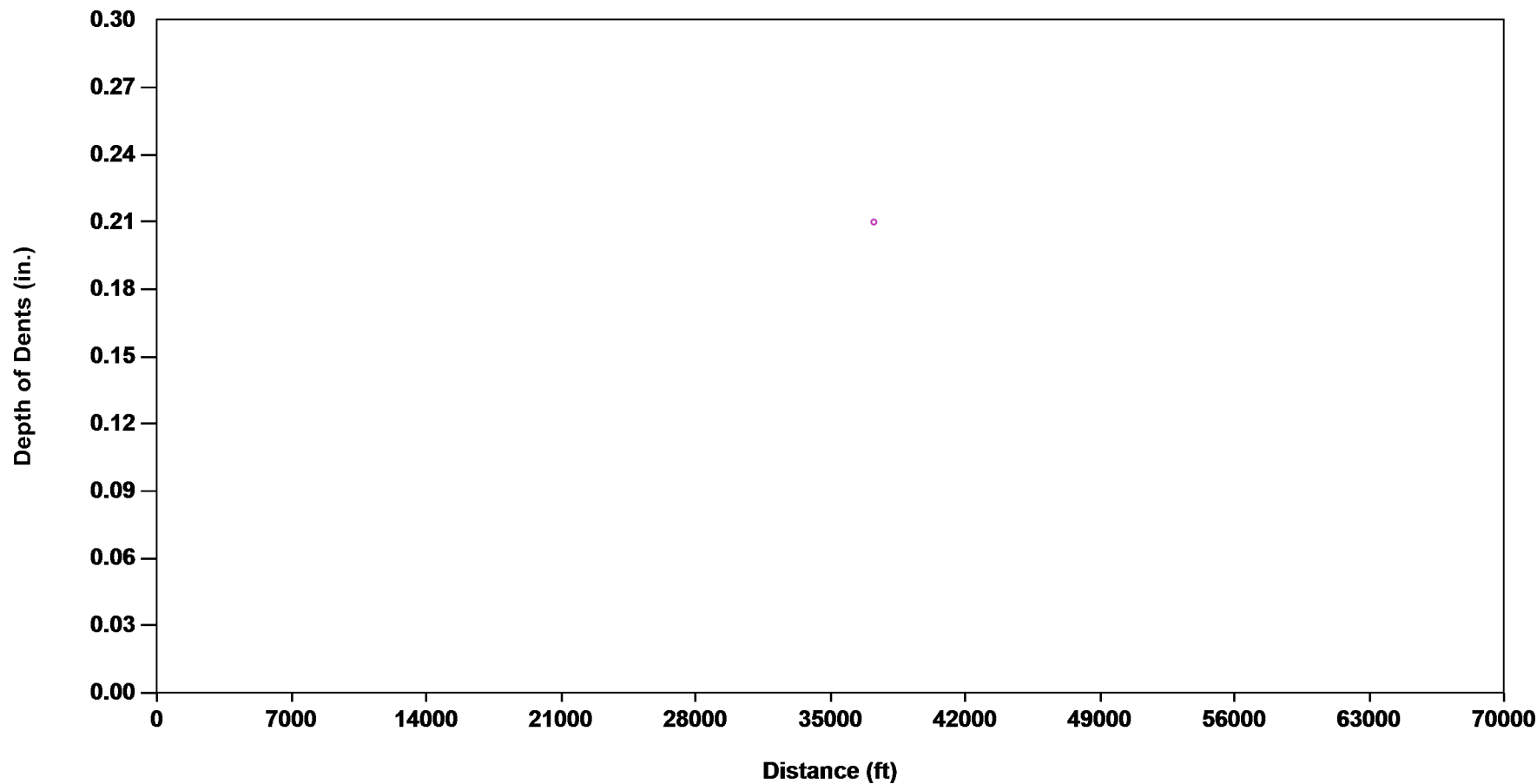
Total Defects: 4

■ Non-Pressure-Reducing Groups

■ Pressure-Reducing Groups (where  $P' < P$ )



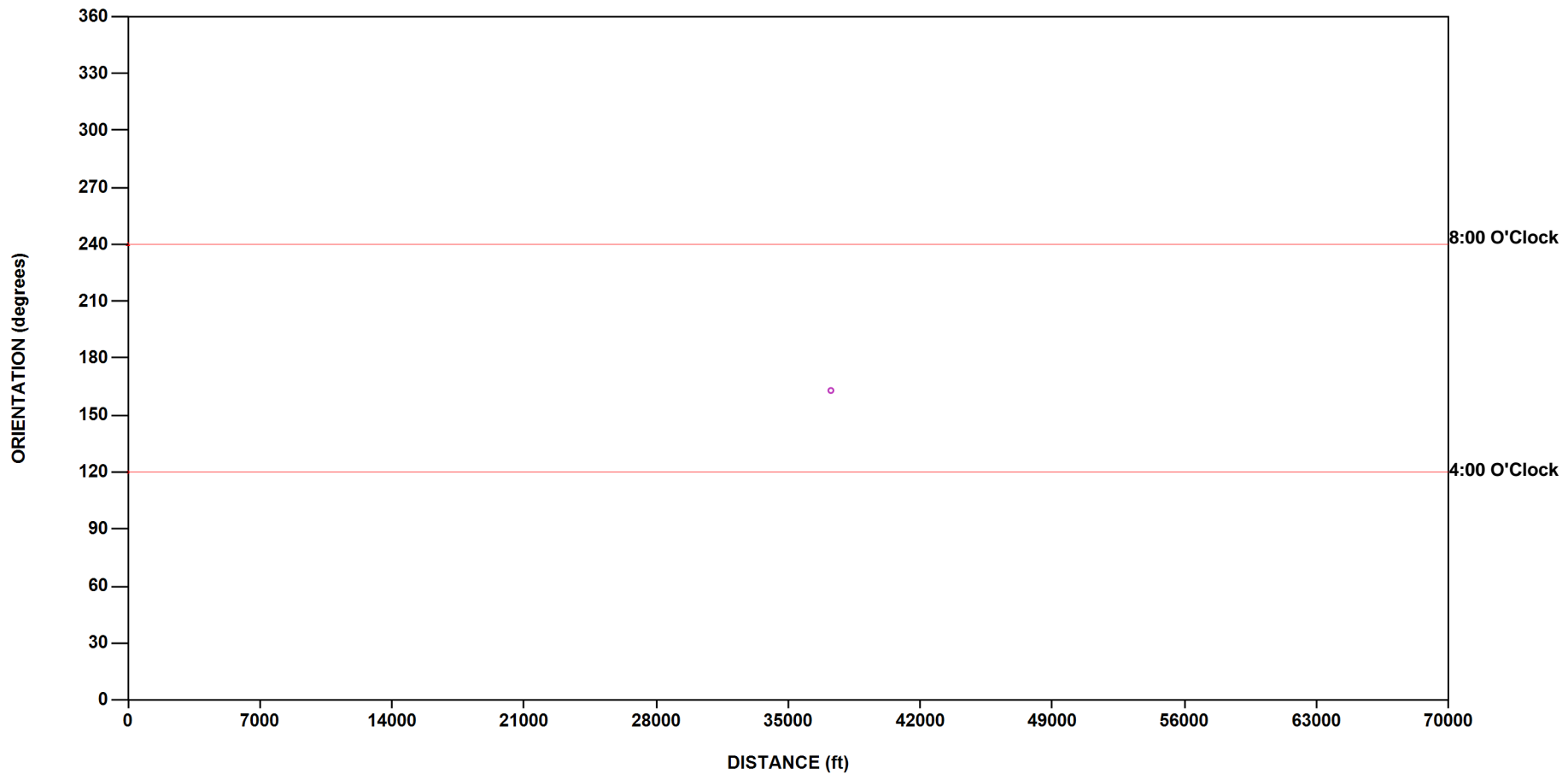
# Dent Depth Graph



Dent Depth Graph



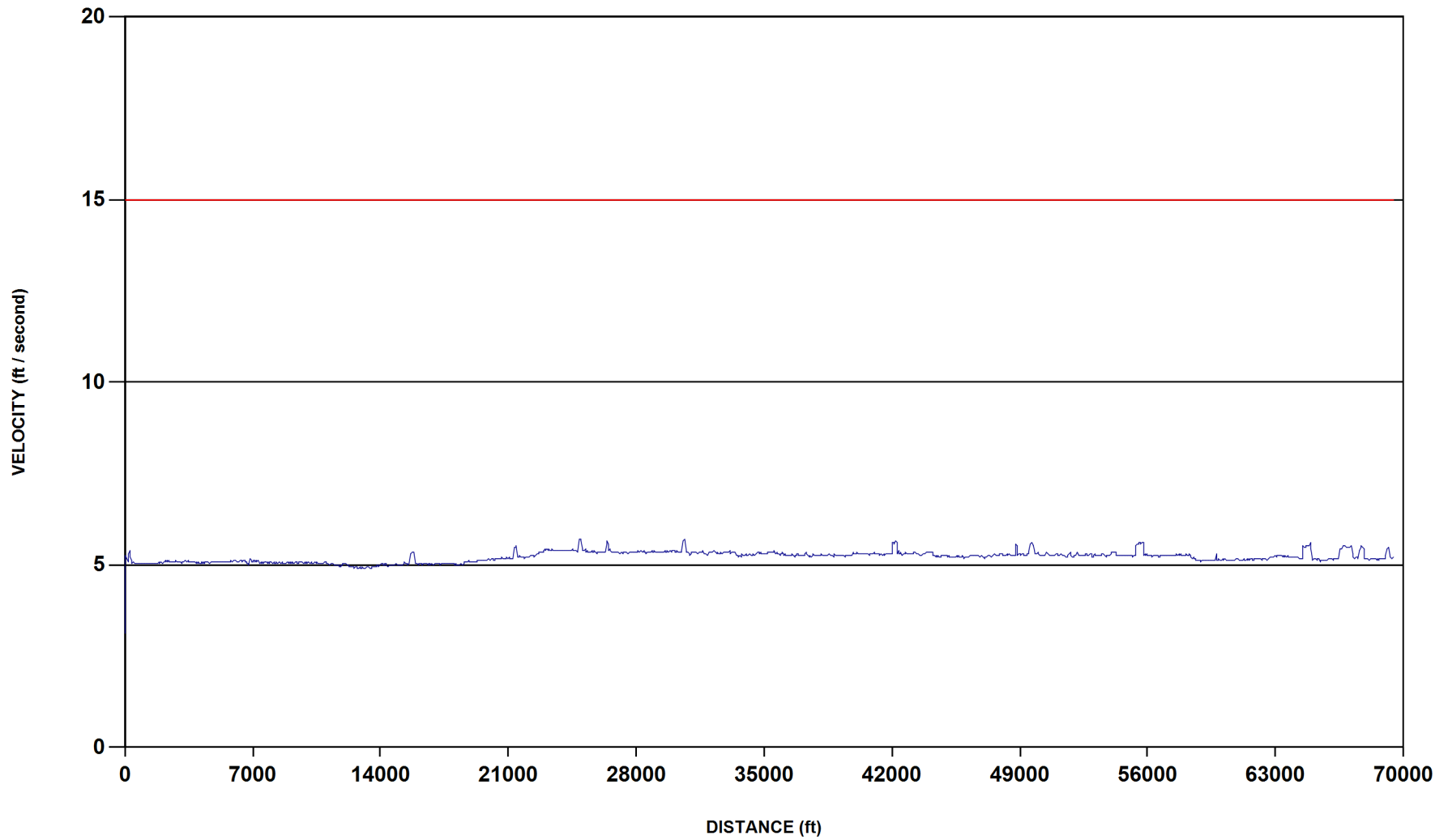
# Dent Orientation Graph



Dent Orientation Graph



# Velocity Graph - DEF



Velocity Graph - DEF



# Locations Summary

## DEFINITIONS

A location is a feature in the pipeline that can be used to correlate the inspection tool data to above ground references. Common location features include valves, fittings, flanges, tees, casings, repairs and aboveground markers (AGMs).

For example, a metal loss area could be referenced as being 200 feet down stream from a valve. Not all locations can be easily found from above ground. Some locations might not be useful if they are not above ground.

<b>ID#</b>	Each location is automatically assigned a number in the software. This number is provided to assist the user of PIGTRAP software to more easily find any given defect.
<b>Time</b>	A reference time from the inspection tool. May also be used to locate features in the PIGTRAP software.
<b>Distance</b>	Given in either feet or meters, based on contractual agreements, this is the absolute distance measured by the tool from launch.
<b>Joint #</b>	This unique number identifies the girth weld number.
<b>U/S Weld Dist.</b>	The distance to the upstream (U/S) weld (in feet or meters).
<b>D/S Weld Dist.</b>	The distance to the downstream (D/S) weld (in feet or meters).
<b>Description</b>	Describes the location in greater detail. Possible entries include valves, flanges, fittings, tees, markers, etc.
<b>Latitude</b>	This shows the north/south position of the Location as supplied by the customer or recorded by an AGM box. For XYZ mapping runs, these values are the supplied survey points or were calculated by the tool.
<b>Longitude</b>	This shows the east/west position of the Location as supplied by the customer or recorded by an AGM box. For XYZ mapping runs, these values are the supplied survey points or were calculated by the tool.
<b>Altitude</b>	For XYZ mapping runs, this shows the elevation above sea level of the location as supplied by the customer or calculated by the tool.

Zeros in Latitude and Longitude mean that no data was supplied by the customer. Calculated or estimated values can be viewed in the Pipe Listing report.



# Locations Summary

ID#	Time	Dist (ft)	Joint #	U/S Weld	D/S Weld	Description	Latitude	Longitude	Altitude
				Dist.	Dist.				
10000001	3,278.33	0.0	110	1.5	1.6	Valve (Launcher), Sta. 0+00, East Camp Creek	47.91828864	-103.34688850	2428.343
10000002	3,278.69	1.1	110	2.6	0.5	Flange	47.91828835	-103.34689285	2428.437
10000003	3,279.05	2.2	120	0.1	1.2	Tee at 90 deg.	47.91828809	-103.34689728	2428.532
10000004	3,280.46	6.7	130	3.6	3.5	Pipe Support	47.91828700	-103.34691514	2428.892
10000005	3,281.70	10.5	140	0.2	1.0	Tee at 90 deg.	47.91828609	-103.34693049	2429.183
10000006	3,282.14	11.9	150	0.5	1.9	Pipe Support	47.91828574	-103.34693590	2429.288
10000007	3,282.84	14.0	160	0.4	0.5	Flange	47.91828517	-103.34694454	2429.450
10000008	3,283.94	17.5	170	2.8	2.3	Pipe Support	47.91828426	-103.34695832	2429.672
10000009	3,284.83	20.2	180	0.1	1.0	Tee at 270 deg.	47.91828353	-103.34696912	2429.831
10000010	3,285.31	21.6	190	0.7	0.5	Pipe Support	47.91828315	-103.34697517	2429.914
10000011	3,285.59	22.5	200	0.4	2.8	Flange	47.91828295	-103.34697831	2429.959
10000012	3,285.95	23.6	200	1.5	1.7	Valve	47.91828272	-103.34698201	2430.010
10000013	3,286.32	24.7	200	2.7	0.6	Flange	47.91828242	-103.34698683	2430.078
10000014	3,286.68	26.0	210	0.6	1.7	Pipe Support	47.91828206	-103.34699209	2430.151
10000015	3,287.41	28.2	220	0.1	1.0	Tee at 90 deg.	47.91828153	-103.34700084	2430.276
10000016	3,288.79	32.4	230	3.6	4.8	Fitting on top of pipe	47.91828034	-103.34701749	2430.502
10000017	3,290.46	37.7	240	0.2	0.9	Tee on bottom of pipe	47.91827887	-103.34703820	2430.782
10000018	3,292.04	42.4	250	4.0	0.4	Pipe Support	47.91827757	-103.34705723	2431.050
10000019	3,292.27	43.1	260	0.5	2.7	Flange	47.91827740	-103.34705990	2431.088
10000020	3,292.61	44.2	260	1.5	1.6	Valve	47.91827714	-103.34706368	2431.137
10000021	3,292.98	45.3	260	2.7	0.5	Flange	47.91827680	-103.34706886	2431.208
10000022	3,293.53	47.6	280	0.2	1.0	Tee at 270 deg.	47.91827615	-103.34707829	2431.350
10000023	3,293.75	48.6	290	0.5	0.4	Flange	47.91827587	-103.34708263	2431.413
10000024	3,294.01	49.9	300	0.4	1.3	Bend down - 45 deg., 3D	47.91827551	-103.34708762	2431.309
10000093	3,294.87	54.3	310	3.6	6.8	Launch Riser, Ground Enter -- Survey Point	47.91827426	-103.34710070	2428.694
10000025	3,296.34	61.8	320	0.1	1.5	Bend up - 45 deg., 3D	47.91827152	-103.34712281	2423.613
10000026	3,314.68	151.8	370	0.1	1.1	Bend right - 35 deg., 3D	47.91823415	-103.34748433	2422.588
10000027	3,345.55	307.5	430	0.1	1.5	Bend left - 45 deg., 3D	47.91843666	-103.34803875	2418.110
10000028	4,158.07	4,191.4	1,250	0.1	1.1	Bend left - 36 deg., 3D	47.91685271	-103.36363750	2385.042
10000029	4,721.73	6,887.3	1,830	1.0	1.0	Valve	47.91029513	-103.36765581	2352.302
10000030	5,243.90	9,380.5	2,360	18.2	30.8	Bend right - 10 deg., 129D	47.90353550	-103.36794901	2289.949
10000031	5,381.90	10,033.2	2,500	0.2	1.4	Bend right-up - 45 deg., 3D	47.90183251	-103.36874647	2291.477
10000032	5,387.15	10,058.0	2,510	16.7	19.1	Bend right - 17 deg., 74D	47.90180234	-103.36883673	2291.952

Locations Summary



# Locations Summary

ID#	Time	Dist (ft)	Joint #	U/S Weld	D/S Weld	Description	Latitude	Longitude	Altitude
				Dist.	Dist.				
10000033	5,400.16	10,119.6	2,530	33.7	15.4	AGM 020, Sta. 104+00, AGM is in fence line -- Survey Point	47.90176505	-103.36908090	2295.231
10000034	5,975.35	12,830.4	3,080	30.4	19.1	Bend left - 12 deg., 78D	47.90118734	-103.37994182	2232.009
10000035	6,308.11	14,397.7	3,400	20.5	29.1	Bend left - 10 deg., 114D	47.90022840	-103.38612872	2259.015
10000036	6,499.07	15,287.5	3,580	20.1	29.1	Bend left-down - 18 deg., 93D	47.89899845	-103.38923375	2267.772
10000037	6,569.73	15,618.8	3,650	7.6	35.1	Bend right - 18 deg., 88D	47.89836317	-103.39018021	2237.133
10000094	6,618.77	15,865.5	3,710	10.7	31.5	AGM 030, Sta. 161+50, AGM is 100' D/S of CR 31 C/L -- Survey Point	47.89809682	-103.39109890	2231.040
10000038	7,621.93	20,768.3	4,720	0.1	1.0	Bend left - 35 deg., 1.5D	47.89285427	-103.40930637	2201.511
10000039	7,814.06	21,721.2	4,950	11.7	37.8	AGM 040, Sta. 220+50, AGM is 251' D/S of Rd C/L -- Survey Point	47.89349694	-103.41305440	2195.552
10000040	8,472.61	24,941.4	5,630	0.1	1.4	Bend right - 45 deg., 3D	47.89437455	-103.42588272	2261.289
10000041	8,785.23	26,473.6	5,980	0.2	6.4	Bend left - 62 deg., 8D	47.89774299	-103.42954507	2343.035
10000042	8,987.04	27,471.0	6,220	6.2	42.5	AGM 050, Sta. 276+86, AGM is 26' D/S of Rd C/L - Han #102	47.89765532	-103.43357000	2350.885
10000043	9,531.12	30,135.5	6,800	0.2	1.0	Tee at 270 deg.	47.89809352	-103.44433529	2395.155
10000044	9,671.65	30,834.8	6,980	0.1	1.5	Bend left - 45 deg., 1.5D	47.89802709	-103.44716804	2392.081
10000045	9,914.41	32,005.0	7,290	38.7	2.1	AGM 060, Sta. 320+49, AGM is in fence line -- Han #114	47.89532257	-103.44967690	2383.351
10000046	10,781.16	36,149.8	8,200	10.8	37.9	Bend right - 13 deg., 98D	47.88470341	-103.45417108	2331.850
10000047	10,793.70	36,208.0	8,210	21.0	27.6	Bend right - 16 deg., 72D	47.88459403	-103.45434224	2328.334
10000048	10,823.23	36,343.7	8,240	20.1	20.1	Bend right - 13 deg., 76D	47.88443919	-103.45484260	2324.689
10000049	11,400.80	39,020.9	8,950	7.3	33.5	Bend right - 22 deg., 116D	47.88442075	-103.46546906	2322.073
10000050	11,408.90	39,059.1	8,960	11.0	29.8	Bend right - 16 deg., 94D	47.88447959	-103.46559551	2321.954
10000051	12,131.86	42,502.7	9,720	2.6	46.8	AGM 070, Sta. 423+34, AGM is 95' D/S of Rd C/L - Han #102	47.89183905	-103.47419390	2380.036
10000052	12,145.95	42,569.8	9,740	0.0	0.8	Bend left - 25 deg., 1.5D	47.89198015	-103.47436619	2384.075
10000053	12,147.33	42,576.9	9,760	0.1	0.8	Bend left - 25 deg., 1.5D	47.89198806	-103.47439209	2384.345
10000054	12,542.12	44,469.3	10,170	0.1	1.2	Bend right-up - 38 deg., 1.5D	47.89207207	-103.48203453	2335.107
10000095	13,516.01	49,143.8	11,160	28.8	13.3	AGM 080, Sta. 486+65, AGM is 37' D/S of Rd C/L - Survey Point	47.90047244	-103.49607980	2198.132
10000055	13,647.91	49,778.4	11,320	0.0	0.9	Bend left - 30 deg., 1.5D	47.90172624	-103.49783640	2177.760
10000056	13,649.27	49,785.4	11,340	0.1	0.9	Bend left - 30 deg., 1.5D	47.90173337	-103.49786286	2177.236
10000058	14,955.78	56,065.6	12,700	39.2	3.1	AGM 090, Sta. 555+55, AGM is 63' D/S of Rd C/L - Han #143	47.90636165	-103.52001020	2201.251
10000059	15,800.88	60,082.1	13,540	0.0	0.5	Bend right - 16 deg., 1.5D	47.91406961	-103.53074688	2157.949
10000060	15,802.29	60,089.2	13,560	0.0	1.5	Bend right - 45 deg., 3D	47.91408361	-103.53076663	2157.948

Locations Summary



# Locations Summary

ID#	Time	Dist (ft)	Joint #	U/S Weld	D/S Weld	Description	Latitude	Longitude	Altitude
				Dist.	Dist.				
10000061	16,063.81	61,317.8	13,850	0.0	0.8	Bend left - 28 deg., 1.5D	47.91742926	-103.53096268	2128.430
10000062	16,336.01	62,610.2	14,130	9.8	38.3	Bend left - 14 deg., 69D	47.91998173	-103.53435730	2148.199
10000063	16,805.17	64,833.4	14,620	0.1	1.5	Bend right-up - 45 deg., 3D	47.92002513	-103.54336275	2130.540
10000064	16,879.38	65,209.5	14,720	24.0	18.3	AGM 100, Sta. 646+17, AGM is 43' D/S of Rd C/L - - Han #115	47.92079227	-103.54437480	2132.751
10000065	16,904.83	65,339.0	14,760	0.1	1.5	Bend left - 45 deg., 3D	47.92104371	-103.54474320	2135.868
10000066	17,832.09	69,836.3	15,760	0.1	1.4	Bend up - 45 deg., 3D	47.92105141	-103.56296816	2125.581
10000096	17,833.47	69,843.0	15,770	5.9	2.3	Receive Riser, Ground Exit -- Survey Point	47.92105279	-103.56298830	2130.422
10000067	17,834.08	69,846.1	15,780	0.1	1.5	Bend down - 45 deg., 3D	47.92105336	-103.56299838	2132.274
10000068	17,834.34	69,847.3	15,790	0.5	2.7	Flange	47.92105354	-103.56300303	2132.333
10000069	17,834.55	69,848.4	15,790	1.5	1.6	Valve	47.92105368	-103.56300673	2132.342
10000070	17,834.78	69,849.5	15,790	2.7	0.5	Flange	47.92105388	-103.56301182	2132.357
10000071	17,834.99	69,850.7	15,800	0.2	1.1	Tee at 90 deg.	47.92105404	-103.56301652	2132.366
10000072	17,835.25	69,852.1	15,810	0.7	0.7	Pipe Support	47.92105423	-103.56302221	2132.383
10000073	17,835.44	69,853.1	15,820	0.4	2.7	Flange	47.92105438	-103.56302634	2132.395
10000074	17,835.66	69,854.2	15,820	1.5	1.6	Valve	47.92105456	-103.56303124	2132.406
10000075	17,835.88	69,855.3	15,820	2.6	0.5	Flange	47.92105471	-103.56303526	2132.413
10000076	17,836.08	69,856.3	15,830	0.4	0.5	Pipe Support	47.92105484	-103.56303890	2132.417
10000077	17,836.26	69,857.2	15,840	0.2	0.9	Tee on bottom of pipe	47.92105499	-103.56304277	2132.426
10000078	17,837.27	69,862.2	15,850	4.3	7.1	Fitting on top of pipe	47.92105574	-103.56306329	2132.491
10000079	17,838.61	69,868.8	15,850	10.9	0.5	Pipe Support	47.92105676	-103.56309020	2132.613
10000080	17,838.78	69,869.7	15,860	0.5	2.7	Flange	47.92105691	-103.56309392	2132.626
10000081	17,838.99	69,870.8	15,860	1.6	1.6	Valve	47.92105709	-103.56309851	2132.650
10000082	17,839.21	69,871.9	15,860	2.7	0.5	Flange	47.92105726	-103.56310277	2132.671
10000083	17,839.39	69,872.8	15,870	0.3	0.9	Pipe Support	47.92105741	-103.56310637	2132.690
10000084	17,839.61	69,874.2	15,880	0.2	1.0	Tee at 90 deg.	47.92105766	-103.56311181	2132.716
10000085	17,840.08	69,877.0	15,890	2.1	2.5	Pipe Support	47.92105817	-103.56312337	2132.775
10000086	17,840.52	69,879.8	15,900	0.5	0.4	Flange	47.92105866	-103.56313472	2132.846
10000087	17,840.72	69,881.1	15,910	0.7	1.8	Pipe Support	47.92105885	-103.56313975	2132.874
10000088	17,841.08	69,883.3	15,920	0.2	0.9	Tee at 90 deg.	47.92105922	-103.56314887	2132.919
10000089	17,841.50	69,885.9	15,930	1.8	2.1	Pipe Support	47.92105967	-103.56315930	2132.977
10000090	17,841.89	69,888.3	15,940	0.5	2.5	Flange	47.92106009	-103.56316874	2133.023
10000091	17,842.07	69,889.4	15,940	1.6	1.5	Valve (Receiver), Sta. 692+70, Camp Creek	47.92106029	-103.56317200	2133.024

Locations Summary



# Locations Summary

Locations Summary

<b>Locations</b>	<b>Number</b>
Bend	34
Casing	0
Flange	17
Fitting	2
Marker	11
Repair	0
Tee	11
Valve	8
Pipe Support	13



# Casings Summary

## DEFINITIONS

A casing is a section of larger diameter pipe through which the pipeline passes. Usually installed to protect a pipeline from excessive external loading, casings can also shield pipelines from protective cathodic protection currents. Therefore, the condition of a pipeline inside a casing can provide valuable information.

TDW MFL tools detect when a casing is not centered around the pipeline. These casings are referred to as being eccentric. The closer the casing is to the pipeline, the stronger the signal seen by the inspection tool. The tool will not detect if the casing is shorted to the pipe wall. The tool might see evidence of a short, such as metal loss.

This information may be useful in updating pipeline databases and alignment sheets.

Sometimes spacers are identified inside casings. These are mechanical devices used to center the pipeline inside the casing and are not considered harmful.

<b>ID#</b>	Each location is automatically assigned a number in the software. This number is provided to assist the user of PIGTRAP software to more easily find any given defect.
<b>Time</b>	A reference time from the inspection tool. May also be used to locate features in the PIGTRAP software.
<b>Distance Start, End</b>	Given in either feet or meters, this is the absolute distance measured by the tool from launch to the beginning and ending of the casing.
<b>Casing Length</b>	The total predicted casing length (in feet or meters).
<b>Eccentric (side)</b>	Identifies one of four conditions associated with the casing: 1- no eccentricity (blank); 2- eccentric on upstream side (upstream); 3- eccentric on downstream side (downstream); 4- eccentric on both ends (both)
<b># of Metal Loss in Casing</b>	Provides the number of metal loss groups identified inside the casing.
<b>Max. Depth of Metal Loss</b>	If metal loss is identified inside the casing, this column provides the maximum predicted depth of all metal loss features.
<b>Above Ground References</b>	The name of the closest upstream and downstream references, usually an Aboveground Marker or a Valve.
<b>Distance from Start/Upstream Side of Casing</b>	The distance from the Aboveground Reference (AGM or Valve) to the start (upstream) side of the casing.



# Casings Summary

ID#	Time	Distance (ft) Start	End	Casing Length (ft)	Eccentric (side)	# of Metal Loss in Casing	Max. Depth of Metal Loss	Above Ground References	Distance from Start/Upstream Side of Casing
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No Casings appear in this pipeline inspection

Casings Summary



# Deformation Summary

## DEFINITIONS

The Deformation Summary Report lists all the deformations and dents detected during the inspection, sorted by depth of deformation (descending)

Dents may affect the integrity of the pipeline and are considered harmful. A dent with associated metal loss is potentially more significant than a dent alone.

<b>ID#</b>	Each Deformation is automatically assigned a number in the software. This number is provided to assist the user of PIGTRAP software to more easily find any given defect.
<b>Distance</b>	Given in either feet or meters, based on contractual agreements, this is the absolute distance measured by the tool from launch.
<b>Depth</b>	Depth of the indication in inches or mm.
<b>Orientation</b>	The orientation of the deformation indication in degrees (top of pipe = 0) and clock position, as viewed facing downstream.
<b>Sub Type</b>	The sub type of deformation if other than dent (i.e. Heavy Weld, Ovality, Buckle, Expansion).
<b>Min X Sec Dia</b>	The minimum measured Cross-Section (ID) measured within the scope of the deformation.
<b>Description</b>	Text describing a deformation in greater detail. Any special conditions are noted.
<b>On Weld</b>	Determination whether the indication crosses a girth (or seam) weld.
<b>Metal Loss</b>	"Yes" is listed if there is any metal loss associated with a dent.
<b>Above-Ground References</b>	The name of the closest upstream and downstream references, usually either an AGM or a valve.
<b>Distance from Defect</b>	The distance to the upstream and downstream reference listed in the previous column. Used for locating defects in the field.



# Deformation Summary

ID#	Distance (ft)	Depth (in)	Depth %	Orientation (Deg / O'Clock)	Sub Type	Min X Sec Dia	Description	On Metal Weld Loss	Above-Ground References	Distance from Defect
14000000	37,256.9	0.21	2.6%	163 5:15		7.88	TDW Correlated Deformation		<b>U/S:</b> AGM 060, Sta. 320+49, AGM is in fence line -- Han #114 <b>D/S:</b> AGM 070, Sta. 423+34, AGM is 95' D/S of Rd C/L -- Han #102	5251.61 5246.13

Type	Number
DENT	1

Deformation Summary



# Gains (Metal in Close Proximity)

## DEFINITIONS

The inspection tool may detect ferrous metal objects located close to or touching the pipeline. They appear as additional metal added to the pipe, and are referred to as gains. This table identifies gains detected during the inspection.

Clamps or anchors around the pipeline are considered gains. Some metal objects can be potentially harmful to the pipeline. They can damage the pipeline's protective coating, or over time may dent or cause damage to the pipeline.

<b>ID#</b>	Each location is automatically assigned a number in the software. This number is provided to assist the user of PIGTRAP software to more easily find any given defect.
<b>Distance</b>	Given in either feet or meters, based on contractual agreements, this is the absolute distance measured by the tool from launch.
<b>Length</b>	The measured length of the gain measured in feet or meters.
<b>Width</b>	The measured width of the gain measured in inches or millimeters. When full circumference, this is usually typical of a clamp or banding around the circumference of the pipeline.
<b>Depth in Gauss</b>	The difference in gauss reading (magnetic strength) at the gain. The greater the number, the greater the mass of the object, or the closer the proximity to the pipeline, or both. This table is sorted with highest depth in gauss listed in a descending order.
<b>Orientation: Degrees / O'Clock</b>	The distance from launch is plotted against the orientation of the defect. Orientation is based on 360 degrees in a circle, with 0 / 360 degrees marking the top of the pipe (180 degrees the bottom).
<b>Joint #</b>	This unique number identifies the girth weld number.
<b>U/S Weld Dist.</b>	The distance to the upstream (U/S) weld (in feet or meters).
<b>D/S Weld Dist.</b>	The distance to the downstream (D/S) weld (in feet or meters).



## Gains (Metal in Close Proximity)

ID#	Distance (ft)	Length (in)	Width (in)	Depth in Gauss	Orientation Degrees	Orientation / O'Clock	Joint #	U/S Weld Dist.	D/S Weld Dist.
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No Gains have been detected on this pipeline inspection

Gains (Metal in Close Proximity)



# Nominal Wall Thickness

## DEFINITIONS

The following list provides locations along the pipeline where changes in wall thickness or pipe type occur. While the TDW inspection tool can easily detect changes in wall thickness, it cannot take direct thickness measurements. Therefore, where wall thicknesses are known, the tool can identify the locations where the thickness changes. Where wall thicknesses are not known, best efforts will be made to estimate thicknesses based on best available data.

<b>ID#</b>	Each wall thickness change ID is automatically assigned a number in the software. This number is provided to assist the user of PIGTRAP software to more easily find any given defect.
<b>Distance</b>	Given in either feet or meters, based on contractual agreements, this is the absolute distance measured by the tool from launch.
<b>Wall Thickness</b>	The predicted wall thickness in inches or millimeters.
<b>Pipetype</b>	Type of pipe construction. Electric Resistance Weld (ERW), Seamless (SMLS), Lap Weld (LW), etc.
<b>Yield Strength (SMYS)</b>	Specified Minimum Yield Strength – A required strength level that measured yield stress of a pipe material must exceed, which is a function of pipe grade. The measured yield stress is the tensile stress required to produce a total elongation of 0.5 percent of a gage length as determined by an extensometer during a tensile test.
<b>Safety Factor</b>	(or design factor) Typically 0.72 per ASME B31.4 In setting the safety factor, due consideration has been given to and allowances made for the manufacturing tolerance and maximum allowable depth of imperfections provided for in the specifications.
<b>Length of Segment</b>	The length of the pipe for the specified wall thickness, measured in feet or meters.



# Nominal Wall Thickness

ID#	Distance (ft)	Wall Thickness (in)	Pipetype	Yield Strength (SMYS)	Safety Factor	Length of Segment (ft)
11000000	-1.55	0.322	ERW	52000	0.72	64.11
11000001	62.56	0.188	ERW	52000	0.72	18.65
11000002	81.21	0.322	ERW	52000	0.72	266.56
11000003	347.77	0.188	ERW	52000	0.72	6533.67
11000004	6881.44	0.322	ERW	52000	0.72	6.87
11000005	6888.31	0.188	ERW	52000	0.72	8756.24
11000006	15644.55	0.322	ERW	52000	0.72	294.37
11000007	15938.92	0.188	ERW	52000	0.72	5459.12
11000008	21398.04	0.322	ERW	52000	0.72	168.75
11000009	21566.79	0.188	ERW	52000	0.72	3373.79
11000010	24940.57	0.322	ERW	52000	0.72	208.11
11000011	25148.68	0.188	ERW	52000	0.72	1321.62
11000012	26470.30	0.322	ERW	52000	0.72	117.33
11000013	26587.63	0.188	ERW	52000	0.72	4116.06
11000014	30703.69	0.322	ERW	52000	0.72	131.94
11000015	30835.63	0.188	ERW	52000	0.72	11410.71
11000016	42246.33	0.322	ERW	52000	0.72	253.76
11000017	42500.09	0.188	ERW	52000	0.72	69.32
11000018	42569.41	0.322	ERW	52000	0.72	7.92
11000019	42577.34	0.188	ERW	52000	0.72	6453.19
11000020	49030.53	0.322	ERW	52000	0.72	126.58
11000021	49157.11	0.188	ERW	52000	0.72	620.78
11000022	49777.89	0.322	ERW	52000	0.72	249.31
11000023	50027.20	0.188	ERW	52000	0.72	5618.5
11000024	55645.71	0.322	ERW	52000	0.72	465.26
11000025	56110.97	0.188	ERW	52000	0.72	3970.9
11000026	60081.87	0.322	ERW	52000	0.72	8.14
11000027	60090.01	0.188	ERW	52000	0.72	1227.34
11000028	61317.35	0.322	ERW	52000	0.72	6.9
11000029	61324.25	0.188	ERW	52000	0.72	3508.36
11000030	64832.62	0.322	ERW	52000	0.72	507.16
11000031	65339.78	0.188	ERW	52000	0.72	1531.36
11000032	66871.14	0.322	ERW	52000	0.72	713.8
11000033	67584.94	0.188	ERW	52000	0.72	407.61
11000034	67992.55	0.322	ERW	52000	0.72	251.71
11000035	68244.26	0.188	ERW	52000	0.72	1190.62
11000036	69434.88	0.322	ERW	52000	0.72	209.96
11000037	69644.84	0.188	ERW	52000	0.72	190.73
11000038	69835.57	0.322	ERW	52000	0.72	53.8

Nominal Wall Thickness



# Nominal Wall Thickness

Wall Thickness	Pipetype	Total Length (ft)	Total Length (miles)	Percent of Total Distance
0.188	ERW	65,779	12.458	94.1%
0.322	ERW	4,112	0.779	5.9%

Nominal Wall Thickness



# Repair Report

## DEFINITIONS

This table lists all the repairs to the pipeline detected during the inspection.

Pipeline repairs that are typically detected include:

- Sleeves
- Half sole
- Patches
- Stopples
- Clamps
- Weld + End
- Clock Spring

**ID#** Each repair is automatically assigned a number in the software. This number is provided to assist the user of PIGTRAP software to more easily find any given defect.

**Distance** Given in either feet or meters, based on contractual agreements, this is the absolute distance measured by the tool from launch.

**Length** Gives the linear length of the repair.

**Type of Repair** Describes the type of repair detected during the inspection.



# Repair Report

ID#	Distance (ft)	Length (ft)	Type of Repair
-----	---------------	-------------	----------------

No Repairs have been detected on this pipeline inspection



# AGM Information Summary

## DEFINITIONS

This table includes all values and above ground marker sites in the inspection run.

<b>ID#</b>	Each location is automatically assigned a number in the software. This number is provided to assist the user of PIGTRAP software to more easily find any given defect.
<b>Time</b>	A reference time from the inspection tool. May also be used to locate features in the PIGTRAP software.
<b>Distance</b>	Given in either feet or meters, based on contractual agreements, this is the absolute distance measured by the tool from launch.
<b>Description</b>	Describes the AGM in greater detail. Generally includes only valves and markers.
<b>Latitude</b>	This shows the north/south position of the Location as supplied by the customer or recorded by an AGM box. For XYZ mapping runs, these values are the supplied survey points or were calculated by the tool.
<b>Longitude</b>	This shows the east/west position of the Location as supplied by the customer or recorded by an AGM box. For XYZ mapping runs, these values are the supplied survey points or were calculated by the tool.
<b>Altitude</b>	For XYZ mapping runs, this shows the elevation above sea level of the location as supplied by the customer or calculated by the tool.

Zeroes in Latitude and Longitude mean that no data was supplied by the customer. Calculated or estimated values can be viewed in the Pipe Listing report.



# AGM Information Summary

AGM Information Summary

ID#	Time	Distance(ft)	Description	Latitude	Longitude	Altitude
10000001	3278.33	0.00	Valve (Launcher), Sta. 0+00, East Camp Creek	47.91828864	-103.34688850	2428.343
10000012	3285.95	23.58	Valve	47.91828272	-103.34698201	2430.010
10000020	3292.61	44.19	Valve	47.91827714	-103.34706368	2431.137
10000093	3294.87	54.25	Launch Riser, Ground Enter -- Survey Point	47.91827426	-103.34710070	2428.694
10000029	4721.73	6887.31	Valve	47.91029513	-103.36765581	2352.302
10000033	5400.16	10119.58	AGM 020, Sta. 104+00, AGM is in fence line -- Survey Point	47.90176505	-103.36908090	2295.231
10000094	6618.77	15865.48	AGM 030, Sta. 161+50, AGM is 100' D/S of CR 31 C/L -- Survey Point	47.89809682	-103.39109890	2231.040
10000039	7814.06	21721.23	AGM 040, Sta. 220+50, AGM is 251' D/S of Rd C/L -- Survey Point	47.89349694	-103.41305440	2195.552
10000042	8987.04	27471.00	AGM 050, Sta. 276+86, AGM is 26' D/S of Rd C/L -- Han #102	47.89765532	-103.43357000	2350.885
10000045	9914.41	32005.00	AGM 060, Sta. 320+49, AGM is in fence line -- Han #114	47.89532257	-103.44967690	2383.351
10000051	12131.86	42502.74	AGM 070, Sta. 423+34, AGM is 95' D/S of Rd C/L -- Han #102	47.89183905	-103.47419390	2380.036
10000095	13516.01	49143.83	AGM 080, Sta. 486+65, AGM is 37' D/S of Rd C/L -- Survey Point	47.90047244	-103.49607980	2198.132
10000058	14955.78	56065.63	AGM 090, Sta. 555+55, AGM is 63' D/S of Rd C/L -- Han #143	47.90636165	-103.52001020	2201.251
10000064	16879.38	65209.49	AGM 100, Sta. 646+17, AGM is 43' D/S of Rd C/L -- Han #115	47.92079227	-103.54437480	2132.751
10000096	17833.47	69842.96	Receive Riser, Ground Exit -- Survey Point	47.92105279	-103.56298830	2130.422
10000069	17834.55	69848.40	Valve	47.92105368	-103.56300673	2132.342
10000074	17835.66	69854.20	Valve	47.92105456	-103.56303124	2132.406
10000081	17838.99	69870.79	Valve	47.92105709	-103.56309851	2132.650
10000091	17842.07	69889.37	Valve (Receiver), Sta. 692+70, Camp Creek	47.92106029	-103.56317200	2133.024

TYPE	NUMBER
Valves	8
Markers	11



# Miscellaneous

## DEFINITIONS

There are occasions when special notations or circumstances require the addition of a note. These notes are included in this table for your reference.

<b>ID#</b>	Each miscellaneous note is automatically assigned a number in the software. This number is provided to assist the user of PIGTRAP software to more easily find any given defect.
<b>Time</b>	A reference time from the inspection tool. May also be used to locate features in the PIGTRAP software.
<b>Distance</b>	Given in either feet or meters, based on contractual agreements, this is the absolute distance measured by the tool from launch.
<b>Memo</b>	A description of the entry.

## MEMO EXAMPLES

<b>Gap or dent in casing</b>	When the casing is not welded, or when a gap occurs in the weld, this signature is detected by the tool, and identified with a Misc. remark.
<b>Inclusion</b>	An anomaly in the cross section of the pipeline. Inclusions may be detrimental if they protrude through the pipe wall.
<b>Mill anomaly</b>	The process of manufacturing pipe can often leave indications in the pipe wall. Typically these anomalies are not detrimental, and are identified for the benefit of the client.
<b>Sensor problems</b>	Noting locations where anomalous sensor readings occurred.
<b>Tool stops/starts</b>	All tools are setup on a time-based system. When the tool stops, it continues to record, although not moving. When the tool moves very slowly, it is possible that its movement is not detected, and therefore, reported distances may appear shorter than actual. Many stops and starts may affect the overall distance accuracy of the tool.



# Miscellaneous

Miscellaneous

ID#	Time	Distance (ft)	Memo
12000000	145.05	-22.40	Begin Run Tickle
12000001	4,983.19	8,141.29	Debris @ 12:00
12000002	19,045.19	69,927.85	End Run Tickle

Total	Number
Misc listings	3



## DEFINITIONS

The Pipeline Listing Report presents all detected pipeline data in sequential order, beginning at launcher and ending at the receiver. The table includes welds, locations, metal loss defects, AGMs, wall thickness changes, etc.

<b>ID#</b>	Each item is automatically assigned a number in the software. This number is provided to assist the user of PIGTRAP software to more easily find any given defect.
<b>Description</b>	Describes the event at the particular location. Identifies the type of the descriptive, being a weld, location, pipe thickness change, etc.
<b>Distance</b>	Given in either feet or meters, based on contractual agreements, this is the absolute distance from launch.
<b>Joint #</b>	This unique number identifies the girth weld number.
<b>U/S Weld</b>	The distance to the upstream (U/S) weld (in feet or meters).
<b>D/S Weld</b>	The distance to the downstream (D/S) weld (in feet or meters).
<b>Latitude</b>	If GPS coordinates were provided for launch, receive and AGMs, this provides the predicted Latitude reading of the location from the first GPS reading based on INS readings obtained by the tool during the inspection.
<b>Longitude</b>	If GPS coordinates were provided for launch, receive and AGMs, this provides the predicted Longitude reading of the location from the first GPS reading based on INS readings obtained by the tool during the inspection.
<b>Altitude</b>	If GPS coordinates were provided for launch, receive and AGMs, this provides the predicted Altitude reading of the location from the first GPS reading based on INS readings obtained by the tool during the inspection.
<b>Orientation: Deg. / O'Clock</b>	Orientation is reported in degrees or o'clock (0 degrees/12:00 at top of pipe) as viewed looking downstream.
<b>% Depth</b>	Predicted depth of the defect as a percentage of nominal wall.
<b>Length or WT (Pipe Thickness)</b>	Predicted length of the defect, reported in either inches or millimeters – or if a wall thickness change, the new wall thickness begins at this point.
<b>Width or YS (Yield Strength)</b>	Predicted width of the defect, reported in either inches or millimeters – or if a wall thickness change, the new SMYS begins at this point.
<b>P' (Calc. Safe Max. Operating Pressure) or SF (Safety Factor)</b>	Calculated safe maximum operating pressure for the pipeline segment as calculated based on information provided by the Customer. TDW software uses either ASME B31G, MODIFIED ASME B31G or Z662-99 to calculate the calculated safe maximum allowable operating pressure (P') of the pipeline at a metal loss area.
<b>(P'/P)</b>	Percent of maximum established pressure, this is calculated by dividing the calculated safe pressure of the defect (P') by the current established maximum operating pressure of the pipeline (P). For TDW reporting, P is either established MOP provided by the customer or the calculated pressure rating for the pipe (P). Percentages less than 100% are considered pressure reducing.



# Pipeline Listing

TDW Services, Inc.

Hiland Crude, LLC  
East Camp Creek to Camp Creek

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)	Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
12000000	Begin Run Tickle	-22.4	0	-	20.9	47.91828862	-103.34688852	2428.349						
11000000	WT CHANGE	-1.6	0	0.0	0.0	47.91828862	-103.34688852	2428.349			0.322	52000	0.72	
	110 WELD	-1.5	110	0.0	3.1	47.91828862	-103.34688852	2428.349						
10000000	Flange	-1.1	110	0.4	2.7	47.91828862	-103.34688852	2428.349	0	12:00				
10000001	Valve (Launcher), Sta. 0+00, East Camp Creek	0.0	110	1.5	1.6	47.91828864	-103.34688850	2428.343						
10000002	Flange	1.1	110	2.6	0.5	47.91828835	-103.34689285	2428.437	0	12:00				
	120 WELD	1.6	120	0.0	1.3	47.91828823	-103.34689493	2428.481						
10000003	Tee at 90 deg.	2.2	120	0.1	1.2	47.91828809	-103.34689728	2428.532	92	3:00				
	130 WELD	2.8	130	0.0	7.1	47.91828793	-103.34689991	2428.588						
10000004	Pipe Support	6.7	130	3.6	3.5	47.91828700	-103.34691514	2428.892						
	140 WELD	9.9	140	0.0	1.2	47.91828623	-103.34692812	2429.140						
10000005	Tee at 90 deg.	10.5	140	0.2	1.0	47.91828609	-103.34693049	2429.183	92	3:00				
	150 WELD	11.1	150	0.0	2.5	47.91828593	-103.34693293	2429.232						
10000006	Pipe Support	11.9	150	0.5	1.9	47.91828574	-103.34693590	2429.288						
	160 WELD	13.6	160	0.0	0.9	47.91828530	-103.34694282	2429.418						
10000007	Flange	14.0	160	0.4	0.5	47.91828517	-103.34694454	2429.450	0	12:00				
	170 WELD	14.5	170	0.0	5.1	47.91828504	-103.34694655	2429.486						
10000008	Pipe Support	17.5	170	2.8	2.3	47.91828426	-103.34695832	2429.672						
	180 WELD	19.6	180	0.0	1.2	47.91828368	-103.34696689	2429.801						
10000009	Tee at 270 deg.	20.2	180	0.1	1.0	47.91828353	-103.34696912	2429.831	267	8:45				
	190 WELD	20.8	190	0.0	1.3	47.91828337	-103.34697163	2429.865						
10000010	Pipe Support	21.6	190	0.7	0.5	47.91828315	-103.34697517	2429.914						
	200 WELD	22.1	200	0.0	3.2	47.91828304	-103.34697683	2429.938						
10000011	Flange	22.5	200	0.4	2.8	47.91828295	-103.34697831	2429.959	0	12:00				
10000012	Valve	23.6	200	1.5	1.7	47.91828272	-103.34698201	2430.010						
10000013	Flange	24.7	200	2.7	0.6	47.91828242	-103.34698683	2430.078	0	12:00				
	210 WELD	25.3	210	0.0	2.3	47.91828224	-103.34698945	2430.114						
10000014	Pipe Support	26.0	210	0.6	1.7	47.91828206	-103.34699209	2430.151						
	220 WELD	27.6	220	0.0	1.2	47.91828167	-103.34699843	2430.240						
10000015	Tee at 90 deg.	28.2	220	0.1	1.0	47.91828153	-103.34700084	2430.276	86	2:45				
	230 WELD	28.7	230	0.0	8.4	47.91828136	-103.34700317	2430.311						
10000016	Fitting on top of pipe	32.4	230	3.6	4.8	47.91828034	-103.34701749	2430.502	355	11:45				
	240 WELD	37.1	240	0.0	1.1	47.91827903	-103.34703599	2430.756						
10000017	Tee on bottom of pipe	37.7	240	0.2	0.9	47.91827887	-103.34703820	2430.782	177	5:45				
	250 WELD	38.3	250	0.0	4.4	47.91827869	-103.34704069	2430.816						
10000018	Pipe Support	42.4	250	4.0	0.4	47.91827757	-103.34705723	2431.050						



# Pipeline Listing

TDW Services, Inc.

Hiland Crude, LLC  
East Camp Creek to Camp Creek

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)	Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
260 WELD		42.7	260	0.0	3.1	47.91827751	-103.34705823	2431.064						
10000019	Flange	43.1	260	0.5	2.7	47.91827740	-103.34705990	2431.088	0	12:00				
10000020	Valve	44.2	260	1.5	1.6	47.91827714	-103.34706368	2431.137						
10000021	Flange	45.3	260	2.7	0.5	47.91827680	-103.34706886	2431.208	0	12:00				
270 WELD		45.8	270	0.0	1.2	47.91827666	-103.34707105	2431.239						
280 WELD		47.0	280	0.0	1.2	47.91827630	-103.34707608	2431.314						
10000022	Tee at 270 deg.	47.6	280	0.2	1.0	47.91827615	-103.34707829	2431.350	272	9:00				
290 WELD		48.2	290	0.0	0.9	47.91827600	-103.34708066	2431.390						
10000023	Flange	48.6	290	0.5	0.4	47.91827587	-103.34708263	2431.413	0	12:00				
300 WELD		49.1	300	0.0	1.6	47.91827574	-103.34708448	2431.427						
10000024	Bend down - 45 deg., 3D	49.9	300	0.4	1.3	47.91827551	-103.34708762	2431.309	0	12:00				
310 WELD		50.7	310	0.0	10.4	47.91827528	-103.34709020	2430.961						
10000093	Launch Riser, Ground Enter -- Survey Point	54.3	310	3.6	6.8	47.91827426	-103.34710070	2428.694						
320 WELD		61.1	320	0.0	1.5	47.91827182	-103.34712031	2423.986						
10000025	Bend up - 45 deg., 3D	61.8	320	0.1	1.5	47.91827152	-103.34712281	2423.613	0	12:00				
11000001	WT CHANGE	62.6	320	0.0	0.0	47.91827119	-103.34712601	2423.444			0.188	52000	0.72	
330 WELD		62.6	330	0.0	18.7	47.91827118	-103.34712609	2423.440						
11000002	WT CHANGE	81.2	330	0.0	0.0	47.91826331	-103.34720144	2423.471			0.322	52000	0.72	
340 WELD		81.2	340	0.0	20.5	47.91826330	-103.34720152	2423.471						
350 WELD		101.7	350	0.0	41.3	47.91825450	-103.34728353	2423.496						
360 WELD		142.9	360	0.0	8.2	47.91823708	-103.34744887	2422.828						
370 WELD		151.2	370	0.0	1.2	47.91823404	-103.34748181	2422.607						
10000026	Bend right - 35 deg., 3D	151.8	370	0.1	1.1	47.91823415	-103.34748433	2422.588	0	12:00				
380 WELD		152.4	380	0.0	7.6	47.91823461	-103.34748683	2422.563						
390 WELD		160.0	390	0.0	42.3	47.91824390	-103.34751455	2422.145						
400 WELD		202.3	400	0.0	42.3	47.91829484	-103.34766775	2419.310						
410 WELD		244.6	410	0.0	42.3	47.91834862	-103.34781950	2418.102						
40000000	Metal Loss - EXTERNAL	268.5	410	23.8	18.5	47.91838220	-103.34790247	2418.081	45	1:30	11%	1.23	0.90	3014 100%
420 WELD		286.9	420	0.0	19.9	47.91840799	-103.34796694	2418.130						
430 WELD		306.8	430	0.0	1.6	47.91843603	-103.34803588	2418.113						
10000027	Bend left - 45 deg., 3D	307.5	430	0.1	1.5	47.91843666	-103.34803875	2418.110	0	12:00				
440 WELD		308.3	440	0.0	26.1	47.91843663	-103.34804200	2418.117						
450 WELD		334.5	450	0.0	13.3	47.91842197	-103.34814637	2417.852						
11000003	WT CHANGE	347.8	450	0.0	0.0	47.91841502	-103.34819908	2417.601			0.188	52000	0.72	
460 WELD		347.8	460	0.0	45.4	47.91841501	-103.34819912	2417.601						
470 WELD		393.1	470	0.0	49.7	47.91839095	-103.34837926	2415.444						



# Pipeline Listing

TDW Services, Inc.

Hiland Crude, LLC  
East Camp Creek to Camp Creek

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)	Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
480	WELD	442.8	480	0.0	49.7	47.91836422	-103.34857714	2414.311						
490	WELD	492.5	490	0.0	49.2	47.91833919	-103.34877562	2414.243						
500	WELD	541.8	500	0.0	49.5	47.91831610	-103.34897307	2414.259						
510	WELD	591.2	510	0.0	49.6	47.91829438	-103.34917165	2413.849						
520	WELD	640.8	520	0.0	49.7	47.91827351	-103.34937067	2412.533						
530	WELD	690.5	530	0.0	49.5	47.91825426	-103.34956965	2408.047						
540	WELD	740.0	540	0.0	49.5	47.91823290	-103.34976876	2405.517						
550	WELD	789.5	550	0.0	49.5	47.91820942	-103.34996747	2405.665						
560	WELD	839.0	560	0.0	49.4	47.91818658	-103.35016659	2405.120						
570	WELD	888.4	570	0.0	49.6	47.91816346	-103.35036581	2403.852						
580	WELD	938.0	580	0.0	49.7	47.91813830	-103.35056405	2403.291						
590	WELD	987.7	590	0.0	46.8	47.91811214	-103.35076209	2403.394						
600	WELD	1,034.5	600	0.0	48.1	47.91808755	-103.35094853	2404.203						
610	WELD	1,082.5	610	0.0	49.6	47.91806227	-103.35114041	2405.009						
620	WELD	1,132.2	620	0.0	49.6	47.91803822	-103.35133893	2404.445						
630	WELD	1,181.7	630	0.0	49.4	47.91801466	-103.35153756	2403.186						
640	WELD	1,231.2	640	0.0	49.6	47.91799078	-103.35173554	2401.810						
650	WELD	1,280.8	650	0.0	49.4	47.91796793	-103.35193424	2401.034						
660	WELD	1,330.2	660	0.0	48.6	47.91794657	-103.35213258	2401.834						
670	WELD	1,378.8	670	0.0	49.5	47.91792371	-103.35232736	2402.805						
680	WELD	1,428.3	680	0.0	49.4	47.91789901	-103.35252513	2405.179						
690	WELD	1,477.7	690	0.0	49.4	47.91787414	-103.35272279	2407.116						
700	WELD	1,527.1	700	0.0	49.1	47.91784914	-103.35292049	2406.693						
710	WELD	1,576.2	710	0.0	45.3	47.91782413	-103.35311702	2404.842						
720	WELD	1,621.5	720	0.0	49.5	47.91780136	-103.35329841	2403.179						
730	WELD	1,671.0	730	0.0	49.4	47.91777783	-103.35349697	2402.273						
740	WELD	1,720.4	740	0.0	49.5	47.91775588	-103.35369596	2401.983						
750	WELD	1,769.8	750	0.0	49.4	47.91773304	-103.35389438	2402.822						
760	WELD	1,819.2	760	0.0	49.6	47.91770819	-103.35409222	2400.244						
770	WELD	1,868.7	770	0.0	49.6	47.91768193	-103.35428952	2395.880						
780	WELD	1,918.3	780	0.0	49.5	47.91765593	-103.35448774	2393.430						
790	WELD	1,967.8	790	0.0	49.2	47.91763082	-103.35468599	2392.516						
800	WELD	2,017.0	800	0.0	49.5	47.91760580	-103.35488291	2391.461						
810	WELD	2,066.5	810	0.0	49.5	47.91757978	-103.35508042	2389.148						
820	WELD	2,115.9	820	0.0	49.5	47.91755426	-103.35527798	2386.948						
830	WELD	2,165.4	830	0.0	49.6	47.91753036	-103.35547663	2386.153						
840	WELD	2,215.0	840	0.0	49.5	47.91750784	-103.35567622	2386.124						



# Pipeline Listing

TDW Services, Inc.

Hiland Crude, LLC  
East Camp Creek to Camp Creek

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)	Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
850	WELD	2,264.6	850	0.0	49.5	47.91748617	-103.35587545	2387.213						
860	WELD	2,314.1	860	0.0	47.6	47.91746322	-103.35607450	2387.633						
870	WELD	2,361.7	870	0.0	49.6	47.91743865	-103.35626479	2387.601						
880	WELD	2,411.3	880	0.0	49.6	47.91741250	-103.35646284	2388.942						
890	WELD	2,460.9	890	0.0	49.3	47.91738676	-103.35666035	2391.096						
900	WELD	2,510.2	900	0.0	49.6	47.91736019	-103.35685672	2391.965						
910	WELD	2,559.8	910	0.0	49.3	47.91733395	-103.35705439	2392.558						
920	WELD	2,609.1	920	0.0	49.5	47.91731108	-103.35725182	2392.943						
930	WELD	2,658.7	930	0.0	49.6	47.91729070	-103.35745055	2391.396						
940	WELD	2,708.3	940	0.0	48.5	47.91726876	-103.35764923	2388.956						
950	WELD	2,756.8	950	0.0	49.3	47.91724762	-103.35784354	2387.008						
960	WELD	2,806.1	960	0.0	48.9	47.91722600	-103.35804083	2386.677						
970	WELD	2,855.0	970	0.0	49.4	47.91720363	-103.35823716	2386.830						
980	WELD	2,904.5	980	0.0	49.5	47.91718072	-103.35843509	2388.069						
990	WELD	2,953.9	990	0.0	49.6	47.91715738	-103.35863332	2389.603						
1000	WELD	3,003.5	1000	0.0	49.6	47.91713344	-103.35883187	2390.132						
1010	WELD	3,053.2	1010	0.0	49.6	47.91710929	-103.35903021	2390.806						
1020	WELD	3,102.8	1020	0.0	49.6	47.91708553	-103.35922916	2392.251						
1030	WELD	3,152.3	1030	0.0	49.6	47.91706316	-103.35942816	2393.540						
1040	WELD	3,201.9	1040	0.0	49.6	47.91704147	-103.35962733	2395.817						
1050	WELD	3,251.6	1050	0.0	47.1	47.91702069	-103.35982690	2397.208						
1060	WELD	3,298.7	1060	0.0	49.5	47.91700326	-103.36001660	2398.353						
1070	WELD	3,348.2	1070	0.0	49.6	47.91698622	-103.36021696	2399.801						
1080	WELD	3,397.8	1080	0.0	49.1	47.91697159	-103.36041741	2400.578						
1090	WELD	3,446.9	1090	0.0	46.2	47.91695929	-103.36061647	2401.371						
1100	WELD	3,493.1	1100	0.0	49.6	47.91695167	-103.36080452	2400.723						
1110	WELD	3,542.7	1110	0.0	49.7	47.91694738	-103.36100619	2398.360						
1120	WELD	3,592.3	1120	0.0	48.6	47.91694278	-103.36120786	2396.469						
1130	WELD	3,641.0	1130	0.0	49.6	47.91693761	-103.36140544	2394.541						
1140	WELD	3,690.6	1140	0.0	49.6	47.91693135	-103.36160701	2392.655						
1150	WELD	3,740.2	1150	0.0	49.5	47.91692491	-103.36180853	2391.418						
1160	WELD	3,789.7	1160	0.0	49.6	47.91691953	-103.36201015	2390.797						
1170	WELD	3,839.3	1170	0.0	49.3	47.91691377	-103.36221185	2390.434						
1180	WELD	3,888.6	1180	0.0	49.6	47.91691010	-103.36241242	2388.360						
1190	WELD	3,938.2	1190	0.0	49.6	47.91690640	-103.36261377	2386.020						
1200	WELD	3,987.8	1200	0.0	46.2	47.91690256	-103.36281522	2384.704						
1210	WELD	4,034.0	1210	0.0	49.3	47.91689842	-103.36300272	2384.554						



# Pipeline Listing

TDW Services, Inc.

Hiland Crude, LLC  
East Camp Creek to Camp Creek

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)	Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
1220	WELD	4,083.3	1220	0.0	49.7	47.91688928	-103.36320230	2383.462						
1230	WELD	4,133.0	1230	0.0	49.0	47.91687417	-103.36340229	2383.660						
1240	WELD	4,182.0	1240	0.0	8.9	47.91685653	-103.36359955	2384.929						
1250	WELD	4,190.8	1250	0.0	1.2	47.91685316	-103.36363533	2385.034						
10000028	Bend left - 36 deg., 3D	4,191.4	1250	0.1	1.1	47.91685271	-103.36363750	2385.042	0	12:00				
1260	WELD	4,192.1	1260	0.0	14.1	47.91685185	-103.36363952	2385.032						
1270	WELD	4,206.2	1270	0.0	48.9	47.91682566	-103.36368208	2384.722						
1280	WELD	4,255.0	1280	0.0	49.6	47.91673418	-103.36382682	2384.104						
1290	WELD	4,304.6	1290	0.0	49.6	47.91663852	-103.36396913	2383.937						
1300	WELD	4,354.2	1300	0.0	49.6	47.91653955	-103.36410617	2385.095						
1310	WELD	4,403.9	1310	0.0	49.6	47.91643642	-103.36423729	2385.600						
1320	WELD	4,453.5	1320	0.0	49.5	47.91632992	-103.36436173	2384.180						
1330	WELD	4,503.0	1330	0.0	49.5	47.91622106	-103.36448075	2382.572						
1340	WELD	4,552.5	1340	0.0	49.6	47.91610951	-103.36459288	2380.175						
1350	WELD	4,602.1	1350	0.0	49.6	47.91599486	-103.36469984	2378.620						
1360	WELD	4,651.7	1360	0.0	49.6	47.91587843	-103.36480278	2378.410						
1370	WELD	4,701.3	1370	0.0	49.6	47.91576191	-103.36490517	2379.207						
1380	WELD	4,750.9	1380	0.0	49.6	47.91564586	-103.36500857	2379.715						
1390	WELD	4,800.5	1390	0.0	49.5	47.91553031	-103.36511412	2379.251						
1400	WELD	4,850.0	1400	0.0	49.5	47.91541548	-103.36521963	2378.832						
1410	WELD	4,899.5	1410	0.0	49.6	47.91530065	-103.36532598	2377.727						
1420	WELD	4,949.1	1420	0.0	49.7	47.91518650	-103.36543324	2376.528						
1430	WELD	4,998.7	1430	0.0	49.4	47.91507196	-103.36554079	2374.889						
1440	WELD	5,048.2	1440	0.0	49.4	47.91495779	-103.36564733	2374.738						
1450	WELD	5,097.6	1450	0.0	48.9	47.91484420	-103.36575562	2376.330						
1460	WELD	5,146.5	1460	0.0	49.5	47.91473165	-103.36586233	2379.995						
1470	WELD	5,196.1	1470	0.0	49.5	47.91461732	-103.36596956	2381.673						
1480	WELD	5,245.6	1480	0.0	49.4	47.91450224	-103.36607507	2379.974						
1490	WELD	5,295.0	1490	0.0	49.7	47.91438796	-103.36618109	2376.629						
1500	WELD	5,344.7	1500	0.0	49.7	47.91427411	-103.36628937	2372.434						
1510	WELD	5,394.4	1510	0.0	49.7	47.91416023	-103.36639721	2367.442						
1520	WELD	5,444.1	1520	0.0	49.7	47.91404580	-103.36650389	2363.215						
1530	WELD	5,493.8	1530	0.0	49.7	47.91393159	-103.36661200	2359.701						
1540	WELD	5,543.5	1540	0.0	49.6	47.91381845	-103.36672319	2357.061						
1550	WELD	5,593.1	1550	0.0	49.7	47.91370522	-103.36683442	2356.015						
1560	WELD	5,642.8	1560	0.0	49.7	47.91359211	-103.36694628	2356.724						
1570	WELD	5,692.4	1570	0.0	49.7	47.91347892	-103.36705735	2357.094						



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ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)	Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
1580	WELD	5,742.1	1580	0.0	49.7	47.91336364	-103.36716395	2356.988						
1590	WELD	5,791.8	1590	0.0	49.6	47.91324600	-103.36726449	2357.770						
1600	WELD	5,841.4	1600	0.0	49.5	47.91312521	-103.36735652	2359.704						
1610	WELD	5,890.9	1610	0.0	49.4	47.91300160	-103.36743744	2362.353						
1620	WELD	5,940.3	1620	0.0	49.5	47.91287381	-103.36750075	2364.818						
1630	WELD	5,989.8	1630	0.0	49.6	47.91274245	-103.36754789	2365.902						
1640	WELD	6,039.4	1640	0.0	49.6	47.91260903	-103.36758490	2366.570						
1650	WELD	6,089.0	1650	0.0	49.3	47.91247481	-103.36761411	2365.961						
1660	WELD	6,138.3	1660	0.0	49.5	47.91234083	-103.36763357	2365.393						
1670	WELD	6,187.8	1670	0.0	49.5	47.91220581	-103.36764333	2365.664						
1680	WELD	6,237.3	1680	0.0	49.6	47.91207043	-103.36764580	2367.066						
1690	WELD	6,286.9	1690	0.0	49.6	47.91193471	-103.36764446	2367.577						
1700	WELD	6,336.5	1700	0.0	49.6	47.91179910	-103.36764242	2367.987						
1710	WELD	6,386.1	1710	0.0	49.6	47.91166367	-103.36764100	2367.920						
40000001	Metal Loss - EXTERNAL	6,394.0	1710	7.9	41.7	47.91164210	-103.36764100	2367.951	291	9:30	11%	0.86	0.57	1760 100%
1720	WELD	6,435.6	1720	0.0	49.6	47.91152814	-103.36764239	2367.982						
1730	WELD	6,485.2	1730	0.0	49.6	47.91139267	-103.36764577	2368.219						
1740	WELD	6,534.9	1740	0.0	49.5	47.91125691	-103.36764690	2367.346						
1750	WELD	6,584.4	1750	0.0	49.4	47.91112220	-103.36764500	2362.870						
1760	WELD	6,633.8	1760	0.0	49.4	47.91098796	-103.36764525	2359.002						
1770	WELD	6,683.2	1770	0.0	49.6	47.91085282	-103.36764730	2356.949						
1780	WELD	6,732.8	1780	0.0	49.2	47.91071738	-103.36764890	2356.024						
1790	WELD	6,782.0	1790	0.0	40.5	47.91058267	-103.36765204	2354.675						
1800	WELD	6,822.5	1800	0.0	40.6	47.91047223	-103.36765570	2353.201						
1810	WELD	6,863.1	1810	0.0	18.4	47.91036137	-103.36765630	2351.969						
11000004	WT CHANGE	6,881.4	1810	0.0	0.0	47.91031110	-103.36765600	2352.179				0.322	52000	0.72
1820	WELD	6,881.5	1820	0.0	4.8	47.91031104	-103.36765600	2352.180						
1830	WELD	6,886.3	1830	0.0	2.1	47.91029793	-103.36765590	2352.286						
10000029	Valve	6,887.3	1830	1.0	1.0	47.91029513	-103.36765581	2352.302						
11000005	WT CHANGE	6,888.3	1830	0.0	0.0	47.91029241	-103.36765580	2352.315				0.188	52000	0.72
1840	WELD	6,888.3	1840	0.0	6.3	47.91029235	-103.36765580	2352.315						
1850	WELD	6,894.7	1850	0.0	46.7	47.91027512	-103.36765570	2352.449						
1860	WELD	6,941.4	1860	0.0	49.2	47.91014713	-103.36765320	2353.564						
1870	WELD	6,990.6	1870	0.0	49.6	47.91001264	-103.36765240	2354.991						
1880	WELD	7,040.2	1880	0.0	49.5	47.90987750	-103.36765340	2357.713						
1890	WELD	7,089.7	1890	0.0	49.2	47.90974213	-103.36765788	2357.171						
1900	WELD	7,138.9	1900	0.0	49.6	47.90960855	-103.36766824	2352.680						



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1910	WELD	7,188.5	1910	0.0	49.4	47.90947402	-103.36768198	2347.842						
1920	WELD	7,237.9	1920	0.0	49.6	47.90933941	-103.36769633	2345.144						
1930	WELD	7,287.5	1930	0.0	49.1	47.90920453	-103.36771030	2341.945						
1940	WELD	7,336.6	1940	0.0	49.5	47.90907127	-103.36772316	2337.596						
1950	WELD	7,386.1	1950	0.0	49.3	47.90893716	-103.36773528	2332.564						
1960	WELD	7,435.4	1960	0.0	49.4	47.90880358	-103.36774721	2327.640						
1970	WELD	7,484.8	1970	0.0	49.3	47.90866979	-103.36776079	2321.998						
1980	WELD	7,534.1	1980	0.0	49.3	47.90853656	-103.36777406	2316.235						
1990	WELD	7,583.4	1990	0.0	48.9	47.90840342	-103.36778522	2309.489						
2000	WELD	7,632.4	2000	0.0	49.7	47.90827202	-103.36779481	2301.748						
2010	WELD	7,682.0	2010	0.0	48.9	47.90813765	-103.36780682	2296.490						
2020	WELD	7,731.0	2020	0.0	49.6	47.90800447	-103.36781962	2300.792						
2030	WELD	7,780.6	2030	0.0	49.6	47.90787042	-103.36783298	2307.076						
2040	WELD	7,830.1	2040	0.0	49.3	47.90773555	-103.36784634	2310.092						
2050	WELD	7,879.5	2050	0.0	49.6	47.90760138	-103.36785954	2312.269						
2060	WELD	7,929.1	2060	0.0	49.6	47.90746616	-103.36787232	2313.626						
2070	WELD	7,978.6	2070	0.0	49.1	47.90733095	-103.36788490	2314.570						
2080	WELD	8,027.7	2080	0.0	39.2	47.90719718	-103.36789814	2315.031						
2090	WELD	8,066.9	2090	0.0	49.4	47.90709045	-103.36790858	2317.699						
2100	WELD	8,116.3	2100	0.0	49.3	47.90695623	-103.36792191	2321.520						
12000001	Debris @ 12:00	8,141.3	2100	25.0	24.2	47.90688803	-103.36792926	2322.559						
2110	WELD	8,165.5	2110	0.0	49.6	47.90682208	-103.36793754	2322.830						
2120	WELD	8,215.1	2120	0.0	24.2	47.90668837	-103.36796090	2317.476						
2130	WELD	8,239.2	2130	0.0	24.6	47.90662358	-103.36797367	2314.413						
2140	WELD	8,263.8	2140	0.0	49.7	47.90655775	-103.36798808	2310.610						
2150	WELD	8,313.5	2150	0.0	49.3	47.90642528	-103.36801909	2303.131						
2160	WELD	8,362.8	2160	0.0	49.3	47.90629256	-103.36805001	2301.234						
2170	WELD	8,412.1	2170	0.0	51.1	47.90615987	-103.36808147	2303.811						
2180	WELD	8,463.2	2180	0.0	49.5	47.90602190	-103.36811303	2306.502						
2190	WELD	8,512.7	2190	0.0	49.6	47.90588797	-103.36813907	2311.164						
2200	WELD	8,562.3	2200	0.0	49.5	47.90575445	-103.36816173	2318.175						
2210	WELD	8,611.8	2210	0.0	49.7	47.90562180	-103.36818069	2326.940						
2220	WELD	8,661.5	2220	0.0	49.6	47.90548756	-103.36818293	2330.289						
2230	WELD	8,711.1	2230	0.0	49.6	47.90535487	-103.36816641	2321.908						
2240	WELD	8,760.7	2240	0.0	49.5	47.90522205	-103.36814814	2313.363						
2250	WELD	8,810.2	2250	0.0	49.5	47.90508806	-103.36813085	2307.423						
2260	WELD	8,859.8	2260	0.0	49.1	47.90495366	-103.36811371	2303.083						



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2270	WELD	8,908.8	2270	0.0	49.6	47.90482020	-103.36809647	2299.774						
2280	WELD	8,958.5	2280	0.0	49.7	47.90468494	-103.36807980	2297.215						
2290	WELD	9,008.2	2290	0.0	49.6	47.90454975	-103.36806359	2295.881						
2300	WELD	9,057.8	2300	0.0	49.5	47.90441452	-103.36804716	2294.997						
2310	WELD	9,107.3	2310	0.0	49.5	47.90427959	-103.36803175	2294.127						
2320	WELD	9,156.7	2320	0.0	49.6	47.90414478	-103.36801682	2293.261						
2330	WELD	9,206.3	2330	0.0	49.4	47.90400956	-103.36799879	2292.489						
2340	WELD	9,255.8	2340	0.0	49.4	47.90387520	-103.36797615	2291.682						
2350	WELD	9,305.2	2350	0.0	49.6	47.90374125	-103.36795226	2290.807						
2360	WELD	9,354.7	2360	0.0	49.1	47.90360588	-103.36794044	2290.012						
10000030	Bend right - 10 deg., 129D	9,380.5	2360	18.2	30.8	47.90353550	-103.36794901	2289.949	0	12:00				
2370	WELD	9,403.8	2370	0.0	49.5	47.90347325	-103.36796970	2290.154						
2380	WELD	9,453.3	2380	0.0	49.5	47.90334379	-103.36802937	2289.988						
2390	WELD	9,502.8	2390	0.0	49.1	47.90321578	-103.36809476	2289.849						
2400	WELD	9,551.9	2400	0.0	49.4	47.90308789	-103.36815449	2290.022						
2410	WELD	9,601.3	2410	0.0	49.5	47.90295872	-103.36821305	2290.206						
2420	WELD	9,650.8	2420	0.0	49.7	47.90282936	-103.36827330	2290.669						
2430	WELD	9,700.5	2430	0.0	49.2	47.90269972	-103.36833451	2291.127						
2440	WELD	9,749.7	2440	0.0	49.6	47.90257145	-103.36839524	2292.102						
2450	WELD	9,799.4	2450	0.0	49.5	47.90244220	-103.36845599	2292.223						
2460	WELD	9,848.8	2460	0.0	49.4	47.90231315	-103.36851680	2292.812						
2470	WELD	9,898.2	2470	0.0	48.4	47.90218406	-103.36857766	2292.197						
2480	WELD	9,946.6	2480	0.0	49.5	47.90205783	-103.36863820	2291.548						
2490	WELD	9,996.2	2490	0.0	36.2	47.90192858	-103.36869976	2291.513						
2500	WELD	10,032.4	2500	0.0	1.5	47.90183438	-103.36874486	2291.488						
10000031	Bend right-up - 45 deg., 3D	10,033.2	2500	0.2	1.4	47.90183251	-103.36874647	2291.477	0	12:00				
2510	WELD	10,033.9	2510	0.0	35.8	47.90183121	-103.36874884	2291.476						
10000032	Bend right - 17 deg., 74D	10,058.0	2510	16.7	19.1	47.90180234	-103.36883673	2291.952	0	12:00				
2520	WELD	10,069.7	2520	0.0	16.1	47.90179446	-103.36888314	2292.638						
2530	WELD	10,085.8	2530	0.0	49.1	47.90178503	-103.36894707	2293.629						
10000033	AGM 020, Sta. 104+00, AGM is in fence line -- Survey Point	10,119.6	2530	33.7	15.4	47.90176505	-103.36908090	2295.231						
2540	WELD	10,135.0	2540	0.0	47.1	47.90175571	-103.36914188	2295.582						
2550	WELD	10,182.1	2550	0.0	49.6	47.90172650	-103.36932868	2294.250						
2560	WELD	10,231.7	2560	0.0	49.4	47.90169539	-103.36952430	2290.950						



# Pipeline Listing

TDW Services, Inc.

Hiland Crude, LLC  
East Camp Creek to Camp Creek

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)	Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
2570	WELD	10,281.1	2570	0.0	49.1	47.90166494	-103.36971964	2288.458						
2580	WELD	10,330.2	2580	0.0	49.0	47.90163443	-103.36991393	2286.104						
2590	WELD	10,379.2	2590	0.0	49.5	47.90160272	-103.37010702	2282.987						
2600	WELD	10,428.7	2600	0.0	49.3	47.90157022	-103.37030231	2280.192						
2610	WELD	10,478.0	2610	0.0	49.4	47.90153838	-103.37049728	2277.482						
2620	WELD	10,527.4	2620	0.0	49.0	47.90150778	-103.37069312	2275.495						
2630	WELD	10,576.4	2630	0.0	49.4	47.90147793	-103.37088735	2272.760						
2640	WELD	10,625.8	2640	0.0	49.6	47.90144658	-103.37108255	2270.646						
2650	WELD	10,675.4	2650	0.0	49.3	47.90141519	-103.37127841	2268.207						
2660	WELD	10,724.7	2660	0.0	49.6	47.90138448	-103.37147339	2266.030						
2670	WELD	10,774.3	2670	0.0	49.0	47.90135320	-103.37166944	2264.523						
2680	WELD	10,823.2	2680	0.0	48.9	47.90132155	-103.37186227	2267.949						
2690	WELD	10,872.1	2690	0.0	49.4	47.90128922	-103.37205545	2270.049						
2700	WELD	10,921.6	2700	0.0	48.4	47.90126000	-103.37225175	2272.068						
2710	WELD	10,970.0	2710	0.0	49.5	47.90123160	-103.37244222	2278.698						
2720	WELD	11,019.6	2720	0.0	48.8	47.90120031	-103.37263726	2284.613						
2730	WELD	11,068.4	2730	0.0	49.0	47.90116940	-103.37282854	2292.023						
2740	WELD	11,117.4	2740	0.0	49.4	47.90113950	-103.37302019	2300.746						
2750	WELD	11,166.8	2750	0.0	49.3	47.90111029	-103.37321074	2312.265						
2760	WELD	11,216.1	2760	0.0	49.4	47.90108445	-103.37340335	2321.595						
2770	WELD	11,265.5	2770	0.0	49.4	47.90107101	-103.37360298	2321.870						
2780	WELD	11,314.9	2780	0.0	49.3	47.90106698	-103.37380294	2317.969						
2790	WELD	11,364.2	2790	0.0	49.3	47.90106751	-103.37400238	2312.620						
2800	WELD	11,413.5	2800	0.0	49.3	47.90107045	-103.37420226	2308.806						
2810	WELD	11,462.8	2810	0.0	49.4	47.90107476	-103.37440241	2305.228						
2820	WELD	11,512.1	2820	0.0	47.7	47.90107845	-103.37460242	2301.797						
2830	WELD	11,559.9	2830	0.0	49.3	47.90108167	-103.37479614	2298.856						
2840	WELD	11,609.1	2840	0.0	49.4	47.90108521	-103.37499585	2295.687						
2850	WELD	11,658.5	2850	0.0	49.1	47.90108882	-103.37519635	2292.526						
2860	WELD	11,707.6	2860	0.0	49.5	47.90109163	-103.37539598	2290.215						
2870	WELD	11,757.1	2870	0.0	49.6	47.90109489	-103.37559660	2287.183						
2880	WELD	11,806.7	2880	0.0	49.6	47.90109956	-103.37579754	2283.344						
2890	WELD	11,856.3	2890	0.0	48.4	47.90110398	-103.37599840	2279.038						
2900	WELD	11,904.7	2900	0.0	49.4	47.90110737	-103.37619485	2275.366						
2910	WELD	11,954.1	2910	0.0	49.5	47.90111215	-103.37639476	2270.943						
2920	WELD	12,003.6	2920	0.0	49.3	47.90111713	-103.37659464	2266.281						
2930	WELD	12,052.8	2930	0.0	49.2	47.90112224	-103.37679439	2263.076						



# Pipeline Listing

TDW Services, Inc.

Hiland Crude, LLC  
East Camp Creek to Camp Creek

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)	Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
2940	WELD	12,102.1	2940	0.0	49.5	47.90112696	-103.37699372	2260.832						
2950	WELD	12,151.6	2950	0.0	49.4	47.90113059	-103.37719447	2257.562						
2960	WELD	12,201.0	2960	0.0	49.4	47.90113332	-103.37739508	2255.337						
2970	WELD	12,250.4	2970	0.0	49.2	47.90113558	-103.37759566	2251.702						
2980	WELD	12,299.6	2980	0.0	49.5	47.90113824	-103.37779526	2249.379						
2990	WELD	12,349.1	2990	0.0	49.1	47.90114133	-103.37799602	2245.816						
3000	WELD	12,398.2	3000	0.0	49.4	47.90114514	-103.37819456	2241.012						
3010	WELD	12,447.7	3010	0.0	49.5	47.90115044	-103.37839511	2242.778						
3020	WELD	12,497.2	3020	0.0	49.6	47.90115542	-103.37859535	2247.673						
3030	WELD	12,546.8	3030	0.0	49.6	47.90115802	-103.37879520	2241.658						
3040	WELD	12,596.3	3040	0.0	49.2	47.90116175	-103.37899303	2232.809						
3050	WELD	12,645.6	3050	0.0	49.5	47.90116858	-103.37919223	2229.382						
3060	WELD	12,695.0	3060	0.0	49.4	47.90117696	-103.37939244	2228.193						
3070	WELD	12,744.4	3070	0.0	49.4	47.90118319	-103.37959277	2230.988						
3080	WELD	12,793.8	3080	0.0	49.5	47.90118689	-103.37979320	2232.128						
10000034	Bend left - 12 deg., 78D	12,830.4	3080	30.4	19.1	47.90118734	-103.37994182	2232.009	0	12:00				
3090	WELD	12,843.3	3090	0.0	49.5	47.90118217	-103.37999389	2233.052						
3100	WELD	12,892.9	3100	0.0	49.6	47.90115907	-103.38019185	2236.425						
3110	WELD	12,942.5	3110	0.0	49.0	47.90113356	-103.38039003	2237.402						
3120	WELD	12,991.5	3120	0.0	49.3	47.90110761	-103.38058550	2237.850						
3130	WELD	13,040.8	3130	0.0	49.1	47.90108133	-103.38078254	2238.894						
3140	WELD	13,089.9	3140	0.0	49.5	47.90105537	-103.38097840	2238.201						
3150	WELD	13,139.3	3150	0.0	49.2	47.90103056	-103.38117643	2238.179						
3160	WELD	13,188.6	3160	0.0	49.5	47.90100595	-103.38137318	2238.692						
3170	WELD	13,238.1	3170	0.0	49.4	47.90097901	-103.38157094	2238.742						
3180	WELD	13,287.5	3180	0.0	48.9	47.90095244	-103.38176752	2238.619						
3190	WELD	13,336.3	3190	0.0	48.7	47.90092662	-103.38196256	2238.294						
3200	WELD	13,385.1	3200	0.0	49.5	47.90090014	-103.38215675	2237.466						
3210	WELD	13,434.6	3210	0.0	49.4	47.90087381	-103.38235427	2237.129						
3220	WELD	13,484.0	3220	0.0	49.6	47.90084822	-103.38255112	2236.966						
3230	WELD	13,533.6	3230	0.0	49.5	47.90082223	-103.38274897	2237.728						
3240	WELD	13,583.1	3240	0.0	42.9	47.90079569	-103.38294550	2238.913						
3250	WELD	13,626.0	3250	0.0	49.5	47.90077237	-103.38311600	2240.457						
3260	WELD	13,675.5	3260	0.0	49.3	47.90074650	-103.38331303	2243.132						
3270	WELD	13,724.8	3270	0.0	49.5	47.90072156	-103.38350969	2244.577						
3280	WELD	13,774.4	3280	0.0	49.5	47.90069642	-103.38370693	2245.752						
3290	WELD	13,823.8	3290	0.0	49.6	47.90067056	-103.38390391	2246.455						



# Pipeline Listing

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East Camp Creek to Camp Creek

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)	Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
3300	WELD	13,873.4	3300	0.0	49.6	47.90064290	-103.38410068	2246.243						
3310	WELD	13,923.0	3310	0.0	49.4	47.90061602	-103.38429821	2246.776						
3320	WELD	13,972.4	3320	0.0	49.7	47.90058889	-103.38449426	2247.319						
3330	WELD	14,022.1	3330	0.0	49.5	47.90055829	-103.38469033	2247.087						
3340	WELD	14,071.6	3340	0.0	49.5	47.90052569	-103.38488511	2247.287						
3350	WELD	14,121.1	3350	0.0	49.6	47.90048934	-103.38507827	2247.958						
3360	WELD	14,170.6	3360	0.0	49.6	47.90044640	-103.38526918	2248.668						
3370	WELD	14,220.3	3370	0.0	49.7	47.90040271	-103.38545959	2249.533						
3380	WELD	14,270.0	3380	0.0	49.6	47.90035790	-103.38564965	2250.872						
3390	WELD	14,319.6	3390	0.0	49.6	47.90031149	-103.38583827	2252.922						
3400	WELD	14,369.2	3400	0.0	49.6	47.90026085	-103.38602436	2256.564						
10000035	Bend left - 10 deg., 114D	14,397.7	3400	20.5	29.1	47.90022840	-103.38612872	2259.015	0	12:00				
3410	WELD	14,418.8	3410	0.0	49.5	47.90019829	-103.38620148	2260.866						
3420	WELD	14,468.3	3420	0.0	49.5	47.90012818	-103.38637236	2265.001						
3430	WELD	14,517.8	3430	0.0	49.7	47.90005829	-103.38654386	2267.825						
3440	WELD	14,567.5	3440	0.0	45.4	47.89998729	-103.38671525	2268.636						
3450	WELD	14,612.9	3450	0.0	49.4	47.89992253	-103.38687213	2269.465						
3460	WELD	14,662.3	3460	0.0	49.5	47.89985264	-103.38704296	2270.692						
3470	WELD	14,711.8	3470	0.0	49.5	47.89978397	-103.38721533	2271.235						
3480	WELD	14,761.2	3480	0.0	49.6	47.89971534	-103.38738770	2271.047						
3490	WELD	14,810.9	3490	0.0	49.6	47.89964634	-103.38756059	2270.547						
3500	WELD	14,860.4	3500	0.0	49.7	47.89957712	-103.38773280	2269.211						
3510	WELD	14,910.1	3510	0.0	49.7	47.89950852	-103.38790612	2267.313						
3520	WELD	14,959.9	3520	0.0	49.6	47.89944127	-103.38808074	2265.085						
3530	WELD	15,009.4	3530	0.0	49.5	47.89937458	-103.38825520	2263.200						
3540	WELD	15,058.9	3540	0.0	49.4	47.89930780	-103.38842928	2262.285						
3550	WELD	15,108.3	3550	0.0	49.5	47.89924084	-103.38860294	2262.595						
3560	WELD	15,157.8	3560	0.0	49.3	47.89917465	-103.38877775	2263.558						
3570	WELD	15,207.1	3570	0.0	49.5	47.89910959	-103.38895241	2265.102						
3580	WELD	15,256.6	3580	0.0	49.2	47.89904362	-103.38912746	2267.302						
10000036	Bend left-down - 18 deg., 93D	15,287.5	3580	20.1	29.1	47.89899845	-103.38923375	2267.772	0	12:00				
3590	WELD	15,305.8	3590	0.0	49.4	47.89896426	-103.38928713	2265.848						
3600	WELD	15,355.2	3600	0.0	49.4	47.89886874	-103.38942607	2259.072						
3610	WELD	15,404.7	3610	0.0	49.4	47.89877208	-103.38956365	2252.946						
3620	WELD	15,454.1	3620	0.0	49.6	47.89867518	-103.38970088	2246.682						
3630	WELD	15,503.7	3630	0.0	49.5	47.89857912	-103.38984136	2241.912						



# Pipeline Listing

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East Camp Creek to Camp Creek

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)	Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
3640	WELD	15,553.2	3640	0.0	48.7	47.89848454	-103.38998443	2238.556						
3650	WELD	15,601.9	3650	0.0	42.7	47.89839296	-103.39012773	2237.123						
10000037	Bend right - 18 deg., 88D	15,618.8	3650	7.6	35.1	47.89836317	-103.39018021	2237.133	0 12:00					
11000006	WT CHANGE	15,644.6	3650	0.0	0.0	47.89833076	-103.39027320	2236.565			0.322	52000	0.72	
3660	WELD	15,644.6	3660	0.0	41.1	47.89833074	-103.39027327	2236.564						
3670	WELD	15,685.7	3670	0.0	42.2	47.89828337	-103.39042474	2235.695						
3680	WELD	15,727.9	3680	0.0	42.2	47.89824037	-103.39058386	2234.535						
3690	WELD	15,770.2	3690	0.0	42.3	47.89820033	-103.39074459	2234.820						
3700	WELD	15,812.5	3700	0.0	42.3	47.89815628	-103.39090319	2234.094						
3710	WELD	15,854.8	3710	0.0	42.3	47.89810898	-103.39105941	2231.517						
10000094	AGM 030, Sta. 161+50, AGM is 100' D/S of CR 31 C/L -- Survey Point	15,865.5	3710	10.7	31.5	47.89809682	-103.39109890	2231.040						
3720	WELD	15,897.0	3720	0.0	41.9	47.89806093	-103.39121510	2230.119						
11000007	WT CHANGE	15,938.9	3720	0.0	0.0	47.89801299	-103.39136907	2229.206			0.188	52000	0.72	
3730	WELD	15,938.9	3730	0.0	48.7	47.89801297	-103.39136914	2229.205						
3740	WELD	15,987.6	3740	0.0	48.4	47.89795641	-103.39154823	2228.837						
3750	WELD	16,036.0	3750	0.0	32.9	47.89790165	-103.39172707	2227.045						
3760	WELD	16,068.9	3760	0.0	49.2	47.89786445	-103.39184915	2226.305						
3770	WELD	16,118.1	3770	0.0	49.0	47.89780915	-103.39203112	2224.523						
3780	WELD	16,167.1	3780	0.0	49.4	47.89775455	-103.39221295	2222.751						
3790	WELD	16,216.5	3790	0.0	49.4	47.89769958	-103.39239596	2220.953						
3800	WELD	16,265.9	3800	0.0	49.4	47.89764473	-103.39257898	2218.262						
3810	WELD	16,315.2	3810	0.0	49.4	47.89758849	-103.39276035	2214.819						
3820	WELD	16,364.6	3820	0.0	49.5	47.89753168	-103.39294249	2212.863						
3830	WELD	16,414.2	3830	0.0	49.5	47.89747459	-103.39312459	2211.094						
3840	WELD	16,463.7	3840	0.0	49.5	47.89741703	-103.39330643	2209.265						
3850	WELD	16,513.2	3850	0.0	49.5	47.89735932	-103.39348848	2209.015						
3860	WELD	16,562.8	3860	0.0	49.5	47.89730228	-103.39367139	2208.461						
3870	WELD	16,612.3	3870	0.0	49.5	47.89724574	-103.39385444	2209.475						
3880	WELD	16,661.8	3880	0.0	49.5	47.89718860	-103.39403699	2210.493						
3890	WELD	16,711.3	3890	0.0	49.3	47.89713079	-103.39421885	2210.858						
3900	WELD	16,760.6	3900	0.0	49.5	47.89707385	-103.39440028	2211.650						
3910	WELD	16,810.1	3910	0.0	49.4	47.89701695	-103.39458271	2211.905						
3920	WELD	16,859.5	3920	0.0	49.7	47.89695919	-103.39476426	2212.644						
3930	WELD	16,909.2	3930	0.0	49.4	47.89690060	-103.39494641	2212.904						
3940	WELD	16,958.6	3940	0.0	49.6	47.89684289	-103.39512759	2215.964						



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East Camp Creek to Camp Creek

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)	Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
3950	WELD	17,008.2	3950	0.0	49.7	47.89678674	-103.39531106	2217.299						
3960	WELD	17,058.0	3960	0.0	49.8	47.89672987	-103.39549397	2219.065						
3970	WELD	17,107.7	3970	0.0	49.4	47.89667299	-103.39567664	2221.013						
3980	WELD	17,157.1	3980	0.0	49.7	47.89661664	-103.39585844	2223.007						
3990	WELD	17,206.8	3990	0.0	49.5	47.89655992	-103.39604138	2225.317						
4000	WELD	17,256.4	4000	0.0	49.8	47.89650302	-103.39622338	2226.566						
4010	WELD	17,306.1	4010	0.0	49.8	47.89644586	-103.39640637	2227.751						
4020	WELD	17,356.0	4020	0.0	49.5	47.89638871	-103.39658921	2229.723						
4030	WELD	17,405.4	4030	0.0	49.4	47.89633149	-103.39677072	2232.101						
4040	WELD	17,454.9	4040	0.0	49.6	47.89627362	-103.39695118	2234.936						
4050	WELD	17,504.5	4050	0.0	49.8	47.89621522	-103.39713249	2237.886						
4060	WELD	17,554.3	4060	0.0	49.7	47.89615583	-103.39731309	2241.073						
4070	WELD	17,604.0	4070	0.0	49.7	47.89609505	-103.39749278	2243.919						
4080	WELD	17,653.7	4080	0.0	49.7	47.89603195	-103.39767081	2248.048						
4090	WELD	17,703.4	4090	0.0	49.4	47.89596979	-103.39784884	2252.307						
4100	WELD	17,752.9	4100	0.0	49.8	47.89590896	-103.39802676	2256.787						
4110	WELD	17,802.7	4110	0.0	49.7	47.89584841	-103.39820676	2260.703						
4120	WELD	17,852.4	4120	0.0	49.8	47.89578895	-103.39838614	2265.746						
4130	WELD	17,902.1	4130	0.0	41.3	47.89573192	-103.39856781	2271.123						
4140	WELD	17,943.5	4140	0.0	49.7	47.89568439	-103.39871944	2273.881						
4150	WELD	17,993.2	4150	0.0	49.8	47.89562868	-103.39890197	2278.113						
4160	WELD	18,042.9	4160	0.0	49.8	47.89557472	-103.39908566	2282.340						
4170	WELD	18,092.7	4170	0.0	49.7	47.89552125	-103.39927008	2283.958						
4180	WELD	18,142.4	4180	0.0	49.6	47.89546501	-103.39945305	2285.620						
4190	WELD	18,192.1	4190	0.0	49.7	47.89540854	-103.39963541	2287.815						
4200	WELD	18,241.7	4200	0.0	49.7	47.89535305	-103.39981794	2292.808						
4210	WELD	18,291.4	4210	0.0	49.7	47.89529703	-103.39999752	2301.581						
4220	WELD	18,341.1	4220	0.0	49.3	47.89524041	-103.40017451	2312.907						
4230	WELD	18,390.4	4230	0.0	49.2	47.89518362	-103.40035000	2323.993						
4240	WELD	18,439.6	4240	0.0	43.1	47.89512410	-103.40052555	2333.123						
4250	WELD	18,482.7	4250	0.0	49.4	47.89506892	-103.40067936	2335.390						
4260	WELD	18,532.1	4260	0.0	49.5	47.89500563	-103.40085620	2335.378						
4270	WELD	18,581.6	4270	0.0	48.6	47.89494186	-103.40103374	2336.148						
4280	WELD	18,630.2	4280	0.0	28.0	47.89488002	-103.40120768	2337.718						
4290	WELD	18,658.2	4290	0.0	39.5	47.89484556	-103.40130899	2338.451						
4300	WELD	18,697.7	4300	0.0	49.6	47.89479757	-103.40145298	2337.162						
4310	WELD	18,747.3	4310	0.0	49.5	47.89473940	-103.40163380	2333.014						



# Pipeline Listing

TDW Services, Inc.

Hiland Crude, LLC  
East Camp Creek to Camp Creek

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)	Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
4320	WELD	18,796.8	4320	0.0	49.6	47.89468276	-103.40181571	2328.449						
4330	WELD	18,846.5	4330	0.0	49.6	47.89462601	-103.40199752	2323.535						
4340	WELD	18,896.1	4340	0.0	49.4	47.89457120	-103.40217994	2317.186						
4350	WELD	18,945.5	4350	0.0	49.3	47.89451762	-103.40236136	2309.776						
4360	WELD	18,994.8	4360	0.0	49.5	47.89446256	-103.40254104	2302.183						
4370	WELD	19,044.3	4370	0.0	49.5	47.89440667	-103.40272132	2294.642						
4380	WELD	19,093.8	4380	0.0	49.5	47.89435192	-103.40290390	2289.134						
4390	WELD	19,143.3	4390	0.0	49.5	47.89429900	-103.40308865	2286.442						
4400	WELD	19,192.8	4400	0.0	49.5	47.89424652	-103.40327398	2285.158						
4410	WELD	19,242.3	4410	0.0	49.5	47.89419436	-103.40345970	2283.670						
4420	WELD	19,291.8	4420	0.0	49.6	47.89414103	-103.40364420	2282.490						
4430	WELD	19,341.4	4430	0.0	49.6	47.89408623	-103.40382779	2279.800						
4440	WELD	19,390.9	4440	0.0	49.3	47.89403335	-103.40401213	2275.465						
4450	WELD	19,440.3	4450	0.0	49.6	47.89398352	-103.40419675	2270.195						
4460	WELD	19,489.8	4460	0.0	46.3	47.89393547	-103.40438396	2265.199						
4470	WELD	19,536.1	4470	0.0	49.6	47.89389328	-103.40456074	2262.815						
4480	WELD	19,585.7	4480	0.0	49.5	47.89385340	-103.40475301	2260.258						
4490	WELD	19,635.2	4490	0.0	49.6	47.89381776	-103.40494684	2258.950						
4500	WELD	19,684.8	4500	0.0	49.3	47.89378389	-103.40514189	2258.342						
4510	WELD	19,734.0	4510	0.0	49.5	47.89374701	-103.40533427	2257.800						
4520	WELD	19,783.5	4520	0.0	49.2	47.89370723	-103.40552669	2257.718						
4530	WELD	19,832.7	4530	0.0	49.5	47.89366700	-103.40571758	2257.725						
4540	WELD	19,882.2	4540	0.0	49.6	47.89362592	-103.40590939	2257.432						
4550	WELD	19,931.8	4550	0.0	49.6	47.89358167	-103.40609959	2256.201						
4560	WELD	19,981.4	4560	0.0	49.6	47.89353380	-103.40628775	2253.992						
4570	WELD	20,031.0	4570	0.0	49.3	47.89348477	-103.40647524	2250.784						
4580	WELD	20,080.3	4580	0.0	49.6	47.89343778	-103.40666230	2247.672						
4590	WELD	20,129.9	4590	0.0	49.6	47.89339158	-103.40685136	2245.440						
4600	WELD	20,179.5	4600	0.0	49.3	47.89334528	-103.40703915	2240.388						
4610	WELD	20,228.8	4610	0.0	49.5	47.89329967	-103.40722586	2234.961						
4620	WELD	20,278.3	4620	0.0	49.6	47.89325543	-103.40741512	2230.356						
4630	WELD	20,327.9	4630	0.0	49.6	47.89321368	-103.40760592	2226.983						
4640	WELD	20,377.4	4640	0.0	49.6	47.89317478	-103.40779835	2224.835						
4650	WELD	20,427.0	4650	0.0	49.3	47.89313759	-103.40799167	2223.527						
4660	WELD	20,476.3	4660	0.0	49.3	47.89310074	-103.40818429	2222.894						
4670	WELD	20,525.7	4670	0.0	49.7	47.89306270	-103.40837615	2221.762						
4680	WELD	20,575.4	4680	0.0	49.5	47.89302156	-103.40856830	2220.151						



# Pipeline Listing

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Hiland Crude, LLC  
East Camp Creek to Camp Creek

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)	Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
4690	WELD	20,624.8	4690	0.0	49.5	47.89297759	-103.40875722	2215.927						
4700	WELD	20,674.3	4700	0.0	49.7	47.89293393	-103.40894653	2211.627						
4710	WELD	20,724.0	4710	0.0	43.8	47.89289186	-103.40913715	2206.756						
4720	WELD	20,767.8	4720	0.0	1.0	47.89285447	-103.40930425	2201.570						
10000038	Bend left - 35 deg., 1.5D	20,768.3	4720	0.1	1.0	47.89285427	-103.40930637	2201.511	0 12:00					
4730	WELD	20,768.8	4730	0.0	6.1	47.89285435	-103.40930858	2201.469						
4740	WELD	20,774.9	4740	0.0	45.2	47.89285835	-103.40933275	2201.277						
4750	WELD	20,820.1	4750	0.0	49.6	47.89288794	-103.40951143	2200.222						
4760	WELD	20,869.7	4760	0.0	49.5	47.89292226	-103.40970655	2199.340						
4770	WELD	20,919.2	4770	0.0	49.2	47.89295803	-103.40990044	2198.767						
4780	WELD	20,968.5	4780	0.0	49.6	47.89299280	-103.41009385	2198.456						
4790	WELD	21,018.1	4790	0.0	49.5	47.89302739	-103.41028858	2198.271						
4800	WELD	21,067.6	4800	0.0	49.5	47.89306141	-103.41048362	2198.564						
4810	WELD	21,117.1	4810	0.0	49.5	47.89309442	-103.41067878	2198.800						
4820	WELD	21,166.7	4820	0.0	49.5	47.89312783	-103.41087381	2198.723						
4830	WELD	21,216.2	4830	0.0	49.5	47.89316158	-103.41106885	2198.464						
4840	WELD	21,265.8	4840	0.0	49.2	47.89319607	-103.41126333	2197.773						
4850	WELD	21,315.0	4850	0.0	34.1	47.89323257	-103.41145583	2198.026						
4860	WELD	21,349.1	4860	0.0	49.0	47.89325640	-103.41158972	2198.240						
11000008	WT CHANGE	21,398.0	4860	0.0	0.0	47.89328945	-103.41178211	2195.606			0.322	52000	0.72	
4870	WELD	21,398.1	4870	0.0	42.1	47.89328947	-103.41178222	2195.604						
4880	WELD	21,440.1	4880	0.0	42.3	47.89332272	-103.41194529	2192.761						
4890	WELD	21,482.4	4890	0.0	42.2	47.89335494	-103.41210947	2190.248						
4900	WELD	21,524.6	4900	0.0	42.2	47.89338050	-103.41227618	2189.797						
11000009	WT CHANGE	21,566.8	4900	0.0	0.0	47.89340491	-103.41244247	2192.921			0.188	52000	0.72	
4910	WELD	21,566.8	4910	0.0	36.3	47.89340493	-103.41244263	2192.923						
4920	WELD	21,603.2	4920	0.0	7.3	47.89342583	-103.41258660	2193.648						
4930	WELD	21,610.5	4930	0.0	49.5	47.89343003	-103.41261542	2193.480						
4940	WELD	21,660.0	4940	0.0	49.5	47.89345977	-103.41281192	2193.318						
4950	WELD	21,709.5	4950	0.0	49.5	47.89348976	-103.41300793	2195.385						
10000039	AGM 040, Sta. 220+50, AGM is 251' D/S of Rd C/L -- Survey Point	21,721.2	4950	11.7	37.8	47.89349694	-103.41305440	2195.552						
4960	WELD	21,759.0	4960	0.0	45.4	47.89352041	-103.41320383	2195.670						
4970	WELD	21,804.4	4970	0.0	49.6	47.89354957	-103.41338313	2196.340						
4980	WELD	21,854.0	4980	0.0	49.5	47.89358158	-103.41357854	2197.710						
4990	WELD	21,903.6	4990	0.0	49.7	47.89361438	-103.41377391	2198.243						



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ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)	Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
5000	WELD	21,953.2	5000	0.0	49.5	47.89364779	-103.41396915	2199.166						
5010	WELD	22,002.8	5010	0.0	49.5	47.89368067	-103.41416365	2199.545						
5020	WELD	22,052.3	5020	0.0	49.7	47.89371381	-103.41435910	2200.424						
5030	WELD	22,102.0	5030	0.0	49.6	47.89374811	-103.41455394	2201.109						
5040	WELD	22,151.6	5040	0.0	49.7	47.89378260	-103.41474853	2202.038						
5050	WELD	22,201.2	5050	0.0	44.3	47.89381588	-103.41494353	2203.796						
5060	WELD	22,245.5	5060	0.0	49.7	47.89384616	-103.41511764	2204.854						
5070	WELD	22,295.2	5070	0.0	49.6	47.89388006	-103.41531219	2206.852						
5080	WELD	22,344.9	5080	0.0	49.7	47.89391282	-103.41550762	2208.704						
5090	WELD	22,394.6	5090	0.0	49.6	47.89394476	-103.41570311	2210.874						
5100	WELD	22,444.2	5100	0.0	49.6	47.89397682	-103.41589869	2212.637						
5110	WELD	22,493.9	5110	0.0	49.7	47.89400934	-103.41609373	2214.853						
5120	WELD	22,543.5	5120	0.0	49.6	47.89404280	-103.41628822	2217.938						
5130	WELD	22,593.2	5130	0.0	49.7	47.89407636	-103.41648274	2220.366						
5140	WELD	22,642.9	5140	0.0	49.6	47.89410937	-103.41667733	2223.401						
5150	WELD	22,692.4	5150	0.0	49.7	47.89414329	-103.41687132	2225.591						
5160	WELD	22,742.1	5160	0.0	49.7	47.89417751	-103.41706535	2228.599						
5170	WELD	22,791.8	5170	0.0	49.4	47.89421028	-103.41725943	2233.059						
5180	WELD	22,841.3	5180	0.0	49.7	47.89424146	-103.41744991	2242.062						
5190	WELD	22,890.9	5190	0.0	49.6	47.89427387	-103.41763880	2253.973						
5200	WELD	22,940.6	5200	0.0	49.6	47.89430881	-103.41782783	2264.351						
5210	WELD	22,990.2	5210	0.0	46.0	47.89434197	-103.41802116	2269.776						
5220	WELD	23,036.2	5220	0.0	8.8	47.89436373	-103.41820340	2273.282						
5230	WELD	23,045.0	5230	0.0	48.3	47.89436631	-103.41823897	2273.577						
5240	WELD	23,093.3	5240	0.0	48.9	47.89437155	-103.41843409	2271.687						
5250	WELD	23,142.3	5250	0.0	49.7	47.89436407	-103.41863007	2265.121						
5260	WELD	23,191.9	5260	0.0	49.6	47.89435139	-103.41882877	2259.465						
5270	WELD	23,241.6	5270	0.0	49.4	47.89433990	-103.41902812	2254.939						
5280	WELD	23,291.0	5280	0.0	49.6	47.89432888	-103.41922694	2251.170						
5290	WELD	23,340.6	5290	0.0	49.5	47.89431798	-103.41942643	2247.554						
5300	WELD	23,390.1	5300	0.0	49.5	47.89430679	-103.41962603	2244.027						
5310	WELD	23,439.6	5310	0.0	49.8	47.89429402	-103.41982495	2240.871						
5320	WELD	23,489.4	5320	0.0	49.7	47.89428044	-103.42002518	2238.397						
5330	WELD	23,539.0	5330	0.0	49.7	47.89426845	-103.42022555	2236.072						
5340	WELD	23,588.7	5340	0.0	49.5	47.89425722	-103.42042599	2235.073						
5350	WELD	23,638.2	5350	0.0	49.7	47.89424706	-103.42062545	2233.273						
5360	WELD	23,687.8	5360	0.0	49.2	47.89423815	-103.42082612	2232.555						



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5370	WELD	23,737.1	5370	0.0	49.5	47.89422921	-103.42102516	2233.750						
5380	WELD	23,786.6	5380	0.0	49.3	47.89421968	-103.42122522	2235.152						
5390	WELD	23,836.0	5390	0.0	49.5	47.89420931	-103.42142410	2237.066						
5400	WELD	23,885.5	5400	0.0	49.7	47.89419800	-103.42162389	2238.514						
5410	WELD	23,935.2	5410	0.0	49.6	47.89418692	-103.42182481	2239.344						
5420	WELD	23,984.8	5420	0.0	49.9	47.89417507	-103.42202493	2240.104						
5430	WELD	24,034.7	5430	0.0	49.4	47.89416165	-103.42222541	2241.577						
5440	WELD	24,084.1	5440	0.0	49.7	47.89415335	-103.42242500	2242.774						
5450	WELD	24,133.8	5450	0.0	49.7	47.89415376	-103.42262625	2243.988						
5460	WELD	24,183.5	5460	0.0	49.7	47.89416503	-103.42282707	2245.321						
5470	WELD	24,233.2	5470	0.0	49.6	47.89418165	-103.42302672	2246.189						
5480	WELD	24,282.8	5480	0.0	49.7	47.89419882	-103.42322585	2247.645						
5490	WELD	24,332.5	5490	0.0	49.4	47.89421389	-103.42342570	2249.157						
5500	WELD	24,381.8	5500	0.0	49.7	47.89422825	-103.42362448	2250.727						
5510	WELD	24,431.5	5510	0.0	49.6	47.89424156	-103.42382410	2252.628						
5520	WELD	24,481.1	5520	0.0	49.6	47.89425476	-103.42402431	2254.522						
5530	WELD	24,530.7	5530	0.0	49.6	47.89426861	-103.42422466	2255.588						
5540	WELD	24,580.4	5540	0.0	49.3	47.89428250	-103.42442476	2256.619						
5550	WELD	24,629.7	5550	0.0	49.6	47.89429583	-103.42462393	2257.339						
5560	WELD	24,679.3	5560	0.0	49.2	47.89430815	-103.42482473	2257.823						
5570	WELD	24,728.5	5570	0.0	49.6	47.89431982	-103.42502343	2259.022						
5580	WELD	24,778.1	5580	0.0	49.6	47.89433014	-103.42522420	2260.089						
5590	WELD	24,827.7	5590	0.0	49.5	47.89433970	-103.42542495	2261.410						
5600	WELD	24,877.2	5600	0.0	49.6	47.89434832	-103.42562587	2262.030						
5610	WELD	24,926.8	5610	0.0	6.9	47.89436656	-103.42582555	2261.382						
5620	WELD	24,933.7	5620	0.0	6.9	47.89436994	-103.42585270	2261.317						
11000010	WT CHANGE	24,940.6	5620	0.0	0.0	47.89437360	-103.42587987	2261.308			0.322	52000	0.72	
5630	WELD	24,940.6	5630	0.0	1.5	47.89437362	-103.42587998	2261.308						
10000040	Bend right - 45 deg., 3D	24,941.4	5630	0.1	1.4	47.89437455	-103.42588272	2261.289	0	12:00				
5640	WELD	24,942.1	5640	0.0	37.5	47.89437604	-103.42588493	2261.244						
5650	WELD	24,979.7	5650	0.0	42.3	47.89446201	-103.42596853	2258.098						
5660	WELD	25,022.0	5660	0.0	42.2	47.89455813	-103.42606260	2260.236						
5670	WELD	25,064.3	5670	0.0	42.2	47.89465210	-103.42615964	2265.464						
5680	WELD	25,106.5	5680	0.0	42.2	47.89474545	-103.42625874	2269.325						
11000011	WT CHANGE	25,148.7	5680	0.0	0.0	47.89483918	-103.42635827	2271.471			0.188	52000	0.72	
5690	WELD	25,148.7	5690	0.0	37.4	47.89483925	-103.42635834	2271.471						
5700	WELD	25,186.1	5700	0.0	49.5	47.89492333	-103.42644464	2272.197						



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5710	WELD	25,235.6	5710	0.0	49.7	47.89503447	-103.42655801	2274.097						
5720	WELD	25,285.3	5720	0.0	49.7	47.89514614	-103.42667214	2276.845						
5730	WELD	25,335.0	5730	0.0	49.4	47.89525763	-103.42678655	2280.335						
5740	WELD	25,384.4	5740	0.0	49.3	47.89536733	-103.42690188	2283.561						
5750	WELD	25,433.6	5750	0.0	48.9	47.89547615	-103.42701869	2286.740						
5760	WELD	25,482.5	5760	0.0	49.2	47.89558400	-103.42713553	2290.338						
5770	WELD	25,531.7	5770	0.0	49.6	47.89569284	-103.42725202	2293.722						
5780	WELD	25,581.3	5780	0.0	48.9	47.89580289	-103.42736949	2296.900						
5790	WELD	25,630.2	5790	0.0	8.2	47.89591235	-103.42748293	2298.472						
5800	WELD	25,638.4	5800	0.0	49.5	47.89593096	-103.42750193	2298.719						
5810	WELD	25,687.9	5810	0.0	48.2	47.89604325	-103.42761453	2300.222						
5820	WELD	25,736.1	5820	0.0	36.1	47.89615214	-103.42772426	2302.773						
5830	WELD	25,772.1	5830	0.0	49.4	47.89623334	-103.42780751	2305.138						
5840	WELD	25,821.6	5840	0.0	49.5	47.89634360	-103.42792394	2304.428						
5850	WELD	25,871.1	5850	0.0	48.2	47.89645254	-103.42804240	2301.723						
5860	WELD	25,919.2	5860	0.0	49.1	47.89655884	-103.42815769	2301.876						
5870	WELD	25,968.3	5870	0.0	49.5	47.89666760	-103.42827422	2302.113						
5880	WELD	26,017.9	5880	0.0	49.5	47.89677618	-103.42839298	2305.891						
5890	WELD	26,067.4	5890	0.0	49.6	47.89688329	-103.42851359	2312.239						
5900	WELD	26,117.0	5900	0.0	44.9	47.89698933	-103.42863790	2316.538						
5910	WELD	26,162.0	5910	0.0	49.5	47.89708518	-103.42875081	2319.383						
5920	WELD	26,211.5	5920	0.0	49.5	47.89718993	-103.42887702	2323.484						
5930	WELD	26,261.0	5930	0.0	49.5	47.89729486	-103.42900249	2328.594						
5940	WELD	26,310.5	5940	0.0	48.7	47.89740104	-103.42912598	2332.902						
5950	WELD	26,359.2	5950	0.0	40.3	47.89750488	-103.42924891	2336.067						
5960	WELD	26,399.5	5960	0.0	48.9	47.89759004	-103.42935237	2337.733						
5970	WELD	26,448.4	5970	0.0	21.9	47.89769321	-103.42947762	2341.023						
11000012	WT CHANGE	26,470.3	5970	0.0	0.0	47.89773969	-103.42953315	2342.728			0.322	52000	0.72	
5980	WELD	26,470.3	5980	0.0	6.7	47.89773975	-103.42953323	2342.731						
10000041	Bend left - 62 deg., 8D	26,473.6	5980	0.2	6.4	47.89774299	-103.42954507	2343.035	0	12:00				
5990	WELD	26,477.0	5990	0.0	40.9	47.89774152	-103.42955875	2343.367						
6000	WELD	26,517.9	6000	0.0	42.4	47.89771945	-103.42971926	2349.836						
6010	WELD	26,560.3	6010	0.0	27.4	47.89770709	-103.42988795	2355.082						
11000013	WT CHANGE	26,587.6	6010	0.0	0.0	47.89770435	-103.42999865	2354.753			0.188	52000	0.72	
6020	WELD	26,587.7	6020	0.0	38.7	47.89770434	-103.42999873	2354.752						
6030	WELD	26,626.4	6030	0.0	49.7	47.89769676	-103.43015499	2352.080						
6040	WELD	26,676.1	6040	0.0	49.5	47.89768760	-103.43035249	2342.942						



# Pipeline Listing

TDW Services, Inc.

Hiland Crude, LLC  
East Camp Creek to Camp Creek

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)	Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
6050	WELD	26,725.6	6050	0.0	49.4	47.89768307	-103.43055013	2334.428						
6060	WELD	26,775.0	6060	0.0	49.6	47.89767952	-103.43074921	2330.091						
6070	WELD	26,824.6	6070	0.0	49.7	47.89767828	-103.43095014	2328.882						
6080	WELD	26,874.3	6080	0.0	49.5	47.89767712	-103.43115145	2328.147						
6090	WELD	26,923.8	6090	0.0	29.5	47.89767538	-103.43135222	2328.334						
6100	WELD	26,953.3	6100	0.0	16.5	47.89767388	-103.43147188	2327.988						
6110	WELD	26,969.8	6110	0.0	49.5	47.89767271	-103.43153877	2327.831						
6120	WELD	27,019.3	6120	0.0	49.4	47.89767032	-103.43173956	2329.212						
6130	WELD	27,068.7	6130	0.0	49.5	47.89766918	-103.43193980	2330.082						
6140	WELD	27,118.1	6140	0.0	49.5	47.89766708	-103.43214021	2331.703						
6150	WELD	27,167.6	6150	0.0	48.9	47.89766515	-103.43234062	2334.706						
6160	WELD	27,216.5	6160	0.0	24.7	47.89766269	-103.43253823	2338.394						
6170	WELD	27,241.2	6170	0.0	29.4	47.89766245	-103.43263776	2340.648						
6180	WELD	27,270.6	6180	0.0	49.4	47.89766336	-103.43275689	2342.759						
6190	WELD	27,320.0	6190	0.0	46.1	47.89766369	-103.43295753	2344.715						
6200	WELD	27,366.1	6200	0.0	49.3	47.89766129	-103.43314458	2346.709						
6210	WELD	27,415.4	6210	0.0	49.4	47.89765787	-103.43334418	2348.540						
6220	WELD	27,464.8	6220	0.0	48.7	47.89765541	-103.43354486	2350.603						
10000042	AGM 050, Sta. 276+86, AGM is 26' D/S of Rd C/L -- Han #102	27,471.0	6220	6.2	42.5	47.89765532	-103.43357000	2350.885						
6230	WELD	27,513.5	6230	0.0	43.1	47.89765529	-103.43374214	2353.478						
6240	WELD	27,556.6	6240	0.0	49.5	47.89765406	-103.43391751	2355.637						
6250	WELD	27,606.1	6250	0.0	49.6	47.89765137	-103.43411810	2358.737						
6260	WELD	27,655.8	6260	0.0	49.4	47.89764903	-103.43431920	2362.351						
6270	WELD	27,705.2	6270	0.0	49.7	47.89764916	-103.43451880	2367.627						
6280	WELD	27,754.9	6280	0.0	49.6	47.89764939	-103.43471941	2373.453						
6290	WELD	27,804.5	6290	0.0	49.3	47.89764849	-103.43491984	2379.230						
6300	WELD	27,853.8	6300	0.0	49.6	47.89764710	-103.43511881	2384.816						
6310	WELD	27,903.4	6310	0.0	49.6	47.89764700	-103.43531925	2390.296						
6320	WELD	27,953.0	6320	0.0	49.5	47.89765147	-103.43551988	2393.704						
6330	WELD	28,002.5	6330	0.0	49.5	47.89766125	-103.43572058	2395.788						
6340	WELD	28,052.1	6340	0.0	49.6	47.89767586	-103.43592067	2397.742						
6350	WELD	28,101.6	6350	0.0	49.5	47.89769231	-103.43612094	2398.274						
6360	WELD	28,151.1	6360	0.0	49.6	47.89770919	-103.43632079	2398.335						
6370	WELD	28,200.7	6370	0.0	49.5	47.89772513	-103.43652086	2396.682						
6380	WELD	28,250.2	6380	0.0	49.3	47.89774055	-103.43672116	2394.952						



# Pipeline Listing

TDW Services, Inc.

Hiland Crude, LLC  
East Camp Creek to Camp Creek

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)	Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)	
6390	WELD	28,299.5	6390	0.0	49.5	47.89775500	-103.43692038	2394.518							
6400	WELD	28,349.0	6400	0.0	49.5	47.89777106	-103.43712070	2394.295							
6410	WELD	28,398.5	6410	0.0	49.2	47.89778844	-103.43732071	2395.197							
6420	WELD	28,447.7	6420	0.0	49.6	47.89780662	-103.43751919	2396.162							
40000002	Metal Loss - EXTERNAL	28,454.2	6420	6.5	43.0	47.89780903	-103.43754560	2396.370	235	7:45	13%	0.90	0.46	1760	100%
6430	WELD	28,497.3	6430	0.0	49.5	47.89782427	-103.43771908	2397.642							
6440	WELD	28,546.7	6440	0.0	49.3	47.89784137	-103.43791900	2398.950							
6450	WELD	28,596.0	6450	0.0	49.6	47.89785725	-103.43811775	2400.686							
6460	WELD	28,645.7	6460	0.0	47.8	47.89787178	-103.43831792	2401.980							
6470	WELD	28,693.5	6470	0.0	49.6	47.89788339	-103.43851120	2403.087							
6480	WELD	28,743.1	6480	0.0	49.3	47.89789467	-103.43871213	2403.205							
6490	WELD	28,792.4	6490	0.0	49.6	47.89790564	-103.43891177	2402.573							
6500	WELD	28,842.0	6500	0.0	49.5	47.89791682	-103.43911244	2401.741							
6510	WELD	28,891.5	6510	0.0	47.9	47.89792961	-103.43931247	2400.366							
6520	WELD	28,939.5	6520	0.0	49.5	47.89794243	-103.43950569	2399.978							
6530	WELD	28,988.9	6530	0.0	49.6	47.89795459	-103.43970534	2399.723							
6540	WELD	29,038.5	6540	0.0	49.7	47.89796615	-103.43990525	2398.422							
6550	WELD	29,088.2	6550	0.0	49.2	47.89797729	-103.44010605	2396.905							
6560	WELD	29,137.4	6560	0.0	49.5	47.89798765	-103.44030497	2395.710							
6570	WELD	29,186.9	6570	0.0	49.7	47.89799836	-103.44050462	2394.915							
6580	WELD	29,236.5	6580	0.0	49.7	47.89801111	-103.44070499	2394.120							
6590	WELD	29,286.2	6590	0.0	46.2	47.89802416	-103.44090525	2392.515							
6600	WELD	29,332.5	6600	0.0	6.5	47.89803552	-103.44109170	2391.245							
6610	WELD	29,338.9	6610	0.0	46.5	47.89803709	-103.44111785	2391.112							
6620	WELD	29,385.4	6620	0.0	49.8	47.89804731	-103.44130568	2390.339							
6630	WELD	29,435.2	6630	0.0	49.8	47.89805838	-103.44150649	2390.375							
6640	WELD	29,484.9	6640	0.0	49.7	47.89807005	-103.44170705	2393.083							
6650	WELD	29,534.6	6650	0.0	49.7	47.89808189	-103.44190677	2397.556							
6660	WELD	29,584.3	6660	0.0	49.4	47.89809710	-103.44210543	2403.415							
6670	WELD	29,633.8	6670	0.0	49.4	47.89811327	-103.44230292	2409.490							
6680	WELD	29,683.1	6680	0.0	49.2	47.89812623	-103.44250217	2412.361							
6690	WELD	29,732.3	6690	0.0	45.0	47.89813163	-103.44270158	2411.491							
6700	WELD	29,777.3	6700	0.0	6.5	47.89813092	-103.44288338	2408.070							
6710	WELD	29,783.7	6710	0.0	49.0	47.89813033	-103.44290943	2407.376							
6720	WELD	29,832.8	6720	0.0	47.0	47.89812414	-103.44310786	2403.717							
6730	WELD	29,879.8	6730	0.0	49.6	47.89811784	-103.44329829	2402.024							
6740	WELD	29,929.4	6740	0.0	49.4	47.89811303	-103.44349935	2401.713							



# Pipeline Listing

TDW Services, Inc.

Hiland Crude, LLC  
East Camp Creek to Camp Creek

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)	Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
6750	WELD	29,978.7	6750	0.0	49.6	47.89810839	-103.44369947	2400.679						
6760	WELD	30,028.3	6760	0.0	49.7	47.89810320	-103.44390067	2399.225						
6770	WELD	30,077.9	6770	0.0	49.6	47.89809857	-103.44410209	2397.917						
6780	WELD	30,127.5	6780	0.0	4.2	47.89809421	-103.44430332	2395.666						
6790	WELD	30,131.7	6790	0.0	3.1	47.89809379	-103.44432023	2395.365						
6800	WELD	30,134.9	6800	0.0	1.1	47.89809355	-103.44433296	2395.186						
1000043	Tee at 270 deg.	30,135.5	6800	0.2	1.0	47.89809352	-103.44433529	2395.155	257 8:30					
6810	WELD	30,136.0	6810	0.0	3.1	47.89809349	-103.44433751	2395.125						
6820	WELD	30,139.1	6820	0.0	37.8	47.89809330	-103.44434982	2394.982						
6830	WELD	30,176.9	6830	0.0	49.6	47.89809060	-103.44450350	2393.337						
6840	WELD	30,226.5	6840	0.0	49.6	47.89808683	-103.44470464	2389.756						
6850	WELD	30,276.1	6850	0.0	49.6	47.89808315	-103.44490557	2385.828						
6860	WELD	30,325.7	6860	0.0	49.7	47.89808075	-103.44510697	2383.299						
6870	WELD	30,375.4	6870	0.0	49.7	47.89807882	-103.44530875	2381.349						
6880	WELD	30,425.1	6880	0.0	49.6	47.89807594	-103.44551024	2378.784						
6890	WELD	30,474.7	6890	0.0	49.6	47.89807091	-103.44571126	2376.985						
6900	WELD	30,524.3	6900	0.0	49.7	47.89806481	-103.44591249	2378.453						
6910	WELD	30,574.0	6910	0.0	49.3	47.89805775	-103.44611342	2382.889						
6920	WELD	30,623.3	6920	0.0	49.5	47.89804877	-103.44631291	2386.918						
6930	WELD	30,672.8	6930	0.0	30.9	47.89804584	-103.44651424	2389.812						
1100014	WT CHANGE	30,703.7	6930	0.0	0.0	47.89804717	-103.44663973	2390.149			0.322	52000	0.72	
6940	WELD	30,703.7	6940	0.0	10.7	47.89804717	-103.44663985	2390.148						
6950	WELD	30,714.4	6950	0.0	42.3	47.89804777	-103.44668349	2389.860						
6960	WELD	30,756.7	6960	0.0	42.2	47.89804748	-103.44685450	2386.450						
6970	WELD	30,798.9	6970	0.0	35.1	47.89803755	-103.44702499	2386.984						
6980	WELD	30,834.0	6980	0.0	1.6	47.89802779	-103.44716511	2392.042						
1000044	Bend left - 45 deg., 1.5D	30,834.8	6980	0.1	1.5	47.89802709	-103.44716804	2392.081	0 12:00					
1100015	WT CHANGE	30,835.6	6980	0.0	0.0	47.89802585	-103.44717048	2392.098			0.188	52000	0.72	
6990	WELD	30,835.7	6990	0.0	31.0	47.89802580	-103.44717056	2392.098						
7000	WELD	30,866.6	7000	0.0	48.8	47.89795756	-103.44724706	2392.822						
7010	WELD	30,915.4	7010	0.0	49.3	47.89784775	-103.44736054	2394.140						
7020	WELD	30,964.7	7020	0.0	49.6	47.89773729	-103.44747563	2394.215						
7030	WELD	31,014.3	7030	0.0	41.2	47.89762821	-103.44759517	2391.990						
7040	WELD	31,055.5	7040	0.0	41.3	47.89753925	-103.44769800	2393.955						
7050	WELD	31,096.8	7050	0.0	13.9	47.89745062	-103.44780143	2396.789						
7060	WELD	31,110.8	7060	0.0	27.1	47.89742055	-103.44783588	2397.623						
7070	WELD	31,137.8	7070	0.0	41.3	47.89736113	-103.44790128	2399.232						



# Pipeline Listing

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East Camp Creek to Camp Creek

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)	Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
7080	WELD	31,179.1	7080	0.0	41.3	47.89726978	-103.44799959	2402.099						
7090	WELD	31,220.5	7090	0.0	41.3	47.89717740	-103.44809597	2403.916						
7100	WELD	31,261.8	7100	0.0	41.3	47.89708382	-103.44818991	2405.130						
7110	WELD	31,303.1	7110	0.0	41.3	47.89698814	-103.44827880	2406.605						
7120	WELD	31,344.4	7120	0.0	41.3	47.89689015	-103.44836247	2407.706						
7130	WELD	31,385.7	7130	0.0	41.3	47.89679112	-103.44844313	2406.645						
7140	WELD	31,427.0	7140	0.0	41.3	47.89669136	-103.44852197	2405.771						
7150	WELD	31,468.2	7150	0.0	41.3	47.89659125	-103.44859977	2406.775						
7160	WELD	31,509.5	7160	0.0	41.3	47.89649208	-103.44867953	2409.371						
7170	WELD	31,550.8	7170	0.0	41.3	47.89639311	-103.44875989	2411.476						
7180	WELD	31,592.0	7180	0.0	41.3	47.89629426	-103.44884107	2412.774						
7190	WELD	31,633.4	7190	0.0	41.3	47.89619546	-103.44892251	2412.694						
7200	WELD	31,674.7	7200	0.0	41.3	47.89609686	-103.44900440	2412.464						
7210	WELD	31,716.0	7210	0.0	41.4	47.89599835	-103.44908602	2411.564						
7220	WELD	31,757.4	7220	0.0	41.3	47.89590043	-103.44916841	2407.862						
7230	WELD	31,798.7	7230	0.0	41.4	47.89580352	-103.44925076	2401.940						
7240	WELD	31,840.1	7240	0.0	13.9	47.89570653	-103.44933349	2396.296						
7250	WELD	31,854.0	7250	0.0	6.2	47.89567385	-103.44936127	2394.754						
7260	WELD	31,860.3	7260	0.0	23.3	47.89565917	-103.44937384	2394.139						
7270	WELD	31,883.6	7270	0.0	41.3	47.89560427	-103.44942096	2392.005						
7280	WELD	31,924.9	7280	0.0	41.4	47.89550716	-103.44950562	2388.854						
7290	WELD	31,966.3	7290	0.0	40.9	47.89541072	-103.44959159	2385.936						
10000045	AGM 060, Sta. 320+49, AGM is in fence line -- Han #114	32,005.0	7290	38.7	2.1	47.89532257	-103.44967690	2383.351						
7300	WELD	32,007.1	7300	0.0	40.3	47.89531772	-103.44968169	2383.392						
7310	WELD	32,047.5	7310	0.0	40.8	47.89522759	-103.44977464	2385.855						
7320	WELD	32,088.2	7320	0.0	41.4	47.89513699	-103.44987028	2386.221						
7330	WELD	32,129.7	7330	0.0	49.5	47.89504545	-103.44996836	2385.684						
7340	WELD	32,179.2	7340	0.0	49.5	47.89493620	-103.45008639	2386.024						
7350	WELD	32,228.6	7350	0.0	49.7	47.89482814	-103.45020593	2388.954						
7360	WELD	32,278.3	7360	0.0	49.7	47.89472071	-103.45032779	2392.724						
7370	WELD	32,328.1	7370	0.0	42.7	47.89461341	-103.45044989	2397.117						
7380	WELD	32,370.8	7380	0.0	49.7	47.89451973	-103.45055252	2397.588						
7390	WELD	32,420.5	7390	0.0	49.7	47.89440962	-103.45067087	2397.267						
7400	WELD	32,470.3	7400	0.0	49.7	47.89429987	-103.45078965	2398.693						
7410	WELD	32,520.0	7410	0.0	49.6	47.89419079	-103.45090955	2401.284						



# Pipeline Listing

TDW Services, Inc.

Hiland Crude, LLC  
East Camp Creek to Camp Creek

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)	Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
7420	WELD	32,569.6	7420	0.0	49.3	47.89408229	-103.45102999	2402.912						
7430	WELD	32,618.9	7430	0.0	49.7	47.89397446	-103.45115065	2404.324						
7440	WELD	32,668.6	7440	0.0	49.6	47.89386704	-103.45127289	2407.814						
7450	WELD	32,718.2	7450	0.0	49.6	47.89376089	-103.45139667	2412.721						
7460	WELD	32,767.8	7460	0.0	49.7	47.89365483	-103.45151911	2419.395						
7470	WELD	32,817.5	7470	0.0	49.4	47.89354759	-103.45163805	2427.311						
7480	WELD	32,866.9	7480	0.0	49.8	47.89343563	-103.45174656	2433.243						
7490	WELD	32,916.6	7490	0.0	49.8	47.89331535	-103.45183877	2435.108						
7500	WELD	32,966.4	7500	0.0	49.7	47.89318986	-103.45191438	2434.247						
7510	WELD	33,016.1	7510	0.0	49.5	47.89306297	-103.45198490	2433.497						
7520	WELD	33,065.6	7520	0.0	49.8	47.89293620	-103.45205238	2433.786						
7530	WELD	33,115.3	7530	0.0	49.7	47.89280769	-103.45211726	2434.819						
7540	WELD	33,165.0	7540	0.0	49.7	47.89267750	-103.45217085	2431.515						
7550	WELD	33,214.7	7550	0.0	49.5	47.89254693	-103.45221284	2423.971						
7560	WELD	33,264.1	7560	0.0	49.7	47.89241650	-103.45225426	2417.043						
7570	WELD	33,313.8	7570	0.0	49.7	47.89228478	-103.45229515	2411.640						
7580	WELD	33,363.5	7580	0.0	49.8	47.89215304	-103.45233654	2406.607						
7590	WELD	33,413.3	7590	0.0	48.5	47.89202104	-103.45237927	2402.923						
7600	WELD	33,461.8	7600	0.0	49.7	47.89189192	-103.45242132	2400.286						
7610	WELD	33,511.6	7610	0.0	49.7	47.89175953	-103.45246411	2398.874						
7620	WELD	33,561.2	7620	0.0	49.5	47.89162710	-103.45250502	2395.960						
7630	WELD	33,610.7	7630	0.0	41.4	47.89149525	-103.45254576	2392.415						
7640	WELD	33,652.2	7640	0.0	41.4	47.89138527	-103.45258109	2389.480						
7650	WELD	33,693.5	7650	0.0	41.4	47.89127548	-103.45261602	2386.911						
7660	WELD	33,734.9	7660	0.0	41.4	47.89116479	-103.45265087	2385.340						
7670	WELD	33,776.3	7670	0.0	41.3	47.89105460	-103.45268574	2384.156						
7680	WELD	33,817.6	7680	0.0	40.1	47.89094417	-103.45271987	2383.322						
7690	WELD	33,857.7	7690	0.0	41.4	47.89083687	-103.45275279	2382.481						
7700	WELD	33,899.1	7700	0.0	41.3	47.89072600	-103.45278343	2380.746						
7710	WELD	33,940.4	7710	0.0	41.3	47.89061469	-103.45280860	2379.298						
7720	WELD	33,981.7	7720	0.0	41.3	47.89050315	-103.45283269	2377.993						
7730	WELD	34,023.0	7730	0.0	41.3	47.89039154	-103.45285702	2375.919						
7740	WELD	34,064.3	7740	0.0	41.3	47.89027989	-103.45287977	2373.100						
7750	WELD	34,105.6	7750	0.0	41.3	47.89016818	-103.45290355	2370.886						
7760	WELD	34,146.9	7760	0.0	40.8	47.89005681	-103.45292551	2368.778						
7770	WELD	34,187.7	7770	0.0	29.3	47.88994611	-103.45294671	2366.586						
7780	WELD	34,217.1	7780	0.0	41.3	47.88986657	-103.45296192	2365.207						



# Pipeline Listing

TDW Services, Inc.

Hiland Crude, LLC  
East Camp Creek to Camp Creek

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)	Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
7790	WELD	34,258.3	7790	0.0	41.3	47.88975495	-103.45298325	2363.590						
7800	WELD	34,299.6	7800	0.0	41.3	47.88964279	-103.45300636	2362.407						
7810	WELD	34,340.9	7810	0.0	41.3	47.88953107	-103.45303025	2361.690						
7820	WELD	34,382.2	7820	0.0	41.3	47.88941947	-103.45305116	2360.966						
7830	WELD	34,423.5	7830	0.0	41.4	47.88930716	-103.45307191	2360.920						
7840	WELD	34,464.9	7840	0.0	41.4	47.88919593	-103.45309669	2362.697						
7850	WELD	34,506.2	7850	0.0	39.6	47.88908443	-103.45312121	2364.644						
7860	WELD	34,545.8	7860	0.0	41.4	47.88897739	-103.45314282	2366.156						
7870	WELD	34,587.3	7870	0.0	41.4	47.88886527	-103.45316452	2366.226						
7880	WELD	34,628.6	7880	0.0	41.4	47.88875312	-103.45318275	2365.869						
7890	WELD	34,670.0	7890	0.0	41.5	47.88864090	-103.45319903	2366.181						
7900	WELD	34,711.5	7900	0.0	41.4	47.88852837	-103.45321341	2365.660						
7910	WELD	34,752.9	7910	0.0	41.4	47.88841571	-103.45322433	2363.225						
7920	WELD	34,794.3	7920	0.0	41.4	47.88830373	-103.45323136	2359.921						
7930	WELD	34,835.7	7930	0.0	49.6	47.88819157	-103.45323613	2356.102						
7940	WELD	34,885.3	7940	0.0	49.6	47.88805608	-103.45324132	2353.569						
7950	WELD	34,934.9	7950	0.0	49.5	47.88792139	-103.45324340	2348.795						
7960	WELD	34,984.4	7960	0.0	49.6	47.88778701	-103.45324955	2345.022						
7970	WELD	35,034.0	7970	0.0	49.6	47.88765191	-103.45325503	2342.359						
7980	WELD	35,083.6	7980	0.0	49.7	47.88751678	-103.45325980	2339.828						
7990	WELD	35,133.3	7990	0.0	49.8	47.88738150	-103.45326529	2337.107						
8000	WELD	35,183.0	8000	0.0	49.7	47.88724618	-103.45327130	2334.743						
8010	WELD	35,232.7	8010	0.0	49.7	47.88711071	-103.45327627	2332.830						
8020	WELD	35,282.4	8020	0.0	49.7	47.88697519	-103.45328157	2334.260						
8030	WELD	35,332.1	8030	0.0	49.6	47.88684012	-103.45329083	2337.357						
8040	WELD	35,381.7	8040	0.0	49.4	47.88670546	-103.45331028	2337.349						
8050	WELD	35,431.0	8050	0.0	49.0	47.88657329	-103.45334280	2331.645						
8060	WELD	35,480.0	8060	0.0	48.2	47.88644418	-103.45338406	2324.883						
8070	WELD	35,528.2	8070	0.0	19.3	47.88631771	-103.45343292	2319.202						
8080	WELD	35,547.5	8080	0.0	48.9	47.88626712	-103.45345346	2317.843						
8090	WELD	35,596.4	8090	0.0	49.7	47.88613820	-103.45350474	2315.116						
8100	WELD	35,646.1	8100	0.0	49.7	47.88600709	-103.45355537	2312.812						
8110	WELD	35,695.8	8110	0.0	49.7	47.88587604	-103.45360721	2309.471						
8120	WELD	35,745.5	8120	0.0	49.3	47.88574493	-103.45365714	2306.155						
8130	WELD	35,794.9	8130	0.0	48.6	47.88561449	-103.45370682	2304.240						
8140	WELD	35,843.5	8140	0.0	48.9	47.88548676	-103.45376083	2306.172						
8150	WELD	35,892.4	8150	0.0	49.7	47.88535926	-103.45382061	2308.096						



# Pipeline Listing

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Hiland Crude, LLC  
East Camp Creek to Camp Creek

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)	Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
8160	WELD	35,942.1	8160	0.0	49.5	47.88523023	-103.45388125	2310.381						
8170	WELD	35,991.6	8170	0.0	49.5	47.88510159	-103.45394111	2314.901						
8180	WELD	36,041.1	8180	0.0	41.8	47.88497431	-103.45400173	2322.679						
8190	WELD	36,082.9	8190	0.0	48.6	47.88486741	-103.45405434	2329.845						
8200	WELD	36,131.5	8200	0.0	48.7	47.88474515	-103.45413013	2332.482						
10000046	Bend right - 13 deg., 98D	36,149.8	8200	10.8	37.9	47.88470341	-103.45417108	2331.850	0	12:00				
8210	WELD	36,180.2	8210	0.0	48.6	47.88464391	-103.45425731	2330.146						
10000047	Bend right - 16 deg., 72D	36,208.0	8210	21.0	27.6	47.88459403	-103.45434224	2328.334	0	12:00				
8220	WELD	36,228.8	8220	0.0	48.4	47.88456723	-103.45441693	2327.636						
8230	WELD	36,277.2	8230	0.0	40.5	47.88450462	-103.45459050	2325.926						
8240	WELD	36,317.7	8240	0.0	40.2	47.88446223	-103.45474258	2325.182						
10000048	Bend right - 13 deg., 76D	36,343.7	8240	20.1	20.1	47.88443919	-103.45484260	2324.689	0	12:00				
8250	WELD	36,357.9	8250	0.0	40.4	47.88443321	-103.45490001	2325.001						
8260	WELD	36,398.4	8260	0.0	40.4	47.88441166	-103.45506111	2325.023						
8270	WELD	36,438.8	8270	0.0	7.6	47.88438316	-103.45521930	2324.144						
8280	WELD	36,446.4	8280	0.0	40.3	47.88437714	-103.45524882	2323.872						
8290	WELD	36,486.7	8290	0.0	40.3	47.88434462	-103.45540497	2323.296						
8300	WELD	36,527.0	8300	0.0	40.6	47.88430887	-103.45555994	2323.162						
8310	WELD	36,567.6	8310	0.0	41.3	47.88426959	-103.45571454	2322.969						
8320	WELD	36,608.9	8320	0.0	37.1	47.88422842	-103.45587059	2323.032						
8330	WELD	36,646.0	8330	0.0	39.2	47.88419033	-103.45601047	2322.945						
8340	WELD	36,685.2	8340	0.0	41.3	47.88415011	-103.45615781	2321.049						
8350	WELD	36,726.5	8350	0.0	49.5	47.88410897	-103.45631359	2319.803						
8360	WELD	36,776.0	8360	0.0	38.2	47.88405849	-103.45650077	2319.994						
8370	WELD	36,814.2	8370	0.0	38.1	47.88402023	-103.45664512	2320.829						
8380	WELD	36,852.3	8380	0.0	41.1	47.88398645	-103.45679153	2321.690						
8390	WELD	36,893.4	8390	0.0	40.3	47.88395705	-103.45695225	2321.698						
8400	WELD	36,933.7	8400	0.0	40.4	47.88393772	-103.45711319	2320.871						
8410	WELD	36,974.1	8410	0.0	40.7	47.88392656	-103.45727606	2319.446						
8420	WELD	37,014.8	8420	0.0	41.5	47.88392100	-103.45744043	2317.302						
8430	WELD	37,056.3	8430	0.0	41.5	47.88391797	-103.45760756	2313.813						
8440	WELD	37,097.7	8440	0.0	41.5	47.88391507	-103.45777458	2311.204						
8450	WELD	37,139.2	8450	0.0	41.0	47.88391131	-103.45794210	2309.322						
8460	WELD	37,180.2	8460	0.0	40.5	47.88390885	-103.45810732	2307.086						
8470	WELD	37,220.7	8470	0.0	40.4	47.88390523	-103.45827127	2307.800						
14000000	DENT	37,256.9	8470	35.9	4.5	47.88390018	-103.45841717	2310.784	163	5:15	2.6%			
8480	WELD	37,261.1	8480	0.0	7.1	47.88389961	-103.45843414	2310.930						



# Pipeline Listing

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ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)	Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
8490	WELD	37,268.2	8490	0.0	40.5	47.88389837	-103.45846311	2311.132						
8500	WELD	37,308.8	8500	0.0	41.3	47.88389256	-103.45862729	2311.791						
8510	WELD	37,350.1	8510	0.0	41.3	47.88388612	-103.45879409	2312.830						
8520	WELD	37,391.4	8520	0.0	41.3	47.88387887	-103.45896121	2312.503						
8530	WELD	37,432.8	8530	0.0	41.3	47.88387321	-103.45912871	2311.666						
8540	WELD	37,474.0	8540	0.0	41.3	47.88386598	-103.45929566	2308.539						
8550	WELD	37,515.3	8550	0.0	41.4	47.88385930	-103.45946238	2304.253						
8560	WELD	37,556.7	8560	0.0	40.8	47.88385228	-103.45962888	2299.935						
8570	WELD	37,597.6	8570	0.0	27.2	47.88384579	-103.45979269	2294.620						
8580	WELD	37,624.7	8580	0.0	40.3	47.88384099	-103.45990176	2291.787						
8590	WELD	37,665.0	8590	0.0	40.4	47.88383484	-103.46006465	2290.618						
8600	WELD	37,705.4	8600	0.0	40.4	47.88382862	-103.46022746	2293.234						
8610	WELD	37,745.8	8610	0.0	40.5	47.88382369	-103.46038828	2300.717						
8620	WELD	37,786.3	8620	0.0	36.3	47.88382236	-103.46054989	2308.046						
8630	WELD	37,822.6	8630	0.0	40.9	47.88382749	-103.46069598	2311.226						
8640	WELD	37,863.5	8640	0.0	41.3	47.88383981	-103.46086102	2312.312						
8650	WELD	37,904.8	8650	0.0	41.3	47.88385519	-103.46102705	2314.042						
8660	WELD	37,946.1	8660	0.0	41.3	47.88387250	-103.46119251	2315.865						
8670	WELD	37,987.4	8670	0.0	41.3	47.88389054	-103.46135768	2316.799						
8680	WELD	38,028.7	8680	0.0	41.2	47.88390856	-103.46152292	2318.830						
8690	WELD	38,069.9	8690	0.0	41.3	47.88392546	-103.46168836	2321.001						
8700	WELD	38,111.2	8700	0.0	41.2	47.88394217	-103.46185399	2322.473						
8710	WELD	38,152.4	8710	0.0	41.2	47.88395743	-103.46201984	2323.439						
8720	WELD	38,193.6	8720	0.0	41.3	47.88397211	-103.46218570	2324.008						
8730	WELD	38,234.9	8730	0.0	41.3	47.88398784	-103.46235166	2324.102						
8740	WELD	38,276.1	8740	0.0	41.3	47.88400674	-103.46251668	2325.118						
8750	WELD	38,317.4	8750	0.0	41.3	47.88402698	-103.46268159	2325.475						
40000003	Metal Loss - EXTERNAL	38,352.4	8750	34.9	6.4	47.88404497	-103.46282108	2325.981	353	11:45	12%	2.72	1.84	1760 100%
8760	WELD	38,358.7	8760	0.0	41.3	47.88404840	-103.46284623	2326.022						
8770	WELD	38,400.1	8770	0.0	41.3	47.88407241	-103.46300992	2326.106						
8780	WELD	38,441.3	8780	0.0	10.2	47.88409719	-103.46317333	2326.713						
8790	WELD	38,451.5	8790	0.0	6.0	47.88410311	-103.46321369	2326.700						
8800	WELD	38,457.5	8800	0.0	26.8	47.88410649	-103.46323776	2326.699						
8810	WELD	38,484.3	8810	0.0	41.3	47.88412140	-103.46334400	2326.325						
8820	WELD	38,525.6	8820	0.0	41.3	47.88414473	-103.46350798	2325.332						
8830	WELD	38,566.9	8830	0.0	27.0	47.88416725	-103.46367224	2326.717						
8840	WELD	38,593.9	8840	0.0	12.7	47.88418141	-103.46377978	2327.073						



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8850	WELD	38,606.6	8850	0.0	41.3	47.88418810	-103.46383028	2327.133						
8860	WELD	38,647.9	8860	0.0	40.5	47.88420938	-103.46399494	2326.420						
8870	WELD	38,688.4	8870	0.0	41.4	47.88423008	-103.46415658	2325.803						
8880	WELD	38,729.8	8880	0.0	41.1	47.88425224	-103.46432090	2324.020						
8890	WELD	38,770.9	8890	0.0	40.5	47.88427426	-103.46448308	2319.292						
8900	WELD	38,811.4	8900	0.0	40.5	47.88429751	-103.46464252	2314.843						
8910	WELD	38,851.9	8910	0.0	40.5	47.88432370	-103.46480163	2313.191						
8920	WELD	38,892.4	8920	0.0	40.4	47.88435155	-103.46496062	2313.762						
8930	WELD	38,932.9	8930	0.0	40.6	47.88437509	-103.46512080	2314.658						
8940	WELD	38,973.4	8940	0.0	25.0	47.88439424	-103.46528205	2317.717						
8950	WELD	38,998.4	8950	0.0	40.8	47.88440554	-103.46538143	2320.446						
10000049	Bend right - 22 deg., 116D	39,020.9	8950	7.3	33.5	47.88442075	-103.46546906	2322.073	0	12:00				
8960	WELD	39,039.2	8960	0.0	40.8	47.88444618	-103.46553259	2322.405						
10000050	Bend right - 16 deg., 94D	39,059.1	8960	11.0	29.8	47.88447959	-103.46559551	2321.954	0	12:00				
8970	WELD	39,080.0	8970	0.0	40.5	47.88452441	-103.46564725	2319.772						
8980	WELD	39,120.6	8980	0.0	40.7	47.88461440	-103.46574057	2316.121						
8990	WELD	39,161.3	8990	0.0	40.6	47.88470632	-103.46583219	2315.576						
9000	WELD	39,201.9	9000	0.0	40.7	47.88479914	-103.46592084	2317.331						
9010	WELD	39,242.6	9010	0.0	35.9	47.88489330	-103.46600849	2317.448						
9020	WELD	39,278.6	9020	0.0	40.9	47.88497686	-103.46608390	2318.850						
9030	WELD	39,319.5	9030	0.0	41.5	47.88507280	-103.46616786	2321.036						
9040	WELD	39,361.0	9040	0.0	41.4	47.88517068	-103.46625097	2323.319						
9050	WELD	39,402.4	9050	0.0	41.4	47.88527008	-103.46633024	2325.434						
9060	WELD	39,443.8	9060	0.0	41.3	47.88537043	-103.46640652	2327.248						
9070	WELD	39,485.1	9070	0.0	41.3	47.88547243	-103.46647833	2329.171						
9080	WELD	39,526.5	9080	0.0	41.3	47.88557558	-103.46654625	2330.422						
9090	WELD	39,567.8	9090	0.0	41.3	47.88567862	-103.46661440	2332.246						
9100	WELD	39,609.2	9100	0.0	41.3	47.88578175	-103.46668231	2334.341						
9110	WELD	39,650.4	9110	0.0	41.3	47.88588442	-103.46675005	2337.432						
9120	WELD	39,691.8	9120	0.0	41.3	47.88598660	-103.46681989	2340.512						
9130	WELD	39,733.1	9130	0.0	41.4	47.88608751	-103.46689405	2342.021						
9140	WELD	39,774.4	9140	0.0	41.3	47.88618596	-103.46697578	2342.518						
9150	WELD	39,815.8	9150	0.0	41.4	47.88628102	-103.46706612	2341.962						
9160	WELD	39,857.1	9160	0.0	41.3	47.88637290	-103.46716351	2341.925						
9170	WELD	39,898.4	9170	0.0	41.3	47.88646106	-103.46726768	2341.571						
9180	WELD	39,939.7	9180	0.0	41.3	47.88654761	-103.46737503	2340.546						



# Pipeline Listing

TDW Services, Inc.

Hiland Crude, LLC  
East Camp Creek to Camp Creek

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)	Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
9190	WELD	39,981.0	9190	0.0	41.2	47.88663367	-103.46748331	2339.383						
9200	WELD	40,022.2	9200	0.0	49.6	47.88671943	-103.46759219	2339.515						
9210	WELD	40,071.8	9210	0.0	49.6	47.88682234	-103.46772317	2338.769						
9220	WELD	40,121.4	9220	0.0	49.3	47.88692434	-103.46785567	2339.282						
9230	WELD	40,170.7	9230	0.0	49.6	47.88702579	-103.46798691	2341.304						
9240	WELD	40,220.2	9240	0.0	49.5	47.88712721	-103.46812011	2343.764						
9250	WELD	40,269.7	9250	0.0	49.6	47.88722858	-103.46825322	2345.785						
9260	WELD	40,319.3	9260	0.0	49.2	47.88733029	-103.46838632	2346.470						
9270	WELD	40,368.5	9270	0.0	49.4	47.88743140	-103.46851814	2347.104						
9280	WELD	40,417.9	9280	0.0	49.6	47.88753341	-103.46864967	2348.244						
9290	WELD	40,467.5	9290	0.0	44.8	47.88763630	-103.46878071	2349.916						
9300	WELD	40,512.3	9300	0.0	49.3	47.88772906	-103.46889980	2351.396						
9310	WELD	40,561.5	9310	0.0	49.4	47.88783106	-103.46903084	2352.037						
9320	WELD	40,611.0	9320	0.0	49.6	47.88793406	-103.46916112	2351.873						
9330	WELD	40,660.6	9330	0.0	49.5	47.88803734	-103.46929173	2352.371						
9340	WELD	40,710.1	9340	0.0	49.4	47.88814046	-103.46942281	2352.223						
9350	WELD	40,759.6	9350	0.0	49.6	47.88824392	-103.46955234	2352.673						
9360	WELD	40,809.1	9360	0.0	49.6	47.88834769	-103.46968239	2352.676						
9370	WELD	40,858.7	9370	0.0	48.8	47.88845106	-103.46981303	2353.172						
9380	WELD	40,907.6	9380	0.0	49.5	47.88855275	-103.46994178	2353.907						
9390	WELD	40,957.1	9390	0.0	49.6	47.88865599	-103.47007203	2354.404						
9400	WELD	41,006.7	9400	0.0	49.5	47.88875958	-103.47020145	2355.966						
9410	WELD	41,056.2	9410	0.0	49.3	47.88886390	-103.47033013	2356.498						
9420	WELD	41,105.5	9420	0.0	49.5	47.88896739	-103.47045859	2357.614						
9430	WELD	41,155.0	9430	0.0	49.1	47.88907072	-103.47058848	2357.733						
9440	WELD	41,204.1	9440	0.0	49.3	47.88917257	-103.47071893	2357.864						
9450	WELD	41,253.4	9450	0.0	49.5	47.88927532	-103.47084919	2357.714						
9460	WELD	41,303.0	9460	0.0	49.5	47.88937808	-103.47098071	2358.270						
9470	WELD	41,352.4	9470	0.0	49.2	47.88948041	-103.47111241	2358.309						
9480	WELD	41,401.6	9480	0.0	49.6	47.88958136	-103.47124525	2358.249						
9490	WELD	41,451.2	9490	0.0	49.6	47.88968209	-103.47137975	2358.300						
9500	WELD	41,500.8	9500	0.0	49.5	47.88978369	-103.47151299	2358.060						
9510	WELD	41,550.3	9510	0.0	49.5	47.88988561	-103.47164495	2355.874						
9520	WELD	41,599.8	9520	0.0	49.5	47.88998757	-103.47177714	2356.172						
9530	WELD	41,649.3	9530	0.0	49.4	47.89008887	-103.47191041	2356.233						
9540	WELD	41,698.7	9540	0.0	49.6	47.89018916	-103.47204491	2358.039						
9550	WELD	41,748.3	9550	0.0	49.6	47.89028914	-103.47218029	2360.481						



# Pipeline Listing

TDW Services, Inc.

Hiland Crude, LLC  
East Camp Creek to Camp Creek

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)	Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
9560	WELD	41,797.9	9560	0.0	49.5	47.89039012	-103.47231429	2362.555						
9570	WELD	41,847.5	9570	0.0	49.5	47.89049107	-103.47244812	2363.933						
9580	WELD	41,897.0	9580	0.0	49.5	47.89059227	-103.47258175	2365.237						
9590	WELD	41,946.5	9590	0.0	47.3	47.89069333	-103.47271554	2366.510						
9600	WELD	41,993.8	9600	0.0	6.0	47.89078929	-103.47284424	2367.860						
9610	WELD	41,999.9	9610	0.0	49.4	47.89080149	-103.47286067	2368.031						
9620	WELD	42,049.2	9620	0.0	49.5	47.89090190	-103.47299452	2369.249						
9630	WELD	42,098.7	9630	0.0	49.6	47.89100326	-103.47312811	2369.366						
9640	WELD	42,148.3	9640	0.0	49.6	47.89110418	-103.47326163	2372.444						
9650	WELD	42,197.9	9650	0.0	48.5	47.89120354	-103.47339804	2373.368						
11000016	WT CHANGE	42,246.3	9650	0.0	0.0	47.89130182	-103.47352928	2373.686			0.322	52000	0.72	
9660	WELD	42,246.4	9660	0.0	42.3	47.89130188	-103.47352936	2373.687						
9670	WELD	42,288.7	9670	0.0	42.3	47.89139004	-103.47364040	2374.617						
9680	WELD	42,331.0	9680	0.0	42.3	47.89147746	-103.47375262	2374.331						
9690	WELD	42,373.3	9690	0.0	42.3	47.89156251	-103.47386883	2373.928						
9700	WELD	42,415.6	9700	0.0	42.3	47.89165171	-103.47397732	2376.207						
9710	WELD	42,457.9	9710	0.0	42.2	47.89174270	-103.47408236	2378.551						
11000017	WT CHANGE	42,500.1	9710	0.0	0.0	47.89183337	-103.47418721	2379.968			0.188	52000	0.72	
9720	WELD	42,500.1	9720	0.0	49.4	47.89183341	-103.47418726	2379.968						
10000051	AGM 070, Sta. 423+34, AGM is 95' D/S of Rd C/L -- Han #102	42,502.7	9720	2.6	46.8	47.89183905	-103.47419390	2380.036						
9730	WELD	42,549.5	9730	0.0	19.9	47.89193793	-103.47431307	2383.235						
11000018	WT CHANGE	42,569.4	9730	0.0	0.0	47.89197956	-103.47436477	2384.062			0.322	52000	0.72	
9740	WELD	42,569.4	9740	0.0	0.8	47.89197957	-103.47436481	2384.063						
10000052	Bend left - 25 deg., 1.5D	42,569.8	9740	0.0	0.8	47.89198015	-103.47436619	2384.075	0	12:00				
9750	WELD	42,570.3	9750	0.0	6.3	47.89198074	-103.47436761	2384.088						
9760	WELD	42,576.5	9760	0.0	0.8	47.89198774	-103.47439047	2384.328						
10000053	Bend left - 25 deg., 1.5D	42,576.9	9760	0.1	0.8	47.89198806	-103.47439209	2384.345	0	12:00				
11000019	WT CHANGE	42,577.3	9760	0.0	0.0	47.89198814	-103.47439379	2384.362			0.188	52000	0.72	
9770	WELD	42,577.3	9770	0.0	6.3	47.89198814	-103.47439383	2384.363						
9780	WELD	42,583.6	9780	0.0	48.9	47.89198845	-103.47441944	2384.633						
9790	WELD	42,632.6	9790	0.0	49.3	47.89199063	-103.47461758	2387.308						
9800	WELD	42,681.8	9800	0.0	49.7	47.89199092	-103.47481701	2390.017						
9810	WELD	42,731.6	9810	0.0	49.7	47.89199049	-103.47501798	2393.434						
9820	WELD	42,781.2	9820	0.0	49.8	47.89199054	-103.47521856	2397.730						
9830	WELD	42,831.0	9830	0.0	49.7	47.89199098	-103.47541958	2402.302						



# Pipeline Listing

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East Camp Creek to Camp Creek

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)	Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
9840	WELD	42,880.7	9840	0.0	49.7	47.89199107	-103.47562018	2406.803						
9850	WELD	42,930.4	9850	0.0	49.7	47.89199066	-103.47582130	2409.883						
9860	WELD	42,980.1	9860	0.0	49.7	47.89199056	-103.47602290	2409.085						
9870	WELD	43,029.8	9870	0.0	49.7	47.89199218	-103.47622412	2408.696						
9880	WELD	43,079.5	9880	0.0	49.7	47.89199529	-103.47642578	2409.343						
9890	WELD	43,129.2	9890	0.0	49.8	47.89199873	-103.47662700	2410.571						
9900	WELD	43,179.0	9900	0.0	49.5	47.89200143	-103.47682875	2411.328						
9910	WELD	43,228.5	9910	0.0	49.7	47.89200232	-103.47702932	2409.117						
9920	WELD	43,278.2	9920	0.0	49.7	47.89200184	-103.47723049	2406.402						
9930	WELD	43,327.9	9930	0.0	49.4	47.89200287	-103.47743129	2402.620						
9940	WELD	43,377.3	9940	0.0	49.8	47.89200390	-103.47763083	2399.041						
9950	WELD	43,427.1	9950	0.0	49.8	47.89200608	-103.47783181	2395.042						
9960	WELD	43,476.9	9960	0.0	49.8	47.89200920	-103.47803242	2390.110						
9970	WELD	43,526.6	9970	0.0	49.7	47.89201174	-103.47823194	2383.557						
9980	WELD	43,576.4	9980	0.0	49.7	47.89201356	-103.47843164	2377.719						
9990	WELD	43,626.1	9990	0.0	49.7	47.89201581	-103.47863228	2375.047						
10000	WELD	43,675.7	10000	0.0	49.8	47.89201684	-103.47883260	2370.296						
10010	WELD	43,725.5	10010	0.0	49.8	47.89201832	-103.47903348	2369.147						
10020	WELD	43,775.2	10020	0.0	49.7	47.89202062	-103.47923337	2374.623						
10030	WELD	43,825.0	10030	0.0	49.7	47.89202419	-103.47943307	2381.261						
10040	WELD	43,874.7	10040	0.0	49.7	47.89202717	-103.47963400	2383.584						
10050	WELD	43,924.4	10050	0.0	49.6	47.89202852	-103.47983546	2383.502						
10060	WELD	43,974.0	10060	0.0	49.2	47.89202981	-103.48003646	2382.156						
10070	WELD	44,023.2	10070	0.0	42.3	47.89203213	-103.48023583	2381.448						
10080	WELD	44,065.5	10080	0.0	49.4	47.89203504	-103.48040726	2378.818						
10090	WELD	44,114.9	10090	0.0	49.7	47.89203903	-103.48060739	2375.999						
10100	WELD	44,164.6	10100	0.0	49.7	47.89204361	-103.48080880	2372.714						
10110	WELD	44,214.3	10110	0.0	49.7	47.89204768	-103.48100973	2368.018						
10120	WELD	44,264.0	10120	0.0	49.7	47.89205132	-103.48120964	2361.719						
10130	WELD	44,313.7	10130	0.0	49.7	47.89205474	-103.48140947	2355.075						
10140	WELD	44,363.4	10140	0.0	49.7	47.89205725	-103.48160966	2349.191						
10150	WELD	44,413.1	10150	0.0	49.5	47.89206219	-103.48180949	2342.844						
10160	WELD	44,462.5	10160	0.0	6.2	47.89207031	-103.48200771	2336.034						
10170	WELD	44,468.7	10170	0.0	1.3	47.89207143	-103.48203237	2335.178						
1000054	Bend right-up - 38 deg., 1.5D	44,469.3	10170	0.1	1.2	47.89207207	-103.48203453	2335.107	0	12:00				
10180	WELD	44,470.0	10180	0.0	6.2	47.89207299	-103.48203654	2335.043						



# Pipeline Listing

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East Camp Creek to Camp Creek

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)	Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
10190	WELD	44,476.1	10190	0.0	9.9	47.89208417	-103.48205557	2334.444						
10200	WELD	44,486.0	10200	0.0	49.1	47.89210158	-103.48208586	2333.587						
10210	WELD	44,535.1	10210	0.0	49.6	47.89218968	-103.48223556	2330.186						
10220	WELD	44,584.6	10220	0.0	49.6	47.89228055	-103.48238407	2326.654						
10230	WELD	44,634.2	10230	0.0	49.6	47.89237274	-103.48253092	2324.345						
10240	WELD	44,683.8	10240	0.0	49.4	47.89246519	-103.48267747	2320.911						
10250	WELD	44,733.1	10250	0.0	49.4	47.89255698	-103.48282317	2316.965						
10260	WELD	44,782.5	10260	0.0	49.6	47.89264839	-103.48296961	2313.777						
10270	WELD	44,832.0	10270	0.0	49.7	47.89274013	-103.48311638	2309.618						
10280	WELD	44,881.7	10280	0.0	46.3	47.89283182	-103.48326398	2306.281						
10290	WELD	44,928.0	10290	0.0	49.5	47.89291792	-103.48340069	2302.502						
10300	WELD	44,977.5	10300	0.0	49.6	47.89301016	-103.48354629	2298.271						
10310	WELD	45,027.1	10310	0.0	49.6	47.89310293	-103.48369137	2293.619						
10320	WELD	45,076.7	10320	0.0	49.3	47.89319578	-103.48383643	2289.575						
10330	WELD	45,126.0	10330	0.0	49.6	47.89328744	-103.48398130	2284.649						
10340	WELD	45,175.6	10340	0.0	49.3	47.89337856	-103.48412899	2281.082						
10350	WELD	45,224.9	10350	0.0	49.6	47.89346930	-103.48427574	2277.955						
10360	WELD	45,274.5	10360	0.0	49.6	47.89355958	-103.48442452	2274.881						
10370	WELD	45,324.0	10370	0.0	49.6	47.89365014	-103.48457294	2271.680						
10380	WELD	45,373.6	10380	0.0	49.6	47.89374135	-103.48472050	2268.180						
10390	WELD	45,423.2	10390	0.0	49.5	47.89383335	-103.48486719	2265.458						
10400	WELD	45,472.8	10400	0.0	46.2	47.89392491	-103.48501455	2263.773						
10410	WELD	45,519.0	10410	0.0	49.7	47.89401018	-103.48515248	2261.976						
10420	WELD	45,568.7	10420	0.0	49.7	47.89410187	-103.48530052	2260.103						
10430	WELD	45,618.4	10430	0.0	49.7	47.89419388	-103.48544820	2257.419						
10440	WELD	45,668.1	10440	0.0	49.6	47.89428615	-103.48559517	2254.835						
10450	WELD	45,717.8	10450	0.0	49.7	47.89437819	-103.48574207	2252.963						
10460	WELD	45,767.5	10460	0.0	49.8	47.89447106	-103.48588883	2251.137						
10470	WELD	45,817.2	10470	0.0	49.5	47.89456449	-103.48603484	2249.242						
10480	WELD	45,866.7	10480	0.0	49.6	47.89465667	-103.48618121	2248.042						
10490	WELD	45,916.3	10490	0.0	49.6	47.89474825	-103.48632923	2246.439						
10500	WELD	45,966.0	10500	0.0	49.6	47.89483878	-103.48647861	2245.688						
10510	WELD	46,015.6	10510	0.0	49.4	47.89492883	-103.48662907	2245.202						
10520	WELD	46,065.0	10520	0.0	49.6	47.89501748	-103.48677999	2244.344						
10530	WELD	46,114.6	10530	0.0	49.4	47.89510528	-103.48693343	2243.901						
10540	WELD	46,164.0	10540	0.0	49.6	47.89518956	-103.48709007	2243.066						
10550	WELD	46,213.6	10550	0.0	49.5	47.89526923	-103.48725273	2242.359						



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East Camp Creek to Camp Creek

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)	Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
10560	WELD	46,263.1	10560	0.0	49.5	47.89534329	-103.48742096	2242.189						
10570	WELD	46,312.6	10570	0.0	49.6	47.89541552	-103.48759115	2242.538						
10580	WELD	46,362.2	10580	0.0	49.6	47.89548565	-103.48776343	2243.359						
10590	WELD	46,411.8	10590	0.0	49.7	47.89555593	-103.48793511	2245.244						
10600	WELD	46,461.5	10600	0.0	49.6	47.89562535	-103.48810764	2247.379						
10610	WELD	46,511.1	10610	0.0	47.7	47.89569556	-103.48827915	2249.768						
10620	WELD	46,558.8	10620	0.0	49.6	47.89576272	-103.48844487	2250.213						
10630	WELD	46,608.4	10630	0.0	49.2	47.89583219	-103.48861766	2250.423						
10640	WELD	46,657.5	10640	0.0	49.4	47.89590207	-103.48878797	2249.524						
10650	WELD	46,707.0	10650	0.0	49.6	47.89597278	-103.48895866	2247.399						
10660	WELD	46,756.6	10660	0.0	49.5	47.89604246	-103.48913080	2244.676						
10670	WELD	46,806.1	10670	0.0	49.2	47.89611244	-103.48930237	2241.237						
10680	WELD	46,855.3	10680	0.0	49.5	47.89618130	-103.48947362	2237.819						
10690	WELD	46,904.9	10690	0.0	49.5	47.89625126	-103.48964534	2234.238						
10700	WELD	46,954.4	10700	0.0	49.5	47.89632309	-103.48981549	2230.983						
10710	WELD	47,003.9	10710	0.0	49.5	47.89639657	-103.48998411	2227.958						
10720	WELD	47,053.4	10720	0.0	24.7	47.89647065	-103.49015246	2226.367						
10730	WELD	47,078.1	10730	0.0	22.5	47.89650737	-103.49023678	2226.281						
10740	WELD	47,100.6	10740	0.0	49.6	47.89654003	-103.49031457	2225.831						
10750	WELD	47,150.2	10750	0.0	49.5	47.89661034	-103.49048642	2223.794						
10760	WELD	47,199.7	10760	0.0	49.5	47.89668157	-103.49065712	2221.555						
10770	WELD	47,249.2	10770	0.0	49.3	47.89676035	-103.49082034	2220.085						
10780	WELD	47,298.5	10780	0.0	49.5	47.89684943	-103.49097086	2219.675						
10790	WELD	47,348.0	10790	0.0	49.2	47.89694763	-103.49110895	2219.984						
10800	WELD	47,397.1	10800	0.0	49.6	47.89705008	-103.49123850	2221.004						
10810	WELD	47,446.7	10810	0.0	49.3	47.89715472	-103.49136604	2221.510						
10820	WELD	47,496.0	10820	0.0	49.6	47.89725962	-103.49149173	2219.869						
10830	WELD	47,545.6	10830	0.0	49.5	47.89736703	-103.49161441	2218.607						
10840	WELD	47,595.1	10840	0.0	49.6	47.89747619	-103.49173344	2217.031						
10850	WELD	47,644.7	10850	0.0	48.6	47.89758464	-103.49185404	2216.175						
10860	WELD	47,693.3	10860	0.0	49.5	47.89768910	-103.49197596	2215.095						
10870	WELD	47,742.8	10870	0.0	45.0	47.89779546	-103.49210016	2215.719						
10880	WELD	47,787.8	10880	0.0	49.3	47.89789232	-103.49221243	2215.992						
10890	WELD	47,837.1	10890	0.0	49.5	47.89799795	-103.49233640	2214.242						
10900	WELD	47,886.6	10900	0.0	49.7	47.89810371	-103.49246025	2209.940						
10910	WELD	47,936.3	10910	0.0	49.6	47.89820989	-103.49258373	2205.311						
10920	WELD	47,985.9	10920	0.0	49.5	47.89831648	-103.49270745	2203.732						



# Pipeline Listing

TDW Services, Inc.

Hiland Crude, LLC  
East Camp Creek to Camp Creek

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)	Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
10930	WELD	48,035.4	10930	0.0	49.6	47.89842292	-103.49283065	2203.581						
10940	WELD	48,085.1	10940	0.0	49.6	47.89853005	-103.49295300	2204.407						
10950	WELD	48,134.6	10950	0.0	49.6	47.89863612	-103.49307718	2204.827						
10960	WELD	48,184.2	10960	0.0	49.6	47.89874035	-103.49320453	2202.981						
10970	WELD	48,233.8	10970	0.0	49.6	47.89884357	-103.49333435	2201.065						
10980	WELD	48,283.4	10980	0.0	49.7	47.89894767	-103.49346235	2199.651						
10990	WELD	48,333.1	10990	0.0	49.3	47.89905455	-103.49358595	2199.189						
11000	WELD	48,382.4	11000	0.0	49.0	47.89916285	-103.49370379	2198.886						
11010	WELD	48,431.3	11010	0.0	49.7	47.89926941	-103.49382335	2198.742						
11020	WELD	48,481.0	11020	0.0	49.6	47.89937271	-103.49395326	2198.720						
11030	WELD	48,530.6	11030	0.0	48.8	47.89946844	-103.49409501	2198.923						
11040	WELD	48,579.4	11040	0.0	49.4	47.89955509	-103.49424488	2197.547						
11050	WELD	48,628.8	11050	0.0	49.6	47.89963829	-103.49440168	2197.046						
11060	WELD	48,678.4	11060	0.0	49.7	47.89972062	-103.49456145	2196.453						
11070	WELD	48,728.1	11070	0.0	49.6	47.89980278	-103.49472153	2195.124						
11080	WELD	48,777.6	11080	0.0	47.2	47.89988449	-103.49488146	2194.163						
11090	WELD	48,824.8	11090	0.0	49.5	47.89996183	-103.49503438	2193.125						
11100	WELD	48,874.4	11100	0.0	49.4	47.90004253	-103.49519567	2191.253						
11110	WELD	48,923.8	11110	0.0	49.6	47.90012239	-103.49535721	2190.411						
11120	WELD	48,973.4	11120	0.0	49.6	47.90020154	-103.49551988	2190.575						
11130	WELD	49,023.0	11130	0.0	7.5	47.90028013	-103.49568281	2192.171						
1100020	WT CHANGE	49,030.5	11130	0.0	0.0	47.90029211	-103.49570739	2192.502			0.322	52000	0.72	
11140	WELD	49,030.6	11140	0.0	42.1	47.90029216	-103.49570749	2192.503						
11150	WELD	49,072.7	11150	0.0	42.3	47.90036028	-103.49584490	2194.176						
11160	WELD	49,115.0	11160	0.0	42.1	47.90042755	-103.49598404	2195.779						
1000095	AGM 080, Sta. 486+65, AGM is 37' D/S of Rd C/L -- Survey Point	49,143.8	11160	28.8	13.3	47.90047244	-103.49607980	2198.132						
1100021	WT CHANGE	49,157.1	11160	0.0	0.0	47.90049295	-103.49612398	2198.875			0.188	52000	0.72	
11170	WELD	49,157.1	11170	0.0	37.0	47.90049300	-103.49612408	2198.875						
11180	WELD	49,194.1	11180	0.0	49.4	47.90054933	-103.49624868	2199.594						
11190	WELD	49,243.5	11190	0.0	49.4	47.90062833	-103.49641169	2198.381						
11200	WELD	49,292.9	11200	0.0	47.5	47.90071764	-103.49656211	2197.029						
11210	WELD	49,340.4	11210	0.0	49.6	47.90081205	-103.49669488	2195.910						
11220	WELD	49,390.0	11220	0.0	49.4	47.90091439	-103.49682686	2194.251						
11230	WELD	49,439.4	11230	0.0	9.2	47.90101790	-103.49695483	2191.022						
11240	WELD	49,448.6	11240	0.0	33.6	47.90103723	-103.49697808	2190.098						



# Pipeline Listing

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East Camp Creek to Camp Creek

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)	Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
11250	WELD	49,482.2	11250	0.0	49.3	47.90110832	-103.49706349	2186.970						
11260	WELD	49,531.6	11260	0.0	49.5	47.90121284	-103.49718920	2184.581						
11270	WELD	49,581.0	11270	0.0	49.5	47.90131676	-103.49731739	2183.856						
11280	WELD	49,630.5	11280	0.0	49.5	47.90141986	-103.49744722	2184.264						
11290	WELD	49,680.1	11290	0.0	49.5	47.90152263	-103.49757745	2182.933						
11300	WELD	49,729.6	11300	0.0	42.4	47.90162536	-103.49770764	2180.815						
11310	WELD	49,771.9	11310	0.0	6.0	47.90171313	-103.49781913	2178.230						
1100022	WT CHANGE	49,777.9	11310	0.0	0.0	47.90172556	-103.49783477	2177.798			0.322	52000	0.72	
11320	WELD	49,777.9	11320	0.0	0.9	47.90172562	-103.49783486	2177.796						
1000055	Bend left - 30 deg., 1.5D	49,778.4	11320	0.0	0.9	47.90172624	-103.49783640	2177.760	0	12:00				
11330	WELD	49,778.8	11330	0.0	6.1	47.90172683	-103.49783801	2177.724						
11340	WELD	49,784.9	11340	0.0	1.0	47.90173320	-103.49786098	2177.264						
1000056	Bend left - 30 deg., 1.5D	49,785.4	11340	0.1	0.9	47.90173337	-103.49786286	2177.236	0	12:00				
11350	WELD	49,785.9	11350	0.0	30.0	47.90173332	-103.49786471	2177.204						
11360	WELD	49,815.9	11360	0.0	42.2	47.90172545	-103.49798644	2175.038						
11370	WELD	49,858.2	11370	0.0	42.2	47.90171077	-103.49815649	2174.692						
11380	WELD	49,900.4	11380	0.0	42.3	47.90169096	-103.49832553	2174.379						
11390	WELD	49,942.7	11390	0.0	42.2	47.90167578	-103.49849590	2173.609						
11400	WELD	49,984.9	11400	0.0	42.3	47.90166528	-103.49866586	2177.175						
1100023	WT CHANGE	50,027.2	11400	0.0	0.0	47.90165532	-103.49883620	2179.330			0.188	52000	0.72	
11410	WELD	50,027.2	11410	0.0	23.4	47.90165532	-103.49883632	2179.330						
11420	WELD	50,050.7	11420	0.0	49.4	47.90164993	-103.49893087	2178.811						
11430	WELD	50,100.1	11430	0.0	49.5	47.90163857	-103.49913044	2176.757						
11440	WELD	50,149.6	11440	0.0	49.7	47.90162711	-103.49933020	2175.548						
11450	WELD	50,199.3	11450	0.0	49.6	47.90161482	-103.49953057	2172.640						
11460	WELD	50,248.9	11460	0.0	49.6	47.90160195	-103.49972961	2168.067						
11470	WELD	50,298.5	11470	0.0	49.5	47.90159126	-103.49992913	2163.394						
11480	WELD	50,348.0	11480	0.0	49.5	47.90158140	-103.50012896	2160.010						
11490	WELD	50,397.4	11490	0.0	49.5	47.90157117	-103.50032878	2158.241						
11500	WELD	50,446.9	11500	0.0	49.5	47.90156038	-103.50052866	2158.043						
11510	WELD	50,496.5	11510	0.0	48.8	47.90155028	-103.50072884	2156.639						
11520	WELD	50,545.3	11520	0.0	49.5	47.90154021	-103.50092625	2156.453						
11530	WELD	50,594.8	11530	0.0	49.5	47.90153048	-103.50112639	2156.425						
11540	WELD	50,644.3	11540	0.0	49.5	47.90152055	-103.50132662	2156.953						
11550	WELD	50,693.8	11550	0.0	49.6	47.90150998	-103.50152690	2156.152						
11560	WELD	50,743.4	11560	0.0	49.4	47.90149683	-103.50172394	2147.970						
11570	WELD	50,792.8	11570	0.0	49.6	47.90148218	-103.50192051	2140.410						



# Pipeline Listing

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East Camp Creek to Camp Creek

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)	Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
11580	WELD	50,842.4	11580	0.0	49.5	47.90146845	-103.50211961	2136.278						
11590	WELD	50,891.9	11590	0.0	49.5	47.90145624	-103.50231860	2140.610						
11600	WELD	50,941.5	11600	0.0	49.5	47.90144589	-103.50251758	2145.701						
11610	WELD	50,991.0	11610	0.0	49.5	47.90143561	-103.50271802	2147.224						
11620	WELD	51,040.5	11620	0.0	49.6	47.90142487	-103.50291832	2147.904						
11630	WELD	51,090.0	11630	0.0	49.3	47.90141348	-103.50311892	2147.782						
11640	WELD	51,139.3	11640	0.0	49.4	47.90140155	-103.50331793	2148.002						
11650	WELD	51,188.8	11650	0.0	49.3	47.90139026	-103.50351723	2150.592						
11660	WELD	51,238.1	11660	0.0	49.7	47.90137966	-103.50371659	2151.961						
11670	WELD	51,287.7	11670	0.0	49.5	47.90137048	-103.50391761	2149.913						
11680	WELD	51,337.2	11680	0.0	49.7	47.90136139	-103.50411781	2147.638						
11690	WELD	51,386.9	11690	0.0	49.8	47.90135204	-103.50431872	2149.004						
11700	WELD	51,436.7	11700	0.0	49.6	47.90134227	-103.50451912	2152.406						
11710	WELD	51,486.3	11710	0.0	49.8	47.90133230	-103.50471873	2156.874						
11720	WELD	51,536.0	11720	0.0	49.7	47.90132251	-103.50491940	2159.366						
11730	WELD	51,585.8	11730	0.0	49.7	47.90131324	-103.50512038	2159.388						
11740	WELD	51,635.5	11740	0.0	49.7	47.90130335	-103.50532118	2159.028						
11750	WELD	51,685.2	11750	0.0	49.7	47.90129268	-103.50552178	2159.118						
11760	WELD	51,734.9	11760	0.0	49.5	47.90128257	-103.50572254	2157.898						
11770	WELD	51,784.4	11770	0.0	49.8	47.90127381	-103.50592262	2157.464						
11780	WELD	51,834.2	11780	0.0	49.7	47.90126657	-103.50612405	2156.959						
11790	WELD	51,883.9	11790	0.0	49.7	47.90126233	-103.50632524	2156.147						
11800	WELD	51,933.6	11800	0.0	49.7	47.90126132	-103.50652688	2156.673						
11810	WELD	51,983.3	11810	0.0	49.5	47.90126440	-103.50672802	2153.498						
11820	WELD	52,032.8	11820	0.0	49.8	47.90126832	-103.50692519	2144.662						
11830	WELD	52,082.6	11830	0.0	49.8	47.90127008	-103.50712288	2135.485						
11840	WELD	52,132.3	11840	0.0	49.7	47.90127851	-103.50732332	2134.635						
11850	WELD	52,182.1	11850	0.0	49.8	47.90128710	-103.50752144	2142.671						
11860	WELD	52,231.9	11860	0.0	49.7	47.90129531	-103.50772119	2148.570						
11870	WELD	52,281.6	11870	0.0	39.4	47.90130333	-103.50792118	2152.883						
11880	WELD	52,321.0	11880	0.0	48.6	47.90130903	-103.50808022	2154.339						
11890	WELD	52,369.6	11890	0.0	34.0	47.90131697	-103.50827632	2152.074						
11900	WELD	52,403.7	11900	0.0	8.7	47.90132541	-103.50841044	2145.018						
11910	WELD	52,412.4	11910	0.0	49.4	47.90132771	-103.50844477	2142.906						
11920	WELD	52,461.8	11920	0.0	47.8	47.90134213	-103.50863853	2133.582						
11930	WELD	52,509.6	11930	0.0	47.7	47.90135622	-103.50882937	2138.908						
11940	WELD	52,557.3	11940	0.0	48.4	47.90136730	-103.50901441	2151.936						



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East Camp Creek to Camp Creek

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)	Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
11950	WELD	52,605.7	11950	0.0	9.4	47.90138038	-103.50920891	2156.770						
11960	WELD	52,615.2	11960	0.0	37.7	47.90138304	-103.50924677	2157.352						
11970	WELD	52,652.9	11970	0.0	49.6	47.90139266	-103.50939890	2159.722						
11980	WELD	52,702.5	11980	0.0	49.4	47.90140455	-103.50959930	2161.645						
11990	WELD	52,751.9	11990	0.0	49.7	47.90141585	-103.50979850	2163.242						
12000	WELD	52,801.6	12000	0.0	49.7	47.90142741	-103.50999889	2165.759						
12010	WELD	52,851.3	12010	0.0	49.7	47.90143924	-103.51019960	2167.033						
12020	WELD	52,901.0	12020	0.0	49.7	47.90145222	-103.51039976	2169.370						
12030	WELD	52,950.6	12030	0.0	42.8	47.90146567	-103.51060025	2172.246						
12040	WELD	52,993.4	12040	0.0	42.8	47.90147798	-103.51077225	2175.132						
12050	WELD	53,036.2	12050	0.0	42.2	47.90149016	-103.51094433	2177.670						
12060	WELD	53,078.4	12060	0.0	38.7	47.90150251	-103.51111382	2180.675						
12070	WELD	53,117.1	12070	0.0	36.4	47.90151416	-103.51126948	2181.858						
12080	WELD	53,153.5	12080	0.0	44.7	47.90152526	-103.51141626	2181.697						
12090	WELD	53,198.2	12090	0.0	45.3	47.90153849	-103.51159593	2183.204						
12100	WELD	53,243.5	12100	0.0	34.7	47.90155240	-103.51177722	2187.700						
12110	WELD	53,278.2	12110	0.0	46.7	47.90156210	-103.51191640	2191.459						
12120	WELD	53,324.8	12120	0.0	38.3	47.90157306	-103.51210440	2196.206						
12130	WELD	53,363.1	12130	0.0	44.6	47.90158455	-103.51225881	2198.401						
12140	WELD	53,407.7	12140	0.0	49.7	47.90160653	-103.51243695	2199.536						
12150	WELD	53,457.4	12150	0.0	38.0	47.90164114	-103.51263221	2199.379						
12160	WELD	53,495.4	12160	0.0	43.0	47.90167177	-103.51277947	2199.144						
12170	WELD	53,538.4	12170	0.0	44.0	47.90170601	-103.51294605	2199.624						
12180	WELD	53,582.3	12180	0.0	49.4	47.90173942	-103.51311728	2200.669						
12190	WELD	53,631.7	12190	0.0	42.7	47.90177486	-103.51331060	2202.146						
12200	WELD	53,674.4	12200	0.0	39.6	47.90180674	-103.51347724	2203.742						
12210	WELD	53,714.1	12210	0.0	35.6	47.90183756	-103.51363075	2207.164						
12220	WELD	53,749.7	12220	0.0	49.4	47.90186773	-103.51376762	2210.395						
12230	WELD	53,799.1	12230	0.0	49.4	47.90191764	-103.51395360	2209.579						
12240	WELD	53,848.5	12240	0.0	49.6	47.90197784	-103.51413286	2206.593						
12250	WELD	53,898.1	12250	0.0	49.5	47.90204377	-103.51430701	2201.011						
12260	WELD	53,947.6	12260	0.0	49.5	47.90210985	-103.51448084	2195.446						
12270	WELD	53,997.1	12270	0.0	49.5	47.90217476	-103.51465720	2194.333						
12280	WELD	54,046.6	12280	0.0	43.7	47.90223857	-103.51483363	2198.529						
12290	WELD	54,090.3	12290	0.0	49.7	47.90229513	-103.51498856	2203.199						
12300	WELD	54,140.0	12300	0.0	49.4	47.90235918	-103.51516546	2207.272						
12310	WELD	54,189.5	12310	0.0	49.6	47.90242192	-103.51534234	2211.008						



# Pipeline Listing

TDW Services, Inc.

Hiland Crude, LLC  
East Camp Creek to Camp Creek

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)	Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
12320	WELD	54,239.0	12320	0.0	49.4	47.90249051	-103.51551508	2212.791						
12330	WELD	54,288.4	12330	0.0	49.5	47.90256859	-103.51567836	2212.507						
12340	WELD	54,337.9	12340	0.0	49.8	47.90265782	-103.51582748	2208.494						
12350	WELD	54,387.7	12350	0.0	49.7	47.90275300	-103.51596889	2201.488						
12360	WELD	54,437.4	12360	0.0	49.5	47.90284626	-103.51611164	2193.994						
12370	WELD	54,486.9	12370	0.0	49.8	47.90293610	-103.51625715	2186.014						
12380	WELD	54,536.6	12380	0.0	49.5	47.90302449	-103.51640422	2175.697						
12390	WELD	54,586.1	12390	0.0	49.9	47.90311338	-103.51655050	2167.198						
12400	WELD	54,636.0	12400	0.0	49.7	47.90320634	-103.51669698	2167.857						
12410	WELD	54,685.7	12410	0.0	49.4	47.90329973	-103.51684154	2173.452						
12420	WELD	54,735.2	12420	0.0	49.4	47.90339271	-103.51698551	2178.137						
12430	WELD	54,784.6	12430	0.0	49.7	47.90348661	-103.51712811	2183.572						
12440	WELD	54,834.3	12440	0.0	49.7	47.90357984	-103.51727209	2190.460						
12450	WELD	54,884.0	12450	0.0	49.7	47.90367071	-103.51741988	2196.608						
12460	WELD	54,933.7	12460	0.0	49.7	47.90375921	-103.51757111	2202.373						
12470	WELD	54,983.3	12470	0.0	49.4	47.90385382	-103.51771500	2206.619						
12480	WELD	55,032.7	12480	0.0	49.7	47.90395764	-103.51784331	2207.644						
12490	WELD	55,082.4	12490	0.0	49.7	47.90406768	-103.51796157	2207.566						
12500	WELD	55,132.1	12500	0.0	48.7	47.90417861	-103.51807798	2209.095						
12510	WELD	55,180.8	12510	0.0	47.5	47.90428680	-103.51819224	2210.498						
12520	WELD	55,228.3	12520	0.0	50.0	47.90439171	-103.51830524	2212.335						
12530	WELD	55,278.4	12530	0.0	49.6	47.90450223	-103.51842358	2215.186						
12540	WELD	55,328.0	12540	0.0	49.4	47.90461452	-103.51853489	2217.744						
12550	WELD	55,377.4	12550	0.0	48.5	47.90472975	-103.51863922	2217.789						
12560	WELD	55,425.9	12560	0.0	49.7	47.90484384	-103.51873925	2217.088						
12570	WELD	55,475.6	12570	0.0	49.1	47.90496070	-103.51884102	2215.457						
12580	WELD	55,524.7	12580	0.0	48.4	47.90507643	-103.51894112	2215.027						
12590	WELD	55,573.1	12590	0.0	48.4	47.90518894	-103.51904364	2213.653						
12600	WELD	55,621.5	12600	0.0	24.3	47.90530074	-103.51914719	2212.510						
11000024	WT CHANGE	55,645.7	12600	0.0	0.0	47.90535674	-103.51919936	2211.424			0.322	52000	0.72	
12610	WELD	55,645.8	12610	0.0	42.2	47.90535685	-103.51919947	2211.423						
12620	WELD	55,687.9	12620	0.0	42.4	47.90545387	-103.51929123	2210.598						
12630	WELD	55,730.3	12630	0.0	42.3	47.90555161	-103.51938212	2210.562						
12640	WELD	55,772.6	12640	0.0	42.3	47.90565346	-103.51946267	2209.821						
12650	WELD	55,814.9	12650	0.0	42.3	47.90575802	-103.51953453	2207.800						
12660	WELD	55,857.2	12660	0.0	42.3	47.90586167	-103.51960924	2206.640						
12670	WELD	55,899.5	12670	0.0	42.3	47.90596353	-103.51968955	2205.490						



# Pipeline Listing

TDW Services, Inc.

Hiland Crude, LLC  
East Camp Creek to Camp Creek

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)	Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
12680	WELD	55,941.8	12680	0.0	42.3	47.90606413	-103.51977312	2203.338						
12690	WELD	55,984.1	12690	0.0	42.3	47.90616480	-103.51985668	2201.341						
12700	WELD	56,026.4	12700	0.0	42.3	47.90626655	-103.51993736	2201.053						
10000058	AGM 090, Sta. 555+55, AGM is 63' D/S of Rd C/L -- Han #143	56,065.6	12700	39.2	3.1	47.90636165	-103.52001020	2201.251						
12710	WELD	56,068.7	12710	0.0	42.2	47.90636911	-103.52001587	2201.239						
11000025	WT CHANGE	56,111.0	12710	0.0	0.0	47.90647144	-103.52009379	2200.267			0.188	52000	0.72	
12720	WELD	56,111.0	12720	0.0	8.0	47.90647149	-103.52009383	2200.266						
12730	WELD	56,119.0	12730	0.0	49.1	47.90649103	-103.52010866	2200.040						
12740	WELD	56,168.1	12740	0.0	49.8	47.90660992	-103.52019770	2197.608						
12750	WELD	56,217.8	12750	0.0	49.8	47.90673009	-103.52029001	2195.171						
12760	WELD	56,267.6	12760	0.0	49.8	47.90684916	-103.52038570	2193.887						
12770	WELD	56,317.4	12770	0.0	49.8	47.90696902	-103.52047926	2192.600						
12780	WELD	56,367.2	12780	0.0	49.8	47.90708956	-103.52057099	2191.611						
12790	WELD	56,417.0	12790	0.0	49.8	47.90720998	-103.52066283	2190.262						
12800	WELD	56,466.8	12800	0.0	49.7	47.90733031	-103.52075526	2188.877						
12810	WELD	56,516.5	12810	0.0	49.5	47.90745038	-103.52084800	2187.837						
12820	WELD	56,566.1	12820	0.0	49.7	47.90756970	-103.52094090	2187.710						
12830	WELD	56,615.7	12830	0.0	48.1	47.90768984	-103.52103372	2187.632						
12840	WELD	56,663.9	12840	0.0	49.5	47.90780601	-103.52112331	2187.112						
12850	WELD	56,713.4	12850	0.0	49.6	47.90792579	-103.52121528	2186.490						
12860	WELD	56,763.0	12860	0.0	49.8	47.90804626	-103.52130625	2186.204						
12870	WELD	56,812.8	12870	0.0	49.8	47.90816720	-103.52139747	2184.620						
12880	WELD	56,862.6	12880	0.0	49.6	47.90828807	-103.52148862	2182.281						
12890	WELD	56,912.3	12890	0.0	49.4	47.90840850	-103.52157949	2181.919						
12900	WELD	56,961.7	12900	0.0	49.5	47.90852819	-103.52167105	2181.979						
12910	WELD	57,011.3	12910	0.0	49.8	47.90864724	-103.52176511	2182.188						
12920	WELD	57,061.0	12920	0.0	49.4	47.90876595	-103.52186215	2183.078						
12930	WELD	57,110.5	12930	0.0	49.7	47.90888305	-103.52196078	2183.077						
12940	WELD	57,160.2	12940	0.0	49.7	47.90900018	-103.52206212	2183.110						
12950	WELD	57,209.8	12950	0.0	49.7	47.90911665	-103.52216498	2182.907						
12960	WELD	57,259.5	12960	0.0	49.4	47.90923322	-103.52226798	2181.686						
12970	WELD	57,308.9	12970	0.0	49.8	47.90934943	-103.52236942	2180.351						
12980	WELD	57,358.7	12980	0.0	49.6	47.90946635	-103.52247210	2179.397						
12990	WELD	57,408.3	12990	0.0	49.4	47.90958258	-103.52257414	2178.093						
13000	WELD	57,457.7	13000	0.0	49.5	47.90969827	-103.52267695	2177.108						



# Pipeline Listing

TDW Services, Inc.

Hiland Crude, LLC  
East Camp Creek to Camp Creek

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)	Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
13010	WELD	57,507.2	13010	0.0	49.5	47.90981383	-103.52278007	2175.698						
13020	WELD	57,556.7	13020	0.0	49.7	47.90992983	-103.52288238	2174.083						
13030	WELD	57,606.4	13030	0.0	49.7	47.91004614	-103.52298520	2173.019						
13040	WELD	57,656.0	13040	0.0	49.6	47.91016292	-103.52308770	2172.392						
13050	WELD	57,705.7	13050	0.0	49.5	47.91027946	-103.52319002	2170.827						
13060	WELD	57,755.2	13060	0.0	49.7	47.91039558	-103.52329272	2169.336						
13070	WELD	57,804.9	13070	0.0	49.6	47.91050871	-103.52340289	2167.219						
13080	WELD	57,854.5	13080	0.0	49.6	47.91061578	-103.52352619	2164.489						
13090	WELD	57,904.1	13090	0.0	49.7	47.91072012	-103.52365407	2162.061						
13100	WELD	57,953.8	13100	0.0	49.4	47.91082513	-103.52378122	2159.064						
13110	WELD	58,003.2	13110	0.0	49.3	47.91092909	-103.52390722	2154.311						
13120	WELD	58,052.6	13120	0.0	41.1	47.91103260	-103.52403331	2149.695						
13130	WELD	58,093.7	13130	0.0	49.6	47.91111886	-103.52413873	2146.022						
13140	WELD	58,143.3	13140	0.0	49.5	47.91122238	-103.52426747	2142.897						
13150	WELD	58,192.8	13150	0.0	48.4	47.91132283	-103.52440080	2140.231						
13160	WELD	58,241.2	13160	0.0	49.3	47.91141936	-103.52453409	2138.170						
13170	WELD	58,290.5	13170	0.0	49.6	47.91151713	-103.52467185	2136.746						
13180	WELD	58,340.1	13180	0.0	49.5	47.91161411	-103.52481196	2136.076						
13190	WELD	58,389.5	13190	0.0	49.7	47.91171069	-103.52495264	2136.092						
13200	WELD	58,439.2	13200	0.0	49.6	47.91180793	-103.52509311	2136.006						
13210	WELD	58,488.9	13210	0.0	49.6	47.91190569	-103.52523303	2136.358						
13220	WELD	58,538.5	13220	0.0	49.8	47.91200368	-103.52537123	2136.144						
13230	WELD	58,588.2	13230	0.0	49.2	47.91210234	-103.52550962	2136.351						
13240	WELD	58,637.5	13240	0.0	49.7	47.91219968	-103.52564687	2137.012						
13250	WELD	58,687.2	13250	0.0	49.7	47.91229775	-103.52578596	2137.716						
13260	WELD	58,736.9	13260	0.0	49.7	47.91239375	-103.52592806	2138.903						
13270	WELD	58,786.7	13270	0.0	49.6	47.91248522	-103.52607665	2138.802						
13280	WELD	58,836.3	13280	0.0	49.8	47.91256785	-103.52623539	2136.248						
13290	WELD	58,886.0	13290	0.0	49.8	47.91264076	-103.52640494	2133.924						
13300	WELD	58,935.8	13300	0.0	49.8	47.91270589	-103.52658085	2129.349						
13310	WELD	58,985.6	13310	0.0	49.8	47.91276609	-103.52676088	2125.215						
13320	WELD	59,035.4	13320	0.0	49.8	47.91282532	-103.52694169	2121.940						
13330	WELD	59,085.2	13330	0.0	49.7	47.91288438	-103.52712328	2119.944						
13340	WELD	59,134.9	13340	0.0	49.7	47.91294224	-103.52730498	2116.793						
13350	WELD	59,184.6	13350	0.0	49.8	47.91299933	-103.52748738	2113.736						
13360	WELD	59,234.4	13360	0.0	49.5	47.91305643	-103.52767030	2114.417						
13370	WELD	59,283.9	13370	0.0	49.7	47.91311382	-103.52785170	2114.974						



# Pipeline Listing

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Hiland Crude, LLC  
East Camp Creek to Camp Creek

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)	Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
13380	WELD	59,333.6	13380	0.0	49.9	47.91317509	-103.52803144	2115.571						
13390	WELD	59,383.4	13390	0.0	49.8	47.91323766	-103.52821003	2112.316						
13400	WELD	59,433.2	13400	0.0	49.7	47.91329981	-103.52838872	2108.805						
13410	WELD	59,483.0	13410	0.0	49.8	47.91336061	-103.52856833	2107.808						
13420	WELD	59,532.8	13420	0.0	49.8	47.91341956	-103.52875005	2109.988						
13430	WELD	59,582.6	13430	0.0	49.8	47.91347787	-103.52893161	2113.891						
13440	WELD	59,632.3	13440	0.0	49.5	47.91353486	-103.52911351	2118.876						
13450	WELD	59,681.8	13450	0.0	49.6	47.91359157	-103.52929433	2123.600						
13460	WELD	59,731.4	13460	0.0	49.7	47.91364859	-103.52947482	2129.512						
13470	WELD	59,781.1	13470	0.0	49.8	47.91370662	-103.52965564	2135.154						
13480	WELD	59,830.9	13480	0.0	49.5	47.91376589	-103.52983563	2140.847						
13490	WELD	59,880.4	13490	0.0	48.9	47.91382533	-103.53001483	2144.909						
13500	WELD	59,929.2	13500	0.0	49.7	47.91388463	-103.53019220	2147.800						
13510	WELD	59,978.9	13510	0.0	49.5	47.91394435	-103.53037224	2152.264						
13520	WELD	60,028.4	13520	0.0	47.2	47.91400367	-103.53055235	2155.994						
13530	WELD	60,075.6	13530	0.0	6.3	47.91406110	-103.53072376	2157.814						
11000026	WT CHANGE	60,081.9	13530	0.0	0.0	47.91406915	-103.53074600	2157.948			0.322	52000	0.72	
13540	WELD	60,081.9	13540	0.0	0.5	47.91406916	-103.53074603	2157.948						
10000059	Bend right - 16 deg., 1.5D	60,082.1	13540	0.0	0.5	47.91406961	-103.53074688	2157.949	0	12:00				
13550	WELD	60,082.4	13550	0.0	6.1	47.91407010	-103.53074771	2157.950						
13560	WELD	60,088.5	13560	0.0	1.6	47.91408177	-103.53076547	2157.959						
10000060	Bend right - 45 deg., 3D	60,089.2	13560	0.0	1.5	47.91408361	-103.53076663	2157.948	0	12:00				
11000027	WT CHANGE	60,090.0	13560	0.0	0.0	47.91408565	-103.53076707	2157.926			0.188	52000	0.72	
13570	WELD	60,090.0	13570	0.0	42.0	47.91408570	-103.53076708	2157.925						
13580	WELD	60,132.0	13580	0.0	49.7	47.91420078	-103.53077153	2156.037						
13590	WELD	60,181.7	13590	0.0	49.5	47.91433611	-103.53078044	2154.956						
13600	WELD	60,231.2	13600	0.0	49.7	47.91447105	-103.53079038	2153.875						
13610	WELD	60,280.9	13610	0.0	49.6	47.91460654	-103.53079910	2152.959						
13620	WELD	60,330.5	13620	0.0	49.4	47.91474156	-103.53080691	2152.049						
13630	WELD	60,379.9	13630	0.0	49.7	47.91487607	-103.53081559	2151.073						
13640	WELD	60,429.6	13640	0.0	49.8	47.91501141	-103.53082371	2149.392						
13650	WELD	60,479.3	13650	0.0	49.7	47.91514682	-103.53082910	2147.734						
13660	WELD	60,529.0	13660	0.0	49.5	47.91528251	-103.53082907	2146.114						
13670	WELD	60,578.6	13670	0.0	20.3	47.91541733	-103.53082960	2143.311						
13680	WELD	60,598.9	13680	0.0	6.1	47.91547264	-103.53082981	2142.222						
13690	WELD	60,605.1	13690	0.0	25.0	47.91548936	-103.53083011	2141.823						
13700	WELD	60,630.0	13700	0.0	49.4	47.91555745	-103.53083303	2139.761						



# Pipeline Listing

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East Camp Creek to Camp Creek

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)	Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
13710	WELD	60,679.4	13710	0.0	49.4	47.91569170	-103.53083979	2137.877						
13720	WELD	60,728.8	13720	0.0	16.4	47.91582633	-103.53085012	2138.291						
13730	WELD	60,745.2	13730	0.0	31.1	47.91587100	-103.53085348	2138.210						
13740	WELD	60,776.3	13740	0.0	49.7	47.91595561	-103.53085885	2137.621						
13750	WELD	60,826.0	13750	0.0	49.4	47.91609104	-103.53086769	2136.412						
13760	WELD	60,875.4	13760	0.0	49.6	47.91622570	-103.53087683	2135.963						
13770	WELD	60,924.9	13770	0.0	49.5	47.91636074	-103.53088518	2136.258						
13780	WELD	60,974.4	13780	0.0	49.5	47.91649549	-103.53089337	2138.500						
13790	WELD	61,023.9	13790	0.0	49.6	47.91663018	-103.53090338	2141.746						
13800	WELD	61,073.5	13800	0.0	49.5	47.91676537	-103.53091441	2143.077						
13810	WELD	61,123.1	13810	0.0	49.7	47.91690018	-103.53092668	2142.090						
13820	WELD	61,172.8	13820	0.0	49.6	47.91703540	-103.53093708	2139.492						
13830	WELD	61,222.4	13830	0.0	49.5	47.91716998	-103.53094654	2134.653						
13840	WELD	61,271.9	13840	0.0	45.4	47.91730456	-103.53095482	2130.737						
11000028	WT CHANGE	61,317.4	13840	0.0	0.0	47.91742810	-103.53096211	2128.455			0.322	52000	0.72	
13850	WELD	61,317.4	13850	0.0	0.9	47.91742817	-103.53096215	2128.453						
10000061	Bend left - 28 deg., 1.5D	61,317.8	13850	0.0	0.8	47.91742926	-103.53096268	2128.430	0	12:00				
13860	WELD	61,318.2	13860	0.0	6.1	47.91743033	-103.53096344	2128.407						
11000029	WT CHANGE	61,324.3	13860	0.0	0.0	47.91744498	-103.53097522	2128.084			0.188	52000	0.72	
13870	WELD	61,324.3	13870	0.0	45.7	47.91744508	-103.53097530	2128.081						
13880	WELD	61,370.0	13880	0.0	49.3	47.91755517	-103.53106353	2126.094						
13890	WELD	61,419.3	13890	0.0	49.6	47.91767303	-103.53115994	2124.702						
13900	WELD	61,468.9	13900	0.0	49.8	47.91779148	-103.53125769	2126.502						
13910	WELD	61,518.7	13910	0.0	49.7	47.91790964	-103.53135692	2127.184						
13920	WELD	61,568.4	13920	0.0	49.7	47.91802812	-103.53145506	2127.648						
13930	WELD	61,618.1	13930	0.0	49.5	47.91814655	-103.53155305	2128.374						
13940	WELD	61,667.5	13940	0.0	49.4	47.91826434	-103.53165031	2129.403						
13950	WELD	61,716.9	13950	0.0	49.8	47.91838190	-103.53174772	2130.208						
13960	WELD	61,766.7	13960	0.0	49.8	47.91850015	-103.53184585	2131.162						
13970	WELD	61,816.5	13970	0.0	49.8	47.91861750	-103.53194687	2132.254						
13980	WELD	61,866.3	13980	0.0	49.8	47.91873242	-103.53205388	2132.767						
13990	WELD	61,916.1	13990	0.0	49.8	47.91884200	-103.53217242	2133.015						
14000	WELD	61,965.9	14000	0.0	49.7	47.91894489	-103.53230340	2133.314						
14010	WELD	62,015.6	14010	0.0	49.5	47.91904549	-103.53243835	2133.442						
14020	WELD	62,065.1	14020	0.0	49.6	47.91914617	-103.53257167	2133.343						
14030	WELD	62,114.7	14030	0.0	46.1	47.91924815	-103.53270340	2133.634						
14040	WELD	62,160.9	14040	0.0	49.4	47.91934265	-103.53282717	2133.915						



# Pipeline Listing

TDW Services, Inc.

Hiland Crude, LLC  
East Camp Creek to Camp Creek

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)	Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
14050	WELD	62,210.2	14050	0.0	49.4	47.91944028	-103.53296538	2134.512						
14060	WELD	62,259.7	14060	0.0	49.7	47.91953123	-103.53311325	2134.670						
14070	WELD	62,309.3	14070	0.0	49.7	47.91961578	-103.53327113	2135.591						
14080	WELD	62,359.0	14080	0.0	49.7	47.91969186	-103.53343757	2138.768						
14090	WELD	62,408.7	14090	0.0	49.4	47.91976066	-103.53361103	2141.578						
14100	WELD	62,458.2	14100	0.0	49.7	47.91982523	-103.53378711	2144.063						
14110	WELD	62,507.8	14110	0.0	49.6	47.91988427	-103.53396847	2145.980						
14120	WELD	62,557.5	14120	0.0	36.4	47.91993512	-103.53415496	2147.943						
14130	WELD	62,593.9	14130	0.0	48.1	47.91996880	-103.53429398	2148.289						
10000062	Bend left - 14 deg., 69D	62,610.2	14130	9.8	38.3	47.91998173	-103.53435730	2148.199	0	12:00				
14140	WELD	62,641.9	14140	0.0	19.7	47.91998818	-103.53448563	2148.390						
14150	WELD	62,661.7	14150	0.0	49.3	47.91999119	-103.53456562	2148.460						
14160	WELD	62,711.0	14160	0.0	49.7	47.91999742	-103.53476536	2149.907						
14170	WELD	62,760.6	14170	0.0	49.7	47.92000016	-103.53496683	2150.911						
14180	WELD	62,810.4	14180	0.0	43.9	47.91999794	-103.53516839	2151.783						
14190	WELD	62,854.3	14190	0.0	49.3	47.91999554	-103.53534671	2153.184						
14200	WELD	62,903.7	14200	0.0	29.5	47.91999396	-103.53554639	2155.462						
14210	WELD	62,933.2	14210	0.0	18.7	47.91999318	-103.53566613	2155.712						
14220	WELD	62,951.9	14220	0.0	49.5	47.91999338	-103.53574212	2155.084						
14230	WELD	63,001.5	14230	0.0	49.7	47.91999552	-103.53594317	2154.721						
14240	WELD	63,051.2	14240	0.0	49.6	47.91999900	-103.53614434	2157.119						
14250	WELD	63,100.8	14250	0.0	12.3	47.91999994	-103.53634538	2159.703						
14260	WELD	63,113.1	14260	0.0	34.5	47.91999978	-103.53639529	2160.066						
14270	WELD	63,147.6	14270	0.0	49.3	47.91999946	-103.53653550	2160.451						
14280	WELD	63,196.9	14280	0.0	49.6	47.92000011	-103.53673533	2159.250						
14290	WELD	63,246.5	14290	0.0	49.7	47.92000125	-103.53693646	2157.079						
14300	WELD	63,296.2	14300	0.0	49.5	47.92000210	-103.53713771	2155.950						
14310	WELD	63,345.7	14310	0.0	49.7	47.92000241	-103.53733820	2154.910						
14320	WELD	63,395.4	14320	0.0	48.9	47.92000194	-103.53753953	2153.406						
14330	WELD	63,444.3	14330	0.0	49.8	47.92000130	-103.53773767	2153.233						
14340	WELD	63,494.2	14340	0.0	49.8	47.92000104	-103.53793948	2153.667						
14350	WELD	63,544.0	14350	0.0	49.8	47.92000094	-103.53814148	2153.331						
14360	WELD	63,593.8	14360	0.0	49.8	47.92000086	-103.53834300	2151.307						
14370	WELD	63,643.6	14370	0.0	49.8	47.92000111	-103.53854473	2149.914						
14380	WELD	63,693.4	14380	0.0	49.6	47.92000160	-103.53874631	2148.042						
14390	WELD	63,743.0	14390	0.0	49.9	47.92000338	-103.53894704	2146.248						
14400	WELD	63,792.8	14400	0.0	49.5	47.92000466	-103.53914886	2145.115						



# Pipeline Listing

TDW Services, Inc.

Hiland Crude, LLC  
East Camp Creek to Camp Creek

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)	Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
14410	WELD	63,842.3	14410	0.0	49.7	47.92000556	-103.53934915	2143.761						
14420	WELD	63,892.0	14420	0.0	49.7	47.92000592	-103.53955080	2143.443						
14430	WELD	63,941.7	14430	0.0	49.7	47.92000688	-103.53975202	2142.741						
14440	WELD	63,991.4	14440	0.0	49.8	47.92000818	-103.53995342	2141.887						
14450	WELD	64,041.2	14450	0.0	49.6	47.92001029	-103.54015498	2140.545						
14460	WELD	64,090.8	14460	0.0	49.6	47.92001157	-103.54035593	2140.304						
14470	WELD	64,140.4	14470	0.0	49.9	47.92001245	-103.54055680	2139.252						
14480	WELD	64,190.3	14480	0.0	49.7	47.92001495	-103.54075866	2138.535						
14490	WELD	64,240.0	14490	0.0	49.5	47.92001748	-103.54096021	2137.641						
14500	WELD	64,289.6	14500	0.0	49.7	47.92001951	-103.54116060	2135.583						
14510	WELD	64,339.3	14510	0.0	49.8	47.92002133	-103.54136207	2135.514						
14520	WELD	64,389.1	14520	0.0	49.5	47.92002238	-103.54156382	2134.824						
14530	WELD	64,438.6	14530	0.0	49.8	47.92002261	-103.54176446	2134.372						
14540	WELD	64,488.4	14540	0.0	49.7	47.92002310	-103.54196618	2133.609						
14550	WELD	64,538.1	14550	0.0	49.5	47.92002420	-103.54216753	2133.386						
14560	WELD	64,587.6	14560	0.0	49.6	47.92002509	-103.54236788	2133.668						
14570	WELD	64,637.2	14570	0.0	49.8	47.92002560	-103.54256901	2133.439						
14580	WELD	64,687.0	14580	0.0	49.8	47.92002381	-103.54277064	2133.917						
14590	WELD	64,736.8	14590	0.0	12.2	47.92001994	-103.54297247	2133.887						
14600	WELD	64,749.0	14600	0.0	34.2	47.92001916	-103.54302171	2133.821						
14610	WELD	64,783.2	14610	0.0	49.5	47.92001804	-103.54316038	2133.044						
11000030	WT CHANGE	64,832.6	14610	0.0	0.0	47.92002409	-103.54336003	2130.577			0.322	52000	0.72	
14620	WELD	64,832.6	14620	0.0	1.6	47.92002411	-103.54336011	2130.576						
10000063	Bend right-up - 45 deg., 3D	64,833.4	14620	0.1	1.5	47.92002513	-103.54336275	2130.540	0	12:00				
14630	WELD	64,834.2	14630	0.0	13.2	47.92002661	-103.54336499	2130.495						
14640	WELD	64,847.4	14640	0.0	42.3	47.92005460	-103.54339945	2129.519						
14650	WELD	64,889.7	14650	0.0	42.3	47.92014233	-103.54351012	2126.890						
14660	WELD	64,932.0	14660	0.0	42.3	47.92022678	-103.54362694	2126.389						
14670	WELD	64,974.3	14670	0.0	42.3	47.92031143	-103.54374334	2126.782						
14680	WELD	65,016.5	14680	0.0	42.2	47.92039805	-103.54385650	2127.645						
14690	WELD	65,058.8	14690	0.0	42.2	47.92048579	-103.54396762	2129.004						
14700	WELD	65,101.0	14700	0.0	42.3	47.92057331	-103.54407905	2130.008						
14710	WELD	65,143.3	14710	0.0	42.3	47.92066080	-103.54419084	2130.855						
14720	WELD	65,185.5	14720	0.0	42.3	47.92074545	-103.54430719	2131.814						
10000064	AGM 100, Sta. 646+17, AGM is 43' D/S of Rd C/L -- Han #115	65,209.5	14720	24.0	18.3	47.92079227	-103.54437480	2132.751						



# Pipeline Listing

TDW Services, Inc.

Hiland Crude, LLC  
East Camp Creek to Camp Creek

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)	Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
14730	WELD	65,227.8	14730	0.0	42.3	47.92082792	-103.54442669	2133.506						
14740	WELD	65,270.1	14740	0.0	42.3	47.92091044	-103.54454654	2134.806						
14750	WELD	65,312.3	14750	0.0	25.9	47.92099295	-103.54466618	2135.964						
14760	WELD	65,338.2	14760	0.0	1.6	47.92104299	-103.54474043	2135.902						
10000065	Bend left - 45 deg., 3D	65,339.0	14760	0.1	1.5	47.92104371	-103.54474320	2135.868	0	12:00				
11000031	WT CHANGE	65,339.8	14760	0.0	0.0	47.92104392	-103.54474625	2135.830			0.188	52000	0.72	
14770	WELD	65,339.8	14770	0.0	25.7	47.92104392	-103.54474636	2135.828						
14780	WELD	65,365.5	14780	0.0	48.5	47.92104344	-103.54485073	2134.672						
14790	WELD	65,414.0	14790	0.0	49.0	47.92104288	-103.54504767	2132.858						
14800	WELD	65,463.0	14800	0.0	49.5	47.92104191	-103.54524660	2130.545						
14810	WELD	65,512.5	14810	0.0	49.6	47.92104040	-103.54544701	2126.825						
14820	WELD	65,562.0	14820	0.0	49.5	47.92103753	-103.54564748	2122.931						
14830	WELD	65,611.6	14830	0.0	49.5	47.92103534	-103.54584797	2118.943						
14840	WELD	65,661.0	14840	0.0	49.5	47.92103432	-103.54604850	2116.304						
14850	WELD	65,710.5	14850	0.0	49.2	47.92103319	-103.54624870	2112.372						
14860	WELD	65,759.7	14860	0.0	49.5	47.92103142	-103.54644800	2107.734						
14870	WELD	65,809.2	14870	0.0	49.5	47.92103007	-103.54664896	2106.208						
14880	WELD	65,858.7	14880	0.0	49.7	47.92102904	-103.54684987	2108.319						
14890	WELD	65,908.4	14890	0.0	49.0	47.92102874	-103.54705079	2112.674						
14900	WELD	65,957.4	14900	0.0	49.6	47.92102857	-103.54724948	2113.556						
14910	WELD	66,007.0	14910	0.0	49.5	47.92102769	-103.54745056	2113.999						
14920	WELD	66,056.5	14920	0.0	49.7	47.92102661	-103.54765144	2114.196						
14930	WELD	66,106.1	14930	0.0	49.6	47.92102481	-103.54785273	2114.127						
14940	WELD	66,155.7	14940	0.0	49.6	47.92102302	-103.54805363	2113.746						
14950	WELD	66,205.3	14950	0.0	49.5	47.92102297	-103.54825491	2113.394						
14960	WELD	66,254.8	14960	0.0	49.4	47.92102357	-103.54845595	2111.817						
14970	WELD	66,304.2	14970	0.0	49.4	47.92102386	-103.54865616	2109.411						
14980	WELD	66,353.6	14980	0.0	49.7	47.92102362	-103.54885631	2106.885						
14990	WELD	66,403.4	14990	0.0	49.5	47.92102402	-103.54905777	2104.298						
15000	WELD	66,452.9	15000	0.0	49.6	47.92102428	-103.54925843	2100.998						
15010	WELD	66,502.5	15010	0.0	49.7	47.92102450	-103.54945908	2097.462						
15020	WELD	66,552.2	15020	0.0	49.6	47.92102452	-103.54966002	2093.899						
15030	WELD	66,601.8	15030	0.0	49.3	47.92102497	-103.54986088	2090.619						
15040	WELD	66,651.1	15040	0.0	49.7	47.92102459	-103.55006080	2087.779						
15050	WELD	66,700.8	15050	0.0	49.3	47.92102433	-103.55026220	2084.859						
15060	WELD	66,750.1	15060	0.0	49.7	47.92102837	-103.55046186	2081.217						
15070	WELD	66,799.8	15070	0.0	49.4	47.92102642	-103.55066225	2075.952						



# Pipeline Listing

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East Camp Creek to Camp Creek

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)	Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
15080	WELD	66,849.1	15080	0.0	22.0	47.92102333	-103.55086162	2071.866						
11000032	WT CHANGE	66,871.1	15080	0.0	0.0	47.92102640	-103.55095050	2070.301			0.322	52000	0.72	
15090	WELD	66,871.2	15090	0.0	37.8	47.92102640	-103.55095062	2070.299						
15100	WELD	66,909.0	15100	0.0	42.3	47.92103267	-103.55110286	2065.841						
15110	WELD	66,951.2	15110	0.0	42.3	47.92103375	-103.55127243	2059.630						
15120	WELD	66,993.5	15120	0.0	42.3	47.92102984	-103.55144347	2056.745						
15130	WELD	67,035.8	15130	0.0	42.3	47.92102797	-103.55161490	2056.310						
15140	WELD	67,078.1	15140	0.0	42.3	47.92102975	-103.55178652	2056.088						
15150	WELD	67,120.4	15150	0.0	42.3	47.92103817	-103.55195772	2055.001						
15160	WELD	67,162.7	15160	0.0	42.2	47.92104879	-103.55212821	2053.001						
15170	WELD	67,204.9	15170	0.0	42.2	47.92105526	-103.55229949	2051.549						
15180	WELD	67,247.2	15180	0.0	42.3	47.92105689	-103.55247109	2051.086						
15190	WELD	67,289.4	15190	0.0	42.3	47.92105422	-103.55264248	2051.617						
15200	WELD	67,331.7	15200	0.0	42.2	47.92105257	-103.55281375	2053.377						
15210	WELD	67,374.0	15210	0.0	42.2	47.92105166	-103.55298482	2056.314						
15220	WELD	67,416.1	15220	0.0	42.2	47.92105103	-103.55315612	2058.231						
15230	WELD	67,458.4	15230	0.0	42.3	47.92105123	-103.55332741	2059.569						
15240	WELD	67,500.6	15240	0.0	42.3	47.92104969	-103.55349893	2061.204						
15250	WELD	67,542.9	15250	0.0	42.1	47.92104702	-103.55367027	2063.245						
11000033	WT CHANGE	67,584.9	15250	0.0	0.0	47.92104425	-103.55384095	2064.592			0.188	52000	0.72	
15260	WELD	67,585.0	15260	0.0	19.8	47.92104425	-103.55384111	2064.591						
15270	WELD	67,604.8	15270	0.0	42.2	47.92104409	-103.55392196	2064.540						
15280	WELD	67,647.0	15280	0.0	49.6	47.92104404	-103.55409402	2063.866						
15290	WELD	67,696.6	15290	0.0	49.5	47.92104413	-103.55429504	2065.182						
15300	WELD	67,746.1	15300	0.0	49.5	47.92104395	-103.55449554	2069.916						
15310	WELD	67,795.5	15310	0.0	49.2	47.92104292	-103.55469650	2072.520						
15320	WELD	67,844.7	15320	0.0	49.3	47.92104163	-103.55489639	2070.685						
15330	WELD	67,894.0	15330	0.0	49.5	47.92104013	-103.55509639	2067.491						
15340	WELD	67,943.5	15340	0.0	49.0	47.92103876	-103.55529710	2063.928						
11000034	WT CHANGE	67,992.5	15340	0.0	0.0	47.92103705	-103.55549530	2059.795			0.322	52000	0.72	
15350	WELD	67,992.6	15350	0.0	42.3	47.92103705	-103.55549545	2059.791						
15360	WELD	68,034.9	15360	0.0	42.2	47.92103763	-103.55566551	2054.537						
15370	WELD	68,077.1	15370	0.0	42.2	47.92104158	-103.55583664	2052.100						
15380	WELD	68,119.3	15380	0.0	42.2	47.92104429	-103.55600805	2052.440						
15390	WELD	68,161.5	15390	0.0	42.3	47.92104260	-103.55617938	2053.736						
15400	WELD	68,203.8	15400	0.0	40.5	47.92104296	-103.55635017	2057.678						
11000035	WT CHANGE	68,244.3	15400	0.0	0.0	47.92104236	-103.55651301	2063.426			0.188	52000	0.72	

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)	Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
15410	WELD	68,244.3	15410	0.0	48.2	47.92104236	-103.55651316	2063.431						
15420	WELD	68,292.5	15420	0.0	47.8	47.92104293	-103.55670824	2067.937						
15430	WELD	68,340.2	15430	0.0	49.7	47.92104335	-103.55690203	2069.639						
15440	WELD	68,389.9	15440	0.0	49.6	47.92104275	-103.55710367	2071.020						
15450	WELD	68,439.5	15450	0.0	49.5	47.92104172	-103.55730440	2072.986						
15460	WELD	68,489.0	15460	0.0	49.7	47.92104263	-103.55750523	2076.791						
15470	WELD	68,538.8	15470	0.0	49.5	47.92104434	-103.55770704	2078.480						
15480	WELD	68,588.2	15480	0.0	45.1	47.92104609	-103.55790791	2079.990						
15490	WELD	68,633.4	15490	0.0	49.5	47.92104687	-103.55809116	2081.210						
15500	WELD	68,682.8	15500	0.0	49.5	47.92104744	-103.55829189	2083.827						
15510	WELD	68,732.3	15510	0.0	49.5	47.92104706	-103.55849279	2086.602						
15520	WELD	68,781.9	15520	0.0	49.3	47.92104602	-103.55869356	2088.264						
15530	WELD	68,831.2	15530	0.0	49.6	47.92104536	-103.55889341	2090.840						
15540	WELD	68,880.8	15540	0.0	49.6	47.92104434	-103.55909439	2092.729						
15550	WELD	68,930.4	15550	0.0	49.8	47.92104413	-103.55929551	2094.457						
15560	WELD	68,980.2	15560	0.0	49.7	47.92104589	-103.55949688	2096.408						
15570	WELD	69,029.8	15570	0.0	49.4	47.92104765	-103.55969816	2098.900						
15580	WELD	69,079.2	15580	0.0	49.5	47.92104936	-103.55989826	2102.083						
15590	WELD	69,128.8	15590	0.0	49.5	47.92105156	-103.56009897	2104.290						
15600	WELD	69,178.2	15600	0.0	49.5	47.92105382	-103.56029939	2107.098						
15610	WELD	69,227.7	15610	0.0	39.6	47.92105387	-103.56050033	2109.686						
15620	WELD	69,267.3	15620	0.0	24.2	47.92105215	-103.56066059	2111.337						
15630	WELD	69,291.5	15630	0.0	48.4	47.92105037	-103.56075862	2111.863						
15640	WELD	69,339.9	15640	0.0	48.4	47.92104742	-103.56095487	2111.409						
15650	WELD	69,388.2	15650	0.0	46.7	47.92104618	-103.56115071	2114.116						
11000036	WT CHANGE	69,434.9	15650	0.0	0.0	47.92104421	-103.56134002	2117.034			0.322	52000	0.72	
15660	WELD	69,434.9	15660	0.0	40.9	47.92104421	-103.56134018	2117.036						
15670	WELD	69,475.8	15670	0.0	42.3	47.92104346	-103.56150607	2117.960						
15680	WELD	69,518.1	15680	0.0	42.3	47.92104394	-103.56167765	2118.333						
15690	WELD	69,560.4	15690	0.0	42.3	47.92104484	-103.56184930	2119.255						
15700	WELD	69,602.7	15700	0.0	42.2	47.92104670	-103.56202071	2120.149						
11000037	WT CHANGE	69,644.8	15700	0.0	0.0	47.92104793	-103.56219131	2122.316			0.188	52000	0.72	
15710	WELD	69,644.9	15710	0.0	48.8	47.92104793	-103.56219150	2122.316						
15720	WELD	69,693.7	15720	0.0	48.9	47.92105233	-103.56238983	2122.628						
15730	WELD	69,742.6	15730	0.0	48.9	47.92105592	-103.56258808	2123.081						
15740	WELD	69,791.5	15740	0.0	38.7	47.92104938	-103.56278631	2124.155						
15750	WELD	69,830.3	15750	0.0	5.3	47.92105055	-103.56294407	2125.141						



# Pipeline Listing

TDW Services, Inc.

Hiland Crude, LLC  
East Camp Creek to Camp Creek

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)	Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
11000038	WT CHANGE	69,835.6	15750	0.0	0.0	47.92105128	-103.56296524	2125.244			0.322	52000	0.72	
	15760 WELD	69,835.6	15760	0.0	1.5	47.92105129	-103.56296532	2125.250						
10000066	Bend up - 45 deg., 3D	69,836.3	15760	0.1	1.4	47.92105141	-103.56296816	2125.581	0	12:00				
	15770 WELD	69,837.1	15770	0.0	8.2	47.92105155	-103.56297059	2126.087						
10000096	Receive Riser, Ground Exit -- Survey Point	69,843.0	15770	5.9	2.3	47.92105279	-103.56298830	2130.422						
	15780 WELD	69,845.2	15780	0.0	1.6	47.92105322	-103.56299549	2132.032						
10000067	Bend down - 45 deg., 3D	69,846.1	15780	0.1	1.5	47.92105336	-103.56299838	2132.274	0	12:00				
	15790 WELD	69,846.9	15790	0.0	3.1	47.92105348	-103.56300135	2132.330						
10000068	Flange	69,847.3	15790	0.5	2.7	47.92105354	-103.56300303	2132.333	0	12:00				
10000069	Valve	69,848.4	15790	1.5	1.6	47.92105368	-103.56300673	2132.342						
10000070	Flange	69,849.5	15790	2.7	0.5	47.92105388	-103.56301182	2132.357	0	12:00				
	15800 WELD	69,850.0	15800	0.0	1.3	47.92105396	-103.56301407	2132.361						
10000071	Tee at 90 deg.	69,850.7	15800	0.2	1.1	47.92105404	-103.56301652	2132.366	79	2:30				
	15810 WELD	69,851.3	15810	0.0	1.3	47.92105412	-103.56301909	2132.373						
10000072	Pipe Support	69,852.1	15810	0.7	0.7	47.92105423	-103.56302221	2132.383						
	15820 WELD	69,852.7	15820	0.0	3.1	47.92105430	-103.56302429	2132.389						
10000073	Flange	69,853.1	15820	0.4	2.7	47.92105438	-103.56302634	2132.395	0	12:00				
10000074	Valve	69,854.2	15820	1.5	1.6	47.92105456	-103.56303124	2132.406						
10000075	Flange	69,855.3	15820	2.6	0.5	47.92105471	-103.56303526	2132.413	0	12:00				
	15830 WELD	69,855.8	15830	0.0	0.8	47.92105477	-103.56303704	2132.415						
10000076	Pipe Support	69,856.3	15830	0.4	0.5	47.92105484	-103.56303890	2132.417						
	15840 WELD	69,856.6	15840	0.0	1.1	47.92105490	-103.56304031	2132.419						
10000077	Tee on bottom of pipe	69,857.2	15840	0.2	0.9	47.92105499	-103.56304277	2132.426	170	5:30				
	15850 WELD	69,857.8	15850	0.0	11.5	47.92105508	-103.56304520	2132.432						
10000078	Fitting on top of pipe	69,862.2	15850	4.3	7.1	47.92105574	-103.56306329	2132.491	356	11:45				
10000079	Pipe Support	69,868.8	15850	10.9	0.5	47.92105676	-103.56309020	2132.613						
	15860 WELD	69,869.2	15860	0.0	3.1	47.92105683	-103.56309183	2132.618						
10000080	Flange	69,869.7	15860	0.5	2.7	47.92105691	-103.56309392	2132.626	0	12:00				
10000081	Valve	69,870.8	15860	1.6	1.6	47.92105709	-103.56309851	2132.650						
10000082	Flange	69,871.9	15860	2.7	0.5	47.92105726	-103.56310277	2132.671	0	12:00				
	15870 WELD	69,872.4	15870	0.0	1.2	47.92105733	-103.56310444	2132.680						
10000083	Pipe Support	69,872.8	15870	0.3	0.9	47.92105741	-103.56310637	2132.690						
	15880 WELD	69,873.6	15880	0.0	1.2	47.92105756	-103.56310946	2132.707						
10000084	Tee at 90 deg.	69,874.2	15880	0.2	1.0	47.92105766	-103.56311181	2132.716	77	2:30				
	15890 WELD	69,874.8	15890	0.0	4.6	47.92105776	-103.56311421	2132.727						
10000085	Pipe Support	69,877.0	15890	2.1	2.5	47.92105817	-103.56312337	2132.775						



# Pipeline Listing

TDW Services, Inc.

Hiland Crude, LLC  
East Camp Creek to Camp Creek

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)	Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
15900	WELD	69,879.4	15900	0.0	0.9	47.92105858	-103.56313286	2132.837						
10000086	Flange	69,879.8	15900	0.5	0.4	47.92105866	-103.56313472	2132.846	0	12:00				
15910	WELD	69,880.3	15910	0.0	2.5	47.92105873	-103.56313650	2132.855						
10000087	Pipe Support	69,881.1	15910	0.7	1.8	47.92105885	-103.56313975	2132.874						
15920	WELD	69,882.8	15920	0.0	1.2	47.92105913	-103.56314657	2132.910						
10000088	Tee at 90 deg.	69,883.3	15920	0.2	0.9	47.92105922	-103.56314887	2132.919	74	2:15				
15930	WELD	69,883.9	15930	0.0	3.8	47.92105933	-103.56315141	2132.932						
10000089	Pipe Support	69,885.9	15930	1.8	2.1	47.92105967	-103.56315930	2132.977						
15940	WELD	69,887.8	15940	0.0	3.0	47.92106002	-103.56316721	2133.016						
10000090	Flange	69,888.3	15940	0.5	2.5	47.92106009	-103.56316874	2133.023	0	12:00				
10000091	Valve (Receiver), Sta. 692+70, Camp Creek	69,889.4	15940	1.6	1.5	47.92106029	-103.56317200	2133.024						
10000092	Flange	69,890.5	15940	2.7	0.4	47.92106026	-103.56317205	2133.036	0	12:00				
15950	WELD	69,890.8	15950	0.0	-	47.92106026	-103.56317205	2133.036						
12000002	End Run Tickle	69,927.8	15950	37.0	-	47.92106026	-103.56317205	2133.036						

Type	Number
DEFORMATION	1
GAINS	0
GROUPED PITS	4
LOCATIONS	96
MISC	3
WT CHANGES	39
WELDS	1585



# General Inline Inspection Terms

## GLOSSARY

<b>AGM (Aboveground Marker)</b>	A portable device placed at an above ground reference point that both detects and records the passage of an in-line inspection tool. AGMs are typically reported using a marker number followed by the aboveground reference point description of the location device (box) placement.
<b>ABOVE-GROUND REFERENCE POINTS</b>	The above ground reference point is a permanent reference on or above the pipeline, which can be used to locate features in the pipeline. Reference points can be valves, fences, test stations, markers posts, or other permanent features.
<b>ACCELEROMETERS</b>	Part of the INS package of the in-line inspection tool. Each TDW tool contains 3 axis-aligned accelerometers measuring orientation and shock.
<b>ANCHOR, WEIGHT OR HANGAR</b>	Non-welded full encirclement pipeline features typically evenly spaced across water crossings. These are usually not detrimental unless associated metal loss is detected.
<b>ANOMALY</b>	Any kind of imperfection or defect that may be present in the wall of the pipe. This includes coating or welding.
<b>APPURTENANCE</b>	A component that is attached to the pipeline; e.g., valve, tee, casing, instrument connection.
<b>ASME B31G, MODIFIED ASME B31G, or DNV RP-F101</b>	Commonly used analysis criterion for metal loss anomalies in a pipeline. TDW software may use ASME B31G, MODIFIED ASME B31G, or DNV RP-F101 to calculate the safe maximum allowable operating pressure or failure pressure at an area of metal loss. These formulas utilize only length and depth - they do not take into consideration the width of the anomaly. The MODIFIED ASME B31G more closely approximates the values obtained via the RSTRENG calculations, which is less conservative than the standard ASME B31G calculation. See also DNV RP-F101.
<b>BEND</b>	A physical pipe configuration that changes pipeline direction.
<b>BEND RADIUS</b>	The radius of the bend in the pipe as related to the pipe diameter (D). Example: A 3-D bend would have a radius of 3 times the diameter of the pipe measured to the centerline of the pipe.
<b>BORE RESTRICTION</b>	Any reduction of the cross-section of the pipe that may restrict the passage of an ILI pig.
<b>BUCKLE</b>	A condition where the pipeline has undergone sufficient plastic deformation to cause permanent wrinkling or deformation of the pipe wall or the pipe's cross section.
<b>BURST PRESSURE</b>	The pressure at which the nominal hoop stress in the wall of a pipe equals the specified minimum yield stress of the pipe grade. It is calculated by $2st/D$ where $s$ = SMYS, $t$ = nominal wall thickness, $D$ = nominal outside diameter of pipe.
<b>CALIBRATION DIG</b>	An exploratory excavation to compare findings of an in-line inspection system to actual conditions with the purpose of improving data analysis.
<b>CASING ANOMALY</b>	When the casing is not welded, or when a gap occurs in the weld, this signature is detected by the tool, and identified with a miscellaneous remark.
<b>CHARACTERIZATION</b>	The process of quantifying the size, shape, orientation, and location of an anomaly, defect, or critical defect after it has been detected.
<b>CHECK VALVE</b>	A valve that prevents reverse flow.
<b>CLAMP</b>	Non-welded full encirclement pipeline feature not located at a bridge or water crossing, in some cases a type of temporary repair.
<b>COMPONENT</b>	Any physical part of the pipeline, other than line pipe, including but not limited to valves, welds, tees, flanges, fitting, taps, branch connections, outlets, supports and anchors.



# General Inline Inspection Terms

GLOSSARY PART 2

<b>CONTROL POINT</b>	Control points are know locations used to provide coordinate updates to aid the final processing of the inertial data gathered from the instruments onboard the inspection vehicle.
<b>CORROSION (External)</b>	Metal loss due to electrochemical, galvanic, microbiological, or other attack on the pipe due to environmental conditions surrounding the pipe.
<b>CORROSION (Internal)</b>	Metal loss due to chemical or other attack on the steel from liquids on the inside of the pipe. Electrochemical attack can also occur in local cells, but this is less frequent.
<b>DATA ANALYSIS</b>	The process through which indications are evaluated to classify, characterize and size them as non-relevant conditions, pipeline components, anomalies, imperfections, or defects.
<b>DATUM</b>	A datum is a set of reference points on the earth's surface against which position measurements are made. Horizontal datums are used for describing a point on the earth's surface, in latitude and longitude or another coordinate system. While hundreds of reference datums exists some examples of horizontal datums include, NAD27, NAD83, and WGS84. Vertical datums are tidal, based on sea levels referencing geodetic datums such as NAVD88, or geodetic, based on the same ellipsoid models of the earth used for computing horizontal datums.
<b>DNV RP-F101</b>	An analysis procedure that differs from the commonly used ASME B31G criterion. Developed by the Norwegian company Det Norske Veritas, this method is employed for European and Asian pipelines. The DNV algorithm is generally considered to be more conservative than ASME B31G.
<b>DEFECT</b>	An anomaly for which an analysis, such as ASME B31G, would indicate that the pipe is approaching failure as the nominal hoop stress approaches the specified minimum yield stress (SMYS).
<b>DEFORMATION PIG</b>	A pig designed to record conditions such as dents, wrinkles, ovalities, bend radius and angle by making measurements of the inside surface of the pipeline.
<b>DENTS</b>	Dents are depressions in the pipeline that may be detected by the inline inspection tool. MFL tools may be able to detect dents, but may not be able to accurately size them.
<b>DETECTION THRESHOLD</b>	A characteristic dimension or dimensions of an anomaly that must be exceeded to achieve a stated probability of detection.
<b>DOT192</b>	Part 192 of the Code for Federal Regulations (CFR) Title 49 that addresses Gas Transmission Pipelines.
<b>DOT195</b>	Part 195 of the Code for Federal Regulations (CFR) Title 49 that addresses Transportation of Hazardous Liquids by Pipeline.
<b>ECCENTRIC CASINGS</b>	TDW tools detect when a casing is not centered on the pipeline. These casings are referred to as being eccentric. The closer the casing is to the pipeline, the stronger the signal seen by the inspection tool. The tool may not detect if the casing is shorted to the pipe wall. The tool might see evidence of a short, such as metal loss.
<b>ESTIMATED REPAIR FACTOR (ERF)</b>	The ratio of pipeline design pressure or in some cases MOP to the safe maximum operating pressure (P').
<b>ERW (Electric Resistance Weld)</b>	Describes a process used to form steel from a sheet into tubular form (pipe). Welds are formed by resistance heating of two edges of a metal sheet and then forcing them together to create a solid-state weld.
<b>EXPANSION</b>	Local increase of pipe diameter during service which indicates the yield stress of the pipe at that location has been surpassed.



# General Inline Inspection Terms

GLOSSARY PART 3

General Inline Inspection Terms

<b>FAILURE PRESSURE RATIO (FPR)</b>	The ratio of the predicted failure pressure calculated by an analysis criterion (e.g. ASME B31G, RSTRENG, etc.) to the MAOP
<b>FEATURE</b>	Any physical object detected by an in-line inspection system. Features may be anomalies, components, or some other item.
<b>FITTING</b>	A branch connection attached to the pipeline which is smaller than the nominal pipe size that alters flow or diverts product (e.g. tap, offtake, split-tee, weld-o-let, thread-o-let).
<b>GAIN (Metal in Close Proximity)</b>	The inspection tool may detect ferrous metal objects located close to or touching the pipeline. They appear as additional metal added to the pipe and are referred to as gains. Clamps or anchors are considered gains as well as features such as puddle welds or CP connections. Generally, repairs such as patches or sleeves are called out as repairs even though they show appear in the data as gains.
<b>GIRTH WELD</b>	A circumferential weld joining two joints of pipe.
<b>GIS</b>	Geographic Information System is any system that captures, stores, analyzes, manages, and presents data that are linked to location. GIS is the merging of cartography and database technology.
<b>GOUGE</b>	Elongated grooves or cavities caused by mechanical removal of metal.
<b>GPS (Global Positioning System)</b>	The navigational system utilizing satellite technology to provide a user an exact position on the earth's surface. When coupled with known surface locations such as valves and AGMs, an ILI tool's INS or IMU can approximate or calculate the centerline of a pipeline.
<b>GYROSCOPES (Gyros)</b>	Electronic sensors used to measure change in direction of in-line inspection tool during inspection process. Displayed as pitch and yaw in PIGTRAP.
<b>GROUP</b>	A group is several pits that are grouped together using specific interaction rules. If a pit is a mountain peak, then a group is a mountain range. The reason for groups is so that the overall extent of the metal loss area can be evaluated. Most formulas for calculating the strength of the pipe wall around metal loss look at the overall length of metal loss after interaction rules have been applied to pits.
<b>HALF SOLE</b>	A device used to repair a pipeline by welding a small section over half the circumference of the pipe over the defect, literally half of a sleeve.
<b>HALL SENSORS</b>	A sensor that directly measures the remaining magnetic field strength not absorbed by the pipe.
<b>HCA (High Consequence Area)</b>	A criterion for pipelines designed by the Code of Federal Regulations which define what program and practices operators must use to manage pipeline integrity if the pipeline is located near a commercially navigable waterway, a high population area, or an unusually sensitive area.
<b>HEAT AFFECTED ZONE (HAZ)</b>	The region around a weld which has been metallurgically affected during the welding process.
<b>HEAVY WELD</b>	A girth weld in which the root pass or a portion of the root pass intrudes further than normal into the ID of the pipe. Not usually considered detrimental.
<b>HIGH RESOLUTION</b>	A term used to describe the function of TDW tools for use in MFL or Deformation analysis schemes. Both MFL and Deformation tools are considered high resolution.
<b>IMPERFECTION</b>	An anomaly with dimension and characteristics that do not exceed acceptable limits.



# General Inline Inspection Terms

GLOSSARY PART 4

General Inline Inspection Terms

<b>IMU (Inertial Measurement Unit)</b>	Inertial measurement unit, or IMU, is the main component of inertial guidance systems. An IMU works by sensing motion including the type, rate, and direction of that motion using a combination of accelerometers and gyroscopes.
<b>INCLUSION</b>	An anomaly in the cross section of the pipeline caused by manufacturing processes. Inclusions may be detrimental if they protrude through the pipe wall. Refer to mill anomaly.
<b>INDICATION</b>	Any measured signal or response from an inspection of a pipe different than the normal baseline signal.
<b>INS (Inertial Navigation System)</b>	Refers to a system of accelerometers and gyroscopes to track the movement and orientation of the inspection tool through bends, turns, etc.
<b>INTERACTION RULES</b>	Specifications that establish spacing criteria between anomalies or defects (pits). If the indications or defects are proximate to one another within the criteria, the anomaly or defect is treated as a single larger unit or group for engineering analysis purposes.
<b>INSPECTION</b>	The use of a non-destructive inspection technique.
<b>JOINT</b>	A single section of pipe that is welded to others to make up a pipeline.
<b>LACK OF FUSION (LOF)</b>	In a weld, any area or zone that lacks complete melting and coalescence of a portion of the weld.
<b>LAUNCHER</b>	Refers to the beginning of the inspection; an oversize section of pipe equipped with sealing door through which the inspection tool is loaded into the pipeline.
<b>LOCATION</b>	A location is a feature in the pipeline that can be used to correlate the inspection tool data to above ground references. Common location features include valves, fitting, flanges, tees, casings, repairs and AGMs. For example, a metal loss area could be referenced as being 200 feet downstream from a valve. Not all locations can be easily found from aboveground.
<b>LATITUDE &amp; LONGITUDE</b>	Latitude is the angular distance north or south from the earth's equator measured through 90 degrees. Longitude is the arc or portion of the earth's equator intersected between the meridian of a given place and the prime meridian and is expressed either in degrees or in time. Latitude and longitude are reported as GPS coordinates. Predicted GPS for features are provided in the Pipeline Listing section.
<b>MAOP (Maximum Allowable Operating Pressure)</b>	(or Design Pressure) The maximum internal pressure permitted in the operation of a pipeline as defined by the Code of Federal Regulations.
<b>MAPPING PIG</b>	An ILI tool that uses an IMU to collect data that can be analyzed to produce an elevation and plan view of the pipeline route.
<b>MEASUREMENT THRESHOLD</b>	A characteristic's dimension or dimensions above which anomaly measurements can be made.
<b>MECHANICAL DAMAGE</b>	A generic term used to describe combinations of dents gouges, and/or cold work caused by the application of external force. Damage includes coating, movement of metal and high residual stress.
<b>METAL LOSS</b>	Any of a number of types of anomalies in pipe in which metal has been removed from the pipe surface, usually due to corrosion or gouging.
<b>MFL (Magnetic Flux Leakage)</b>	An inspection technique in which a magnetic field is applied to a pipe section and measurements are taken of a magnetic flux density at the pipe surface. Changes in measured flux density indicate the presence of a possible defect.



# General Inline Inspection Terms

GLOSSARY PART 5

<b>MILL ANOMALY</b>	The process of manufacturing pipe can often leave indications in the pipe wall. Typically these anomalies are not detrimental, and are identified for the benefit of the client.
<b>MINIMUM BORE</b>	The minimum measured Internal Diameter of the pipe at any particular point. Also referred to as minimum cross-section.
<b>MISALIGNMENT</b>	A girth weld anomaly where the two joints of pipe were not aligned properly prior to welding. Sometimes referred to as a hi-lo.
<b>MOP (Maximum Operating Pressure)</b>	The established maximum internal pressure expected during the operation of a pipeline, which cannot normally exceed the maximum allowable operating pressure (MAOP).
<b>ODOMETER</b>	Wheels on in-line inspection tool, which rotate along the pipe to measure the distance the tool has traveled.
<b>ORIENTATION</b>	The location of the reference around the circumference of the pipe, as viewed in the direction of flow (downstream). The value is represented in degrees 0-360° rotating clockwise around pipe. (0° = top of pipe, 90° = 3:00)
<b>OVALITY</b>	A condition in which a circular pipe forms into an ellipse, usually as the result of external forces.
<b>P</b>	Calculated pressure rating for the pipe. Per ASME B31G, it is the greater of either the established MOP for liquid lines (MAOP for gas lines), or $2stFT/D$ , where S = SMYS, F = appropriate design factor from ASME B31G, T = Temperature derating factor, D = nominal outside diameter of pipe, and t = nominal wall thickness. See ASME B31G. In application, this variable is identical per DNV RP-F101, however it is calculated using different formulas and factors.
<b>P' (Calculated safe maximum operating pressure)</b>	Calculated safe maximum operating pressure for the pipeline segment as calculated based on information provided by the Customer. TDW software uses ASME B31G, MODIFIED ASME B31G, or DNV RP-F101 to calculate the safe maximum allowable operating pressure (P') of the pipeline at a metal loss area for liquid lines. The calculation also takes into consideration a temperature factor, for use when the line is at elevated temperature, and a safety factor. The default values used in calculations are a temperature factor of 1, and a safety factor of 72% (80% for Canada).
<b>Pfail (Calculated failure pressure)</b>	Calculated maximum operating pressure for the pipeline segment as calculated based on information provided by the Customer. TDW software uses ASME B31G, MODIFIED ASME B31G, or DNV RP-F101 to calculate the failure pressure (Pfail) of the pipeline at a metal loss area for gas lines. The calculation also takes into consideration a temperature factor, for use when the line is at elevated temperature, and a safety factor. The default values used in calculations are a temperature factor of 1, and a safety factor of 100%.
<b>P'/P</b>	Percent of maximum established pressure, this is calculated by dividing the calculated safe pressure of the defect (P') by the current established maximum operating pressure of the pipeline (P). For TDW reporting, P is either established MOP provided by the customer or the calculated pressure rating for the pipe (P). Percentages less than 100% are considered pressure-reducing.
<b>Pfail/MAOP</b>	Percent of MAOP, this is calculated by dividing the calculated failure pressure of the defect (Pfail) by the current MAOP of the pipeline (P). For TDW reporting, P is either established MAOP provided by the customer or the calculated pressure rating for the pipe (P).
<b>PATCH</b>	A device used to repair a pipeline by welding a small section of pipe on top of the defect.
<b>PIG</b>	A generic term signifying any independent, self-contained device, tool or vehicle that moves through the interior of the pipeline for purposes of inspecting, batching, dimensioning, or cleaning.



# General Inline Inspection Terms

GLOSSARY PART 6

<b>PIGTRAP</b>	Pipeline Inspection Graphical Test Reporting and Analysis Program (PIGTRAP). Proprietary software developed by TDW Inc. for viewing data collected by the inspection tool.
<b>PIPE SUPPORT</b>	Any device used to support an aboveground pipeline.
<b>PIT</b>	Localized concentrated-cell corrosion on the external or internal surfaces that results from generation of a potential (voltage) difference set up by variations in oxygen concentrations within and outside the pit. The oxygen-starved pit acts as anode and the pipe surface acts as the cathode. If several pits are in close proximity to each other, they may be grouped together using interaction rules as one group.
<b>PLANAR</b>	An NDT term indicating a feature has two-dimensional characteristics like a fissure. Sometimes referred to as crack-like.
<b>RSTRENG</b>	A computer program designed to calculate the calculated safe maximum operating pressure (P') of corroded pipe. RSTRENG results are approximated when Modified B31G criteria is used.
<b>REBOUNDING</b>	The process of changing the dent depth and shape by internal pressure in the pipe. Generally, dents due to third-party contact will re-round, while dents due to rocks will not unless the rock causing the dent is removed.
<b>RECEIVER</b>	Refers to the ending of the inspection; an oversize section of pipe equipped with sealing door through which the inspection tool is retrieved from the pipeline.
<b>REPORTING THRESHOLD</b>	A parameter that defines whether or not an anomaly will be reported. The parameter may be a limiting value on the depth, width, or length of the anomaly or feature.
<b>RESIDUAL DENT DEPTH</b>	The dent depth measured under a particular set of conditions, e.g., in pressurized or un-pressurized pipeline. While maximum dent depth does not change, the residual or measured dent depth changes with pressure and loading. Also referred to as the measured dent depth.
<b>RUPTURE PRESSURE RATIO (RPR)</b>	The ratio of the predicted failure pressure calculated by an analysis criterion (e.g. ASME B31G, RSTRENG, etc.) to the pressure at specified minimum yield strength (SMYS)
<b>SAFETY FACTOR</b>	(or Design Factor) Typically 0.72 for liquid lines per ASME B31G (0.80 in Canada) . In setting the safety factor, due consideration has been given to and allowances made for the manufacturing tolerance and maximum allowable depth of imperfections provided for in the specifications.  DNV RP-F101 uses a slightly different Total Usage Factor, which is entered as the Safety Factor in PIGTRAP. The typical 0.72 factor becomes 0.648 when applying the DNV modeling factor of 0.9.
<b>SEAMLESS</b>	Pipe that is manufactured by means of extrusion. This process typically creates significantly more variation in pipe wall thickness than ERW pipe.
<b>SEAM VARIATION</b>	Non-detrimental irregularity due to the manufacturing of the seam weld. An example is excess or variance in trim.
<b>SEAM WELD (or SEAM)</b>	The longitudinal or spirally-oriented weld in pipe connecting two edges of a formed plate which was created at the pipe mill.
<b>SLEEVE</b>	A device used to repair a pipeline by welding a small section of pipe over the full circumference of the pipe over the top of the defect.
<b>SpirALL™ Magnetic Flux Leakage</b>	A tool system that unites a conventional axial MFL and a unique spiral MFL tool section into one tool combining the benefits of each for enhanced defect characterization and sizing.



# General Inline Inspection Terms

GLOSSARY PART 7

General Inline Inspection Terms

<b>Spiral MFL (SMFL)</b>	A unique type of MFL tool section that creates an oblique, near-45 degree magnetic field within the pipe wall. This allows detection and characterization of long and narrow metal loss or seam features on par with circumferential or transverse MFL tools.
<b>SPACER</b>	A device used to maintain space between a casing and a pipeline.
<b>SMYS (Specified Minimum Yield Strength)</b>	A required strength level that measured yield stress of a pipe material must exceed, which is reported as pipe grade. The measured yield stress is the tensile stress required to produce a total elongation of 0.5 percent of a gage length as determined by an extensometer during a tensile test.
<b>STITCHING</b>	Intermittent or repeating lack of fusion in a seam weld.
<b>TEMPERATURE FACTOR</b>	Typically 1.0 unless the metal temperature is expected to exceed a normal temperature range of -20°F (-30°C) to 250°F (120°C).
<b>THIRD PARTY DAMAGE</b>	Damage to a pipeline system by an outside party. See mechanical damage.
<b>TRACKING</b>	The process used to monitor the progress of the inspection tool through the pipeline. AGM boxes are placed at aboveground marker reference locations to record the passage of the inspection tool.
<b>TRAP</b>	Pipeline facility for launching and receiving tools and pigs.
<b>VOLUMETRIC</b>	A term indicating a feature has three-dimensional characteristic similar to a typical corrosion pit.
<b>WELD ANOMALY</b>	Any area or zone in a weld that lacks complete melting and fusion of a portion of the weld which could have occurred during the welding process or caused by corrosion.
<b>WRINKLE</b>	A smooth and localized bulge visible on the outside wall of the pipe.
<b>WRINKLE BEND</b>	A field bend that contains smooth and localized bulges on the inner radius of the bend, sometimes formed when pipe is cold bent.



# Appendix A

## Database and Reporting Details

1. The Graphs, Dig Sheets, and Tables used in this report were generated using a standalone reporting engine from data contained in a Microsoft Access™ database.
2. If the end user has Microsoft™ Access on their computer, they have complete access to the inspection database. The database file which has an extension of \*.mdb (Microsoft™ database) is stored in the same directory as the tool data. Although the printed reports and report spreadsheet were generated by a standalone reporting engine, using Access the user can customize some basic graphs or tables contained in the database. Alternatively, the data can be exported to a spreadsheet if preferred.
3. The PigTrap™ software, included with this report, provides the user with an easy way to view the data collected by the TDW in-line inspection tool and can also be helpful when trying to locate certain features or specific sections of pipe. The software can be run off various media or installed onto a network or hard drive. Please refer to Appendix B for installation requirements and instructions.
4. For dig sheet creation, please refer to Appendix C.
5. TDW inspection tools are designed to detect various features and anomalies within a pipeline. These various features and anomalies are added to the database using PigTrap™ software by qualified Data Analysts.
6. Database Numbering System: All entries in the database have a unique number assigned to them. The table below lists the number range of each category of database records.

7. All records are numbered sequentially from the beginning of the pipeline section to the end of the pipeline section. By default Welds begin at 110 and are incremented by 10 from one weld to the next. This can be altered to match customer weld or joint numbering by request.

Welds	110	to	9,999,999
Locations	10,000,000	to	10,999,999
Pipe	11,000,000	to	11,999,999
Misc	12,000,000	to	12,999,999
Gains	13,000,000	to	13,999,999
Deformations	14,000,000	to	14,999,999
Bore Restrictions	15,000,000	to	15,999,999
Pits or Other Defects	20,000,000	to	39,999,999
Groups (of Pits)	40,000,000	to	49,999,999
Seam Welds	51,000,000	to	51,999,999

8. All other records are incremented by 1 from one record to the next. For example, the first Location record would be numbered 10,000,000, the second record would be 10,000,001, and the third record would be 10,000,002, etc. Depending on information sent out previous to the final report, numbering may change during analysis of the run.



# Appendix B

## Installation Instructions for PigTrap™ Pipeline Inspection Graphical Test/Report Analysis Program

The PigTrap™ software allows the user to view all of the data collected during the Magpie/TDW inline inspection survey. Installation requires the disk(s) or external drive that accompany the inspection report.

### System Requirements

Before you install and run PigTrap™ please verify that the computer you are installing to meets the minimum requirements needed to successfully open and operate PigTrap™.

#### Windows OS

- Microsoft® Windows 7, Vista®; Windows® XP Professional, Home Edition
  - o Administrator rights required
- 2.0 GHz Intel® Core™ 2 Duo Processor or higher
- 2 GB RAM or more
- 1 GB available hard drive space plus additional necessary for the run size.
- Qualified hardware-accelerated OpenGL graphics card, 32-bit color, and 256MB of VRAM (latest manufacturer drivers strongly recommended also).
- Microsoft® Access 2003 or higher
- Microsoft® .NET Framework 3.5 Service pack 1
- Microsoft® Visual C++ 2008 SP1 Redistributable Package (x86)
- Microsoft® Report Viewer 2008 SP1

### What electronic data accompanied the inspection report

The CD, DVD, or external drive supplied by T.D. Williamson, Inc. for this PigTrap™ inspection of your pipeline contains the following types of files. For CD or DVDs the first disk will contain these files while accompanying disks (if any) contain raw tool data only. External drives will contain this information in the Final Report folder on the external drive under the run name folder.

- Database – .MBD (Microsoft Data Base) Files of this type may be viewed through Microsoft Access. This file contains the analysis of the inspection.
- .rsf – This is a PigTrap™ reference file which holds specific settings for the run to be viewed.
- Spreadsheet – .XLS (Microsoft Excel) A Pipeline Listing is generated for your run in an Excel spreadsheet format. Each event at a particular location is identified and described. You may use Copy and Paste techniques to build your own custom formatted report.
- Setup.exe file – This file executes the installation of the data for the specific run contained on the disk(s) or external drive.

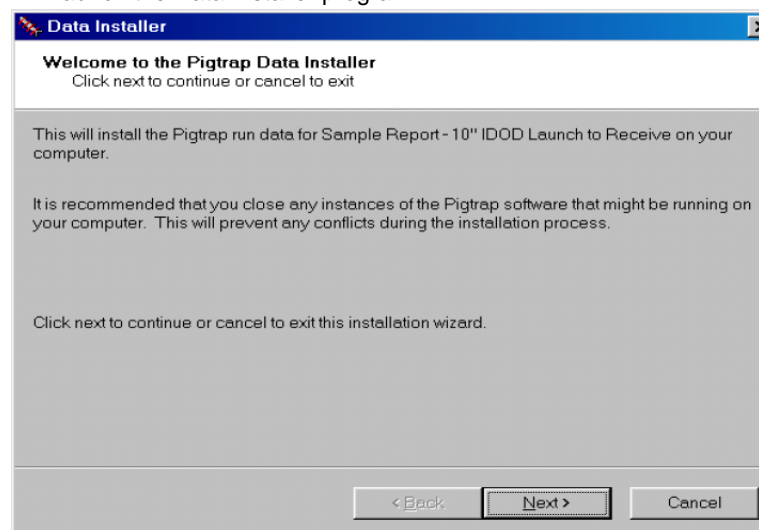
- h\*.nnn, c\*.nnn, i\*.nnn, p\*.nnn, t\*.nnn, l\*.nnn & o\*.nnn – The raw tool data created on-board the inspection tool. These files are necessary for PigTrap™ to function properly. CD and DVDs have the option to install these files onto your computer, if chosen not to install them to your computer the disks must be used to view the run.

### Run Data and PigTrap™ Installation

The inspection report will be accompanied by either CDs, DVDs, or an external drive containing all files necessary for installation. Installation for CDs and DVDs differs from external drives, if an external drive accompanied your final report please skip to PigTrap™ Installation.

#### CDs and DVDs

1. Insert Disk 1 from the report binder into your computer's CD/DVD drive.
2. Access the Setup.exe program located on the CD or DVD. This can be done by browsing to your computer's CD/DVD drive and double clicking Setup.exe. This will launch the Data Installer program.



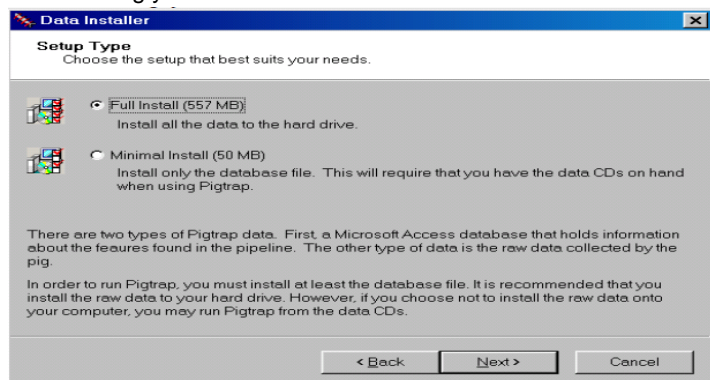
*Note: If you want to install only the Pigtrap™ software and not the run data (advanced users only), choose Cancel and go to the Pigtrap™ Installation steps on page 3.*

3. Click Next to continue installing the run data.

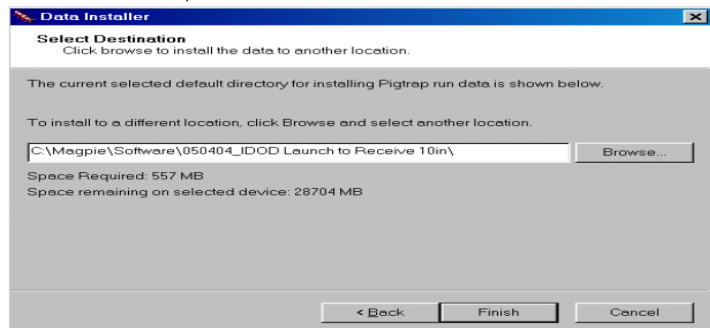


## Appendix B

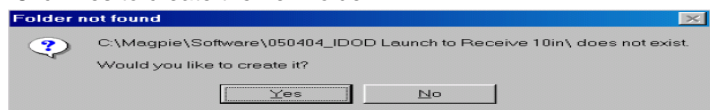
- Choose the type of install you would like to perform: Full Install (recommended) or Minimal Install. The size of the installation is shown next to each type of installation. The database file must be installed for PigTrap™ to operate properly, but you may choose to not install the raw data. If you choose to not install all the data, you may need to change disks while viewing the data in PigTrap™. Click Next to continue after making your choice.



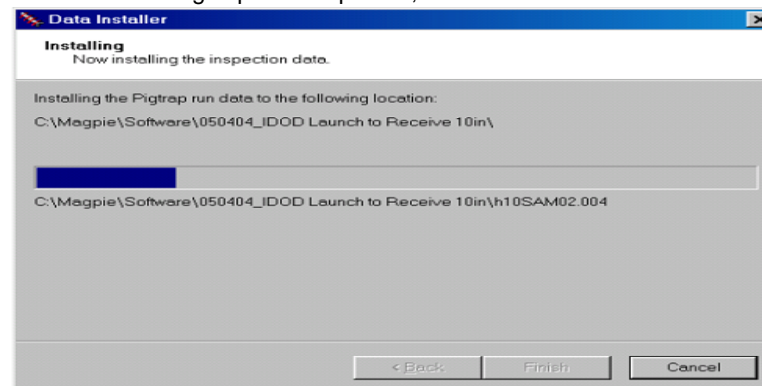
- Choose the installation location on your computer for the data files. The default and recommended location is C:\Magpie\Software. The location inside this folder is based on the trap date, name, and size of the run. If you would like to specify another location, click the Browse... button. Click Finish to continue.



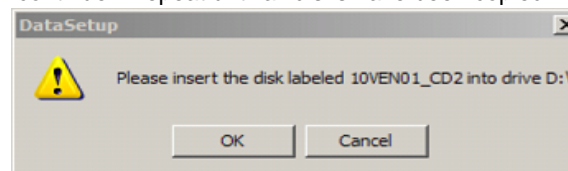
- If the installation folder does not already exist, then you will be prompted to create it. Click Yes to create the new folder.



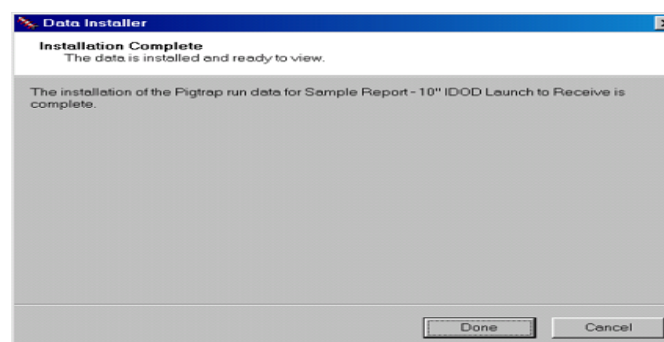
- The following progress bar will appear. There may be a short delay while the database is being copied. Be patient, this is normal.



- You may be prompted to insert other disks from the run distribution if data was supplied on more than one disk. Insert the required disk and click OK to continue. Repeat until all disks have been copied.



- Click Done to complete the run data installation.



- After clicking Done in the Data Installer PigTrap™ Installation will automatically launch.

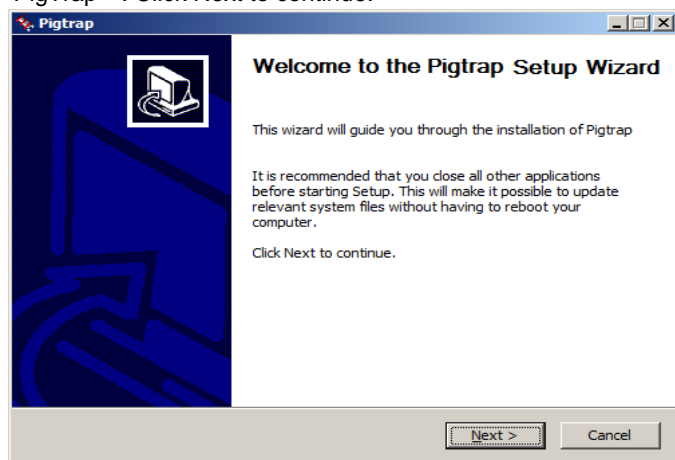


## Appendix B

### PigTrap™ Installation

Note: CD and DVDs follow a slightly different installation process. Steps 1 and 2 are for external drives, if you are installing from CDs or DVDs please skip to step 3.

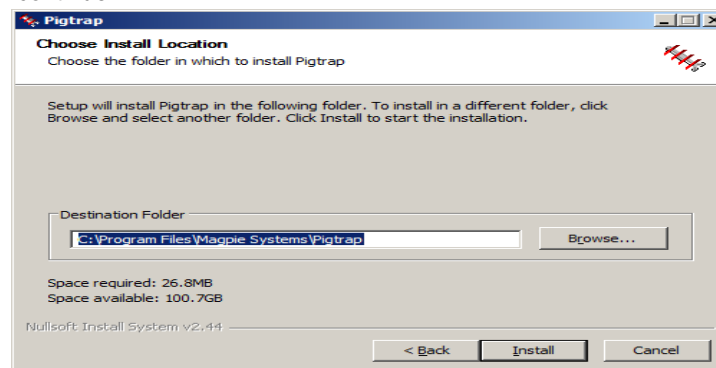
1. Plug the external drive into your computer.
2. Access the PigTrap™ setup.exe located on the external drive. This can be done by browsing to external drive and double clicking PigTrap™ setup.exe.
3. PigTrap™ Setup Wizard will launch. This will guide you through the installation of PigTrap™. Click Next to continue.



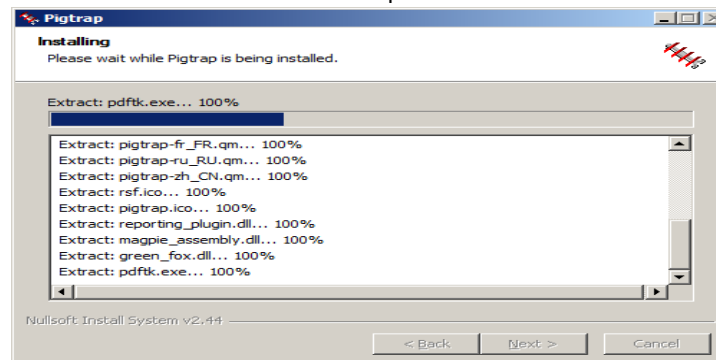
4. The Software License Agreement will appear. Read the agreement select I Agree to continue. You must accept the agreement to install PigTrap™.



5. Choose the installation location on your computer for the PigTrap™ software. The default and recommended location is C:\Magpie\Software. Click Install to continue.



6. The following progress bar will appear while PigTrap™ installs all the necessary files. Once the installation has completed click Finish to close the wizard.



7. When prompted whether you would like to view the run data, click Yes to launch PigTrap™. Shortcuts are now on the desktop to the run and to PigTrap™. Once PigTrap™ opens with the data, choose save in the upper left of the data view.





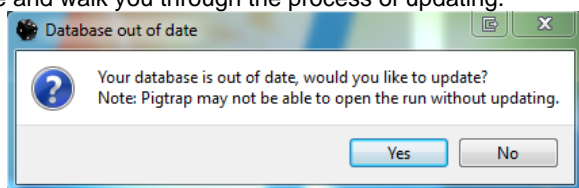
# Appendix B

## Opening and Viewing the Inspection Data

Viewing the inspection data in PigTrap™ can be done by using one of three different methods.

1. Double click on PigTrap™ .exe icon. Click on the Open Folder icon, then browse to the installed inspection data folder and select the desired .rsf or .mrsf file.
2. Double click on a run settings file (.rsf or .mrsf) that is associated with PigTrap™.
3. Drag and drop a run settings file (.rsf or .mrsf) on top of the PigTrap™ .exe file.

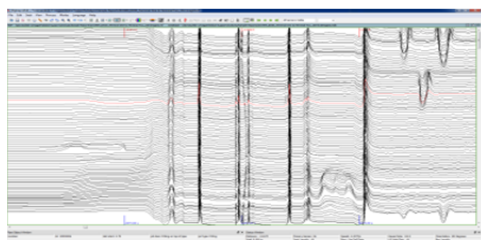
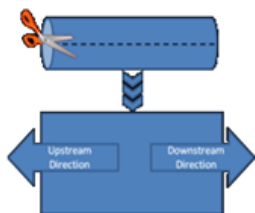
PigTrap™ was designed so you would have the ability to review previous TDW/Magpie inspection data when needed. However, you may need to acquire an updated Microsoft Access Data-base from one of our TDW representatives. When opening previous data in PigTrap™ you may encounter the message, "Your database is very old. You may need to update it." If this happens, don't panic. Chances are you will be able to view the data without any problems. If you can't, just contact your TDW representative and we can send you a newer database and walk you through the process of updating.



We packed so much into the new PigTrap™ the older reference files just couldn't hold it all so a new one may need to be created. Once the new reference file finishes, you will be able to freely navigate around in PigTrap™.

### What am I looking at?

The data viewed in PigTrap™ is a 360 degree snapshot of the inside of the inspected pipe. This captured data is sliced down the middle and laid flat in the PigTrap™ main display. The horizontal lines represent sensor data collected from the pigging tool. Each line is one sensor. The left side of the screen is "upstream" while the right side of the screen is "downstream". So, as you scroll from left to right you are moving downstream from the launch valve.



## Basic Navigation

The horizontal scrollbar at the bottom of the main view moves the view upstream or downstream. Clicking on the left arrow moves upstream while clicking on the right arrow moves downstream.

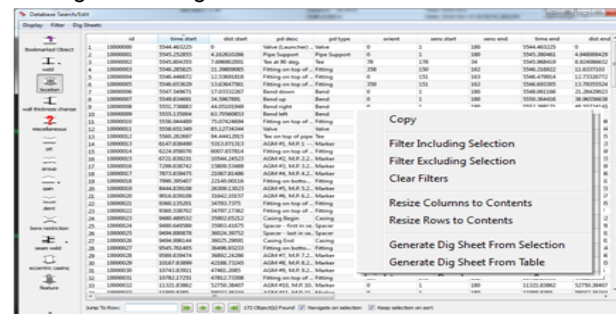


The vertical scrollbar at the right side of the main view rolls the data vertically to a desired orientation of the view.

Zooming IN/OUT on the data is easily performed by clicking on the Zoom buttons.

Select the "Jump to Distance" icon from the run toolbar to enter a desired distance point to navigate in the inspection data. The option "View Width" sets how much viewable area to display (time based).

Click on the binoculars to open the Database/Search Edit (DSE). This displays a table of the pipe objects marked by the Data Analysis personnel. The buttons in the DSE allow for a high level filtering of specific types of marked pipe objects in the table. Right click on any pipe object to display a context menu of filtering, resize columns/rows and generate dig/feature sheets.



For example: Launch and Receive Valves can be found under "location" button, you'll also find Bends, Tees, Markers, etc.

For additional information regarding dig/feature sheet creation, see Appendix C.

## Training

For detailed Pigtrap training, contact your TDW representative.

Appendix B



# Appendix B

## Trouble Shooting

Issue	Possible Cause	Possible Solution
"Data files missing" message displayed on the Main view.	PigTrap™ is not able to load the necessary data file(s) because they are missing, not installed correctly, media/hardware damage (Dirty or scratched CD/DVD, drive failure).	Please reinstall the inspection data, check the run setting has the correct path to the files (Run Settings>Files>Data File Directory), clean the CD/DVD.
"Generate Dig Sheet" is not available from the DSE.	PigTrap™ is not installed correctly.	Please reinstall PigTrap™.
Main window title bar is not visible.	Full screen is enabled.	Press "F11" on the keyboard.
Not able to highlight pipe objects.	The color bit depth is not set correctly.	PigTrap™ requires a 32 bit color depth, please contact IT to assist in changing to the correct setting.
	One of the task specific modes is enabled.	Press the "Done" or "Cancel" buttons from the bottom left.
REF error message.	If this is the first time opening a run with PigTrap™, it may attempt to create a reference file (.ref2). This message appears because a .ref2 file does not exist or it is corrupt.	Select OK to create a new ref2 file.
Can't see the sensor data.	Zoomed in very close.	Click on the Zoom OUT button.
	Sensors are not enabled.	Turn on the sensors from the Run Toolbar.
Can't find the Status/Database Window.	The Status/Database windows are not enabled	Go to View>Status Window and toggle the option ON
Crashes while opening.	The video card drivers are out of date.	Update the graphic card drivers. Note: Before installing the latest driver, you may need to uninstall the current drivers while in Windows safe mode. Can also turn off shaders.
	The .rsf is corrupt and needs replacing.	Reinstall the inspection data.
	Microsoft Visual C++2010 redistributable is corrupt or not installed.	This is typically installed the TDW Inspection data. It is possible to have a corrupt install and additional help may be required to correct the issue. Please contact your local IT department to assist with the prerequisite install.



# Appendix B

## Tool Bar Layouts and Functions

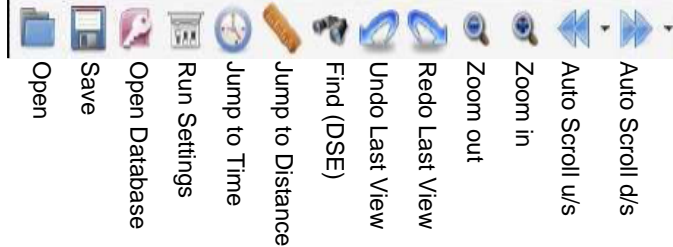
### Run Toolbar

The run toolbar will contain button that will toggle different views, traces and features on and off. Some of the features will be technology specific, such as IDOD as proximity sensors are only present on MFL tools. The arrows next to some buttons will provide additional options related to the specific button. Each window can be undocked by clicking and dragging the dotted left side of the toolbar.



### Main

The main toolbar contains navigation buttons that will aid in viewing run data and seeking to specific distances or locations.



### Database Navigation

These buttons navigate to features listed in the DSE.



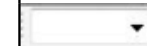
### Sensor Visibility

PigTrap™ allows user to zoom in on specific set of sensors, this dialog will display what sensors are currently being viewed. To return to viewing all sensors simply zoom out (-).



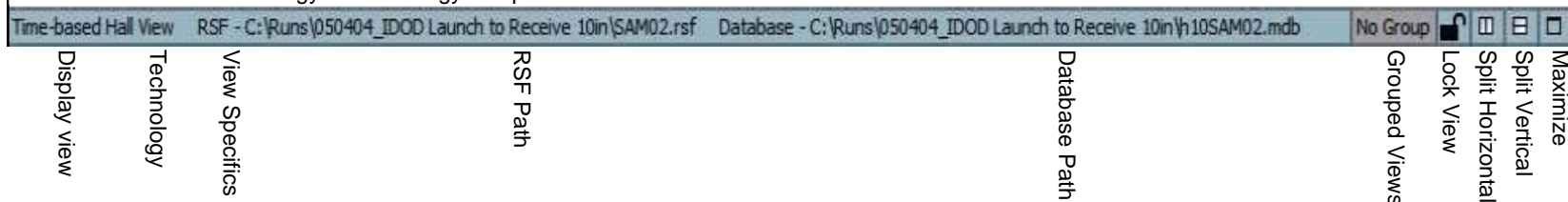
### Quick Search

The quick search allows users to quickly search for features by typing in a certain criteria, such as '+valve' this will jump to the next downstream valve.



### Run Details Status Bar

The run details status bar displays information regarding the view-type (time or distance), the location of the RSF and database and allows for the splitting of multiple views. Additional views can be split vertically or horizontally and even un-docked into a separate window using the button that appears after a view has been split. Locking a view will keep the current view in place. This feature will allow for multiple runs to be open in the same PigTrap™ for easier run to run or technology to technology comparison.





# Appendix B

## Displayed Information and Shortcuts

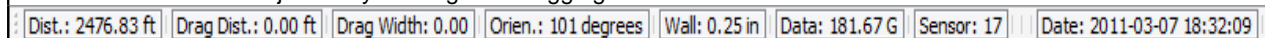
### Pipe Object and Status Windows

The Pipe Object and Status Windows will be defaulted to the right side of PigTrap™. Both windows can be docked and undocked by double clicking the title bar, left clicking and dragging or clicking the undock button located in the top right corner. As PigTrap™ has the ability to display multiple datasets the Status Window will update each section depending on which tool technology is selected (refer to the Run Details Status Bar on the Tool Bar Layout and Functions page). The information contained in each section of the Status Window can also be customized by right clicking on the desired section and selecting what data to display.

	<p>The pipe object window will display information about a highlighted feature, such as a weld, providing the weld ID and Distance. Features are highlighted when the cursor is placed upstream of an object and the object becomes highlighted with a teal color.</p>	
	<p>The General section of the Status Window will display information pertaining to all datasets. The information is dependent on the cursor location, displaying the current distance, orientation, wall thickness, joint length, up stream weld and date and time. The drag distance and drag width is populated when a box is drawn and can be useful when manually measuring lengths and widths.</p>	
	<p>The MFL window will display information for the current highlighted sensor. The highlighted sensor will be a red line over the entire sensor. These sensors can be turned on and off using the Esc key.</p>	
	<p>The IDOD window will display information for the current highlighted IDOD sensor. The IDOD sensors can be turned on by pressing the tilde (~) key.</p>	
	<p>The odometer section displays information about the speed for the current cursor location.</p>	

### Status Bar

The Status Bar is located at the bottom left of PigTrap™ and contains much of the same information as the General section of the Status Window. It can also be customized by right clicking and selecting what information to display. The order can also be adjusted by clicking and dragging a section above or below other rows.



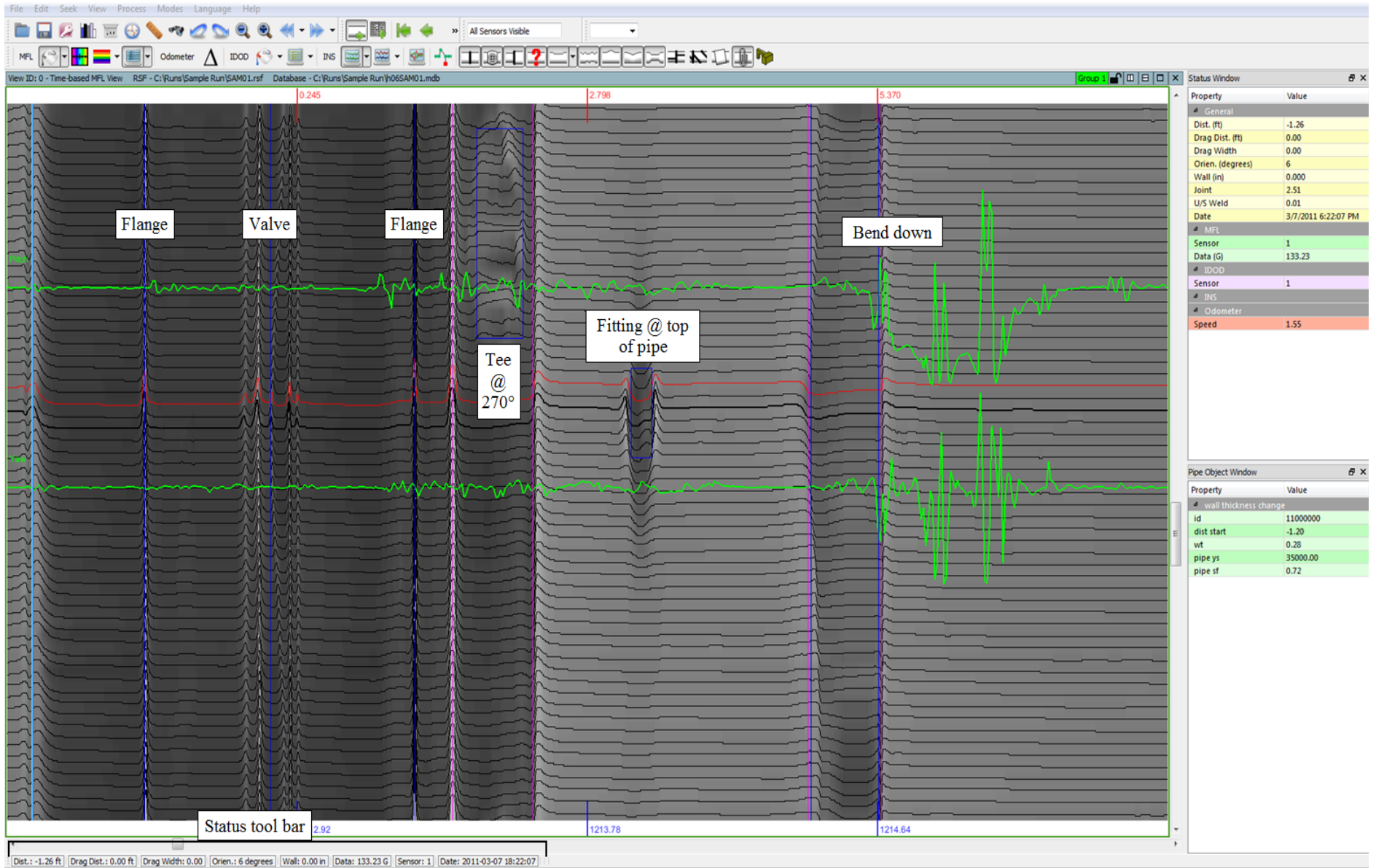
### Keyboard Shortcuts

Ôd ÆÁ	Jump to Launch Valve
Ôd ÆÁ	Jump to Receive Valve
	Move Half Screen Downstream
	Move Half Screen Upstream
Page Down	Move Full Screen Downstream
Page Up	Move Full Screen Upstream
	Rotate Orientation Up
	Rotate Orientation Down
Mouse Wheel	Rotate Orientation
Ctrl + F	Open Database Search Edit (DSE)
Spacebar	Repeat Last DSE Find
Ctrl + Z	Undo Last View
Ctrl + Shift + Z	Redo Last View
Ctrl + D	Jump to Distance
Ctrl + T	Jump to Time
Ctrl + H	Open Deformation Cross Section
Ôd ÆÁ	Jump to Downstream Marker Trip
Ôd ÆÁ	Jump to Upstream Marker Trip
Alt + Double Click	Hide Status Windows
Esc	Turn Hall sensors on/off
Tilde (~)	Turn IDOD sensors on/off
M	Measure dragged box



# Appendix B

## PigTrap™ MFL Runs

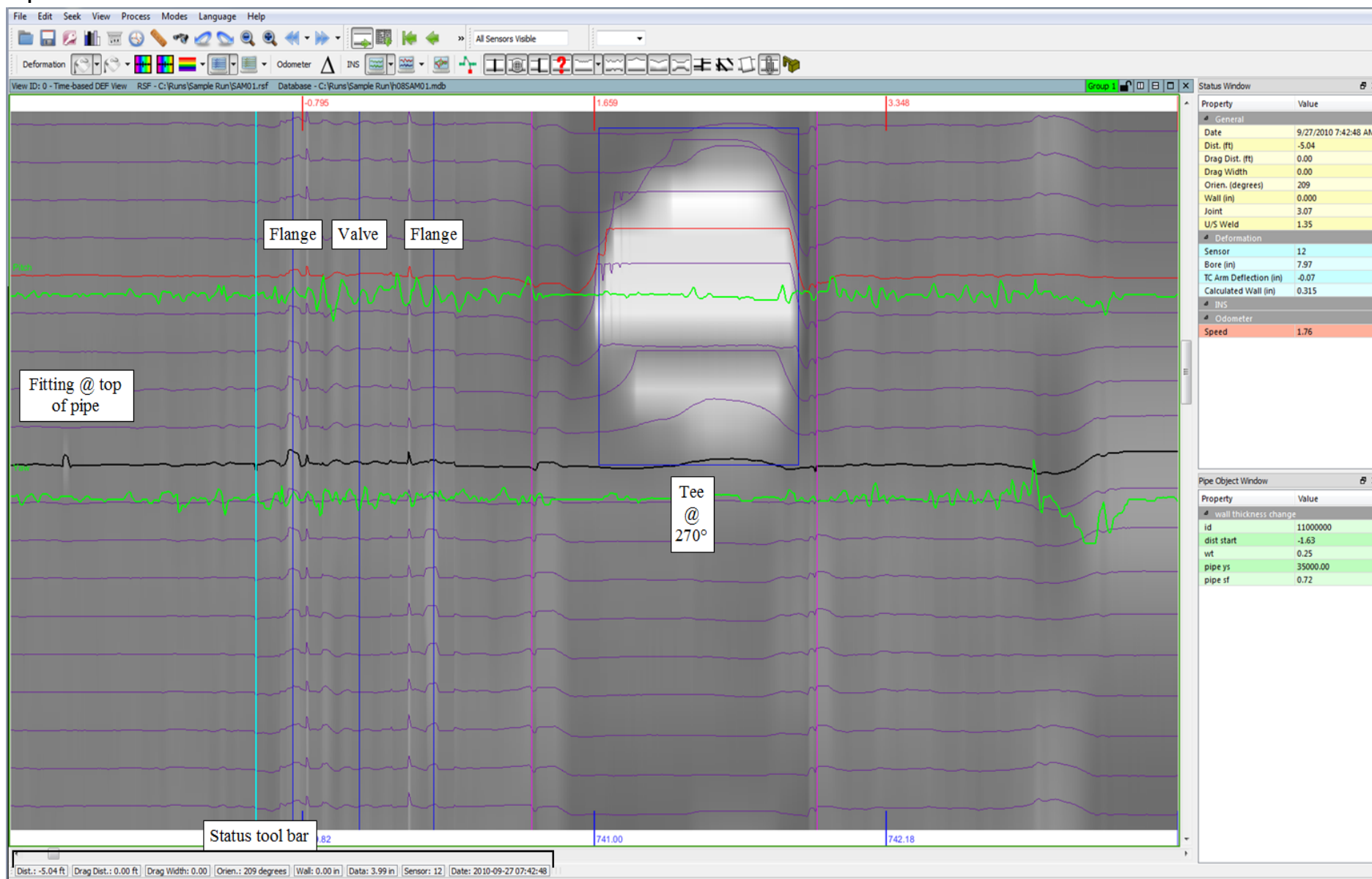


Appendix B



# Appendix B

## PigTrap™ DEF Runs



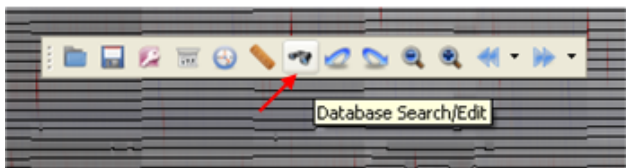
Appendix B



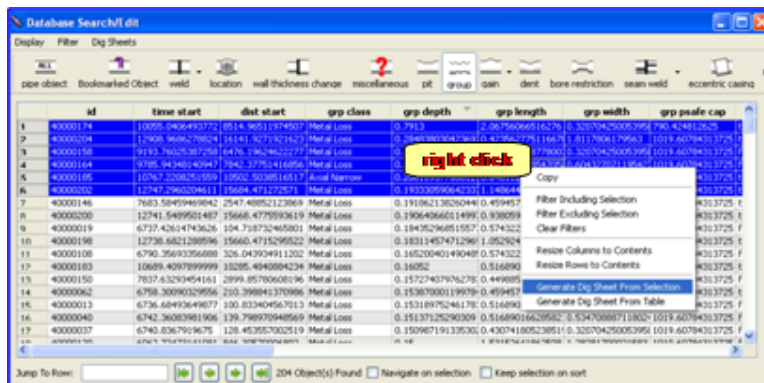
# Appendix C

The user can view and print dig sheets for any anomaly or feature detected in the pipeline including Metal Loss (Groups or Pits), Dents, Locations, Gains, Wall Thickness changes, Welds, Miscellaneous notes, etc.

1. Open PigTrap™ to view the inspection data for the run. Please consult Appendix B if you need instructions on installing and viewing the raw data.
2. Click on the Database Search/Edit option either by clicking on the small binoculars icon in the toolbar or choosing the option under the Seek toolbar.
4. Once the list populates with that type of object, you can filter or sort the data to find the object(s) for which you want to create dig sheets.
  - a. Clicking on the header of the column will sort either ascending or descending. Click again to reverse the order.
  - b. You may also use or create various filters by clicking on one of the two Filters buttons.
  - c. There is also a Displayed Columns button which allows you to hide or show the various columns of data.



a. This will bring up the Database Search/Edit (DSE) window.



3. You can choose what type of feature you want to list in the window by clicking on the icon in the margin.
6. The dig sheets you requested will automatically be previewed for easier printing as well as saved to a directory as a pdf file for printing later.
  - a. To choose which directory the dig sheets are saved into, choose Report Creation Settings under the Dig Sheets option in the top toolbar.
7. Also under the Dig Sheets toolbar in the DSE window, you may change various dig sheet formatting preferences by clicking on Dig Sheet Settings option.