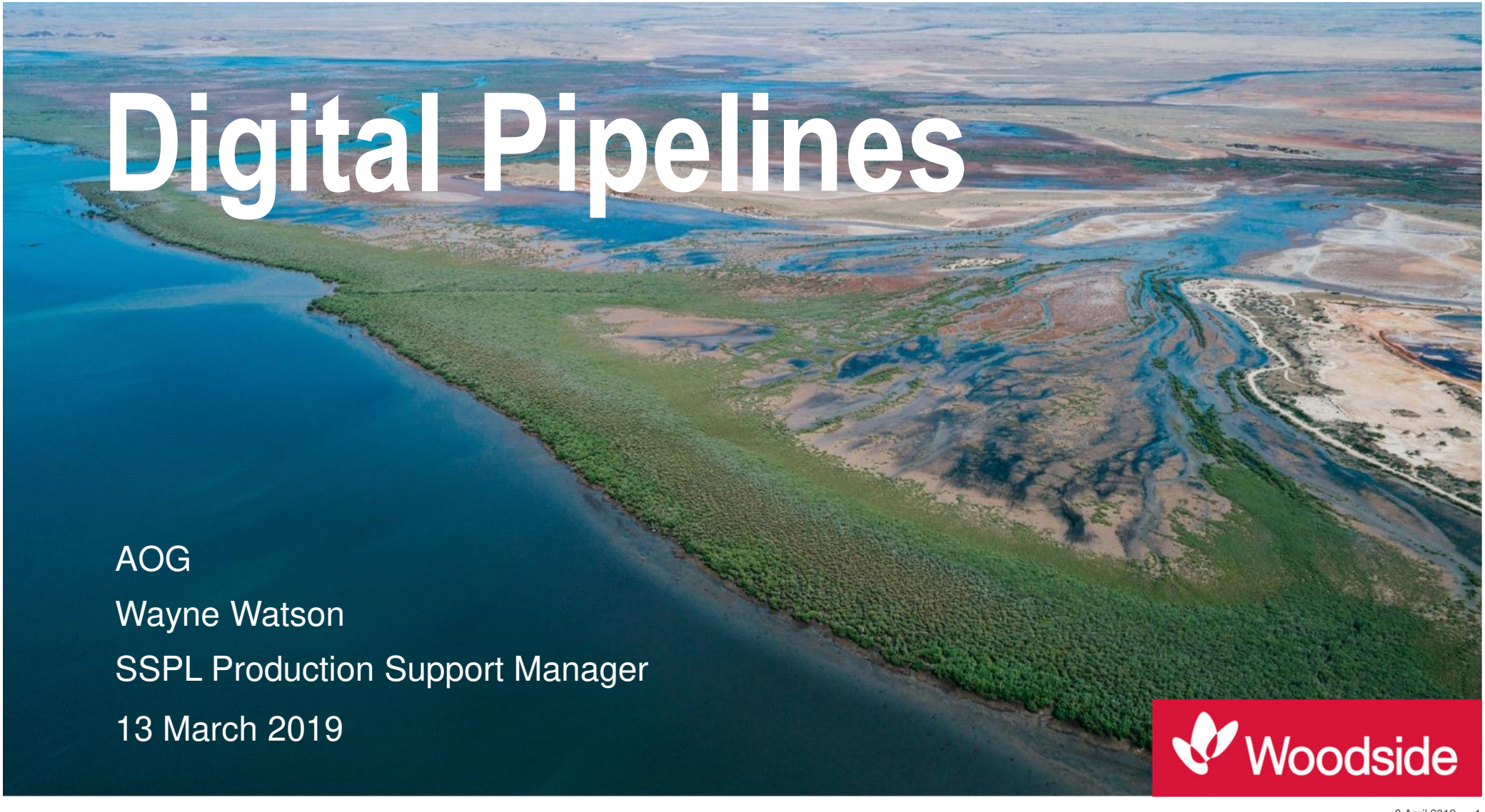


Digital Pipelines

AOG

Wayne Watson

SSPL Production Support Manager

13 March 2019

Woodside

Disclaimer and important notice

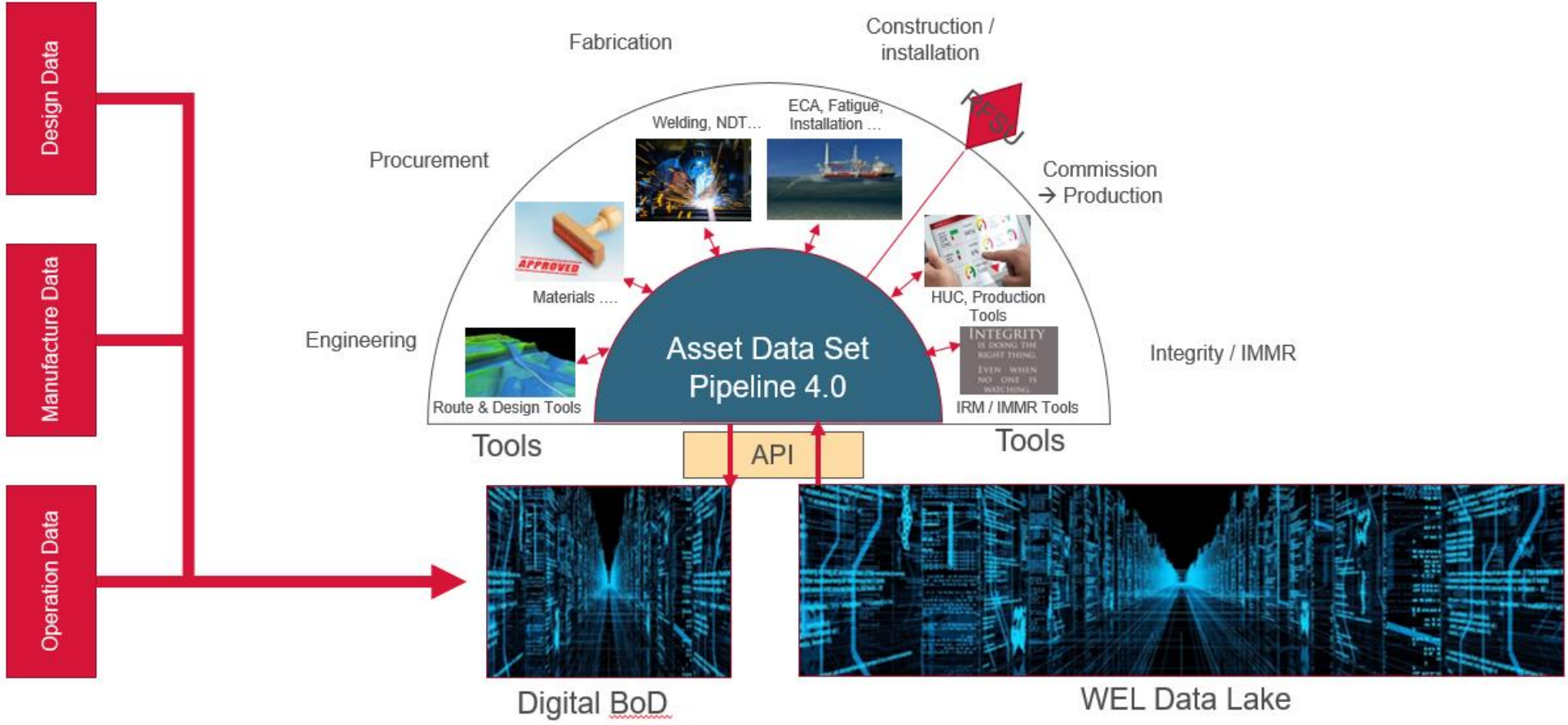
This presentation contains forward looking statements that are subject to risk factors associated with oil and gas businesses. It is believed that the expectations reflected in these statements are reasonable but they may be affected by a variety of variables and changes in underlying assumptions which could cause actual results or trends to differ materially, including but not limited to: price fluctuations, actual demand, currency fluctuations, drilling and production results, reserve estimates, loss of market, industry competition, environmental risks, physical risks, legislative, fiscal and regulatory developments, economic and financial market conditions in various countries and regions, political risks, project delay or advancement, approvals and cost estimates.

All references to dollars, cents or $ in this presentation are to US currency, unless otherwise stated.

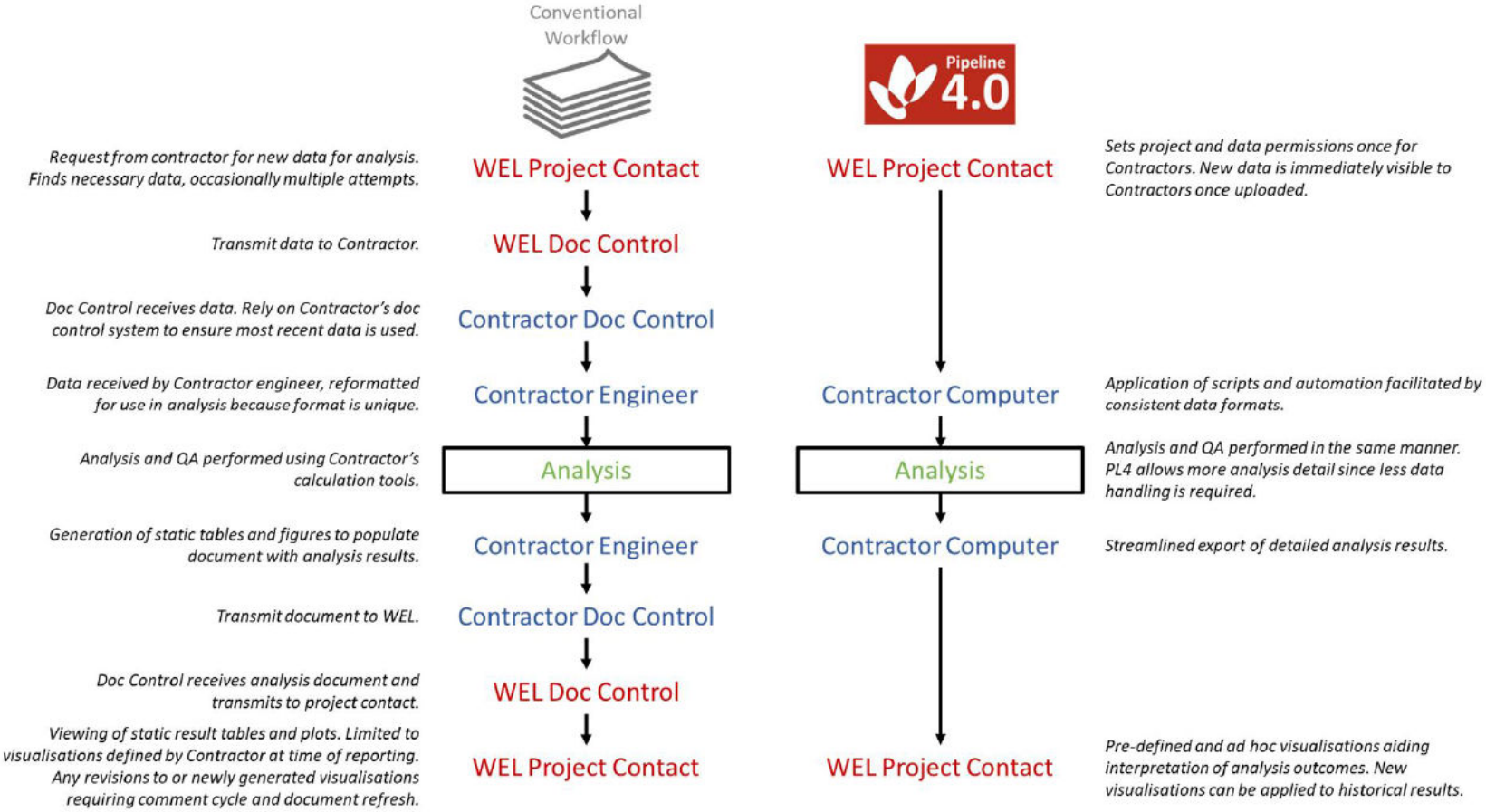
References to “Woodside” may be references to Woodside Petroleum Ltd. or its applicable subsidiaries.

The authors wish to acknowledge Woodside and the North West Shelf Joint Venture participants for supporting this publication

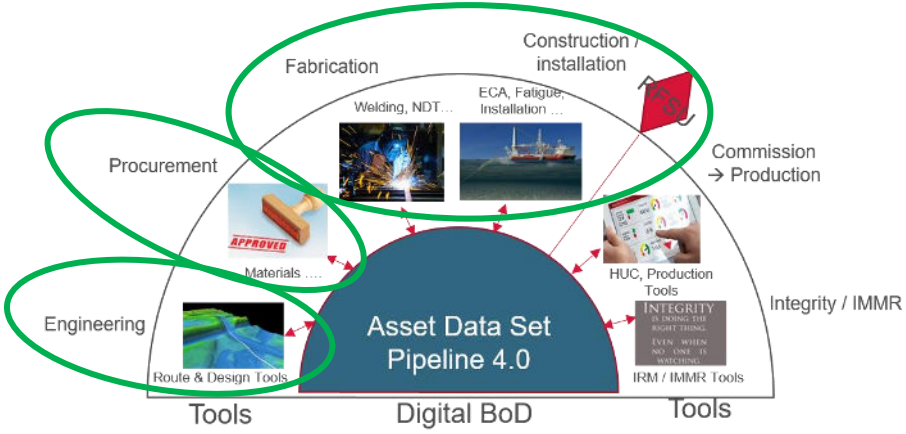
Woodside's Pipeline Data Management Vision

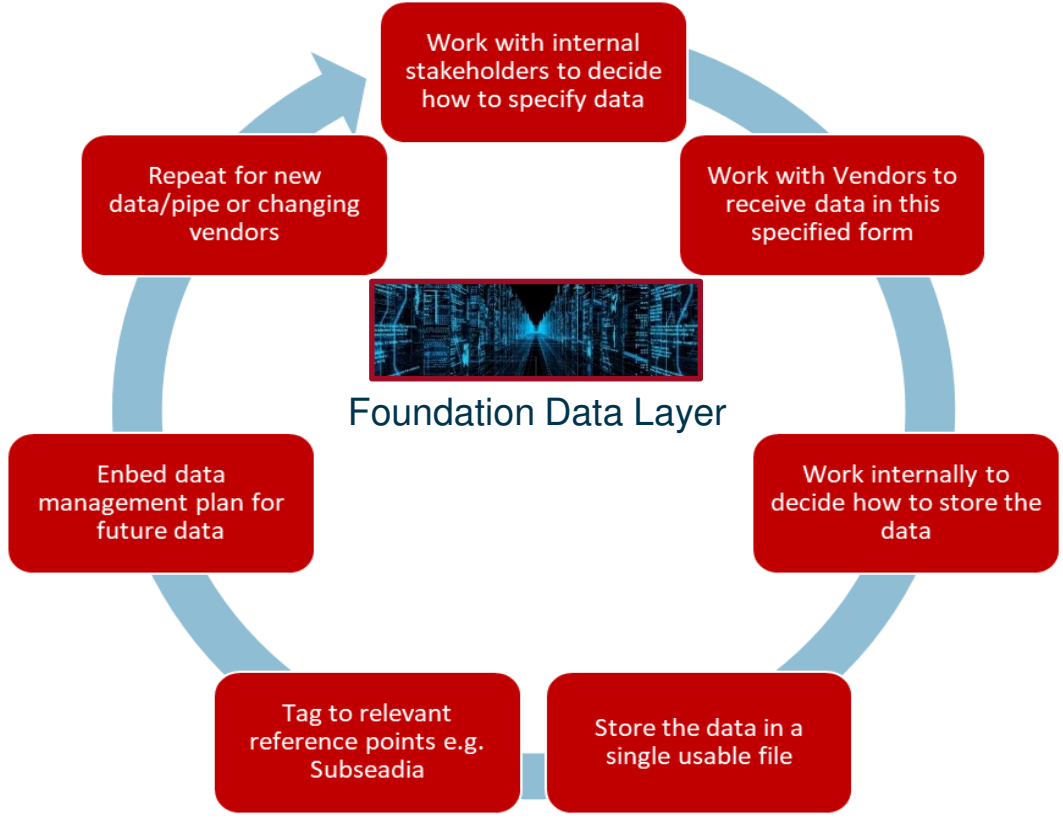


Why have a digital pipeline



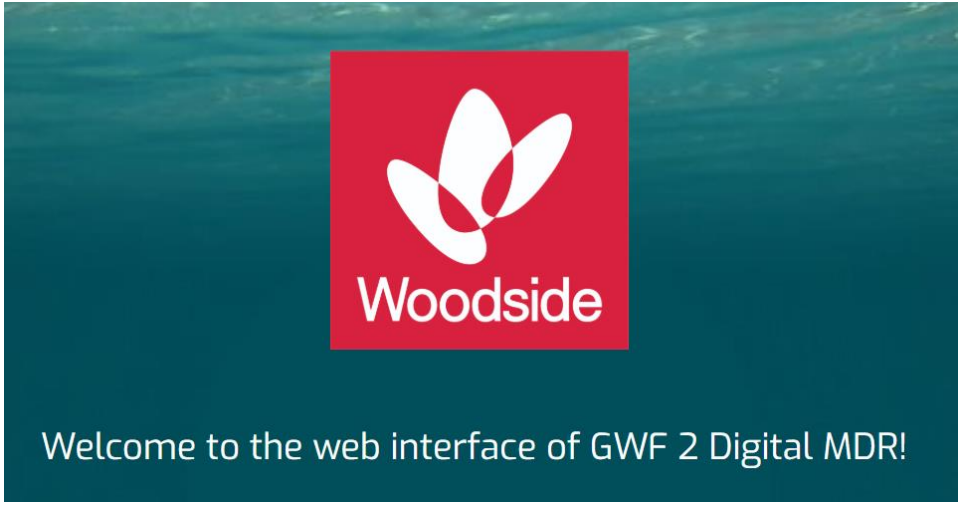
Design, Procurement, Manufacturing and Installation





Key Milestone In Process:

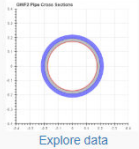
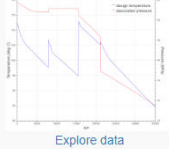
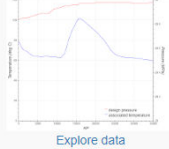
- Move from theory to real
- Foundation data set for Project & Asset.



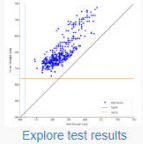
Explore flowline data

The links provided in this section give access to traditional views of the data for a sample of datasets.

Design data

Section	Design temperature conditions	Design pressure conditions	Bathymetry
 Explore data	 Explore data	 Explore data	 Explore data

Manufacturing data

Yield strength	Tensile strength	Yield to tensile
 Explore test results	 Explore test results	 Explore test results

Installation data: Pipeline route


Explore data

Explore aggregated double joint data

This section gives access to aggregated data and visualisations for data from manufacture and installation phase, for each double joint.
If you know the double joint for which you would like to view the data, proceed using the red box below. If not, please use any of the two widgets hereafter.

Select by double joint

Offshore weld to double joint widget:

If you would like to access information for a specific offshore weld but are unsure about which double joint it refers to, please use this widget to assist with double joint selection.

Select by offshore weld

Kp to double joint widget

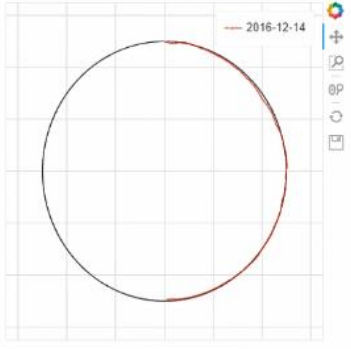
If you would like to access information for a specific Kp but are unsure about which double joint it refers to, please use this widget to assist with double joint selection.

Note that:

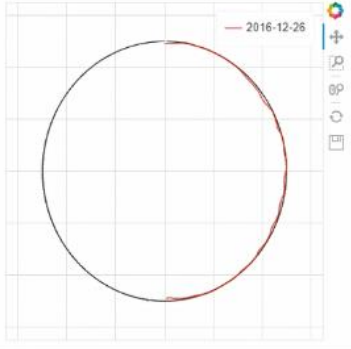
- this widget is based on Kp recorded at beadstall in the installation pipe tally. It is therefore an approximation.
- if the Kp you select does not correspond to a Kp that was recorded to be in beadstall (i.e. the Kp of an offshore weld), the widget will display the data of the nearest Kp corresponding to an offshore weld.

Select by KP

Pipe 1	
Pipe number	P10786
Reference point	T
Distance from reference point	0.01
Scaling factor *(used to scale results to ease visualisation)*	30



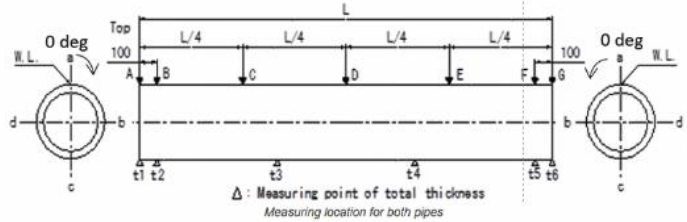
Pipe 2	
Pipe number	P10234
Reference point	T
Distance from reference point	0.01
Scaling factor *(used to scale results to ease visualisation)*	30



Double joint data for DJ-0011

Pipe 1		Pipe 2		Onshore weld data		Offshore weld (OFW) data			
Pipe Number	Welded End	Pipe Number	Welded End	Relative Rotation	Inner Diameter Hi/Lo	Weld for Pipe 1	Weld for Pipe 2	Kp OFW Pipe 1	Kp OFW Pipe 2
P10786	B	P10234	B	-176.6	0.5	OFW-1287	OFW-1286	3958	3983

External dimensions



Woodside

Hardness test

CS parent heat number	CRA parent heat number	Test number	Ident. number	Line	Location	Location measuring point	Readings
16D5060	I496	PL1-10	MC1	A	LEFT	CLADDING ALLOY	[212.0, 215.0, 208.0]
16D5060	I496	PL1-10	MC1	A	LEFT	HAZ	[202.0, 194.0, 194.0, 188.0, 185.0]
16D5060	I496	PL1-10	MC1	A		WELD OVERLAY	[196.0, 237.0, 217.0]
16D5060	I496	PL1-10	MC1	A	RIGHT	HAZ	[204.0, 208.0, 205.0, 208.0, 209.0]
16D5060	I496	PL1-10	MC1	A	RIGHT	CLADDING ALLOY	[201.0, 197.0, 194.0]
16D5060	I496	PL1-10	MC1	B	LEFT	BACKING STEEL	[196.0, 195.0, 192.0]
16D5060	I496	PL1-10	MC1	B	LEFT	HAZ	[162.0, 183.0, 190.0, 189.0, 191.0, 196.0, 200.0]
16D5060	I496	PL1-10	MC1	B		WELD METAL	[198.0]
16D5060	I496	PL1-10	MC1	B	RIGHT	HAZ	[200.0, 203.0, 201.0, 197.0, 196.0, 190.0, 188.0, 187.0]
16D5060	I496	PL1-10	MC1	B	RIGHT	BACKING STEEL	[197.0, 201.0, 202.0]

16D5039 | 16D5039 | I496 | I498

Tensile test

CS parent heat number	CRA parent heat number	Test number	Ident. number	Tensile strength	Elongation	Yield to tensile	Shear strength
16D5039	I477	PL1-7	TJ-B1	631000000.0	-	-	-
16D5039	I477	PL1-7	TT-B1	599000000.0	51.2	0.88	-
16D5039	I477	PL1-7	TT-T1	606000000.0	56.4	0.889	-
16D5039	I477	PL1-7	TL-T1	620000000.0	57.4	0.944	-
16D5039	I477	PL1-7	TL-B1	580000000.0	23.7	0.917	-
16D5039	I477	PL1-7	TL-C1	694000000.0	40.0	0.823	-
16D5039	I477	PL1-7	TD-C1	594000000.0	41.7	0.801	-
16D5039	I477	PL1-7	SH1	-	-	-	410000000.0
16D5039	I477	PL1-7	TL-B1A	566000000.0	30.6	0.87	-

Double joint data for DJ-0011

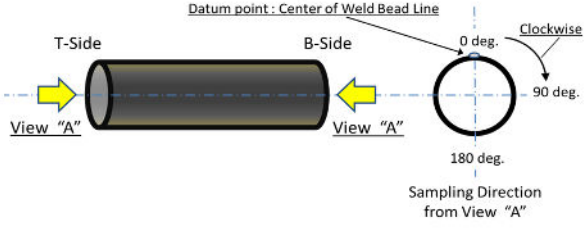
Pipe 1		Pipe 2		Onshore weld data		Offshore weld (OFW) data			
Pipe Number	Welded End	Pipe Number	Welded End	Relative Rotation	Inner Diameter Hi/Lo	Weld for Pipe 1	Weld for Pipe 2	Kp OFW Pipe 1	Kp OFW Pipe 2
P10786	B	P10234	B	176.6	0.5	OFW 1267	OFW 1266	3958	3983

Individual pipe data

Pipe 1	
Pipe number	P10786
Plate number	AE283
CS heat number	16D5039-12-2-1
CRA heat number	I496-6
Misc. info	Heavy Wall - Plain
Weight	3390.0
Length	12.27

Pipe 2	
Pipe number	P10234
Plate number	AE258
CS heat number	16D5039-4-1-2
CRA heat number	I496-7
Misc. info	Heavy Wall - Plain
Weight	3400
Length	12.294

Visualisation of OOR measurements

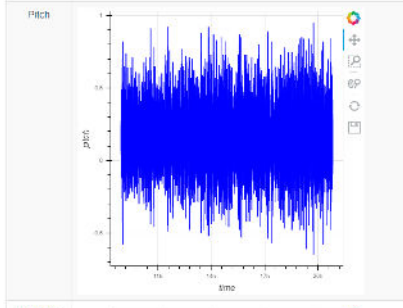


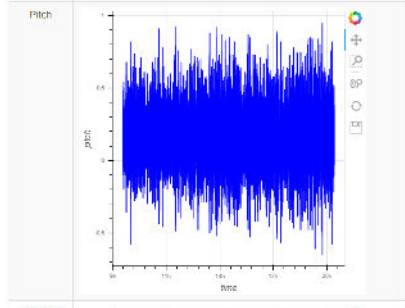
Installation data

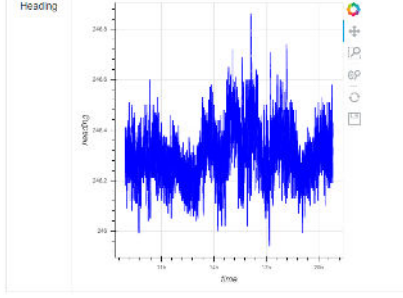
Pipetally information

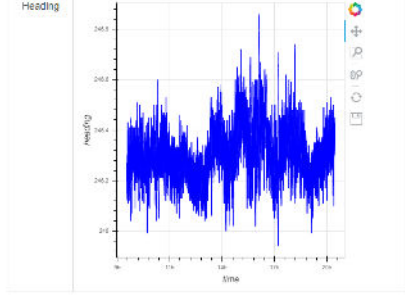
Offshore Weld for Pipe 1				
Position	Time	Easting	Northing	Additional comment (optional)
In beadstall	June 2, 2018, 9:51 a.m.	362799.14	7809076.61	Theoretical TD. LB=411
Touchdown	June 2, 2018, 8:52 p.m.	362793.19	7809074.29	Theoretical TD. LB=409

Offshore Weld for Pipe 2				
Position	Time	Easting	Northing	Additional comment (optional)
In beadstall	June 2, 2018, 9:31 a.m.	362822	7809087	Theoretical TD. LB=411
Touchdown	June 2, 2018, 8:30 p.m.	362816	7809085	Theoretical TD. LB=409









Woodside's Pipeline Data Management Vision