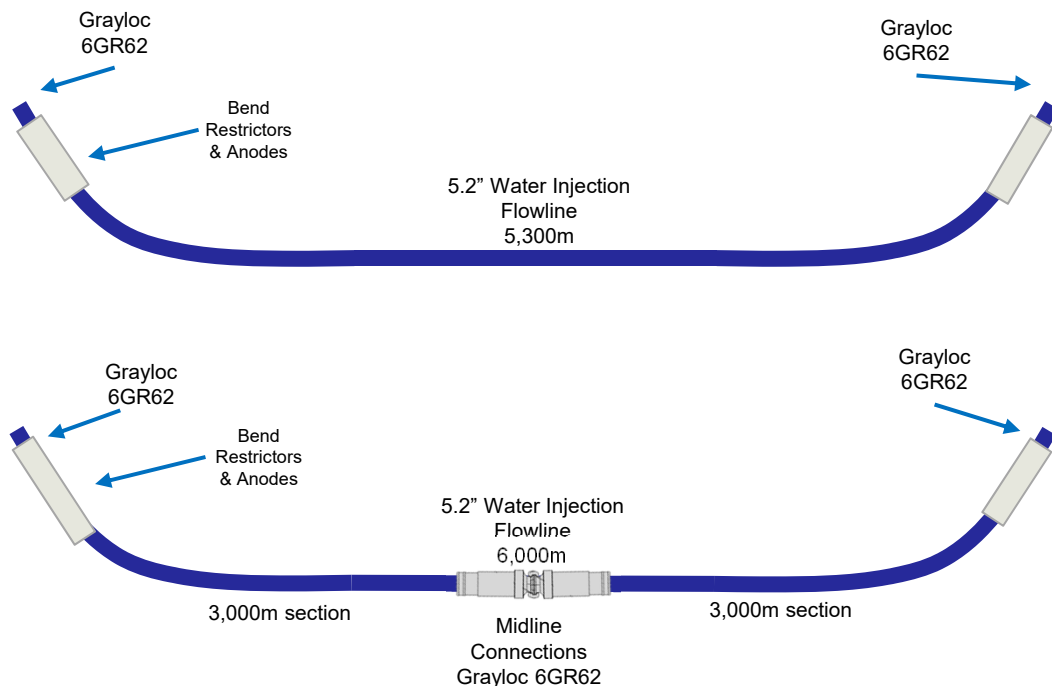


Water Injection Flowlines

Reel #	Reel Size Nominal OD	Packing Contents	Estimated weight
1	9.2m	5.2" Water Injection (5300m)	265.5Te
2	8.6m	5.2" Water Injection (3000m)	160.5Te



INTERNAL DIAMETER 5.20" SWEET SERVICE
DESIGN PRESSURE 3495 psi 241 bars
DESIGN TEMPERATURE 45 °C
FACTORY TEST PRESSURE 4554 psi 314 bars
FTP/DP 1.30

N°	LAYER DESCRIPTION	UTS (MPa)	MYS (MPa)	Mass (Kg/m)	I.D. (mm)	Th. (mm)	SDP (MPa)
1	TUBE TP35			2.00	132.08	4.90	
2	ZETA WIRE 6.2 FI 11	1000	-	19.28	141.88	6.20	319
3	ANTI-COLLAPSE SH. POLYETHYLENE TP11 TRANSLUCENT			2.08	154.28	4.40	
4	FIRST ARMOUR LAY. FI41 63 Flat wires: 7 x 2 at -25 deg.	1400	-	7.24	163.08	2.00	205
5	SECOND ARMOUR LAY FI41 65 Flat wires: 7 x 2 at 25 deg.	1400	-	7.47	167.08	2.00	271
6	HIGH STRENGTH TAPE G1/G2/G2/ESTER/ESTER			0.57	171.08	1.40	
7	EXTERNAL SHEATH POLYETHYLENE TP14 YELLOW			2.10	173.88	4.00	

THEORETICAL CHARACTERISTICS	IMPERIAL	METRIC
DIAMETER inside	5.20 in	132.08 mm
DIAMETER outside	7.16 in	181.88 mm
VOLUME internal	0.147 cft/ft	13.70 l/m
VOLUME external	0.280 cft/ft	25.98 l/m
WEIGHT in air empty	27.35 lbf/ft	40.70 kgf/m
WEIGHT in air full of seawater	36.79 lbf/ft	54.74 kgf/m
WEIGHT in seawater empty	9.45 lbf/ft	14.07 kgf/m
WEIGHT in seawater full of seawater	18.89 lbf/ft	28.11 kgf/m
SPECIFIC GRAVITY in sea water empty	1.53	1.53
PRESSURE Nominal bursting	9862 psi	680 bars
HYDROSTATIC collapse pressure lay 3	2146 psi	148 bars
DAMAGING PULL in straight line	424860 lbf	1889.87 kN
MINIMUM BENDING RADIUS for STORAGE	4.35 ft	1.33 m
BENDING STIFFNESS at 20°C	44639 lbf.ft2	18.45 kN.m2
RELATIVE ELONGATION at design pressure	0.117 %	0.117 %
RELATIVE ELONGATION for 100 kN	0.040278 %	0.040278 %
THERMAL EXCHANGE COEFFICIENT at 20°C	5.99 Btu/hft.F	10.36 W/m.K

Production Flowline

Reel #	Reel Size Nominal OD	Packing Contents	Estimated weight
1	8.6m	2" Gas Lift (50m) – will be used 4" Production (50m) – will be used 2" Gas Lift (100m) 4" Production (100m)	66.9Te



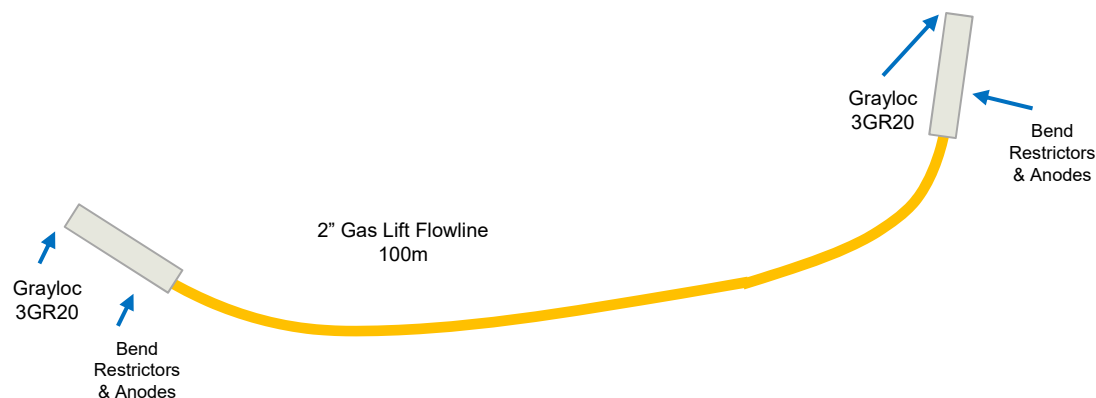
INTERNAL DIAMETER 4.00" SOUR SERVICE
DESIGN PRESSURE 3495 psi 241 bars
DESIGN TEMPERATURE 85 °C
FACTORY TEST PRESSURE 4554 psi 314 bars
FTP/DP 1.30

N°	LAYER DESCRIPTION	UTS (MPa)	MYS (MPa)	Mass (Kg/m)	I.D. (mm)	Th. (mm)	SDP (MPa)
1	INTERLOCKED CARCASS 40.0 x 0.8 x 4.0 AISI 316L (FE 02)	570	-	6.21	101.80	4.00	
2	PRESSURE SHEATH TP35			2.01	109.80	5.50	256
3	ZETA WIRE 8.2 FI 27	780	700	16.50	120.80	6.20	
4	FABRIC TAPE ESTER			0.11	133.00	0.40	
5	FIRST ARMOUR LAY. FI 27 29 Flat wires: 12 x 3 at -30 deg.	780	700	9.10	133.80	3.00	132
6	FABRIC TAPE ESTER			0.11	139.80	0.40	
7	SECOND ARMOUR LAY. FI 27 31 Flat wires: 12 x 3 at 30 deg.	780	700	9.70	140.80	3.00	161
8	HIGH STRENGTH TAPE G1/TECH/TECH/ESTER/ESTER			0.45	146.80	2.05	
9	INSULATION MO03 4 Strips: 50 x 5.5			7.59	150.70	22.00	
10	FABRIC TAPE G2			0.12	194.70	0.15	
11	INSULATION MO03 4 Strips: 50 x 5.5			9.54	195.00	22.00	
12	FABRIC TAPE TE/G2/ESTER/ESTER			0.49	239.00	1.05	
13	EXTERNAL SHEATH POLYETHYLENE TP14 YELLOW			4.53	241.10	6.20	

THEORETICAL CHARACTERISTICS	IMPERIAL	METRIC
DIAMETER inside	4.00 in	101.80 mm
DIAMETER outside	9.98 in	253.50 mm
VOLUME internal	0.093 cft/ft	8.64 l/m
VOLUME external	0.543 cft/ft	50.47 l/m
WEIGHT in air empty	44.65 lbf/ft	66.45 kgf/m
WEIGHT in air full of seawater	50.60 lbf/ft	75.31 kgf/m
WEIGHT in seawater empty	9.89 lbf/ft	14.71 kgf/m
WEIGHT in seawater full of seawater	15.84 lbf/ft	23.57 kgf/m
SPECIFIC GRAVITY in sea water empty	1.28	1.28
PRESSURE Nominal bursting	9514 psi	656 bars
HYDROSTATIC collapse pressure lay 2	2509 psi	173 bars
DAMAGING PULL in straight line	270035 lbf	1201.18 kN
MINIMUM BENDING RADIUS for STORAGE	5.40 ft	1.65 m
BENDING STIFFNESS at 20°C	77568 lbf.ft2	32.06 kN.m2
RELATIVE ELONGATION at design pressure	0.059 %	0.059 %
RELATIVE ELONGATION for 100 kN	0.038248 %	0.038248 %
THERMAL EXCHANGE COEFFICIENT at 20°C	0.94 Btu/h.ft.F	1.63 W/m.K

Gas Injection Flowline

Reel #	Reel Size Nominal OD	Packing Contents	Estimated weight
1	8.6m	2" Gas Lift (50m) – will be used 4" Production (50m) – will be used 2" Gas Lift (100m) 4" Production (100m)	66.9Te



INTERNAL DIAMETER 2.00" SOUR SERVICE
DESIGN PRESSURE 3495 psi 241 bars
DESIGN TEMPERATURE 85 °C
FACTORY TEST PRESSURE 4554 psi 314 bars
FTP/DP 1.30

N°	LAYER DESCRIPTION	UTS (MPa)	MYS (MPa)	Mass (Kg/m)	I.D. (mm)	Th. (mm)	SDP (MPa)
1	INTERLOCKED CARCASS 40.0 x 0.8 x 4.0 AISI 316L (FE 02)	570	-	3.23	50.80	4.00	
2	PRESSURE SHEATH TP35	780	700	1.12	58.80	5.50	151
3	ZETA WIRE 6.2 FI 27			9.91	69.80	6.20	
4	FABRIC TAPE ESTER			0.07	82.20	0.40	
5	FIRST ARMOUR LAY. FI 27 24 Flat wires: 9 x 3 at -30 deg.	780	700	5.56	83.00	3.00	65
6	FABRIC TAPE ESTER			0.07	89.00	0.40	
7	SECOND ARMOUR LAY. FI 27 26 Flat wires: 9 x 3 at 30 deg.	780	700	6.02	89.80	3.00	93
8	HIGH STRENGTH TAPE G1/G2/G2/ESTER/ESTER			0.26	95.80	1.25	
9	EXTERNAL SHEATH POLYETHYLENE TP14 YELLOW			1.21	98.30	4.00	

THEORETICAL CHARACTERISTICS	IMPERIAL	METRIC
DIAMETER inside	2.00 in	50.80 mm
DIAMETER outside	4.19 in	106.30 mm
VOLUME internal	0.025 cf/ft	2.30 l/m
VOLUME external	0.096 cf/ft	8.87 l/m
WEIGHT in air empty	18.44 lb/ft	27.44 kg/m
WEIGHT in air full of seawater	20.03 lb/ft	29.80 kg/m
WEIGHT in seawater empty	12.33 lb/ft	18.35 kg/m
WEIGHT in seawater full of seawater	13.92 lb/ft	20.71 kg/m
SPECIFIC GRAVITY in sea water empty	3.02	3.02
PRESSURE Nominal bursting	16200 psi	1117 bars
HYDROSTATIC collapse pressure lay 2	6236 psi	430 bars
DAMAGING PULL in straight line	157649 lbf	701.26 kN
MINIMUM BENDING RADIUS for STORAGE	2.26 ft	0.69 m
BENDING STIFFNESS at 20°C	4931 lbf.ft ²	2.04 kN.m ²
RELATIVE ELONGATION at design pressure	0.031 %	0.031 %
RELATIVE ELONGATION for 100 kN	0.084056 %	0.084056 %
THERMAL EXCHANGE COEFFICIENT at 20°C	3.49 Btu/h.ft.F	6.05 W/m.K