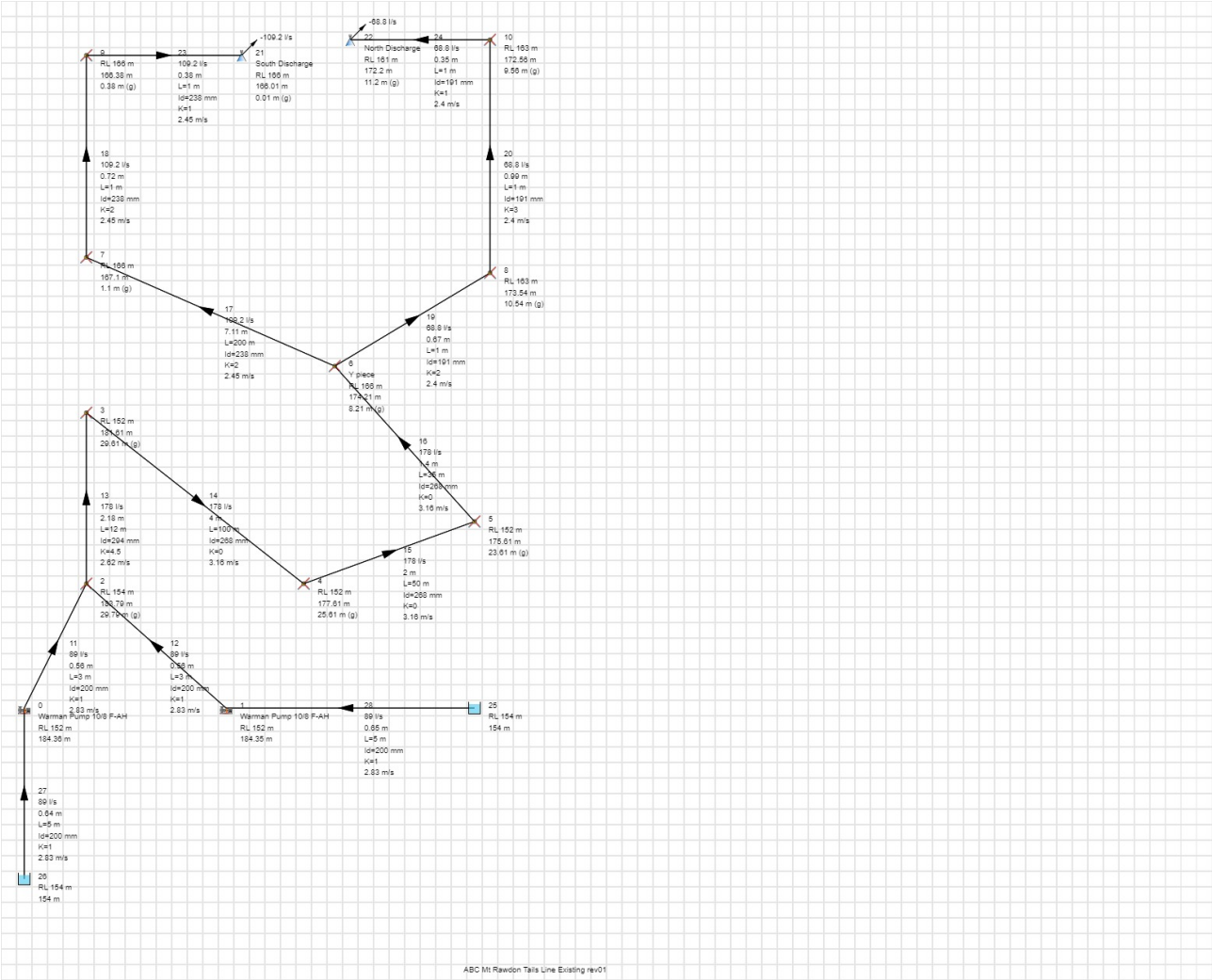
Helix Technologies

Project	Evolution Mt Rawdon	Client	ABC Engineering
Project No.	P	Design Date	23/01/2016
Category	Demo slurry	Atmos. Press	99.52 kPa
Network Type	Liquid	Calc. Method	Darcy
Description	ABC Mt Rawdon Tails Line Existing rev01		

Tailings pipeline feeding to two monitors at either end of tailings storage dam.
Pipes sized to give reasonable head loss without excessive slurry settlement in the pipe.
View graoh by clicking on a pipe and then on the Graph tab on RHS of drawing.

Helix Technologies

Project	Evolution Mt Rawdon	Client	ABC Engineering
Project No.	P	Design Date	23/01/2016
Category	Demo slurry	Atmos. Press	99.52 kPa
Description	ABC Mt Rawdon Tails Line Existing rev01		



Helix Technologies

Project	Evolution Mt Rawdon	Client	ABC Engineering
Project No.	P	Design Date	23/01/2016
Category	Demo slurry	Atmos. Press	99.52 kPa
Description	ABC Mt Rawdon Tails Line Existing rev01		

Pipe No	11	From node to node	0 - 2
Description		Equipment No	
Slurry Type	Settling Slurry		
Slurry Description	Mt Rawdon Tails	Slurry Reference	
SG Carrier Liquid Sl	1.03	Liquid Viscosity	25 cP
SG of Dry Solids	2.7	SG of Mixture	1.45
Conc. by Mass Cw	47 % w/w	Concentration by Vol	1.45 % v/v
Solids Flow Rate	218.51 tonnes/hr	Particle Size d50	0.08 mm
Grading	Closely Graded		
Durand co-eff. Fl	0.85	Settling Velocity Vl	2.15 m/s
Settling Flow Rate	67.6 l/s		
Pump Wear Factor Pw	0.9	Pump Head Ratio HR	0.96
Pipe Description	Steel Pipe Rubber lined	Pipe Class	
Nominal Diameter	200 mm	Inside Diameter	200 mm
Outside Diameter	220 mm	Pipe Length	3 m
Pipe Roughness	0.15 mm	Allowable Press.	2780 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	1	Total Fittings kf	0
Flow Rate	89 l/s	Velocity	2.83 m/s
Friction Loss	0.15 m	Fitting Losses	0.41 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.56 m	Total Pressure Drop	8.01 kPa
Entry Total Head	184.36 m	Exit Total Head	183.79 m
Entry Gauge Head	32.36 m	Exit Gauge Head	29.79 m
Reynolds No.	32885.35	Friction Factor	0.02497 (Darcy f)

Helix Technologies

Project	Evolution Mt Rawdon	Client	ABC Engineering
Project No.	P	Design Date	23/01/2016
Category	Demo slurry	Atmos. Press	99.52 kPa
Description	ABC Mt Rawdon Tails Line Existing rev01		

Pipe No	12	From node to node	1 - 2
Description		Equipment No	
Slurry Type	Settling Slurry		
Slurry Description	Mt Rawdon Tails	Slurry Reference	
SG Carrier Liquid Sl	1.03	Liquid Viscosity	25 cP
SG of Dry Solids	2.7	SG of Mixture	1.46
Conc. by Mass Cw	48 % w/w	Concentration by Vol	1.46 % v/v
Solids Flow Rate	225.11 tonnes/hr	Particle Size d50	0.08 mm
Grading	Closely Graded		
Durand co-eff. Fl	0.85	Settling Velocity Vl	2.15 m/s
Settling Flow Rate	67.6 l/s		
Pump Wear Factor Pw	0.9	Pump Head Ratio HR	0.95
Pipe Description	Steel Pipe Rubber lined	Pipe Class	
Nominal Diameter	200 mm	Inside Diameter	200 mm
Outside Diameter	220 mm	Pipe Length	3 m
Pipe Roughness	0.15 mm	Allowable Press.	2780 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	1	Total Fittings kf	0
Flow Rate	89 l/s	Velocity	2.83 m/s
Friction Loss	0.15 m	Fitting Losses	0.41 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.56 m	Total Pressure Drop	8.07 kPa
Entry Total Head	184.35 m	Exit Total Head	183.79 m
Entry Gauge Head	32.35 m	Exit Gauge Head	29.79 m
Reynolds No.	33178.24	Friction Factor	0.02494 (Darcy f)

Helix Technologies

Project	Evolution Mt Rawdon	Client	ABC Engineering
Project No.	P	Design Date	23/01/2016
Category	Demo slurry	Atmos. Press	99.52 kPa
Description	ABC Mt Rawdon Tails Line Existing rev01		

Pipe No	13	From node to node	2 - 3
Description		Equipment No	
Slurry Type	Settling Slurry		
Slurry Description	Mt Rawdon Tails	Slurry Reference	
SG Carrier Liquid Sl	1.03	Liquid Viscosity	25 cP
SG of Dry Solids	2.7	SG of Mixture	1.46
Conc. by Mass Cw	48 % w/w	Concentration by Vol	1.46 % v/v
Solids Flow Rate	450.19 tonnes/hr	Particle Size d50	0.08 mm
Grading	Closely Graded		
Durand co-eff. Fl	0.85	Settling Velocity Vl	2.61 m/s
Settling Flow Rate	177.1 l/s		
Pump Wear Factor Pw	0.9	Pump Head Ratio HR	0.95
Pipe Description	Steel Pipe Rubber lined	Pipe Class	
Nominal Diameter	300 mm	Inside Diameter	294 mm
Outside Diameter	323.9 mm	Pipe Length	12 m
Pipe Roughness	0.15 mm	Allowable Press.	2780 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	4.5	Total Fittings kf	0
Flow Rate	178 l/s	Velocity	2.62 m/s
Friction Loss	0.61 m	Fitting Losses	1.58 m
Slurry Losses	0.28 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	2.18 m	Total Pressure Drop	31.36 kPa
Entry Total Head	183.79 m	Exit Total Head	181.61 m
Entry Gauge Head	29.79 m	Exit Gauge Head	29.61 m
Reynolds No.	45138.18	Friction Factor	0.023 (Darcy f)

Helix Technologies

Project	Evolution Mt Rawdon	Client	ABC Engineering
Project No.	P	Design Date	23/01/2016
Category	Demo slurry	Atmos. Press	99.52 kPa
Description	ABC Mt Rawdon Tails Line Existing rev01		

Pipe No	14	From node to node	3 - 4
Description		Equipment No	
Slurry Type	Settling Slurry		
Slurry Description	Mt Rawdon Tails	Slurry Reference	
SG Carrier Liquid Sl	1.03	Liquid Viscosity	25 cP
SG of Dry Solids	2.7	SG of Mixture	1.46
Conc. by Mass Cw	48 % w/w	Concentration by Vol	1.46 % v/v
Solids Flow Rate	450.19 tonnes/hr	Particle Size d50	0.08 mm
Grading	Closely Graded		
Durand co-eff. Fl	0.85	Settling Velocity Vl	2.49 m/s
Settling Flow Rate	140.5 l/s		
Pump Wear Factor Pw	0.9	Pump Head Ratio HR	0.95
Pipe Description	Polyethylene PE100 AS4130	Pipe Class	PN12.5
Nominal Diameter	315 mm	Inside Diameter	268 mm
Outside Diameter	315 mm	Pipe Length	100 m
Pipe Roughness	0.007 mm	Allowable Press.	1250 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	178 l/s	Velocity	3.16 m/s
Friction Loss	4 m	Fitting Losses	0 m
Slurry Losses	0.01 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	4 m	Total Pressure Drop	57.4 kPa
Entry Total Head	181.61 m	Exit Total Head	177.61 m
Entry Gauge Head	29.61 m	Exit Gauge Head	25.61 m
Reynolds No.	49517.25	Friction Factor	0.02103 (Darcy f)

Helix Technologies

Project	Evolution Mt Rawdon	Client	ABC Engineering
Project No.	P	Design Date	23/01/2016
Category	Demo slurry	Atmos. Press	99.52 kPa
Description	ABC Mt Rawdon Tails Line Existing rev01		

Pipe No	15	From node to node	4 - 5
Description		Equipment No	
Slurry Type	Settling Slurry		
Slurry Description	Mt Rawdon Tails	Slurry Reference	
SG Carrier Liquid Sl	1.03	Liquid Viscosity	25 cP
SG of Dry Solids	2.7	SG of Mixture	1.46
Conc. by Mass Cw	48 % w/w	Concentration by Vol	1.46 % v/v
Solids Flow Rate	450.19 tonnes/hr	Particle Size d50	0.08 mm
Grading	Closely Graded		
Durand co-eff. Fl	0.85	Settling Velocity Vl	2.49 m/s
Settling Flow Rate	140.5 l/s		
Pump Wear Factor Pw	0.9	Pump Head Ratio HR	0.95
Pipe Description	Polyethylene PE100 AS4130	Pipe Class	PN12.5
Nominal Diameter	315 mm	Inside Diameter	268 mm
Outside Diameter	315 mm	Pipe Length	50 m
Pipe Roughness	0.007 mm	Allowable Press.	1250 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	178 l/s	Velocity	3.16 m/s
Friction Loss	2 m	Fitting Losses	0 m
Slurry Losses	0.01 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	2 m	Total Pressure Drop	28.7 kPa
Entry Total Head	177.61 m	Exit Total Head	175.61 m
Entry Gauge Head	25.61 m	Exit Gauge Head	23.61 m
Reynolds No.	49517.25	Friction Factor	0.02103 (Darcy f)

Helix Technologies

Project	Evolution Mt Rawdon	Client	ABC Engineering
Project No.	P	Design Date	23/01/2016
Category	Demo slurry	Atmos. Press	99.52 kPa
Description	ABC Mt Rawdon Tails Line Existing rev01		

Pipe No	16	From node to node	5 - 6
Description		Equipment No	
Slurry Type	Settling Slurry		
Slurry Description	Mt Rawdon Tails	Slurry Reference	
SG Carrier Liquid Sl	1.03	Liquid Viscosity	25 cP
SG of Dry Solids	2.7	SG of Mixture	1.46
Conc. by Mass Cw	48 % w/w	Concentration by Vol	1.46 % v/v
Solids Flow Rate	450.19 tonnes/hr	Particle Size d50	0.08 mm
Grading	Closely Graded		
Durand co-eff. Fl	0.85	Settling Velocity Vl	2.49 m/s
Settling Flow Rate	140.5 l/s		
Pump Wear Factor Pw	0.9	Pump Head Ratio HR	0.95
Pipe Description	Polyethylene PE100 AS4130	Pipe Class	PN12.5
Nominal Diameter	315 mm	Inside Diameter	268 mm
Outside Diameter	315 mm	Pipe Length	35 m
Pipe Roughness	0.007 mm	Allowable Press.	1250 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	0	Total Fittings kf	0
Flow Rate	178 l/s	Velocity	3.16 m/s
Friction Loss	1.4 m	Fitting Losses	0 m
Slurry Losses	0.01 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	1.4 m	Total Pressure Drop	20.09 kPa
Entry Total Head	175.61 m	Exit Total Head	174.21 m
Entry Gauge Head	23.61 m	Exit Gauge Head	8.21 m
Reynolds No.	49517.25	Friction Factor	0.02103 (Darcy f)

Helix Technologies

Project	Evolution Mt Rawdon	Client	ABC Engineering
Project No.	P	Design Date	23/01/2016
Category	Demo slurry	Atmos. Press	99.52 kPa
Description	ABC Mt Rawdon Tails Line Existing rev01		

Pipe No	17	From node to node	6 - 7
Description		Equipment No	
Slurry Type	Settling Slurry		
Slurry Description	Mt Rawdon Tails	Slurry Reference	
SG Carrier Liquid Sl	1.03	Liquid Viscosity	25 cP
SG of Dry Solids	2.7	SG of Mixture	1.46
Conc. by Mass Cw	48 % w/w	Concentration by Vol	1.46 % v/v
Solids Flow Rate	276.18 tonnes/hr	Particle Size d50	0.08 mm
Grading	Closely Graded		
Durand co-eff. Fl	0.85	Settling Velocity Vl	2.35 m/s
Settling Flow Rate	104.42 l/s		
Pump Wear Factor Pw	0.9	Pump Head Ratio HR	0.95
Pipe Description	Polyethylene PE100 AS4130	Pipe Class	PN12.5
Nominal Diameter	280 mm	Inside Diameter	238 mm
Outside Diameter	280 mm	Pipe Length	200 m
Pipe Roughness	0.003 mm	Allowable Press.	1250 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	2	Total Fittings kf	0
Flow Rate	109.2 l/s	Velocity	2.45 m/s
Friction Loss	6.5 m	Fitting Losses	0.61 m
Slurry Losses	0.61 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	7.11 m	Total Pressure Drop	102.06 kPa
Entry Total Head	174.21 m	Exit Total Head	167.1 m
Entry Gauge Head	8.21 m	Exit Gauge Head	1.1 m
Reynolds No.	34207.16	Friction Factor	0.02281 (Darcy f)

Helix Technologies

Project	Evolution Mt Rawdon	Client	ABC Engineering
Project No.	P	Design Date	23/01/2016
Category	Demo slurry	Atmos. Press	99.52 kPa
Description	ABC Mt Rawdon Tails Line Existing rev01		

Pipe No	18	From node to node	7 - 9
Description		Equipment No	
Slurry Type	Settling Slurry		
Slurry Description	Mt Rawdon Tails	Slurry Reference	
SG Carrier Liquid Sl	1.03	Liquid Viscosity	25 cP
SG of Dry Solids	2.7	SG of Mixture	1.46
Conc. by Mass Cw	48 % w/w	Concentration by Vol	1.46 % v/v
Solids Flow Rate	276.18 tonnes/hr	Particle Size d50	0.08 mm
Grading	Closely Graded		
Durand co-eff. Fl	0.85	Settling Velocity Vl	2.35 m/s
Settling Flow Rate	104.42 l/s		
Pump Wear Factor Pw	0.9	Pump Head Ratio HR	0.95
Pipe Description	Polyethylene PE100 AS4130	Pipe Class	PN12.5
Nominal Diameter	280 mm	Inside Diameter	238 mm
Outside Diameter	280 mm	Pipe Length	1 m
Pipe Roughness	0.003 mm	Allowable Press.	1250 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	2	Total Fittings kf	0
Flow Rate	109.2 l/s	Velocity	2.45 m/s
Friction Loss	0.1 m	Fitting Losses	0.61 m
Slurry Losses	0.07 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.72 m	Total Pressure Drop	10.32 kPa
Entry Total Head	167.1 m	Exit Total Head	166.38 m
Entry Gauge Head	1.1 m	Exit Gauge Head	0.38 m
Reynolds No.	34207.16	Friction Factor	0.02281 (Darcy f)

Helix Technologies

Project	Evolution Mt Rawdon	Client	ABC Engineering
Project No.	P	Design Date	23/01/2016
Category	Demo slurry	Atmos. Press	99.52 kPa
Description	ABC Mt Rawdon Tails Line Existing rev01		

Pipe No	19	From node to node	6 - 8
Description		Equipment No	
Slurry Type	Settling Slurry		
Slurry Description	Mt Rawdon Tails	Slurry Reference	
SG Carrier Liquid Sl	1.03	Liquid Viscosity	25 cP
SG of Dry Solids	2.7	SG of Mixture	1.46
Conc. by Mass Cw	48 % w/w	Concentration by Vol	1.46 % v/v
Solids Flow Rate	174.01 tonnes/hr	Particle Size d50	0.08 mm
Grading	Closely Graded		
Durand co-eff. Fl	0.85	Settling Velocity Vl	2.1 m/s
Settling Flow Rate	60.25 l/s		
Pump Wear Factor Pw	0.9	Pump Head Ratio HR	0.95
Pipe Description	Polyethylene PE100 AS4130	Pipe Class	PN12.5
Nominal Diameter	225 mm	Inside Diameter	191 mm
Outside Diameter	225 mm	Pipe Length	1 m
Pipe Roughness	0.003 mm	Allowable Press.	1250 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	2	Total Fittings kf	0
Flow Rate	68.8 l/s	Velocity	2.4 m/s
Friction Loss	0.08 m	Fitting Losses	0.59 m
Slurry Losses	0.04 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.67 m	Total Pressure Drop	9.62 kPa
Entry Total Head	174.21 m	Exit Total Head	173.54 m
Entry Gauge Head	8.21 m	Exit Gauge Head	10.54 m
Reynolds No.	26855.08	Friction Factor	0.02415 (Darcy f)

Helix Technologies

Project	Evolution Mt Rawdon	Client	ABC Engineering
Project No.	P	Design Date	23/01/2016
Category	Demo slurry	Atmos. Press	99.52 kPa
Description	ABC Mt Rawdon Tails Line Existing rev01		

Pipe No	20	From node to node	8 - 10
Description		Equipment No	
Slurry Type	Settling Slurry		
Slurry Description	Mt Rawdon Tails	Slurry Reference	
SG Carrier Liquid Sl	1.03	Liquid Viscosity	25 cP
SG of Dry Solids	2.7	SG of Mixture	1.46
Conc. by Mass Cw	48 % w/w	Concentration by Vol	1.46 % v/v
Solids Flow Rate	174.01 tonnes/hr	Particle Size d50	0.08 mm
Grading	Closely Graded		
Durand co-eff. Fl	0.85	Settling Velocity Vl	2.1 m/s
Settling Flow Rate	60.25 l/s		
Pump Wear Factor Pw	0.9	Pump Head Ratio HR	0.95
Pipe Description	Polyethylene PE100 AS4130	Pipe Class	PN12.5
Nominal Diameter	225 mm	Inside Diameter	191 mm
Outside Diameter	225 mm	Pipe Length	1 m
Pipe Roughness	0.003 mm	Allowable Press.	1250 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	3	Total Fittings kf	0
Flow Rate	68.8 l/s	Velocity	2.4 m/s
Friction Loss	0.1 m	Fitting Losses	0.88 m
Slurry Losses	0.07 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.99 m	Total Pressure Drop	14.15 kPa
Entry Total Head	173.54 m	Exit Total Head	172.56 m
Entry Gauge Head	10.54 m	Exit Gauge Head	9.56 m
Reynolds No.	26855.08	Friction Factor	0.02415 (Darcy f)

Helix Technologies

Project	Evolution Mt Rawdon	Client	ABC Engineering
Project No.	P	Design Date	23/01/2016
Category	Demo slurry	Atmos. Press	99.52 kPa
Description	ABC Mt Rawdon Tails Line Existing rev01		

Pipe No	23	From node to node	9 - 21
Description		Equipment No	
Slurry Type	Settling Slurry		
Slurry Description	Mt Rawdon Tails	Slurry Reference	
SG Carrier Liquid Sl	1.03	Liquid Viscosity	25 cP
SG of Dry Solids	2.7	SG of Mixture	1.46
Conc. by Mass Cw	48 % w/w	Concentration by Vol	1.46 % v/v
Solids Flow Rate	276.18 tonnes/hr	Particle Size d50	0.08 mm
Grading	Closely Graded		
Durand co-eff. Fl	0.85	Settling Velocity Vl	2.35 m/s
Settling Flow Rate	104.42 l/s		
Pump Wear Factor Pw	0.9	Pump Head Ratio HR	0.95
Pipe Description	Polyethylene PE100 AS4130	Pipe Class	PN12.5
Nominal Diameter	280 mm	Inside Diameter	238 mm
Outside Diameter	280 mm	Pipe Length	1 m
Pipe Roughness	0.003 mm	Allowable Press.	1250 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	1	Total Fittings kf	0
Flow Rate	109.2 l/s	Velocity	2.45 m/s
Friction Loss	0.07 m	Fitting Losses	0.31 m
Slurry Losses	0.04 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.38 m	Total Pressure Drop	5.39 kPa
Entry Total Head	166.38 m	Exit Total Head	166.01 m
Entry Gauge Head	0.38 m	Exit Gauge Head	0.01 m
Reynolds No.	34207.16	Friction Factor	0.02281 (Darcy f)

Helix Technologies

Project	Evolution Mt Rawdon	Client	ABC Engineering
Project No.	P	Design Date	23/01/2016
Category	Demo slurry	Atmos. Press	99.52 kPa
Description	ABC Mt Rawdon Tails Line Existing rev01		

Pipe No	24	From node to node	10 - 22
Description		Equipment No	
Slurry Type	Settling Slurry		
Slurry Description	Mt Rawdon Tails	Slurry Reference	
SG Carrier Liquid Sl	1.03	Liquid Viscosity	25 cP
SG of Dry Solids	2.7	SG of Mixture	1.46
Conc. by Mass Cw	48 % w/w	Concentration by Vol	1.46 % v/v
Solids Flow Rate	174.01 tonnes/hr	Particle Size d50	0.08 mm
Grading	Closely Graded		
Durand co-eff. Fl	0.85	Settling Velocity Vl	2.1 m/s
Settling Flow Rate	60.25 l/s		
Pump Wear Factor Pw	0.9	Pump Head Ratio HR	0.95
Pipe Description	Polyethylene PE100 AS4130	Pipe Class	PN12.5
Nominal Diameter	225 mm	Inside Diameter	191 mm
Outside Diameter	225 mm	Pipe Length	1 m
Pipe Roughness	0.003 mm	Allowable Press.	1250 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	1	Total Fittings kf	0
Flow Rate	68.8 l/s	Velocity	2.4 m/s
Friction Loss	0.06 m	Fitting Losses	0.29 m
Slurry Losses	0.02 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.35 m	Total Pressure Drop	5.08 kPa
Entry Total Head	172.56 m	Exit Total Head	172.2 m
Entry Gauge Head	9.56 m	Exit Gauge Head	11.2 m
Reynolds No.	26855.08	Friction Factor	0.02415 (Darcy f)

Helix Technologies

Project	Evolution Mt Rawdon	Client	ABC Engineering
Project No.	P	Design Date	23/01/2016
Category	Demo slurry	Atmos. Press	99.52 kPa
Description	ABC Mt Rawdon Tails Line Existing rev01		

Pipe No	27	From node to node	26 - 0
Description		Equipment No	
Slurry Type	Settling Slurry		
Slurry Description	Mt Rawdon Tails	Slurry Reference	
SG Carrier Liquid Sl	1.03	Liquid Viscosity	25 cP
SG of Dry Solids	2.7	SG of Mixture	1.46
Conc. by Mass Cw	48 % w/w	Concentration by Vol	1.46 % v/v
Solids Flow Rate	225.08 tonnes/hr	Particle Size d50	0.08 mm
Grading	Closely Graded		
Durand co-eff. Fl	0.85	Settling Velocity Vl	2.15 m/s
Settling Flow Rate	67.6 l/s		
Pump Wear Factor Pw	0.9	Pump Head Ratio HR	0.95
Pipe Description	Polyethylene PE100 AS4130	Pipe Class	PN12.5
Nominal Diameter	200 mm	Inside Diameter	200 mm
Outside Diameter	220 mm	Pipe Length	5 m
Pipe Roughness	0.007 mm	Allowable Press.	1250 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	1	Total Fittings kf	0
Flow Rate	89 l/s	Velocity	2.83 m/s
Friction Loss	0.24 m	Fitting Losses	0.41 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.64 m	Total Pressure Drop	9.26 kPa
Entry Total Head	154 m	Exit Total Head	153.36 m
Entry Gauge Head	0 m	Exit Gauge Head	1.36 m
Reynolds No.	33174.91	Friction Factor	0.02304 (Darcy f)

Helix Technologies

Project	Evolution Mt Rawdon	Client	ABC Engineering
Project No.	P	Design Date	23/01/2016
Category	Demo slurry	Atmos. Press	99.52 kPa
Description	ABC Mt Rawdon Tails Line Existing rev01		

Pipe No	28	From node to node	25 - 1
Description		Equipment No	
Slurry Type	Settling Slurry		
Slurry Description	Mt Rawdon Tails	Slurry Reference	
SG Carrier Liquid Sl	1.03	Liquid Viscosity	25 cP
SG of Dry Solids	2.7	SG of Mixture	1.46
Conc. by Mass Cw	48 % w/w	Concentration by Vol	1.46 % v/v
Solids Flow Rate	225.11 tonnes/hr	Particle Size d50	0.08 mm
Grading	Closely Graded		
Durand co-eff. Fl	0.85	Settling Velocity Vl	2.15 m/s
Settling Flow Rate	67.6 l/s		
Pump Wear Factor Pw	0.9	Pump Head Ratio HR	0.95
Pipe Description	Polyethylene PE100 AS4130	Pipe Class	PN12.5
Nominal Diameter	200 mm	Inside Diameter	200 mm
Outside Diameter	220 mm	Pipe Length	5 m
Pipe Roughness	0.007 mm	Allowable Press.	1250 kPa
Orifice Plate Dia	-	Non Return Valve	No
Total Fittings k	1	Total Fittings kf	0
Flow Rate	89 l/s	Velocity	2.83 m/s
Friction Loss	0.24 m	Fitting Losses	0.41 m
Slurry Losses	0 m	Orifice Losses	0 m
Fixed Head Loss	0 m	Booster Pump Head	0 m
Total Head Loss	0.65 m	Total Pressure Drop	9.26 kPa
Entry Total Head	154 m	Exit Total Head	153.35 m
Entry Gauge Head	0 m	Exit Gauge Head	1.35 m
Reynolds No.	33178.27	Friction Factor	0.02304 (Darcy f)

Helix Technologies

Project	Evolution Mt Rawdon	Client	ABC Engineering
Project No.	P	Design Date	23/01/2016
Category	Demo slurry	Atmos. Press	99.52 kPa
Description	ABC Mt Rawdon Tails Line Existing rev01		

Node No	0	Node Type	Pump
Description	Warman Pump 10/8 F-AH	Equipment No	30-PP-25
Rel. Level (RL)	152 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	-
Int.(Gauge) Head	-	Int.(Gauge) Pressure	-
Total Node Head	184.36 m		
Pump Head	31 m	Pump Flow Rate	89 l/s
Pump / Fan Efficiency	70 %	Pump Absorbed Power	56.58 kW
Casing Pressure	464.48 kPa		
Pump NPSH required	0 m	Pump NPSH available	8.18 m

Helix Technologies

Project	Evolution Mt Rawdon	Client	ABC Engineering
Project No.	P	Design Date	23/01/2016
Category	Demo slurry	Atmos. Press	99.52 kPa
Description	ABC Mt Rawdon Tails Line Existing rev01		

Node No	1	Node Type	Pump
Description	Warman Pump 10/8 F-AH	Equipment No	30-PP-24
Rel. Level (RL)	152 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	-
Int.(Gauge) Head	-	Int.(Gauge) Pressure	-
Total Node Head	184.35 m		
Pump Head	31 m	Pump Flow Rate	89 l/s
Pump / Fan Efficiency	72 %	Pump Absorbed Power	55.01 kW
Casing Pressure	464.48 kPa		
Pump NPSH required	0 m	Pump NPSH available	8.18 m

Helix Technologies

Project	Evolution Mt Rawdon	Client	ABC Engineering
Project No.	P	Design Date	23/01/2016
Category	Demo slurry	Atmos. Press	99.52 kPa
Description	ABC Mt Rawdon Tails Line Existing rev01		

Node No	2	Node Type	Junction
Description		Equipment No	
Rel. Level (RL)	154 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	0 l/s
Int.(Gauge) Head	29.79 m	Int.(Gauge) Pressure	427.69 kPa
Total Node Head	183.79 m		

Helix Technologies

Project	Evolution Mt Rawdon	Client	ABC Engineering
Project No.	P	Design Date	23/01/2016
Category	Demo slurry	Atmos. Press	99.52 kPa
Description	ABC Mt Rawdon Tails Line Existing rev01		

Node No	3	Node Type	Junction
Description		Equipment No	
Rel. Level (RL)	152 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	0 l/s
Int.(Gauge) Head	29.61 m	Int.(Gauge) Pressure	425.04 kPa
Total Node Head	181.61 m		

Helix Technologies

Project	Evolution Mt Rawdon	Client	ABC Engineering
Project No.	P	Design Date	23/01/2016
Category	Demo slurry	Atmos. Press	99.52 kPa
Description	ABC Mt Rawdon Tails Line Existing rev01		

Node No	4	Node Type	Junction
Description		Equipment No	
Rel. Level (RL)	152 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	0 l/s
Int.(Gauge) Head	25.61 m	Int.(Gauge) Pressure	367.64 kPa
Total Node Head	177.61 m		

Helix Technologies

Project	Evolution Mt Rawdon	Client	ABC Engineering
Project No.	P	Design Date	23/01/2016
Category	Demo slurry	Atmos. Press	99.52 kPa
Description	ABC Mt Rawdon Tails Line Existing rev01		

Node No	5	Node Type	Junction
Description		Equipment No	
Rel. Level (RL)	152 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	0 l/s
Int.(Gauge) Head	23.61 m	Int.(Gauge) Pressure	338.94 kPa
Total Node Head	175.61 m		

Helix Technologies

Project	Evolution Mt Rawdon	Client	ABC Engineering
Project No.	P	Design Date	23/01/2016
Category	Demo slurry	Atmos. Press	99.52 kPa
Description	ABC Mt Rawdon Tails Line Existing rev01		

Node No	6	Node Type	Junction
Description	Y piece	Equipment No	
Rel. Level (RL)	166 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	0 l/s
Int.(Gauge) Head	8.21 m	Int.(Gauge) Pressure	117.87 kPa
Total Node Head	174.21 m		

Helix Technologies

Project	Evolution Mt Rawdon	Client	ABC Engineering
Project No.	P	Design Date	23/01/2016
Category	Demo slurry	Atmos. Press	99.52 kPa
Description	ABC Mt Rawdon Tails Line Existing rev01		

Node No	7	Node Type	Junction
Description		Equipment No	
Rel. Level (RL)	166 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	0 l/s
Int.(Gauge) Head	1.1 m	Int.(Gauge) Pressure	15.81 kPa
Total Node Head	167.1 m		

Helix Technologies

Project	Evolution Mt Rawdon	Client	ABC Engineering
Project No.	P	Design Date	23/01/2016
Category	Demo slurry	Atmos. Press	99.52 kPa
Description	ABC Mt Rawdon Tails Line Existing rev01		

Node No	8	Node Type	Junction
Description		Equipment No	
Rel. Level (RL)	163 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	0 l/s
Int.(Gauge) Head	10.54 m	Int.(Gauge) Pressure	151.32 kPa
Total Node Head	173.54 m		

Helix Technologies

Project	Evolution Mt Rawdon	Client	ABC Engineering
Project No.	P	Design Date	23/01/2016
Category	Demo slurry	Atmos. Press	99.52 kPa
Description	ABC Mt Rawdon Tails Line Existing rev01		

Node No	9	Node Type	Junction
Description		Equipment No	
Rel. Level (RL)	166 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	0 l/s
Int.(Gauge) Head	0.38 m	Int.(Gauge) Pressure	5.5 kPa
Total Node Head	166.38 m		

Helix Technologies

Project	Evolution Mt Rawdon	Client	ABC Engineering
Project No.	P	Design Date	23/01/2016
Category	Demo slurry	Atmos. Press	99.52 kPa
Description	ABC Mt Rawdon Tails Line Existing rev01		

Node No	10	Node Type	Junction
Description		Equipment No	
Rel. Level (RL)	163 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	0 l/s
Int.(Gauge) Head	9.56 m	Int.(Gauge) Pressure	137.17 kPa
Total Node Head	172.56 m		

Helix Technologies

Project	Evolution Mt Rawdon	Client	ABC Engineering
Project No.	P	Design Date	23/01/2016
Category	Demo slurry	Atmos. Press	99.52 kPa
Description	ABC Mt Rawdon Tails Line Existing rev01		

Node No	21	Node Type	Nozzle
Description	South Discharge	Equipment No	
Rel. Level (RL)	166 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-109.2 l/s
Int.(Gauge) Head	0.01 m	Int.(Gauge) Pressure	0.11 kPa
Total Node Head	166.01 m		

Helix Technologies

Project	Evolution Mt Rawdon	Client	ABC Engineering
Project No.	P	Design Date	23/01/2016
Category	Demo slurry	Atmos. Press	99.52 kPa
Description	ABC Mt Rawdon Tails Line Existing rev01		

Node No	22	Node Type	Nozzle
Description	North Discharge	Equipment No	
Rel. Level (RL)	161 m	Pressure Input	0 kPa
Nozzle K value	0	Ext Flow (+In/-Out)	-68.8 l/s
Int.(Gauge) Head	11.2 m	Int.(Gauge) Pressure	160.8 kPa
Total Node Head	172.2 m		

Helix Technologies

Project	Evolution Mt Rawdon	Client	ABC Engineering
Project No.	P	Design Date	23/01/2016
Category	Demo slurry	Atmos. Press	99.52 kPa
Description	ABC Mt Rawdon Tails Line Existing rev01		

Node No	25	Node Type	Tank
Description		Equipment No	
Rel. Level (RL)	154 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	-
Int.(Gauge) Head	-	Int.(Gauge) Pressure	-
Total Node Head	154 m		

Helix Technologies

Project	Evolution Mt Rawdon	Client	ABC Engineering
Project No.	P	Design Date	23/01/2016
Category	Demo slurry	Atmos. Press	99.52 kPa
Description	ABC Mt Rawdon Tails Line Existing rev01		

Node No	26	Node Type	Tank
Description		Equipment No	
Rel. Level (RL)	154 m	Pressure Input	0 kPa
Nozzle K value	-	Ext Flow (+In/-Out)	-
Int.(Gauge) Head	-	Int.(Gauge) Pressure	-
Total Node Head	154 m		