

# PetroChad (Mangara) Limited

## A GLENCORE Company

### Vendor Document Cover Sheet

<b>Vendor Name:</b>	Alderley
<b>Purchase Order Title:</b>	Mangara Produced Water Treatment Upgrade
<b>Equipment / Tag Number:</b>	DOB-MAN-Z-4010
<b>Vendor Document No:</b>	29647W-00-E-0917-02

#### Vendor Issue Record

Rev	Date	Issue Status	Originator	Verifier	Approver
05	17/10/2019	Issued for review	CD	AT	MA
04	05/09/2019	Issued for review	CD	AT	MA
03	08/08/2019	Issued for review	CD	MG	AT
02	11/07/2019	Issued for review	CD	MG	MA
01	19/06/2019	First Issue	CD	MG	MA

#### Document Title

Instrument Data Sheet (Control Valve)

#### Glencore Document Details

Document Number	P3048	PO	416441	TCD	MAN	E09	0002
	PROJECT	PO NUMBER		COUNTRY	ASSET-BLOCK	DOCUMENT TYPE	SEQUENCE
Issue Status	Issued for review				Revision	04	
					Revision Date	17/10/2019	

#### Vendor Document Review

Purchaser's review of Vendor's documents does not relieve Vendor of the responsibility for correctness under the Purchase Order. Permission to proceed does not constitute acceptance of design, detail and calculations, test methods or materials developed or selected by the Vendor and does not relieve the Vendor from full compliance with the Purchase Order or any other obligations, nor detract from any of the Purchaser's rights.

Code	1	2	3	4
<b>Name</b>	Chris Hicks			
<b>Signature</b>				
<b>Date</b>	04/Nov/19			

Code 1	Reviewed with No comments (approved)
Code 2	Reviewed with Comments (revise and re-submit, work may proceed subject to incorporation of changes indicated)
Code 3	Revise and re-submit (work may NOT proceed)
Code 4	Not Reviewed (for information only)

#### IMPORTANT

Should the Vendor consider that any comments made by the Purchaser change the Scope of Supply, the Vendor shall advise the price and delivery implications of such changes within five working days of receipt. The Vendor must not incorporate such changes without prior approval of the Purchaser of the revised price and/or delivery period. RETROSPECTIVE CLAIMS WILL NOT BE CONSIDERED.

The document consists of this front sheet plus 2 pages.

## Control Valve Datasheet



<b>Package no.</b>	<b>Doc No.</b> 29647W-00-E-0917-02	<b>Rev.</b> 05
Tag no.	LV-40111	Location/Module
Unit	Level Control Valve	No. req'd
Service	Produced Water Treatment	Project no.
Size & type	1.5" NB Level Control Valve	P.O. no.
Supplier	Alderley Systems Limited	P&ID no.
Manufacturer	Severn Glocon Limited	Line no.

		FLUID: Produced Water / Liquid				CRITICAL PRESSURE: 221 bar(a)				
		UNITS	CASE 1	CASE 2	CASE 3	CASE 4	CASE 5	CASE 6	SHUT-OFF	
1	<b>PROCESS DATA</b>	FLOW RATE	USBPD	1,555.0	1,555.0	250.0	250.0			
2		INLET PRESSURE	bar(g)	0.80	0.80	0.80	0.80		10	
3		OUTLET PRESSURE	bar(g)	0.30	0.30	0.30	0.30			
4		INLET TEMPERATURE	°C	60	60	60	60			
5		SP. GRAVITY		0.996	1.006	0.996	1.006			
6		VAPOUR PRESSURE	bar(a)	0.20	0.20	0.20	0.20			
7		VISCOSITY	Cp	0.59	0.65	0.59	0.65			
8		2 PHASE VAP. MW		-	-	-	-			
9		2 PHASE MIX IN / OUT	% by wt	/	/	/	/			
10		CALCULATED	Cv	17.04	17.13	2.74	2.75			
11		PERCENTAGE OPEN	%	73	73	28	28			
12		SPL AT 1 METRE	dBA	<75	<75	<75	<75			
13		INLET VELOCITY	m/s	2.5	2.5	0.4	0.4			
14		OUTLET VELOCITY	m/s	2.5	2.5	0.4	0.4			
15										
16	<b>PIPE</b>	IN PIPE SIZE / SCH	2 in/Sch 80 (see note <b>N14</b> )		ACTUATOR TYPE		Pneumatic Cylinder		45	
17		OUT PIPE SIZE / SCH	2 in/Sch 80 (see note <b>N14</b> )		ACTUATOR MODEL / STROKE		P2BN 1.5"		46	
18		INSULATION	N/A		SIZE / SPRING		B / STD		47	
19		DESIGN PRESSURE	10 bar(g)		FAIL ACTION		Modulating AFC		48	
20		DESIGN TMP. MIN/MAX	0°C / 100°C		AIR SUPPLY / SET AT / MIN		1,000 / 450 / 450 kPag		49	
21	<b>BODY</b>	VALVE MODEL NO.	5412		ACT. ORIENTATION		Vertical		50	
22		SIZE / CLASS	1.5 ins / ASME 300		HANDWHEEL		None		51	
23		BODY STYLE	Globe		TRAVEL STOPS		None		52	
24		BODY MATERIAL	CS ASTM A216 WCB		TUBING		Imperial 316L SS (Min 2.5% moly & Max hardness RB-90) 1/4" OD x 0.035" wt		53	
25		END CONNECTIONS	Integral Flange as Body		FITTINGS		Swagelok 316L SS, double compression		54	
26	END FINISH / PREP.	RF(125-250 AARH)3.2-6.3um		OPEN / CLOSE / TRIP TIME		<5s / <5s / -		55		
27	BODY F/F DIMS.	235mm		POSITIONER MANF / MODEL		See note <b>N4</b> .		56		
28	BONNET TYPE	Standard		SIGNAL ACTION		4mA=close / 20mA=open		57		
29	BONNET MATERIAL	As Valve Body		AIRSET MANF / MODEL		See note <b>N6</b> .		58		
30	EXTENSION DIMS.	N/A		L. SWITCH / P. TRANS TYPE		None		59		
31	BODY/BONNET NDE 1	See note <b>N1</b> .		L. SWITCH / P. TRANS POS'N		N/A		60		
32	BODY/BONNET NDE 2	N/A		BOOSTERS		None		61		
33	BONNET BOLTING	See note <b>N3</b> .		PILOT VALVES		None		62		
34	GASKET MATERIAL	Spiral Wound 316L/Graph.		AIRLOCK VALVE		None		63		
35	GLAND PACKING	PTFE Chevrons (Teflon)		IP CONV'TR MANF/MODEL		None		64		
36	SEAT SIZE INS / TYPE	1.375	Cage 1CC		SOLENOID MODEL		None		65	
37	CV / CHARACTERISTIC	25	Equal Percent		SOLENOID ACTION		N/A		66	
38	BALANCING	Unbalanced		AIR RECEIVER		None		67		
39	FLOW DIRECTION	Over		TESTING		See note <b>N5 + N15</b> .		68		
40	TRIM MATERIAL	316 SS / Stellite FC		CE CERTIFICATION		See note <b>N8</b> .		69		
41	SOFT SEAT	None		CLEANING		Standard		70		
42	SEAT LEAKAGE	ANSI Class IV		PAINT FINISH		See note <b>N9</b> .		71		
43	BELLOWS MATERIAL	None		PARTS CERTIFICATION		See note <b>N10</b> .		72		
44				BAFFLES		None		73		
		<b>Notes</b>				<b>Revisions</b>				
74	<b>N1</b>	NDE to be in accordance with Document No. PCM-TCD-GEN-PI				<b>Rev</b>	<b>By</b>	<b>Chk</b>	<b>App</b>	<b>Date</b>
75		-SPC-0001 Rev U03 Clause 2.5.				01	CD	MG	MA	19/06/2019
76	<b>N3</b>	A193Gr B7M Bolt/A194Gr 2HM Nut C/Steel NACE -55 to +1000 deg F, Hot Dip Galvanise to ASTM A153.				02	CD	MG	MA	11/07/2019
77						03	CD	MG	AT	08/08/2019
78	<b>N4</b>	Metso Positioner ND9200, 4-20mA + HART, ATEX Ex d Zone 1 IIB T3, Anodised Aluminium Alloy Enclosure, IP65.				04	CD	AT	MA	05/09/2019
79						05	CD		MA	10/17/2019
80	<b>N5</b>	Valve requires Hysteresis (±0.5%)/Linearity (±0.5%)/Deadband, repeatability required ±0.25%								
81										
82	<b>N6</b>	Valve to be supplied with ControlAir 350-BC-F filter pressure regulator + output pressure gauge.								
83										
84	<b>N8</b>	PED N/A + ATEX								
85	<b>N9</b>	Painting to be in accordance with PCM-TCD-GEN-MC-SPC-0001 Rev U01 System 1.								
86										
87	<b>N10</b>	3.1 Material Certs for pressure retaining parts.								
88		Electrical Connection M20 x 1.5								
89		Pneumatic Connection 1/2" NPT								
90	<b>N11</b>	Actuator Moc = Carbon Steel Enclosure, top plate, yoke & base plate.								
91	<b>N12</b>	Mechanical valve stem position indicator required.								
92	<b>N13</b>	Pressure gauge displaying positioner output to the actuator required.								
93	<b>N14</b>	Inlet / Outlet piping reduced down to meet the valve body size.								
94	<b>N15</b>	Testing to be carried out in accordance with Document No. GLN-CRP -GEN-IC-SPC-0001 Rev U02 Section 15.2.17.								
95										
96	<b>N16</b>	No India or China originated material to be used for major valve components.								
97										
98	<b>N17</b>	Body Corrosion Allowance = 3mm								

## Control Valve Datasheet



<b>Package no.</b>	<b>Doc No.</b> 29647W-00-E-0917-02	<b>Rev.</b> 05
Tag no.	PV-40118	Location/Module
Unit	Pressure Control Valve	No. req'd
Service	Produced Water Treatment	Project no.
Size & type	1" NB Pressure Control Valve	P.O. no.
Supplier	Alderley Systems Limited	P&ID no.
Manufacturer	Severn Glocon Limited	Line no.

		FLUID: Hydrocarbon Gas / Gas		CRITICAL PRESSURE: 46 bar(a)					
		UNITS	CASE 1	CASE 2	CASE 3	CASE 4	CASE 5	CASE 6	SHUT-OFF
1	<b>PROCESS DATA</b>	FLOW RATE	scfh	636.0	102.3				
2		INLET PRESSURE	bar(g)	0.80	0.80				10
3		OUTLET PRESSURE	bar(g)	0.05	0.05				
4		INLET TEMPERATURE	°C	60	60				
5		MOL. WEIGHT	kg/kmol	24.40	24.40				
6		SP. HEAT RATIO		1.27	1.27				
7		COMPRESSIBILITY		1.00	1.00				
8		2 PHASE VAP. MW		-	-				
9		2 PHASE MIX IN / OUT	% by wt	/	/				
10		CALCULATED	Cv	0.77	0.12				
11		PERCENTAGE OPEN	%	69	27				
12		SPL AT 1 METRE	dBA	<75	<75				
13		INLET VELOCITY	m/s	6.4	1.0				
14		OUTLET VELOCITY	mach	0.030	0.005				
15									
16	<b>PIPE</b>	IN PIPE SIZE / SCH	2 in/Sch 80 (see note <b>N14</b> )		ACTUATOR TYPE	Pneumatic Cylinder			45
17		OUT PIPE SIZE / SCH	2 in/Sch 80 (see note <b>N14</b> )		ACTUATOR MODEL / STROKE	P1AN	0.75"		46
18		INSULATION	N/A		SIZE / SPRING	A / LIT			47
19		DESIGN PRESSURE	10 bar(g)		FAIL ACTION	Modulating AFO			48
20		DESIGN TMP. MIN/MAX	0°C / 100°C		AIR SUPPLY / SET AT / MIN	1,000 / 450 / 450 kPag			49
21	<b>BODY</b>	VALVE MODEL NO.	5412		ACT. ORIENTATION	Vertical			50
22		SIZE / CLASS	1 ins / ASME 300		HANDWHEEL	None			51
23		BODY STYLE	Globe		TRAVEL STOPS	None			52
24		BODY MATERIAL	CS ASTM A216 WCB		TUBING	Imperial 316L SS (Min 2.5% moly & Max hardness RB-90) 1/4" OD x 0.035" wt			53
25		END CONNECTIONS	Integral Flange as Body		FITTINGS	Swagelok 316L SS, double compression			54
26	END FINISH / PREP.	RF(125-250 AARH)3.2-6.3um		OPEN / CLOSE / TRIP TIME	<2s / <2s / -			55	
27	BODY F/F DIMS.	197mm		POSITIONER MANF / MODEL	See note <b>N4</b> .			56	
28	<b>BONNET</b>	BONNET TYPE	Standard		SIGNAL ACTION	4mA=open / 20mA=close			57
29		BONNET MATERIAL	As Valve Body		AIRSET MANF / MODEL	See note <b>N6</b> .			58
30		EXTENSION DIMS.	N/A		L. SWITCH / P. TRANS TYPE	None			59
31		BODY/BONNET NDE 1	See note <b>N1</b> .		L. SWITCH / P. TRANS POS'N	N/A			60
32		BODY/BONNET NDE 2	N/A		BOOSTERS	None			61
33		BONNET BOLTING	See note <b>N3</b> .		PILOT VALVES	None			62
34		GASKET MATERIAL	Spiral Wound 316L/Graph.		AIRLOCK VALVE	None			63
35	GLAND PACKING	PTFE Chevrons (Teflon)		IP CONV'TR MANF/MODEL	None			64	
36	<b>TRIM</b>	SEAT SIZE INS / TYPE	0.625	Microspline	SOLENOID MODEL	None			65
37		CV / CHARACTERISTIC	1.45	Parabolic	SOLENOID ACTION	N/A			66
38		BALANCING	Unbalanced		AIR RECEIVER	None			67
39		FLOW DIRECTION	Over		TESTING	See note <b>N5 + N15</b> .			68
40		TRIM MATERIAL	316 SS / Stellite FC		CE CERTIFICATION	See note <b>N8</b> .			69
41		SOFT SEAT	None		CLEANING	Standard			70
42		SEAT LEAKAGE	ANSI Class IV		PAINT FINISH	See note <b>N9</b> .			71
43	<b>MISC</b>	BELLOWS MATERIAL	None		PARTS CERTIFICATION	See note <b>N10</b> .			72
44					BAFFLES	None			73
<b>Notes</b>					<b>Revisions</b>				
74	<b>N1</b>	NDE to be in accordance with Document No. PCM-TCD-GEN-PI			<b>Rev</b>	<b>By</b>	<b>Chk</b>	<b>App</b>	<b>Date</b>
75		-SPC-0001 Rev U03 Clause 2.5.			01	CD	MG	MA	19/06/2019
76	<b>N3</b>	A193Gr B7M Bolt/A194Gr 2HM Nut C/Steel NACE -55 to +1000 deg F,			02	CD	MG	MA	11/07/2019
77		Hot Dip Galvanise to ASTM A153.			03	CD	MG	AT	08/08/2019
78	<b>N4</b>	Metso Positioner ND9200, 4-20mA + HART, ATEX Ex d Zone 1 IIB T3,			04	CD	AT	MA	05/09/2019
79		Anodised Aluminium Alloy Enclosure, IP65.			05	CD		MA	10/17/2019
80	<b>N5</b>	Valve requires Hysteresis (±0.5%)/Linearity (±0.5%)/Deadband,							
81		repeatability required ±0.25%							
82	<b>N6</b>	Valve to be supplied with ControlAir 350-BC-F filter pressure							
83		regulator + output pressure gauge.							
84	<b>N8</b>	PED N/A + ATEX							
85	<b>N9</b>	Painting to be in accordance with PCM-TCD-GEN-MC-SPC-0001							
86		Rev U01 System 1.							
87	<b>N10</b>	3.1 Material Certs for pressure retaining parts.							
88		Electrical Connection M20 x 1.5							
89		Pneumatic Connection 1/2" NPT							
90	<b>N11</b>	Actuator Moc = Carbon Steel Enclosure, top plate, yoke & base plate.							
91	<b>N12</b>	Mechanical valve stem position indicator required.							
92	<b>N13</b>	Pressure gauge displaying positioner output to the actuator required.							
93	<b>N14</b>	Inlet / Outlet piping reduced down to meet the valve body size.							
94	<b>N15</b>	Testing to be carried out in accordance with Document No. GLN-CRP							
95		-GEN-IC-SPC-0001 Rev U02 Section 15.2.17.							
96	<b>N16</b>	No India or China originated material to be used for major valve							
97		components.							
98	<b>N17</b>	Body Corrosion Allowance = 3mm							