NOTES:
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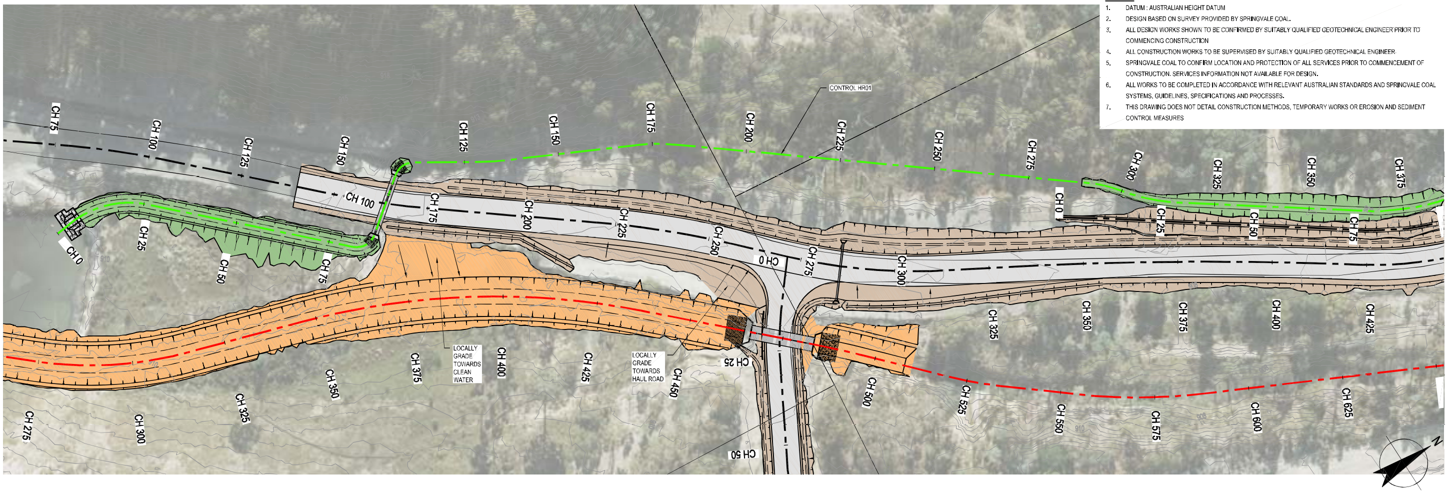
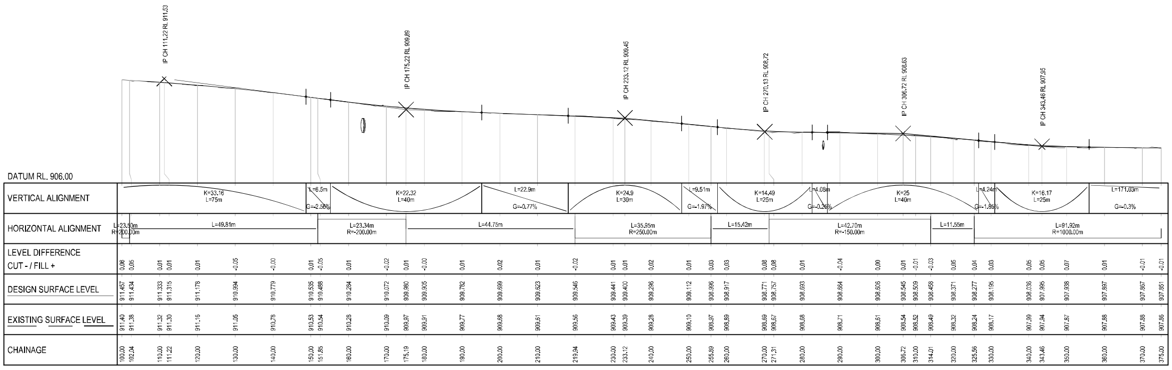
7. THIS DRAWING DOES NOT DETAIL CONSTRUCTION METHODS, TEMPORARY WORKS OR EROSION AND SEDIMENT CONTROL MEASURES





LONGITUDINAL SECTION - CONTROL HR01
SCALE 1:500H 1:100V

VERTICAL 1:100 AT ORIGINAL SIZE
HORIZONTAL 1:500 AT ORIGINAL SIZE

No	Revision	Drawn	Job Manager	Project Director	Date
B	DRAWING UPDATED	M.C.	D.G.	B.B.	24.11.16
A	PRELIMINARY DESIGN	M.C.	D.G.	B.B.	25.10.16

Note: * indicates signatures on original issue of drawing or last revision of drawing

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Drafting Check D.GREEN | Design Check B. BATCHELDER
Approved (Project Director)
Date
Scale AS SHOWN
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Client SPRINGVALE COAL -
Project DIRTY AND CLEAN WATER SEPARATION PLANS
Title HAUL ROAD HR01
PLAN AND LONGITUDINAL SECTION SHEET 1
Original Size A1 Drawing No: 21-24377-C330 Rev: B

Plot Date: 30 January 2017 - 4:37 PM Plotted by: Trish Etchells Cad File No: N:\AU\Newcastle\Projects\22\18584\Tech\responses\E-Transmit DWGs\E-Transmit DWGs\21-24377-C330 ROAD LSECT.dwg

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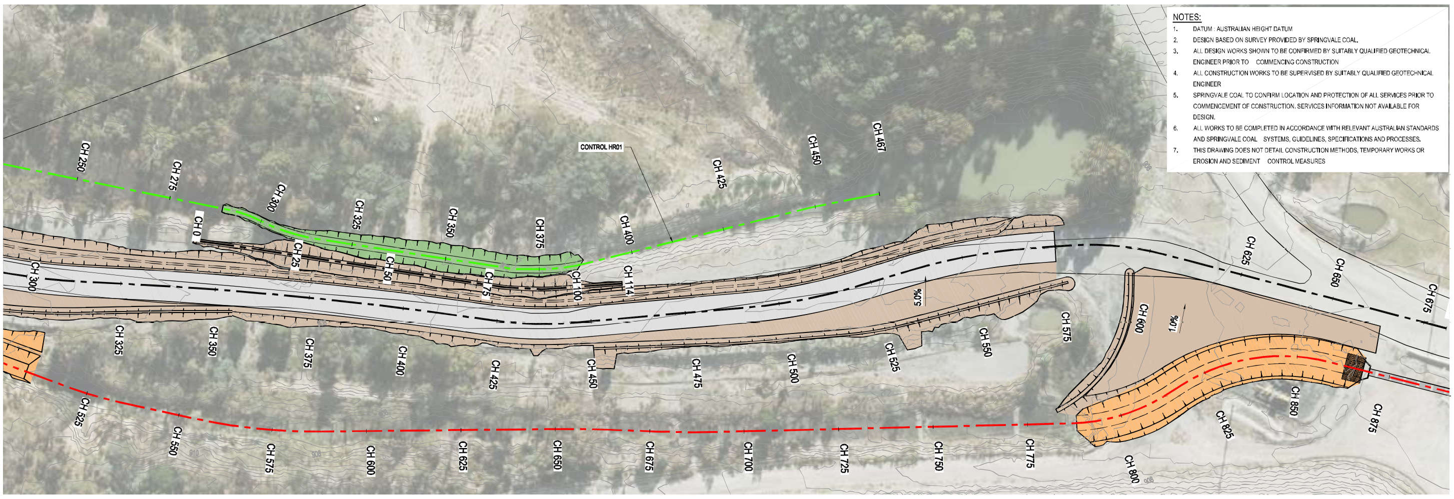

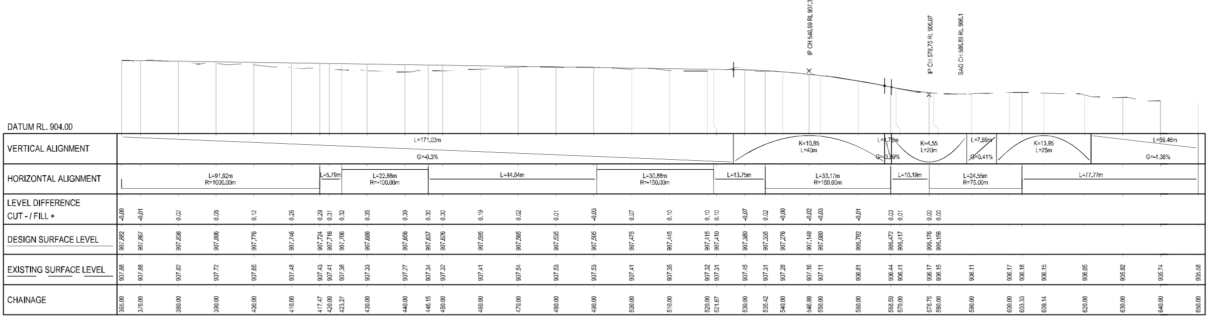

LONGITUDINAL SECTION - CONTROL HR01
SCALE 1:500H 1:100V

VERTICAL 1:100 AT ORIGINAL SIZE
HORIZONTAL 1:500 AT ORIGINAL SIZE

No	Revision	Drawn	Job Manager	Project Director	Date
A	PRELIMINARY DESIGN	M.C.	D.G.	B.B.	25.10.16

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Drafting Check D.GREEN | Design Check B. BATCHELDER
Approved (Project Director)
Date
Scale AS SHOWN
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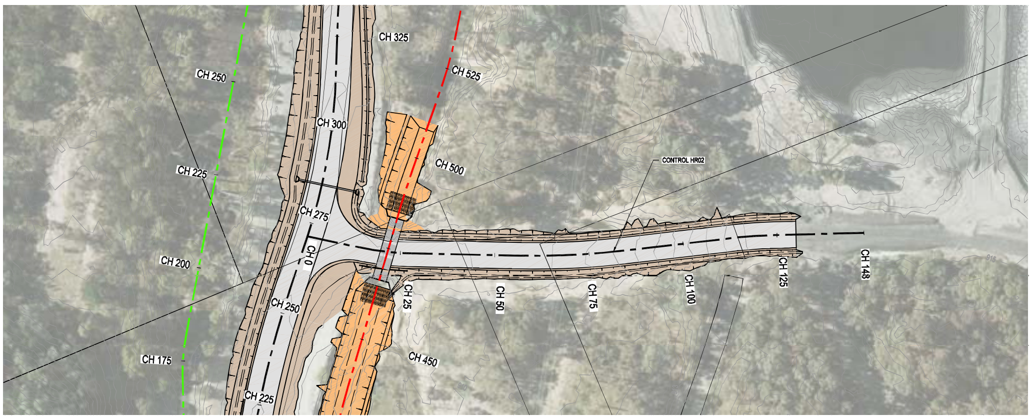
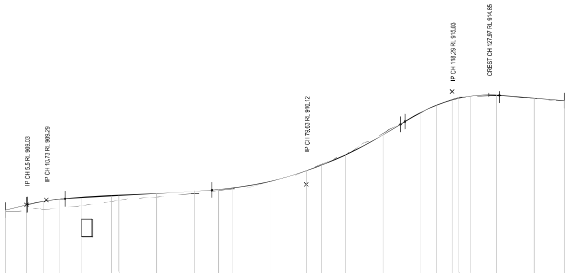
Client SPRINGVALE COAL -
Project DIRTY AND CLEAN WATER SEPARATION PLANS
Title HAUL ROAD HR01
PLAN AND LONGITUDINAL SECTION SHEET 2
Original Size A1 Drawing No: 21-24377-C331 Rev: A

Plot Date: 30 January 2017 - 4:37 PM Plotted by: Trish Etchells Cad File No: N:\AU\Newcastle\Projects\22\18584\Tech\responses\E-Transmit DWGs\E-Transmit DWGs\21-24377-C330 ROAD LSECT.dwg



0 5 10 15 20 25m
SCALE 1:500 AT ORIGINAL SIZE



DATUM RL. 905.00

VERTICAL ALIGNMENT	L=5.5m G=4.96%	L=0.23m G=4.95%	K=2.67 L=10m		L=38.89m G=1.2%						K=4.35 L=50m						L=1.16m G=2.7%		K=1.75 L=25m					L=17.24m G=-1.61%		
HORIZONTAL ALIGNMENT	L=14.15m				L=13.87m R=-75.00m			L=28.39m			L=27.19m R=-200.00m				L=30.57m				L=8.93m R=100.00m					L=24.91m		
LEVEL DIFFERENCE CUT - / FILL +	0.08	0.31	0.45	0.46	0.42	0.29	0.25	0.19	0.13	0.05	0.04	0.01	-0.01	-0.04	-0.04	-0.08	0.04	-0.03	-0.03	-0.04	0.03	0.03	0.02	0.01		
DESIGN SURFACE LEVEL	908.757	909.030	909.218	909.325	909.400	909.496	909.520	909.640	909.760	909.841	909.913	910.272	910.834	911.129	911.679	912.728	913.922	914.303	914.578	914.665	914.779	914.835	914.676	914.547		
EXISTING SURFACE LEVEL	908.67	908.72	908.77	908.87	908.98	909.21	909.27	909.44	909.63	909.79	909.87	910.26	910.85	911.17	911.72	912.81	913.88	914.33	914.61	914.71	914.75	914.81	914.66	914.54		
CHAINAGE	0.00	5.50	10.00	14.15	20.00	28.03	30.00	40.00	50.00	56.42	60.00	70.00	79.63	83.61	90.00	100.00	110.00	114.18	118.29	120.00	123.12	130.00	140.00	148.03		

LONGITUDINAL SECTION - CONTROL HR02
SCALE 1:500H 1:100V

NOTES:
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VERTICAL 1:100 AT ORIGINAL SIZE 0 1 2 3 4 5m
HORIZONTAL 1:500 AT ORIGINAL SIZE 0 5 10 15 20 25m

No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Job Manager	Project Director	Date
A	PRELIMINARY DESIGN		M.C.	D.G.	B.B.	25.10.16

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Drafting Check D.GREEN | Design Check B. BATCHELDER
Approved (Project Director)
Date
Scale AS SHOWN
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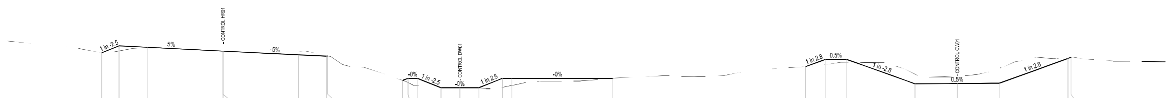
Client SPRINGVALE COAL -
Project DIRTY AND CLEAN WATER SEPARATION PLANS
Title ACCESS ROAD HR02
PLAN AND LONGITUDINAL SECTION
Original Size A1 Drawing No: 21-24377-C332 Rev: A

Plot Date: 30 January 2017 - 4:37 PM Plotted by: Trish Elchelb Cad File No: N:\AU\Newcastle\Projects\22\18884\Tech\response\...\21-24377-C332 ROAD LSECT.dwg



DATUM R.L. 908.00

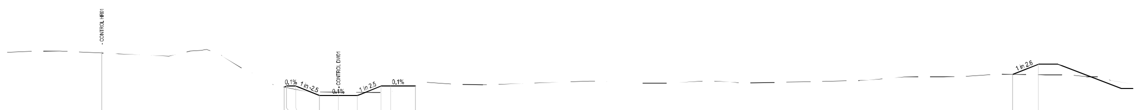
DESIGN SURFACE LEVEL	910.887	911.054	910.879	910.779	910.779	910.579	910.504	910.528	909.232	909.347	909.347	908.847	908.847	908.847	909.347	909.347	909.347	909.96	910.339	910.344	909.661	909.071	909.662	910.399	910.404			
DEPTH CUT - / FILL +	0	0.27	0.05	-0	-0	-0.18	-0.03	0	-0.01	0.23	0.26	-0.07	-0.02	0.03	0.36	0.38	-0	0	0.28	0.15	-1.5	-0.36	-0.78	-0.04	-0			
EXISTING SURFACE LEVEL	910.89	910.78	910.83	910.78	910.78	910.76	910.54	910.52	909.24	909.12	909.07	908.92	908.87	908.81	908.88	908.97	909.35	909.96	910.06	910.19	909.56	909.43	909.86	910.44	910.40			
OFFSET FROM CENTRELINE	-6.42	-5.5	-4	0	0	4	5.5	5.55	9.51	9.8	10.3	11.55	12.55	13.55	14.8	15.3	23.64	30.85	31.89	33.01	36.61	38.88	41.11	44.24	44.9			

CH 140

DATUM R.L. 908.00

DESIGN SURFACE LEVEL	911.178	909.321	909.454	909.454	908.954	908.954	908.954	909.454	909.454	909.453	910.206	910.571	910.576	909.293	909.303
DEPTH CUT - / FILL +	0.01	0	0.26	0.32	-0.16	-0.16	-0.16	0.34	0.27	0	-0	0.29	0.23	-0.3	-0.38
EXISTING SURFACE LEVEL	911.16	909.32	909.2	909.13	909.11	909.11	909.11	909.12	909.19	909.45	910.21	910.28	910.34	909.6	909.69
OFFSET FROM CENTRELINE	0	9.41	9.74	10.24	11.49	12.49	13.49	14.74	15.24	18.37	40.86	41.87	42.99	46.62	48.85

CH 120



DATUM R.L. 908.00

DESIGN SURFACE LEVEL	911.457	909.599	909.648	909.648	909.149	909.15	909.151	909.653	909.653	909.655	910.27	910.801
DEPTH CUT - / FILL +	0.06	0	0.07	0.17	-0.18	-0.18	-0.17	0.34	0.29	0	0	0.55
EXISTING SURFACE LEVEL	911.4	909.6	909.57	909.48	909.33	909.33	909.32	909.31	909.37	909.65	910.27	910.25
OFFSET FROM CENTRELINE	0	9.65	9.77	10.27	11.53	12.53	13.53	14.79	15.29	16.61	48.23	49.6

CH 100

NOTES:
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0 1 2 3 4 5m
SCALE 1:100 AT ORIGINAL SIZE

No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Job Manager	Project Director	Date
A	PRELIMINARY DESIGN		M.C.	D.G.	B.B.	25.10.16

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Drafting Check D.GREEN | Design Check B. BATCHELDER
Approved (Project Director)
Date
Scale AS SHOWN
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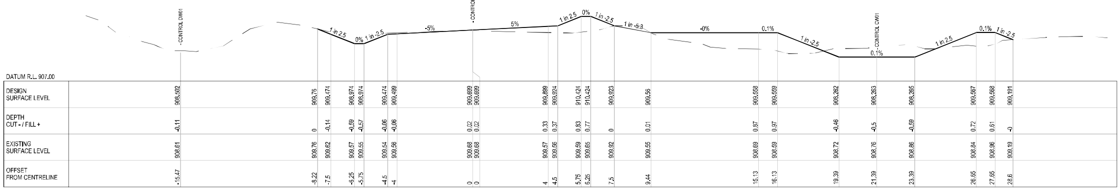
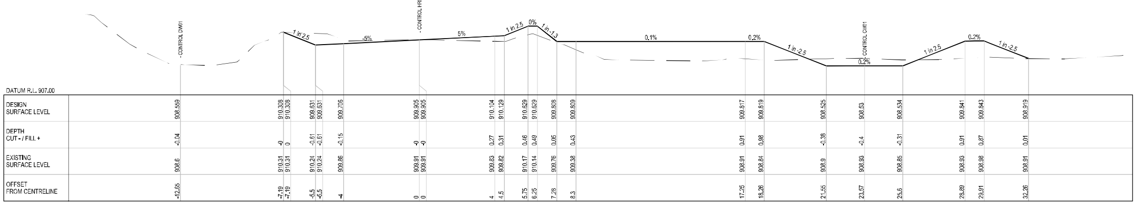
Client SPRINGVALE COAL -
Project DIRTY AND CLEAN WATER SEPARATION PLANS
Title HAUL ROAD HR01
CROSS SECTIONS - SHEET 1 OF 10
Original Size A1 Drawing No: 21-24377-C340 Rev: A

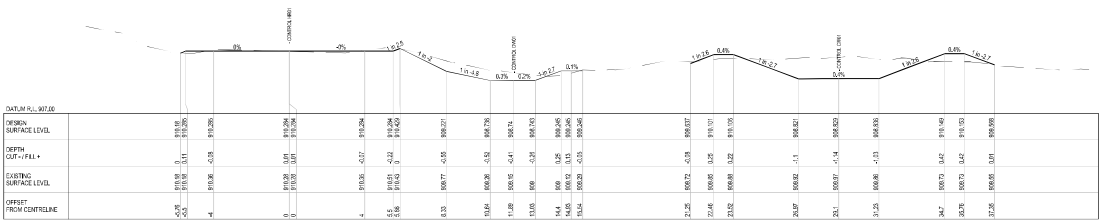
Plot Date: 30 January 2017 - 4:36 PM Plotted by: Trish Elchelb Cad File No: N:\AU\Newcastle\Projects\22\18884\Tech\response\...\21-24377-C340 ROAD XSECT.dwg



CH 200



CH 180



CH 160

NOTES:

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0 1 2 3 4 5m
SCALE 1:100 AT ORIGINAL SIZE

No	Revision	Drawn	Job Manager	Project Director	Date
A	PRELIMINARY DESIGN	M.C.	D.G.	B.B.	25.10.16

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Drafting Check D.GREEN | Design Check B. BATCHELDER
Approved (Project Director)
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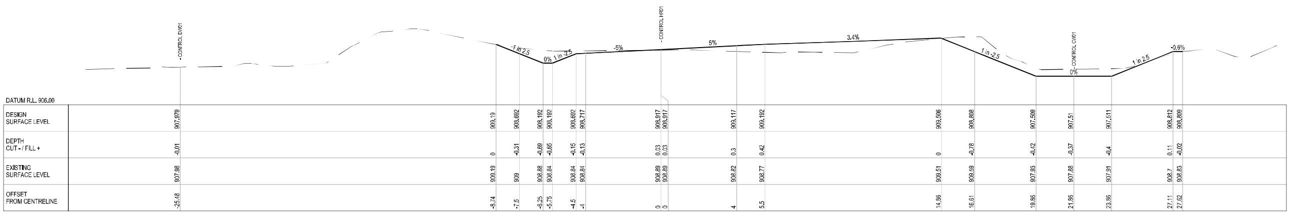
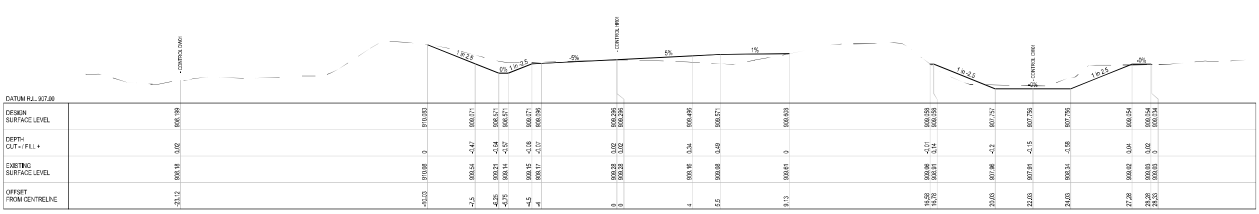
Client **SPRINGVALE COAL -**
Project **DIRTY AND CLEAN WATER SEPARATION PLANS**
Title **HAUL ROAD HR01**
CROSS SECTIONS - SHEET 2 OF 10

Original Size A1 **Drawing No: 21-24377-C341** **Rev: A**

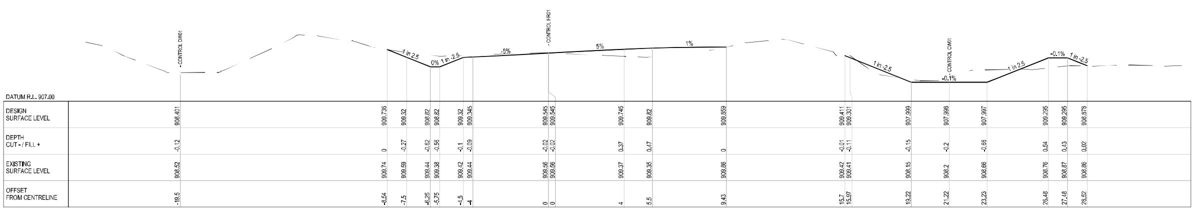
Plot Date: 30 January 2017 - 4:35 PM Plotted by: Trish Etchells Cad File No: N:\AU\Newcastle\Projects\22\18584\Tech\responses\E-Transmit DWGs\E-Transmit DWGs\21-24377-C341.dwg



CH 260



CH 240



CH 220

NOTES:

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0 1 2 3 4 5m
SCALE 1:100 AT ORIGINAL SIZE

No	Revision	Drawn	Job Manager	Project Director	Date
A	PRELIMINARY DESIGN	M.C.	D.G.	B.B.	25.10.16

Note: * indicates signatures on original issue of drawing or last revision of drawing

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Drafting Check D.GREEN | Design Check B. BATCHELDER
Approved (Project Director)
Date
Scale AS SHOWN
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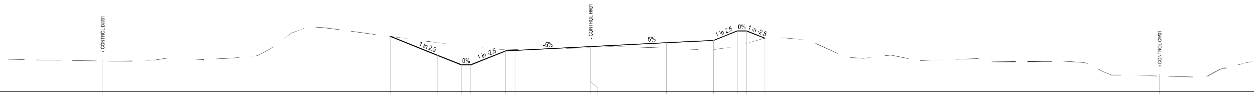
Client **SPRINGVALE COAL -**
Project **DIRTY AND CLEAN WATER SEPARATION PLANS**
Title **HAUL ROAD HR01**
CROSS SECTIONS - SHEET 3 OF 10

Original Size A1 **Drawing No: 21-24377-C342** **Rev: A**

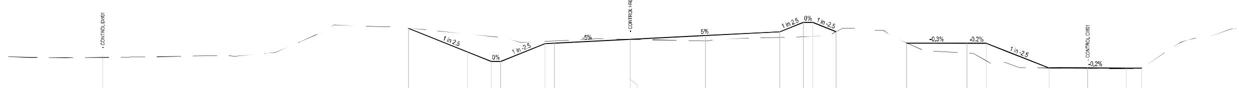
Plot Date: 30 January 2017 - 4:35 PM Plotted by: Trish Etchells Cad File No: N:\AU\Newcastle\Projects\22\18584\Tech\responses\E-Transmit DWGs\E-Transmit DWGs\21-24377-C342.dwg



DATUM R.L. 906.00

DESIGN SURFACE LEVEL	907.695	908.901	907.906	907.406	907.406	908.146	908.171	908.371	908.371	908.571	908.696	909.196	909.196	908.809	906.914
DEPTH CUT - / FILL +	0.09	0	-0.67	-1.04	-0.98	-0.04	-0.03	0.05	0.05	0.29	0.47	0.8	0.65	0	0.09
EXISTING SURFACE LEVEL	907.61	908.9	908.57	908.44	908.39	908.19	908.2	908.32	908.32	908.28	908.22	908.4	908.54	908.81	906.82
OFFSET FROM CENTRELINE	-25.83	-10.59	-8.1	-6.85	-6.35	-4.5	-4	0	0	4	6.5	7.75	8.25	9.22	30.11

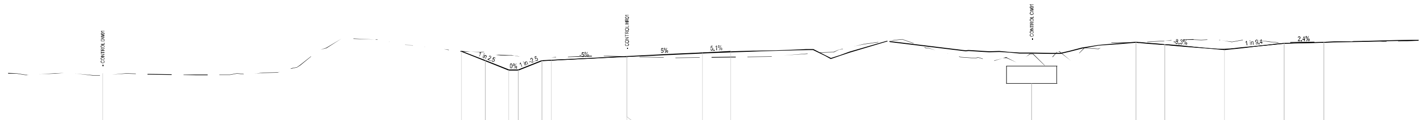
CH 320



DATUM R.L. 906.00

DESIGN SURFACE LEVEL	907.746	909.192	907.941	907.441	907.441	908.381	908.406	908.606	908.606	908.806	909.003	909.503	909.503	909.012	908.406	908.398	908.397	907.091	907.088	907.085	907.084
DEPTH CUT - / FILL +	0.1	0	-0.95	-1.32	-1.26	-0.11	-0.11	0	0	0.29	0.3	0.76	0.74	0	-0.02	0.52	0.93	-0	0.02	0.04	0
EXISTING SURFACE LEVEL	907.65	909.19	908.89	908.76	908.7	908.49	908.52	908.61	908.61	908.52	908.7	908.74	908.77	909.01	908.42	907.88	907.47	907.09	907.07	907.05	907.08
OFFSET FROM CENTRELINE	-27.93	-11.73	-8.6	-7.35	-6.85	-4.5	-4	0	0	4	7.93	9.18	9.68	10.91	14.64	17.84	18.86	22.18	24.23	26.27	27.09

CH 300



DATUM R.L. 905.00

DESIGN SURFACE LEVEL	907.793	908.971	908.468	907.968	907.968	908.468	908.493	908.693	908.693	908.893	908.969	907.262	909.45	909.323	909.06	909.187	909.447
DEPTH CUT - / FILL +	0.1	0	-0.44	-0.79	-0.73	-0.16	-0.15	0.01	0.01	0.25	0.31	-1.57	0.02	-0.2	-0.47	-0.04	-0.02
EXISTING SURFACE LEVEL	907.69	908.97	908.91	908.76	908.7	908.63	908.65	908.68	908.68	908.64	908.66	908.83	909.43	909.53	909.53	909.44	909.47
OFFSET FROM CENTRELINE	-27.79	-8.76	-7.5	-6.25	-5.75	-4.5	-4	0	0	4	5.49	21.43	26.95	28.45	31.63	31.79	36.9

CH 280

NOTES:

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SCALE 1:100 AT ORIGINAL SIZE

No	Revision	Drawn	Job Manager	Project Director	Date
A	PRELIMINARY DESIGN	M.C.	D.G.	B.B.	25.10.16

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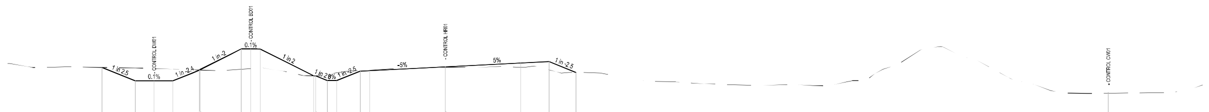
Drafting Check: D.GREEN | Design Check: B. BATCHELDER
Approved (Project Director)
Date
Scale: AS SHOWN
This Drawing must not be used for Construction unless signed as Approved

Client: **SPRINGVALE COAL -**
Project: **DIRTY AND CLEAN WATER SEPARATION PLANS**
Title: **HAUL ROAD HR01**
CROSS SECTIONS - SHEET 4 OF 10

Original Size: A1 | Drawing No: **21-24377-C343** | Rev: **A**

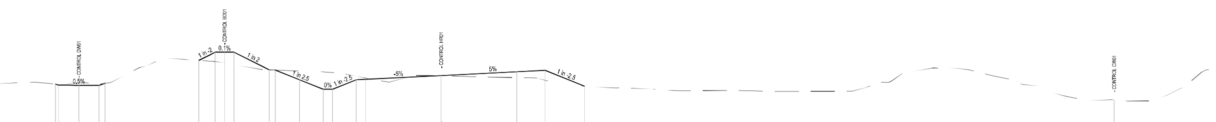
Plot Date: 30 January 2017 - 4:34 PM Plotted by: Trish Etchells Cad File No: [illegible]21-24377-C343.dwg



DATUM R.L. 905.00

DESIGN SURFACE LEVEL	907.805	907.101	907.1	907.099	907.669	907.668	908.781	908.78	908.78	907.361	907.359	907.111	907.111	907.611	907.636	907.836	907.836	908.036	908.111	907.542	906.488
DEPTH CUT - / FILL +	0	-0.67	-0.65	-0.61	0	0	1.07	1.03	0.99	0	0	-0.3	-0.41	-0.01	-0.02	0.02	0.02	0.23	0.43	0	0.05
EXISTING SURFACE LEVEL	907.8	907.77	907.75	907.71	907.67	907.67	907.71	907.75	907.79	907.36	907.36	907.41	907.52	907.62	907.66	907.82	907.82	907.81	907.68	907.54	906.44
OFFSET FROM CENTRELINE	-18.18	-16.42	-15.41	-14.41	-13.03	-12.99	-10.8	-10.3	-9.8	-6.96	-6.87	-6.25	-5.75	-4.5	-4	0	0	4	5.5	6.92	35.1

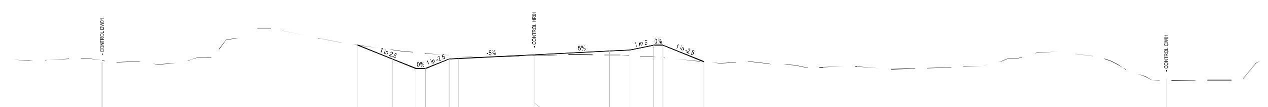
CH 380



DATUM R.L. 905.00

DESIGN SURFACE LEVEL	907.445	907.384	907.379	907.374	907.491	908.698	909.128	909.128	909.127	908.2	908.187	907.672	907.172	907.172	907.672	907.697	907.897	907.897	908.097	908.172	907.334	906.624
DEPTH CUT - / FILL +	0	-0.06	-0.14	-0.08	0.01	0	0.49	0.56	0.65	0	0	-0.47	-0.91	-0.88	-0.19	-0.07	0.01	0.01	0.31	0.52	0	0.02
EXISTING SURFACE LEVEL	907.44	907.45	907.52	907.46	907.48	908.7	908.63	908.57	908.48	908.2	908.19	908.14	908.09	908.05	907.86	907.76	907.88	907.88	907.78	907.65	907.33	906.61
OFFSET FROM CENTRELINE	-20.43	-20.27	-19.2	-18.12	-17.8	-12.84	-11.97	-11.47	-10.97	-9.12	-8.79	-7.5	-6.25	-5.75	-4.5	-4	0	0	4	5.5	7.59	35.65

CH 360



DATUM R.L. 905.00

DESIGN SURFACE LEVEL	907.635	908.547	907.811	907.311	907.311	907.811	907.836	908.036	908.036	908.236	908.289	908.539	908.539	907.67	906.765
DEPTH CUT - / FILL +	-0.11	0	-0.49	-0.85	-0.81	-0.2	-0.14	0.05	0.05	0.21	0.3	0.62	0.66	0	0.08
EXISTING SURFACE LEVEL	907.74	908.55	908.3	908.16	908.12	908.01	907.97	907.99	907.99	908.03	907.99	907.92	907.88	907.67	906.69
OFFSET FROM CENTRELINE	-22.87	-9.34	-7.5	-6.25	-5.75	-4.5	-4	0	0	4	5.07	6.32	6.82	8.99	33.45

CH 340

NOTES:

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0 1 2 3 4 5m

SCALE 1:100 AT ORIGINAL SIZE

No	Revision	Drawn	Job Manager	Project Director	Date
A	PRELIMINARY DESIGN	M.C.	D.G.	B.B.	25.10.16

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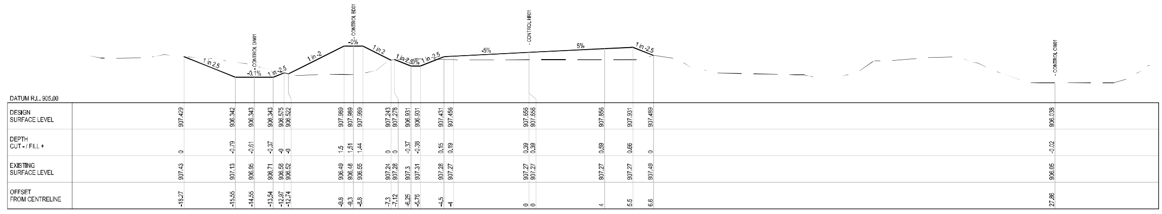
Drafting Check: D.GREEN | Design Check: B. BATCHELDER
Approved (Project Director)
Date
Scale: AS SHOWN
This Drawing must not be used for Construction unless signed as Approved

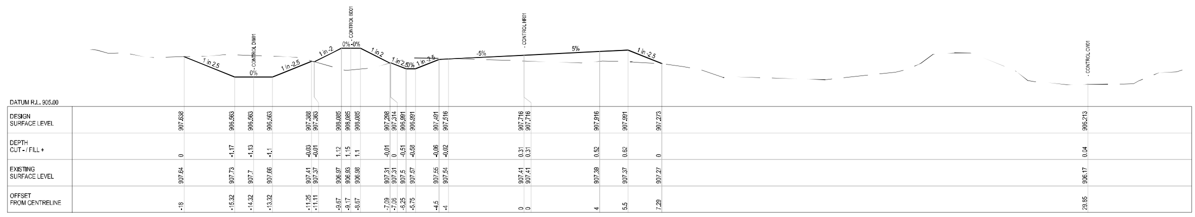
Client: **SPRINGVALE COAL -**
Project: **DIRTY AND CLEAN WATER SEPARATION PLANS**
Title: **HAUL ROAD HR01**
CROSS SECTIONS - SHEET 5 OF 10

Original Size: A1 | Drawing No: **21-24377-C344** | Rev: **A**

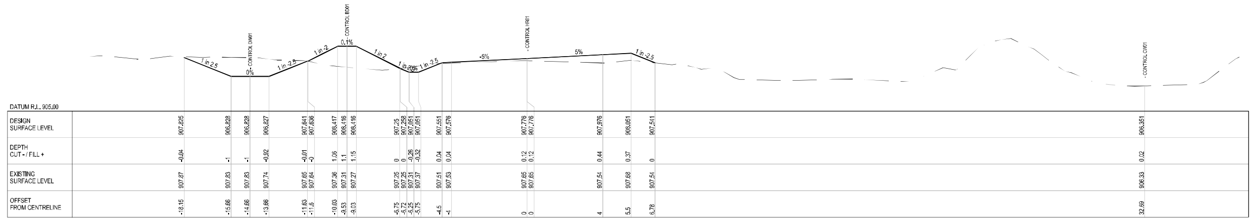
Plot Date: 30 January 2017 - 4:34 PM Plotted by: Trish Etchells Cad File No: [illegible]21-24377-C344.dwg



CH 440



CH 420



CH 400

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0 1 2 3 4 5m
SCALE 1:100 AT ORIGINAL SIZE

No	Revision	Drawn	Job Manager	Project Director	Date
A	PRELIMINARY DESIGN	M.C.	D.G.	B.B.	25.10.16

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Approved (Project Director)
Date
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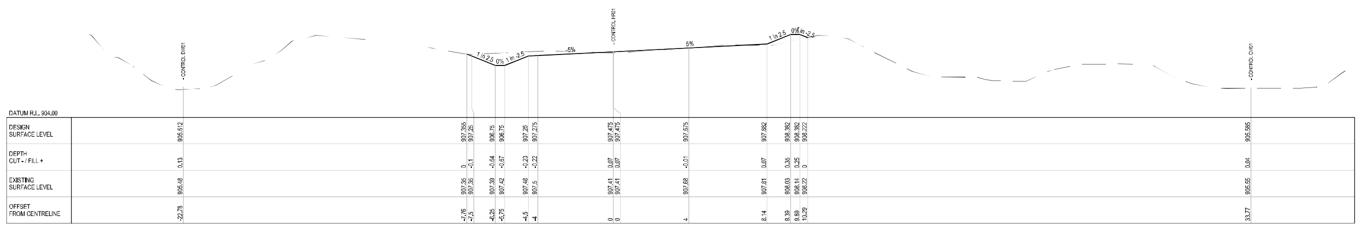
Client **SPRINGVALE COAL -**
Project **DIRTY AND CLEAN WATER SEPARATION PLANS**
Title **HAUL ROAD HR01**
CROSS SECTIONS - SHEET 6 OF 10
Original Size A1 Drawing No: **21-24377-C345** Rev: A

Plot Date: 30 January 2017 - 4:34 PM Plotted by: Trish Etchells Cad File No: N:\AU\Newcastle\Projects\22\18584\Tech\responses\E-Transmit DWGs\E-Transmit DWGs\21-24377-C345.dwg



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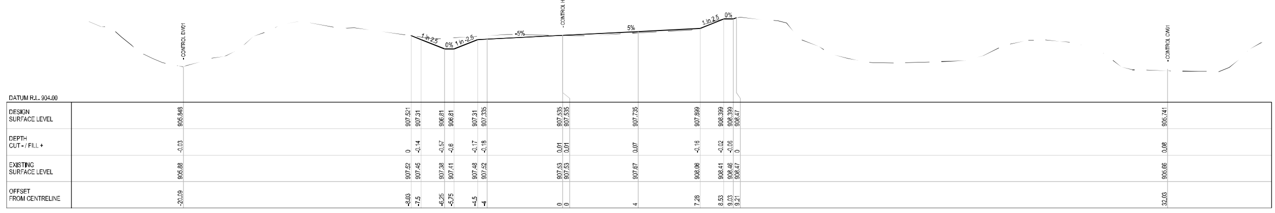
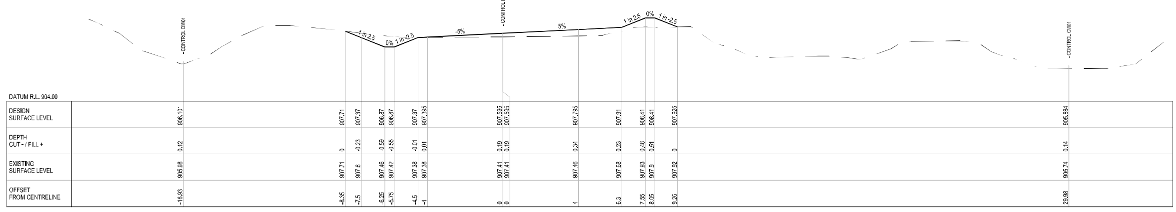


CH 480



CH 460

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0 1 2 3 4 5m
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No	Revision	Drawn	Job Manager	Project Director	Date
A	PRELIMINARY DESIGN	M.C.	D.G.	B.B.	25.10.16

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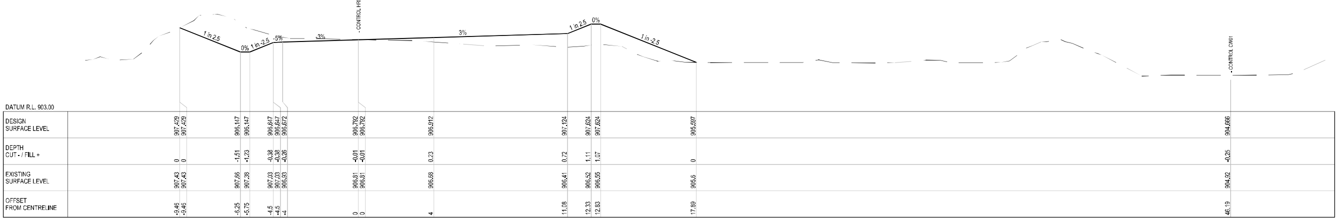
Client **SPRINGVALE COAL -**
Project **DIRTY AND CLEAN WATER SEPARATION PLANS**
Title **HAUL ROAD HR01**
CROSS SECTIONS - SHEET 7 OF 10
Original Size A1 Drawing No: **21-24377-C346** Rev: A

Plot Date: 30 January 2017 - 4:33 PM Plotted by: Trish Etchells Cad File No: N:\AU\Newcastle\Projects\22\18584\Tech\responses\E-Transmit DWGs\E-Transmit DWGs\21-24377-C346.dwg



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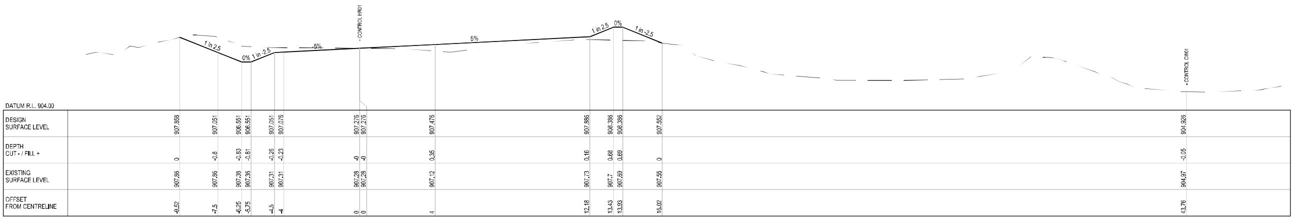
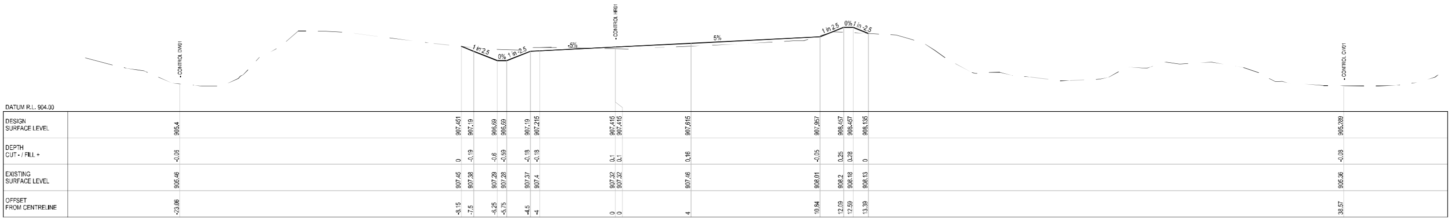


CH 540



CH 520

NOTES:

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No	Revision	Drawn	Job Manager	Project Director	Date
A	PRELIMINARY DESIGN	M.C.	D.G.	B.B.	25.10.16

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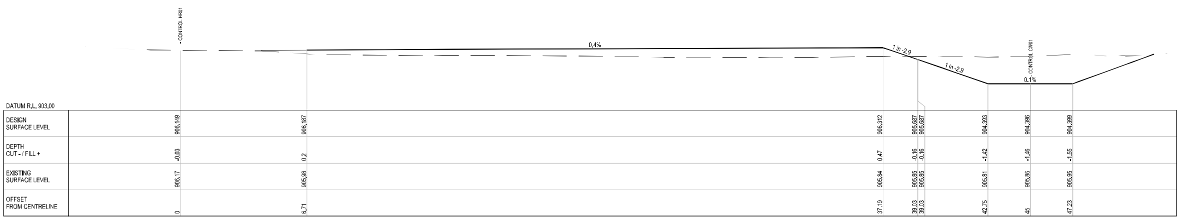
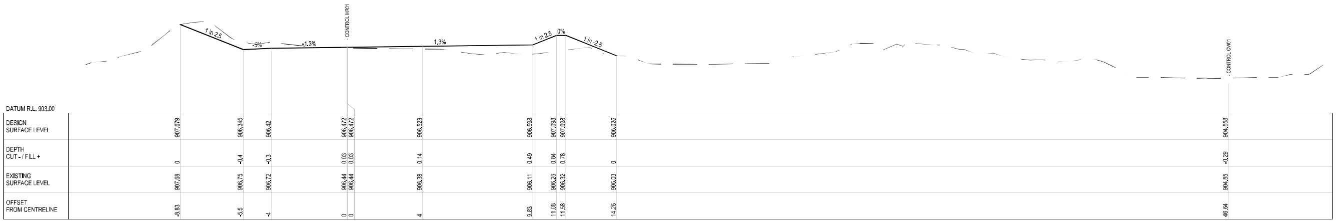
Client **SPRINGVALE COAL -**
Project **DIRTY AND CLEAN WATER SEPARATION PLANS**
Title **HAUL ROAD HR01 CROSS SECTIONS - SHEET 8 OF 10**
Original Size A1 **Drawing No: 21-24377-C347** **Rev: A**

Plot Date: 30 January 2017 - 4:33 PM Plotted by: Trish Etchells Cad File No: N:\AU\Newcastle\Projects\22\18484\Tech\responses\It-Transmit DWGs\It-Transmit DWGs\21-24377-C347.dwg



CH 600

CH 580



CH 569

NOTES:

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SCALE 1:100 AT ORIGINAL SIZE

No	Revision	Drawn	Job Manager	Project Director	Date
A	PRELIMINARY DESIGN	M.C.	D.G.	B.B.	25.10.16

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Date
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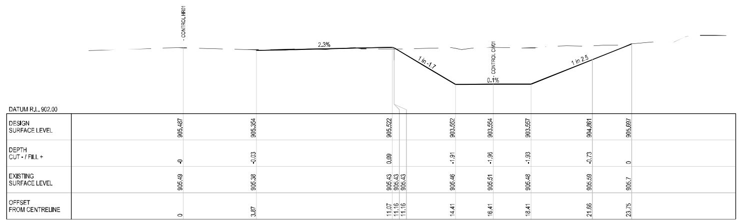
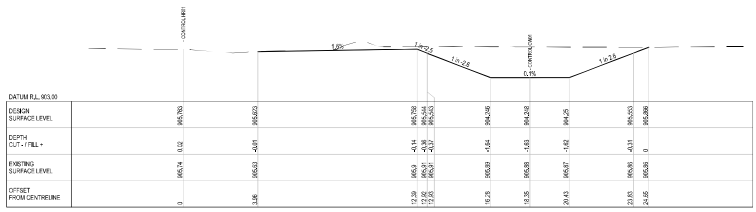
Client **SPRINGVALE COAL -**
Project **DIRTY AND CLEAN WATER SEPARATION PLANS**
Title **HAUL ROAD HR01 CROSS SECTIONS - SHEET 9 OF 10**
Original Size A1 **Drawing No: 21-24377-C348** **Rev: A**

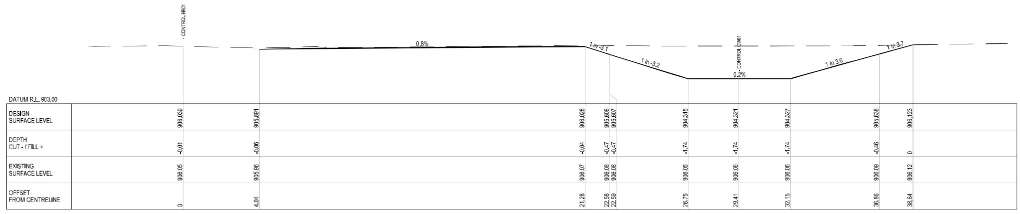
Plot Date: 30 January 2017 - 4:32 PM Plotted by: Trish Etchells Cad File No: N:\AU\Newcastle\Projects\22\18484\Tech\responses\It-Transmit DWGs\It-Transmit DWGs\21-24377-C348.dwg



CH 660



CH 640



CH 620

NOTES:

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0 1 2 3 4 5m
SCALE 1:100 AT ORIGINAL SIZE

No	Revision	Drawn	Job Manager	Project Director	Date
A	PRELIMINARY DESIGN	M.C.	D.G.	B.B.	25.10.16

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Drafting Check D.GREEN | Design Check B. BATCHELDER
Approved (Project Director)
Date
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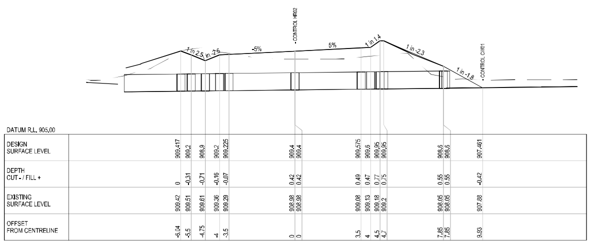
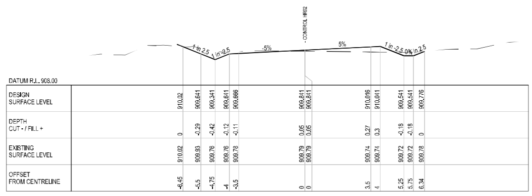
Client **SPRINGVALE COAL -**
Project **DIRTY AND CLEAN WATER SEPARATION PLANS**
Title **HAUL ROAD HR01**
CROSS SECTIONS - SHEET 10 OF 10
Original Size A1 Drawing No: **21-24377-C349** Rev: A

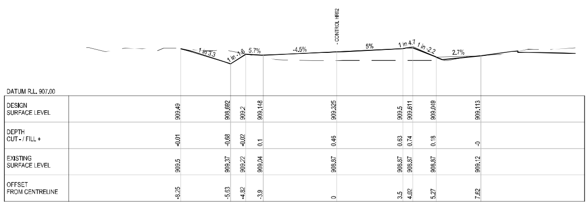
Plot Date: 30 January 2017 - 4:32 PM Plotted by: Trish Etchells Cad File No: N:\AU\Newcastle\Projects\22\18584\Tech\responses\E-Transmit DWGs\E-Transmit DWGs\21-24377-C349.dwg



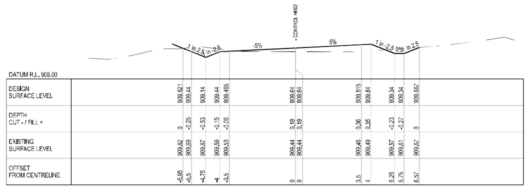
CH 20



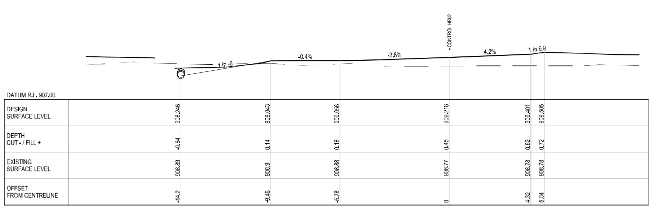
CH 56



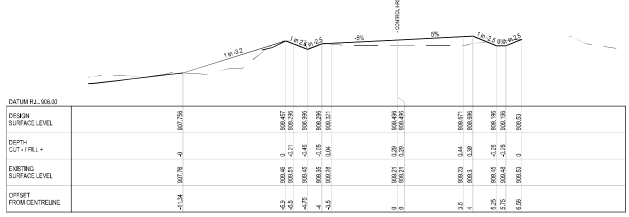
CH 14



CH 40



CH 10



CH 28

NOTES:

1. DATUM : AUSTRALIAN HEIGHT DATUM
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7. THIS DRAWING DOES NOT DETAIL CONSTRUCTION METHODS, TEMPORARY WORKS OR EROSION AND SEDIMENT CONTROL MEASURES

0 1 2 3 4 5m
SCALE 1:100 AT ORIGINAL SIZE

No	Revision	Drawn	Job Manager	Project Director	Date
A	PRELIMINARY DESIGN	M.C.	D.G.	B.B.	25.10.16

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Drafting Check D.GREEN | Design Check B. BATCHELDER
Approved (Project Director)
Date
Scale AS SHOWN
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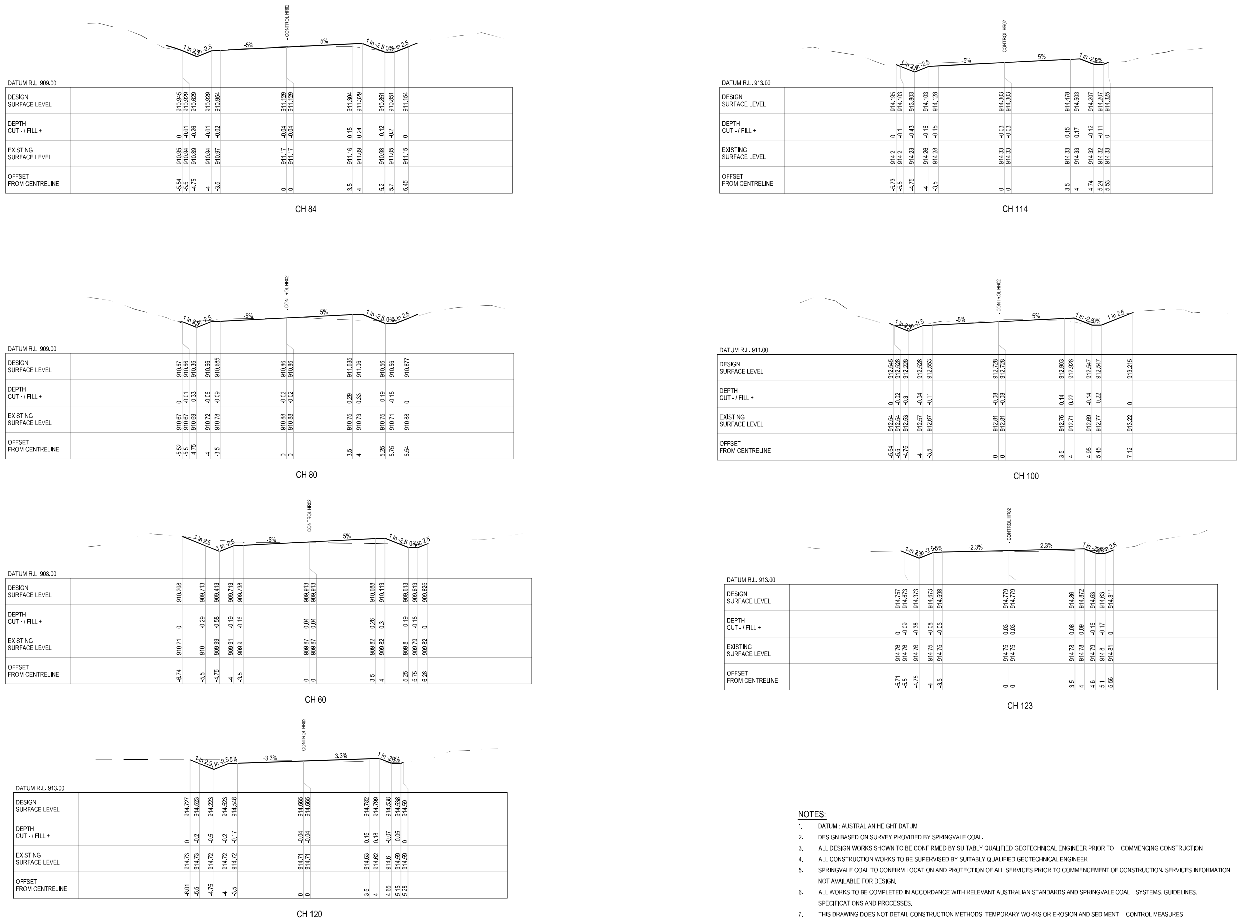
Client **SPRINGVALE COAL -**
Project **DIRTY AND CLEAN WATER SEPARATION PLANS**
Title **HAUL ROAD HR02**
CROSS SECTIONS - SHEET 1 OF 2
Original Size A1 Drawing No: **21-24377-C350** Rev: A

Plot Date: 30 January 2017 - 4:31 PM Plotted by: Trish Etchells Cad File No: N:\AU\Newcastle\Projects\22\18584\Tech\responses\E-Transmit DWGs\E-Transmit DWGs\21-24377-C350.dwg



NOTES:

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0 1 2 3 4 5m
SCALE 1:100 AT ORIGINAL SIZE

No	Revision	Drawn	Job Manager	Project Director	Date
A	PRELIMINARY DESIGN	M.C.	D.G.	B.B.	25.10.16

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Drafting Check D.GREEN | Design Check B. BATCHELDER
Approved (Project Director)
Date
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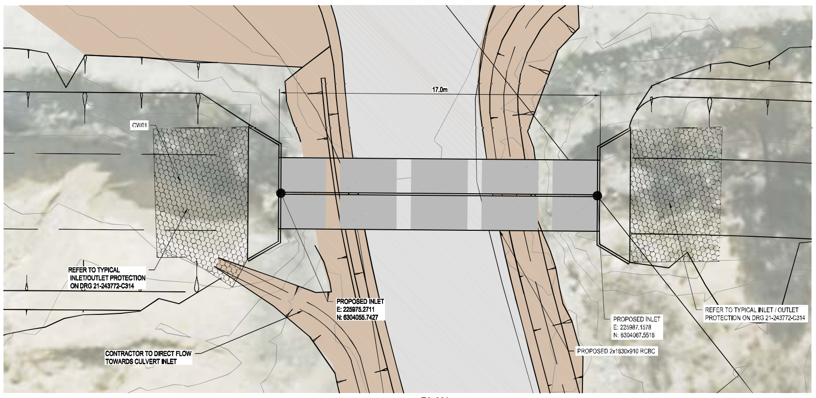
Client **SPRINGVALE COAL -**
Project **DIRTY AND CLEAN WATER SEPARATION PLANS**
Title **HAUL ROAD HR02**
CROSS SECTIONS - SHEET 2 OF 2
Original Size **A1** Drawing No: **21-24377-C351** Rev: **A**

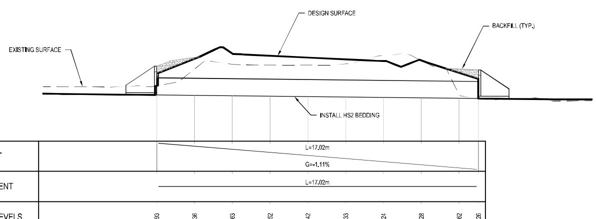
Plot Date: 30 January 2017 - 4:31 PM Plotted by: Trish Etchells Cad File No: N:\AU\Newcastle\Projects\22\18584\Tech\responses\E-Transmit DWGs\E-Transmit DWGs\21-24377-C351.dwg



PLAN
SCALE 1:100

N

0 1 2 3 4 5m
SCALE 1:100 AT ORIGINAL SIZE



DATUM RL. 905.00

VERTICAL ALIGNMENT	L=17.02m G=-1.11%									
HORIZONTAL ALIGNMENT	L=17.02m									
FINISHED SURFACE LEVELS	907.93	909.36	909.63	909.52	909.42	909.33	909.24	909.28	908.62	907.26
LEVEL DIFFERENCE TO FSL CUT - / FILL +	-0.49	-1.95	-2.24	-2.15	-2.07	-2.00	-1.93	-1.99	-1.36	-0.01
PROGRESSIVE INVERT LEVEL	907.438	907.416	907.394	907.371	907.349	907.327	907.305	907.282	907.260	907.249
EXISTING SURFACE LEVEL	907.93	908.81	909.06	909.03	909.03	909.08	909.53	909.25	907.46	907.26
CHAINAGE	0.00	2.00	4.00	6.00	8.00	10.00	12.00	14.00	16.00	17.02

LONGITUDINAL SECTION - CULVERT CW01-A
SCALE 1:1

NOTES:

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0 1 2 3 4 5m
SCALE 1:100 AT ORIGINAL SIZE

No	Revision	Drawn	Job Manager	Project Director	Date
A	PRELIMINARY DESIGN	M.C.	D.G.	B.B.	25.10.16

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Drafting Check D.GREEN | Design Check B. BATCHELDER
Approved (Project Director)
Date
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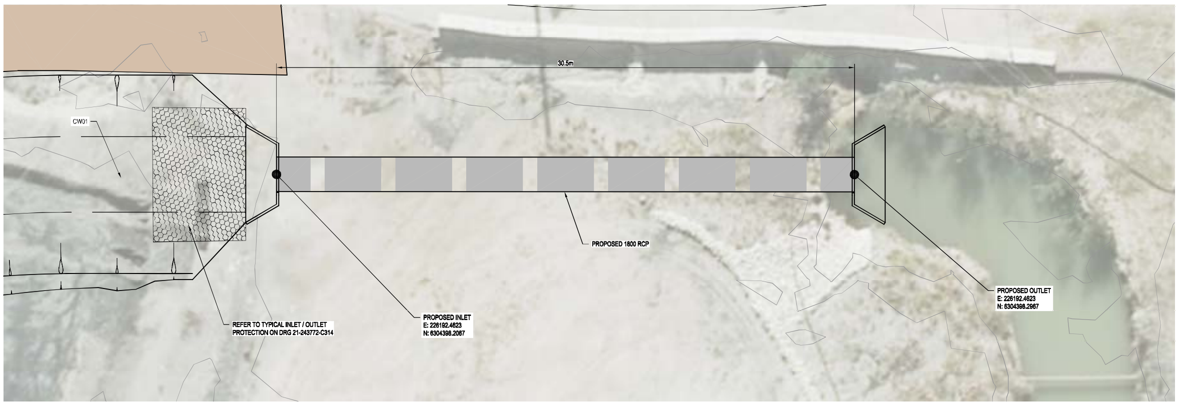
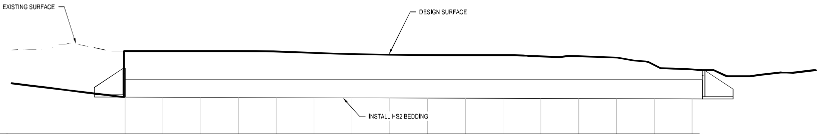
Client **SPRINGVALE COAL -**
Project **DIRTY AND CLEAN WATER SEPARATION PLANS**
Title **CLEAN WATER CULVERT CW01-A**
PLAN & ELEVATION
Original Size **A1** Drawing No: **21-24377-C360** Rev: **A**

Plot Date: 30 January 2017 - 4:30 PM Plotted by: Trish Etchells Cad File No: N:\AU\Newcastle\Projects\22\18584\Tech\responses\E-Transmit DWGs\E-Transmit DWGs\21-24377-C360-CULVERTS.dwg



PLAN
SCALE 1:100

0 1 2 3 4 5m
SCALE 1:100 AT ORIGINAL SIZE



DATUM RL. 901.00

VERTICAL ALIGNMENT	L=30.55m G=-0.32%															
HORIZONTAL ALIGNMENT	L=30.55m															
FINISHED SURFACE LEVELS	905.41	905.41	905.41	905.41	905.39	905.32	905.26	905.22	905.20	905.19	905.19	905.13	905.15	905.07	904.67	904.44
LEVEL DIFFERENCE TO FSL CUT - / FILL +	-2.44	-2.45	-2.46	-2.46	-2.45	-2.38	-2.33	-2.30	-2.28	-2.28	-2.29	-2.24	-2.26	-2.18	-1.80	-1.57
PROGRESSIVE INVERT LEVEL	902.968	902.961	902.955	902.948	902.942	902.935	902.929	902.922	902.916	902.909	902.903	902.896	902.890	902.884	902.877	902.871
EXISTING SURFACE LEVEL	905.41	905.41	905.41	905.41	905.39	905.32	905.26	905.22	905.20	905.19	905.19	905.13	905.15	905.07	904.67	904.44
CHAINAGE	0.00	2.00	4.00	6.00	8.00	10.00	12.00	14.00	16.00	18.00	20.00	22.00	24.00	26.00	28.00	30.00

LONGITUDINAL SECTION - CULVERT CW01-B
SCALE 1:1

NOTES:
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0 1 2 3 4 5m
SCALE 1:100 AT ORIGINAL SIZE

No	Revision	Drawn	Job Manager	Project Director	Date
A	PRELIMINARY DESIGN	M.C.	D.G.	B.B.	25.10.16

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Drafting Check D.GREEN | Design Check B. BATCHELDER
Approved (Project Director)
Date
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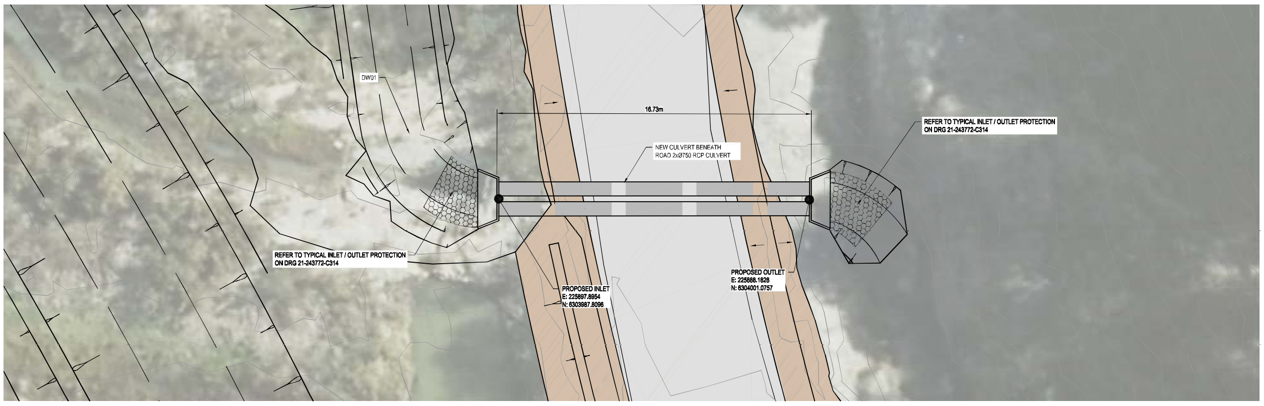
Client **SPRINGVALE COAL -**
Project **DIRTY AND CLEAN WATER SEPARATION PLANS**
Title **CLEAN WATER CULVERT CW01-B**
PLAN & ELEVATION

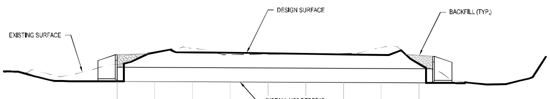
Original Size A1 Drawing No: **21-24377-C361** Rev: A

Plot Date: 30 January 2017 - 4:30 PM Plotted by: Trish Etchells Cad File No: N:\AU\Newcastle\Projects\22\18584\Tech\responses\E-Transmit DWGs\E-Transmit DWGs\21-24377-C360 CULVERTS.dwg



PLAN
SCALE 1:100

0 1 2 3 4 5m
SCALE 1:100 AT ORIGINAL SIZE



DATUM RL. 907.00

VERTICAL ALIGNMENT	L=16.73m G=-0.49%								
HORIZONTAL ALIGNMENT	L=16.73m								
FINISHED SURFACE LEVELS	908.72	910.25	910.25	910.23	910.21	910.18	910.15	910.11	909.65
LEVEL DIFFERENCE TO FSL CUT - / FILL +	0.00	-1.54	-1.55	-1.54	-1.53	-1.51	-1.49	-1.46	-1.01
PROGRESSIVE INVERT LEVEL	908.720	908.710	908.700	908.690	908.680	908.670	908.660	908.650	908.640
EXISTING SURFACE LEVEL	909.63	910.25	910.47	910.14	910.16	910.18	910.20	910.52	909.65
CHAINAGE	0.00	2.00	4.00	6.00	8.00	10.00	12.00	14.00	16.00

LONGITUDINAL SECTION - CULVERT DW01-A
SCALE 1:1

NOTES:
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0 1 2 3 4 5m
SCALE 1:100 AT ORIGINAL SIZE

No	Revision	Drawn	Job Manager	Project Director	Date
A	PRELIMINARY DESIGN	M.C.	D.G.	B.B.	25.10.16

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Drafting Check D.GREEN | Design Check B. BATCHELDER
Approved (Project Director)
Date
Scale AS SHOWN
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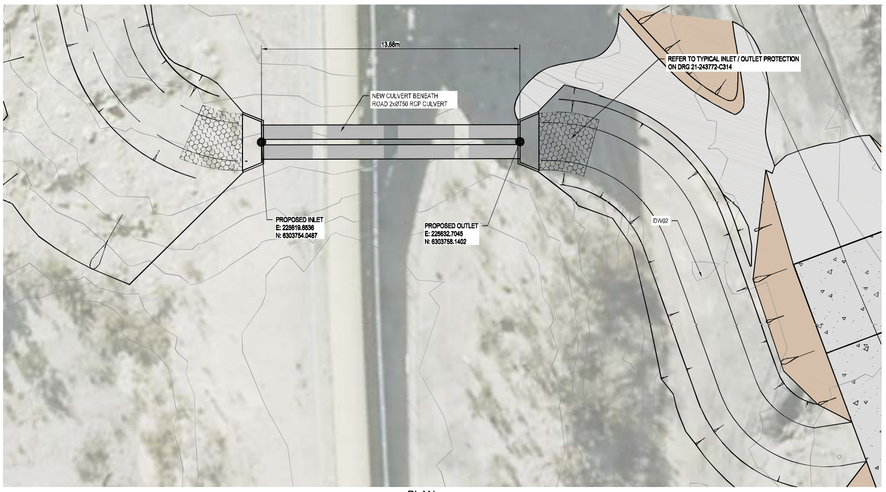
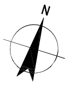
Client **SPRINGVALE COAL -**
Project **DIRTY AND CLEAN WATER SEPARATION PLANS**
Title **DIRTY WATER CULVERT DW01-A**
PLAN & ELEVATION

Original Size A1 Drawing No: **21-24377-C362** Rev: A

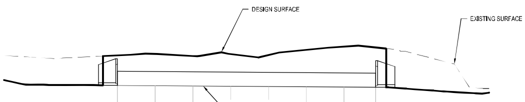
Plot Date: 30 January 2017 - 4:29 PM Plotted by: Trish Etchells Cad File No: N:\AU\Newcastle\Projects\22\18584\Tech\responses\E-Transmit DWGs\E-Transmit DWGs\21-24377-C360 CULVERTS.dwg





0 1 2 3 4 5m
SCALE 1:100 AT ORIGINAL SIZE

PLAN
SCALE 1:100



DATUM RL. 915.00

VERTICAL ALIGNMENT	L=13.68m G=-0.75%							
HORIZONTAL ALIGNMENT	L=13.68m							
FINISHED SURFACE LEVELS	918.59	918.67	918.56	918.66	918.61	918.89	919.06	919.02
LEVEL DIFFERENCE TO FSL CUT - / FILL +	-1.59	-1.69	-1.59	-1.70	-1.66	-1.96	-2.14	-2.11
PROGRESSIVE INVERT LEVEL	917.004	916.989	916.974	916.959	916.944	916.929	916.914	916.902
EXISTING SURFACE LEVEL	918.59	918.67	918.56	918.66	918.61	918.89	919.06	919.02
CHAINAGE	0.00	2.00	4.00	6.00	8.00	10.00	12.00	13.68

LONGITUDINAL SECTION - CULVERT DW02-A
SCALE 1:1

NOTES:
1. DATUM : AUSTRALIAN HEIGHT DATUM
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0 1 2 3 4 5m
SCALE 1:100 AT ORIGINAL SIZE

No	Revision	Drawn	Job Manager	Project Director	Date
A	PRELIMINARY DESIGN	M.C.	D.G.	B.B.	25.10.16

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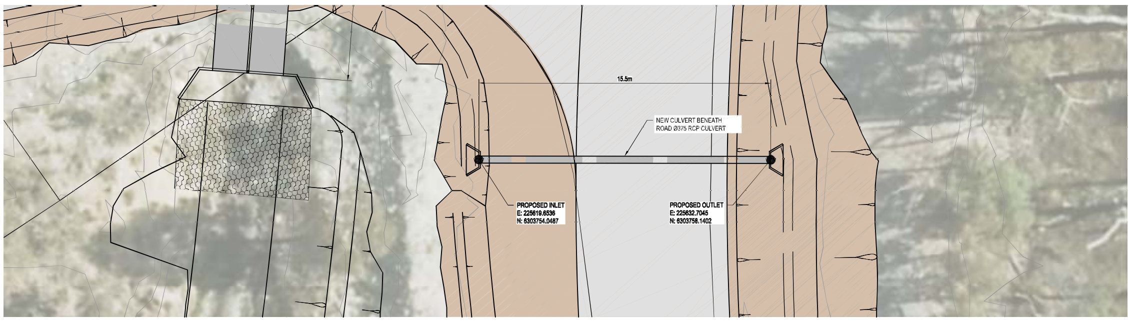
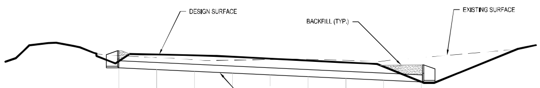
Drafting Check D.GREEN | Design Check B. BATCHELDER
Approved (Project Director)
Date
Scale AS SHOWN | This Drawing must not be used for Construction unless signed as Approved

Client **SPRINGVALE COAL -**
Project **DIRTY AND CLEAN WATER SEPARATION PLANS**
Title **DIRTY WATER CULVERT DW02-A PLAN & ELEVATION**
Original Size A1 | Drawing No: **21-24377-C363** | Rev: A

Plot Date: 30 January 2017 - 4:29 PM Plotted by: Trish Etchells Cad File No: N:\AU\Newcastle\Projects\22\18584\Tech\responses\E-Transmit DWGs\E-Transmit DWGs\21-24377-C360 CULVERTS.dwg



0 1 2 3 4 5m
SCALE 1:100 AT ORIGINAL SIZE



DATUM RL. 905.00

VERTICAL ALIGNMENT	L=16.05m G=-4.67%								
HORIZONTAL ALIGNMENT	L=16.05m								
FINISHED SURFACE LEVELS	908.61	908.95	908.90	908.83	908.73	908.63	908.53	908.31	907.51
LEVEL DIFFERENCE TO FSL CUT - / FILL +	-0.36	-0.79	-0.84	-0.87	-0.86	-0.85	-0.85	-0.72	-0.01
PROGRESSIVE INVERT LEVEL	908.250	908.157	908.063	907.970	907.876	907.783	907.689	907.596	907.502
EXISTING SURFACE LEVEL	908.89	908.79	908.67	908.65	908.69	908.70	908.64	908.60	908.79
CHAINAGE	0.00	2.00	4.00	6.00	8.00	10.00	12.00	14.00	16.00

LONGITUDINAL SECTION - CULVERT HR01-A
SCALE 1:1

NOTES:
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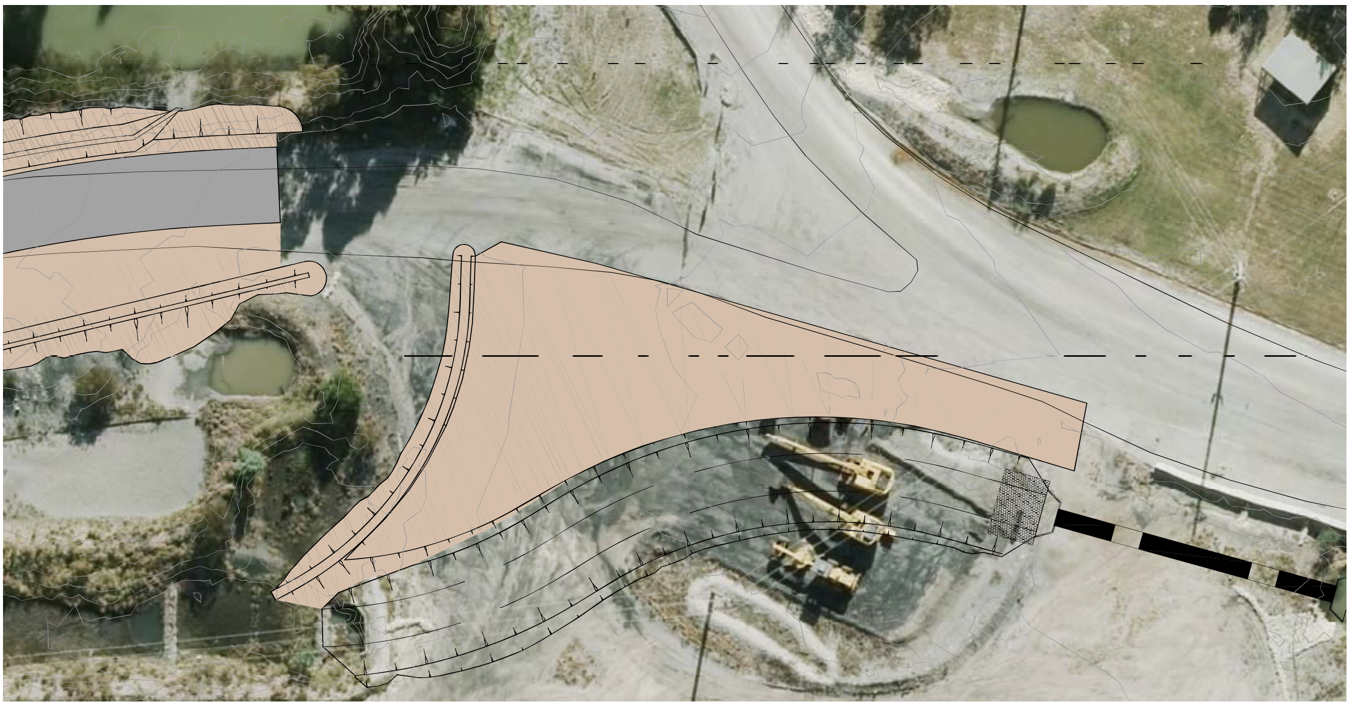
Client **SPRINGVALE COAL -**
Project **DIRTY AND CLEAN WATER SEPARATION PLANS**
Title **HAUL ROAD CULVERT HR01 PLAN & ELEVATION**
Original Size A1 | Drawing No: **21-24377-C364** | Rev: A

Plot Date: 30 January 2017 - 4:29 PM Plotted by: Trish Etchells Cad File No: N:\AU\Newcastle\Projects\22\18584\Tech\responses\E-Transmit DWGs\E-Transmit DWGs\21-24377-C360 CULVERTS.dwg



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Client **SPRINGVALE COAL -**
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Title **CAUSEWAY AU02**
PLAN & ELEVATION

Original Size A1 | Drawing No: **21-24377-C370** | Rev: A

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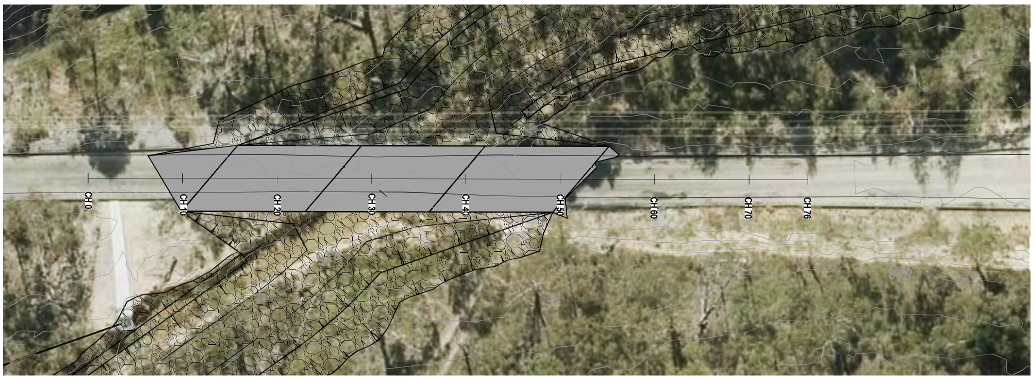

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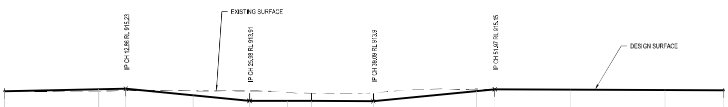

DATUM RL. 910.00

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HORIZONTAL ALIGNMENT	L=76.23m					

LEVEL DIFFERENCE CUT - / FILL +	0.01	0.20	0.23	-0.47	-1.06	-0.91	-0.82	-0.90	-0.22	0.00	0.04	-0.03	0.01
DESIGN SURFACE LEVEL	914.950	915.170	915.233	914.515	913.914	913.909	913.905	913.896	914.963	915.155	915.119	915.075	915.047
EXISTING SURFACE LEVEL	914.94	914.97	915.01	914.98	914.98	914.82	914.72	914.79	915.18	915.15	915.08	915.10	915.04
CHAINAGE	0.00	10.00	12.86	20.00	25.98	30.00	32.54	39.09	50.00	51.97	60.00	70.00	76.23

LONGITUDINAL SECTION - CULVERT AU02
SCALE 1:1

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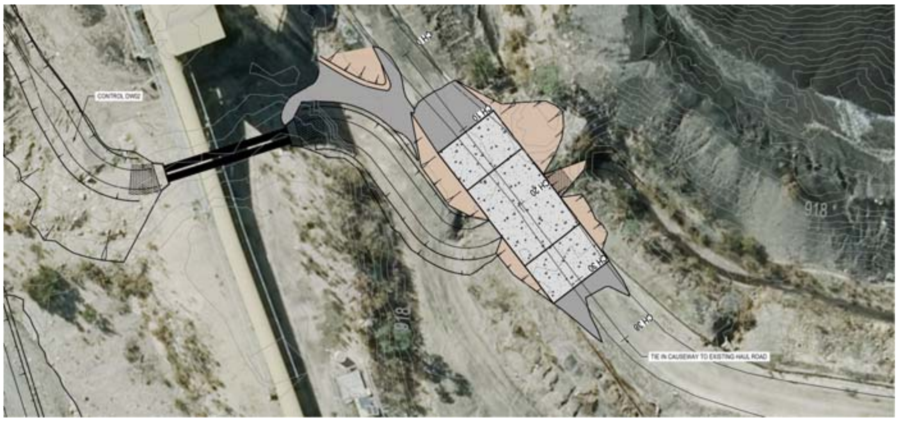
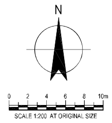
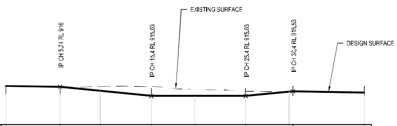
Title **CAUSEWAY AU02**
PLAN & ELEVATION

Original Size A1 | Drawing No: **21-24377-C371** | Rev: A

Plot Date: 30 January 2017 - 4:28 PM Plotted by: Trish Etchells Cad File No: N:\AU\Newcastle\Projects\22\18584\Tech\responses\E-Transmit DWGs\E-Transmit DWGs\21-24377-C370 CAUSEWAY.dwg







DATUM RL. 912.00

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LEVEL DIFFERENCE CUT - / FILL +	-0.00	-0.06	-0.45	-0.97	-0.69	-0.51	0.02	-0.00
DESIGN SURFACE LEVEL	916.090	915.996	915.571	915.031	915.031	915.031	915.491	915.390
EXISTING SURFACE LEVEL	916.09	916.05	916.02	916.00	915.72	915.54	915.47	915.39
CHAINAGE	0.00	5.74	10.00	15.40	20.00	25.40	30.00	37.94

LONGITUDINAL SECTION - CULVERT AU03
SCALE 1:1

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Title: **CAUSEWAY AU03 PLAN & ELEVATION**

Original Size A1 **Drawing No: 21-24377-C370** **Rev: B**

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27 February 2017

Nagindar Singh
Environmental Projects Coordinator - West
Springvale Coal Pty Ltd
1384 Castlereagh Highway
LIDSDALE NSW 2790

Our ref: 2218584-65623
Your ref:

Dear Nagindar

Modification for Water Treatment Plan Residuals
Water and Salt Balance Model Sensitivity

1 Background

Springvale Coal Pty Limited is seeking a modification (MOD 1) to State Significant Development consent SSD-5579 to address operational interactions with the proposed Springvale Water Treatment Project (SWTP). The modification is to allow for the receipt of residuals stream from the water treatment plant and emplacement within the existing reject emplacement area at the Springvale Coal Services site (SCSS).

A water and salt balance model was developed for the Coxs River catchment to assess the impact of the SWTP and the emplacement of residuals at the SCSS. The residuals stream was modelled using a maximum flow rate of 0.43 ML/day and maximum electrical conductivity (EC) of 2,500 µS/cm. These parameters were based on conservative estimates which have since been reviewed. The predicted volume of residuals is expected to range from 0.16 ML/day to 0.35 ML/day, with an EC between 1,100 µS/cm and 1,200 µS/cm.

This letter details the methodology and results of water and salt balance modelling for the Coxs River catchment to provide a sensitivity analysis of the parameters used to model the residuals stream from the SWTP to the SCSS.

2 Methodology

The water and salt balance model was developed as part of the Water Resources Impact Assessment for the Western Coal Services Project Modification 1. Note that this same model has been updated to assess the amended SWTP and considers the transfer of excess treated water from the water treatment plant to Thompsons Creek Reservoir. As a result, some modelling predictions will vary from those presented in the Western Coal Services Project Modification 1 impact assessment. However, this does not affect results for Wangcol Creek catchment.

A number of scenarios were modelled with varying flow and EC for the residuals stream, as shown in Table 2-1. Note that Scenario 1 is the same as the results presented in the Western Coal Services Project Modification 1 and amended SWTP impact assessments using the maximum flow and EC values.

Table 2-1 Modelling scenarios

Scenario	Flow (ML/day)	EC (µS/cm)
Scenario 1	0.43	2,500
Scenario 2	0.35	1,200

The following operational conditions were modelled, all with a 50% power generation requirement at Mount Piper Power Station:

- Existing conditions – based on site conditions in the year 2016.
- Future conditions – based on site conditions following the implementation of improvements to the clean water management system at the SCSS.
- Proposed conditions – based on site conditions following the commissioning of the SWTP and residuals emplacement at the SCSS.

3 Results

Average annual results of flow and EC are presented for the following locations in the Coxs River catchment:

1. LDP006 discharge to Wangcol Creek from the SCSS.
2. Wangcol Creek at the confluence with the discharge from LDP006.
3. Wangcol Creek at the confluence with the Coxs River.
4. Coxs River at the inflow to Lake Wallace.
5. Coxs River at the inflow to Lake Lyell.
6. Coxs River at the inflow to Lake Burragorang.

3.1 Scenario 1

Summaries of the change in average results between existing, future and proposed conditions for Scenario 1 are presented in Table 3-1, Table 3-2 and Table 3-3 for the water volume, salt load and EC respectively. This scenario modelled the residuals stream from the SWTP with the maximum flow rate of 0.43 ML/day and EC of 2,500 µS/cm.

Table 3-1 Summary of change in water volume results for Scenario 1

Location	Existing conditions (ML/year)	Future conditions (ML/year)	Proposed conditions (ML/year)	Change between		
				Existing and future conditions	Existing and proposed conditions	Future and proposed conditions
1	848	441	570	-48%	-33%	29%
2	2,719	2,659	2,791	-2%	3%	5%
3	3,027	2,965	3,097	-2%	2%	4%
4	23,174	23,400	15,490	1%	-33%	-34%
5	33,616	33,826	25,848	1%	-23%	-24%
6	123,418	123,560	122,737	0%	-1%	-1%

Table 3-2 Summary of change in salt load results for Scenario 1

Location	Existing conditions (tonnes/year)	Future conditions (tonnes/year)	Proposed conditions (tonnes/year)	Change between		
				Existing and future conditions	Existing and proposed conditions	Future and proposed conditions
1	1,521	1,107	1,446	-27%	-5%	31%
2	1,815	1,553	1,892	-14%	4%	22%
3	1,838	1,575	1,915	-14%	4%	22%
4	10,221	10,174	4,008	0%	-61%	-61%
5	11,391	11,334	5,306	-1%	-53%	-53%
6	14,315	14,305	12,630	0%	-12%	-12%

Table 3-3 Summary of change in electrical conductivity results for Scenario 1

Location	Existing conditions (µS/cm)	Future conditions (µS/cm)	Proposed conditions (µS/cm)	Change between		
				Existing and future conditions	Existing and proposed conditions	Future and proposed conditions
1	2,680	3,750	3,790	40%	41%	1%
2	1,000	870	1,010	-13%	1%	16%
3	910	790	920	-13%	1%	16%
4	660	650	390	-2%	-41%	-40%
5	510	500	310	-2%	-39%	-38%
6	170	170	150	0%	-12%	-12%

As shown in Table 3-1, the emplacement of residuals at the SCSS was modelled to increase LDP006 discharge by 29% compared to future conditions. However, the increase in LDP006 discharge is compensated by the installation of clean water diversions at the site, with an overall decrease in LDP006 discharge of 33% when compared to existing conditions.

Flow is increased slightly in Wangcol Creek under proposed conditions by 3% and 5% at the confluence with the discharge from LDP006 compared to existing and future conditions respectively and by 2% and 4% at the confluence with the Coxs River compared to existing and future conditions respectively.

The results for proposed conditions compared to existing and future conditions indicate a decrease in inflows to Lake Wallace of up to 34% and to Lake Lyell of up to 24%. This is due to the commencement of the SWTP, which involves the cessation of discharges from Springvale Mine's LDP009 to the catchment, with mine water make transferred to the SWTP for use at Mount Piper Power Station.

The salt load of LDP006 discharges under future and proposed conditions was predicted to decrease by 27% and 5% respectively compared to existing conditions, as shown in Table 3-2. However, due to the associated decrease in water volume, the EC of LDP006 discharges was predicted to increase by up to 41% compared to existing conditions, as shown in Table 3-3. This was due to modelled improvements in the separation of the clean and dirty water management systems at the SCSS, resulting in clean water reporting to Wangcol Creek rather than LDP006. The impact of emplacing residuals from the SWTP at the SCSS under proposed conditions was modelled to increase the salt load at LDP006 by 31%, as shown in the comparison with future conditions, which resulted in a slight increase in EC of 1%.

The salt load and EC in Wangcol Creek was predicted by the water and salt balance modelling to decrease under future conditions compared to existing conditions, due to a reduction in salt yield from disturbed areas as they are rehabilitated and the future improvements in clean water management at the SCSS, with increase clean water contributing directly to Wangcol Creek rather than LDP006. The increase in EC modelled at LDP006 was predicted to increase the EC in Wangcol Creek by 16%

compared to future conditions. However, the changes to the clean water management system were found to mitigate the majority of this increase, with only a 1% increase in EC for proposed conditions compared to existing conditions.

The future changes to water management at SCSS was predicted to result in a negligible to slight decrease in the salt load and EC of the Coxs River at the inflow to Lake Wallace, Lake Lyell and Lake Burragorang compared to existing conditions. A more significant decrease in salt load and EC was observed under proposed conditions compared to both existing and future conditions. This occurred as a result of the SWTP under proposed conditions, with the treatment of mine water make using reverse osmosis processes to decrease EC and the reuse of this water at Mount Piper Power Station.

3.2 Scenario 2

Table 3-4, Table 3-5 and Table 3-6 present the changes in average results for existing, future and proposed conditions for Scenario 2 for water volume, salt load and EC respectively. This scenario modelled a reduced flow rate of 0.35 ML/day and reduced EC of 1,200 µS/cm for the residuals.

Table 3-4 Summary of change in water volume results for Scenario 2

Location	Existing conditions (ML/year)	Future conditions (ML/year)	Proposed conditions (ML/year)	Change between		
				Existing and future conditions	Existing and proposed conditions	Future and proposed conditions
1	848	441	544	-48%	-36%	23%
2	2,719	2,659	2,766	-2%	2%	4%
3	3,027	2,965	3,072	-2%	1%	4%
4	23,174	23,400	15,465	1%	-33%	-34%
5	33,616	33,826	25,822	1%	-23%	-24%
6	123,418	123,560	122,727	0%	-1%	-1%

Table 3-5 Summary of change in salt load results for Scenario 2

Location	Existing conditions (tonnes/year)	Future conditions (tonnes/year)	Proposed conditions (tonnes/year)	Change between		
				Existing and future conditions	Existing and proposed conditions	Future and proposed conditions
1	1,521	1,107	1,379	-27%	-9%	25%

Location	Existing conditions (tonnes/year)	Future conditions (tonnes/year)	Proposed conditions (tonnes/year)	Change between		
				Existing and future conditions	Existing and proposed conditions	Future and proposed conditions
2	1,815	1,553	1,825	-14%	1%	18%
3	1,838	1,575	1,848	-14%	1%	17%
4	10,221	10,174	3,941	0%	-61%	-61%
5	11,391	11,334	5,246	-1%	-54%	-54%
6	14,315	14,305	12,606	0%	-12%	-12%

Table 3-6 Summary of change in electrical conductivity results for Scenario 2

Location	Existing conditions (μS/cm)	Future conditions (μS/cm)	Proposed conditions (μS/cm)	Change between		
				Existing and future conditions	Existing and proposed conditions	Future and proposed conditions
1	2,680	3,750	3,780	40%	41%	1%
2	1,000	870	980	-13%	-2%	13%
3	910	790	900	-13%	-1%	14%
4	660	650	380	-2%	-42%	-42%
5	510	500	300	-2%	-41%	-40%
6	170	170	150	0%	-12%	-12%

Comparison of the results in Table 3-1 and Table 3-4 indicates that the reduced residuals flow rate from the SWTP to the SCSS was modelled to reduce LDP006 discharges slightly, by 25 ML/year on average. LDP006 discharges under proposed conditions compared to future conditions were predicted to increase by 23% (compared to 29% for Scenario 1). For proposed conditions compared to existing conditions, the overall decrease in LDP006 discharges was 36% for Scenario 2 (compared to a decrease of 33% for Scenario 1). The reduced residuals flow rate used in Scenario 2 was estimated to have a limited impact on the flow of Wangcol Creek compared to the results for Scenario 1, with no impact on results for the inflows to Lake Wallace and Lake Lyell.

The reduced flow rate and EC for the residuals stream modelled in Scenario 2 resulted in a reduced salt load for LDP006 discharges compared to Scenario 1, as shown in Table 3-5, and a corresponding decrease in EC of 10 µS/cm, as shown in Table 3-6. The EC of Wangcol Creek under proposed conditions compared to existing conditions was modelled to decrease by between 1% and 2% for Scenario 2 (compared to an increase of 1% for Scenario 1). As with the results for water volume, modelling of Scenario 2 indicated limited sensitivity for the salt load and EC of inflows to Lake Wallace, Lake Lyell and Lake Burragorang.

Sincerely
GHD Pty Ltd

Lachlan Hammersley
Senior Water Engineer
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Centennial Coal

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