

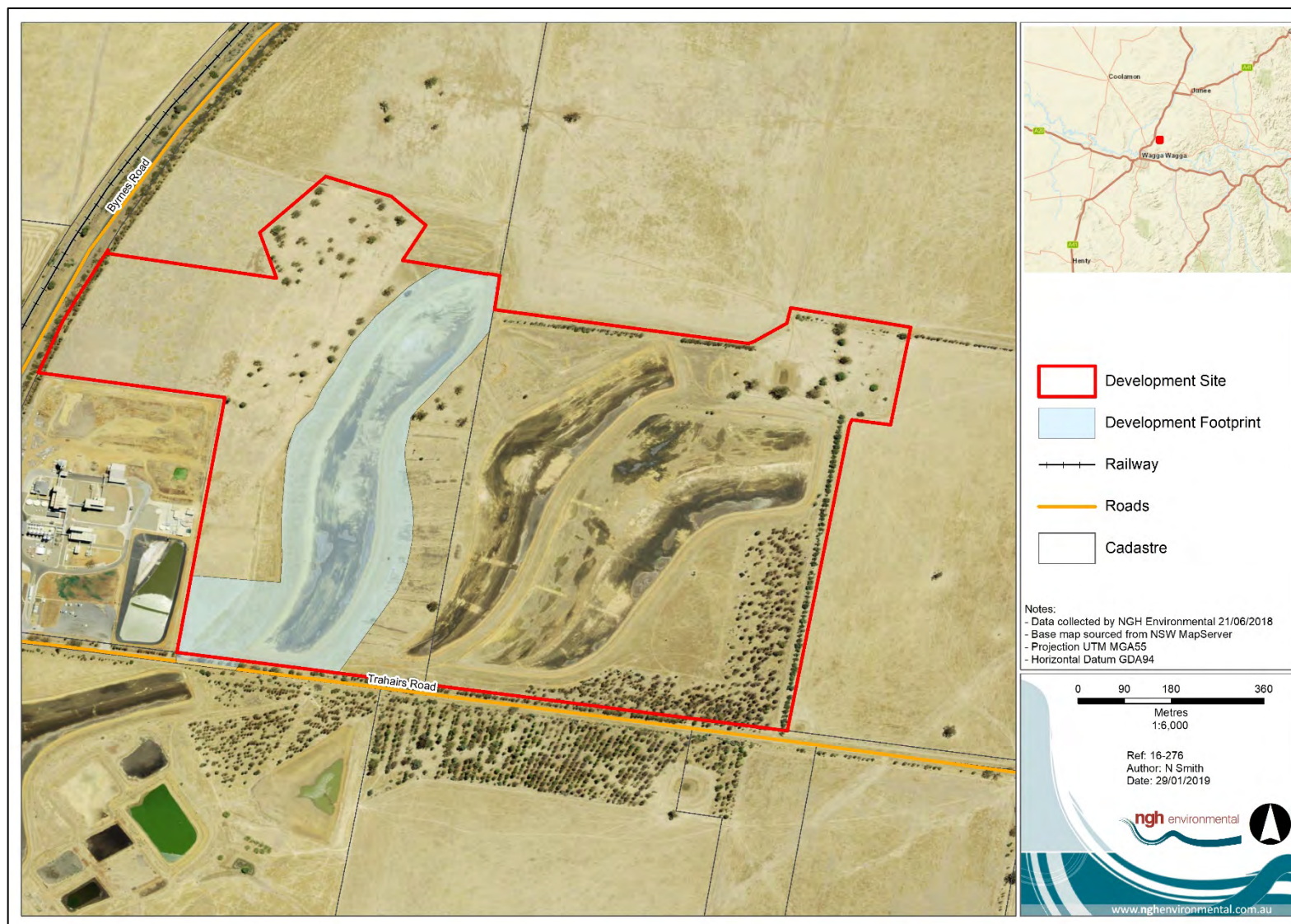


Figure 1-1 Location of proposed development site and development footprint

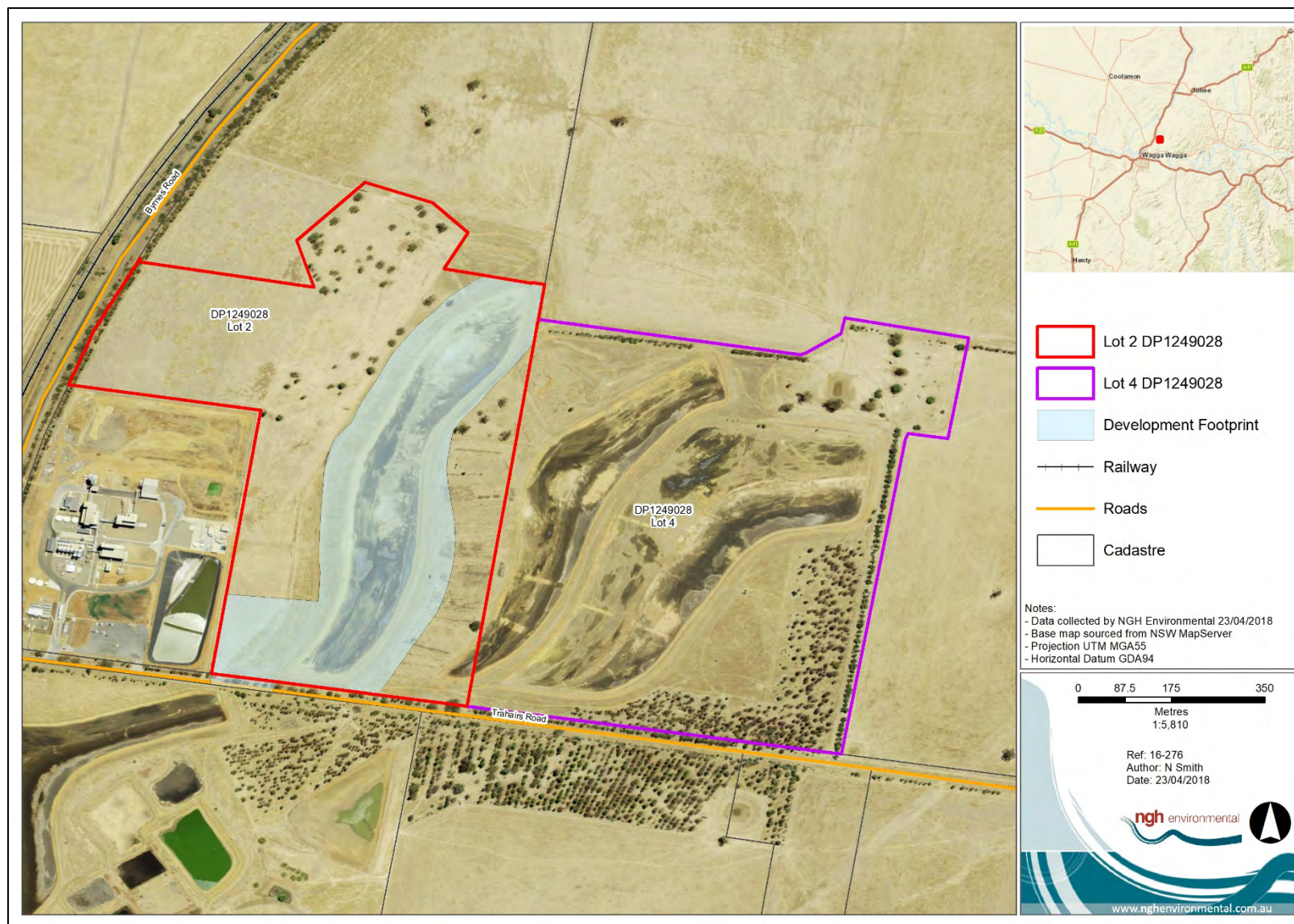


Figure 3-1 Development site and DP numbers.

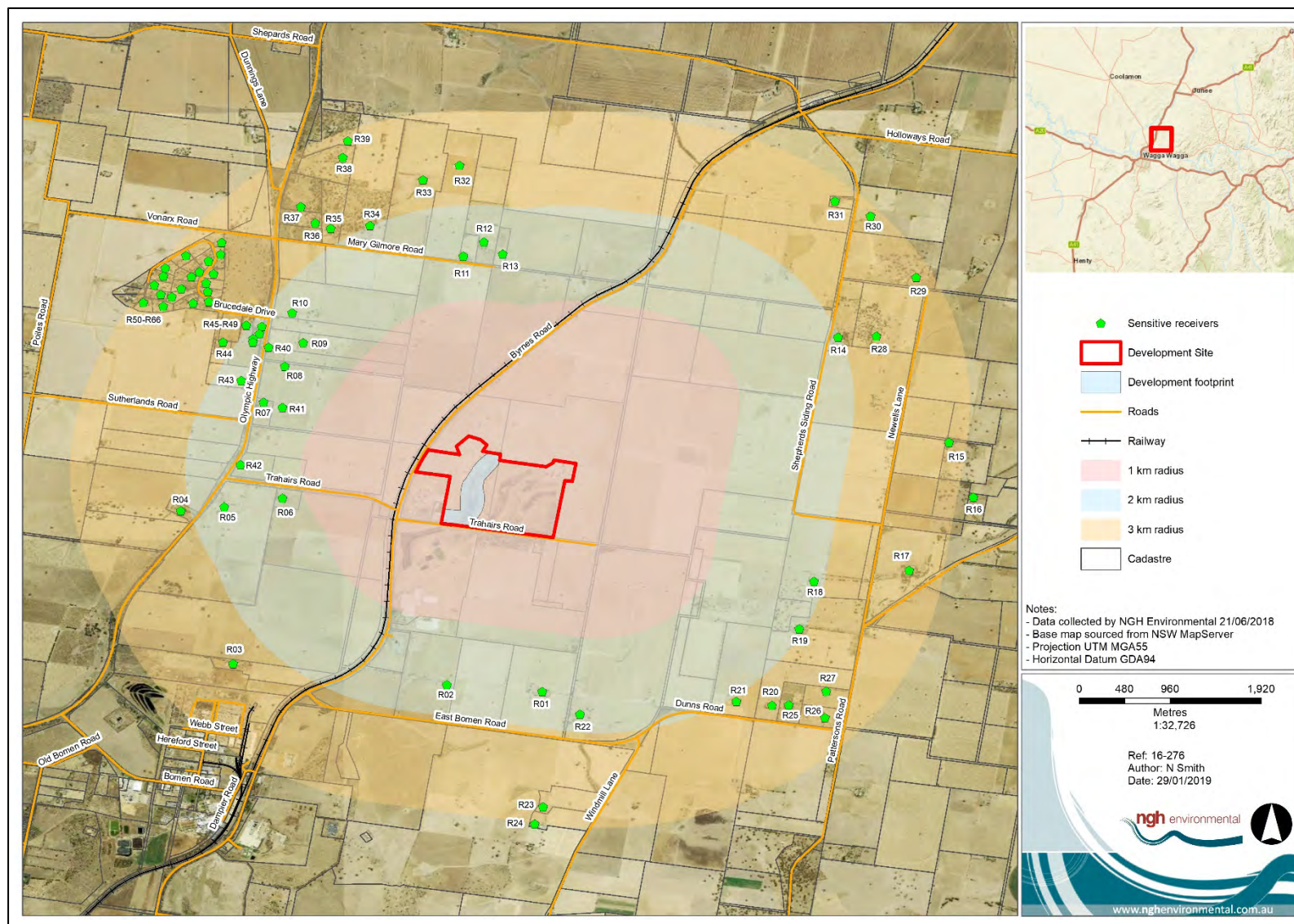


Figure 3-2 Sensitive receivers (residences) to the proposed development site



Figure 3-3 Proposal layout



Figure 3-4 Sub-catchments of the proposed development site

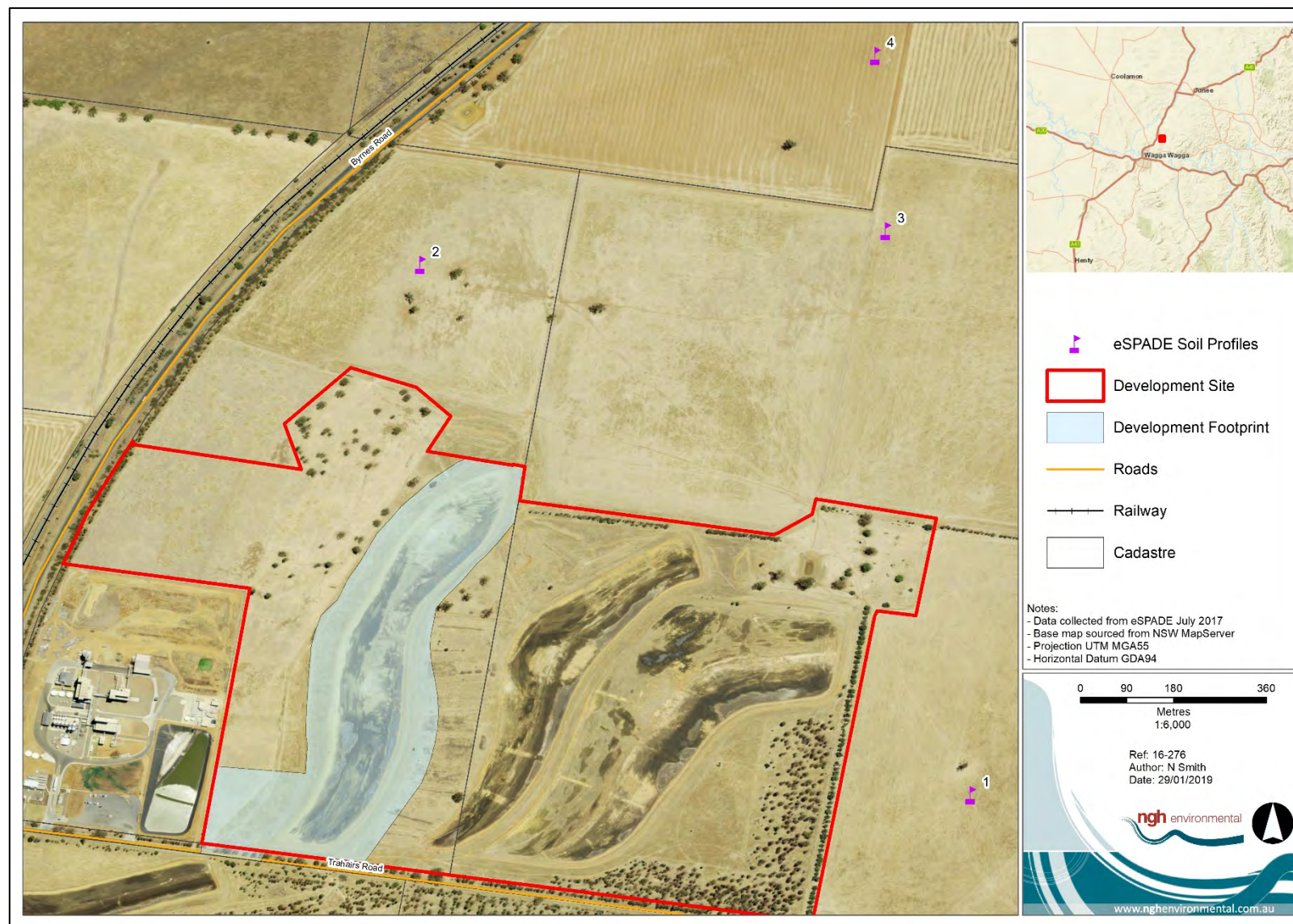


Figure 6-1 Location of eSPADE soil profiles in proximity to the development site

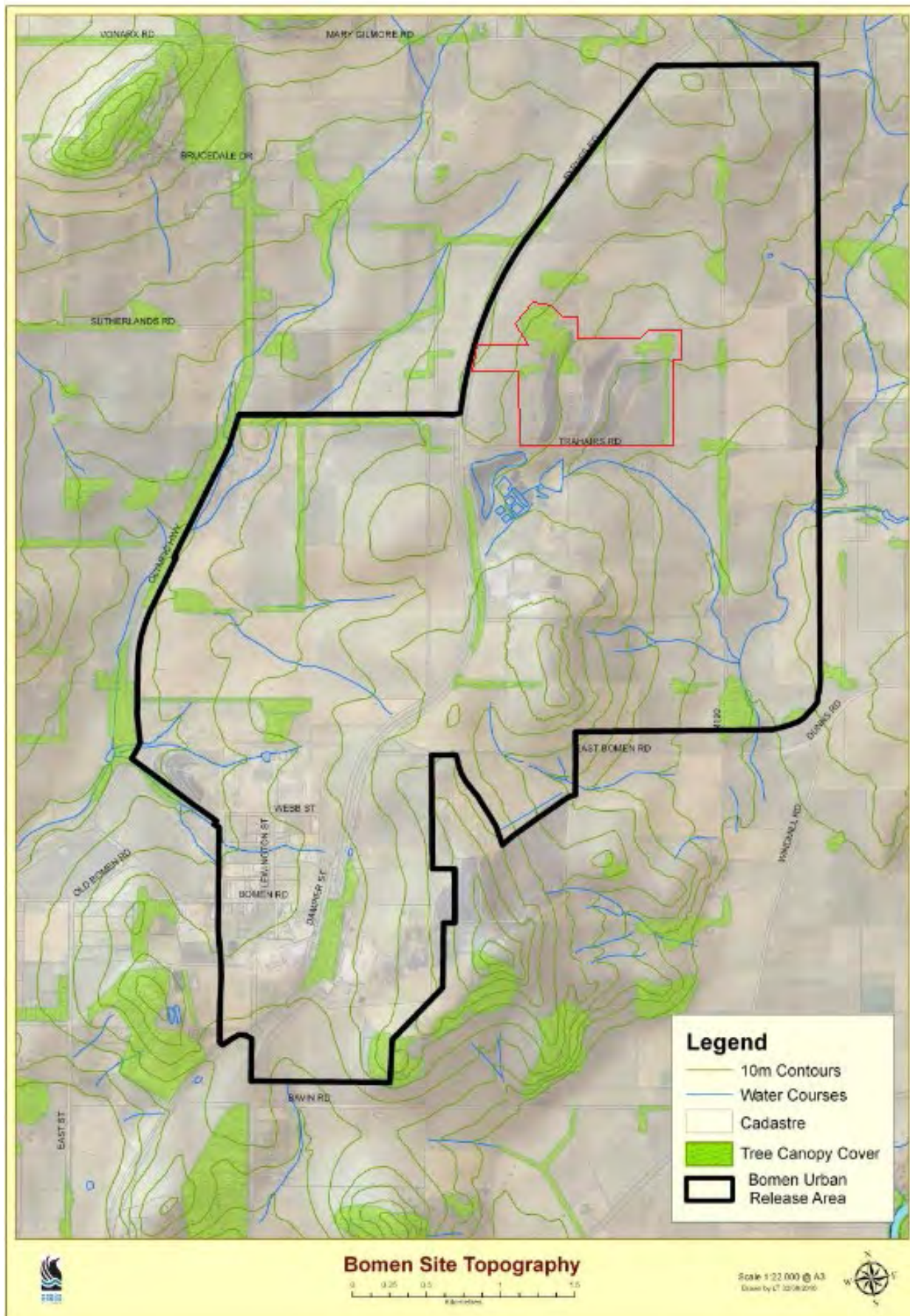


Figure 6-2 Drainage of Bomen industrial area, including development site (outlined in red).

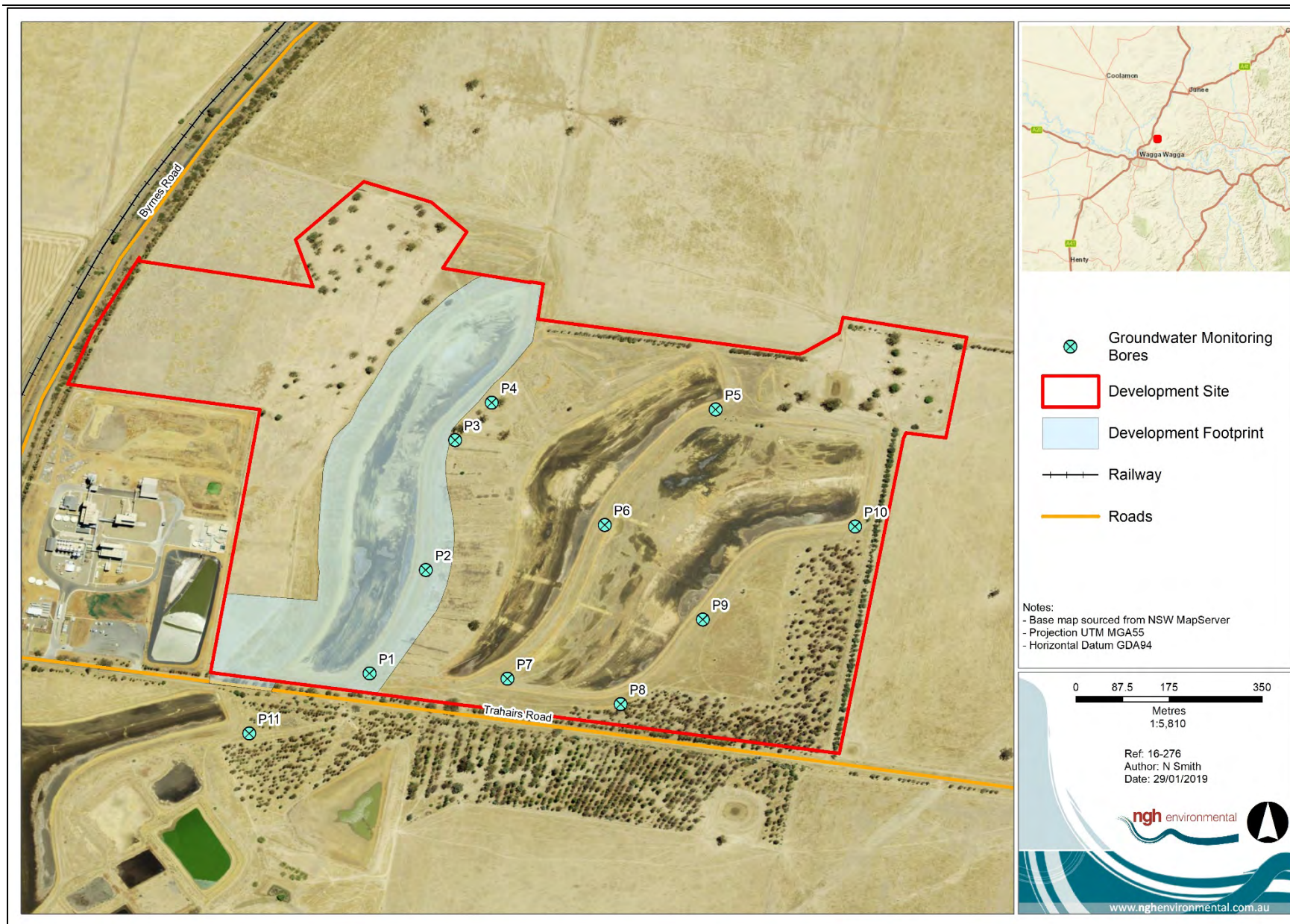


Figure 6-8 Groundwater monitoring bores in proximity to the development site

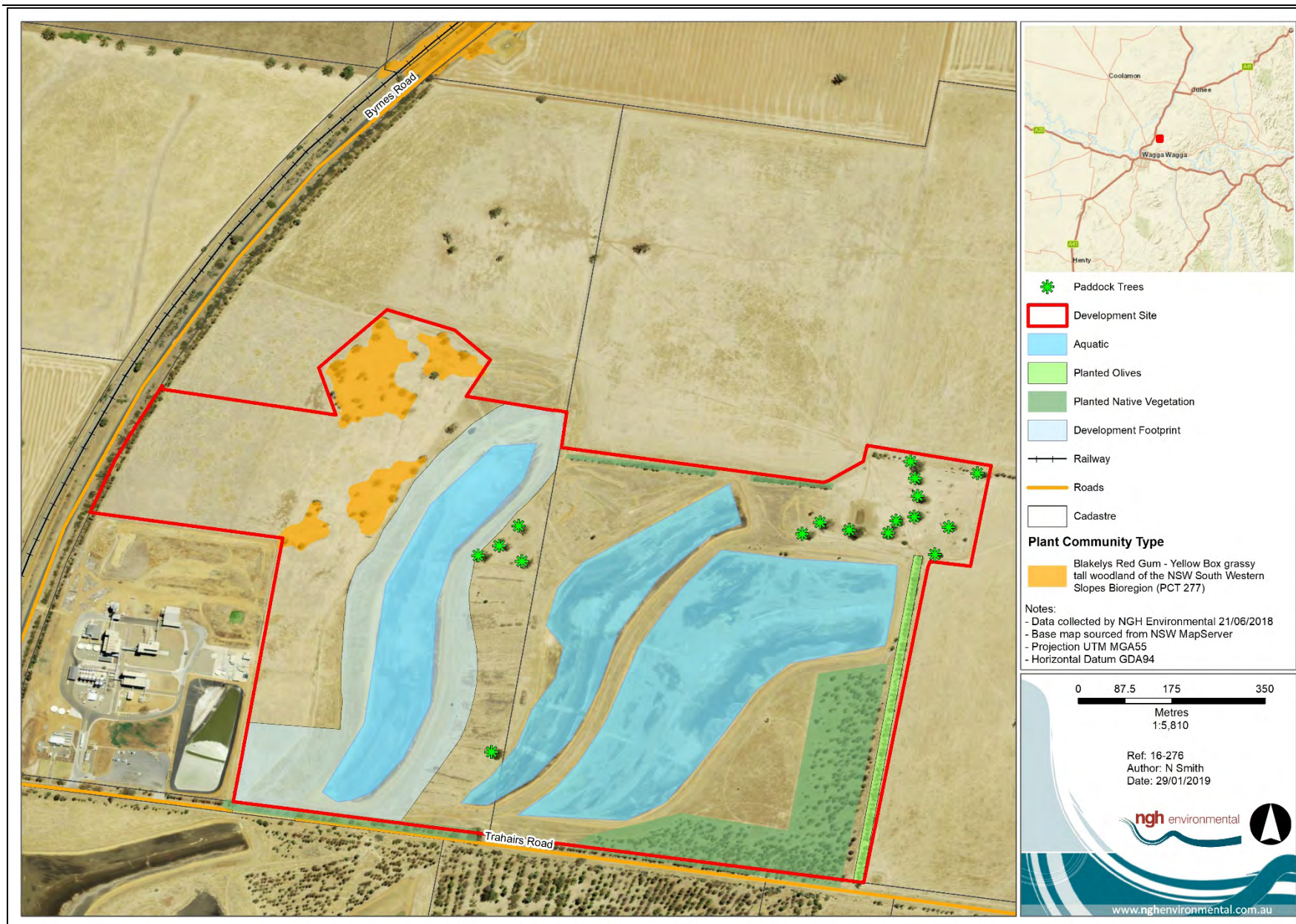


Figure 6-9 Vegetation mapping for the development site based on site inspection in December 2016 and OEH mapping

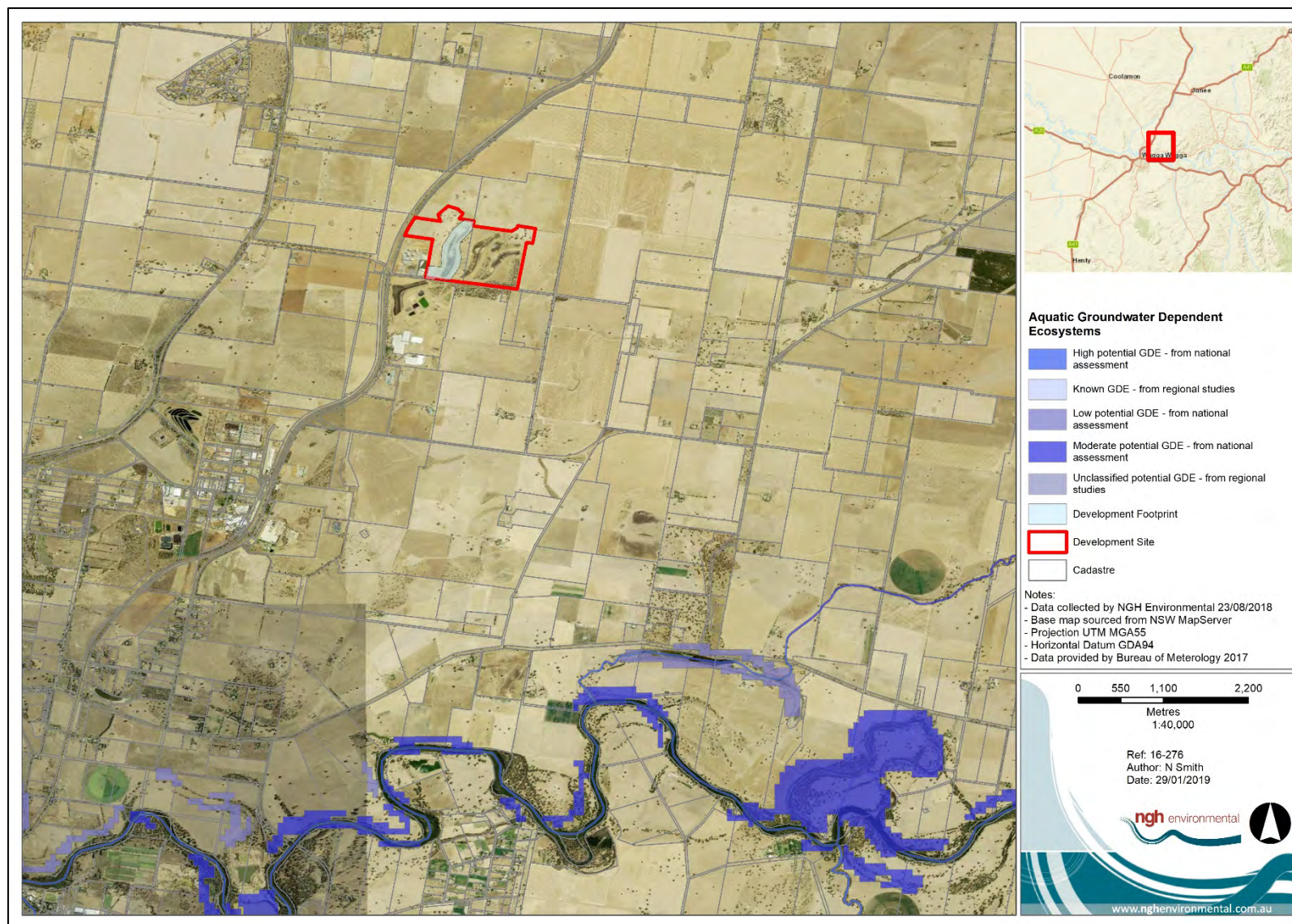


Figure 6-10 Aquatic groundwater dependent ecosystems in proximity to the development site, indicated by the red boundary

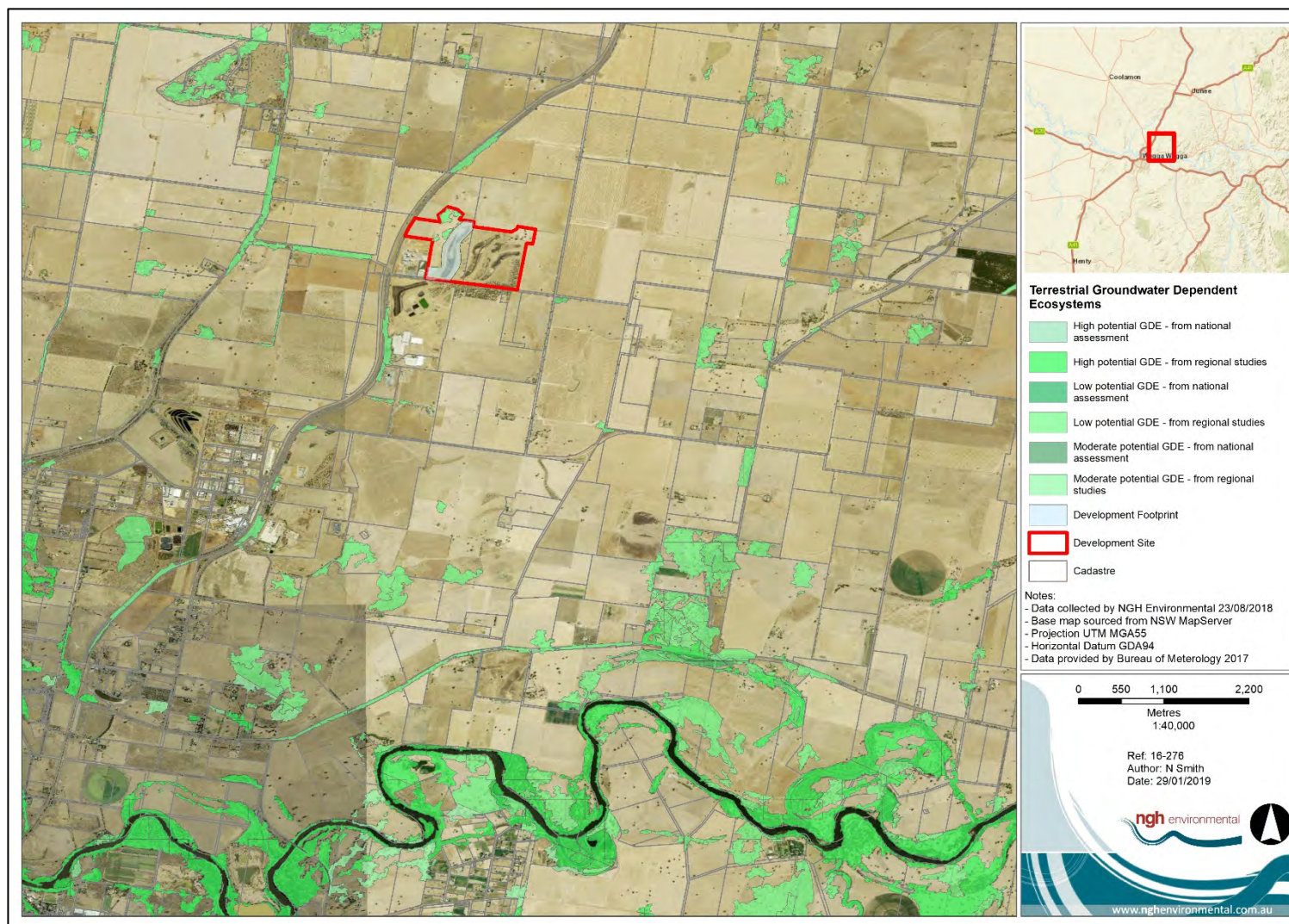


Figure 6-11 Terrestrial groundwater dependent ecosystems in proximity to the development site, indicated by the red boundary

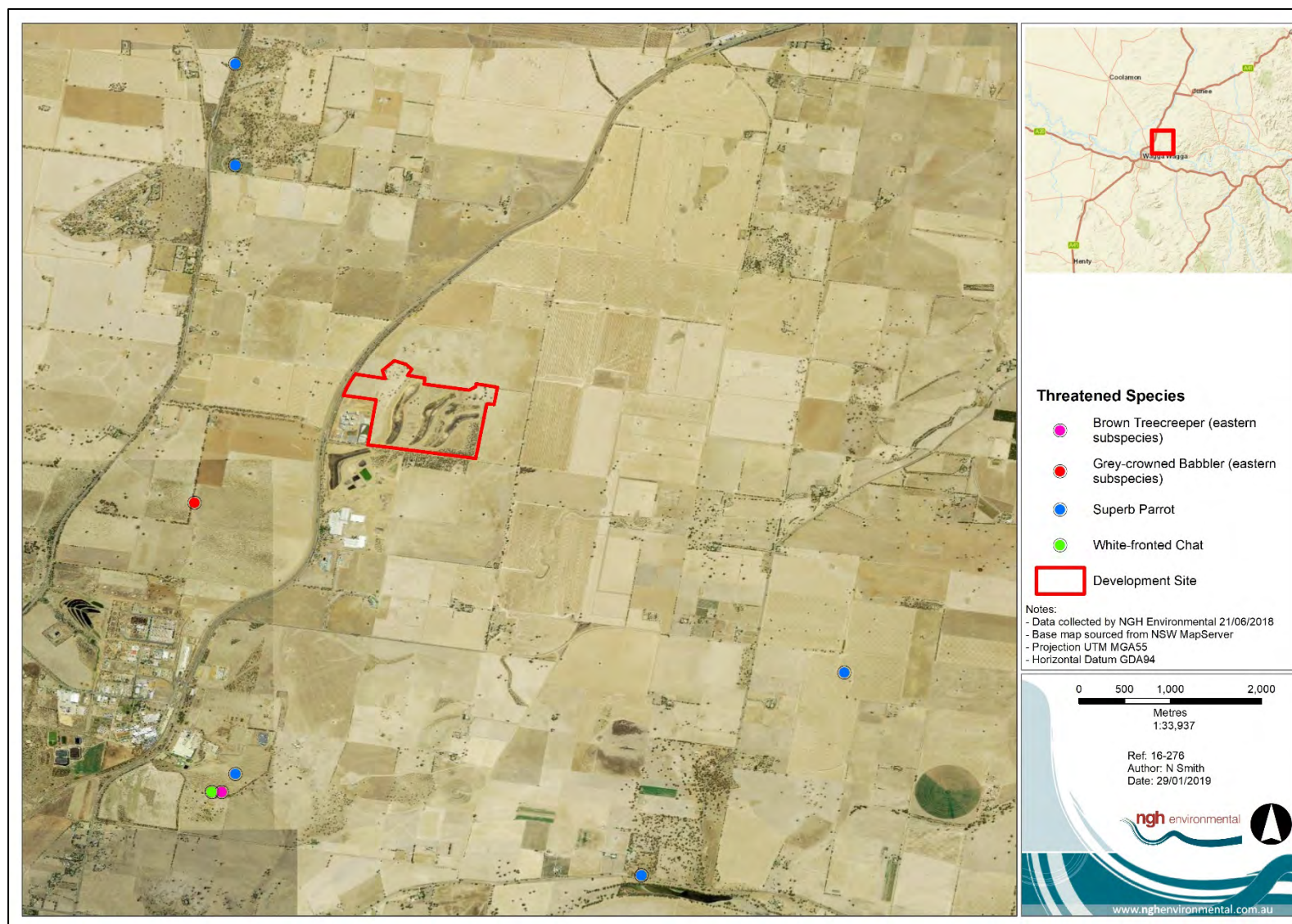


Figure 6-12 Threatened species records from NSW BioNet (2016)



Table 6-33 Traffic access at Trahairs Road for the North Ridge site (Source: SIX Maps 2017)

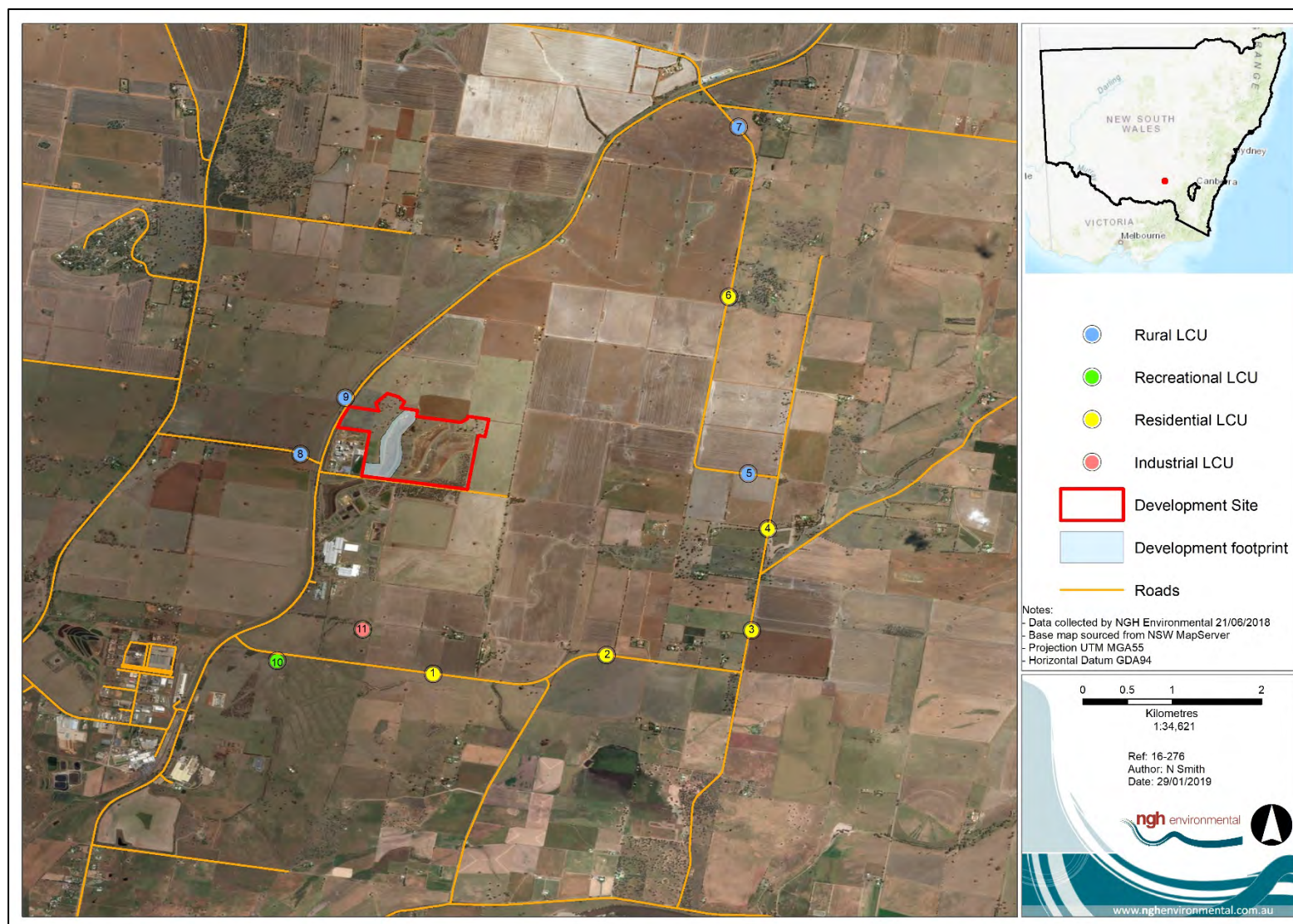


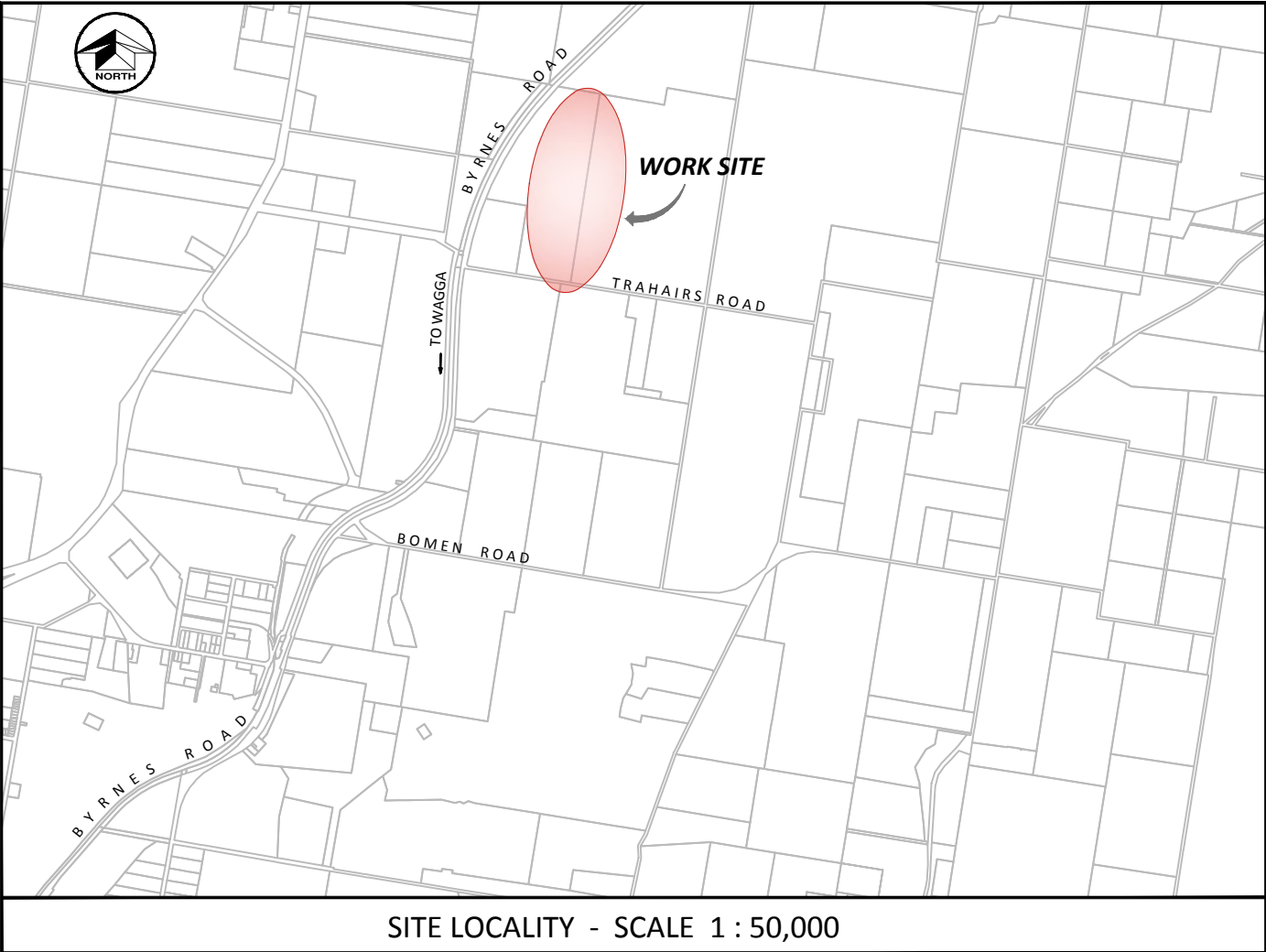
Figure 6-17 Viewpoint locations



NORTH RIDGE MATERIALS FACILITY

PROPOSED CELL 1 - STAGE 1

TRAHAIRS ROAD - BOMEN



INDEX		
SHEET DETAILS	SHEET NO.	ISSUE
TITLE	1	3
STAGE PLAN	2	3
OVERALL LAYOUT	3	3
DESIGN LAYOUT	4	3
CELL PROFILES	5	3
DESIGN DETAILS - BOTTOM OF BANK	6	3
DESIGN DETAILS - TOP OF BANK	7	3
SUBSOIL DRAINAGE LAYOUT	8	3
HDPE LINER ARRANGEMENT	9	3
LEACHATE LAYOUT	10	3
BANK PROFILE - LEACHATE FLUSH POINT	11	3
HDPE & PIPE CONNECTION DETAILS	12	3
ROAD & HARDSTAND DESIGN LAYOUT	13	3
HARDSTAND DESIGN CO-ORDINATES	14	3
CELL CROSS SECTIONS -1	15	3
CELL CROSS SECTIONS -2	16	3
CELL CROSS SECTIONS -3	17	3
INTRENAL VEHICLE MOVEMENT	18	3

Plan No.

SW101

Issue No.

3

Client:

THE NORTH RIDGE UNIT TRUST

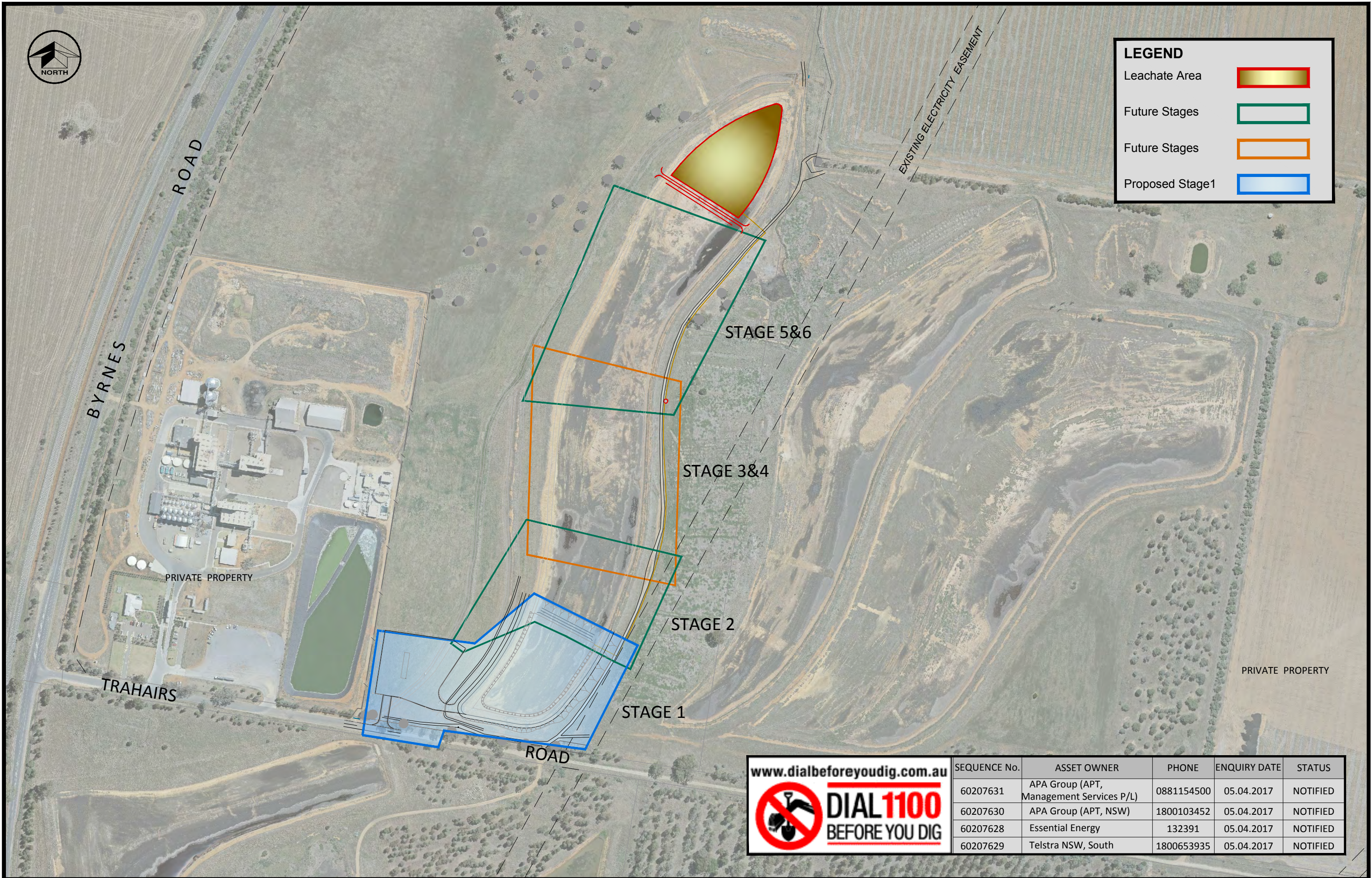
Associated Client:

ISSUED FOR COMMENT



LEGEND

- Leachate Area
- Future Stages
- Future Stages
- Proposed Stage1



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SEQUENCE No.	ASSET OWNER	PHONE	ENQUIRY DATE	STATUS
60207631	APA Group (APT, Management Services P/L)	0881154500	05.04.2017	NOTIFIED
60207630	APA Group (APT, NSW)	1800103452	05.04.2017	NOTIFIED
60207628	Essential Energy	132391	05.04.2017	NOTIFIED
60207629	Telstra NSW, South	1800653935	05.04.2017	NOTIFIED

3	LEACHATE POND SIZE & HARDSTAND DETAILS AMENDED	08.10.2017
2	DETAILS AMENDED	28.08.2017
1	ISSUED FOR COMMENTS	31.07.2017
REVISION	AMENDMENT :	ISSUED
SCALE		
On A3 Sheet 1:4000		

A. Fenwick	
CHECKED BY	CLIENT APPROVED
DESIGN: Z.Wrobel	DATE: 21/07/2017

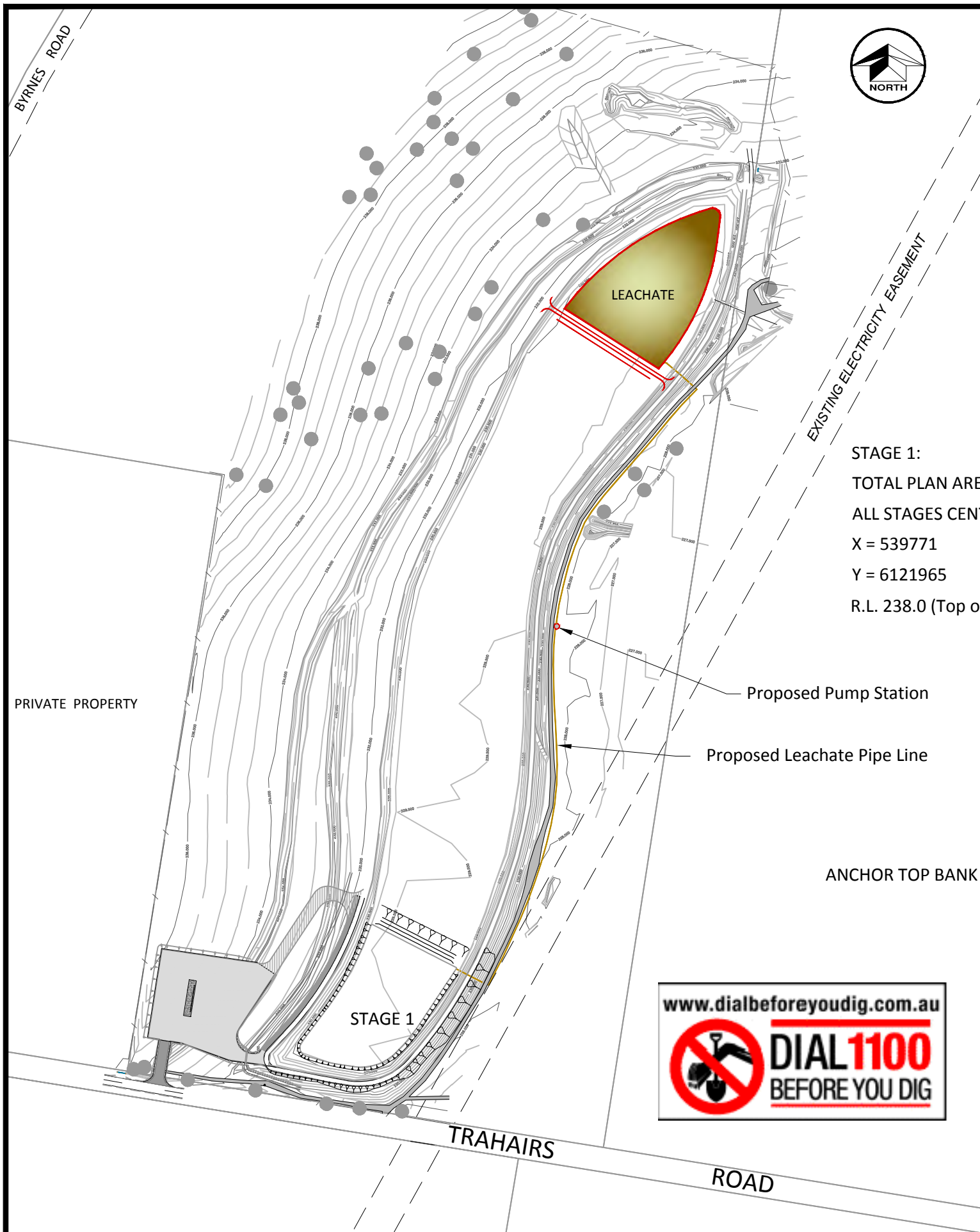
NOTES:
ALL DIMENSIONS TO BE CHECKED ON SITE BY SUPERINTENDENT PRIOR TO CONSTRUCTION. USE WRITTEN DIMENSIONS WERE ASSIGNED.

Client:
North Ridge Pty Ltd
Associated Client: ngh environmental

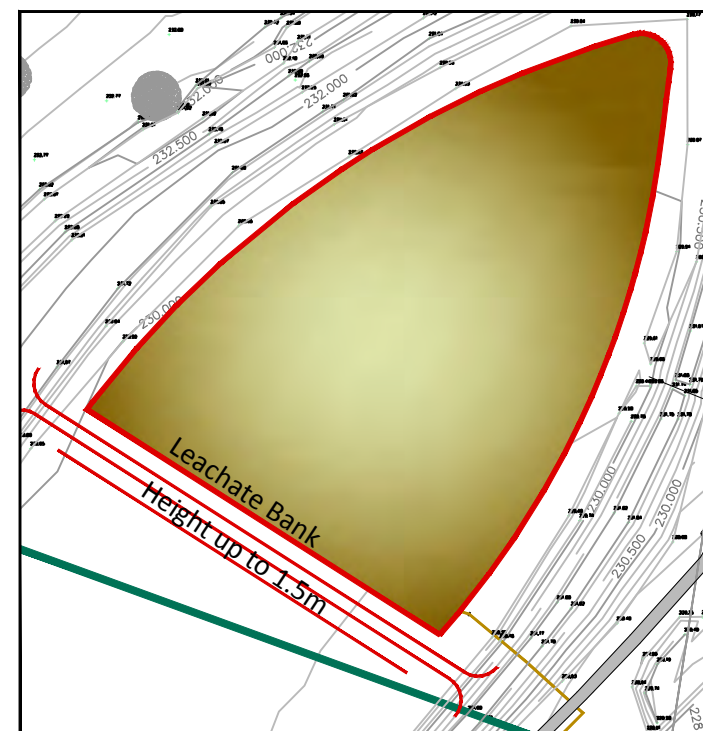
ENGINEERING PROJECT SOLUTIONS AUSTRALIA
Mob: +61405463692 +61402524359
Project Design Project Management Engineering Consulting

NORTH RIDGE MATERIALS FACILITY
PROPOSED CELL 1 - STAGE 1
STAGE PLAN

PLAN NO.
SW101
SHEET 02 of 18 SHEET
ISSUED FOR COMMENT



STAGE 1:
 TOTAL PLAN AREA = 86688.533 m²
 ALL STAGES CENTER COORDINATES
 X = 539771
 Y = 6121965
 R.L. 238.0 (Top of Cover)



PROPOSED LEACHATE AREA

LEACHATE AREA = 9084.45 m²
 MAX DEPTH = 1.5 m
 FREEBOARD = 0.5 m
 LEACHATE AREA COORDINATES
 X = 539917.1
 Y = 6122239.8
 R.L. 229.5 (Floor Level)

QUANTITIES

300mm DEPTH FREE DRAINING MATERIAL	2651 m ³ (solid)	LEACHATE LAYER
500mm DEPTH COMPACTED CLAY	7635 m ³ (solid)	CLAY LAYER
300mm DEPTH IN-SITUE COMPACTED CLAY	3902 m ³ (solid)	CLAY LAYER
EXCAVATION TO BASE OF 500mm LAYER	14030 m ³ (solid)	4209 non-constructable
WEST BANK		
SOUTH BANK		
EAST BANK		
	3771 m ³ (solid)	
150Ø SUBSOIL DRAINAGE CLASS 1000	870 m	
100Ø LEACHATE DRAINAGE CLASS 1000	870 m	
150Ø LEACHATE CLASS SEH	220 m	
HDPE LINER (2mm)	16000 m ²	
ROAD : PAVEMENT	 m ³	
SEAL	330 m ²	
HARDSTAND AREA	6662 m ²	

3	LEACHATE POND SIZE & HARDSTAND DETAILS AMENDED	08.10.2017
2	DETAILS AMENDED	28.08.2017
1	ISSUED FOR COMMENTS	31.07.2017
REVISION	AMENDMENT :	ISSUED
SCALE	0 50 100 200 M	DATUM AHD
On A3 Sheet 1:4000		

A. Fenwick	
CHECKED BY	CLIENT APPROVED
DESIGN: Z.Wrobel	DATE: 21/07/2017

NOTES:
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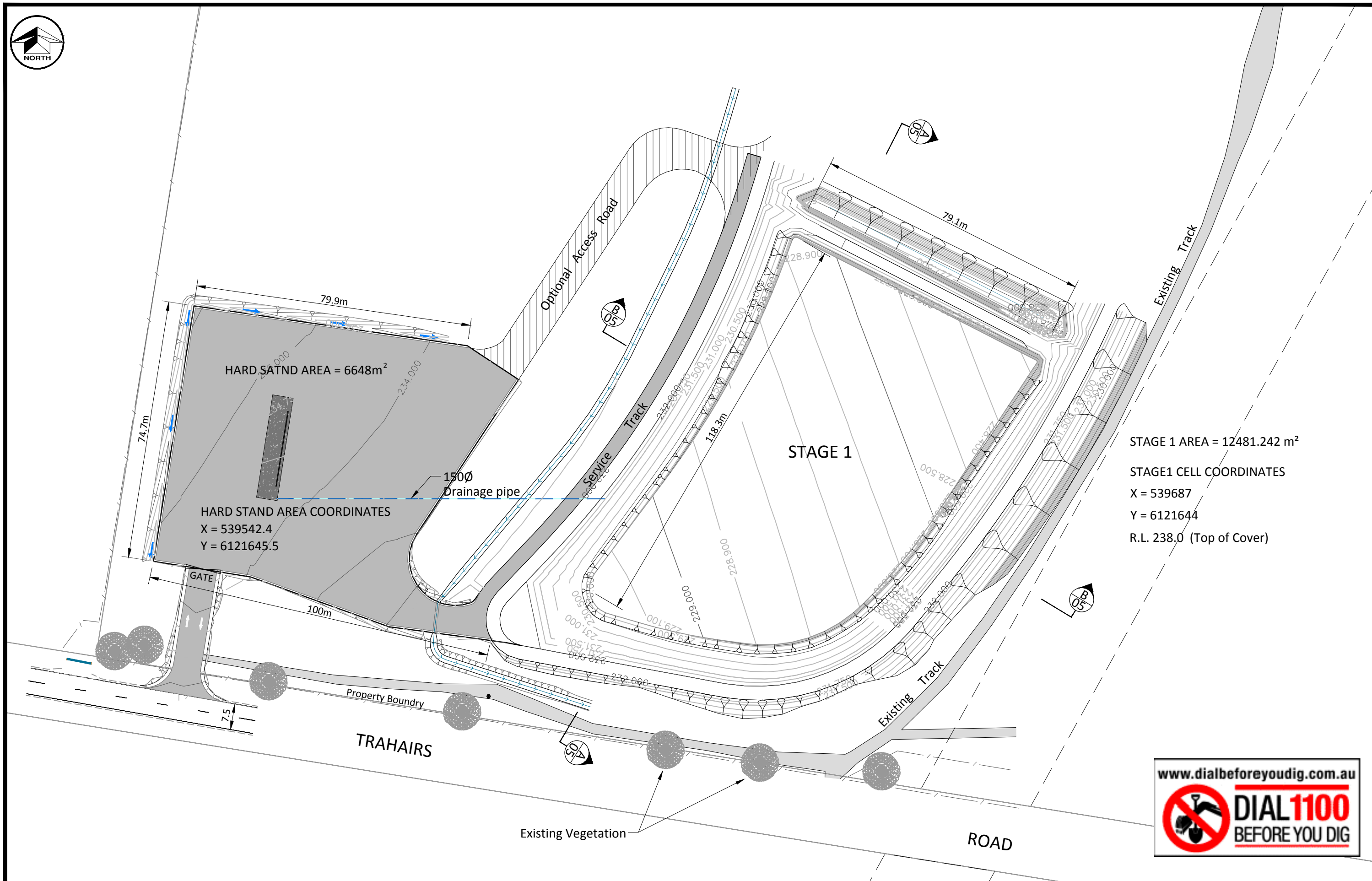
Client:
North Ridge Pty Ltd
 Associated Client:
ngh environmental

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 Project Design Project Management
 Engineering Consulting

NORTH RIDGE MATERIALS FACILITY
 PROPOSED CELL 1 - STAGE 1
OVERALL LAYOUT

PLAN NO.
SW101
 SHEET 03 of 18 SHEET

ISSUED FOR COMMENT



STAGE 1 AREA = 12481.242 m²

STAGE1 CELL COORDINATES

X = 539687

Y = 6121644

R.L. 238.0 (Top of Cover)



3	ROAD & HARDSTAND DETAILS AMENDED	08.10.2017	A. Ferwick	
2	DETAILS AMENDED	28.08.2017	CHECKED BY	CLIENT APPROVED
1	ISSUED FOR COMMENTS	31.07.2017		
REVISION	AMENDMENT :	ISSUED		
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NOTES:
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SUPERINTENDENT PRIOR TO CONSTRUCTION. USE
WRITTEN DIMENSIONS WERE ASSIGNED.

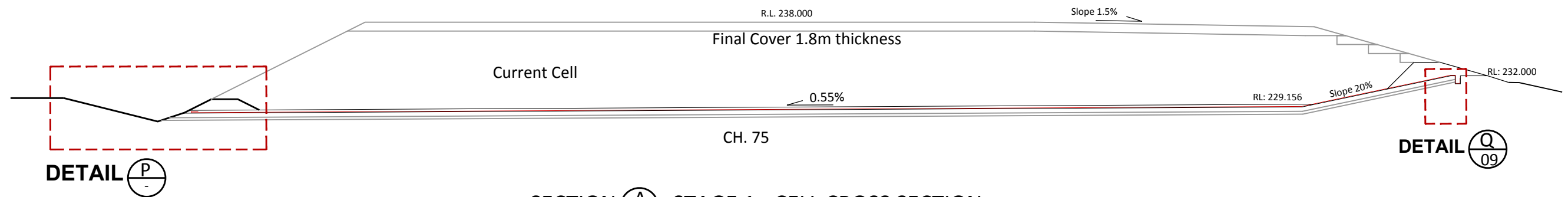
Client:
North Ridge Pty Ltd
Associated Client:
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Project Design Project Management
Engineering Consulting

NORTH RIDGE MATERIALS FACILITY
PROPOSED CELL 1 - STAGE 1
DESIGN LAYOUT

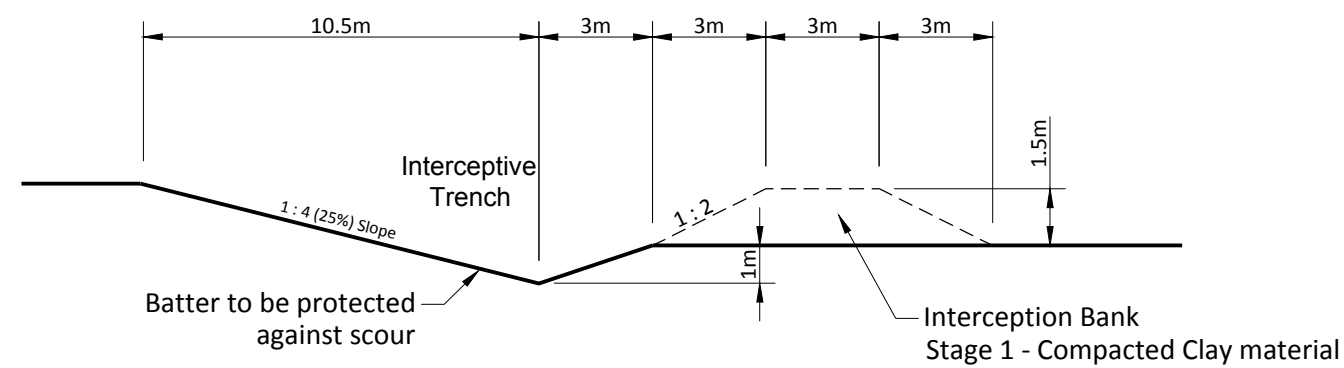
PLAN NO.
SW101
SHEET 04 of 18 SHEET

ISSUED FOR COMMENT



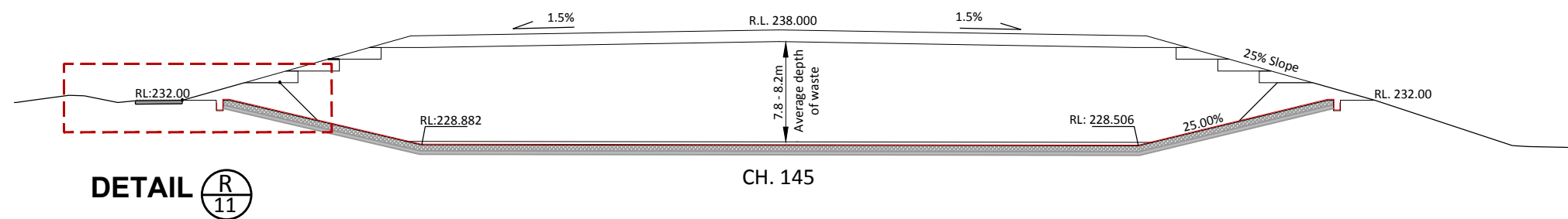
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SCALE 1 : 500



DETAIL $\frac{P}{04}$: INTERCEPTION BANK PROFILE

SCALE 1 : 200



SECTION $\frac{B}{04}$: STAGE 1 - CELL CROSS SECTION

SCALE 1 : 500

					NOTES: ALL DIMENSIONS TO BE CHECKED ON SITE BY SUPERINTENDENT PRIOR TO CONSTRUCTION. USE WRITTEN DIMENSIONS WERE ASSIGNED.	Client: North Ridge Pty Ltd Associated Client: 	 Mob: +61405463692 +61402524359 Project Design Project Management Engineering Consulting	NORTH RIDGE MATERIALS FACILITY PROPOSED CELL 1 - STAGE 1 CELL PROFILES	PLAN NO. SW101
3	SECTION DETAILS DETAILS AMENDED	08.10.2017	A. Fenwick CHECKED BY CLIENT APPROVED	SHEET 05 of 18 SHEET					
2	DETAILS AMENDED	28.08.2017							
1	ISSUED FOR COMMENTS	31.07.2017							
REVISION	AMENDMENT :	ISSUED	ISSUED FOR COMMENT						
SCALE AS SHOWN		DATUM AHD	DESIGN: Z.Wrobel DATE: 21/07/2017						

Horizontal Alignment Report

Model: DESIGN1A
String: MCB1
Units: Metric

*****Element B001 Straight*****

Begin on Straight Chainage 0+000.000
Begin on Straight X 539752.858
Begin on Straight Y 6121674.196
Bearing 33 18 24.666
Length 3.412
Straight End Chainage 0+003.412
Straight End X 539754.731
Straight End Y 6121677.047

*****Element B009 Arc*****

Arc Start Chainage 0+003.412
Arc Start X 539754.731
Arc Start Y 6121677.047
Radius .500
Hand of Arc Left
Arc Centre X 539754.313
Arc Centre Y 6121677.322
Arc End Chainage 0+004.250
Arc End X 539754.542
Arc End Y 6121677.766

*****Element B002 Straight*****

Straight Start Chainage 0+004.250
Straight Start X 539754.542
Straight Start Y 6121677.766
Bearing 297 10 59.370
Length 77.679
Straight End Chainage 0+081.929
Straight End X 539685.442
Straight End Y 6121713.253

*****Element B010 Arc*****

Arc Start Chainage 0+081.929
Arc Start X 539685.442
Arc Start Y 6121713.253
Radius 1.000
Hand of Arc Left
Arc Centre X 539684.985
Arc Centre Y 6121712.364
Arc End Chainage 0+083.624
Arc End X 539684.046
Arc End Y 6121712.707

*****Element B003 Straight*****

Straight Start Chainage 0+083.624
Straight Start X 539684.046
Straight Start Y 6121712.707
Bearing 200 04 50.664
Length 5.364
Straight End Chainage 0+088.988
Straight End X 539682.204
Straight End Y 6121707.669

*****Element B011 Arc*****

Arc Start Chainage 0+088.988
Arc Start X 539682.204
Arc Start Y 6121707.669
Radius 250.000
Hand of Arc Right
Arc Centre X 539447.402
Arc Centre Y 6121793.505
Arc End Chainage 0+162.654
Arc End X 539647.156
Arc End Y 6121643.178

*****Element B004 Straight*****

Straight Start Chainage 0+162.654
Straight Start X 539647.156
Straight Start Y 6121643.178
Bearing 216 57 49.658
Length 33.705
Straight End Chainage 0+196.359
Straight End X 539626.889
Straight End Y 6121616.247

*****Element B012 Arc*****

Arc Start Chainage 0+196.359
Arc Start X 539626.889
Arc Start Y 6121616.247
Radius 7.500
Hand of Arc Left
Arc Centre X 539632.882
Arc Centre Y 6121611.737
Arc End Chainage 0+210.883
Arc End X 539630.814
Arc End Y 6121604.528

*****Element B006 Straight*****

Straight Start Chainage 0+210.883
Straight Start X 539630.814
Straight Start Y 6121604.528
Bearing 106 00 18.975
Length 11.261
Straight End Chainage 0+222.144
Straight End X 539641.638
Straight End Y 6121601.423

*****Element B013 Arc*****

Arc Start Chainage 0+222.144
Arc Start X 539641.638
Arc Start Y 6121601.423
Radius 150.000
Hand of Arc Left
Arc Centre X 539682.997
Arc Centre Y 6121745.608
Arc End Chainage 0+243.383
Arc End X 539662.400
Arc End Y 6121597.029

*****Element B005 Straight*****

Straight Start Chainage 0+243.383
Straight Start X 539662.400
Straight Start Y 6121597.029
Bearing 97 53 33.432
Length 8.243
Straight End Chainage 0+251.626
Straight End X 539670.564
Straight End Y 6121595.897

*****Element B014 Arc*****

Arc Start Chainage 0+251.626
Arc Start X 539670.564
Arc Start Y 6121595.897
Radius 40.000
Hand of Arc Left
Arc Centre X 539676.057
Arc Centre Y 6121635.519
Arc End Chainage 0+288.995
Arc End X 539704.653
Arc End Y 6121607.549

*****Element B007 Straight*****

Straight Start Chainage 0+288.995
Straight Start X 539704.653
Straight Start Y 6121607.549
Bearing 44 21 54.984
Length 3.521
Straight End Chainage 0+292.516
Straight End X 539707.115
Straight End Y 6121610.066

*****Element B015 Arc*****

Arc Start Chainage 0+292.516
Arc Start X 539707.115
Arc Start Y 6121610.066
Radius 150.000
Hand of Arc Left
Arc Centre X 539599.880
Arc Centre Y 6121714.951
Arc End Chainage 0+320.784
Arc End X 539724.865
Arc End Y 6121632.012

*****Element B008 Straight*****

Straight Start Chainage 0+320.784
Straight Start X 539724.865
Straight Start Y 6121632.012
Bearing 33 34 03.651
Length 50.616
Finish on Straight Chainage 0+371.399
Finish on Straight X 539752.851
Finish on Straight Y 6121674.187

Vertical Alignment Report

Model: DESIGN1A
String: MCB1
Units: Metric

*****Element 1 Grade*****

Gradient -.598
Begin on Gradient Chainage 0+000.000
Begin on Gradient Level 228.200
Gradient Length 4.250
End on Gradient Chainage 0+004.250
Gradient End Level 228.175

*****Element 2 Grade*****

Gradient .501
Begin on Gradient Chainage 0+004.250
Begin on Gradient Level 228.175
Gradient Length 82.544
Gradient End Chainage 0+086.794
Gradient End Level 228.588

*****Element 3 Grade*****

Gradient .504
Gradient Start Chainage 0+086.794
Grade Start Level 228.588
Gradient Length 116.323
Gradient End Chainage 0+203.117
Gradient End Level 229.175

*****Element 4 Vertical Curve*****

Curve Start Gradient .504
Curve End Gradient -.645
Curve Start Chainage 0+203.117
Curve Start Level 229.175
IP Chainage 0+208.117
IP Level 229.200
Curve Length 10.000
Curve End Chainage 0+213.117
Curve End Level 229.168

*****Element 5 Grade*****

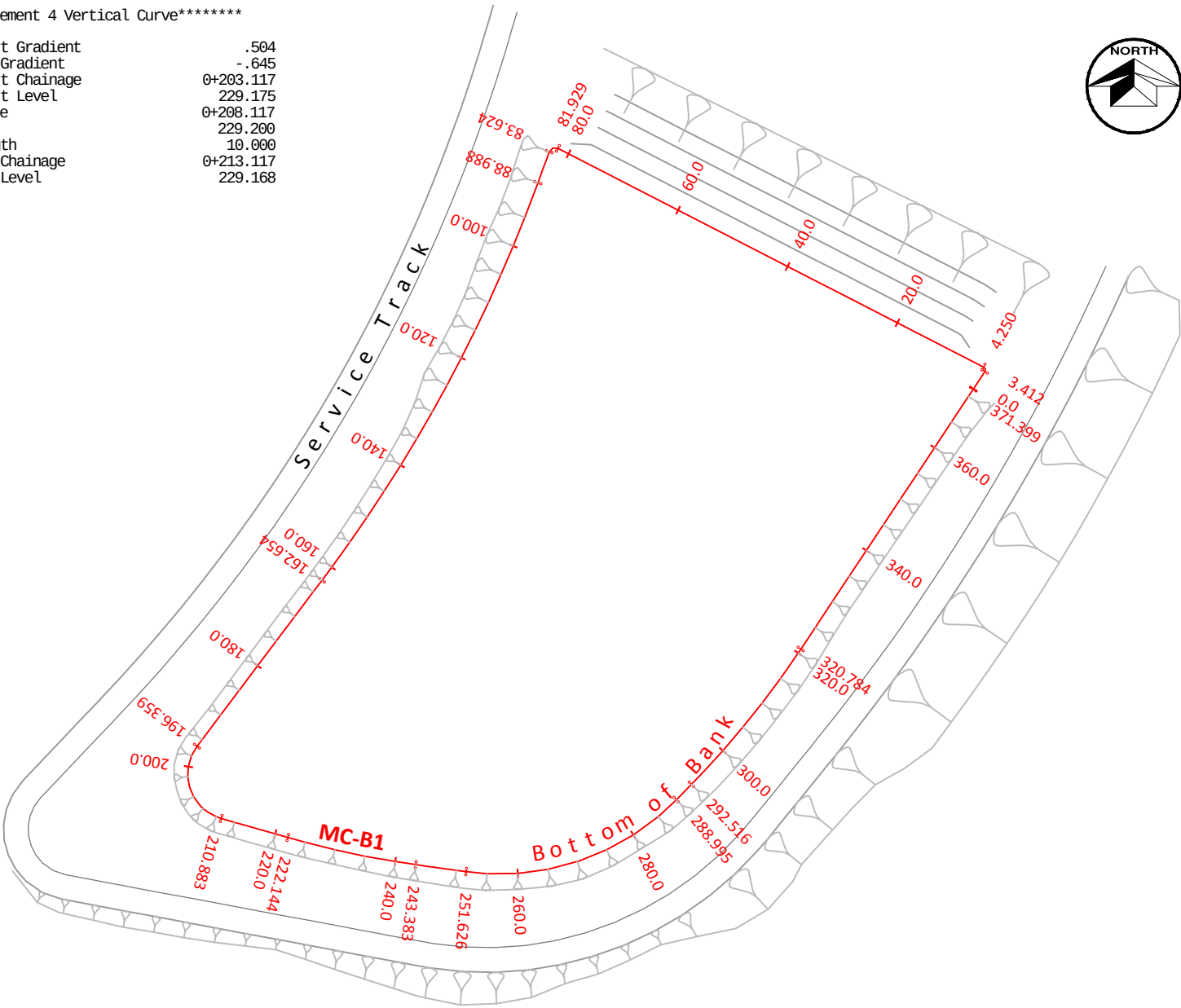
Gradient -.645
Gradient Start Chainage 0+213.117
Grade Start Level 229.168
Gradient Length 46.758
Gradient End Chainage 0+259.874
Gradient End Level 228.866

*****Element 6 Vertical Curve*****

Curve Start Gradient -.645
Curve End Gradient -.595
Curve Start Chainage 0+259.874
Curve Start Level 228.866
IP Chainage 0+264.874
IP Level 228.834
Curve Length 10.000
Curve End Chainage 0+269.874
Curve End Level 228.804

*****Element 7 Grade*****

Gradient -.595
Gradient Start Chainage 0+269.874
Grade Start Level 228.804
Gradient Length 101.525
End on Gradient Chainage 0+371.399
Gradient End Level 228.200



				NOTES:	Client:	ENGINEERING PROJECT SOLUTIONS AUSTRALIA	NORTH RIDGE MATERIALS FACILITY PROPOSED CELL 1 - STAGE 1	PLAN NO.
3	BOTTOM OF BANK DESIGN AMENDED	08.10.2017	A.Fenwick	ALL DIMENSIONS TO BE CHECKED ON SITE BY	North Ridge Pty Ltd			SW101
2	DETAILS AMENDED	28.08.2017		SUPERINTENDENT PRIOR TO CONSTRUCTION. USE	Associated Client: nghenvironmental			
1	ISSUED FOR COMMENTS	31.07.2017	CHECKED BY	WRITTEN DIMENSIONS WERE ASSIGNED.				
REVISION	AMENDMENT :	ISSUED	CLIENT APPROVED					
SCALE	0 10 20 30 40 50	DATUM AHD	DESIGN: Z.Wrobel	DATE: 21/07/2017		Mob: +61405463692 +61402524359	DESIGN DETAILS - BOTTOM OF BANK	SHEET 06 of 18 SHEET
On A3 Sheet 1:1000						Project Design Project Management Engineering Consulting		ISSUED FOR COMMENT

Horizontal Alignment Report

Model: DESIGN1A
String: MCTB
Units: Metric

*****Element 1 Straight*****

Begin on Straight Chainage 0+000.000
Begin on Straight X 539774.376
Begin on Straight Y 6121694.094
Bearing 204 52 59.974
Length 5.141
Straight End Chainage 0+005.141
Straight End X 539772.213
Straight End Y 6121689.430

*****Element 2 Arc*****

Arc Start Chainage 0+005.141
Arc Start X 539772.213
Arc Start Y 6121689.430
Radius 350.000
Hand of Arc Right
Arc Centre X 539454.704
Arc Centre Y 6121836.700
Arc End Chainage 0+091.874
Arc End X 539726.391
Arc End Y 6121616.050

*****Element 3 Straight*****

Straight Start Chainage 0+091.874
Straight Start X 539726.391
Straight Start Y 6121616.050
Bearing 219 04 54.131
Length 15.668
Straight End Chainage 0+107.542
Straight End X 539716.513
Straight End Y 6121603.888

*****Element 4 Arc*****

Arc Start Chainage 0+107.542
Arc Start X 539716.513
Arc Start Y 6121603.888
Radius 55.000
Hand of Arc Right
Arc Centre X 539673.820
Arc Centre Y 6121638.561
Arc End Chainage 0+166.599
Arc End X 539663.699
Arc End Y 6121584.500

*****Element 5 Straight*****

Straight Start Chainage 0+166.599
Straight Start X 539663.699
Straight Start Y 6121584.500
Bearing 280 36 12.519
Length 59.131
Straight End Chainage 0+225.730
Straight End X 539605.577
Straight End Y 6121595.381

*****Element 6 Arc*****

Arc Start Chainage 0+225.730
Arc Start X 539605.577
Arc Start Y 6121595.381
Radius 7.500
Hand of Arc Right
Arc Centre X 539606.957
Arc Centre Y 6121602.753
Arc End Chainage 0+241.825
Arc End X 539601.522
Arc End Y 6121607.921

*****Element 7 Straight*****

Straight Start Chainage 0+241.825
Straight Start X 539601.522
Straight Start Y 6121607.921
Bearing 43 33 22.293
Length 18.371
Straight End Chainage 0+260.196
Straight End X 539614.181
Straight End Y 6121621.235

*****Element 8 Arc*****

Arc Start Chainage 0+260.196
Arc Start X 539614.181
Arc Start Y 6121621.235
Radius 270.000
Hand of Arc Left
Arc Centre X 539418.513
Arc Centre Y 6121807.282
Arc End Chainage 0+387.526
Arc End X 539677.346
Arc End Y 6121730.436

*****Element 9 Straight*****

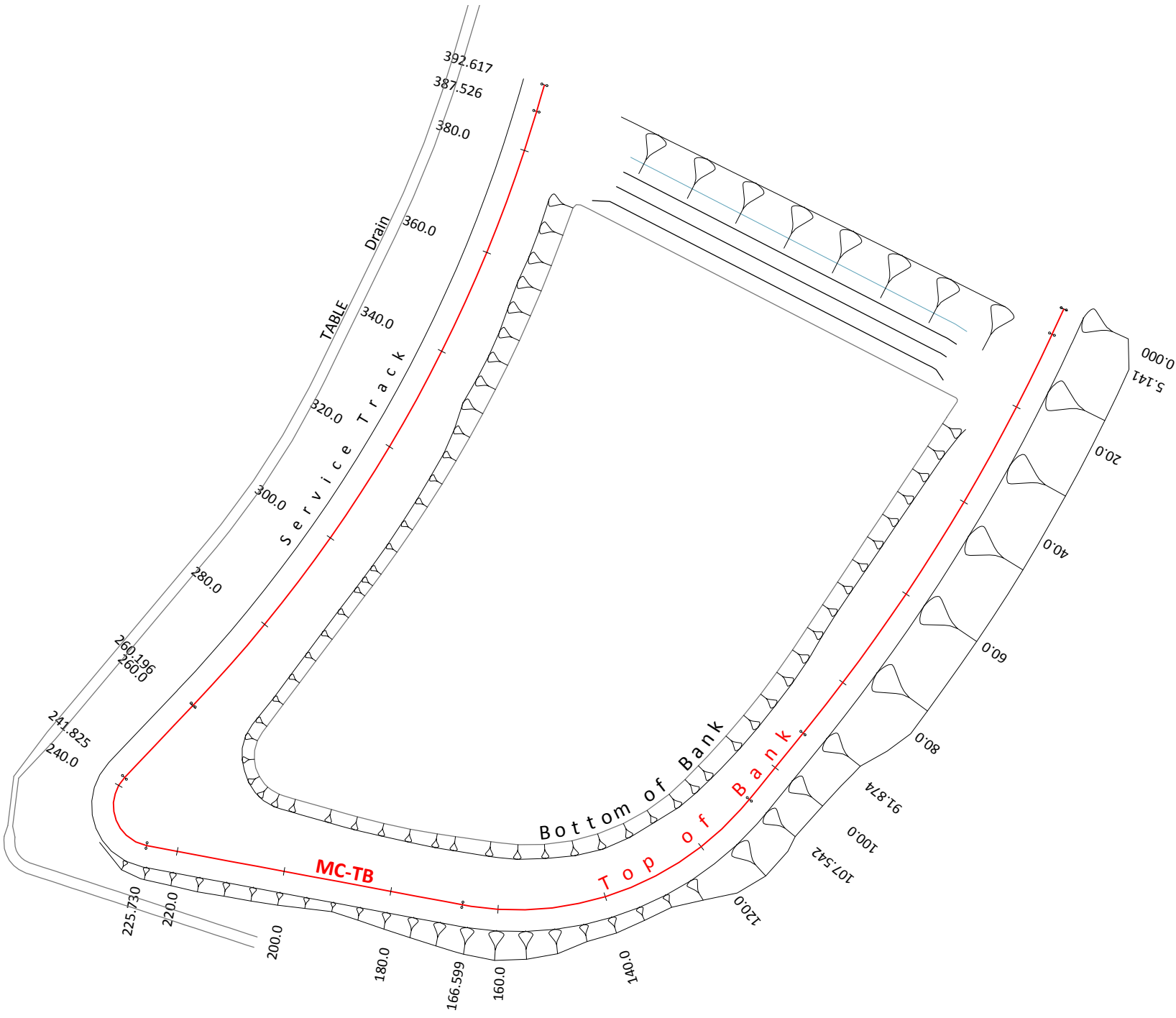
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Straight Start X 539677.346
Straight Start Y 6121730.436
Bearing 16 32 09.323
Length 5.091
Finish on Straight Chainage 0+392.617
Finish on Straight X 539678.795
Finish on Straight Y 6121735.316

Vertical Alignment Report

Model: DESIGN1A
String: MCTB
Units: Metric

*****Element 1 Grade*****

Gradient .000
Begin on Gradient Chainage 0+000.000
Begin on Gradient Level 232.000
Gradient Length 392.617
End on Gradient Chainage 0+392.617
Gradient End Level 232.000



3	EARTHWORK DETAILS AMENDED	08.10.2017
2	DETAILS AMENDED	28.08.2017
1	ISSUED FOR COMMENTS	31.07.2017
REVISION	AMENDMENT :	ISSUED
SCALE	0 10 20 30 40 50 M	DATUM AHD
On A3 Sheet 1:1000		

A.Fenwick	
CHECKED BY	CLIENT APPROVED
DESIGN: Z.Wrobel	DATE: 21/07/2017

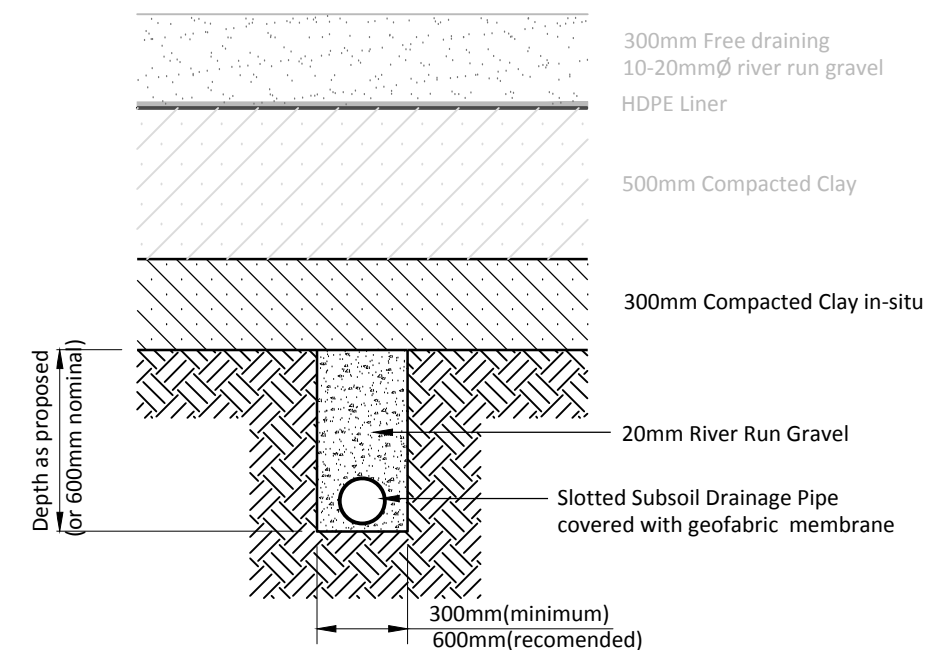
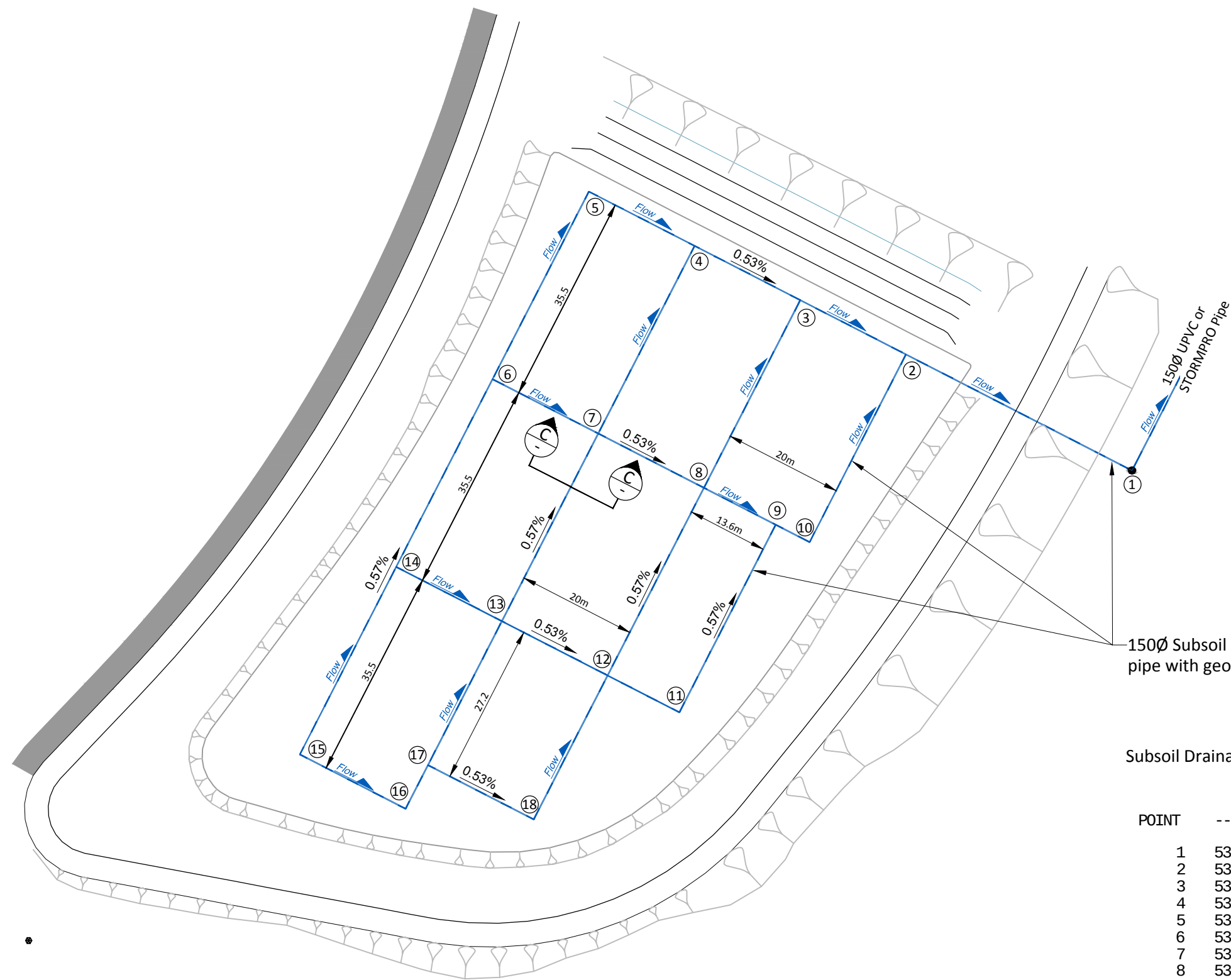
NOTES:
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WRITTEN DIMENSIONS WERE ASSIGNED.

Client:
North Rridge Pty Ltd
Associated Client: **nghenvironmental**

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Project Design Project Management Engineering Consulting

**NORTH RIDGE MATERIALS FACILITY
PROPOSED CELL 1 - STAGE 1
DESIGN DETAILS - TOP OF BANK**

PLAN NO.
SW101
SHEET 07 of 18 SHEET
ISSUED FOR COMMENT



SECTION C-C: TYPICAL SUBSOIL SECTION

150Ø Subsoil drainage
pipe with geofabric sock

Subsoil Drainage Points

POINT	-----X-----	-----Y-----	-----Z-----	
1	539781.908	6121659.773	226.300	New Subsoil Drainage Pit
2	539743.860	6121679.313	226.523	T Junction
3	539726.069	6121688.450	226.629	T Junction
4	539708.278	6121697.586	226.734	T Junction
5	539690.487	6121706.723	226.840	R. Angle Junction
6	539674.261	6121675.128	227.043	T Junction
7	539692.062	6121666.010	226.937	X Junction
8	539709.852	6121656.871	226.832	X Junction
9	539721.939	6121650.663	226.760	T Junction
10	539727.643	6121647.734	226.726	R. Angle Junction
11	539705.722	6121619.084	226.963	R. Angle Junction
12	539693.632	6121625.288	227.036	X Junction
13	539675.843	6121634.430	227.141	X Junction
14	539658.035	6121643.533	227.247	T Junction
15	539641.834	6121611.986	227.450	R. Angle Junction
16	539659.625	6121602.849	227.344	R. Angle Junction
17	539663.404	6121610.207	227.297	T Junction
18	539681.195	6121601.070	227.192	R. Angle Junction



NOTE:

Provide 150Ø slotted subsoil drainage pipe class1000 in geofabric sock, below bottom of HDPE liner, backfill with 20mm aggregate and cover with a geotextile membrane filter to prevent soil particles from entering the drain.

3	POINT CO-ORDINATES AMENDED	08.10.2017	A. Fenwick	
2	DETAILS AMENDED	28.08.2017	CHECKED BY	CLIENT APPROVED
1	ISSUED FOR COMMENTS	31.07.2017	DESIGN: Z.Wrobel	DATE: 21/06/2017
REVISION	AMENDMENT :	ISSUED		

NOTES:
ALL DIMENSIONS TO BE CHECKED ON SITE BY
SUPERINTENDENT PRIOR TO CONSTRUCTION. USE
WRITTEN DIMENSIONS WERE ASSIGNED.

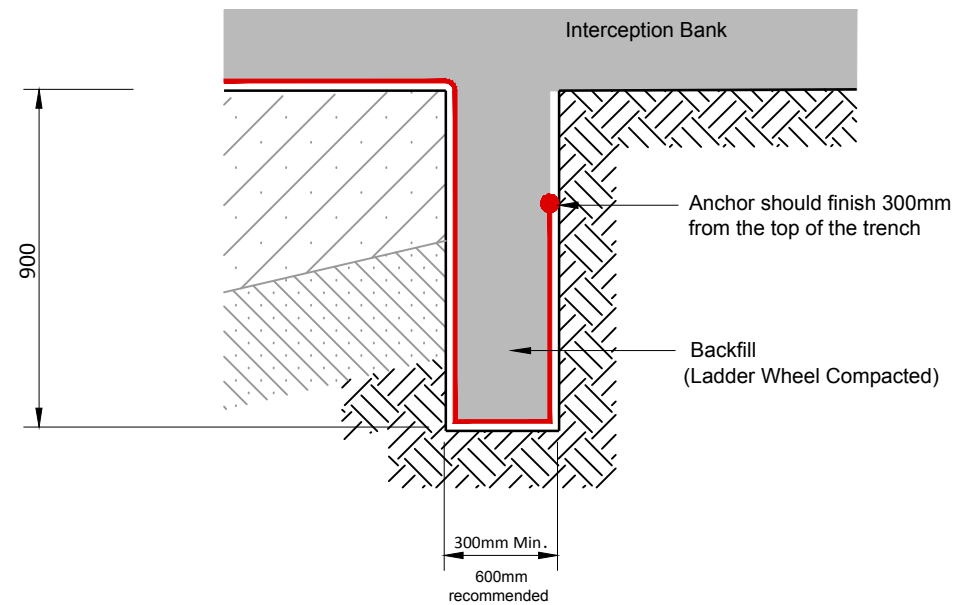
Client:
North Ridge Pty Ltd
Associated Client:
ngh environmental

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Project Design Project Management
Engineering Consulting

NORTH RIDGE MATERIALS FACILITY
PROPOSED CELL 1 - STAGE 1
SUBSOIL DRAINAGE DETAILS

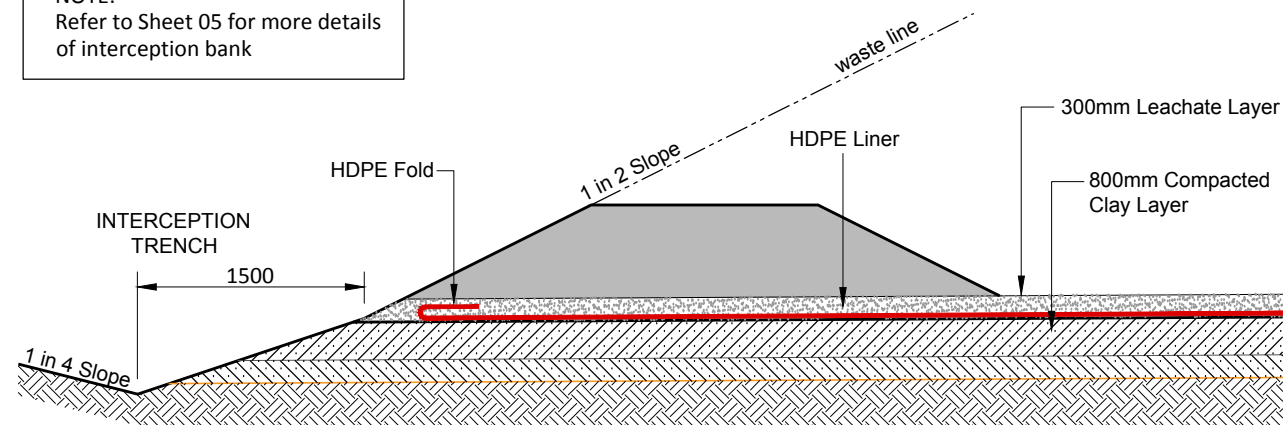
PLAN NO.
SW101
SHEET 08 of 18 SHEET

ISSUED FOR COMMENT



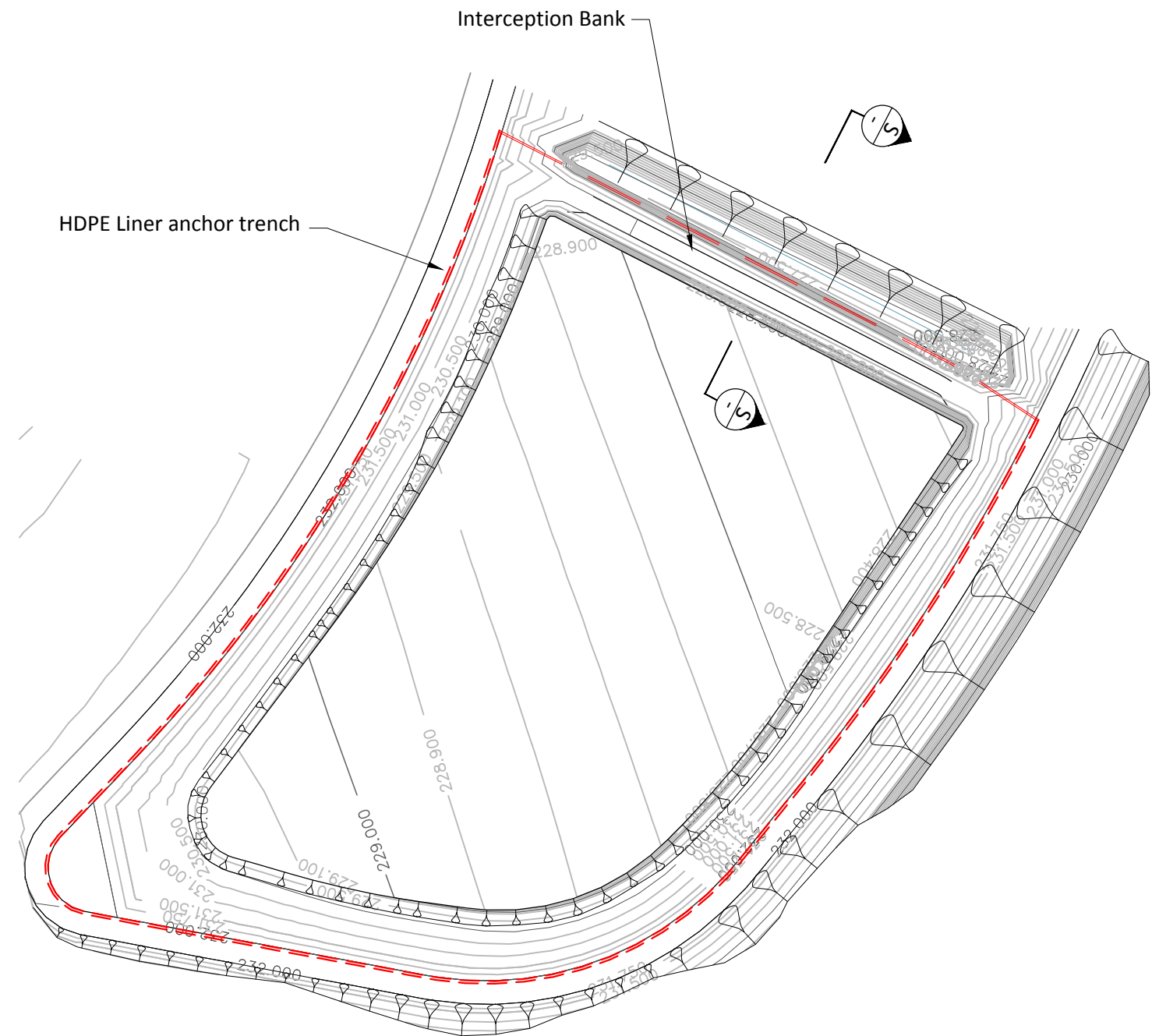
DETAIL **Q**
05 **HDPE LINER ANCHOR TRENCH**
SCALE - 1:20

NOTE:
Refer to Sheet 05 for more details
of interception bank



HDPE LINER FOLD AT INTERCEPTION BANK

SECTION **S**
SCALE - 1:50



3	DESIGN CONTOURS AMENDED	08.10.2017	A. Fenwick	
2	DETAILS AMENDED	28.08.2017		
1	ISSUED FOR COMMENTS	31.07.2017	CHECKED BY	CLIENT APPROVED
REVISION	AMENDMENT :	ISSUED		
SCALE	0 10 20 30 40 50 M	DATUM	AHD	DESIGN: Z.Wrobel DATE: 21/06/2017
On A3 Sheet 1:1000				

NOTES:
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WRITTEN DIMENSIONS WERE ASSIGNED.

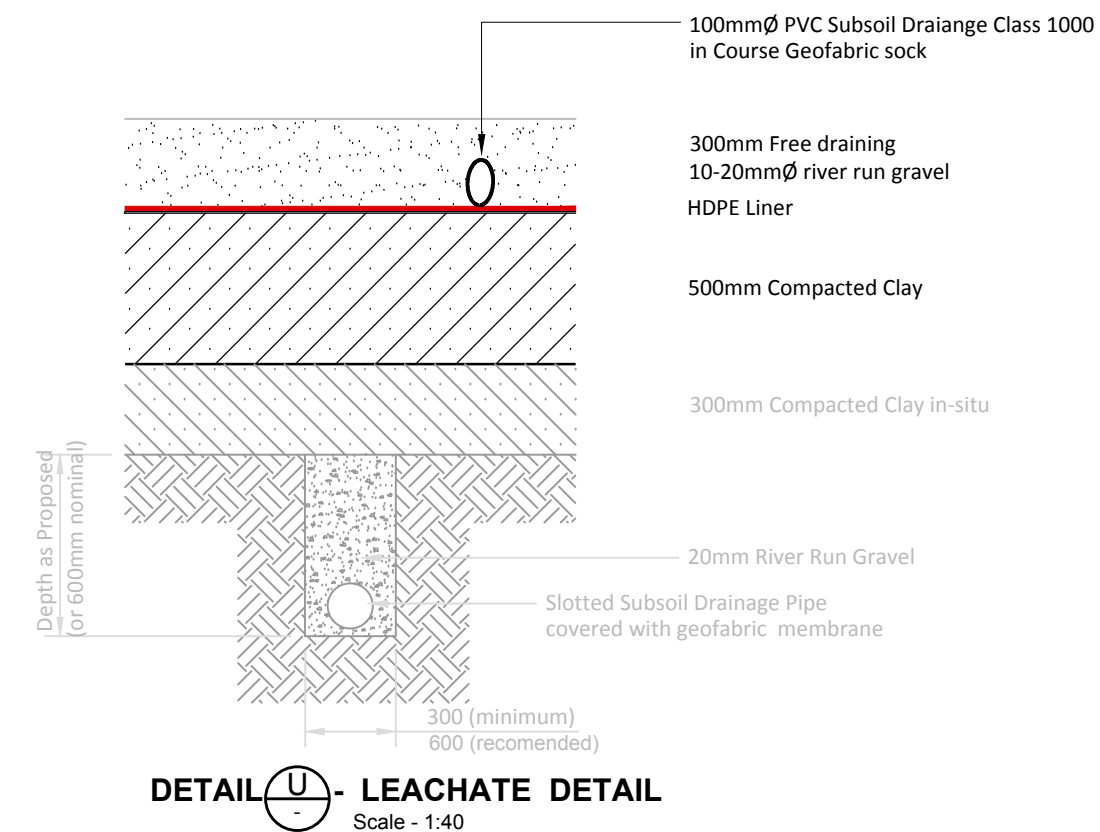
Client:
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Associated Client:
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**NORTH RIDGE MATERIALS FACILITY
PROPOSED CELL 1 - STAGE 1
HDPE LINER ARRANGEMENTS**

PLAN NO.
SW101
SHEET 09 of 18 SHEET

ISSUED FOR COMMENT



1. HDPE membrane to be welded to 150Ø HDPE pipe
2. Clay component of liner to be thickened around 150Ø HDPE pipe and keyed with Bentonite



3	DETAILS AMENDED	08.10.2017	A. Fenwick		
2	DETAILS AMENDED	28.08.2017			
1	ISSUED FOR COMMENTS	31.07.2017			
REVISION	AMENDMENT :	ISSUED	CHECKED BY		CLIENT APPROVED
SCALE					
On A3 Sheet 1:1000		0 10 20 30 40 50 M	DATUM	AHD	DESIGN: Z.Wrobel
					DATE: 21/06/2017

NOTES:
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WRITTEN DIMENSIONS WERE ASSIGNED.

Client: North Ridge Pty Ltd

Associated Client:  ngh environmental

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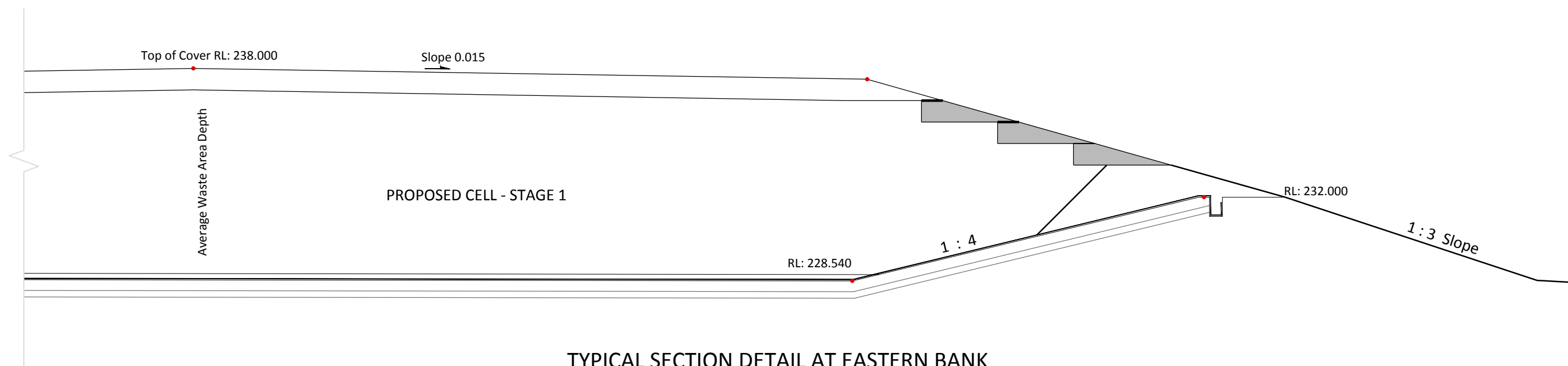
Mob: +61405463692 +61402524359

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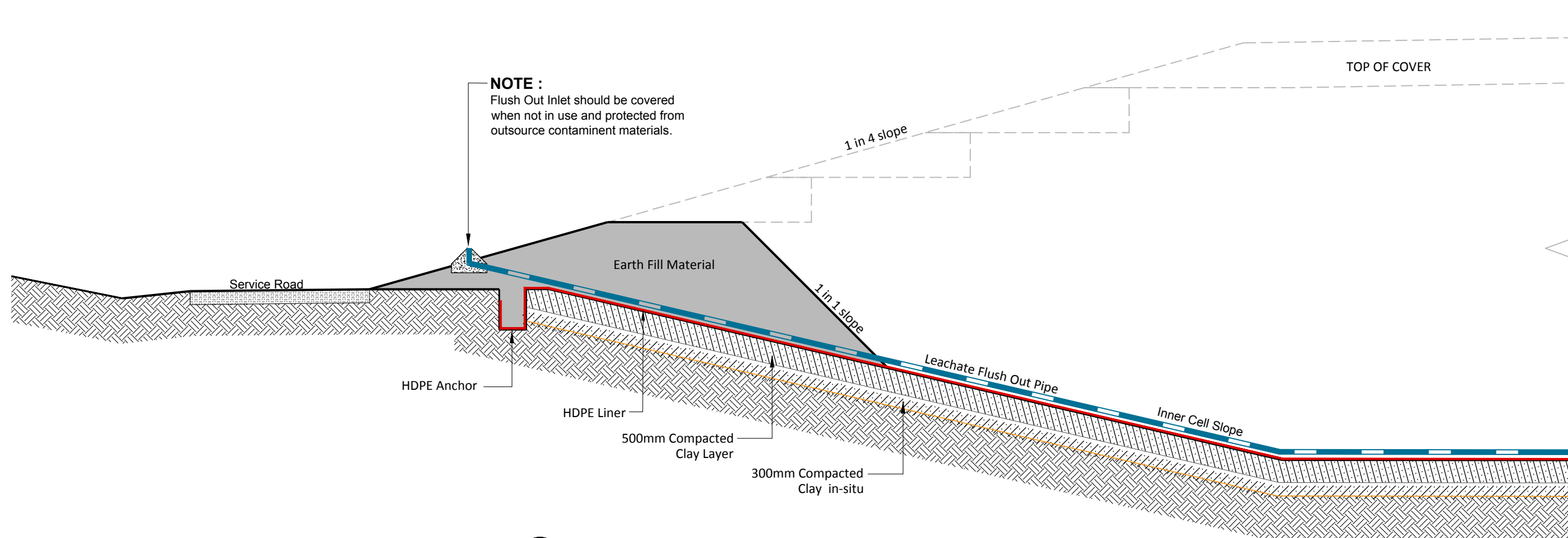
NORT HRIDGE MATERIALS FACILITY
PROPOSED CELL 1 - STAGE 1
LEACHATE LAYOUT

PLAN NO.	SW101
SHEET 10 of 18 SHEET	

ISSUED FOR COMMENT



Scale 1 : 200



Scale - 1:100

					NOTES:	Client:	ENGINEERING PROJECT SOLUTIONS AUSTRALIA Mob: +61405463692 +61402524359 Project Design Project Management Engineering Consulting	NORTH RIDGE MATERIALS FACILITY PROPOSED CELL 1 - STAGE 1 BANK PROFILES - FLUSH OUT POINTS	PLAN NO.
3	MINOR AMENDMENTS	08.10.2017	A. Fenwick	ALL DIMENSIONS TO BE CHECKED ON SITE BY SUPERINTENDENT PRIOR TO CONSTRUCTION. USE WRITTEN DIMENSIONS WERE ASSIGNED.	North Ridge Pty Ltd Associated Client: nghenvironmental	SW101 SHEET 11 of 18 SHEET			
2	DETAILS AMENDED	28.08.2017							
1	ISSUED FOR COMMENTS	31.07.2017	CHECKED BY CLIENT APPROVED						
REVISION	AMENDMENT :	ISSUED							
SCALE		DATUM AHD	DESIGN: Z.Wrobel	DATE: 21/06/2017					ISSUED FOR COMMENT
AS SHOWN									



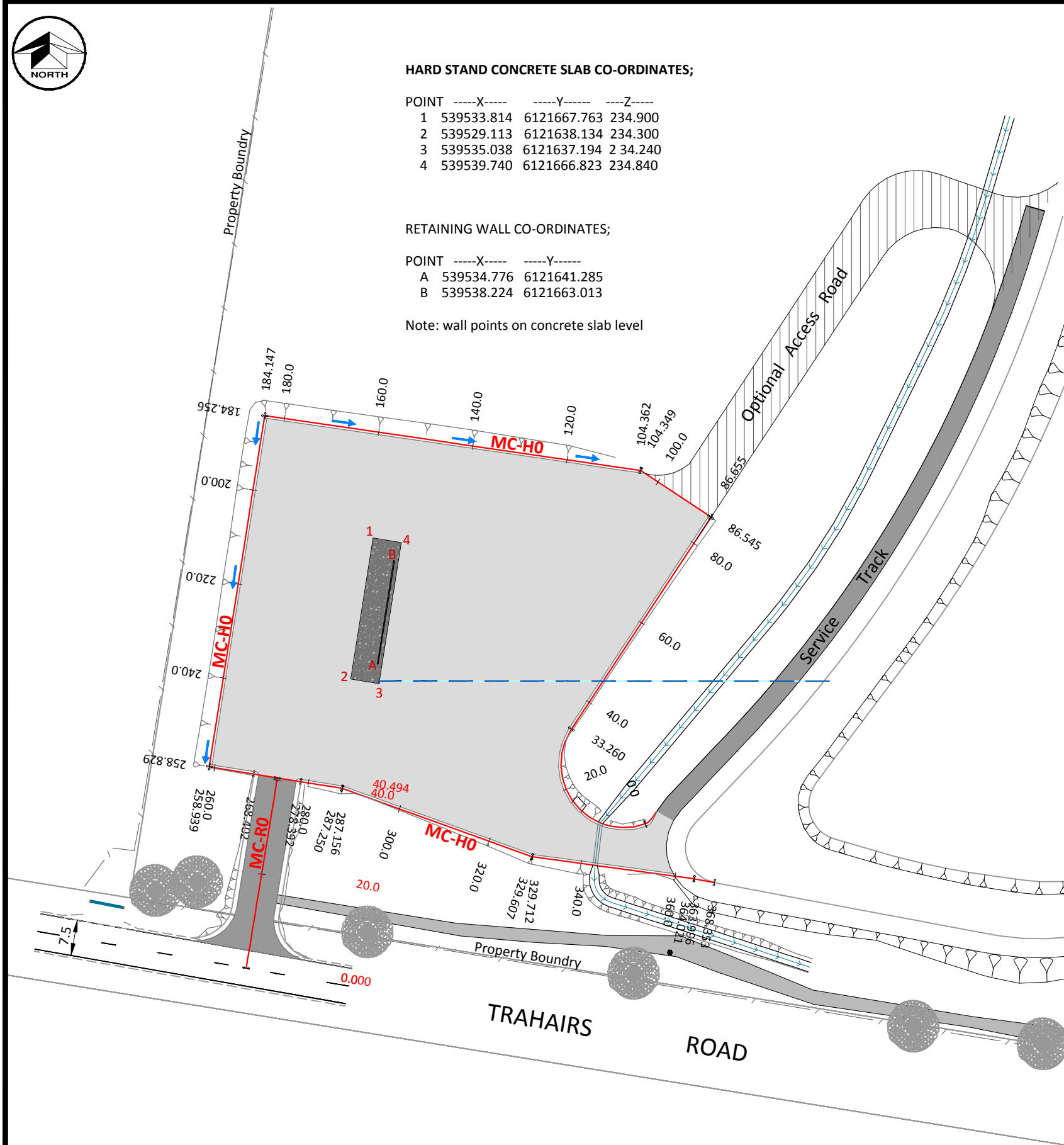
HARD STAND CONCRETE SLAB CO-ORDINATES;

POINT	X	Y	Z
1	539533.814	6121667.763	234.900
2	539529.113	6121638.134	234.300
3	539535.038	6121637.194	234.240
4	539539.740	6121666.823	234.840

RETAINING WALL CO-ORDINATES;

POINT	X	Y
A	539534.776	6121641.285
B	539538.224	6121663.013

Note: wall points on concrete slab level



Horizontal Alignment Report

Model: DESIGN1A
String: MCR0
Units: Metric

*****Element 1 Straight*****

Begin on Straight Chainage	0+000.000
Begin on Straight X	539507.128
Begin on Straight Y	6121577.418
Bearing	09 19 43.322
Length	40.494
Finish on Straight Chainage	0+040.494
Finish on Straight X	539513.693
Finish on Straight Y	6121617.377

Vertical Alignment Report

Model: DESIGN1A
String: MCR0
Units: Metric

*****Element 1 Grade*****

Gradient	.996
Begin on Gradient Chainage	0+000.000
Begin on Gradient Level	232.783
Gradient Length	2.673
Gradient End Chainage	0+002.673
Gradient End Level	232.810

*****Element 2 Vertical Curve*****

Curve Start Gradient	.996
Curve End Gradient	6.999
Curve Start Chainage	0+002.673
Curve Start Level	232.810
IP Chainage	0+003.673
IP Level	232.820
Curve Length	2.000
Curve End Chainage	0+004.673
Curve End Level	232.890

*****Element 3 Grade*****

Gradient	6.999
Gradient Start Chainage	0+004.673
Grade Start Level	232.890
Gradient Length	6.231
Gradient End Chainage	0+010.904
Gradient End Level	233.326

*****Element 4 Vertical Curve*****

Curve Start Gradient	6.999
Curve End Gradient	3.498
Curve Start Chainage	0+010.904
Curve Start Level	233.326
IP Chainage	0+013.404
IP Level	233.501
Curve Length	5.000
Curve End Chainage	0+015.904
Curve End Level	233.588

*****Element 5 Grade*****

Gradient	3.498
Gradient Start Chainage	0+015.904
Grade Start Level	233.588
Gradient Length	19.307
Gradient End Chainage	0+035.211
Gradient End Level	234.263

*****Element 6 Vertical Curve*****

Curve Start Gradient	3.498
Curve End Gradient	1.248
Curve Start Chainage	0+035.211
Curve Start Level	234.263
IP Chainage	0+037.243
IP Level	234.334
Curve Length	4.064
Curve End Chainage	0+039.275
Curve End Level	234.360

*****Element 7 Grade*****

Gradient	1.248
Gradient Start Chainage	0+039.275
Grade Start Level	234.360
Gradient Length	1.219
End on Gradient Chainage	0+040.494
Gradient End Level	234.375

3	HARDSTAND DETAILS ADDED	08.10.2017
REVISION	AMENDMENT :	ISSUED
SCALE	On A3 Sheet 1:1000	DATUM AHD
DESIGN: Z.Wrobel	DATE: 21/07/2017	CHECKED BY
A. Fenwick	CLIENT APPROVED	

NOTES:
ALL DIMENSIONS TO BE CHECKED ON SITE BY
SUPERINTENDENT PRIOR TO CONSTRUCTION. USE
WRITTEN DIMENSIONS WERE ASSIGNED.

Client:
North Ridge Pty Ltd
Associated Client: **nghenvironmental**

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Engineering Consulting

NORTH RIDGE MATERIALS FACILITY
PROPOSED CELL 1 - STAGE 1
ROAD & HARDSTAND DESIGN LAYOUT

PLAN NO.
SW101
SHEET 13 of 18 SHEET
ISSUED FOR COMMENT

Horizontal Alignment Report

Model: DESIGN1A
String: MCH0
Units: Metric

*****Element 1 Arc*****

Begin on Arc Chainage 0+000.000
Begin on Arc X 539591.068
Begin on Arc Y 6121607.680
Radius 13.350
Hand of Arc Right
Arc Centre X 539586.648
Arc Centre Y 6121620.277
Arc End Chainage 0+033.260
Arc End X 539575.505
Arc End Y 6121627.628

*****Element 2 Straight*****

Straight Start Chainage 0+033.260
Straight Start X 539575.505
Straight Start Y 6121627.628
Bearing 33 24 39.606
Length 53.285
Straight End Chainage 0+086.545
Straight End X 539604.846
Straight End Y 6121672.107

*****Element 3 Arc*****

Arc Start Chainage 0+086.545
Arc Start X 539604.846
Arc Start Y 6121672.107
Radius .070
Hand of Arc Left
Arc Centre X 539604.787
Arc Centre Y 6121672.146
Arc End Chainage 0+086.655
Arc End X 539604.826
Arc End Y 6121672.204

*****Element 4 Straight*****

Straight Start Chainage 0+086.655
Straight Start X 539604.826
Straight Start Y 6121672.204
Bearing 303 24 39.613
Length 17.694
Straight End Chainage 0+104.349
Straight End X 539590.056
Straight End Y 6121681.947

*****Element 5 Arc*****

Arc Start Chainage 0+104.349
Arc Start X 539590.056
Arc Start Y 6121681.947
Radius .030
Hand of Arc Left
Arc Centre X 539590.039
Arc Centre Y 6121681.922
Arc End Chainage 0+104.362
Arc End X 539590.044
Arc End Y 6121681.952

*****Element 6 Straight*****

Straight Start Chainage 0+104.362
Straight Start X 539590.044
Straight Start Y 6121681.952
Bearing 278 17 54.864
Length 79.785
Straight End Chainage 0+184.147
Straight End X 539511.094
Straight End Y 6121693.467

*****Element 7 Arc*****

Arc Start Chainage 0+184.147
Arc Start X 539511.094
Arc Start Y 6121693.467
Radius .070
Hand of Arc Left
Arc Centre X 539511.084
Arc Centre Y 6121693.398
Arc End Chainage 0+184.256
Arc End X 539511.015
Arc End Y 6121693.409

*****Element 8 Straight*****

Straight Start Chainage 0+184.256
Straight Start X 539511.015
Straight Start Y 6121693.409
Bearing 188 59 30.927
Length 74.572
Straight End Chainage 0+258.829
Straight End X 539499.359
Straight End Y 6121619.753

*****Element 9 Arc*****

Arc Start Chainage 0+258.829
Arc Start X 539499.359
Arc Start Y 6121619.753
Radius .070
Hand of Arc Left
Arc Centre X 539499.429
Arc Centre Y 6121619.742
Arc End Chainage 0+258.939
Arc End X 539499.418
Arc End Y 6121619.673

*****Element 10 Straight*****

Straight Start Chainage 0+258.939
Straight Start X 539499.418
Straight Start Y 6121619.673
Bearing 99 02 20.697
Length 9.453
Straight End Chainage 0+268.392
Straight End X 539508.754
Straight End Y 6121618.188

*****Element 11 Arc*****

Arc Start Chainage 0+268.392
Arc Start X 539508.754
Arc Start Y 6121618.188
Radius 2.000
Hand of Arc Right
Arc Centre X 539508.439
Arc Centre Y 6121616.213
Arc End Chainage 0+268.402
Arc End X 539508.764
Arc End Y 6121618.186

*****Element 12 Straight*****

Straight Start Chainage 0+268.402
Straight Start X 539508.764
Straight Start Y 6121618.186
Bearing 99 19 43.240
Length 9.990
Straight End Chainage 0+278.392
Straight End X 539518.621
Straight End Y 6121616.567

*****Element 13 Arc*****

Arc Start Chainage 0+278.392
Arc Start X 539518.621
Arc Start Y 6121616.567
Radius 2.000
Hand of Arc Left
Arc Centre X 539518.946
Arc Centre Y 6121618.540
Arc End Chainage 0+278.402
Arc End X 539518.631
Arc End Y 6121616.565

*****Element 14 Straight*****

Straight Start Chainage 0+278.402
Straight Start X 539518.631
Straight Start Y 6121616.565
Bearing 99 02 20.711
Length 8.754
Straight End Chainage 0+287.156
Straight End X 539527.276
Straight End Y 6121615.190

*****Element 15 Arc*****

Arc Start Chainage 0+287.156
Arc Start X 539527.276
Arc Start Y 6121615.190
Radius .500
Hand of Arc Right
Arc Centre X 539527.198
Arc Centre Y 6121614.696
Arc End Chainage 0+287.250
Arc End X 539527.367
Arc End Y 6121615.167

*****Element 16 Straight*****

Straight Start Chainage 0+287.250
Straight Start X 539527.367
Straight Start Y 6121615.167
Bearing 109 47 58.122
Length 42.357
Straight End Chainage 0+329.607
Straight End X 539567.220
Straight End Y 6121600.819

*****Element 17 Arc*****

Arc Start Chainage 0+329.607
Arc Start X 539567.220
Arc Start Y 6121600.819
Radius .500
Hand of Arc Left
Arc Centre X 539567.389
Arc Centre Y 6121601.290
Arc End Chainage 0+329.712
Arc End X 539567.322
Arc End Y 6121600.794

*****Element 18 Straight*****

Straight Start Chainage 0+329.712
Straight Start X 539567.322
Straight Start Y 6121600.794
Bearing 97 43 51.308
Length 34.284
Straight End Chainage 0+363.996
Straight End X 539601.295
Straight End Y 6121596.182

*****Element 19 Arc*****

Arc Start Chainage 0+363.996
Arc Start X 539601.295
Arc Start Y 6121596.182
Radius .500
Hand of Arc Right
Arc Centre X 539601.227
Arc Centre Y 6121595.687
Arc End Chainage 0+364.021
Arc End X 539601.319
Arc End Y 6121596.178

*****Element 20 Straight*****

Straight Start Chainage 0+364.021
Straight Start X 539601.319
Straight Start Y 6121596.178
Bearing 100 36 12.506
Length 4.332
Finish on Straight Chainage 0+368.353
Finish on Straight X 539605.577
Finish on Straight Y 6121595.381

Vertical Alignment Report

Model: DESIGN1A
String: MCH0
Units: Metric

*****Element 1 Grade*****

Gradient -4.805
Begin on Gradient Chainage 0+000.000
Begin on Gradient Level 231.960
Gradient Length 8.490
Gradient End Chainage 0+008.490
Gradient End Level 231.552

*****Element 2 Vertical Curve*****

Curve Start Gradient -4.805
Curve End Gradient 6.996
Curve Start Chainage 0+008.490
Curve Start Level 231.552
IP Chainage 0+009.990
IP Level 231.480
Curve Length 3.000
Curve End Chainage 0+011.490
Curve End Level 231.585

*****Element 3 Grade*****

Gradient 6.996
Gradient Start Chainage 0+011.490
Grade Start Level 231.585
Gradient Length 16.219
Gradient End Chainage 0+027.709
Gradient End Level 232.720

*****Element 4 Vertical Curve*****

Curve Start Gradient 6.996
Curve End Gradient .503
Curve Start Chainage 0+027.709
Curve Start Level 232.720
IP Chainage 0+032.181
IP Level 233.033
Curve Length 8.942
Curve End Chainage 0+036.652
Curve End Level 233.055

*****Element 5 Grade*****

Gradient .503
Gradient Start Chainage 0+036.652
Grade Start Level 233.055
Gradient Length 49.950
Gradient End Chainage 0+086.602
Gradient End Level 233.306

*****Element 6 Grade*****

Gradient 1.999
Gradient Start Chainage 0+086.602
Grade Start Level 233.306
Gradient Length 17.754
Gradient End Chainage 0+104.356
Gradient End Level 233.661

*****Element 7 Grade*****

Gradient 3.004
Gradient Start Chainage 0+104.356
Grade Start Level 233.661
Gradient Length 79.845
Gradient End Chainage 0+184.201
Gradient End Level 236.060

*****Element 8 Grade*****

Gradient -1.152
Gradient Start Chainage 0+184.201
Grade Start Level 236.060
Gradient Length 10.821
Gradient End Chainage 0+195.022
Gradient End Level 235.935

*****Element 9 Vertical Curve*****

Curve Start Gradient -1.152
Curve End Gradient -2.498
Curve Start Chainage 0+195.022
Curve Start Level 235.935
IP Chainage 0+222.522
IP Level 235.618
Curve Length 55.000
Curve End Chainage 0+250.022
Curve End Level 234.931

*****Element 10 Grade*****

Gradient -2.498
Gradient Start Chainage 0+250.022
Grade Start Level 234.931
Gradient Length 8.859
End on Gradient Chainage 0+258.881
Gradient End Level 234.710

*****Element 11 Grade*****

Gradient -2.522
Begin on Gradient Chainage 0+258.881
Begin on Gradient Level 234.710
Gradient Length 9.516
End on Gradient Chainage 0+268.397
Gradient End Level 234.470

*****Element 12 Grade*****

Gradient -2.000
Begin on Gradient Chainage 0+268.397
Begin on Gradient Level 234.470
Gradient Length 10.000
End on Gradient Chainage 0+278.397
Gradient End Level 234.270

*****Element 13 Grade*****

Gradient -3.600
Begin on Gradient Chainage 0+278.397
Begin on Gradient Level 234.270
Gradient Length 8.809
End on Gradient Chainage 0+287.206
Gradient End Level 233.953

*****Element 14 Grade*****

Gradient -4.703
Begin on Gradient Chainage 0+287.206
Begin on Gradient Level 233.953
Gradient Length 52.776
Gradient End Chainage 0+339.982
Gradient End Level 231.471

*****Element 15 Vertical Curve*****

Curve Start Gradient -4.703
Curve End Gradient 3.239
Curve Start Chainage 0+339.982
Curve Start Level 231.471
IP Chainage 0+341.482
IP Level 231.400
Curve Length 3.000
Curve End Chainage 0+342.982
Curve End Level 231.449

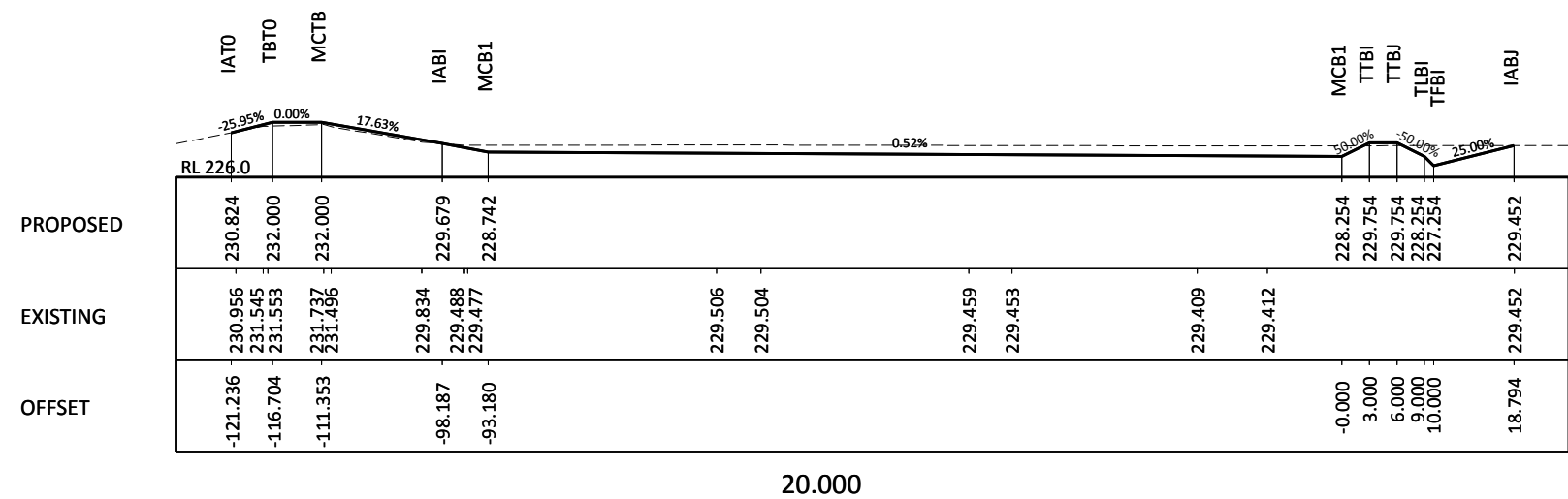
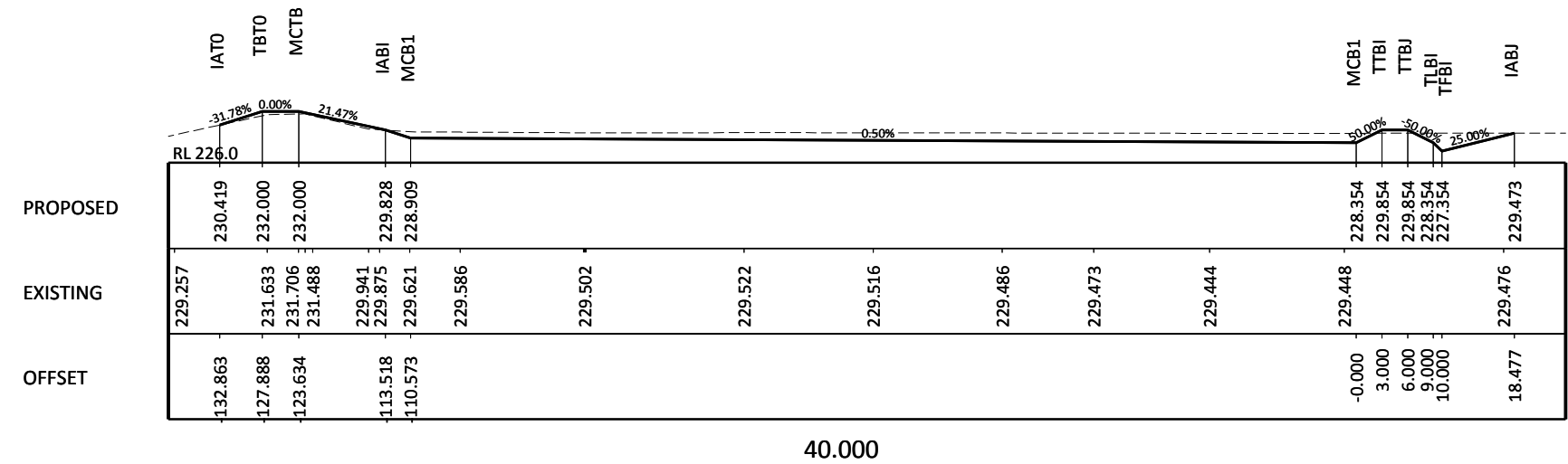
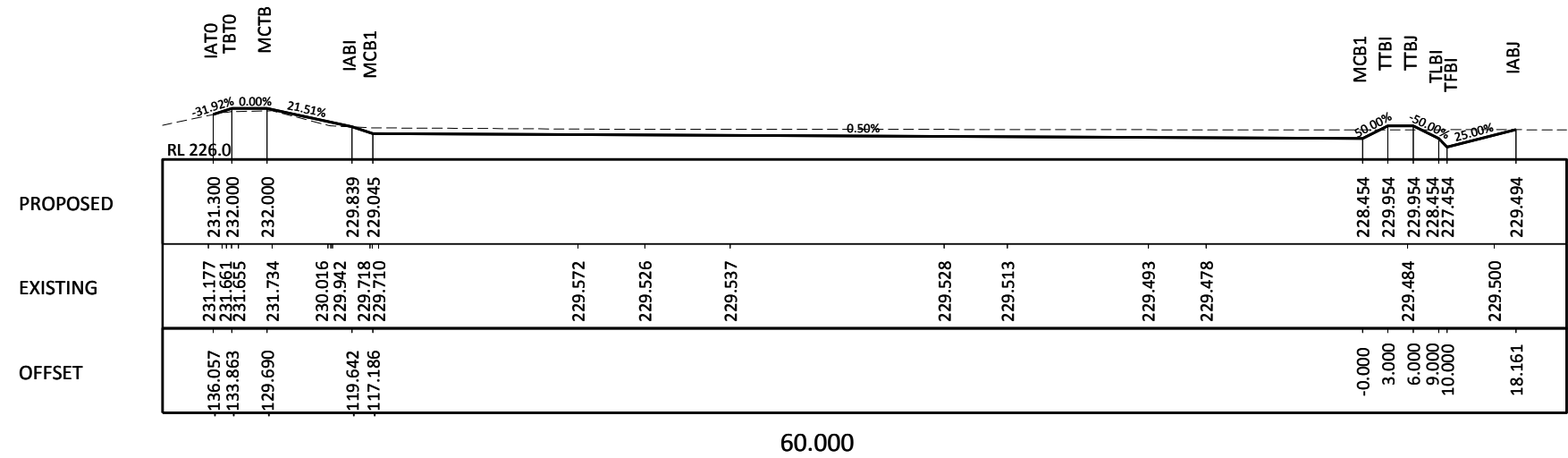
*****Element 16 Grade*****

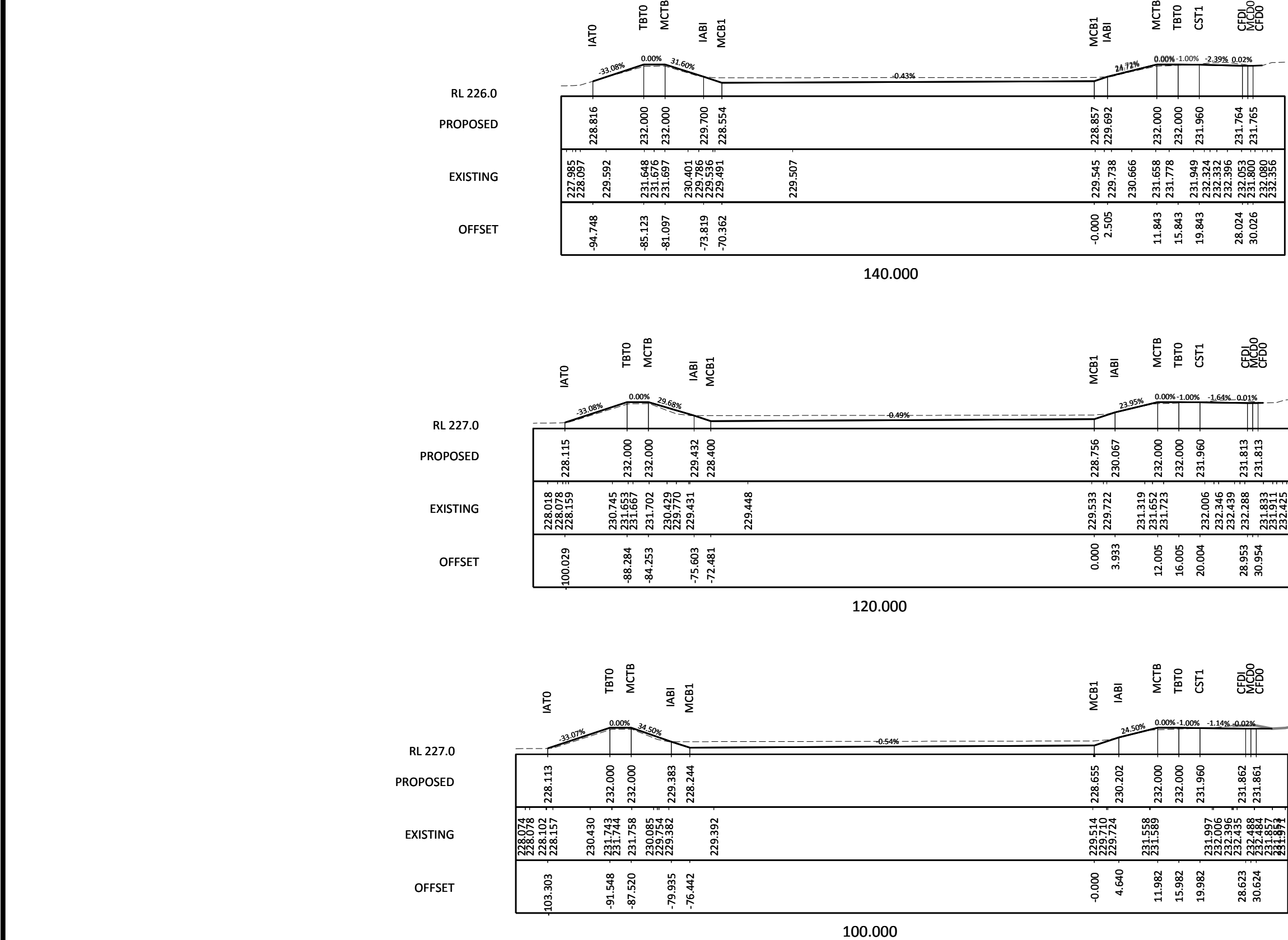
Gradient 3.239
Gradient Start Chainage 0+342.982
Grade Start Level 231.449
Gradient Length 17.018
End on Gradient Chainage 0+360.000
Gradient End Level 232.000

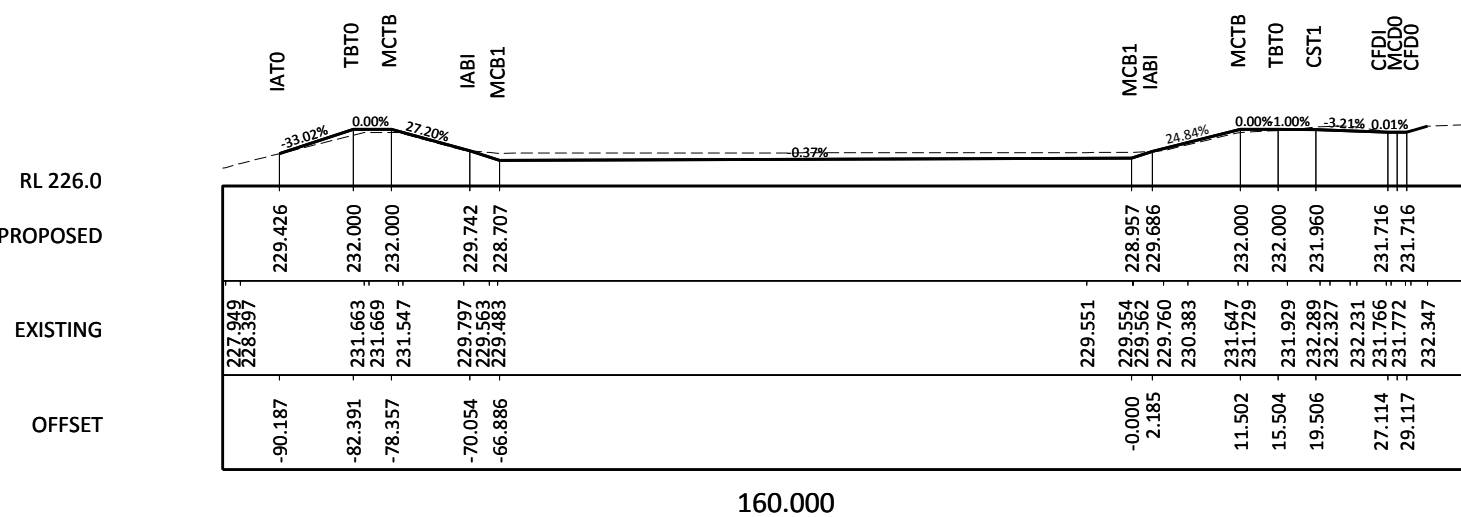
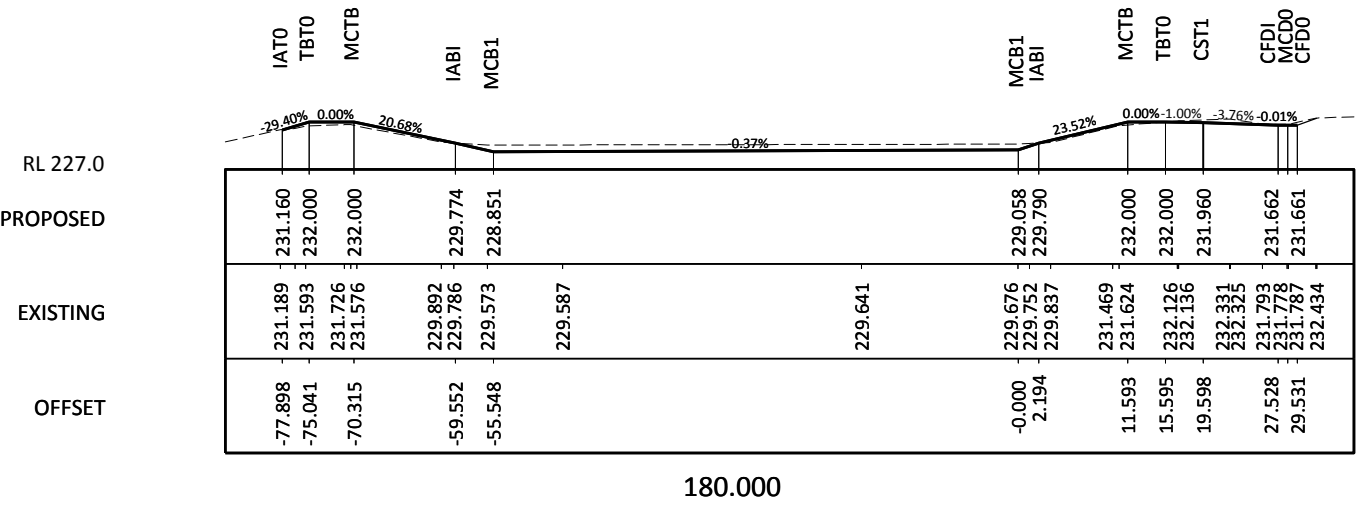
*****Element 17 Grade*****

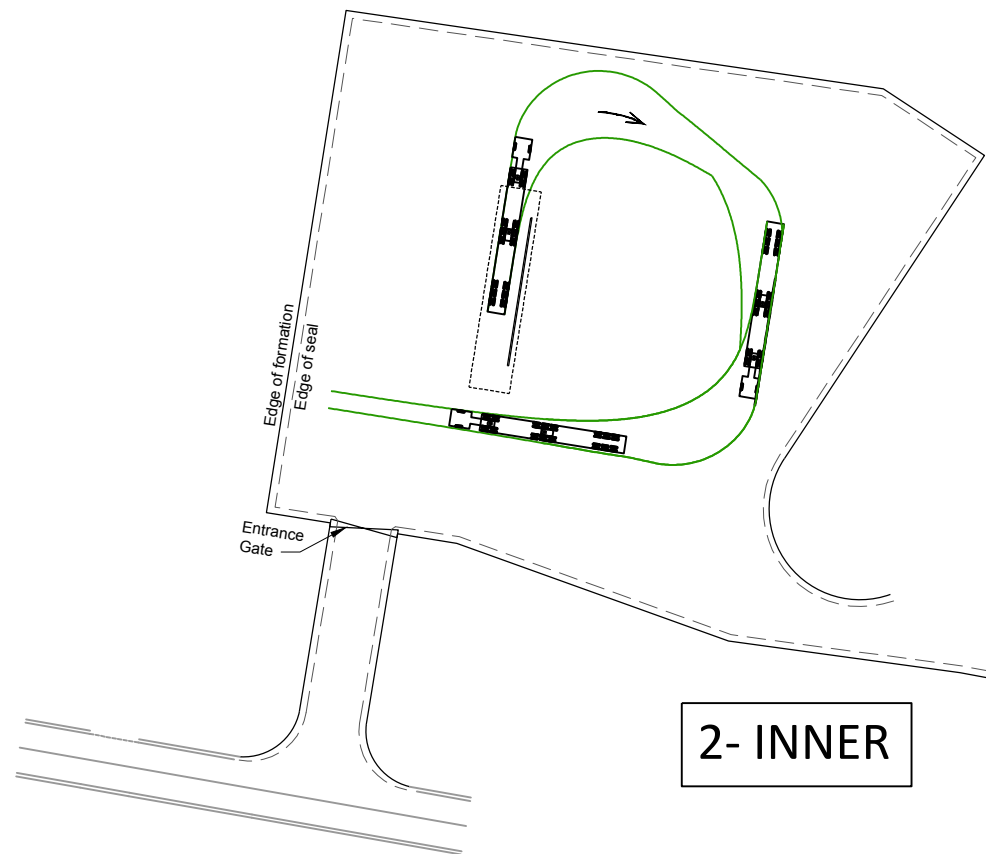
Gradient .000
Begin on Gradient Chainage 0+360.000
Begin on Gradient Level 232.000
Gradient Length 8.353
End on Gradient Chainage 0+368.353
Gradient End Level 232.000

			A. Fenwick CHECKED BY CLIENT APPROVED	NOTES: ALL DIMENSIONS TO BE CHECKED ON SITE BY SUPERINTENDENT PRIOR TO CONSTRUCTION. USE WRITTEN DIMENSIONS WERE ASSIGNED.	Client: North Ridge Pty Ltd Associated Client: 	 Mob: +61405463692 +61402524359 Project Design Project Management Engineering Consulting	NORTH RIDGE MATERIALS FACILITY PROPOSED CELL 1 - STAGE 1 HARDSTAND DESIGN CO-ORDINATES	PLAN NO. SW101 SHEET 14 of 18 SHEET ISSUED FOR COMMENT
3	HARDSTAND DETAILS ADDED	08.10.2017						
REVISION	AMENDMENT :	ISSUED						
SCALE N/A		DATUM AHD	DESIGN: Z.Wrobel	DATE: 21/07/2017				

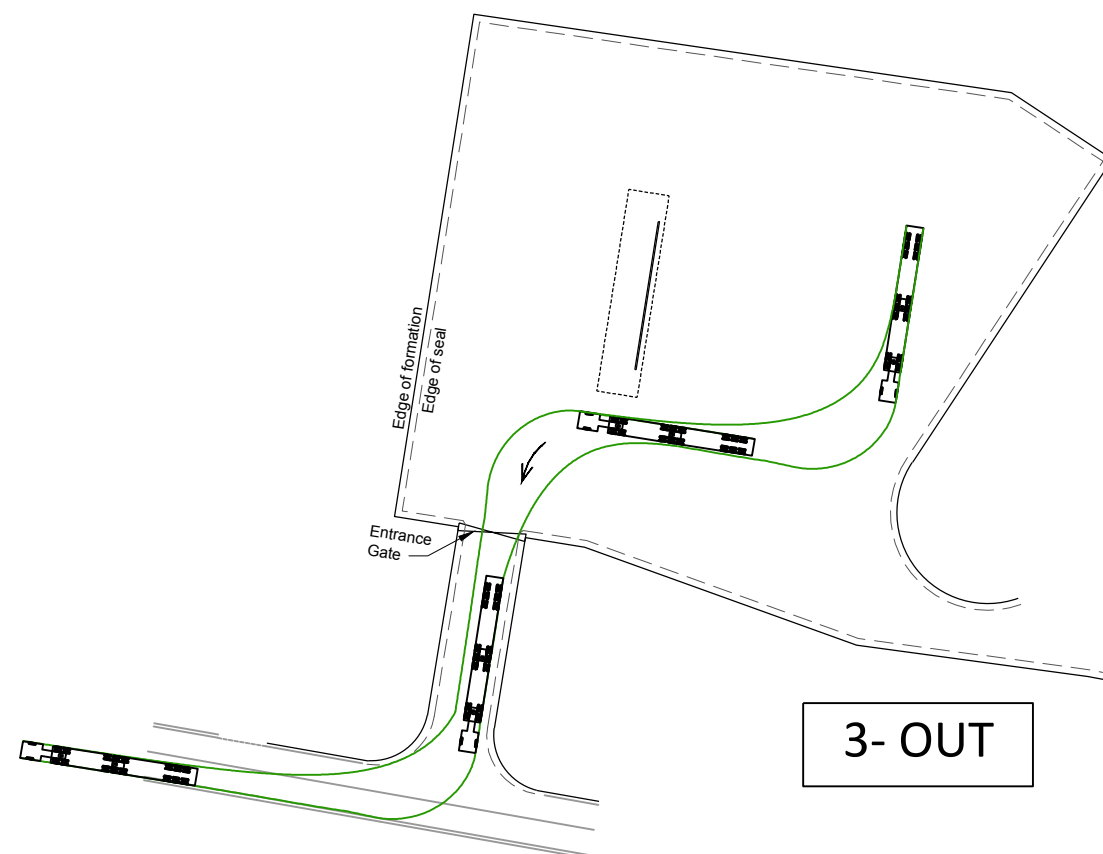




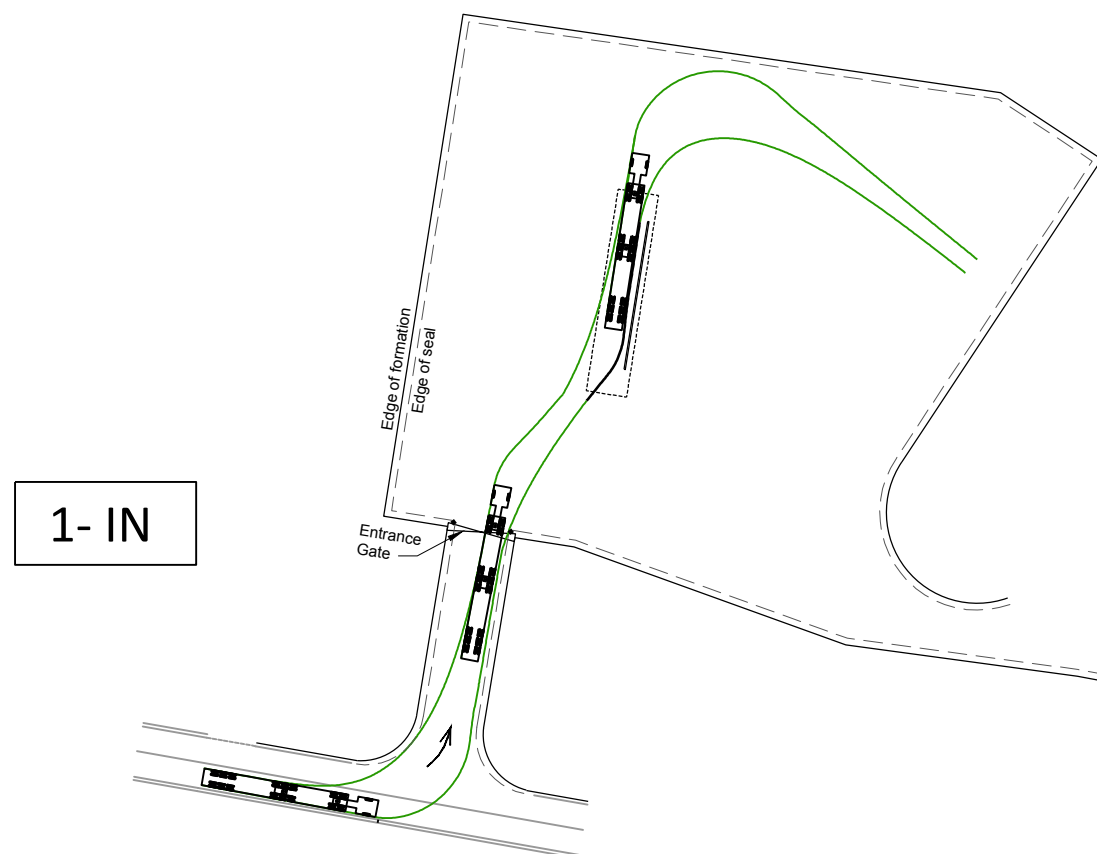




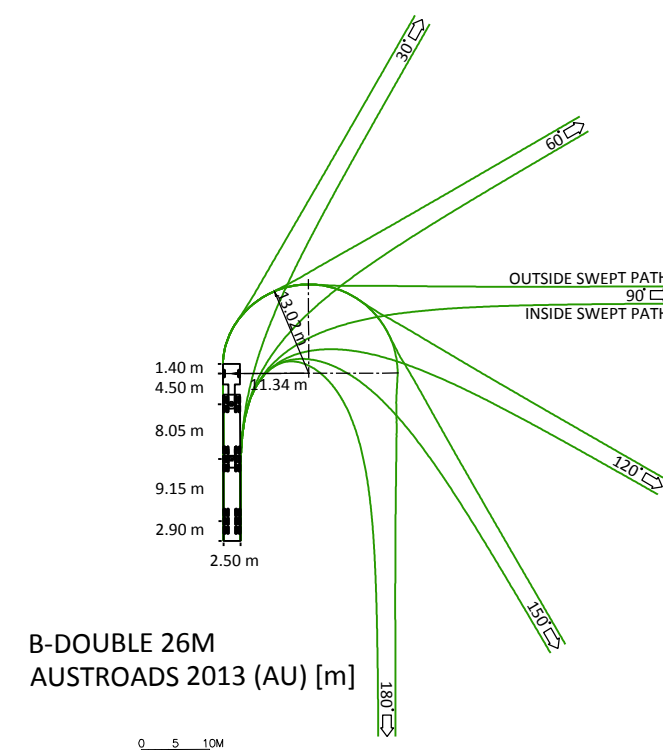
2- INNER



3- OUT



1- IN



STEERING LOCK ANGLE = 23.4 deg.
ACHIEVED STEERING ANGLE: 30 deg.
SWEEP ANGLE: 16.8 deg. 60 deg.
SWEEP ANGLE: 21.5 deg. 90 deg.
SWEEP ANGLE: 22.9 deg. 120 deg.
SWEEP ANGLE: 23.3 deg. 150 deg.
SWEEP ANGLE: 23.4 deg. 180 deg.
SWEEP ANGLE: 23.4 deg.

			A .Fenwick		NOTES: ALL DIMENSIONS TO BE CHECKED ON SITE BY SUPERINTENDENT PRIOR TO CONSTRUCTION. USE WRITTEN DIMENSIONS WERE ASSIGNED.	Client: North Ridge Pty Ltd Associated Client:	ENGINEERING PROJECT SOLUTIONS AUSTRALIA Mob: +61405463692 +61402524359 Project Design Project Management Engineering Consulting	NORTH RIDGE MATERIALS FACILITY PROPOSED CELL 1 - STAGE 1 INTERNAL VEHICLE MOVEMENT	PLAN NO. SW101 SHEET 18 of 18 SHEET ISSUED FOR COMMENT
3	VEHICLE MOVEMENT DETAILS ADDED	08.10.2017	CHECKED BY	CLIENT APPROVED					
REVISION	AMENDMENT :	ISSUED							
SCALE	N/A	DATUM AHD	DESIGN: Z.Wrobel	DATE: 21/06/2017					



Figure 1: Proposed layout

D.6 GROUNDWATER-DEPENDENT ECOSYSTEMS

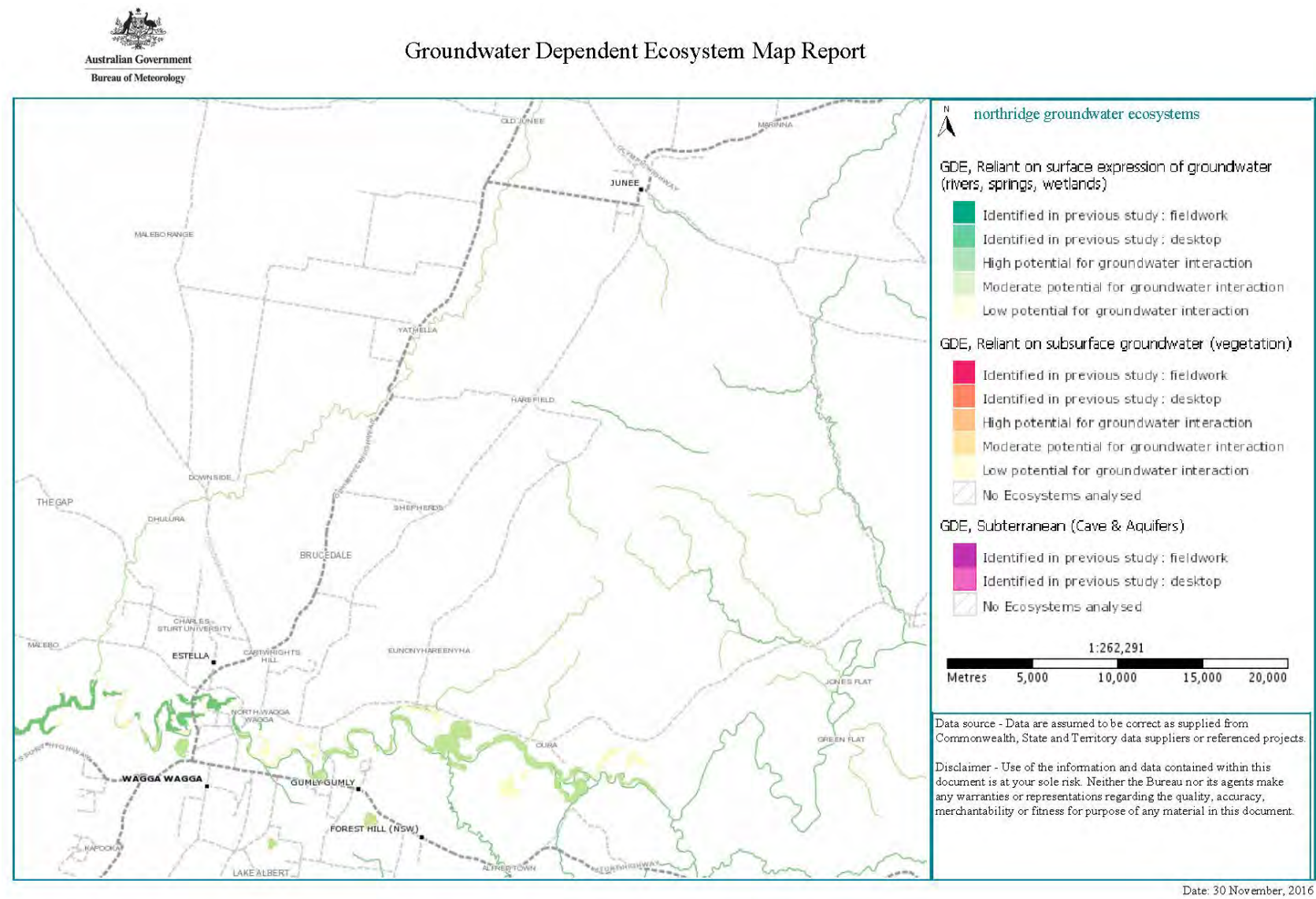


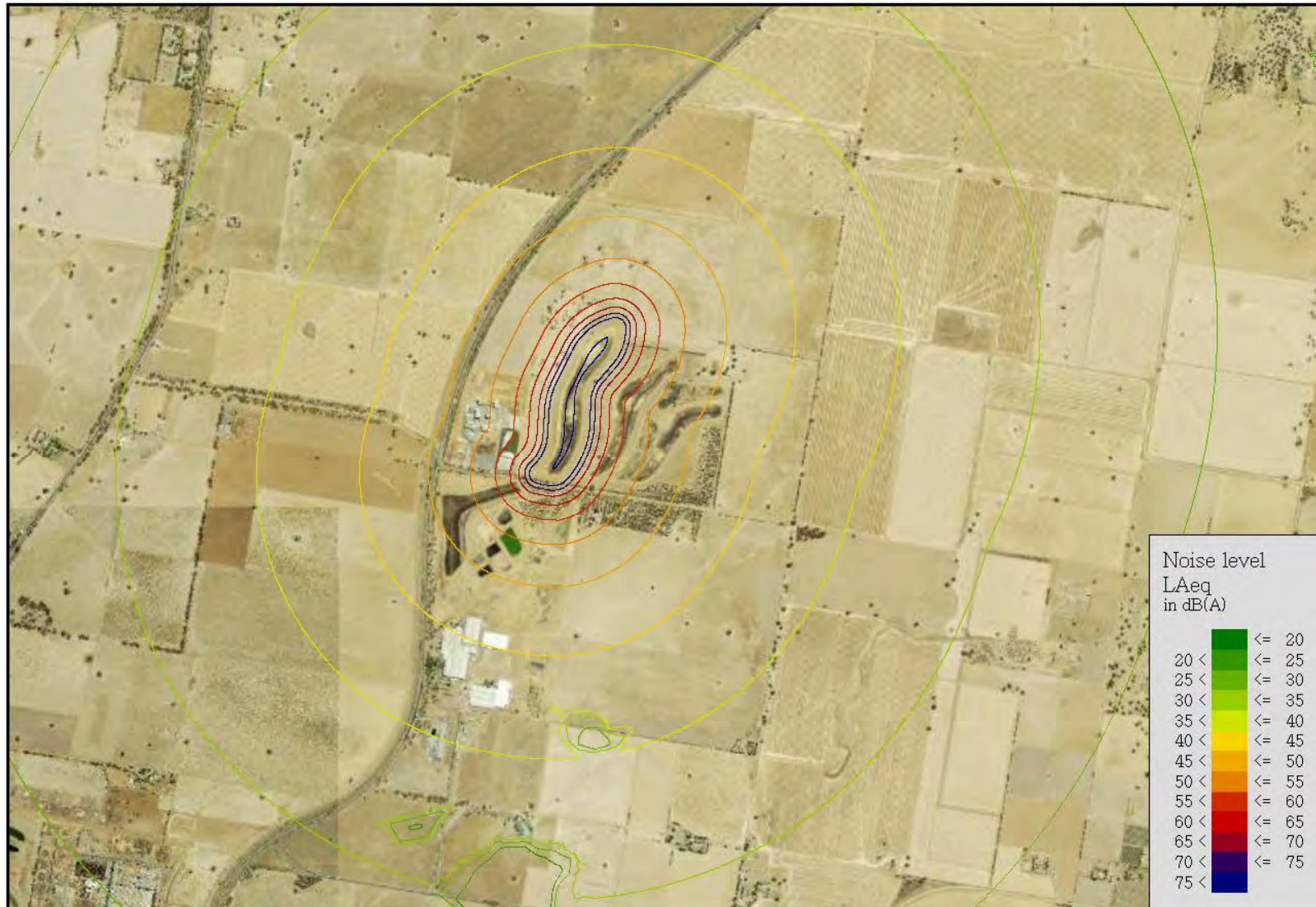
Figure 10-8 Map of groundwater-dependent ecosystems in locality from BOM.

Appendix B. Construction noise contours

B.1 Construction of site access and hard stand area



B.2 Construction of landfill footprint and leachate pond



Appendix C. Operational noise contours

C.1 Operational noise contours during the operations at the southernmost cell



C.2 Operational noise contours during the operations at the middle cell



C.3 Operational noise contours during the operations at the northernmost cell



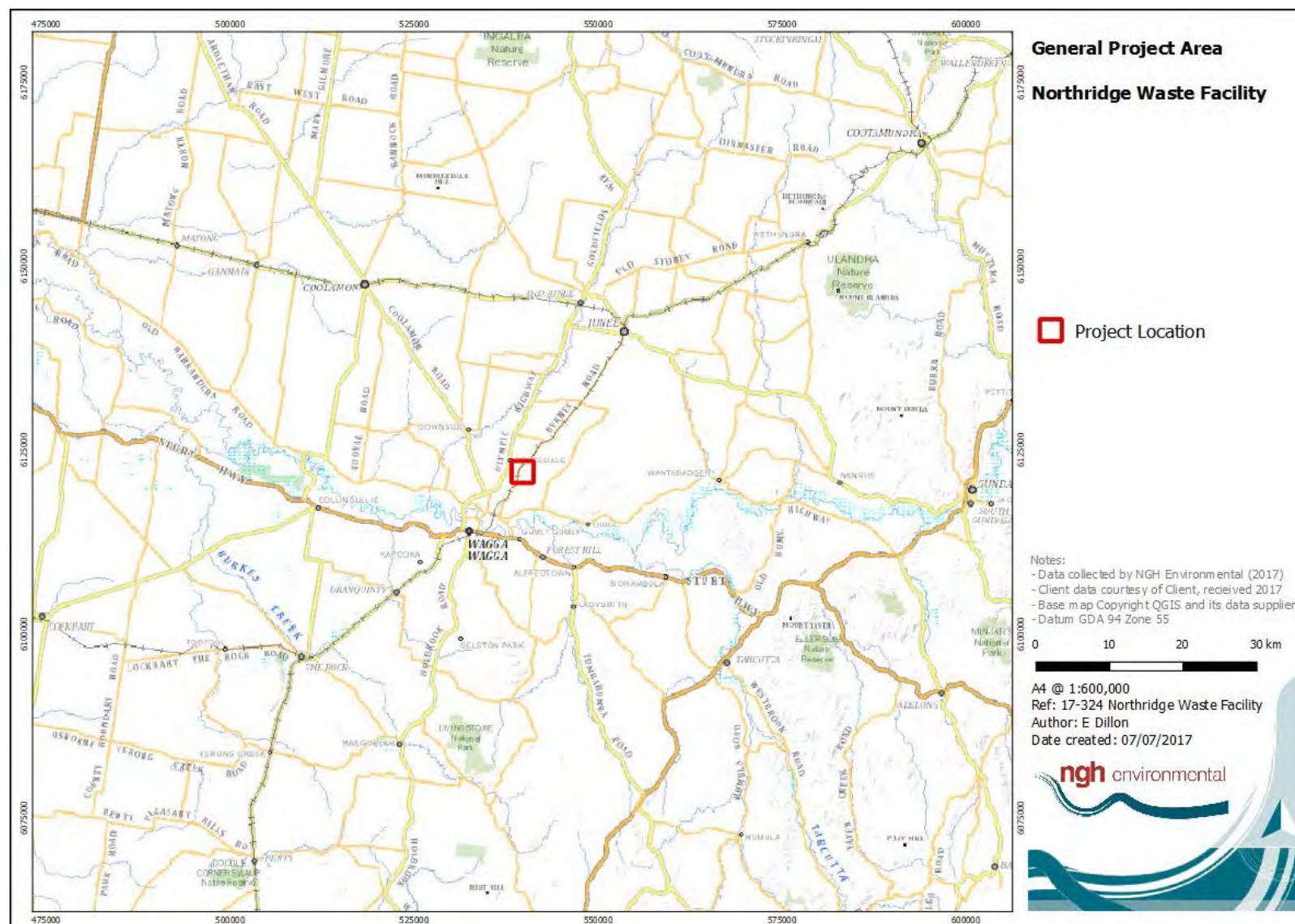


Figure 1 General project location.

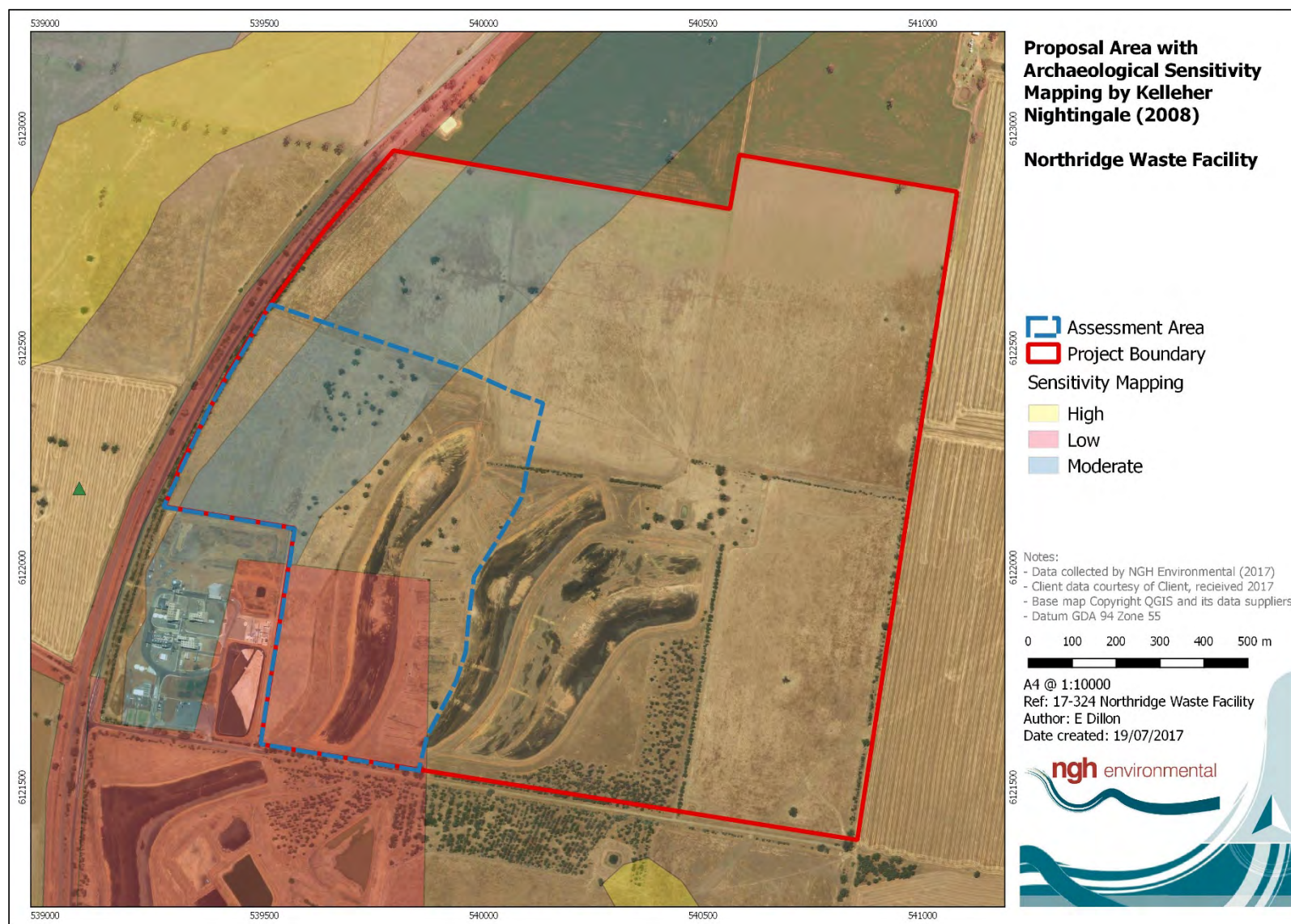


Figure 2 Project boundary and assessment area of this report with Kelleher Nightingale (2008) archaeological sensitivity mapping overlay

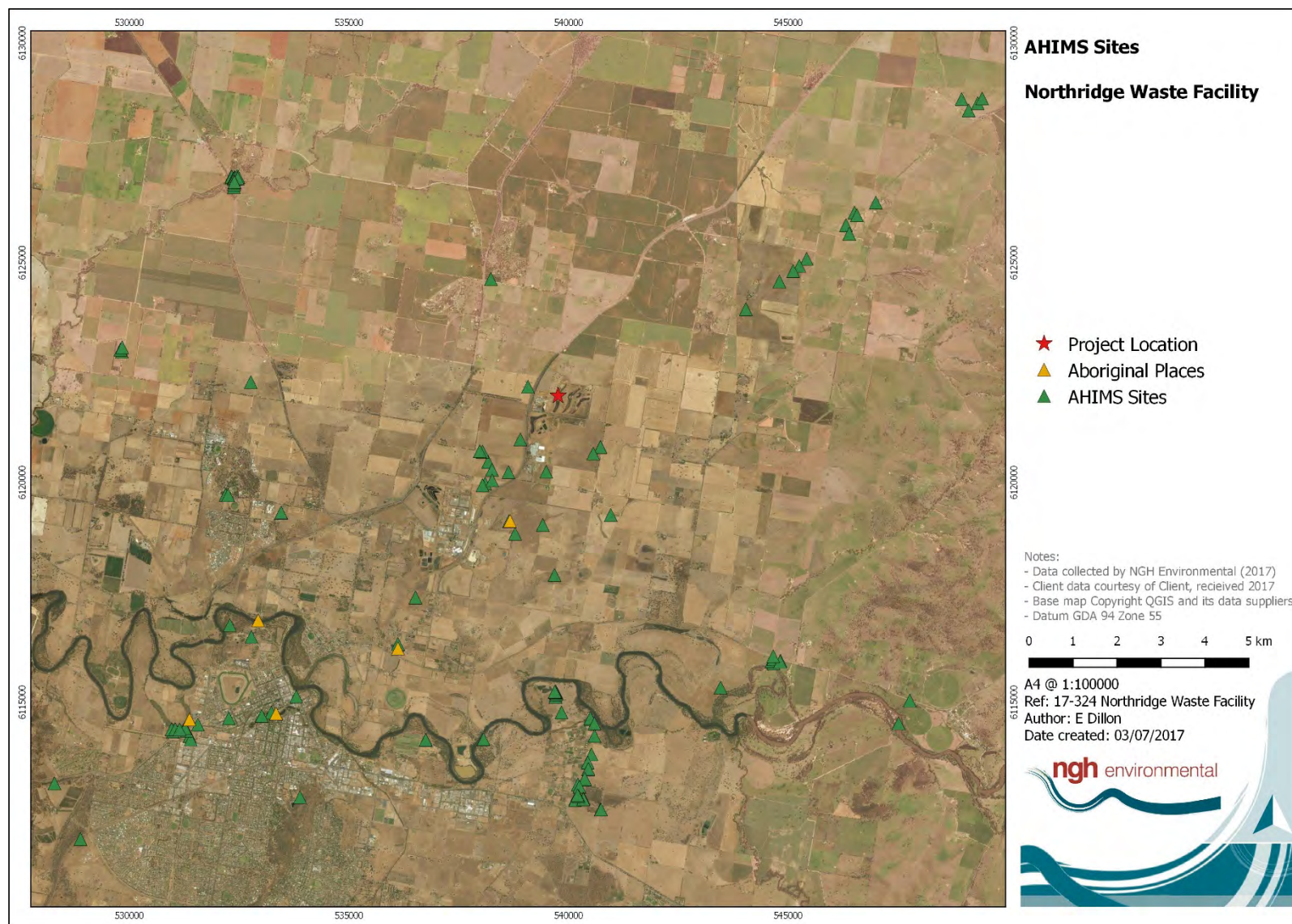


Figure 3 AHIMS sites and Aboriginal Places near the project area

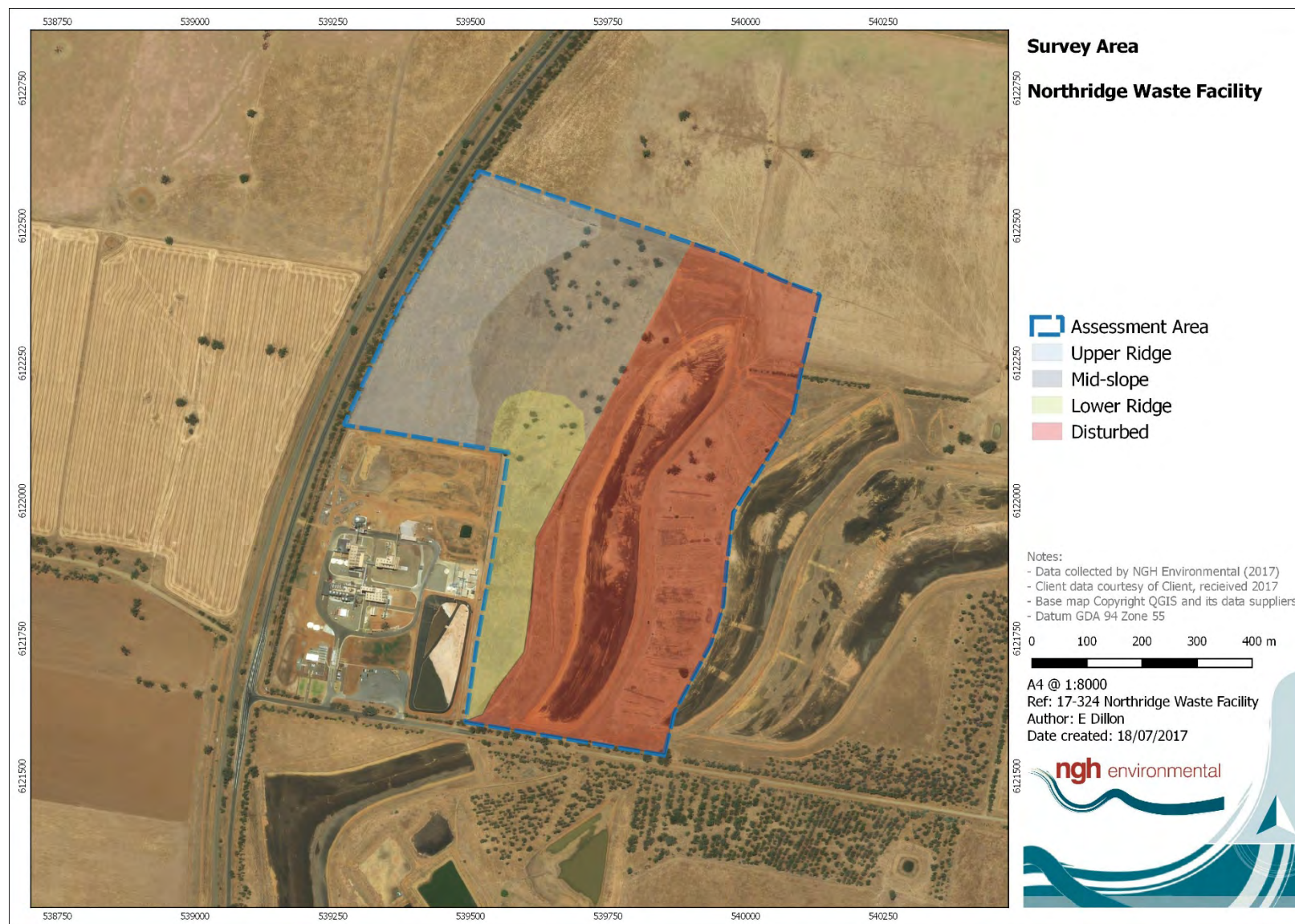


Figure 4 Division of proposal area into landforms



Test Pit 6

Test Pit 5

Test Pit 4

Test Pit 3

Test Pit 2

Test Pit 1

Gate

Trahaars Rd



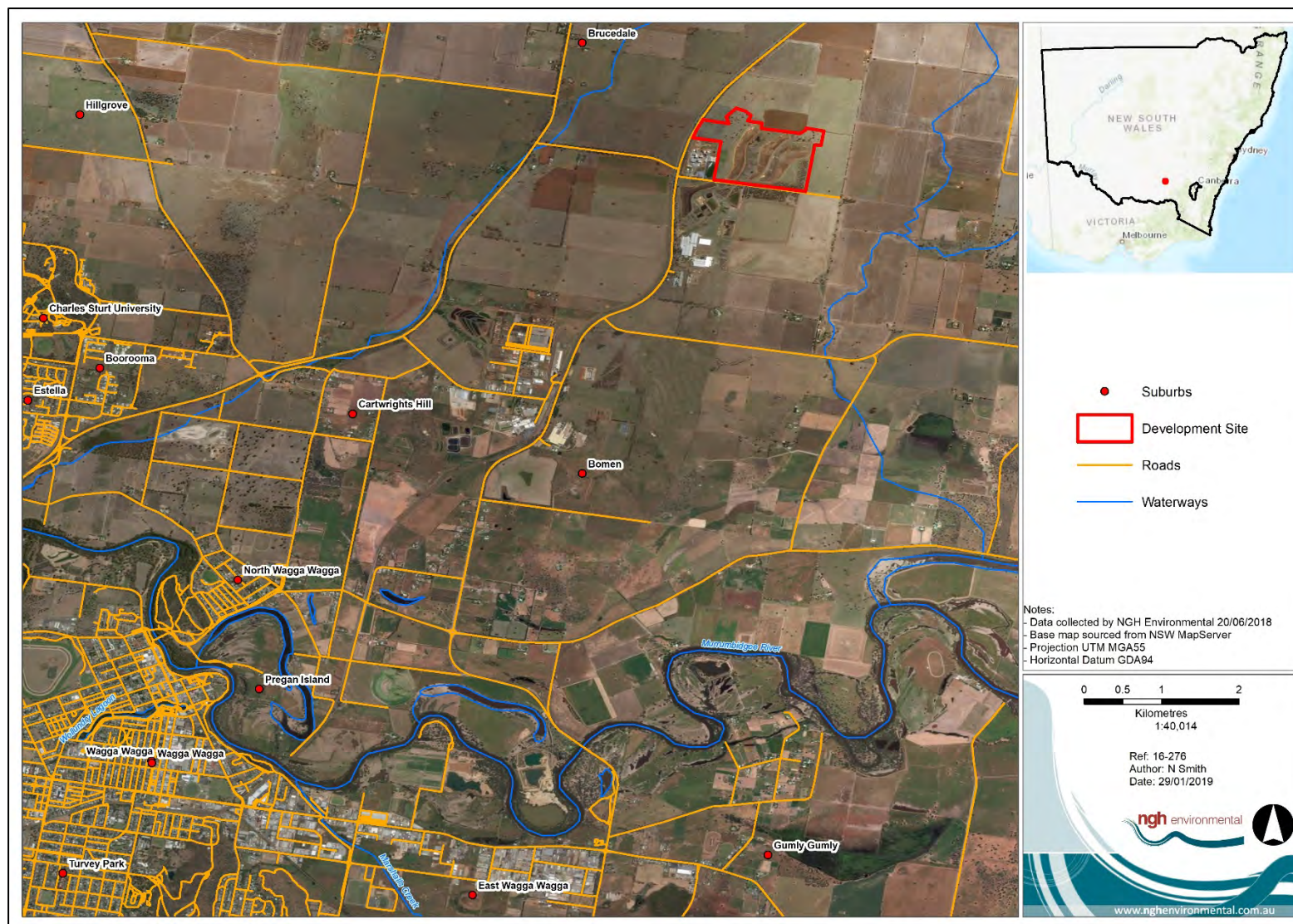


Figure 1-2 Location of the proposed North Ridge Materials Facility

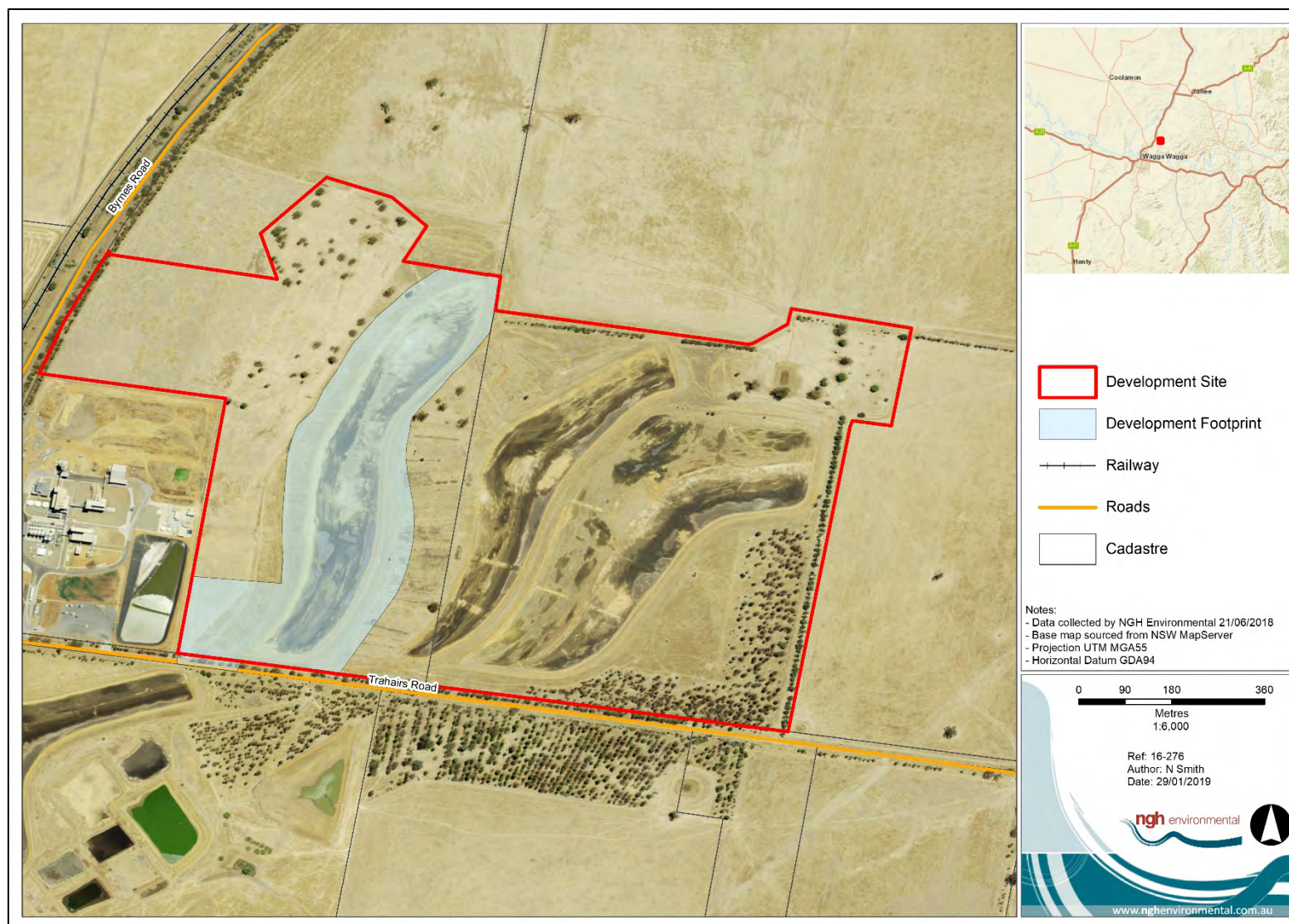


Figure 1-3 Proposed development site and footprint

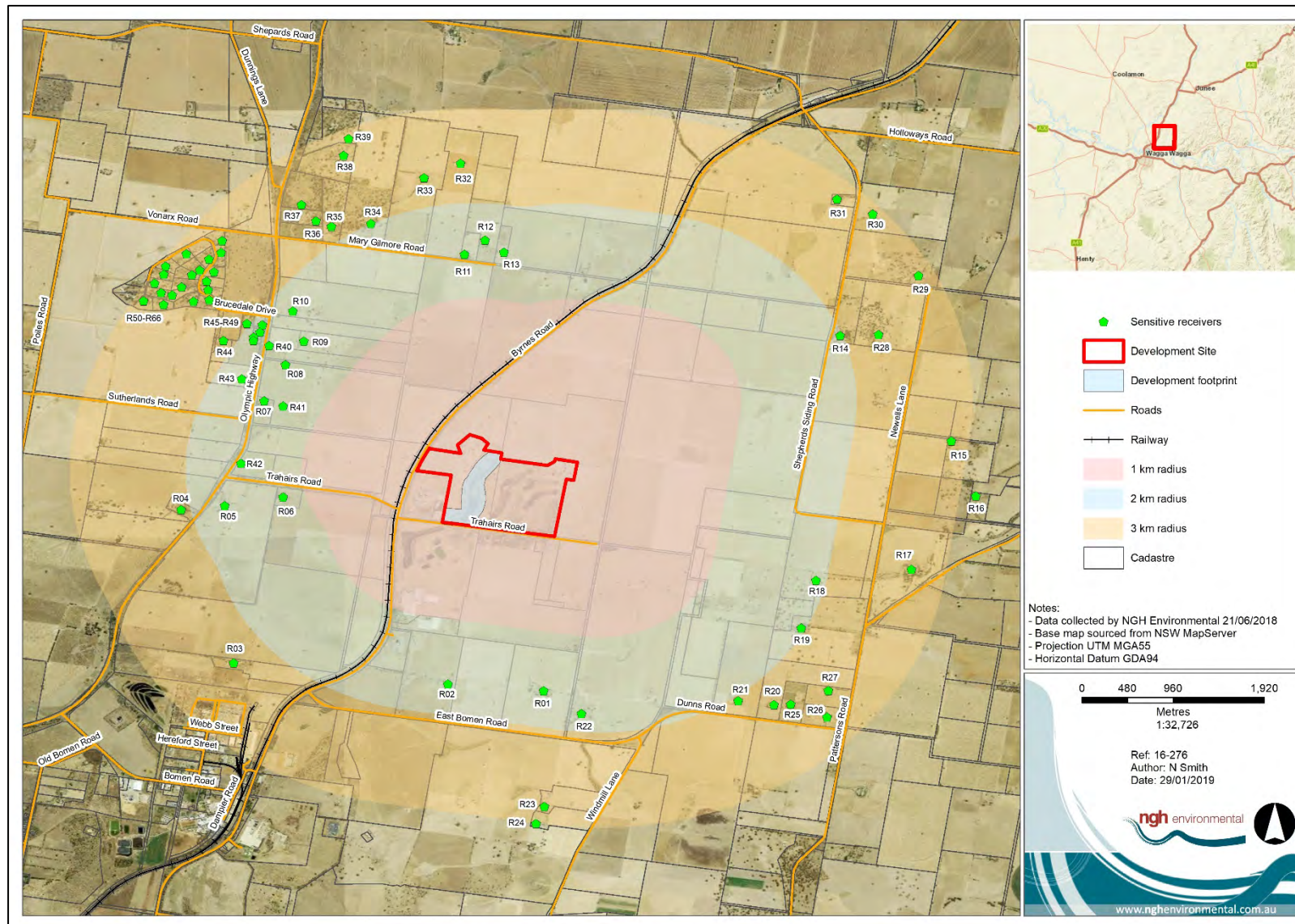


Figure 3-1 Representative sensitive receivers surrounding the proposed development site

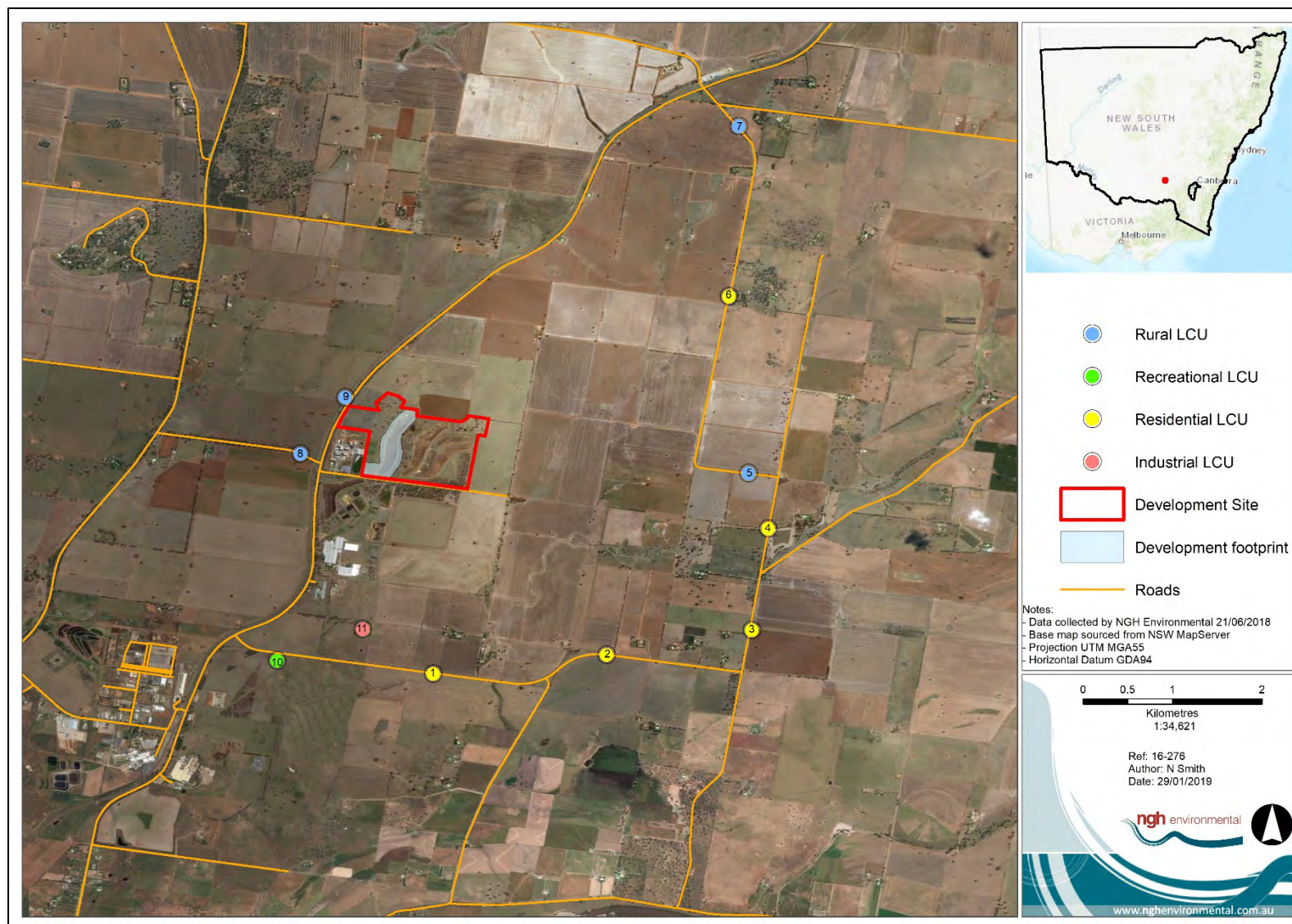
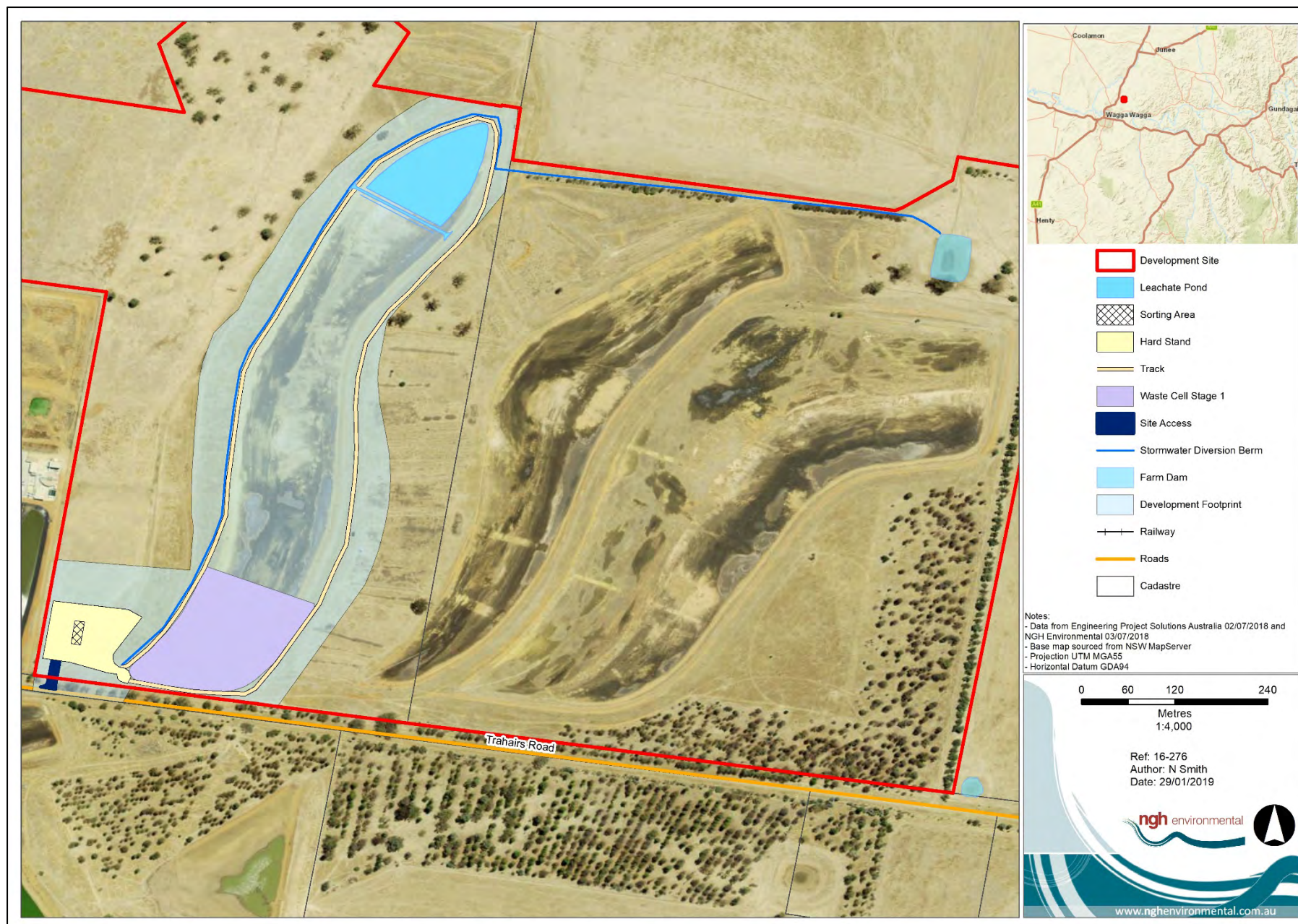
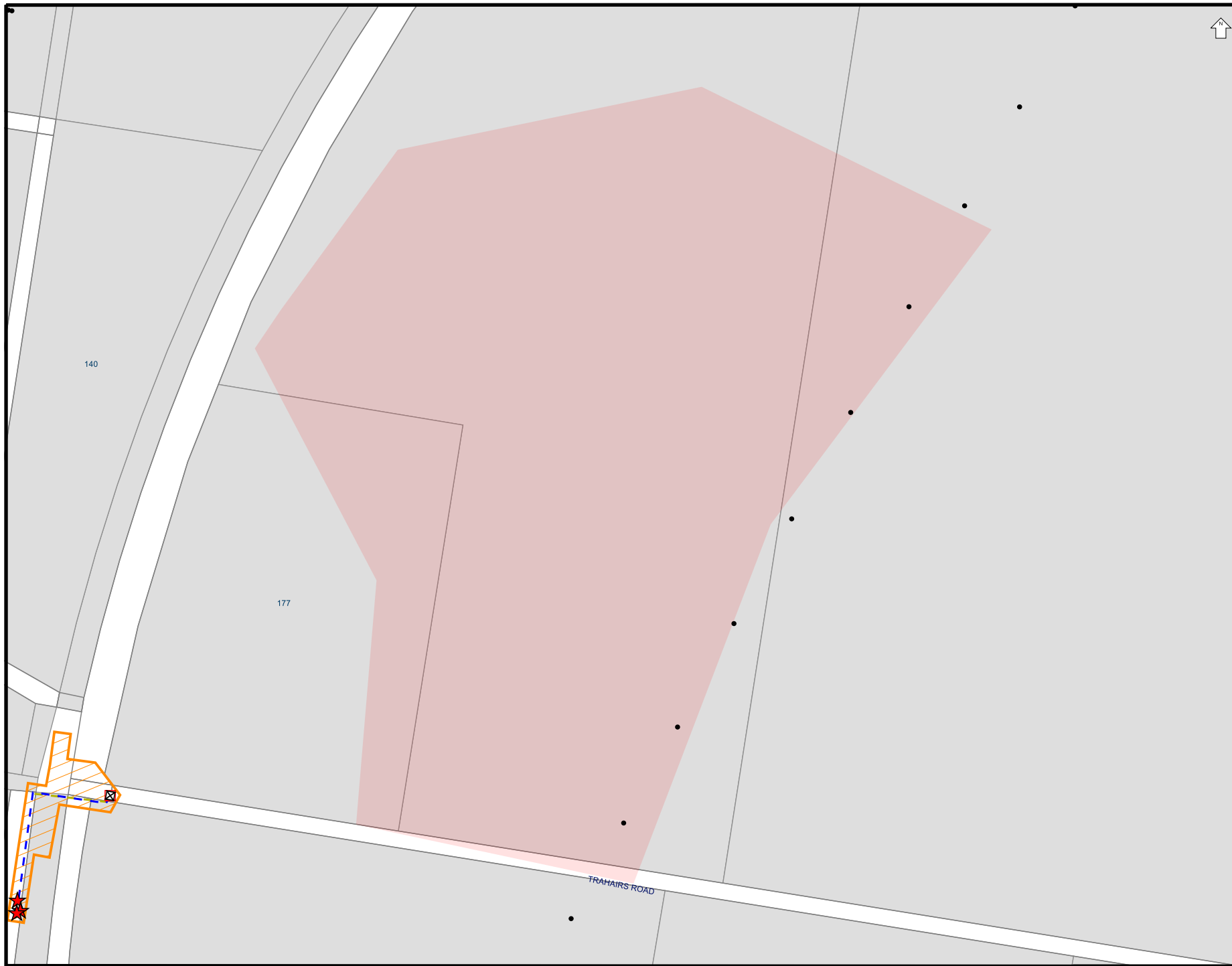


Figure 3-3 Representative viewpoints and corresponding Landscape Character Units





Overhead wires not shown
LOOK UP & LIVE!

LEGEND

- LV Underground Cable
- HV Underground Cable
- Underground Pipe
- ★ Underground Earth or Wires
- ▲ Ground Substation
- Pole
- ⊠ Cubicle
- Pit
- Area of Interest

Critical Assets

Contact Essential Energy
on 13 23 91

- Zone Substation
- Underground Cable
- Underground Fibre

Proposed Works

- Area of proposed works

Proposed assets are shown as
orange symbols

THE INFORMATION ON THIS
MAP MAY NOT BE
ACCURATE.

If details are incorrect,
please notify
Essential Energy on
13 23 91
(or fax 1800 354 636)

ISSUE DATE: 05/07/2018

You must resubmit your
request if you have not
started work within 4 weeks
of the 'Issue Date' above

A4 SCALE: 1:6143



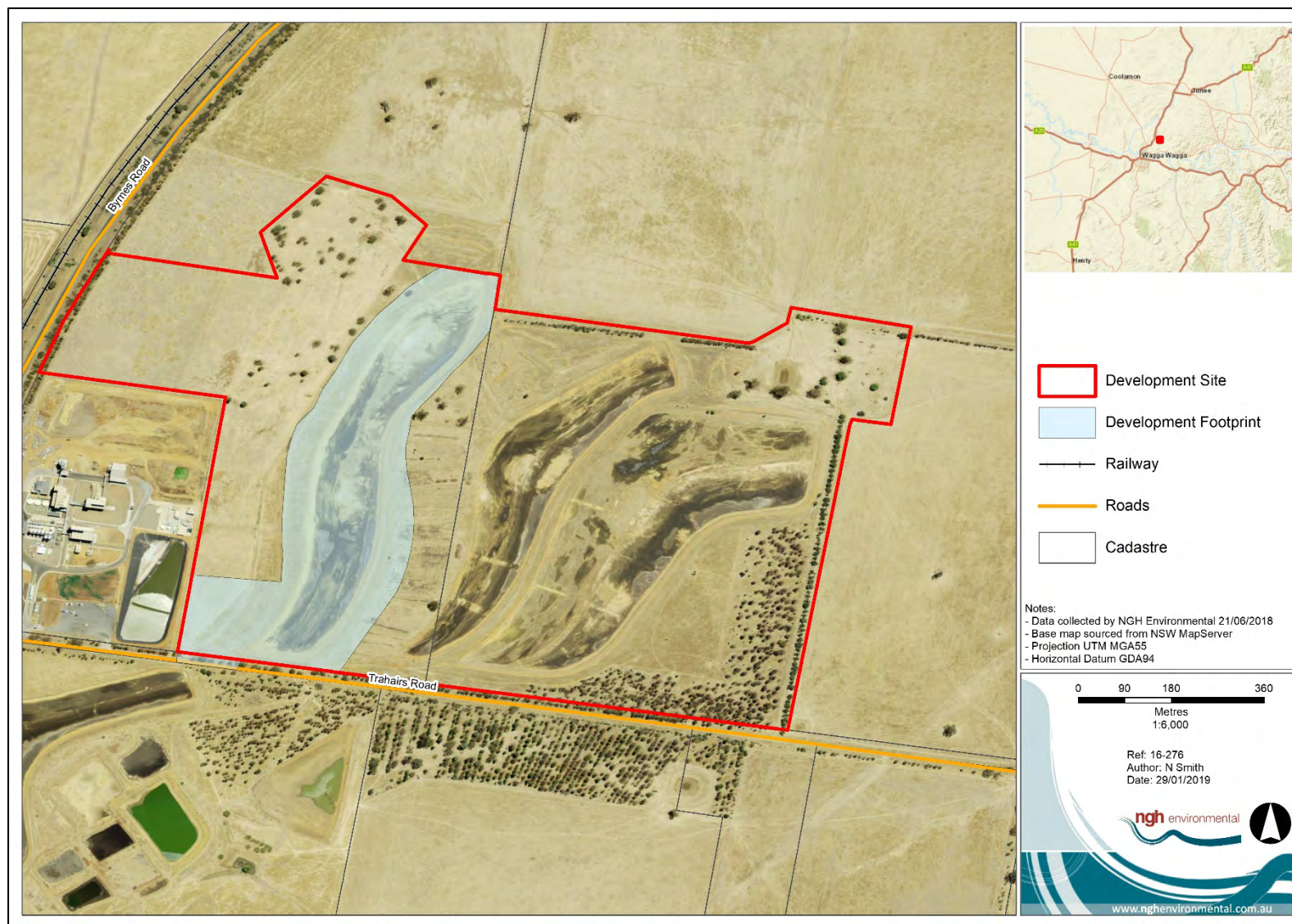


Figure 1-1 The proposed development site, development footprint, evaporation ponds and the ROBE facility (corner of Byrnes Road and Trahairs Road)

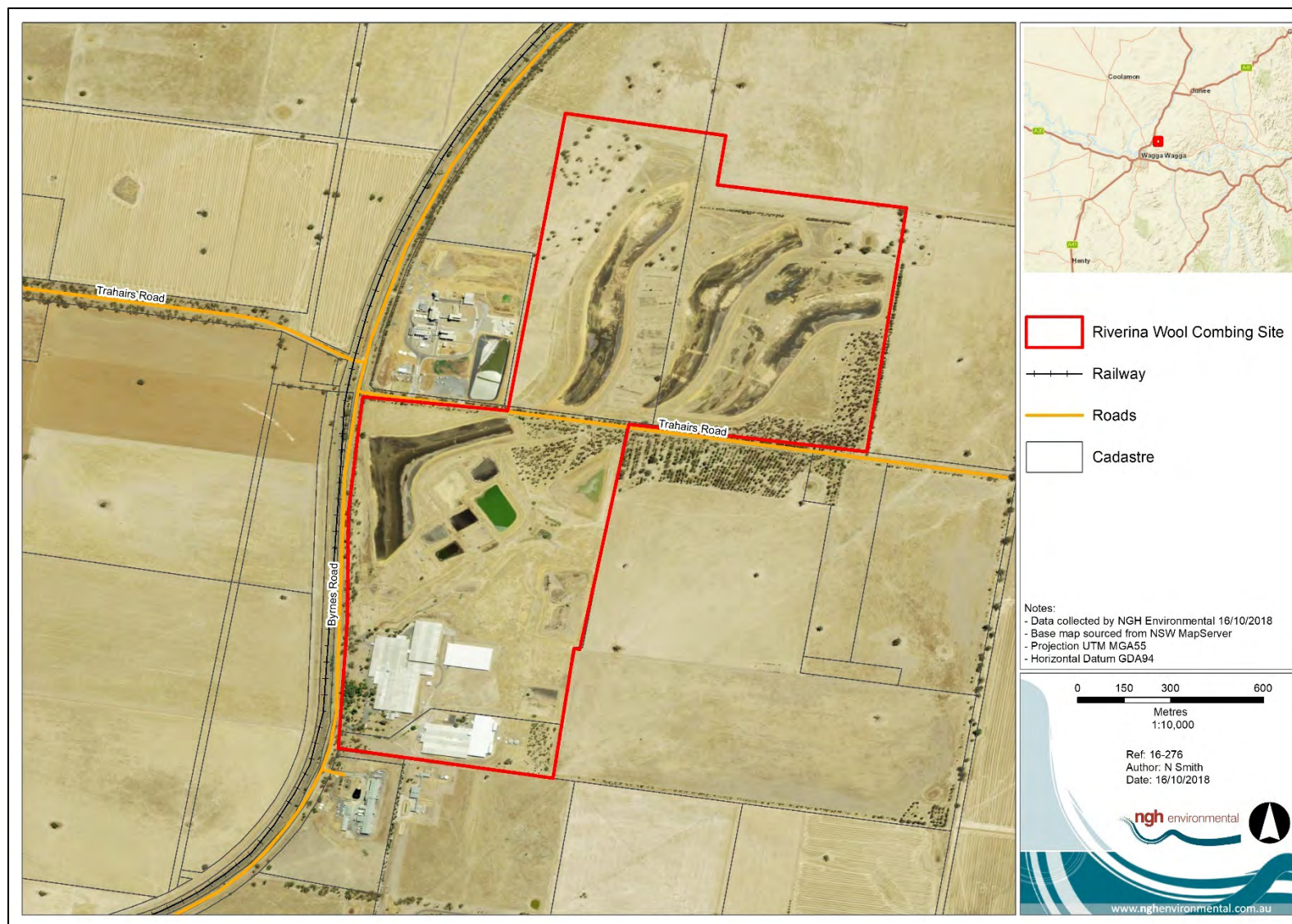


Figure 2-2 Location of the Riverina Wool Combing site

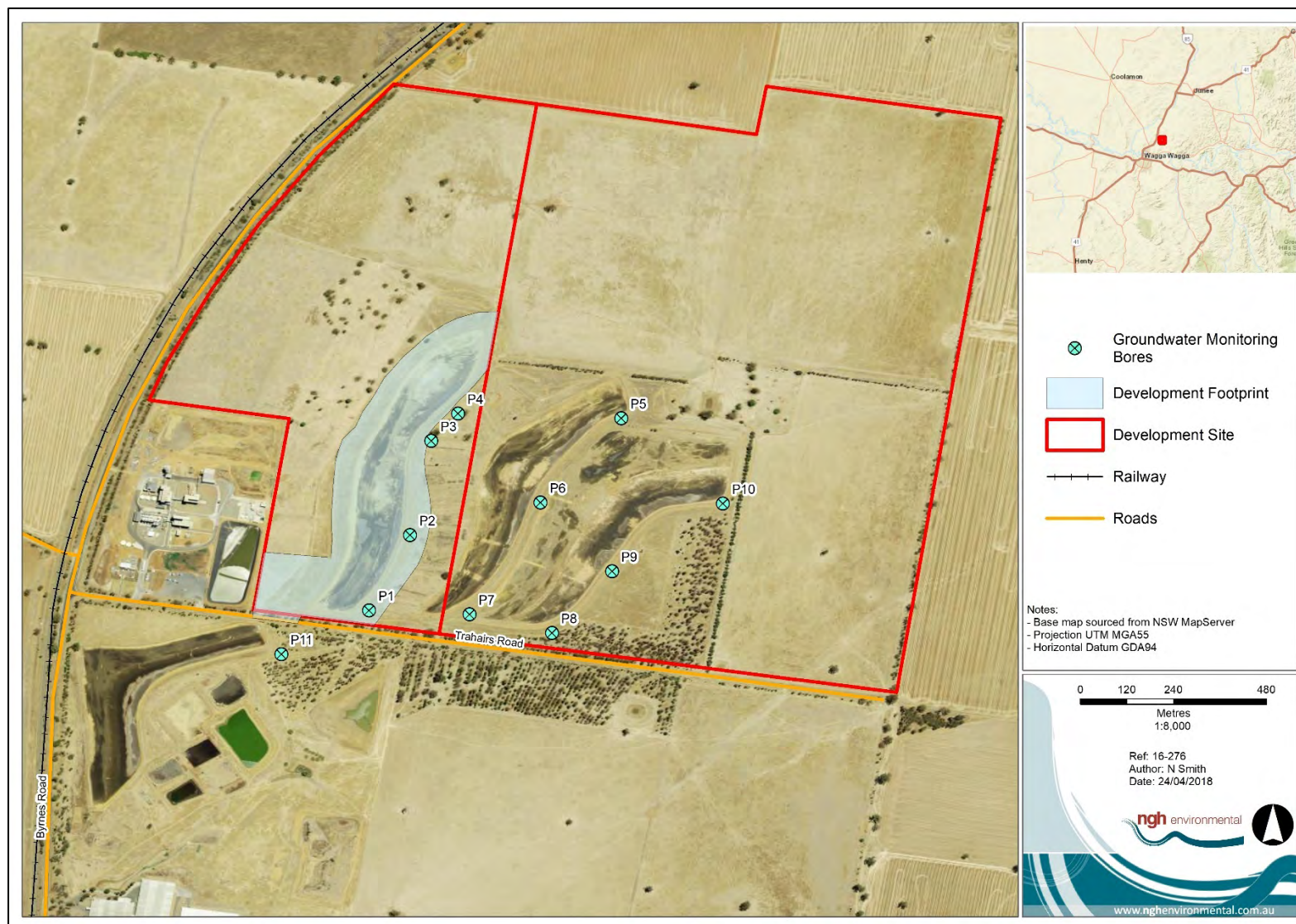


Figure 2-6 Groundwater monitoring bores down-gradient of the evaporation ponds

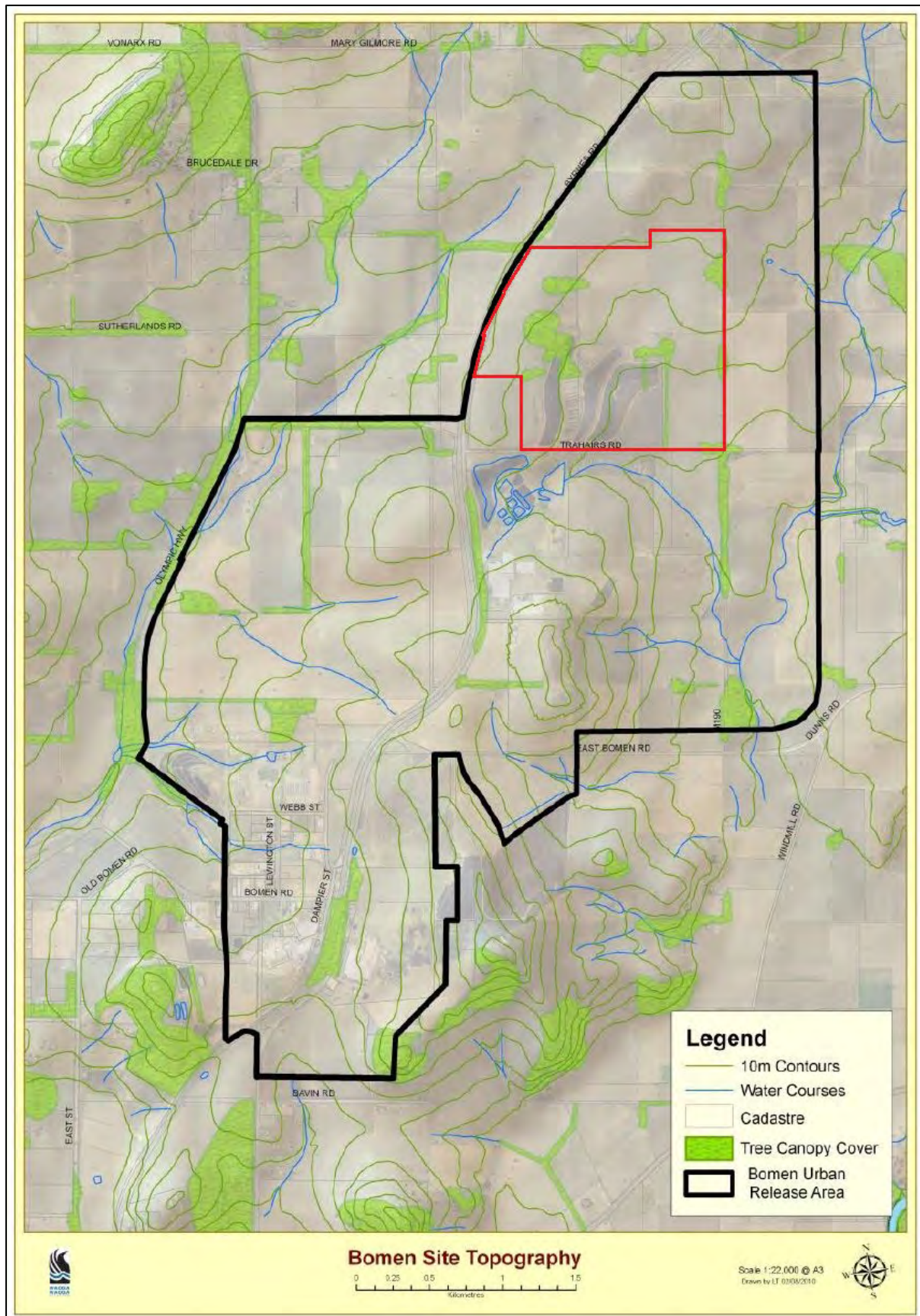


Figure 3-2 Drainage of Bomen Industrial Area, including the development site (outlined in red)

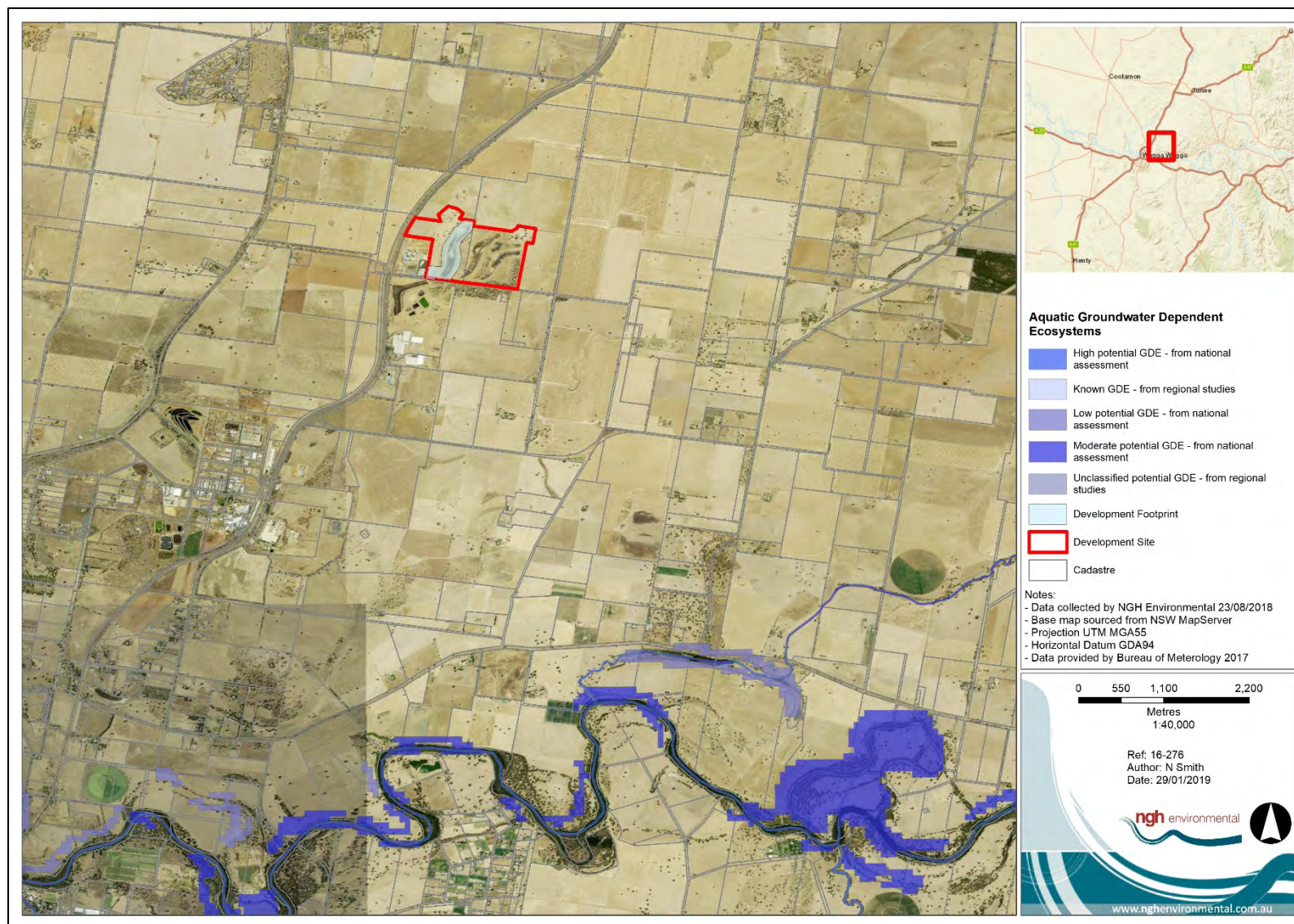


Figure 3-3 Aquatic groundwater dependent ecosystems in proximity to the development site, indicated by the red boundary

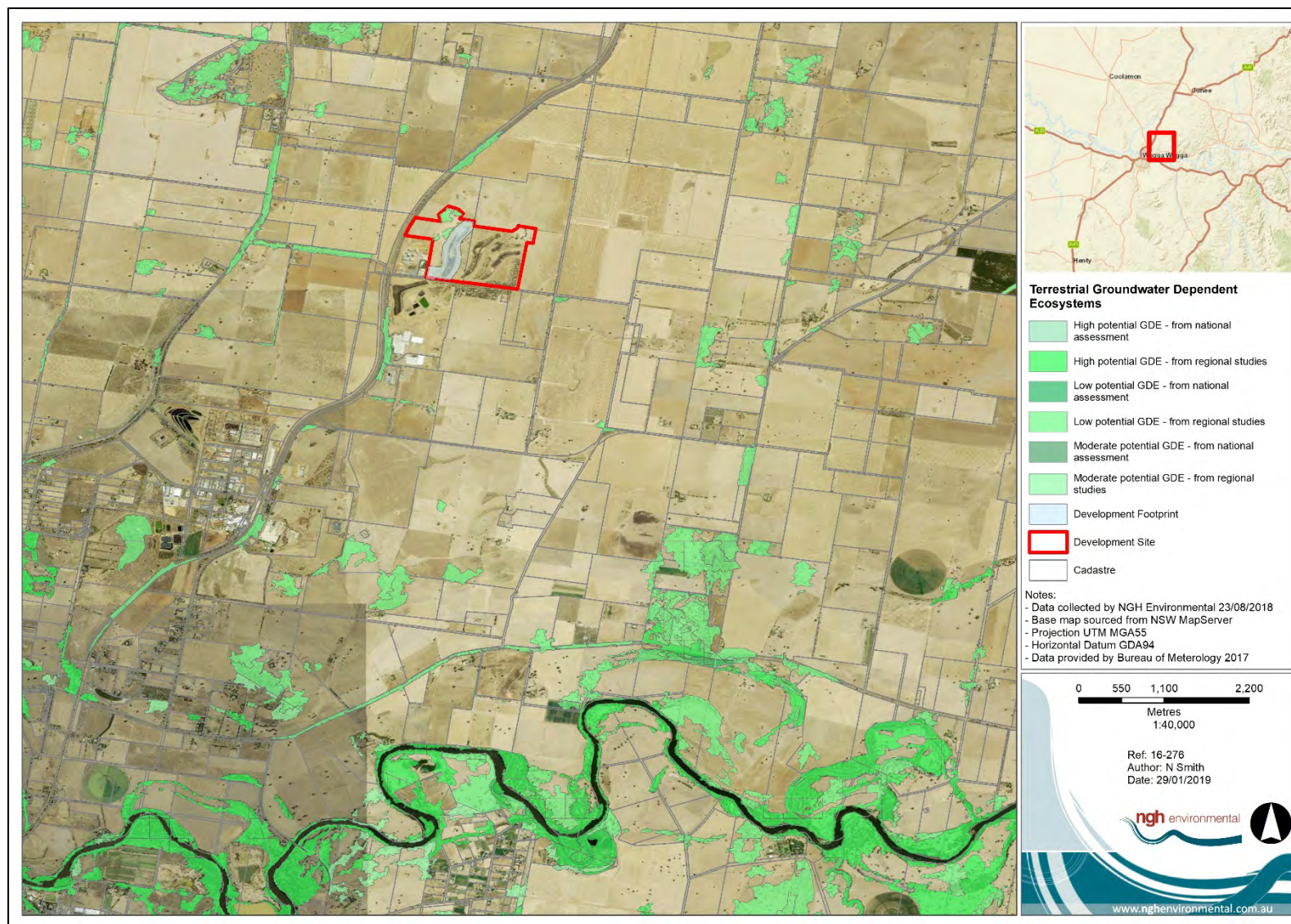


Figure 3-4 Terrestrial groundwater dependent ecosystems in proximity to the development site, indicated by the red boundary

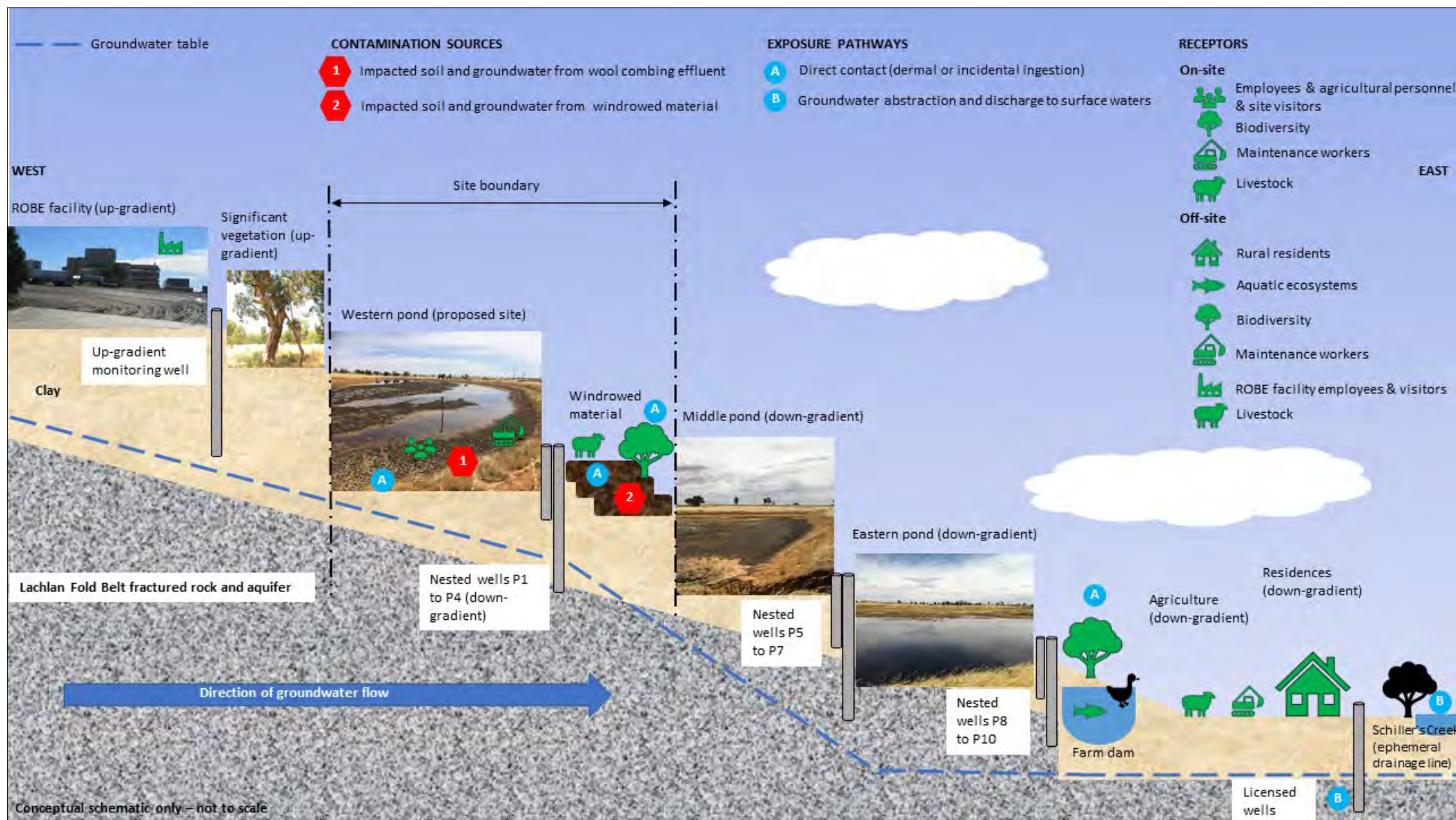


Figure 5-2 Visual schematic of the CSM

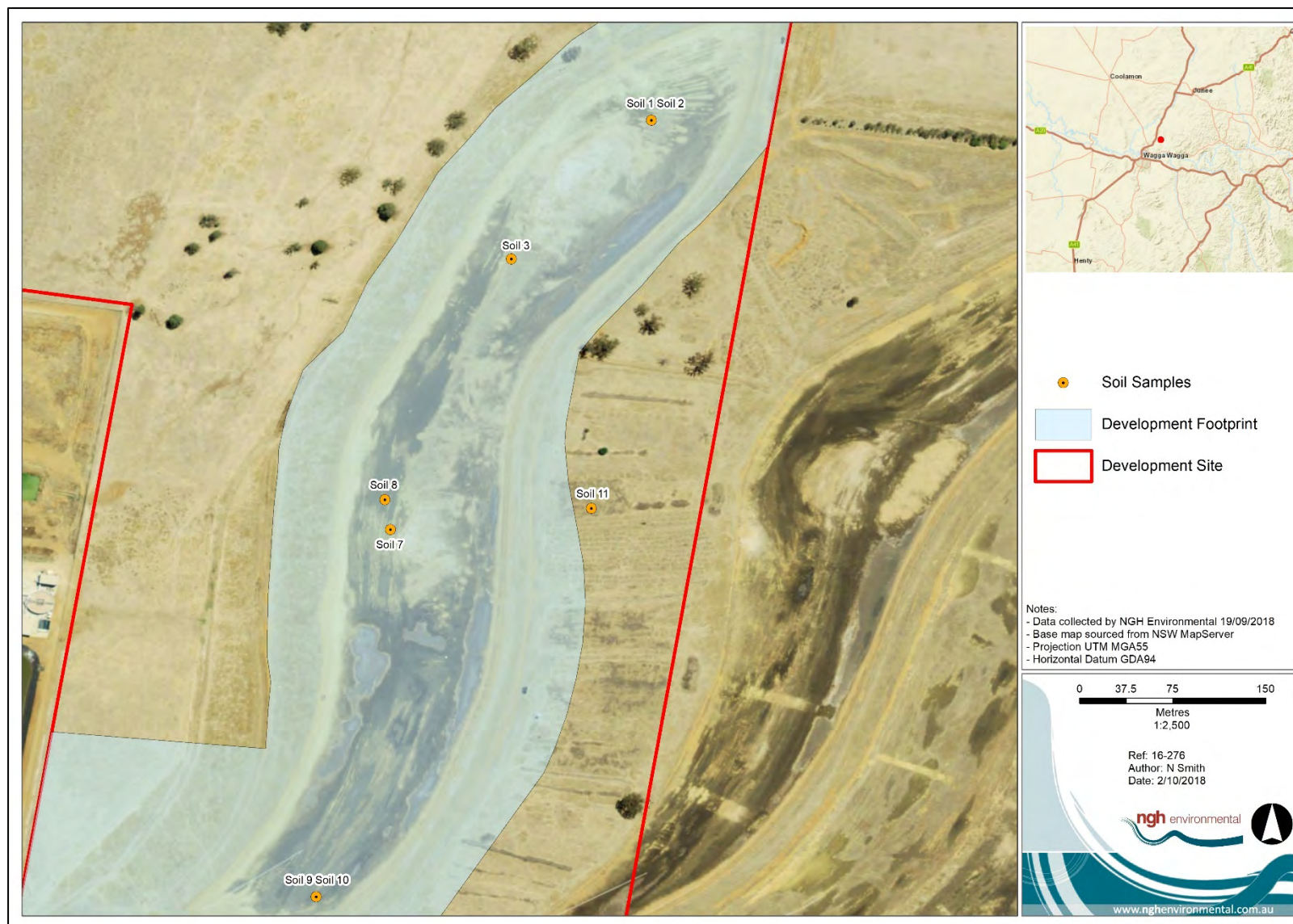


Figure 6-1 Soil sample locations



Test Pit 6

Test Pit 5

Test Pit 4

Test Pit 3

Test Pit 2

Test Pit 1

Gate

Trahairs Rd

