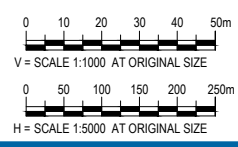


LEGEND

- COLLUVIUM
- ALLUVIUM
- MANGAKAHIA COMPLEX:**
 - UNDIFFERENTIATED (INFERRED)
 - NON CALCAREOUS MUDSTONE
- MOTATAU COMPLEX:**
 - UNDIFFERENTIATED (INFERRED)
 - CALCAREOUS MUDSTONE
 - MAHURANGI LIMESTONE
- MELANGE
- PAKIRI FORMATION:**
 - UNDIFFERENTIATED (INFERRED)
 - RESIDUALLY TO HIGHLY WEATHERED
 - SANDSTONE
 - GRITSTONE
 - ALTERNATING SANDSTONE AND SILTSTONE
- INFERRED GROUND WATER LEVEL
- INFERRED GEOLOGICAL BOUNDARY
- CPT1000 WARKWORTH-WELLSFORD BOREHOLE/CPT (2017)
- BH4000 PUHOI-WARKWORTH BOREHOLE/CPT (2015)
- BH20000 COUNCIL BOREHOLES (2017)

LONGITUDINAL SECTION - MCS0
SCALE 1:5000H-A1, 1:1000V-A1

NOTE
1. LONG SECTION REPRESENTS PROFILE ALONG THE SOUTHBOUND LANES OF THE INDICATIVE ALIGNMENT.



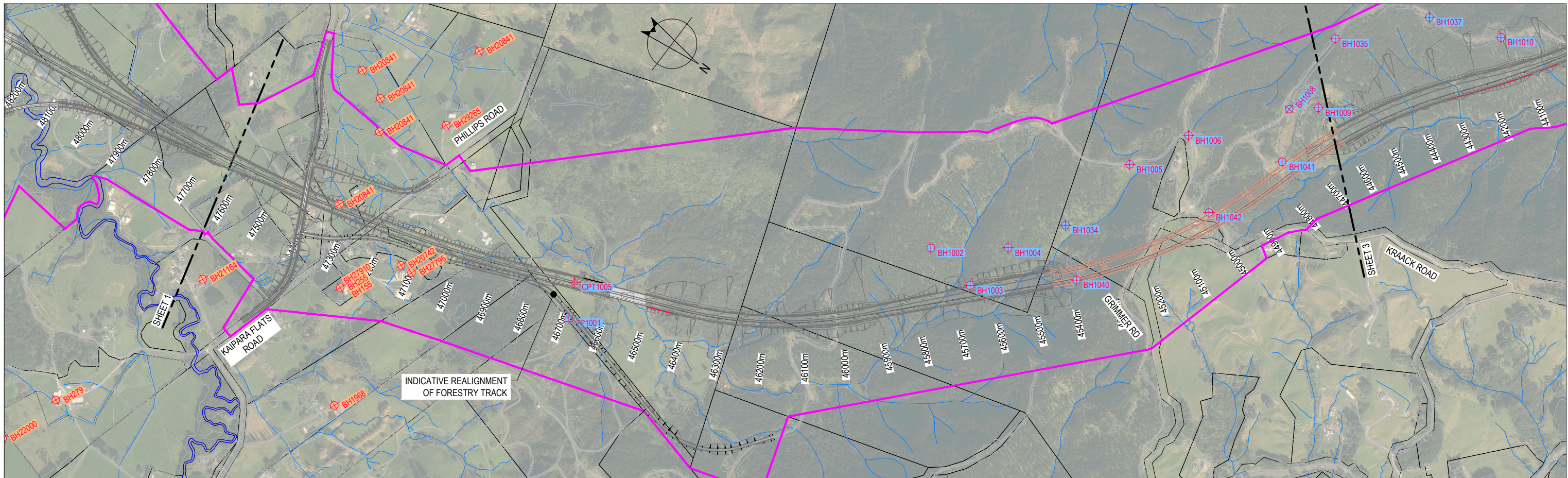
0	ISSUED FOR RMA APPROVALS	WAS	JB*	BN*	07/19	
No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Checked	Approved	Date



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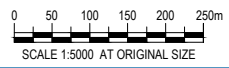
FOR RMA APPROVALS			
Drawn WAS	Drafting SA* Check	Designed SA	Design GH* Check
Approved BN*	Date JULY 2019		Original Size A1
Scale AS SHOWN	This Drawing must not be used for Construction unless signed as Approved		

Project	WARKWORTH TO WELLSFORD PROJECT			
Title	GROUND WATER LONGITUDINAL SECTION			
Contract:	PA4156	Drawing No:	GW-011	Sheet: 1 of 10
Rev:	0			



FOR LONGITUDINAL SECTION REFER TO DRAWING G-013

- LEGEND**
- COLLUVIUM
 - ALLUVIUM
 - MANGAKAHIA COMPLEX:**
 - UNDIFFERENTIATED (INFERRED)
 - NON CALCAREOUS MUDSTONE
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 - CPT1000 WARKWORTH-WELLSFORD BOREHOLE/CPT (2017)
 - BH4000 PUHOI-WARKWORTH BOREHOLE/CPT (2015)
 - BH20000 COUNCIL BOREHOLES (2017)



No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Checked	Approved	Date
0	ISSUED FOR RMA APPROVALS		WAS	JB*	BN*	07/19



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Drawn WAS	Drafting SA* Check	Designed SA	Design GH* Check
Approved BN*		Date JULY 2019	
Scale AS SHOWN		This Drawing must not be used for Construction unless signed as Approved	
		Original Size	A1

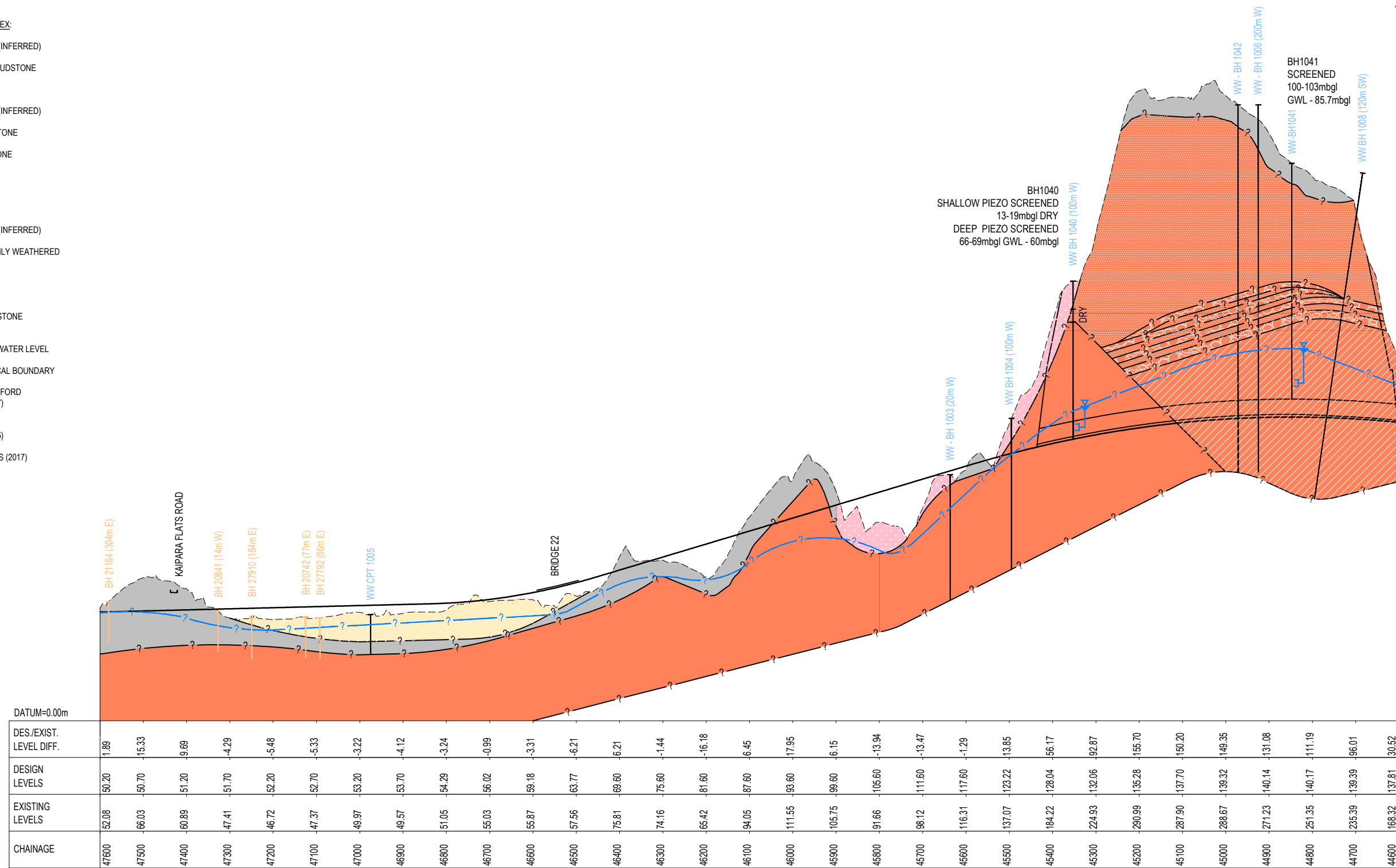
Project	WARKWORTH TO WELLSFORD PROJECT		
Title	GROUND WATER LONGITUDINAL SECTION		
Contract:	PA4156	Drawing No:	GW-012
Sheet:	2 OF 10	Rev:	0

LEGEND

- COLLUVIUM
- ALLUVIUM
- MANGAKAHIA COMPLEX:**
- UNDIFFERENTIATED (INFERRED)
- NON CALCAREOUS MUDSTONE
- MOTATAU COMPLEX:**
- UNDIFFERENTIATED (INFERRED)
- CALCAREOUS MUDSTONE
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- INFERRED GEOLOGICAL BOUNDARY
- WARKWORTH-WELLSFORD BOREHOLE/CPT (2017)
- PUHOI-WARKWORTH BOREHOLE/CPT (2015)
- COUNCIL BOREHOLES (2017)

NOTE

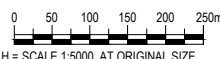
1. LONG SECTION REPRESENTS PROFILE ALONG THE SOUTHBOUND LANES OF THE INDICATIVE ALIGNMENT.



LONGITUDINAL SECTION - MCSO
SCALE 1:5000H-A1, 1:1000V-A1



V = SCALE 1:1000 AT ORIGINAL SIZE



H = SCALE 1:5000 AT ORIGINAL SIZE

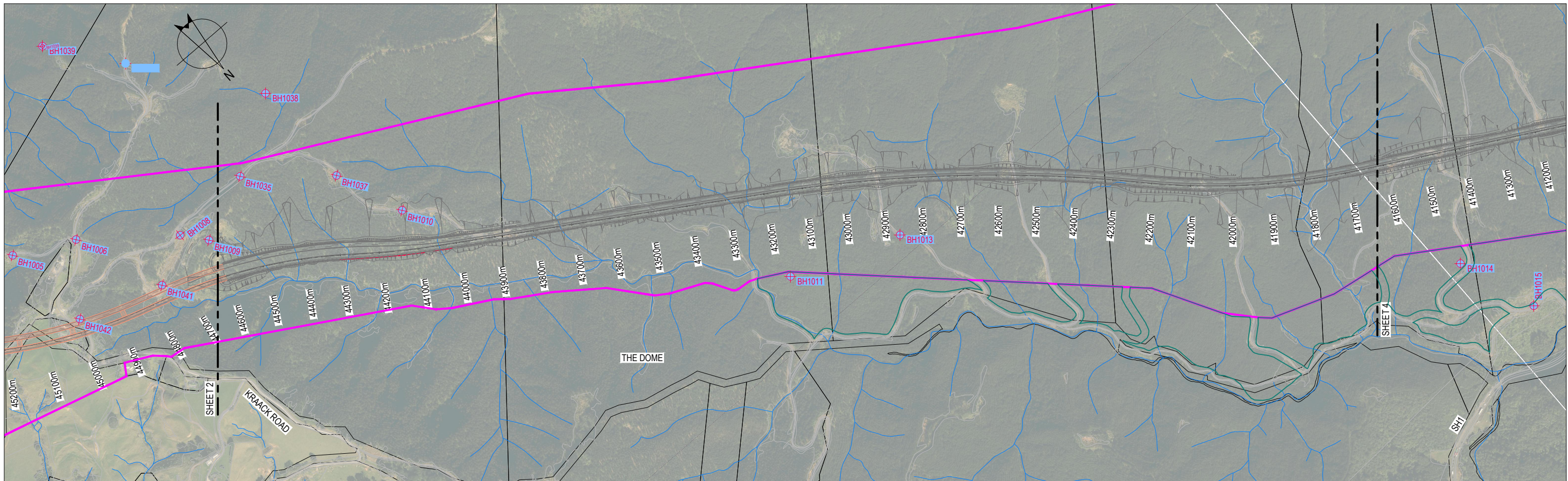
0	ISSUED FOR RMA APPROVALS	WAS	JB*	BN*	07/19				
No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Checked	Approved	Date			



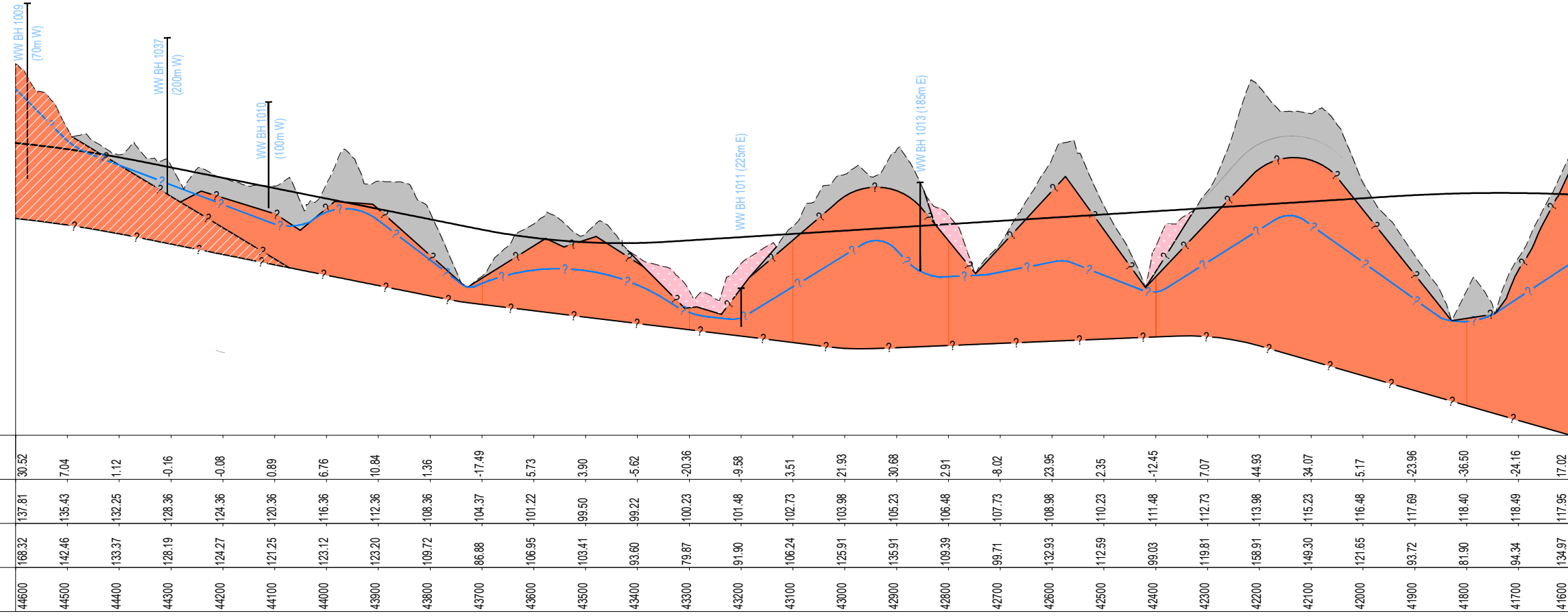
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FOR RMA APPROVALS			
Drawn WAS	Drafting SA* Check	Designed SA	Design GH* Check
Approved BN*		Date JULY 2019	
Scale AS SHOWN		This Drawing must not be used for Construction unless signed as Approved	
		Original Size	A1

Project	WARKWORTH TO WELLSFORD PROJECT			
Title	GROUND WATER LONGITUDINAL SECTION			
Contract:	PA4156	Drawing No:	GW-013	Sheet: 3 OF 10
Rev:	0			



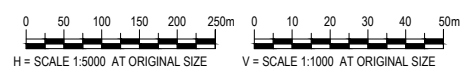
NOTE
 1. LONG SECTION REPRESENTS PROFILE ALONG THE SOUTHBOUND LANES OF THE INDICATIVE ALIGNMENT.



- LEGEND**
- COLLUVIUM
 - ALLUVIUM
 - MANGAKAHIA COMPLEX:**
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 - MELANGE
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 - BH4000 PUHOI-WARKWORTH BOREHOLE/CPT (2015)
 - BH20000 COUNCIL BOREHOLES (2017)

DATUM=25.00m

	44600	44500	44400	44300	44200	44100	44000	43900	43800	43700	43600	43500	43400	43300	43200	43100	43000	42900	42800	42700	42600	42500	42400	42300	42200	42100	42000	41900	41800	41700	41600
DES./EXIST. LEVEL DIFF.	30.52	7.04	1.12	-0.16	-0.08	0.89	6.76	-10.84	-1.36	-17.49	-5.73	3.90	-5.62	-20.36	-9.98	-3.51	21.93	-30.68	2.91	-8.02	23.95	2.35	-12.45	7.07	-44.93	34.07	-5.17	-23.96	-36.50	-24.16	17.02
DESIGN LEVELS	137.81	135.43	132.25	128.36	124.36	120.36	116.36	112.36	108.36	104.37	101.22	99.50	99.22	100.23	101.48	102.73	103.98	105.23	106.48	107.73	108.98	110.23	111.48	112.73	113.98	115.23	116.48	117.69	118.40	118.49	117.95
EXISTING LEVELS	168.32	142.46	133.37	128.19	124.27	121.25	116.36	112.20	109.72	106.88	106.95	103.41	93.60	79.87	91.90	106.24	125.91	135.91	109.39	99.71	132.93	112.59	99.03	119.81	158.91	149.30	121.65	93.72	81.90	94.34	134.97
CHAINAGE	44600	44500	44400	44300	44200	44100	44000	43900	43800	43700	43600	43500	43400	43300	43200	43100	43000	42900	42800	42700	42600	42500	42400	42300	42200	42100	42000	41900	41800	41700	41600



LONGITUDINAL SECTION - MCS0
 SCALE 1:5000H-A1, 1:1000V-A1

0	ISSUED FOR RMA APPROVALS	WAS	JB*	BN*	07/19	
No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Checked	Approved	Date

NZ TRANSPORT AGENCY
WAKA KOTAHĪ

JACOBS GHD

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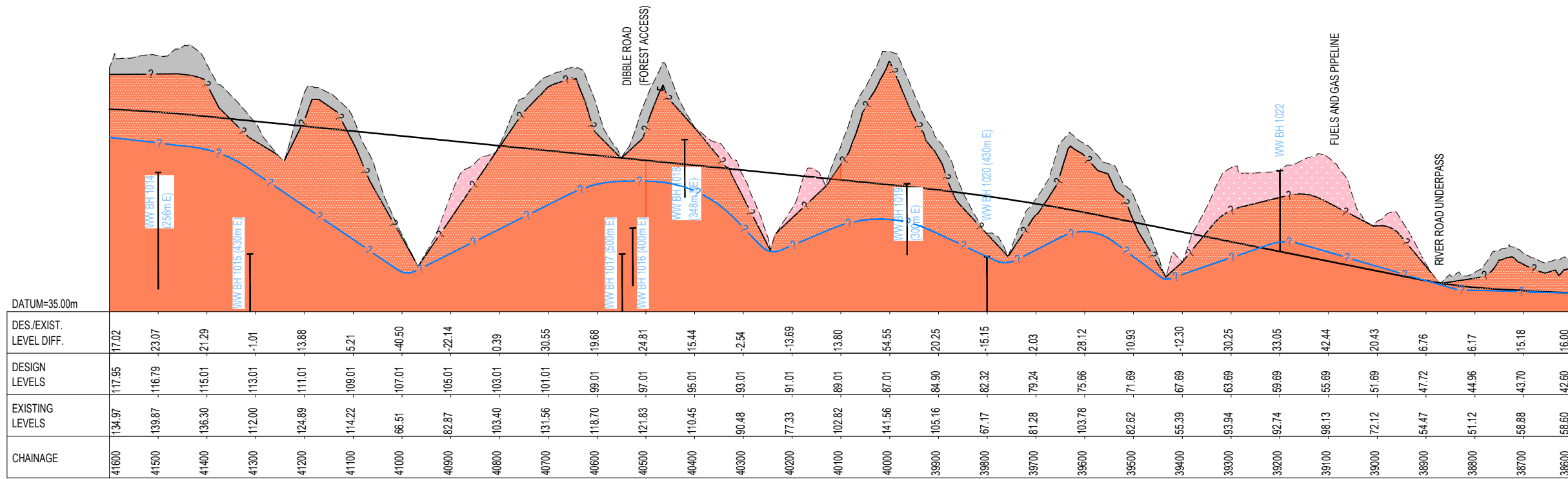
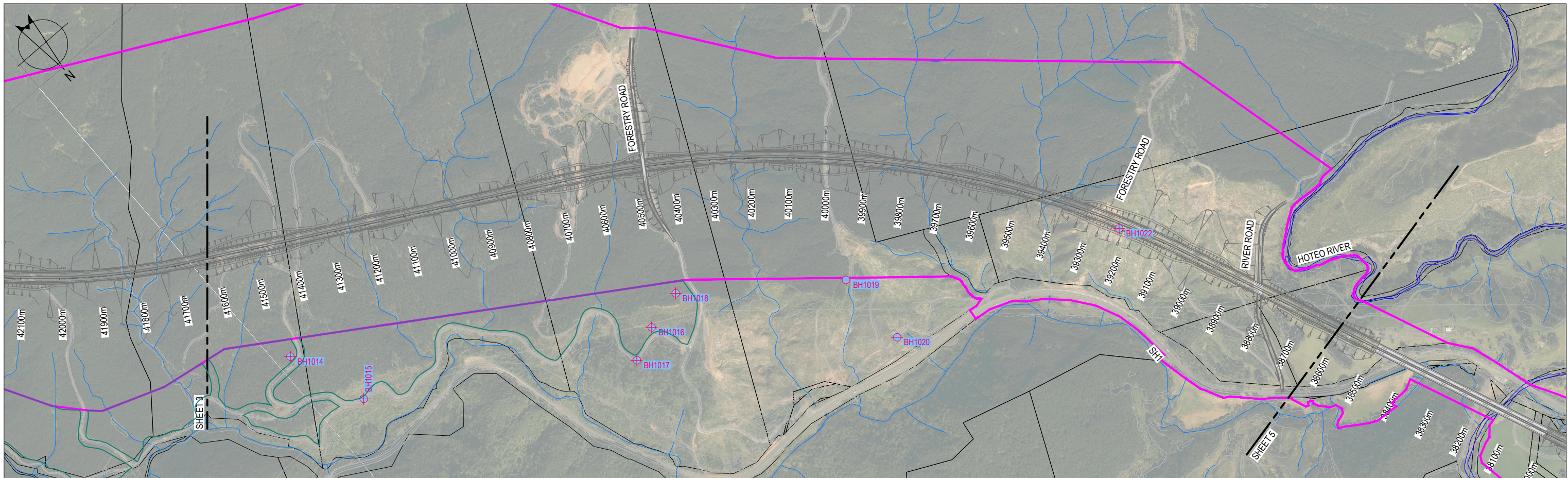
FOR RMA APPROVALS

Drawn WAS	Drafting SA* Check	Designed SA	Design GH* Check
Approved BN*		Date JULY 2019	
Scale AS SHOWN		This Drawing must not be used for Construction unless signed as Approved	

Project **WARKWORTH TO WELLSFORD PROJECT**

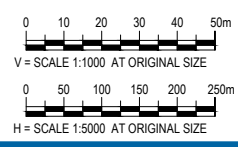
Title **GROUND WATER LONGITUDINAL SECTION**

Contract: **PA4156** Drawing No: **GW-014** Sheet: **4 OF 10** Rev: **0**



- LEGEND**
- COLLUVIUM
 - ALLUVIUM
 - MANGAKAHIA COMPLEX:**
 - UNDIFFERENTIATED (INFERRED)
 - NON CALCAREOUS MUDSTONE
 - MOTATAU COMPLEX:**
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 - UNDIFFERENTIATED (INFERRED)
 - RESIDUALLY TO HIGHLY WEATHERED
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 - WARKWORTH-WELLSFORD BOREHOLE/CPT (2017)
 - PUHOI-WARKWORTH BOREHOLE/CPT (2015)
 - COUNCIL BOREHOLES (2017)

NOTE
 1. LONG SECTION REPRESENTS PROFILE ALONG THE SOUTHBOUND LANES OF THE INDICATIVE ALIGNMENT.



LONGITUDINAL SECTION - MCS0
 SCALE 1:5000H-A1, 1:1000V-A1

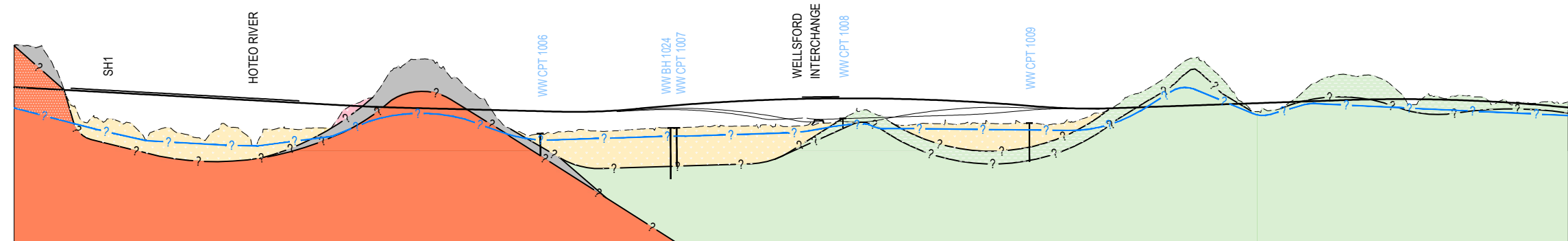
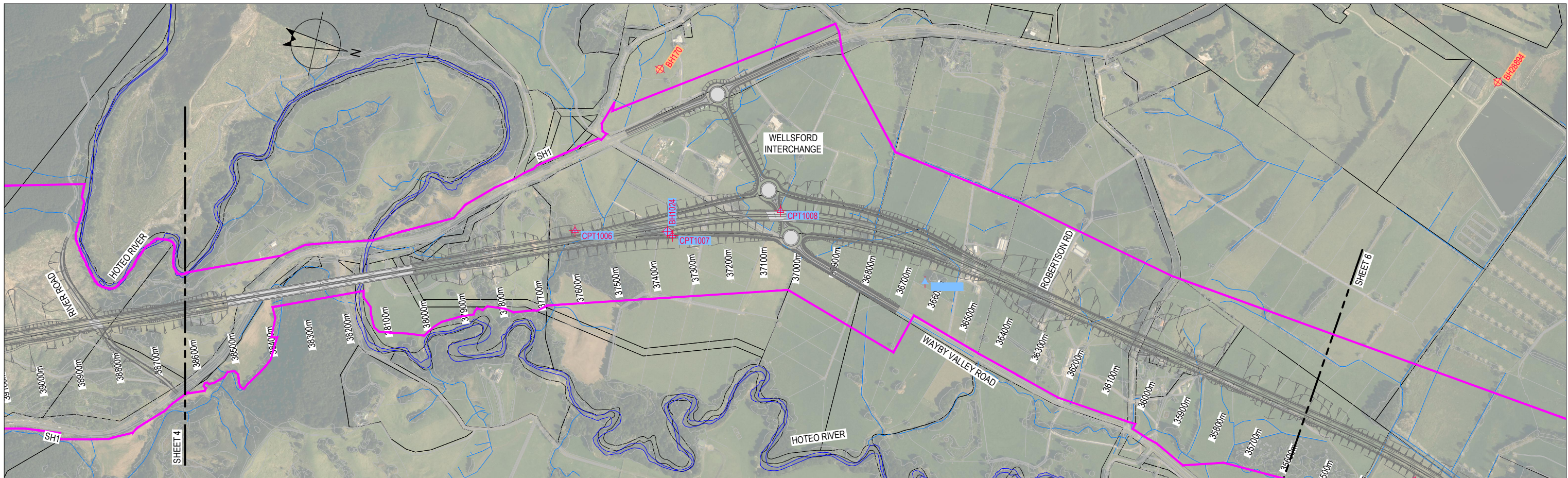
0	ISSUED FOR RMA APPROVALS	WAS	JB*	BN*	07/19	
No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Checked	Approved	Date



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FOR RMA APPROVALS			
Drawn WAS	Drafting SA* Check	Designed SA	Design GH* Check
Approved BN*		Date JULY 2019	
Scale AS SHOWN		This Drawing must not be used for Construction unless signed as Approved	

Project	WARKWORTH TO WELLSFORD PROJECT			
Title	GROUND WATER LONGITUDINAL SECTION			
Contract:	PA4156	Drawing No:	GW-015	Sheet: 5 OF 10
Rev:	0	Original Size:	A1	



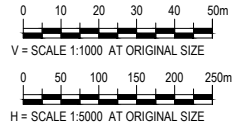
- LEGEND**
- COLLUVIUM
 - ALLUVIUM
 - MANGAKAHIA COMPLEX:**
 - UNDIFFERENTIATED (INFERRED)
 - NON CALCAREOUS MUDSTONE
 - MOTATAU COMPLEX:**
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 - CPT1000 WARKWORTH-WELLSFORD BOREHOLE/CPT (2017)
 - BH4000 PUHOI-WARKWORTH BOREHOLE/CPT (2015)
 - BH20000 COUNCIL BOREHOLES (2017)

DATUM=-20.00m

DES./EXIST. LEVEL DIFF.	16.00	-1.85	-10.82	-12.48	-9.73	-10.83	-9.15	-5.73	-18.89	4.34	-9.23	-6.87	-7.89	-8.82	-9.63	-10.49	-7.72	-9.76	-8.11	-7.80	-6.63	-1.64	-8.28	-16.08	-3.24	-5.78	9.02	-2.08	-1.75	-0.33	2.12
DESIGN LEVELS	42.60	41.50	40.40	39.30	38.20	37.10	36.00	35.00	34.42	33.92	33.42	33.10	34.22	35.95	37.21	37.99	38.29	38.11	37.45	36.32	34.81	34.38	35.04	35.74	36.44	37.14	37.80	37.98	37.53	36.46	34.76
EXISTING LEVELS	58.60	39.65	29.58	26.82	28.47	26.27	26.85	40.73	53.30	38.26	24.18	26.23	26.33	27.13	27.59	27.50	30.57	28.35	29.35	28.52	28.18	32.73	43.32	51.81	33.20	42.91	46.82	35.90	39.28	36.78	36.88
CHAINAGE	38600	38500	38400	38300	38200	38100	38000	37900	37800	37700	37600	37500	37400	37300	37200	37100	37000	36900	36800	36700	36600	36500	36400	36300	36200	36100	36000	35900	35800	35700	35600

LONGITUDINAL SECTION - MCSO
SCALE 1:5000H-A1, 1:1000V-A1

NOTE
1. LONG SECTION REPRESENTS PROFILE ALONG THE SOUTHBOUND LANES OF THE INDICATIVE ALIGNMENT.



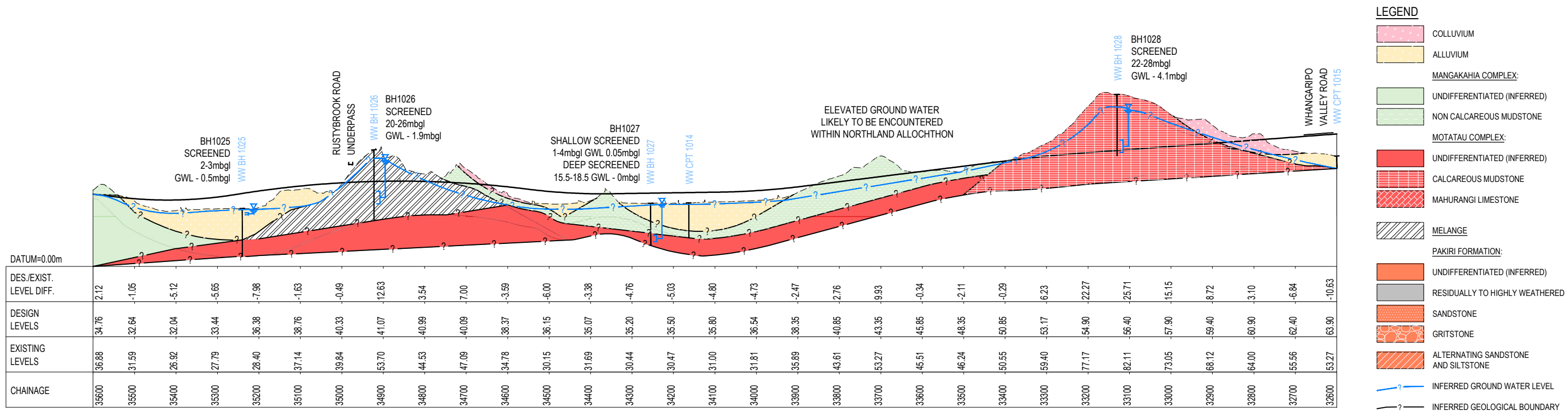
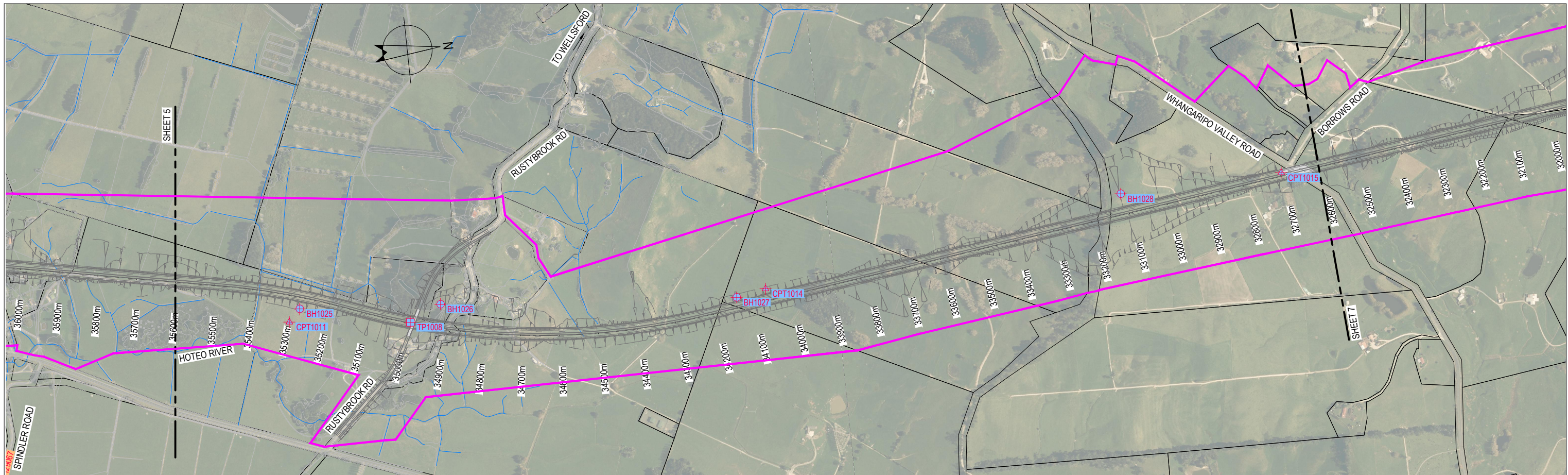
0	ISSUED FOR RMA APPROVALS	WAS	JB*	BN*	07/19	
No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Checked	Approved	Date



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FOR RMA APPROVALS			
Drawn WAS	Drafting SA* Check	Designed SA	Design GH* Check
Approved BN*		Date JULY 2019	
Scale AS SHOWN		This Drawing must not be used for Construction unless signed as Approved	
		Original Size	A1

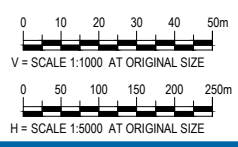
Project	WARKWORTH TO WELLSFORD PROJECT		
Title	GROUND WATER LONGITUDINAL SECTION		
Contract:	PA4156	Drawing No:	GW-016
Sheet:	6 OF 10	Rev:	0



LONGITUDINAL SECTION - MCS0
SCALE 1:5000H-A1, 1:1000V-A1

NOTE
1. LONG SECTION REPRESENTS PROFILE ALONG THE SOUTHBOUND LANES OF THE INDICATIVE ALIGNMENT.

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 - CPT1000 WARKWORTH-WELLSFORD BOREHOLE/CPT (2017)
 - BH4000 PUHOI-WARKWORTH BOREHOLE/CPT (2015)
 - BH20000 COUNCIL BOREHOLES (2017)



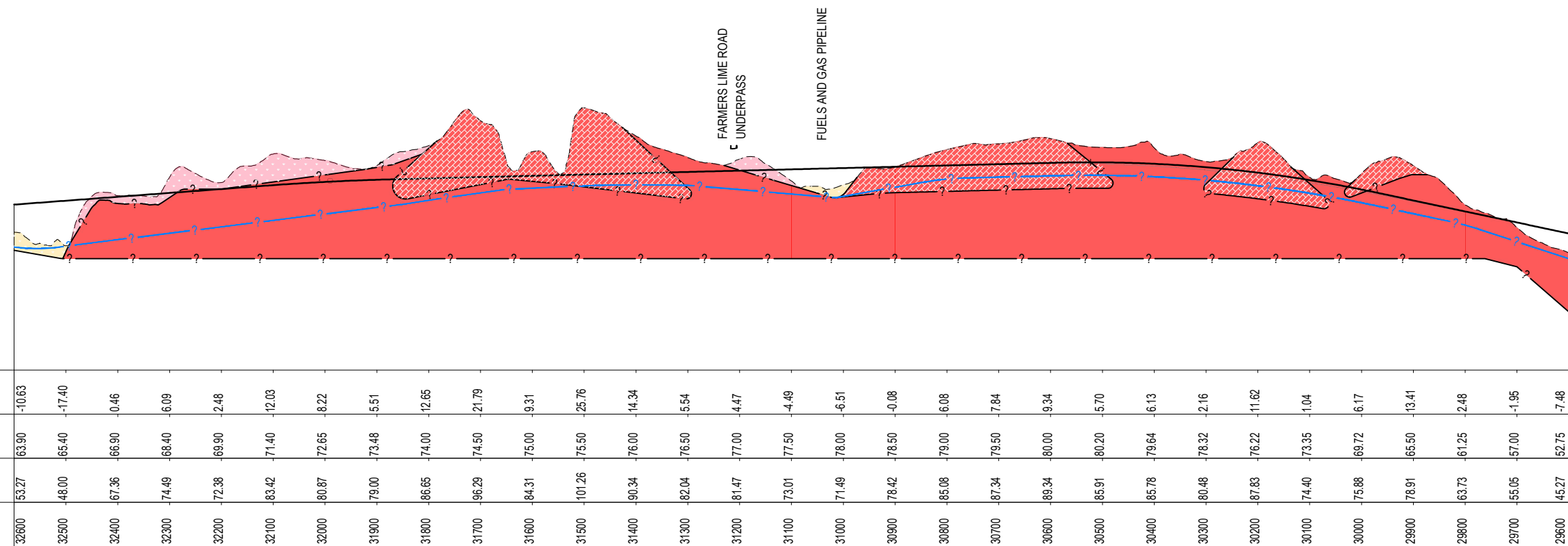
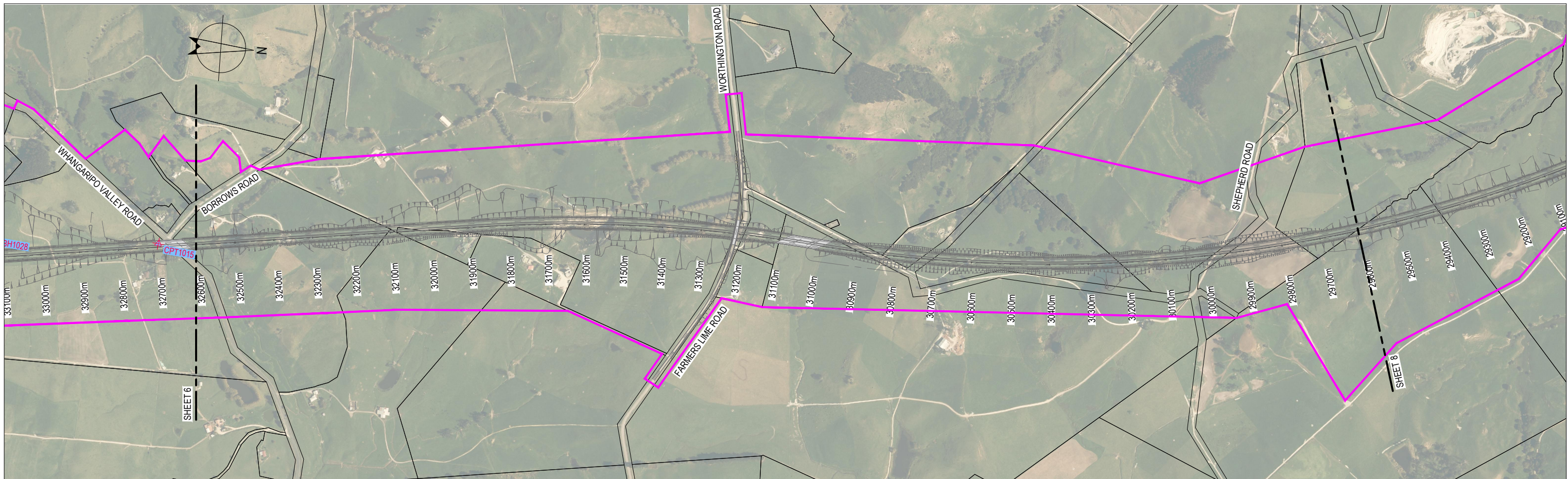
0	ISSUED FOR RMA APPROVALS	WAS	JB*	BN*	07/19	
No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Checked	Approved	Date



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Approved BN*	Date JULY 2019		
Scale AS SHOWN	This Drawing must not be used for Construction unless signed as Approved		Original Size A1

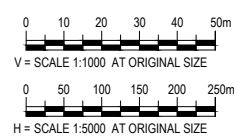
Project	WARKWORTH TO WELLSFORD PROJECT				
Title	GROUND WATER LONGITUDINAL SECTION				
Contract:	PA4156	Drawing No:	GW-017	Sheet:	7 OF 10
Rev:	0				



LEGEND

- COLLUVIUM
- ALLUVIUM
- MANGAKAHIA COMPLEX:**
- UNDIFFERENTIATED (INFERRED)
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CHAINAGE	32600	32500	32400	32300	32200	32100	32000	31900	31800	31700	31600	31500	31400	31300	31200	31100	31000	30900	30800	30700	30600	30500	30400	30300	30200	30100	30000	29900	29800	29700	29600
DES./EXIST. LEVEL DIFF.	-10.63	-17.40	0.46	-6.09	2.48	-12.03	-8.22	-5.51	-12.65	-21.79	-9.31	-25.76	-14.34	-5.54	-4.47	-4.49	-6.51	-0.08	6.08	-7.84	-9.34	-5.70	-6.13	-2.16	-11.62	-1.04	-6.17	-13.41	-2.48	-1.95	-7.48
DESIGN LEVELS	63.90	66.40	66.90	68.40	69.90	71.40	72.65	73.48	74.00	74.50	75.00	75.50	76.00	76.50	77.00	77.50	78.00	-0.08	6.08	7.84	9.34	5.70	6.13	2.16	11.62	1.04	6.17	13.41	2.48	1.95	7.48
EXISTING LEVELS	53.27	48.00	67.36	74.49	72.38	83.42	80.87	79.00	86.65	96.29	84.31	101.26	90.34	82.04	81.47	73.01	71.49	78.42	85.08	87.34	89.34	85.91	85.78	80.48	87.83	74.40	75.88	78.91	63.73	55.05	45.27



LONGITUDINAL SECTION - MCS0
SCALE 1:5000H-A1, 1:1000V-A1

NOTE
1. LONG SECTION REPRESENTS PROFILE ALONG THE SOUTHBOUND LANES OF THE INDICATIVE ALIGNMENT.

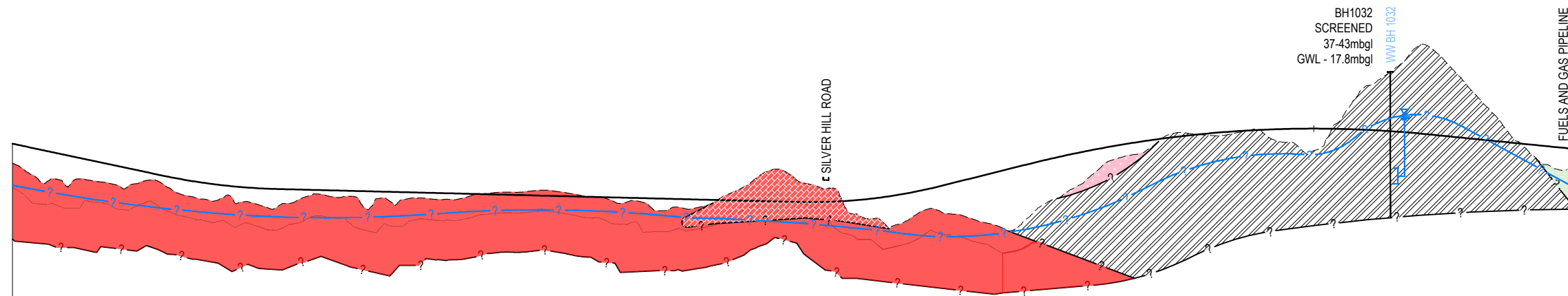
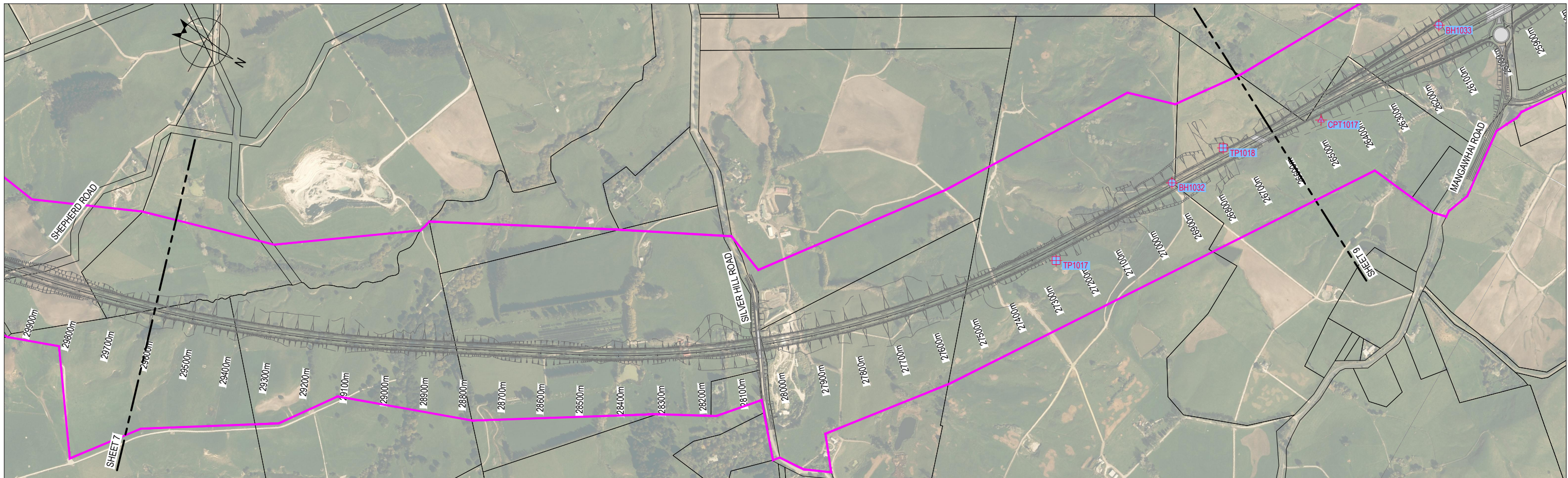
0	ISSUED FOR RMA APPROVALS	WAS	JB*	BN*	07/19	
No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Checked	Approved	Date



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FOR RMA APPROVALS			
Drawn WAS	Drafting SA* Check	Designed SA	Design GH* Check
Approved BN*		Date JULY 2019	
Scale AS SHOWN		This Drawing must not be used for Construction unless signed as Approved	

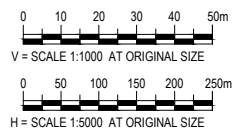
Project	WARKWORTH TO WELLSFORD PROJECT			
Title	GROUND WATER LONGITUDINAL SECTION			
Contract:	PA4156	Drawing No:	GW-018	Sheet: 8 OF 10
Rev:	0	Original Size:	A1	



DES./EXIST. LEVEL DIFF.	DESIGN LEVELS	EXISTING LEVELS	CHAINAGE
-7.48	52.75	45.27	29600
-11.37	48.50	37.13	29500
-7.39	44.25	36.86	29400
-4.19	40.02	35.83	29300
-5.14	36.87	31.73	29200
-7.80	35.39	27.59	29100
-1.87	34.88	33.01	29000
-2.72	34.38	31.66	28900
-2.29	33.88	31.60	28800
0.09	33.38	33.48	28700
-1.78	32.88	34.67	28600
0.03	32.38	32.41	28500
-1.17	31.88	30.71	28400
-3.79	31.38	27.60	28300
4.84	30.88	35.72	28200
9.26	30.38	39.64	28100
-2.86	30.74	27.88	28000
-11.30	33.09	21.79	27900
-11.58	37.41	25.83	27800
-22.03	42.41	20.38	27700
-15.81	47.29	31.47	27600
-5.79	51.36	45.56	27500
-0.86	54.52	53.66	27400
-0.92	56.77	55.85	27300
-1.07	58.11	57.04	27200
-8.36	58.55	50.18	27100
16.97	58.07	75.04	27000
33.79	56.69	90.48	26900
18.61	54.70	73.31	26800
-0.76	52.70	51.94	26700
-7.62	50.70	43.08	26600

- LEGEND**
- COLLUVIUM
 - ALLUVIUM
 - MANGAKAHIA COMPLEX:**
 - UNDIFFERENTIATED (INFERRED)
 - NON CALCAREOUS MUDSTONE
 - MOTATAU COMPLEX:**
 - UNDIFFERENTIATED (INFERRED)
 - CALCAREOUS MUDSTONE
 - MAHURANGI LIMESTONE
 - MELANGE
 - PAKIRI FORMATION:**
 - UNDIFFERENTIATED (INFERRED)
 - RESIDUALLY TO HIGHLY WEATHERED
 - SANDSTONE
 - GRITSTONE
 - ALTERNATING SANDSTONE AND SILTSTONE
 - INFERRED GROUND WATER LEVEL
 - INFERRED GEOLOGICAL BOUNDARY
 - WARKWORTH-WELLSFORD BOREHOLE/CPT (2017)
 - PUHOI-WARKWORTH BOREHOLE/CPT (2015)
 - COUNCIL BOREHOLES (2017)

NOTE
 1. LONG SECTION REPRESENTS PROFILE ALONG THE SOUTHBOUND LANES OF THE INDICATIVE ALIGNMENT.



LONGITUDINAL SECTION - MCSO
 SCALE 1:5000H-A1, 1:1000V-A1

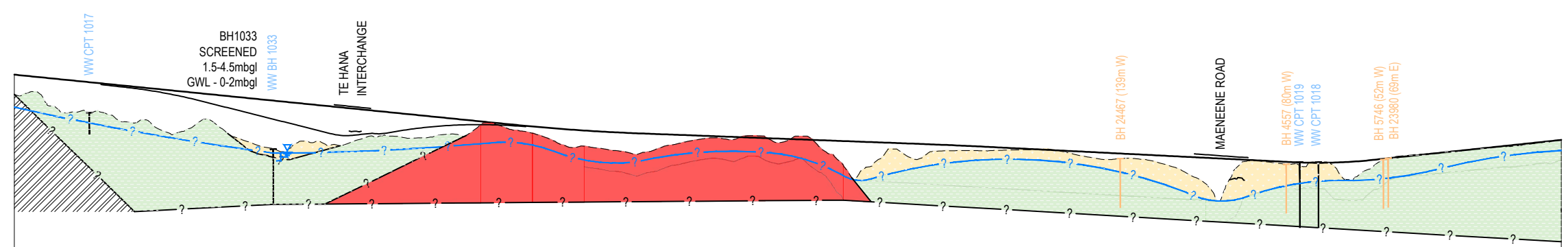
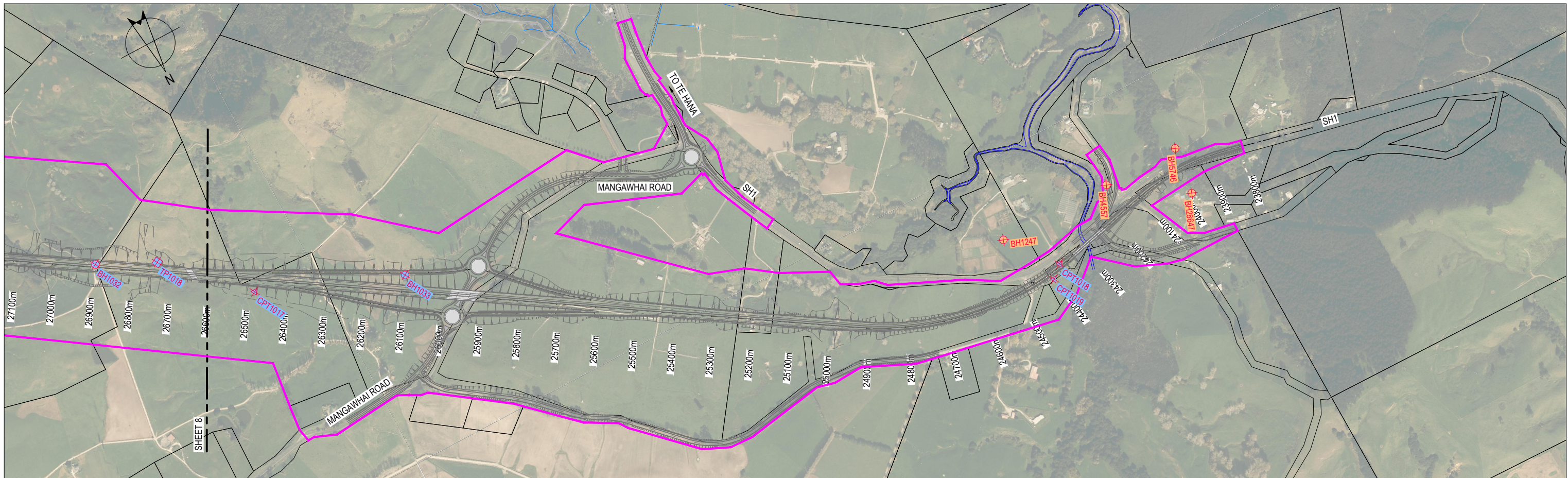
0	ISSUED FOR RMA APPROVALS	WAS	JB*	BN*	07/19	
No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Checked	Approved	Date



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Approved BN*		Date JULY 2019	
Scale AS SHOWN		This Drawing must not be used for Construction unless signed as Approved	Original Size A1

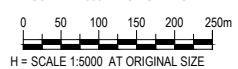
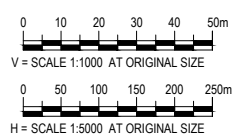
Project	WARKWORTH TO WELLSFORD PROJECT			
Title	GROUND WATER LONGITUDINAL SECTION			
Contract:	PA4156	Drawing No:	GW-019	Sheet: 9 OF 10
Rev:	0			



DATUM = -30.00m

DES./EXIST. LEVEL DIFF.	-7.62	-12.75	-13.38	-16.59	-12.71	-18.74	-14.76	-10.23	-8.16	-1.35	-2.59	-6.01	-8.22	-2.39	-0.12	-0.24	-9.22	-2.37	-2.23	-1.12	-0.21	-2.60	-2.33	-10.03	-0.22	-0.06	-4.69	-0.35	-0.10	-0.44	
DESIGN LEVELS	50.70	48.70	46.70	44.70	42.70	40.70	38.70	36.70	34.70	32.70	30.74	29.18	28.12	27.37	26.62	25.87	25.12	24.37	23.60	22.66	21.66	20.66	19.66	18.66	17.66	16.77	17.41	19.48	21.60	23.72	25.55
EXISTING LEVELS	43.08	35.95	33.32	28.11	29.99	21.96	23.94	26.47	26.54	31.35	28.14	23.17	19.90	24.98	26.50	26.11	15.90	22.00	21.37	21.54	21.87	18.06	17.33	8.63	17.44	16.83	12.73	19.82	21.50	23.28	25.55
CHAINAGE	26600	26500	26400	26300	26200	26100	26000	25900	25800	25700	25600	25500	25400	25300	25200	25100	25000	24900	24800	24700	24600	24500	24400	24300	24200	24100	24000	23900	23800	23700	23614

LONGITUDINAL SECTION - MCSO
SCALE 1:5000H-A1, 1:1000V-A1



NOTE
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 - CALCAREOUS MUDSTONE
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 - RESIDUALLY TO HIGHLY WEATHERED
 - SANDSTONE
 - GRITSTONE
 - ALTERNATING SANDSTONE AND SILTSTONE
 - INFERRED GROUND WATER LEVEL
 - INFERRED GEOLOGICAL BOUNDARY
 - CPT1000 WARKWORTH-WELLSFORD BOREHOLE/CPT (2017)
 - BH4000 PUHOI-WARKWORTH BOREHOLE/CPT (2015)
 - BH20000 COUNCIL BOREHOLES (2017)

0	ISSUED FOR RMA APPROVALS	WAS	JB*	BN*	07/19	
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Project	WARKWORTH TO WELLSFORD PROJECT		
Title	GROUND WATER LONGITUDINAL SECTION		
Contract:	PA4156	Drawing No:	GW-020
Sheet:	10 OF 10	Rev:	0