

APPENDIX G

TECHNICAL DRAWINGS

Note: *The geotechnical drawings, appendices to the Geotechnical investigations carried out by the Mokolo Crocodile Consultants in 2012, have been provided for additional information purposes. The drawings were the basis to the boundaries of the proposed borrow pits, however the boundaries and required borrow areas have since been updated and are included in the Scoping Report.*



TCTA

**MOKOLO AND CROCODILE
WATER AUGMENTATION PROJECT
(MCWAP)**

CONTRACT № TCTA 07-041

CONSULTING SERVICES FOR MCWAP

**PHASE 2: GEOTECHNICAL INVESTIGATIONS
Stage 1: Tarantaalpan – Operational Reservoir**

VOLUME 2.3: ANNEXURES D AND E

AUGUST 2011

MOKOLO CROCODILE CONSULTANTS

Report No: 2A-R-111E-43 (Rev A)


**MOKOLO AND CROCODILE
WATER AUGMENTATION PROJECT**

CONTRACT № TCTA 07-041

DOCUMENT CONTROL SHEET

Report No : **2A-R-111E-43**

Title : **Phase 2: Geotechnical Investigations
Stage 1: Tarantalpan – Operational Reservoir
Volume 2.3: Annexures D and E**

Rev No	Date of Issue	Originator		Checked		Approved		Description
		Initials	Signature	Initials	Signature	Initials	Signature	
A	Aug 2011	AJS GND GJH BHJS MCW RV		SM PJIR		JPie		1 st issue for discussion ¹

¹ Finalisation pending outstanding Phase 2 Geotechnical Results

**MOKOLO AND CROCODILE
WATER AUGMENTATION PROJECT**

CONTRACT № TCTA 07-041

**PHASE 2: GEOTECHNICAL INVESTIGATIONS
Stage 1: Tarantaalpan – Operational Reservoir**

LIST OF VOLUMES

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Volume 2 Phase 2, Stage 1: Geotechnical Report – Annexures

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2.2 Annexures B and C

2.3 Annexures D and E

Volume 3 Phase 2, Stage 1: Geotechnical Interpretive Report

MOKOLO AND CROCODILE WATER AUGMENTATION PROJECT

CONTRACT № TCTA 07-041

PHASE 2: GEOTECHNICAL INVESTIGATIONS Stage 1: Tarantaalpan – Operational Reservoir

VOLUME 2.3: ANNEXURES D and E

EXECUTIVE SUMMARY

Volumes 2.1, 2.2 and 2.3 of Geotechnical Report No. 2A-R-111E-43 contain the Annexures referred to in Volume 1 and should be read in conjunction with the latter referenced Volume.

**MOKOLO AND CROCODILE
WATER AUGMENTATION PROJECT**

CONTRACT № TCTA 07-041

**PHASE 2: GEOTECHNICAL INVESTIGATIONS
Stage 1: Tarantaalpan – Operational Reservoir**

VOLUME 2.3: ANNEXURES D and E

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 - C3: Core logging parameters

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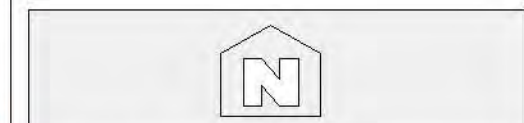
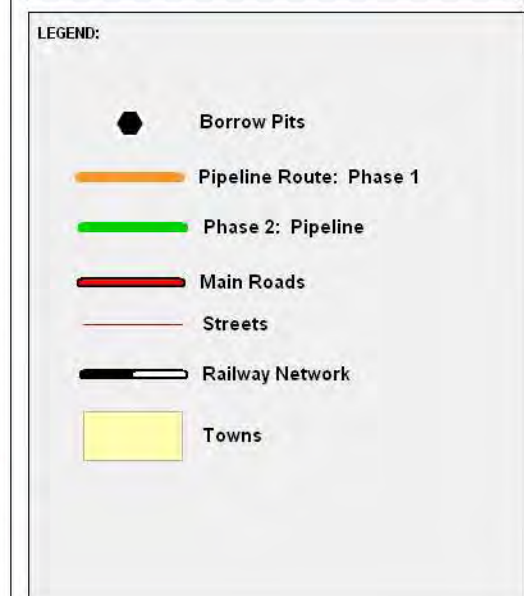
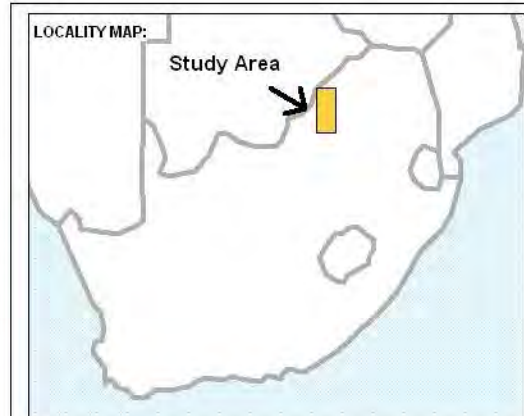
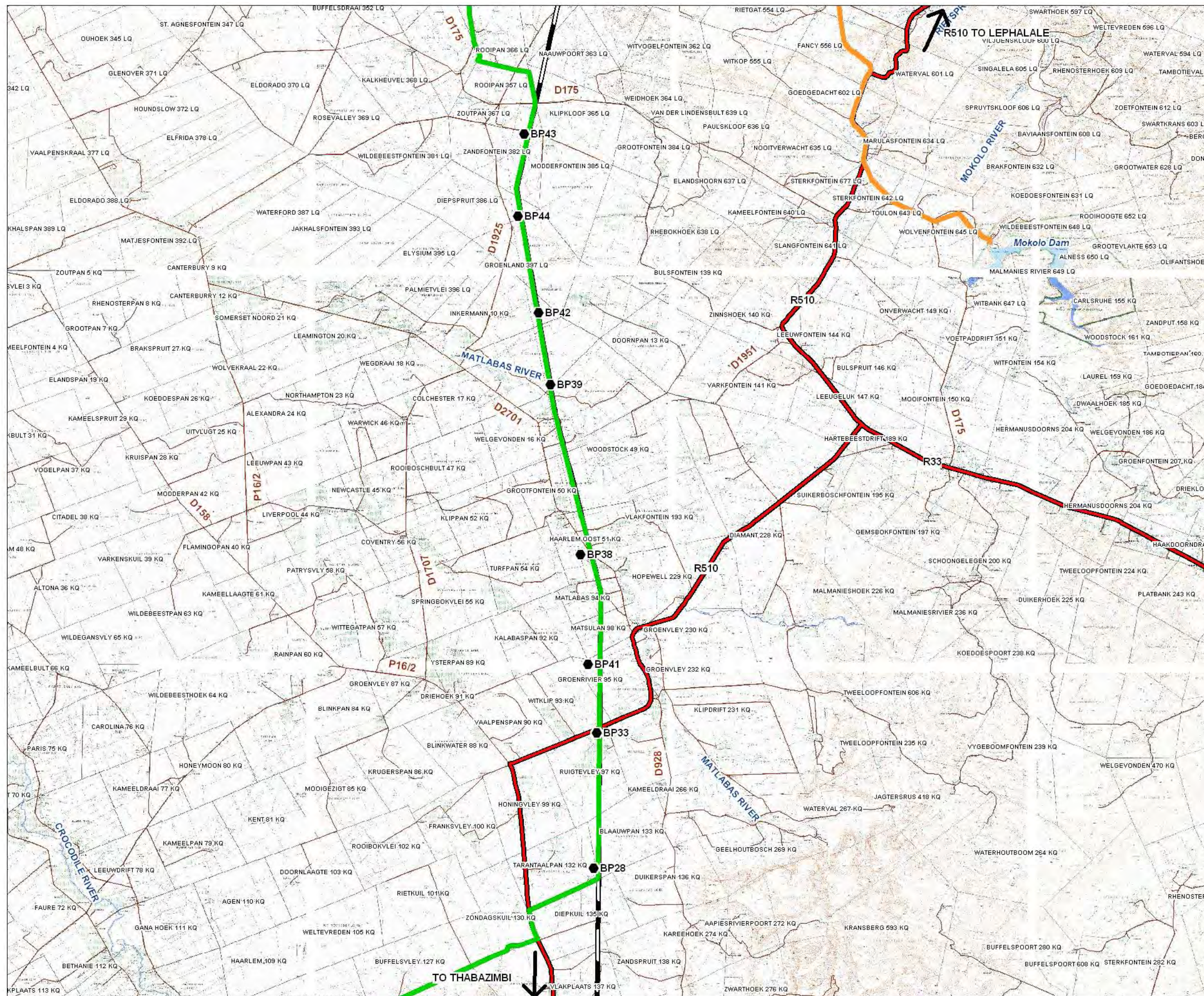
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- Annexure D: Borrow Pit Plans
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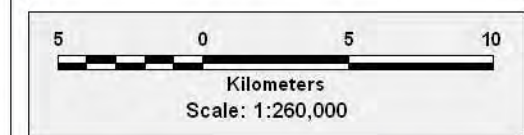
Volume 3: Geotechnical Interpretive Report (Bound Separately)

ANNEXURE D

BORROW PIT PLANS



PROJECTION:
**Transverse Mercator
LO 27**



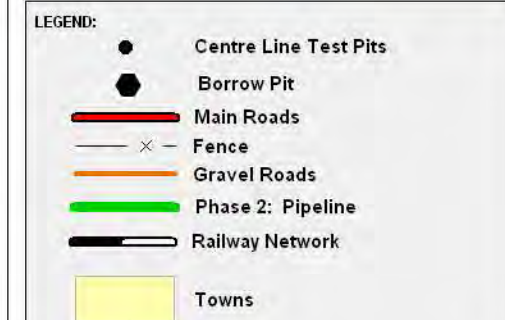
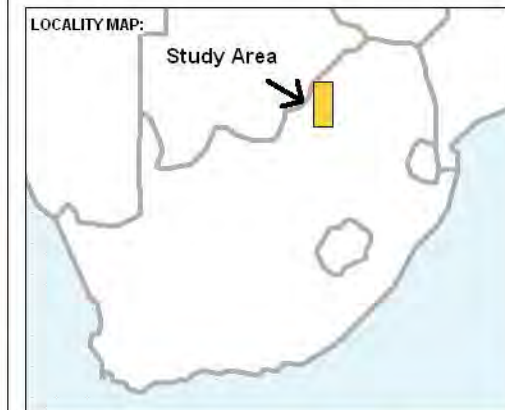
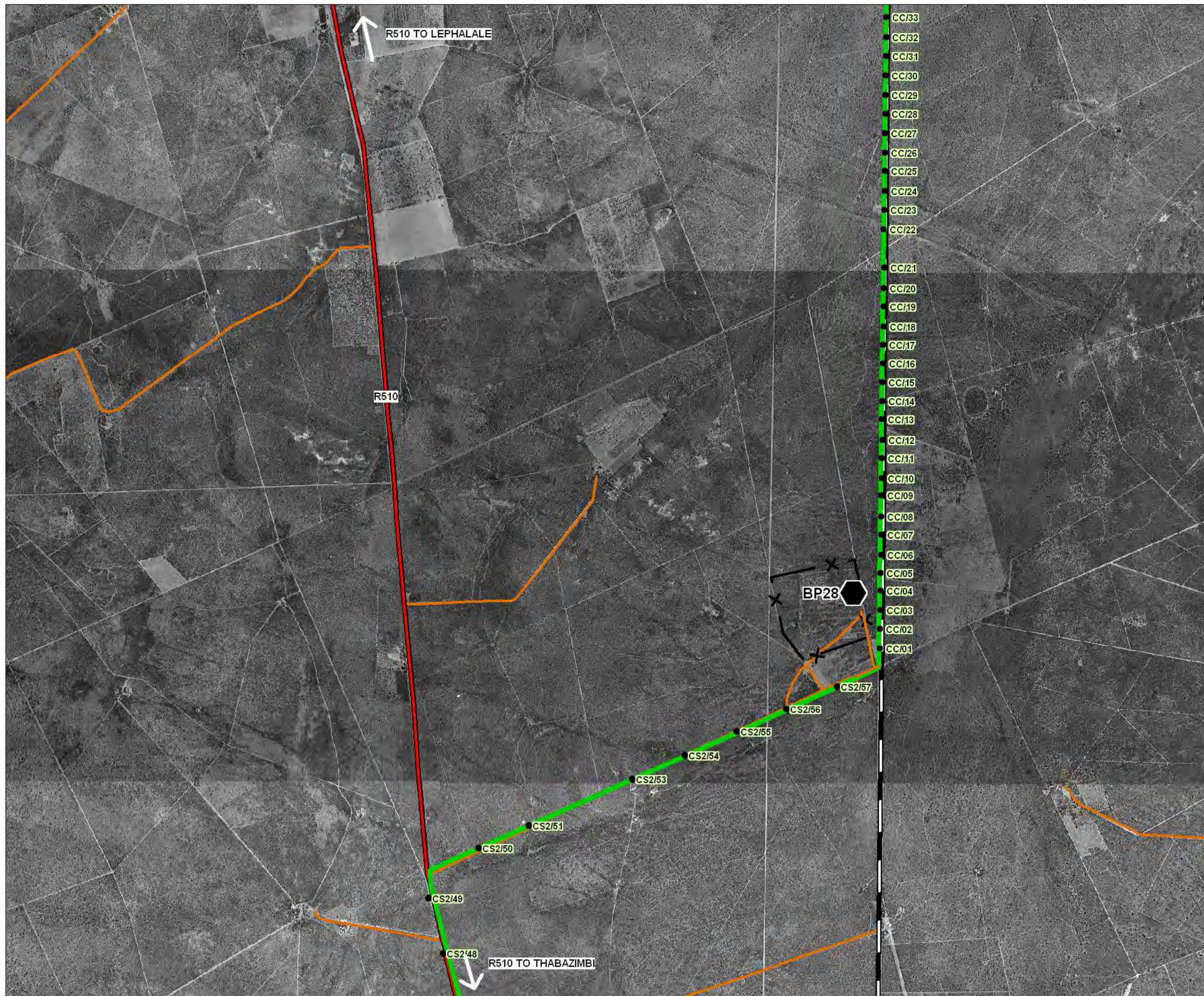
PREPARED BY:

PREPARED FOR:

PROJECT:
**Mokolo and Crocodile Water
Augmentation Project (MCWAP)**

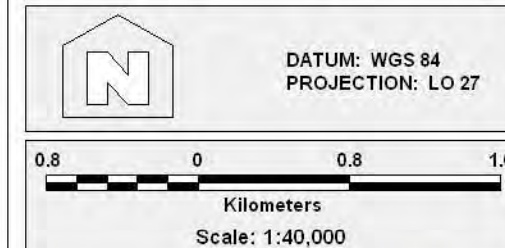
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**Locality Plan of Borrow Pits:
Phase 2 Stage 1**

DRAWING NO:



BORROW PIT DESCRIPTION:

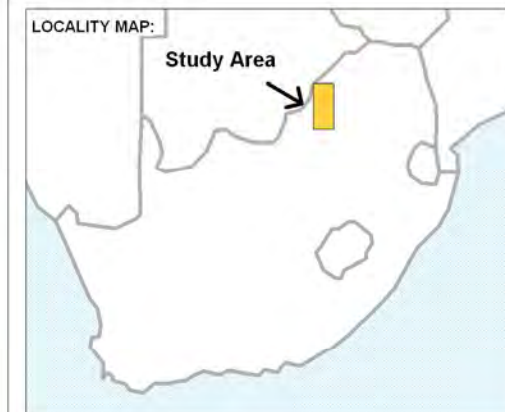
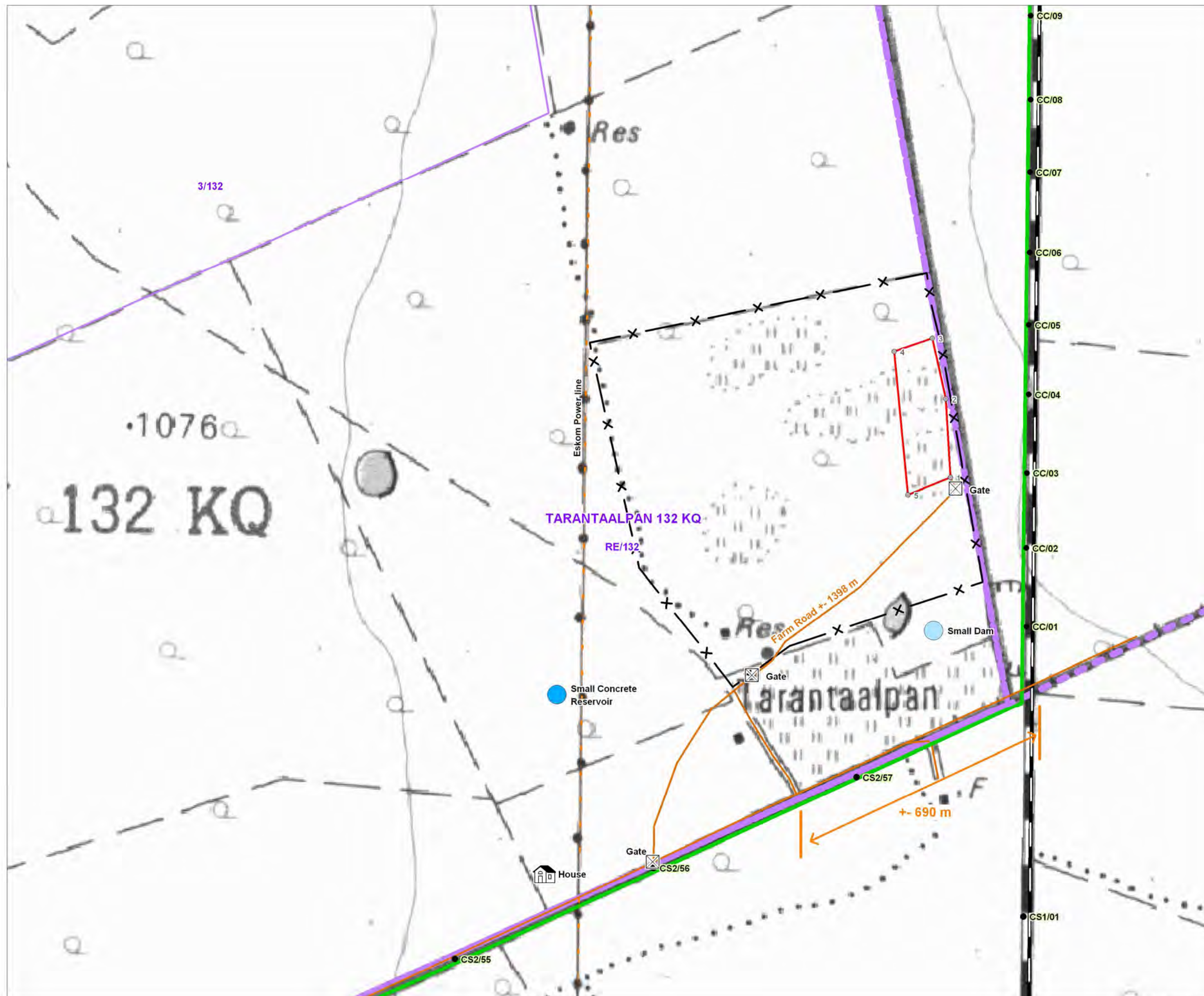
Description	Borrowpit_28
Location of Borrow pit	X2697434 Y-45267
Shortest distance relative to pipeline	+200 m
Distance to access road	+1398 m
Farm name	Tarantaal Pan 132KQ
Farm number	Ptn RE/132
Owner name	Carel Vos
Contact details: Mobile no	0823609464
Estimated quantity (m ³)	105000
Suitability of the material	Sand



PROJECT:
Mokolo and Crocodile Water Augmentation Project (MCWAP)

DRAWING TITLE:
Borrow Pit 28 Locality Plan

DRAWING NR:
28_1



LEGEND:

- Centre Line Test Pits
- Borrow Pit Corner Points
- Gate
- Main Roads
- Gravel Roads
- Fence
- Eskom Power line
- Phase 2: Pipeline
- Railway Network
- Towns
- Parent Farm Boundary

BORROW PIT DESCRIPTION:

Description	Borrowpit_28
Location of Borrow pit	X2697434 Y-45267
Shortest distance relative to pipeline	+200 m
Distance to access road	+1398 m
Farm name	Tarantaal Pan 132KQ
Farm number	Ptn RE/132
Owner name	Carel Vos
Contact details: Mobile no	0823609464
Estimated quantity (m³)	105000
Suitability of the material	Sand

DATUM: WGS 84
PROJECTION: LO 27

0.2 0 0.2 0.4
Kilometers
Scale: 1:10,000

PREPARED BY:

MOKOLO CROCODILE Consultants

GEOSTRADA

PREPARED FOR:

TCTA

PROJECT:

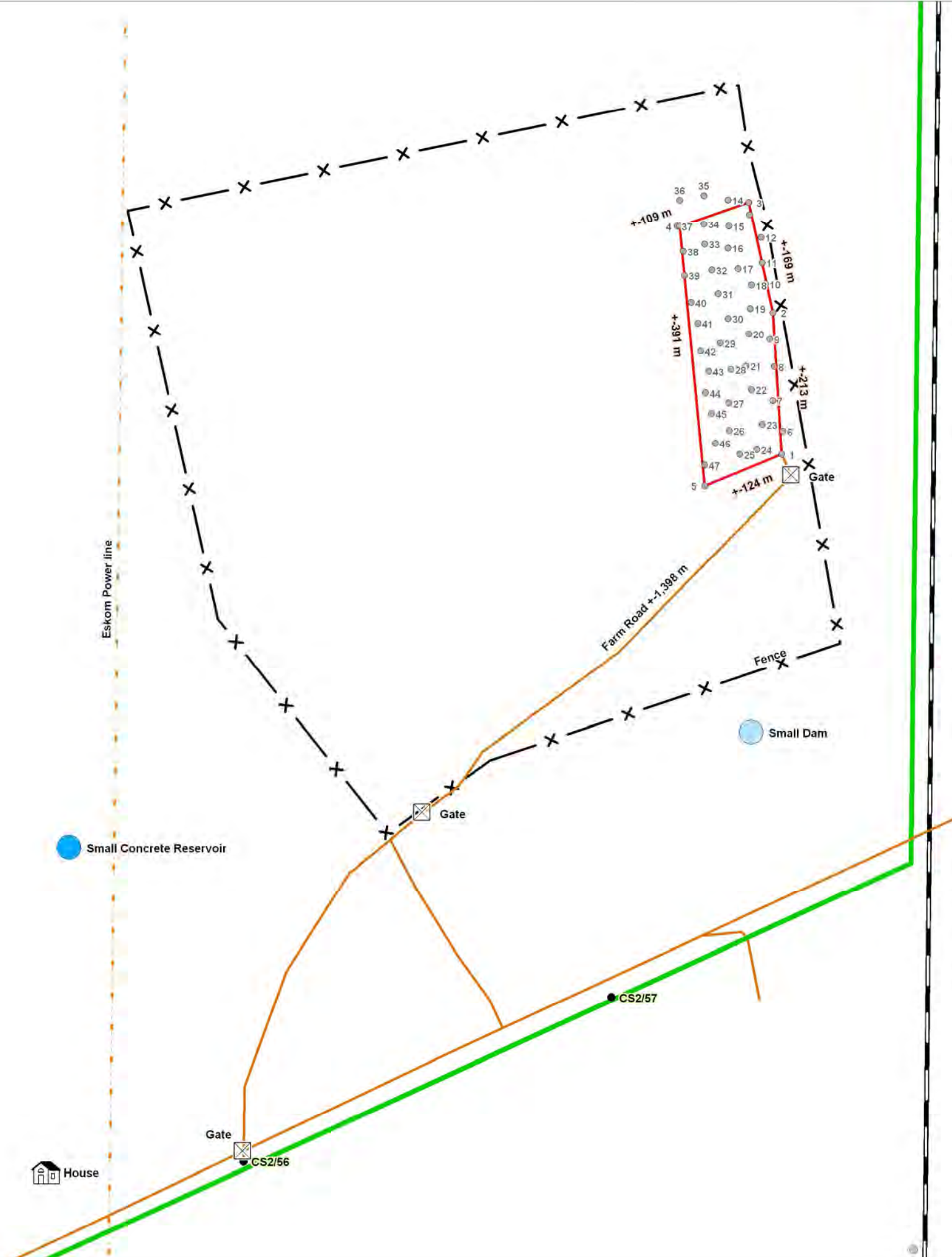
Mokolo and Crocodile Water Augmentation Project (MCWAP)

DRAWING TITLE:

Borrow Pit 28 Layout Plan

DRAWING NR:

28_2



BORROW PIT 28 EXTENSION TEST PIT COORDINATES:

ID	LO27Y	LO27X
1	Y-045324	X2697602
2	Y-045311	X2697390
3	Y-045275	X2697225
4	Y-045172	X2697261
5	Y-045209	X2697649
6	Y-045326	X2697567
7	Y-045311	X2697521
8	Y-045313	X2697471
9	Y-045306	X2697430
10	Y-045300	X2697347
11	Y-045295	X2697316
12	Y-045293	X2697278
13	Y-045276	X2697243
14	Y-045244	X2697221
15	Y-045245	X2697261
16	Y-045244	X2697294
17	Y-045259	X2697325
18	Y-045279	X2697349
19	Y-045277	X2697384
20	Y-045275	X2697422
21	Y-045271	X2697470
22	Y-045279	X2697505
23	Y-045295	X2697557
24	Y-045287	X2697595
25	Y-045261	X2697602
26	Y-045246	X2697566
27	Y-045245	X2697525
28	Y-045248	X2697475
29	Y-045232	X2697436
30	Y-045244	X2697399
31	Y-045229	X2697362
32	Y-045220	X2697327
33	Y-045209	X2697288
34	Y-045208	X2697258
35	Y-045208	X2697215
36	Y-045172	X2697222
37	Y-045168	X2697261
38	Y-045177	X2697299
39	Y-045179	X2697335
40	Y-045189	X2697375
41	Y-045199	X2697406
42	Y-045203	X2697448
43	Y-045215	X2697478
44	Y-045210	X2697510
45	Y-045219	X2697541
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47	Y-045209	X2697618

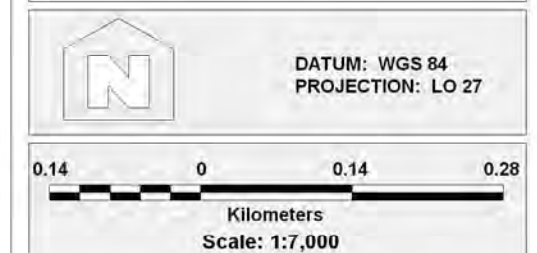


LEGEND:

●	Centre Line Test Pits
●	Test Pits
—	Borrow Pit Border
- - -	Eskom Power line
—	Gravel Road
- - -	Fence
—	Railway Line
—	Phase 2: Pipeline
⊗	Gates
●	Small Dam
●	Reservoir
🏠	House

BORROW PIT DESCRIPTION:

Description	Borrowpit_28
Location of Borrow pit	X2697434 Y-45267
Shortest distance relative to pipeline	+200 m
Distance to access road	+1398 m
Farm name	Tarantaal Pan 132KQ
Farm number	Ptn RE/132
Owner name	Carel Vos
Contact details: Mobile no	0823609464
Estimated quantity (m³)	105000
Suitability of the material	Sand



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MOKOLO CROCODILE
Consultants

GEOSTRADA
Engineering and Surveying

PREPARED FOR:

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A NEW WORLD FOR WATER

PROJECT:

**Mokolo and Crocodile Water
Augmentation Project (MCWAP)**

DRAWING TITLE:

**Borrow Pit 28
Test Pit Positions**

DRAWING NR:

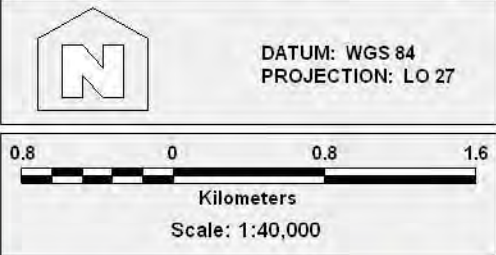
28_3



- LEGEND:
- Centre Line Test Pits
 - Borrow Pit
 - Main Roads
 - Gravel Roads
 - Phase 2: Pipeline
 - Railway Network

BORROW PIT DESCRIPTION:

Description	Borrowpit_33
Location of Borrow pit	X2687891 Y-45410
Shortest distance relative to pipeline	+50 m
Distance to access road	+~1.5 km
Farm name	Ruigtevley 97 KQ
Farm number	Ptn RE/97
Owner name	Jacques Fourie
Contact details: Mobile no	0834146369
Estimated quantity (m³)	223500
Suitability of the material	Sand



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Engineering & Construction Solutions

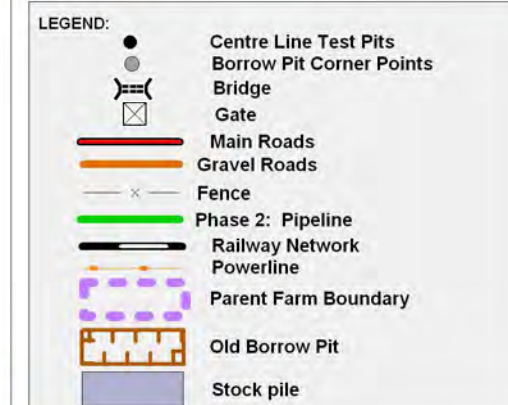
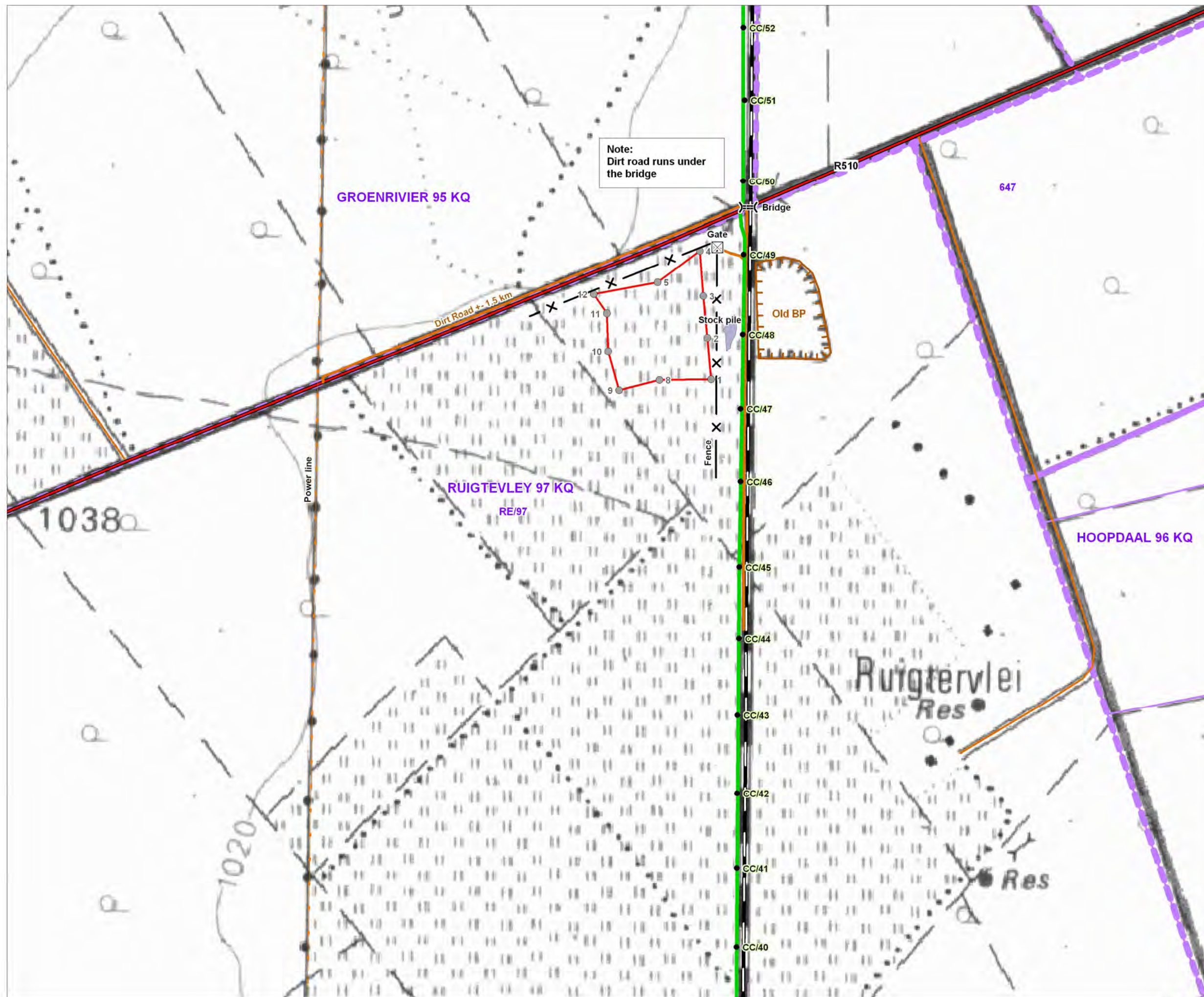
PREPARED FOR:

TCTA
A NEW WORLD FOR WATER

PROJECT:
Mokolo and Crocodile Water Augmentation Project (MCWAP)

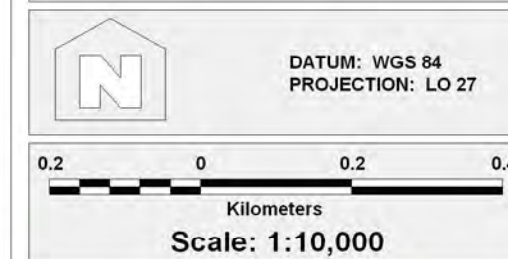
DRAWING TITLE:
Borrow Pit 33 Locality Plan

DRAWING NR:
33_1



BORROW PIT DESCRIPTION:

Description	Borrowpit_33
Location of Borrow pit	X2687891 Y-45410
Shortest distance relative to pipeline	±50 m
Distance to access road	±1.5 km
Farm name	Ruigtevley 97 KQ
Farm number	Ptn RE/97
Owner name	Jacques Fourie
Contact details: Mobile no	0834146369
Estimated quantity (m³)	223500
Suitability of the material	Sand



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GEOSTRADA
Engineering & Geomatics Laboratory

PREPARED FOR:

TCTA
A new world for water

PROJECT:

Mokolo and Crocodile Water Augmentation Project (MCWAP)

DRAWING TITLE:

Borrow Pit 33 Layout Plan

DRAWING NR:

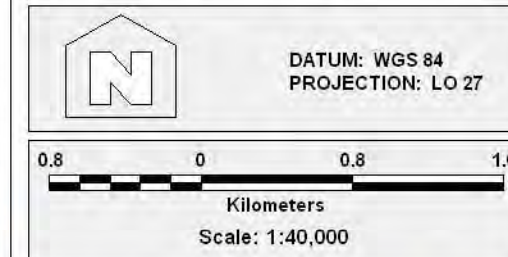
33_2



- LEGEND:
- Centre Line Test Pits
 - Borrow Pit
 - Main Roads
 - Gravel Roads
 - Phase 2: Pipeline
 - Railway Network

BORROW PIT DESCRIPTION:

Description	Borrowpit_38
Location of Borrow pit	X2675398 Y-44327
Shortest distance relative to pipeline	+540 m
Distance to access road	+460 m
Farm name	Haarlem Oost 51 KG
Farm number	Ptn 5/51
Owner name	Kevin Miles
Contact details: Mobile no	0781522631
Estimated quantity (m³)	100000
Suitability of the material	Sand



PREPARED BY:

PREPARED FOR:

PROJECT:

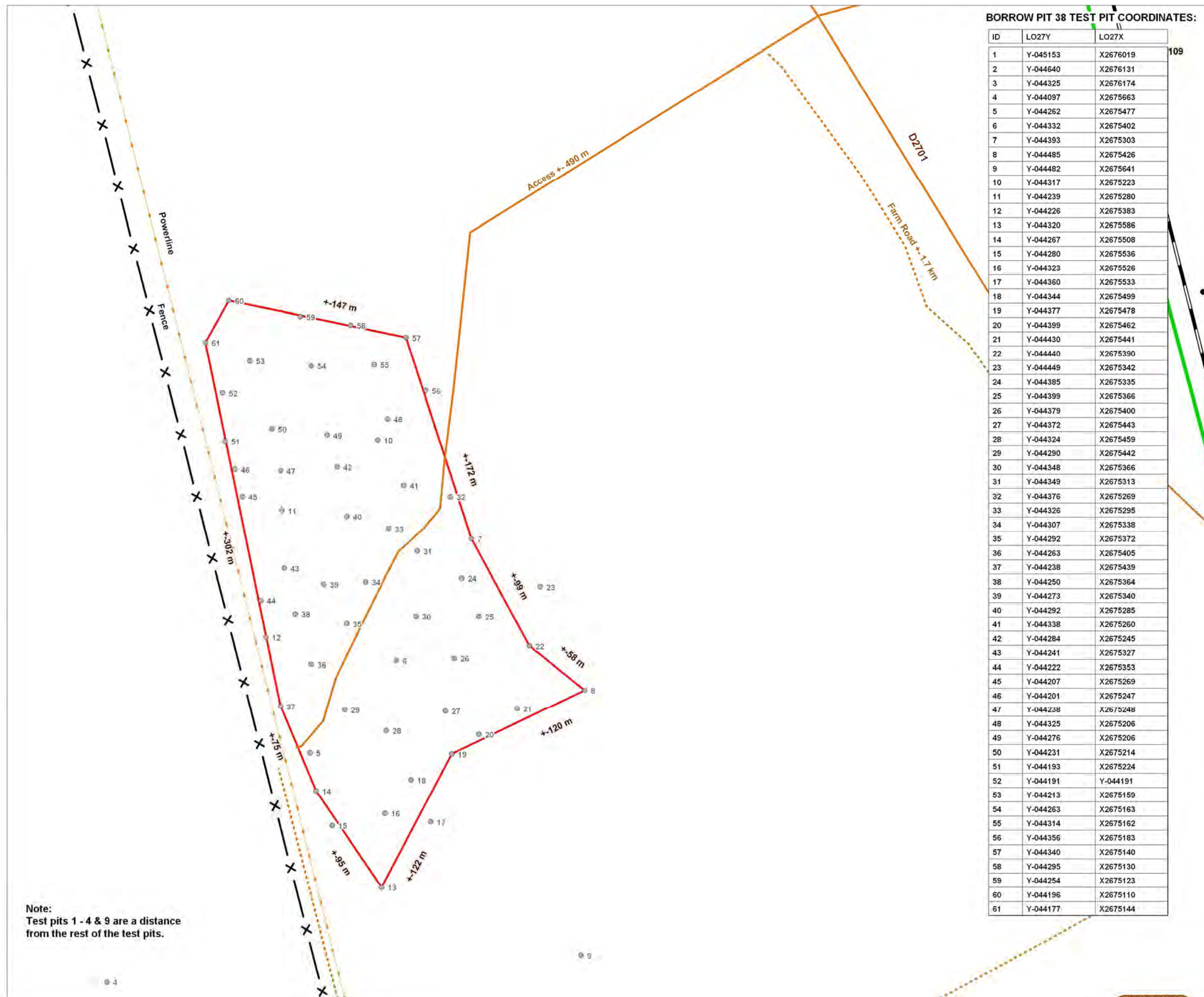
Mokolo and Crocodile Water Augmentation Project (MCWAP)

DRAWING TITLE:

Borrow Pit 38 Locality Plan

DRAWING NR:

38_1



BORROW PIT 38 TEST PIT COORDINATES:

ID	LO27Y	LO27X
1	Y-045153	X2676019
2	Y-044640	X2676131
3	Y-044325	X2676174
4	Y-044097	X2675663
5	Y-044262	X2675477
6	Y-044332	X2675402
7	Y-044393	X2675303
8	Y-044485	X2675426
9	Y-044482	X2675641
10	Y-044317	X2675223
11	Y-044239	X2675280
12	Y-044226	X2675383
13	Y-044320	X2675586
14	Y-044267	X2675508
15	Y-044280	X2675536
16	Y-044323	X2675526
17	Y-044360	X2675533
18	Y-044344	X2675499
19	Y-044377	X2675478
20	Y-044399	X2675462
21	Y-044430	X2675441
22	Y-044440	X2675390
23	Y-044449	X2675342
24	Y-044385	X2675335
25	Y-044399	X2675366
26	Y-044379	X2675400
27	Y-044372	X2675443
28	Y-044324	X2675459
29	Y-044290	X2675442
30	Y-044348	X2675366
31	Y-044349	X2675313
32	Y-044376	X2675269
33	Y-044326	X2675295
34	Y-044307	X2675338
35	Y-044292	X2675372
36	Y-044263	X2675405
37	Y-044238	X2675439
38	Y-044250	X2675364
39	Y-044273	X2675340
40	Y-044292	X2675285
41	Y-044338	X2675260
42	Y-044284	X2675245
43	Y-044241	X2675327
44	Y-044222	X2675353
45	Y-044207	X2675269
46	Y-044201	X2675247
47	Y-044238	X2675248
48	Y-044325	X2675206
49	Y-044276	X2675206
50	Y-044231	X2675214
51	Y-044193	X2675224
52	Y-044191	Y-044191
53	Y-044213	X2675159
54	Y-044263	X2675163
55	Y-044314	X2675162
56	Y-044356	X2675183
57	Y-044340	X2675140
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59	Y-044254	X2675123
60	Y-044196	X2675110
61	Y-044177	X2675144



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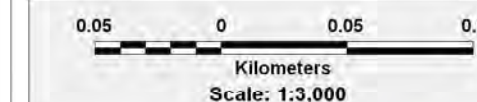
- Centre Line Test Pits
- Test Pits
- Borrow Pit Border
- Gravel Road
- Farm Road
- Fence
- Railway Line
- Main Roads
- Phase 2: Pipeline
- Powerline

BORROW PIT DESCRIPTION:

Description	Borrowpit_38
Location of Borrow pit	X2675399 Y-44327
Shortest distance relative to pipeline	+540 m
Distance to access road	+460 m
Farm name	Haarlem Oost 51 KQ
Farm number	Ptn 5/51
Owner name	Kevin Miles
Contact details: Mobile no	0781522631
Estimated quantity (m³)	100000
Suitability of the material	Sand



DATUM: WGS 84
PROJECTION: LO 27



PREPARED BY:



PREPARED FOR:



PROJECT:

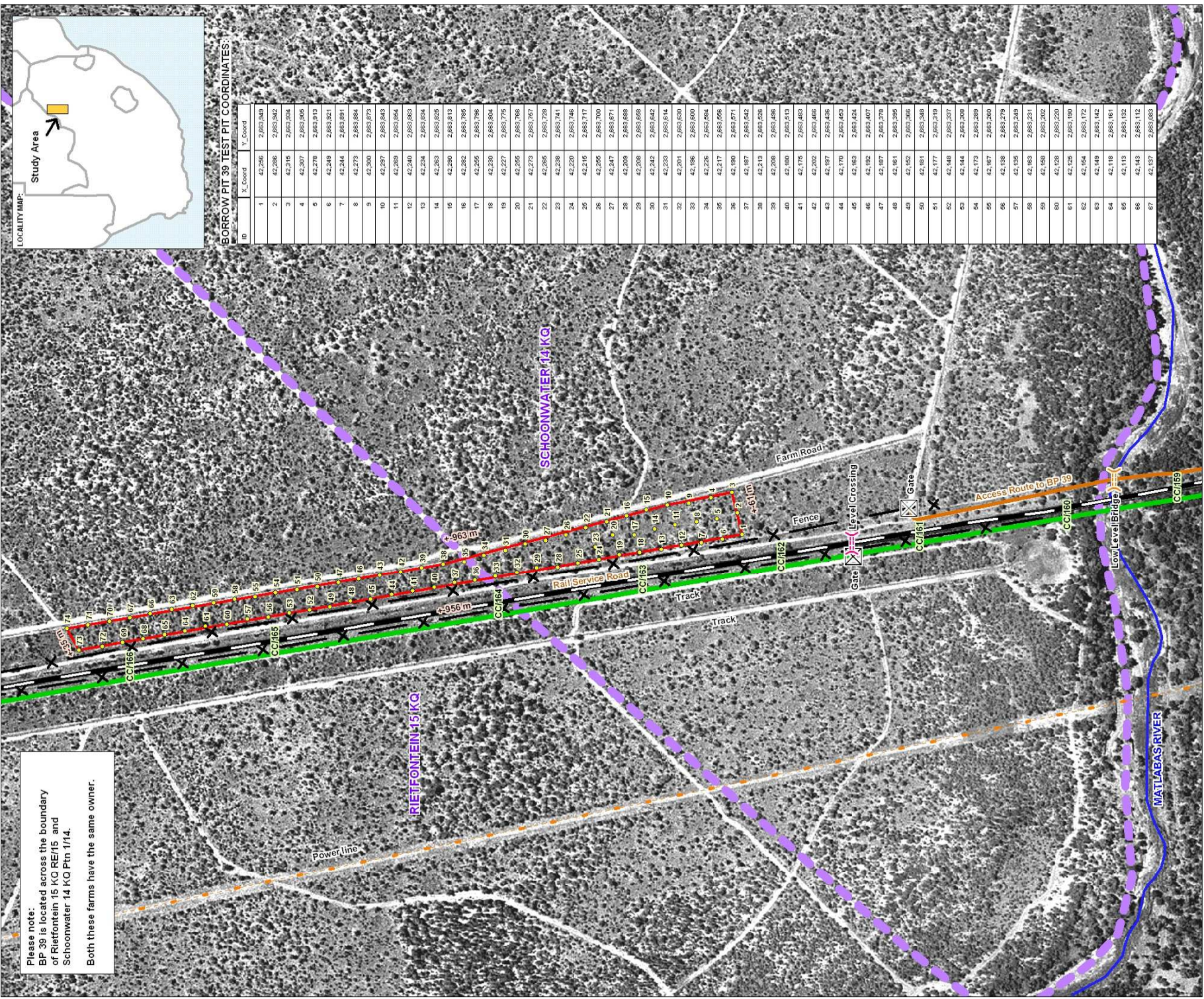
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Augmentation Project (MCWAP)**

DRAWING TITLE:

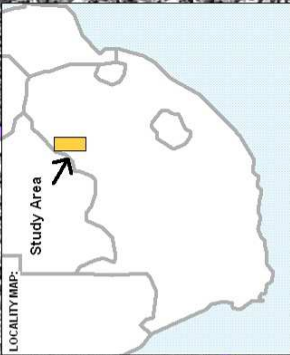
**Borrow Pit 38
Test Pit Positions**

DRAWING NR:

38_3



Please note:
BP 39 is located across the boundary
of Rietfontein 15 KQ RE/15 and
Schoonwater 14 KQ Pm 1/14.
Both these farms have the same owner.



BORROW PIT 39 TEST PIT COORDINATES:

ID	X_Coord	Y_Coord
1	42,296	2,693,345
2	42,296	2,693,342
3	42,215	2,693,334
4	42,207	2,693,305
5	42,278	2,693,313
6	42,248	2,693,321
7	42,244	2,693,391
8	42,273	2,693,384
9	42,200	2,693,373
10	42,297	2,693,343
11	42,269	2,693,364
12	42,240	2,693,383
13	42,234	2,693,334
14	42,263	2,693,325
15	42,290	2,693,313
16	42,262	2,693,795
17	42,255	2,693,786
18	42,230	2,693,804
19	42,227	2,693,775
20	42,255	2,693,766
21	42,273	2,693,767
22	42,265	2,693,729
23	42,238	2,693,741
24	42,220	2,693,746
25	42,215	2,693,717
26	42,266	2,693,700
27	42,247	2,693,671
28	42,209	2,693,688
29	42,208	2,693,659
30	42,242	2,693,642
31	42,233	2,693,614
32	42,201	2,693,630
33	42,196	2,693,600
34	42,226	2,693,584
35	42,217	2,693,556
36	42,190	2,693,571
37	42,187	2,693,542
38	42,213	2,693,526
39	42,208	2,693,496
40	42,180	2,693,513
41	42,176	2,693,483
42	42,202	2,693,466
43	42,197	2,693,436
44	42,170	2,693,450
45	42,163	2,693,421
46	42,192	2,693,407
47	42,187	2,693,378
48	42,181	2,693,350
49	42,162	2,693,306
50	42,181	2,693,319
51	42,177	2,693,319
52	42,148	2,693,337
53	42,144	2,693,308
54	42,173	2,693,289
55	42,167	2,693,260
56	42,158	2,693,273
57	42,158	2,693,249
58	42,163	2,693,231
59	42,168	2,693,202
60	42,128	2,693,220
61	42,125	2,693,190
62	42,154	2,693,172
63	42,149	2,693,142
64	42,118	2,693,161
65	42,113	2,693,132
66	42,143	2,693,112
67	42,137	2,693,083



DATUM: WGS 84
PROJECTION: LO 27

PREPARED BY:
MOKOLO CROCODILE
CONSULTANTS

PROJECT:
**Mokolo and Crocodile Water
Augmentation Project (MCWAP)**

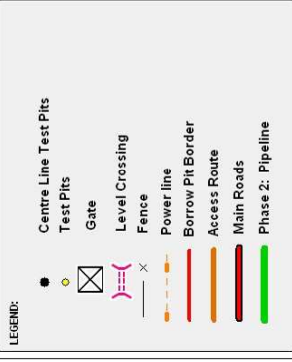
PREPARED FOR:
TGA
A NEW MOTIF FOR WEST

DRAWING TITLE:
**Borrow Pit 39
Test Pit Positions**

DRAWING NR:
39_2

BORROW PIT DESCRIPTION:

Description	Borrow Pit 39
Location of Borrow pit	X:0837793 Y:42295
Shortest distance relative to pipeline	4.56 m
Distance to access road	4.3 km
Farm name 1	Rietfontein 15 KQ RE/15
Farm name 2	Schoonwater 14 KQ Pm 1/14
Owner name	Berardo van Leeuwen
Contact details: Mobile no	0834597744
Estimated quantity (m³)	105000
Suitability of the material	Sand





LEGEND:

- Centre Line Test Pits
- ⬡ Borrow Pit
- Main Roads
- Gravel Roads
- Phase 2: Pipeline
- Railway Network
- Towns

BORROW PIT DESCRIPTION:

Description	Borrowpit_41
Location of Borrow pit:	3248250N 344872E
Shortest distance relative to pipeline	±150 m
Distance to access road	±2.7 km to R510
Farm name	Grootvlei 35 (Q)
Farm number	Pf 37/55
Owner name	Mr. Ventzi
Contact details: Mobile no.	08260 14356
Contact details: Tel no.	14721 150
Estimated quantity (m³)	180000
Suitability of the material	Sand

DATUM: WGS 84
PROJECTION: LO 27

0.8 0 0.8 1.6
Kilometers
Scale: 1:40,000

PREPARED BY:

MOKOLO CROCODILE Consultants
GEOSTRADA Engineering & Construction Solutions

PREPARED FOR:

TCTA
A NEW WORLD FOR WATER

PROJECT:

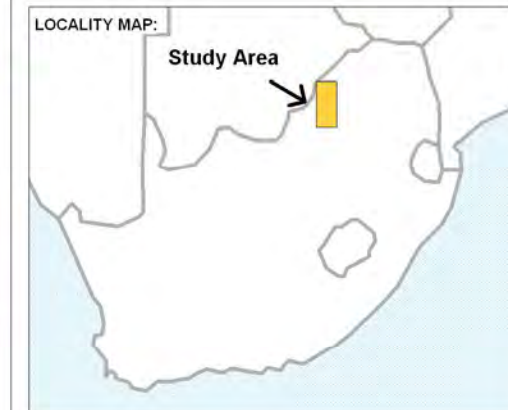
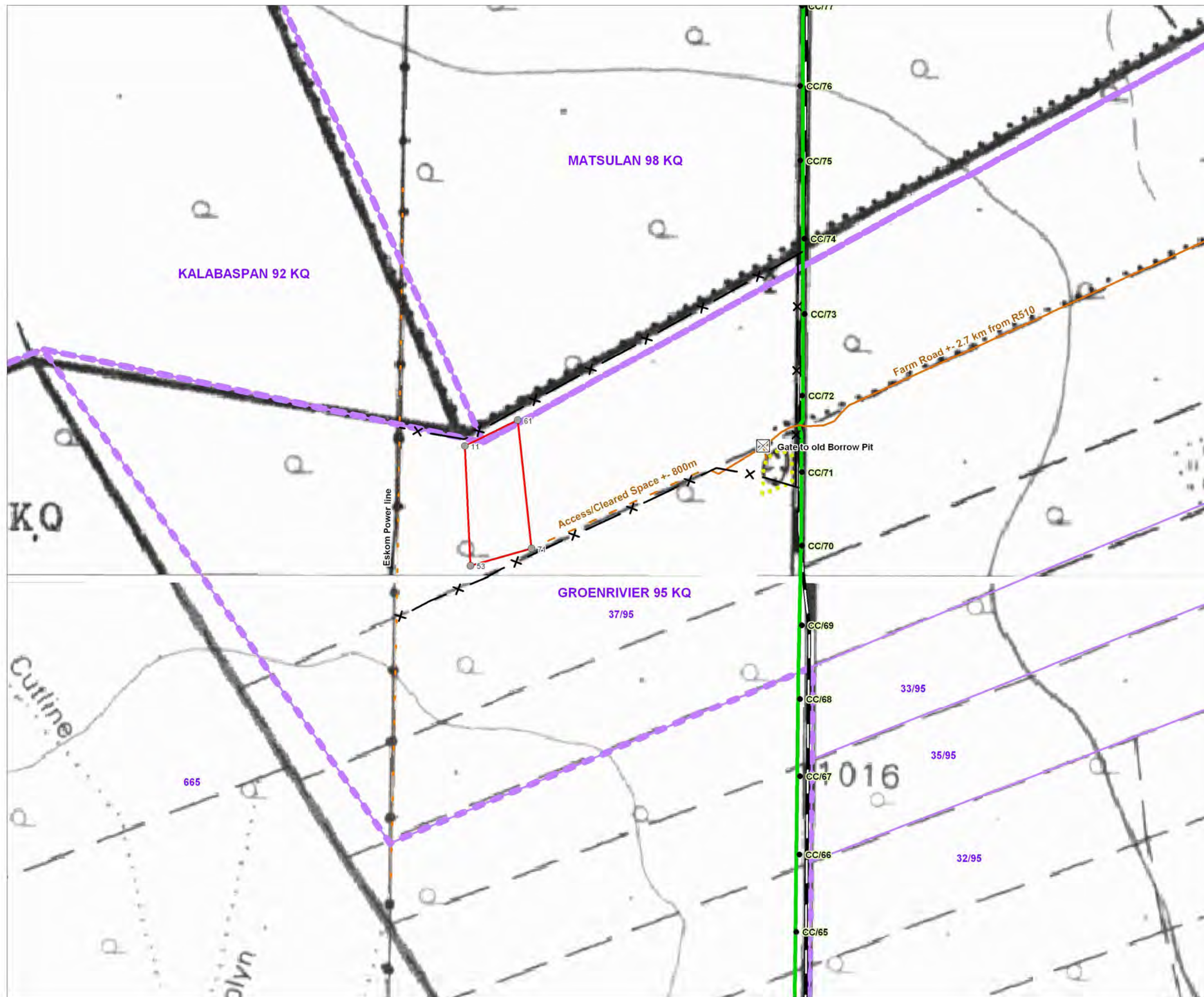
Mokolo and Crocodile Water Augmentation Project (MCWAP)

DRAWING TITLE:

Borrow Pit 41 Locality Plan

DRAWING NR:

41_1

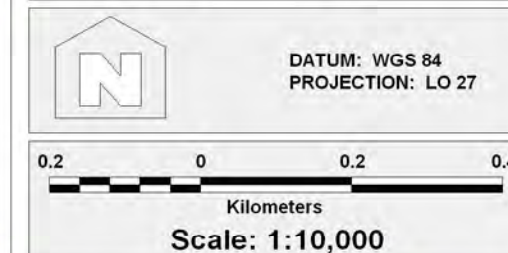


LEGEND:

●	Centre Line Test Pits
●	Borrow Pit Corner Points
—	Main Roads
—	Gravel Road
—	Eskom Power Line
—	Fence
●	Old Borrow Pit
—	Phase 2: Pipeline
—	Railway Network
■	Towns
—	Parent Farm Boundary

BORROW PIT DESCRIPTION:

Description	Borrowpit_41
Location of Borrow pit	X2682930 Y-44872
Shortest distance relative to pipeline	±130 m
Distance to access road	±2.7 km to R510
Farm name	Groenrivier 95 KQ
Farm number	Ptn 37/95
Owner name	Vic Wentzel
Contact details: Mobile no	0828014350
Contact details: Tel no	147721150
Estimated quantity (m³)	180000
Suitability of the material	Sand



PREPARED BY:

MOKOLO CROCODILE Consultants

GEOSTRADA

PREPARED FOR:

TCTA

PROJECT:

Mokolo and Crocodile Water Augmentation Project (MCWAP)

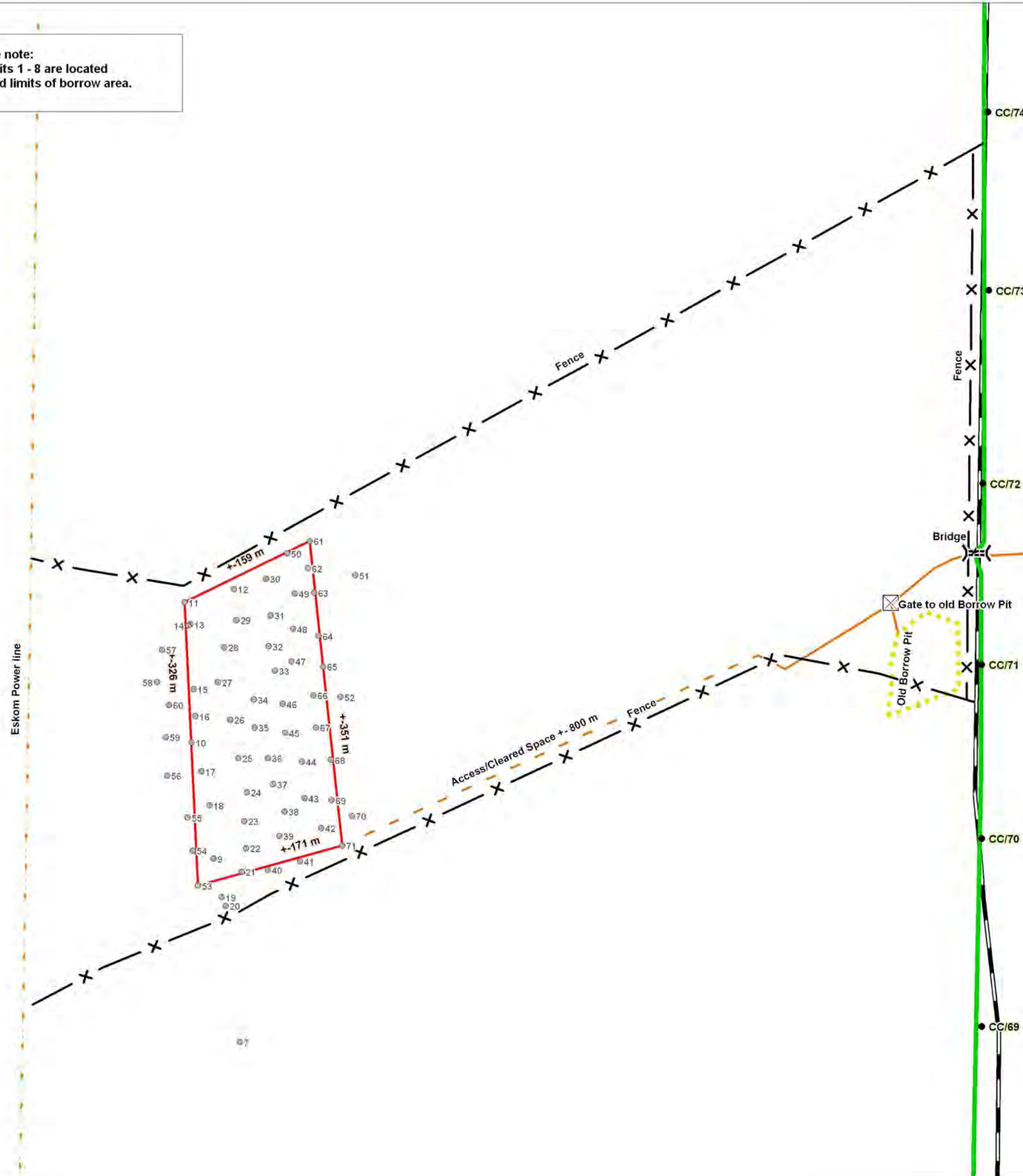
DRAWING TITLE:

Borrow Pit 41 Layout Plan

DRAWING NR:

41_2

Please note:
Test Pits 1 - 8 are located
beyond limits of borrow area.



BORROW PIT 41 TEST PIT COORDINATES:

ID	LO27Y	LO27X
7	-044824	2683287
8	-044852	2683451
9	-044794	2683077
10	-044769	2682944
11	-044761	2682784
12	-044817	2682769
13	-044767	2682809
14	-044765	2682810
15	-044771	2682883
16	-044773	2682914
17	-044780	2682977
18	-044789	2683016
19	-044803	2683121
20	-044808	2683131
21	-044826	2683092
22	-044831	2683065
23	-044829	2683034
24	-044832	2683001
25	-044822	2682962
26	-044813	2682918
27	-044799	2682875
28	-044806	2682835
29	-044820	2682804
30	-044854	2682757
31	-044859	2682799
32	-044857	2682834
33	-044864	2682862
34	-044840	2682895
35	-044841	2682927
36	-044856	2682962
37	-044862	2682992
38	-044875	2683023
39	-044869	2683051
40	-044856	2683090
41	-044893	2683080
42	-044917	2683042
43	-044898	2683008
44	-044895	2682966
45	-044876	2682933
46	-044873	2682900
47	-044883	2682851
48	-044885	2682814
49	-044887	2682774
50	-044878	2682728
51	-044956	2682753
52	-044939	2682892
53	-044776	2683108
54	-044770	2683068
55	-044764	2683030
56	-044741	2682982
57	-044735	2682838
58	-044729	2682875
59	-044739	2682938
60	-044743	2682901
61	-044904	2682714
62	-044902	2682745
63	-044909	2682773
64	-044914	2682822
65	-044919	2682857
66	-044908	2682890
67	-044911	2682927
68	-044928	2682964
69	-044929	2683010
70	-044952	2683028
71	-044941	2683062



LEGEND:

- Centre Line Test Pits
- Test Pits
- Gate
- Bridge
- Borrow Pit Border
- Gravel Road
- Power Line
- Fence
- Old Borrow Pit
- Railway Line
- Main Roads

BORROW PIT DESCRIPTION:

Description	Borrowpit_41
Location of Borrow pit	X2682930 Y-44872
Shortest distance relative to pipeline	+~130 m
Distance to access road	+~2.7 km to R510
Farm name	Groenrivier 95 KQ
Farm number	Ptn 37/95
Owner name	Vic Wentzel
Contact details: Mobile no	0828014350
Contact details: Tel no	147721150
Estimated quantity (m ³)	180000
Suitability of the material	Sand

DATUM: WGS 84
PROJECTION: LO 27

0.1 0 0.1 0.2
Kilometers
Scale: 1:5,000

PREPARED BY:

MOKOLO CROCODILE Consultants

GEOSTRADA

PREPARED FOR:

TCTA

PROJECT:

Mokolo and Crocodile Water Augmentation Project (MCWAP)

DRAWING TITLE:

Borrow Pit 41 Test Pit Positions

DRAWING NR:

41_3



LEGEND:

- Centre Line Test Pits
- Borrow Pit
- Main Roads
- Access Route
- Phase 2: Pipeline
- Railway Network

BORROW PIT DESCRIPTION:

Description	Borrowpit_42
Location of Borrow pit	X2658291 Y-41366
Shortest distance relative to pipeline	+/- 70 m
Distance to access road	+/- 5.4 km
Farm name	Inkermann 10 KQ
Farm number	Ptn 1/10
Owner name	Mr G Taylor
Contact details: Mobile no	0836530326
Estimated quantity (m³)	150000
Suitability of the material	Sand

DATUM: WGS 84
PROJECTION: LO 27

0.8 0 0.8 1.6
Kilometers
Scale: 1:40,000

PREPARED BY:

MOKOLO CROCODILE
Consultants

GEOSTRADA
Engineering & Construction Solutions

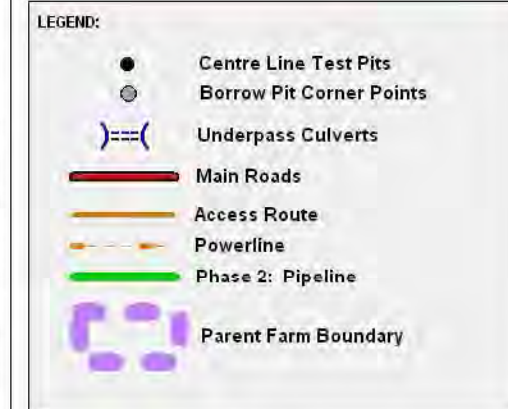
PREPARED FOR:

TETA
A NEW WORLD FOR WATER

PROJECT:
Mokolo and Crocodile Water Augmentation Project (MCWAP)

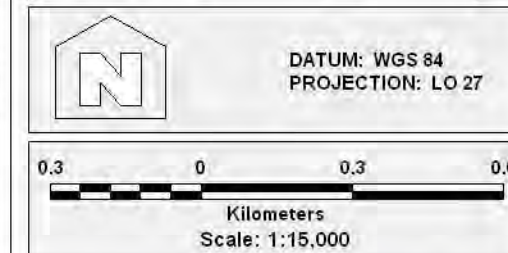
DRAWING TITLE:
Borrow Pit 42 Locality Plan

DRAWING NR:
42_1



BORROW PIT DESCRIPTION:

Description	Borrowpit_42
Location of Borrow pit	X:2659291 Y:41366
Shortest distance relative to pipeline	+70 m
Distance to access road	+ 5.4 km
Farm name	Inkermann 10 KQ
Farm number	Ptn 1/10
Owner name	Mr G Taylor
Contact details: Mobile no	0838530326
Estimated quantity (m³)	150000
Suitability of the material	Sand



PROJECT:

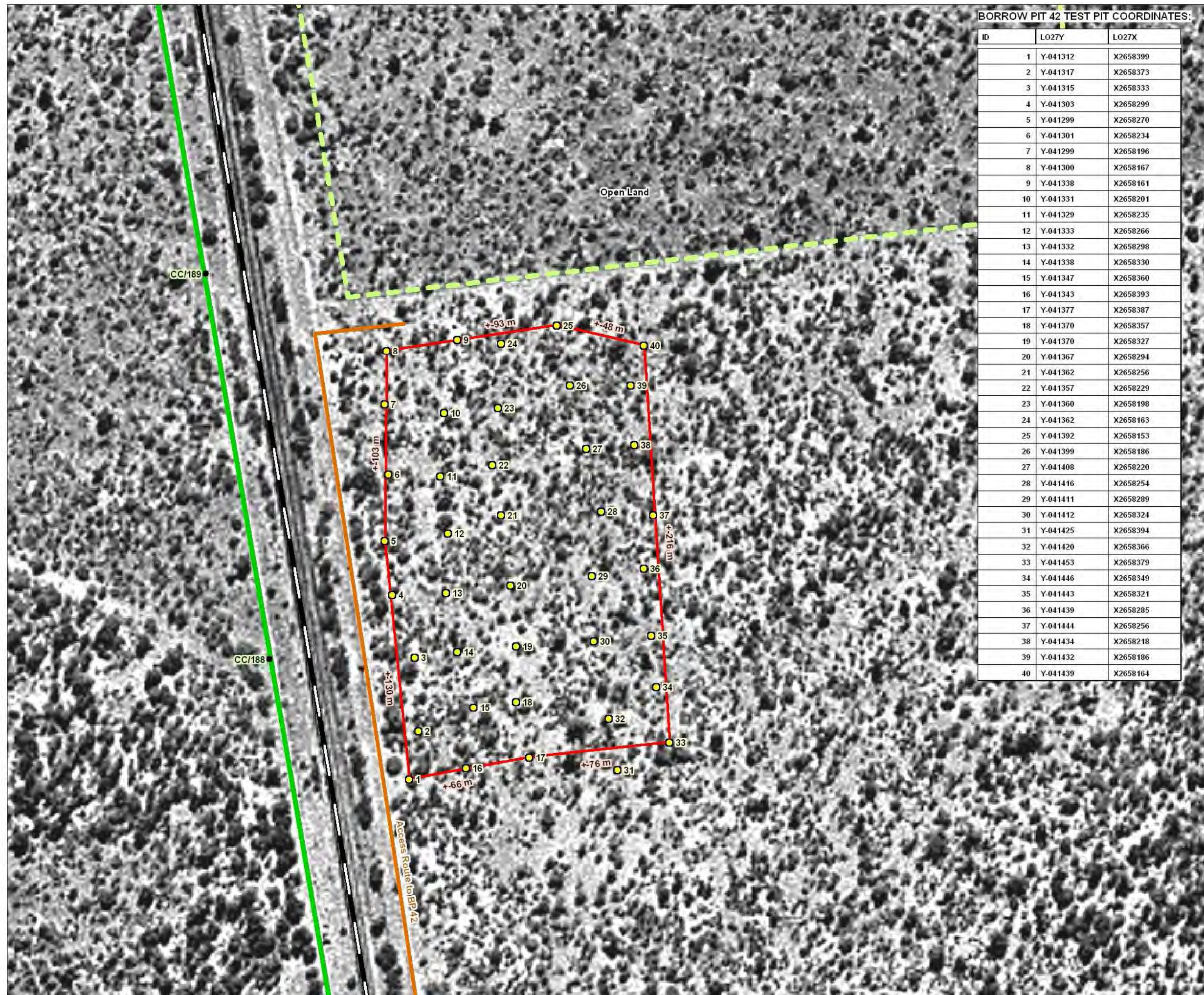
Mokolo and Crocodile Water Augmentation Project (MCWAP)

DRAWING TITLE:

Borrow Pit 42 Layout Plan

DRAWING NR:

42_2



BORROW PIT 42 TEST PIT COORDINATES:

ID	LO27Y	LO27X
1	Y-041312	X2658399
2	Y-041317	X2658373
3	Y-041315	X2658333
4	Y-041303	X2658299
5	Y-041299	X2658270
6	Y-041301	X2658234
7	Y-041299	X2658196
8	Y-041300	X2658167
9	Y-041338	X2658161
10	Y-041331	X2658201
11	Y-041329	X2658235
12	Y-041333	X2658266
13	Y-041332	X2658298
14	Y-041338	X2658330
15	Y-041347	X2658360
16	Y-041343	X2658393
17	Y-041377	X2658387
18	Y-041370	X2658357
19	Y-041370	X2658327
20	Y-041367	X2658294
21	Y-041362	X2658256
22	Y-041357	X2658229
23	Y-041360	X2658198
24	Y-041362	X2658163
25	Y-041392	X2658153
26	Y-041399	X2658186
27	Y-041408	X2658220
28	Y-041416	X2658254
29	Y-041411	X2658289
30	Y-041412	X2658324
31	Y-041425	X2658394
32	Y-041420	X2658366
33	Y-041453	X2658379
34	Y-041446	X2658349
35	Y-041443	X2658321
36	Y-041439	X2658285
37	Y-041444	X2658256
38	Y-041434	X2658218
39	Y-041432	X2658186
40	Y-041439	X2658164



LEGEND:

- Centre Line Test Pits
- Test Pits
- Borrow Pit Border
- Access Route
- Open Land
- Main Roads
- Phase 2: Pipeline

BORROW PIT DESCRIPTION:

Description	Borrowpit_42
Location of Borrow pit	X2658291 Y-41366
Shortest distance relative to pipeline	+~70 m
Distance to access road	+~5.4 km
Farm name	Inkermann 10 KQ
Farm number	Ptn 1/10
Owner name	Mr G Taylor
Contact details: Mobile no	0836530326
Estimated quantity (m³)	150000
Suitability of the material	Sand

DATUM: WGS 84
PROJECTION: LO 27

0.04 0 0.04 0.08
Kilometers
Scale: 1:2,000

PREPARED BY:

MOKOLO CROCODILE
Consultants

GEOSTRADA
Engineering, Survey and Laboratory

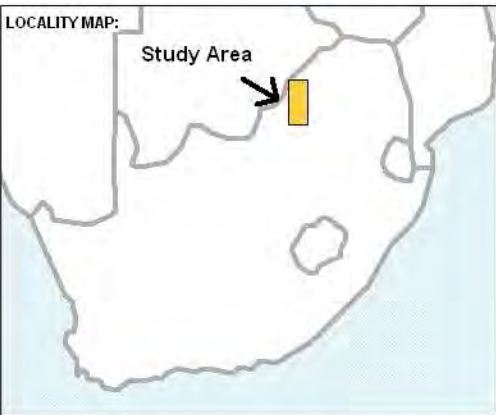
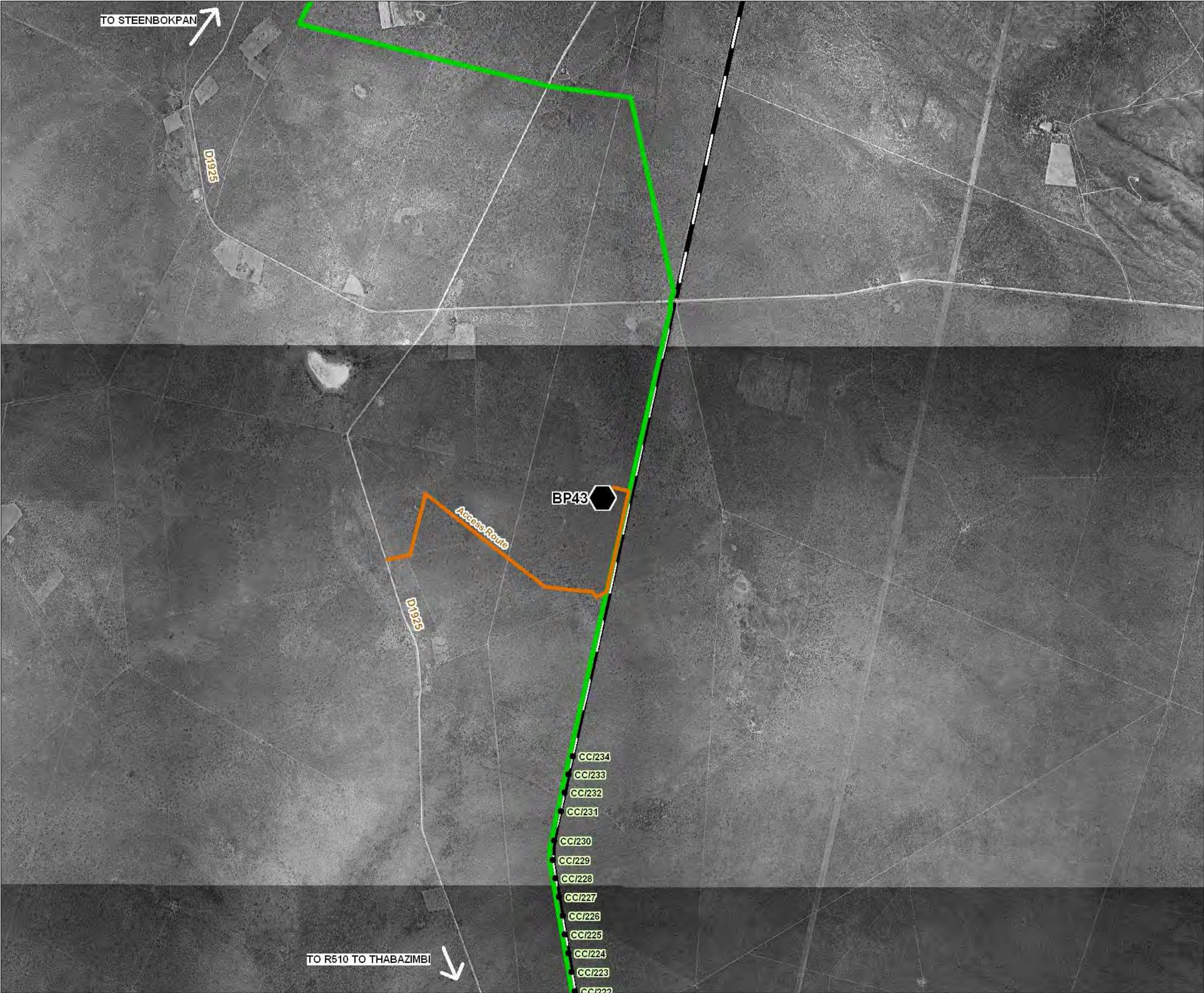
PREPARED FOR:

TCTA
A NEW WORLD FOR WATER

PROJECT:
Mokolo and Crocodile Water
Augmentation Project (MCWAP)

DRAWING TITLE:
Borrow Pit 42
Test Pit Positions

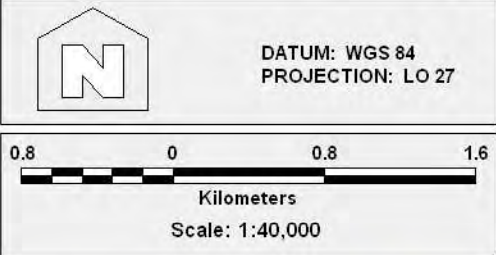
DRAWING NR:
42_3



- LEGEND:
- Centre Line Test Pits
 - ⬡ Borrow Pit
 - Main Roads
 - Access Route
 - Phase 2: Pipeline
 - Railway Network

BORROW PIT DESCRIPTION:

Description	Borrowpit_43
Location of Borrow pit	X2645668 Y-41362
Shortest distance relative to pipeline	+/-177 m
Distance to access road	+/-4.6 km from D1925
Farm name	Zandfontein 382 KQ
Farm number	Ptn 2/382
Owner name	Hermanus Mountany
Contact details: Mobile no	0827026885
Estimated quantity (m³)	110000
Suitability of the material	Sand



PREPARED BY:

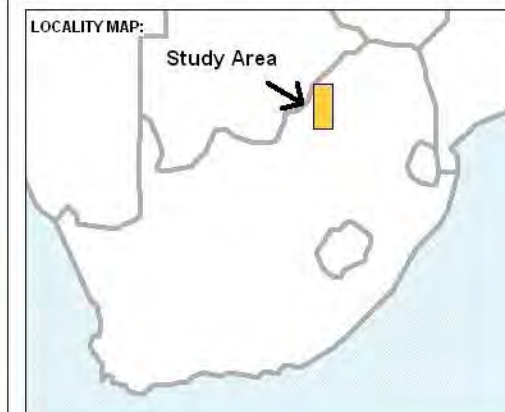
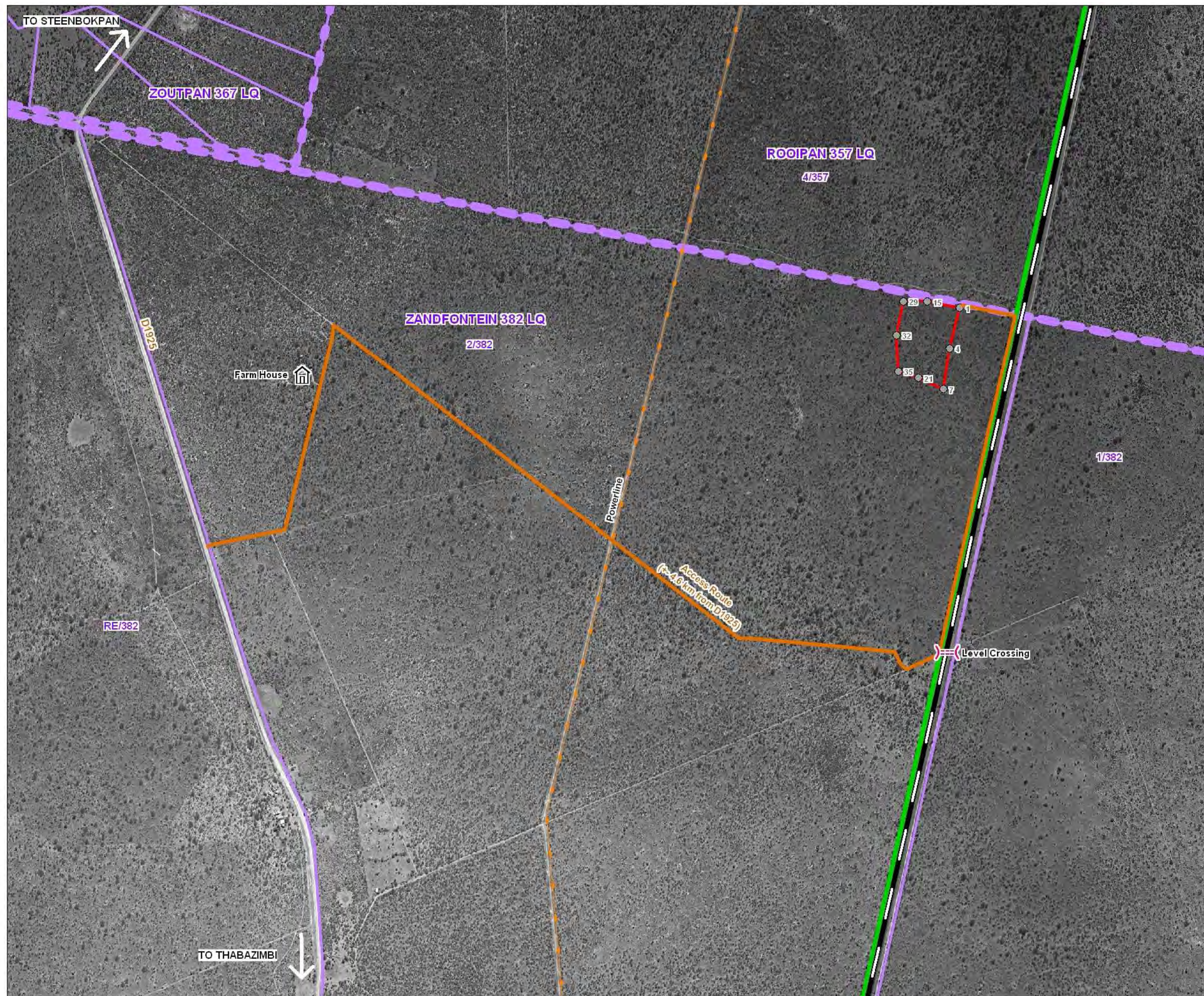
PREPARED FOR:



PROJECT:
Mokolo and Crocodile Water Augmentation Project (MCWAP)

DRAWING TITLE:
Borrow Pit 43 Locality Plan

DRAWING NR:
43_1



LEGEND:

- Centre Line Test Pits
- Borrow Pit Corner Points
- Level Crossing
- 🏠 Farm House
- Main Roads
- Phase 2: Pipeline
- Access Route
- Powerline
- Parent Farm Boundary

BORROW PIT DESCRIPTION:

Description	Borrowpit_43
Location of Borrow pit	X2645668 Y41362
Shortest distance relative to pipeline	+177 m
Distance to access road	+4.6 km from D1925
Farm name	Zandfontein 382 KQ
Farm number	Pln 2/382
Owner name	Hermanus Mountany
Contact details: Mobile no	0827026885
Estimated quantity (m³)	110000
Suitability of the material	Sand

DATUM: WGS 84
PROJECTION: LO 27

0.2 0 0.2 0.4
Kilometers
Scale: 1:12,000

PREPARED BY:

MOKOLO CROCODILE
Consultants

GEOSTRADA
Engineering, Surveying & Construction

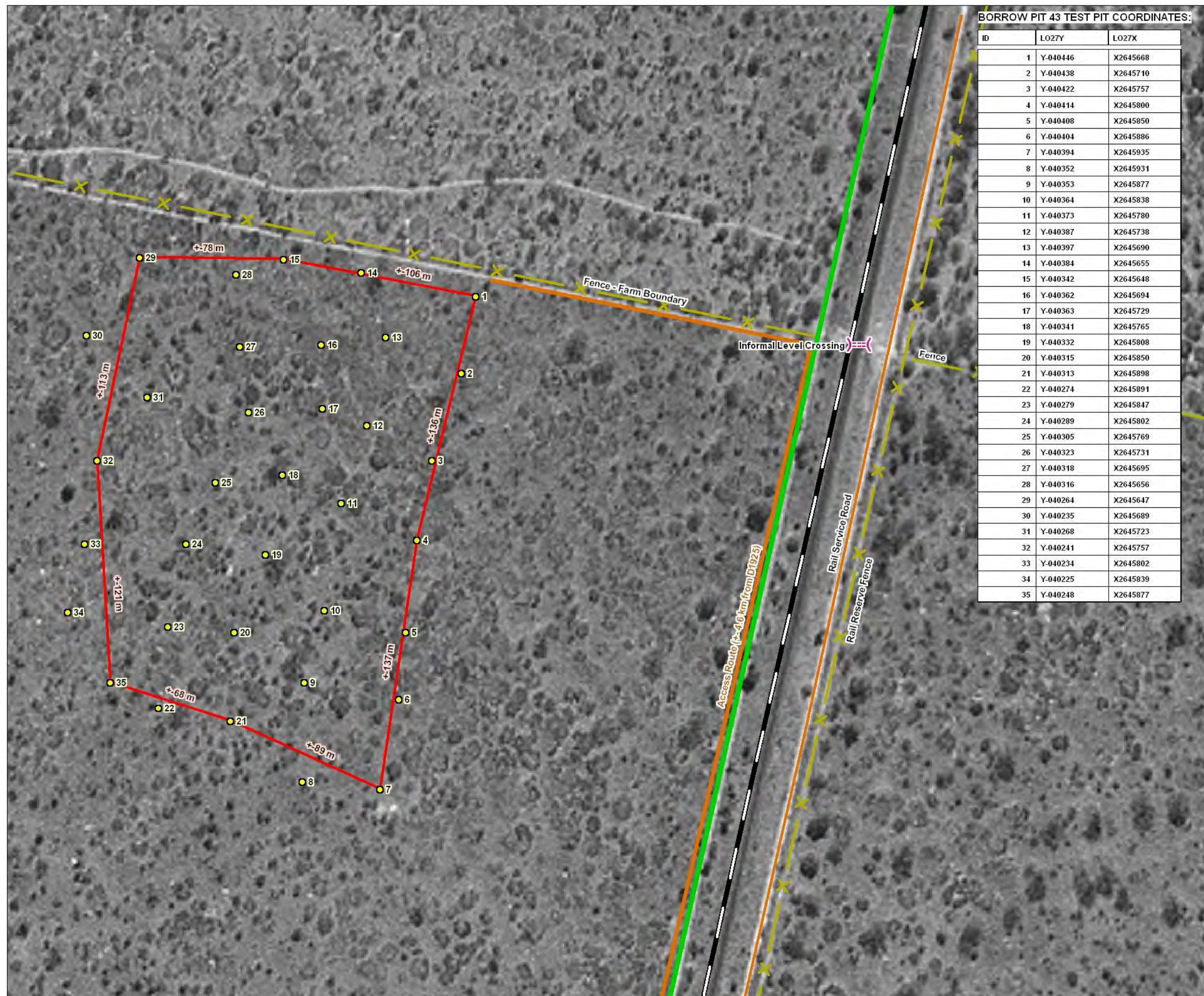
PREPARED FOR:

TCTA
A NEW WORLD FOR WATER

PROJECT:
Mokolo and Crocodile Water
Augmentation Project (MCWAP)

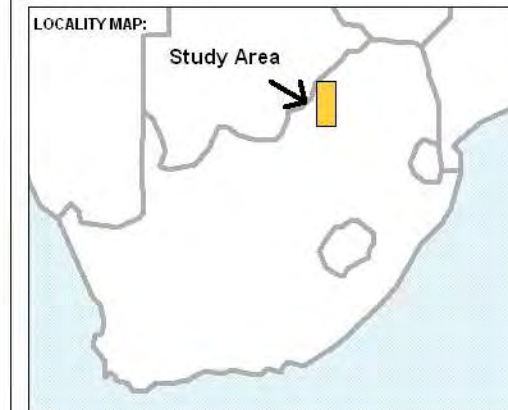
DRAWING TITLE:
Borrow Pit 43
Layout Plan

DRAWING NR:
43_2



BORROW PIT 43 TEST PIT COORDINATES:

ID	LO27Y	LO27X
1	Y-040446	X2645668
2	Y-040438	X2645710
3	Y-040422	X2645757
4	Y-040414	X2645800
5	Y-040408	X2645850
6	Y-040404	X2645886
7	Y-040394	X2645935
8	Y-040352	X2645931
9	Y-040353	X2645877
10	Y-040364	X2645838
11	Y-040373	X2645780
12	Y-040387	X2645738
13	Y-040397	X2645690
14	Y-040384	X2645655
15	Y-040342	X2645648
16	Y-040362	X2645694
17	Y-040363	X2645729
18	Y-040341	X2645765
19	Y-040332	X2645808
20	Y-040315	X2645850
21	Y-040313	X2645898
22	Y-040274	X2645891
23	Y-040279	X2645847
24	Y-040289	X2645802
25	Y-040305	X2645769
26	Y-040323	X2645731
27	Y-040318	X2645695
28	Y-040316	X2645656
29	Y-040264	X2645647
30	Y-040235	X2645689
31	Y-040268	X2645723
32	Y-040241	X2645757
33	Y-040234	X2645802
34	Y-040225	X2645839
35	Y-040248	X2645877

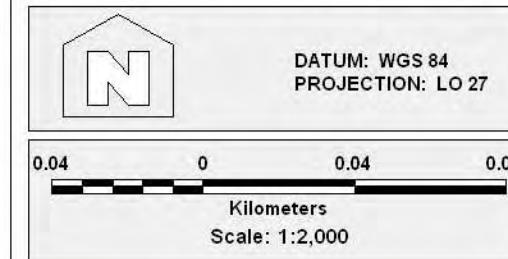


LEGEND:

●	Centre Line Test Pits
●	Test Pits
(==)	Level Crossing
—	Borrow Pit Border
—	Access Route
— x —	Fence
—	Main Roads
—	Phase 2: Pipeline

BORROW PIT DESCRIPTION:

Description	Borrowpit_43
Location of Borrow pit	X2645668 Y-41362
Shortest distance relative to pipeline	+~177 m
Distance to access road	+~4.6 km from D1925
Farm name	Zandfontein 382 KQ
Farm number	Ptn 2/382
Owner name	Hermanus Mountany
Contact details: Mobile no	0827026885
Estimated quantity (m³)	110000
Suitability of the material	Sand



PREPARED BY:

MOKOLO CROCODILE
Consultants

GEOSTRADA
Engineering, water and environment

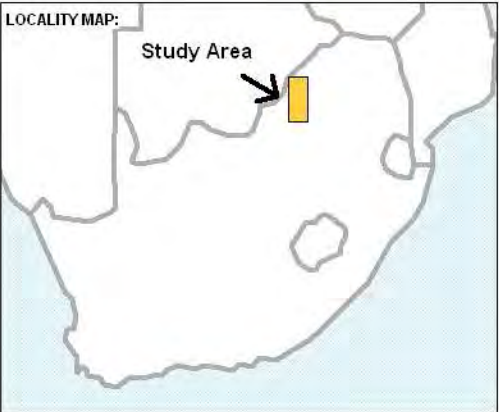
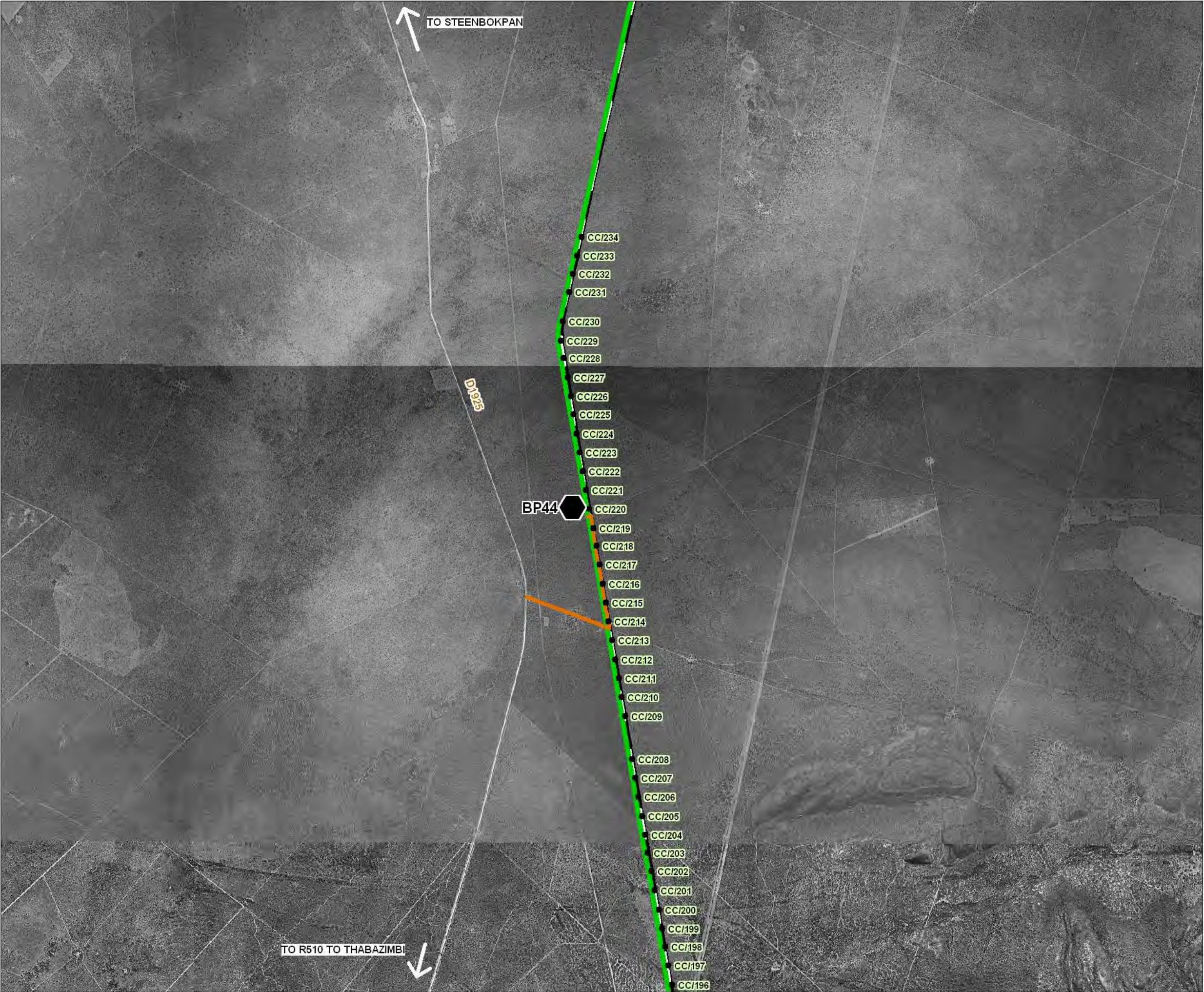
PREPARED FOR:

TCTA
A NEW WORLD FOR WATER

PROJECT:
Mokolo and Crocodile Water Augmentation Project (MCWAP)

DRAWING TITLE:
Borrow Pit 43 Test Pit Positions

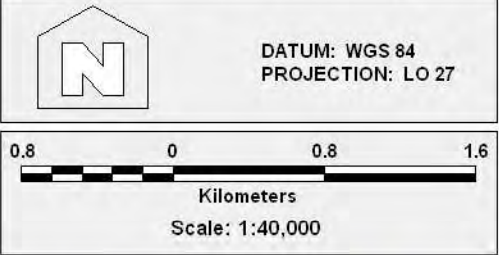
DRAWING NR:
43_3




- LEGEND:
- Centre Line Test Pits
 - ⬡ Borrow Pit
 - Main Roads
 - Access Route
 - Phase 2: Powerline
 - Railway Network

BORROW PIT DESCRIPTION:

Description	Borrowpit_44
Location of Borrow pit	X265 1463 Y-355 14
Shortest distance relative to pipeline	+70 m
Distance to access road	+2.2 km from D1925
Farm name	Deerpriest 386 LQ
Farm number	Phs of 386
Owner name	AJ Janzen van Vuuren
Contact details: Mobile no	982468874
Contact details: Tel no	0 147 634587
Estimated quantity (m³)	140000
Suitability of the material	Sand



PREPARED BY:

MOKOLO CROCODILE Consultants 

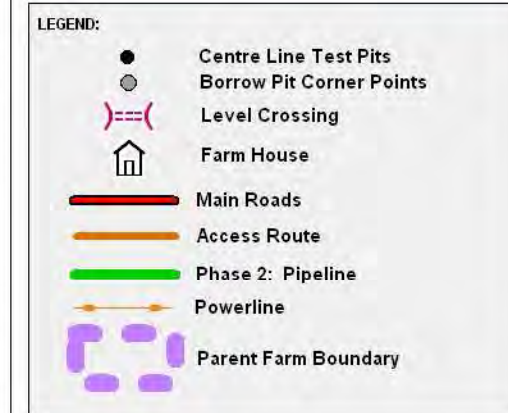
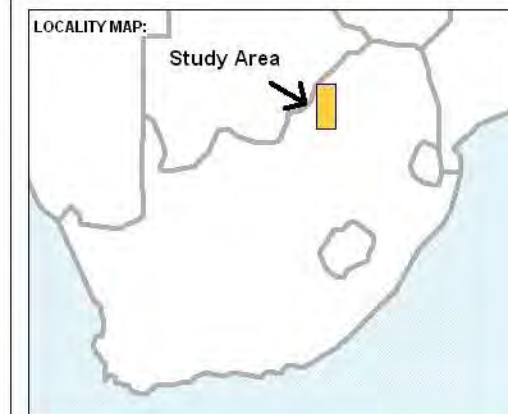
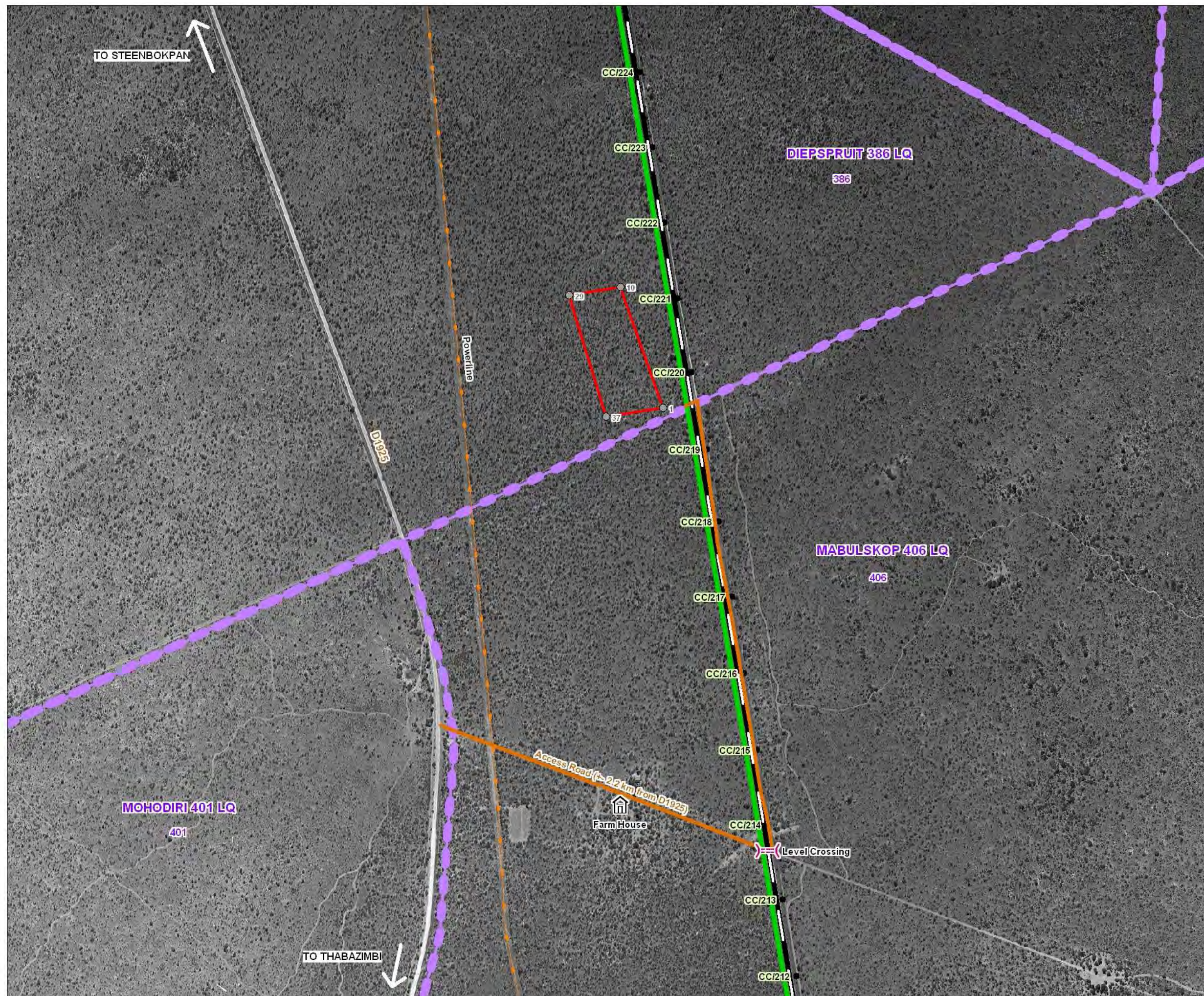
PREPARED FOR:

 **TCTA**
A NEW WORLD FOR WATER

PROJECT:
Mokolo and Crocodile Water Augmentation Project (MCWAP)

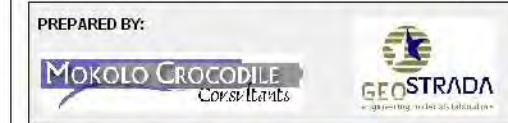
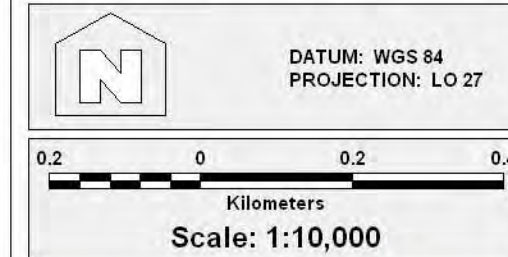
DRAWING TITLE:
Borrow Pit 44 Locality Plan

DRAWING NR:
44_1



BORROW PIT DESCRIPTION:

Description	Borrowpit_44
Location of Borrow pit	X2651463 Y-39914
Shortest distance relative to pipeline	+70 m
Distance to access road	+2.2 km from D1925
Farm name	Diepspruit 386 LQ
Farm number	Ptn of 386
Owner name	AJ Jansen van Vuuren
Contact details: Mobile no	0824688674
Contact details: Tel no	0147634587
Estimated quantity (m³)	140000



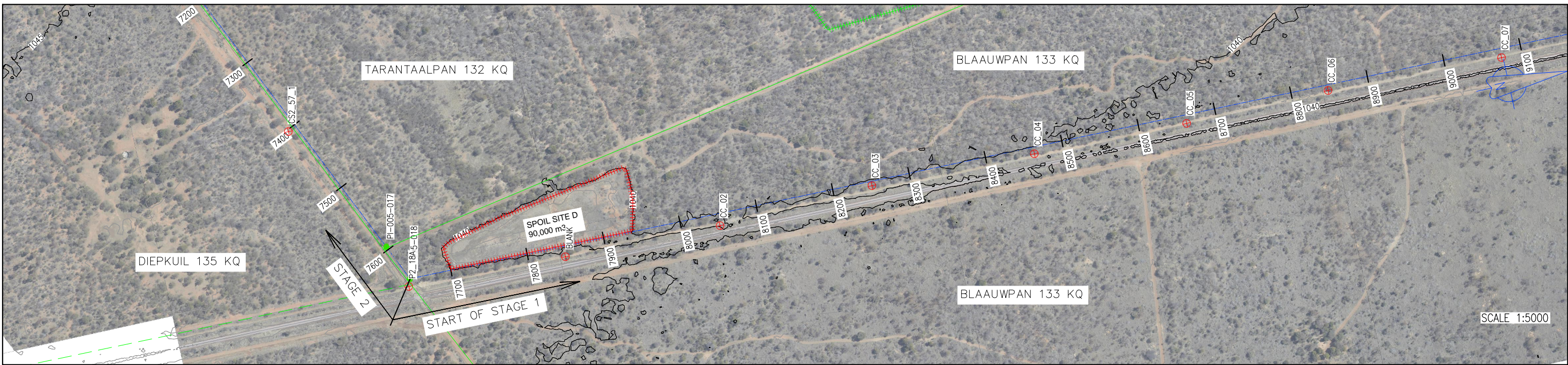
PROJECT:
Mokolo and Crocodile Water Augmentation Project (MCWAP)

DRAWING TITLE:
Borrow Pit 44 Layout Plan

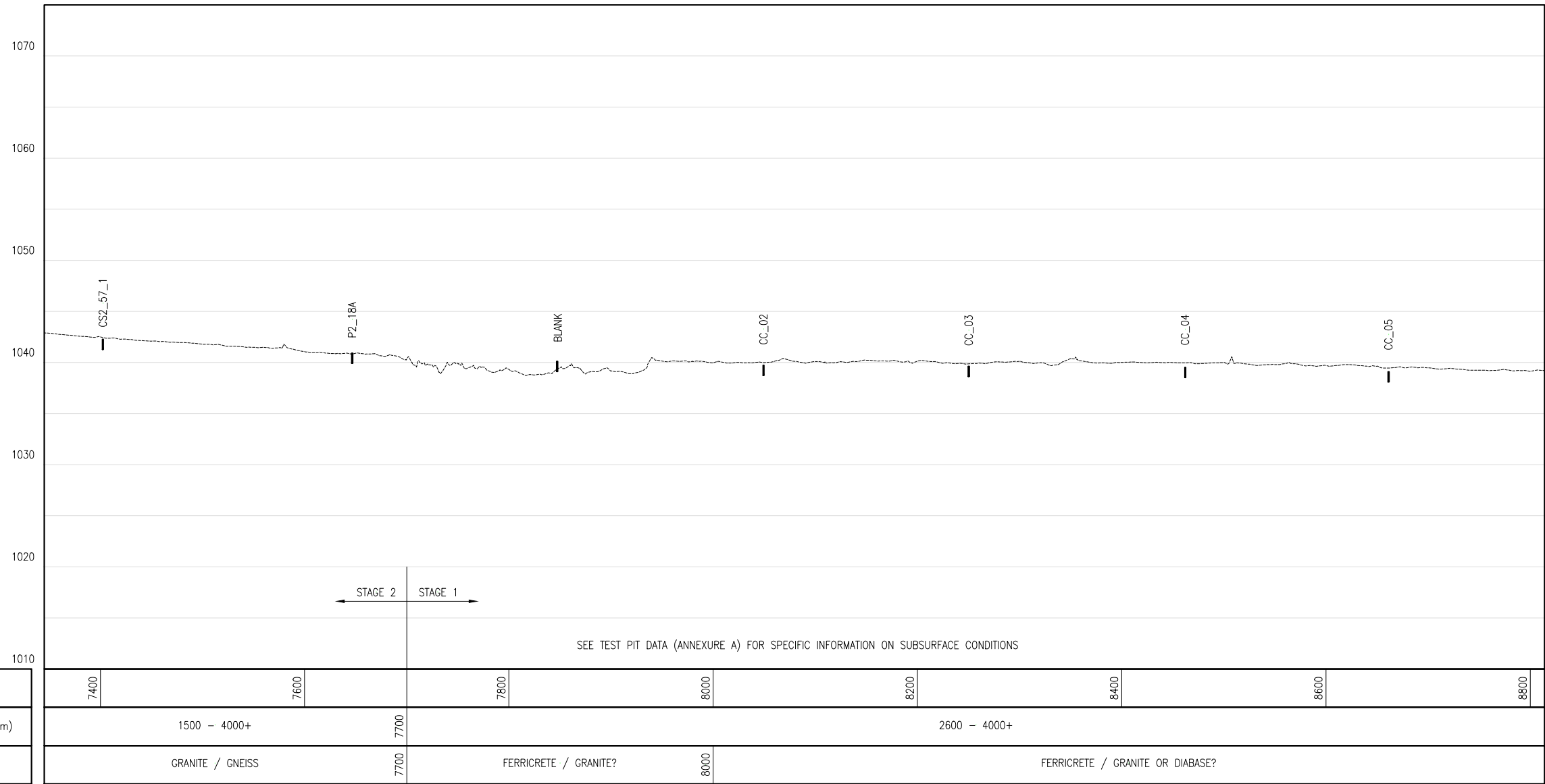
DRAWING NR:
44_2

ANNEXURE E

GEOTECHNICAL MAPS



SCALE 1:5000







SCALE HOR 1:5000
VERT 1:500

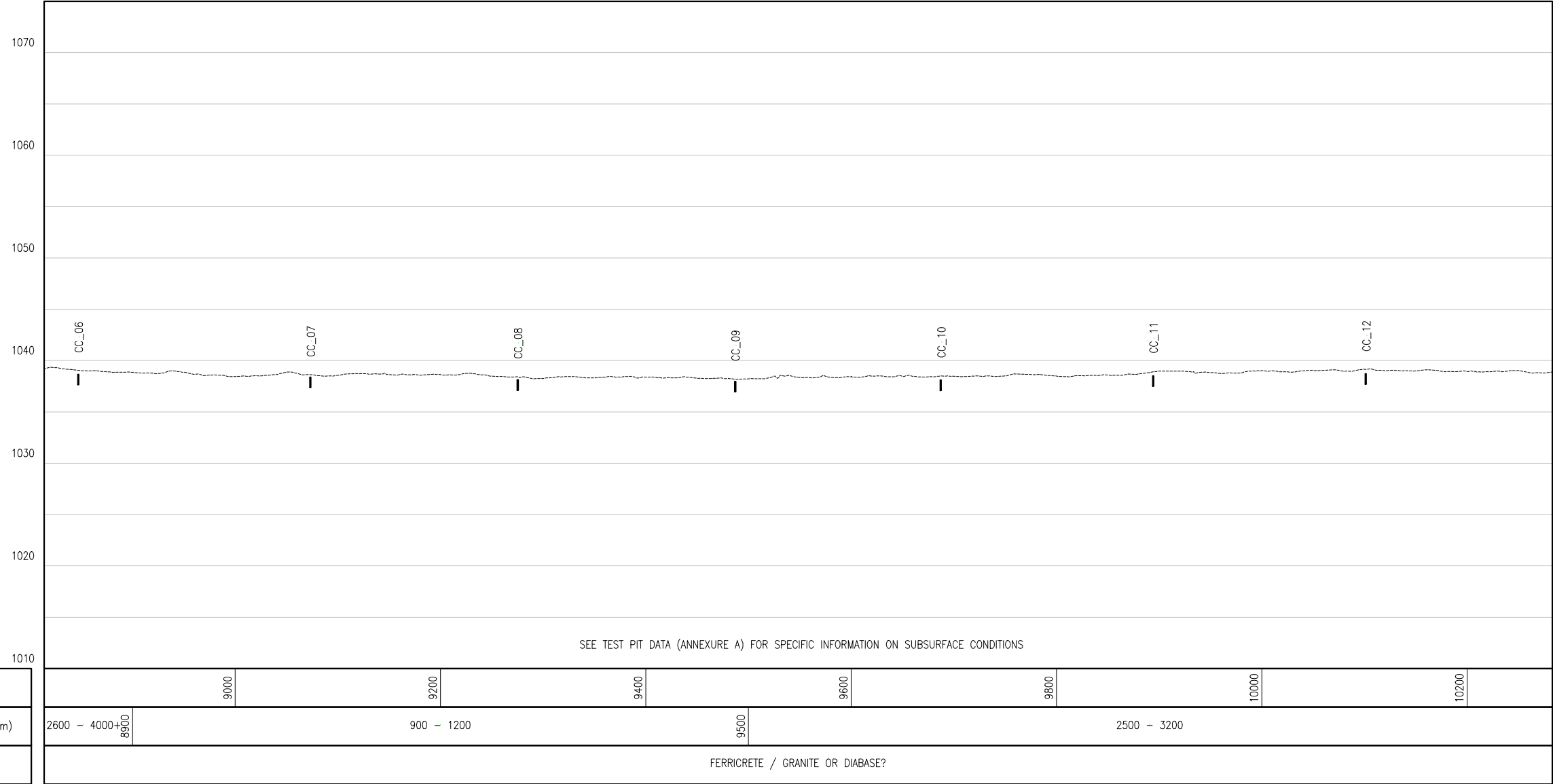
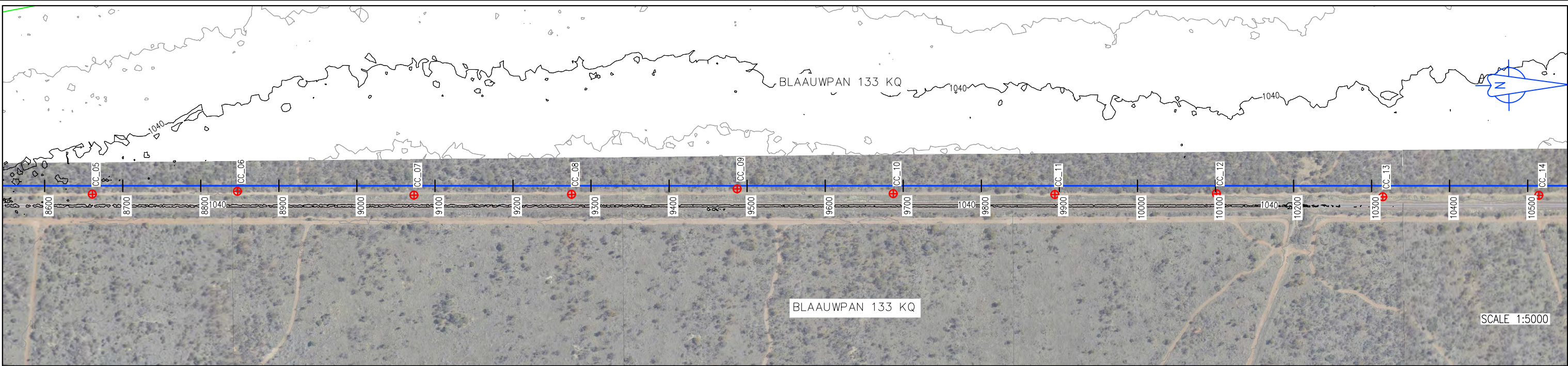
CHAINAGE (m)
REFUSAL DEPTH RANGE (mm)
GEOLOGY

7400	7600	7800	8000	8200	8400	8600	8800
1500 - 4000+		7700	2600 - 4000+				
GRANITE / GNEISS		7700	FERRICRETE / GRANITE?	8000	FERRICRETE / GRANITE OR DIABASE?		

LEGEND:

- CHAINAGE MARKER (PLAN ONLY)
- POINT OF INTERSECTION (PI)
- TEST PIT
- BOREHOLE
- PIPELINE
- OVERHEAD POWERLINE
- FARM BOUNDARY
- FARM PORTION BOUNDARY
- CROSSING - SURFACED ROAD
- CROSSING - GRAVEL ROAD
- CROSSING - PRIVATE DIRT ROAD
- CROSSING - POWERLINE
- AREA OF INTERMITTENT OUTCROP
- AREA OF OUTCROP
- AREA OF IMPEDED DRAINAGE
- POTENTIAL BORROW PIT
- EXISTING BORROW PIT / SPOIL SITE

REFERENCE DRAWINGS		REVISIONS				DESIGNED:		PROJECT ENGINEER:	P LE ROUX		MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)				
DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:			GEOTECHNICAL PROFILE STAGE 1: TARANTAALPAN TO OPERATIONAL RESERVOIR				
		A	02/09/11	FOR INFORMATION		CHECKED:	J MULDER				PLAN & LONG SECTION				
						CHIEF DESIGNER:	E SERFONTEIN	SCALE:	AS SHOWN						
						SCALE: 1:500									
						SCALE: 1:5000									
															
											A3	DWAF DRG. No.	DRAWING NUMBER	2E - G7 - 006	REV N A



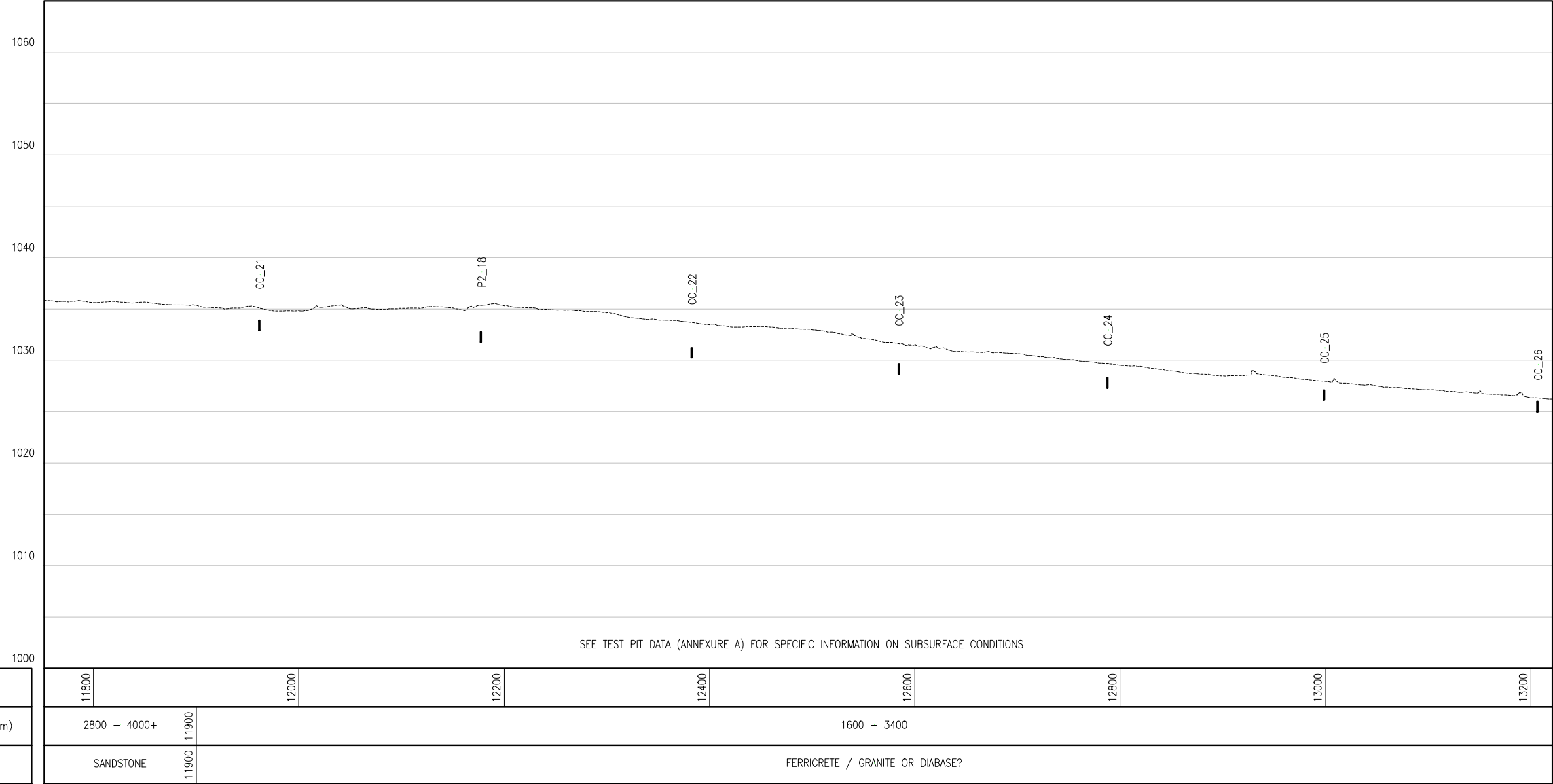
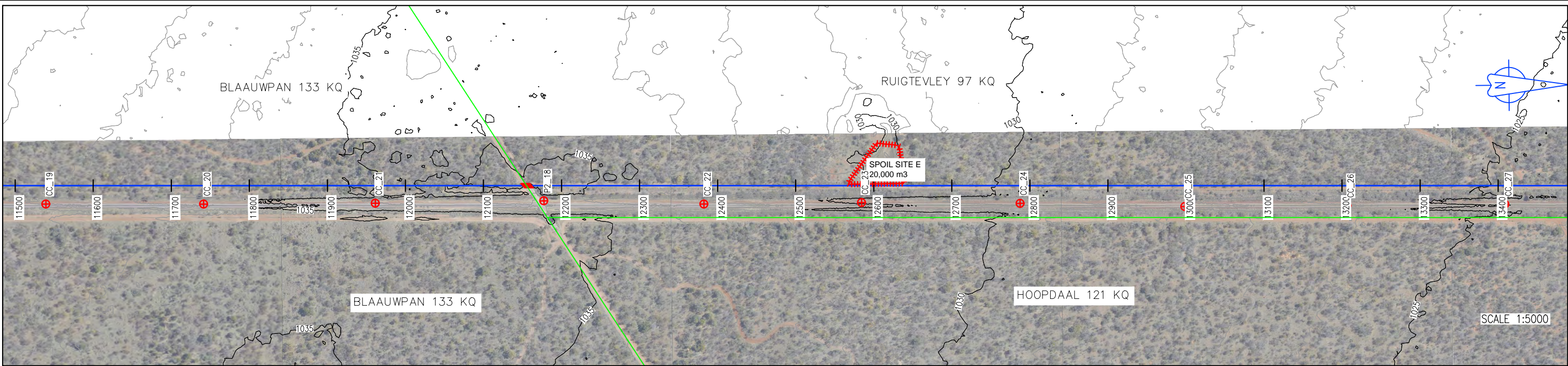
LEGEND:

- CHAINAGE MARKER (PLAN ONLY)
- POINT OF INTERSECTION (PI)
- TEST PIT
- BOREHOLE
- PIPELINE
- OVERHEAD POWERLINE
- FARM BOUNDARY
- FARM PORTION BOUNDARY
- CROSSING - SURFACED ROAD
- CROSSING - GRAVEL ROAD
- CROSSING - PRIVATE DIRT ROAD
- CROSSING - POWERLINE
- AREA OF INTERMITTENT OUTCROP
- AREA OF OUTCROP
- AREA OF IMPEDED DRAINAGE
- POTENTIAL BORROW PIT
- EXISTING BORROW PIT / SPOIL SITE

CHAINAGE (m)
REFUSAL DEPTH RANGE (mm)
GEOLOGY

9000	9200	9400	9600	9800	10000	10200
2600 - 4000	900 - 1200	9500	2500 - 3200			
FERRICRETE / GRANITE OR DIABASE?						

REFERENCE DRAWINGS				REVISIONS			DESIGNED:		PROJECT ENGINEER:	P LE ROUX		MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP) GEOTECHNICAL PROFILE STAGE 1: TARANTAALPAN TO OPERATIONAL RESERVOIR PLAN & LONG SECTION					
DRG. No.	TITLE			REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:							
				A	24/02/11	FOR INFORMATION		CHECKED:	J MULDER								
								CHIEF DESIGNER:	E SERFONTEIN	SCALE:					AS SHOWN		
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							SCALE: 1:5000										


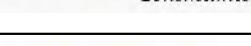





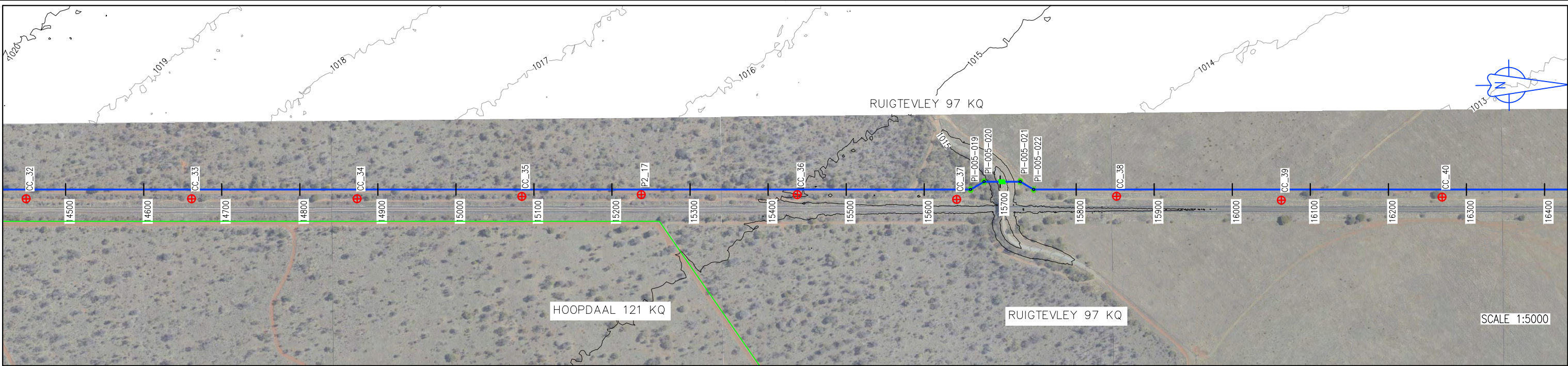
LEGEND:

- CHAINAGE MARKER (PLAN ONLY)
- POINT OF INTERSECTION (PI)
- TEST PIT
- BOREHOLE
- PIPELINE
- OVERHEAD POWERLINE
- FARM BOUNDARY
- FARM PORTION BOUNDARY
- CROSSING – SURFACED ROAD
- CROSSING – GRAVEL ROAD
- CROSSING – PRIVATE DIRT ROAD
- CROSSING – POWERLINE
- AREA OF INTERMITTENT OUTCROP
- AREA OF OUTCROP
- AREA OF IMPEDED DRAINAGE
- POTENTIAL BORROW PIT
- EXISTING BORROW PIT / SPOIL SITE

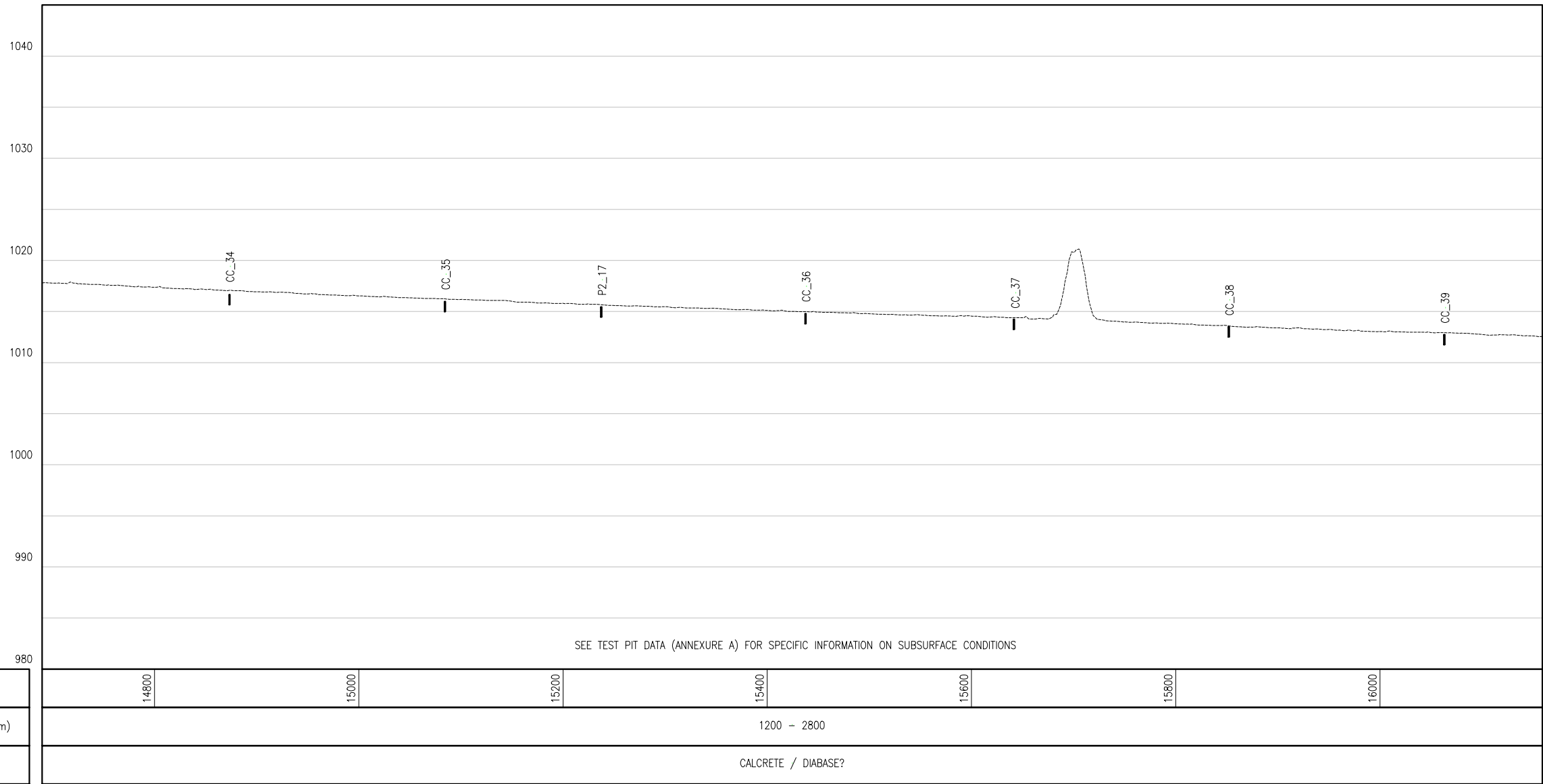
CHAINAGE (m)
REFUSAL DEPTH RANGE (mm)
GEOLOGY

11800	12000	12200	12400	12600	12800	13000	13200
2800 – 4000+	11900			1600 – 3400			
SANDSTONE	11900			FERRICRETE / GRANITE OR DIABASE?			

REFERENCE DRAWINGS		REVISIONS				DESIGNED:		PROJECT ENGINEER:	P LE ROUX		MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)				
DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:			GEOTECHNICAL PROFILE STAGE 1: TARANTAALPAN TO OPERATIONAL RESERVOIR				
		A	24/02/11	FOR INFORMATION		CHECKED:	J MULDER				PLAN & LONG SECTION				
						CHIEF DESIGNER:	E SERFONTEIN	SCALE:	AS SHOWN			DWAF DRG. No.	DRAWING NUMBER	2E – G7 – 009	REV N A
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						SCALE: 1:5000									



SCALE 1:5000







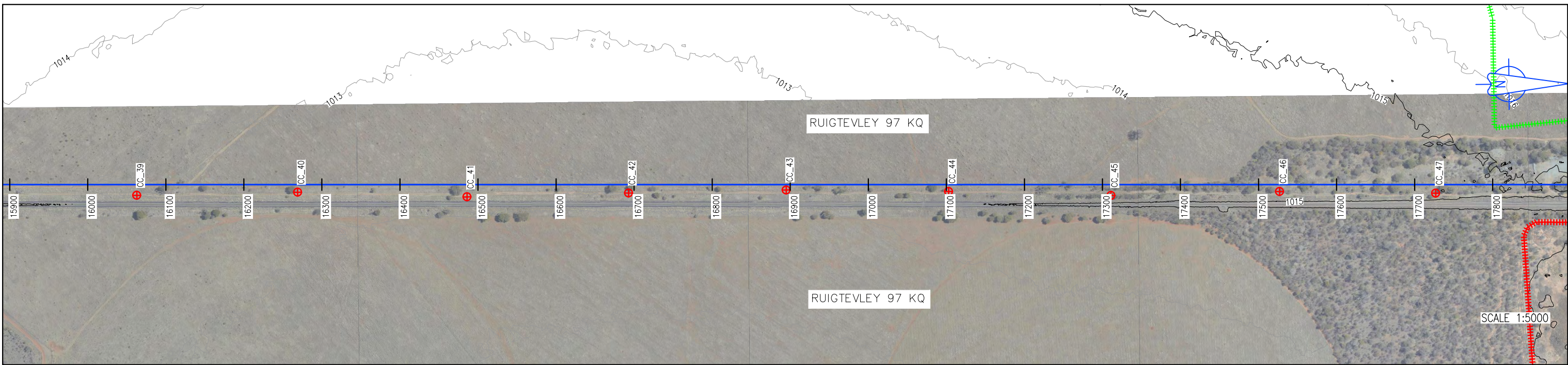
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VERT 1:500

CHAINAGE (m)
REFUSAL DEPTH RANGE (mm)
GEOLOGY

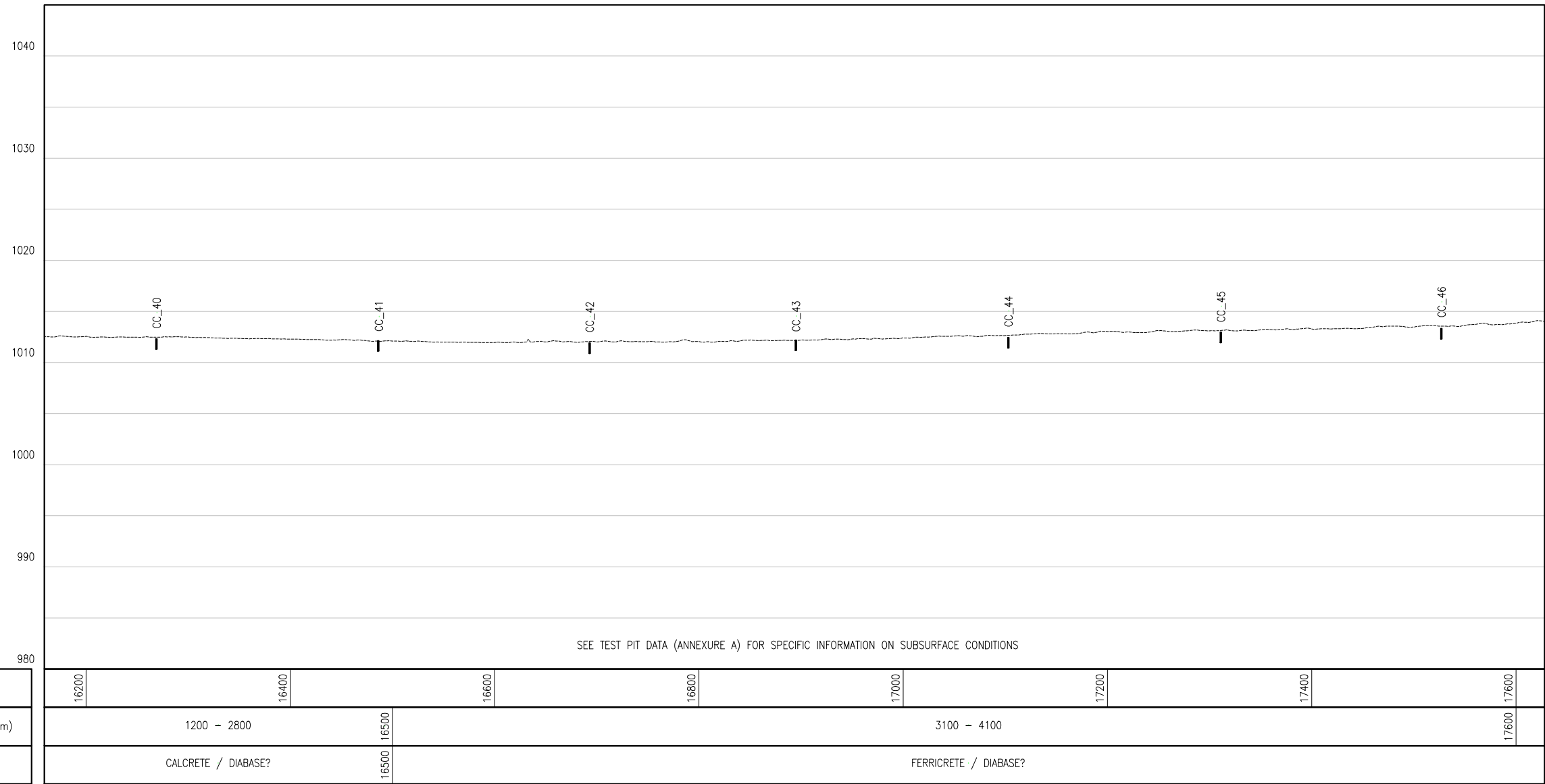
LEGEND:

- CHAINAGE MARKER (PLAN ONLY)
- POINT OF INTERSECTION (PI)
- TEST PIT
- BOREHOLE
- PIPELINE
- OVERHEAD POWERLINE
- FARM BOUNDARY
- FARM PORTION BOUNDARY
- CROSSING - SURFACED ROAD
- CROSSING - GRAVEL ROAD
- CROSSING - PRIVATE DIRT ROAD
- CROSSING - POWERLINE
- AREA OF INTERMITTENT OUTCROP
- AREA OF OUTCROP
- AREA OF IMPEDED DRAINAGE
- POTENTIAL BORROW PIT
- EXISTING BORROW PIT / SPOIL SITE

REFERENCE DRAWINGS		REVISIONS				DESIGNED:		PROJECT ENGINEER:	P LE ROUX		MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)					
DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:				GEOTECHNICAL PROFILE STAGE 1: TARANTAALPAN TO OPERATIONAL RESERVOIR				
		A	24/02/11	FOR INFORMATION		CHECKED:	J MULDER					PLAN & LONG SECTION				
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						SCALE: 1:5000										







SCALE 1:5000

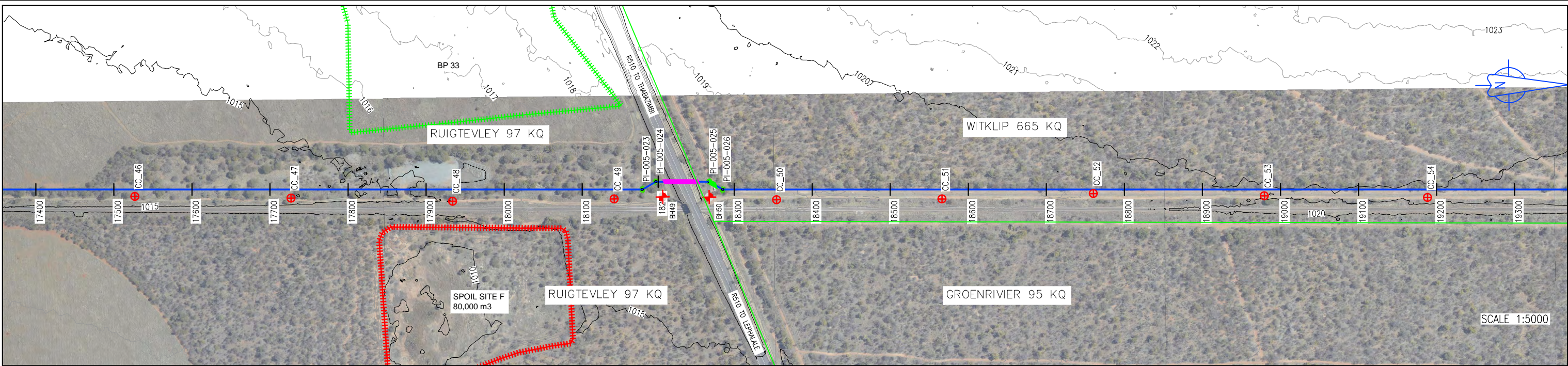


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VERT 1:500

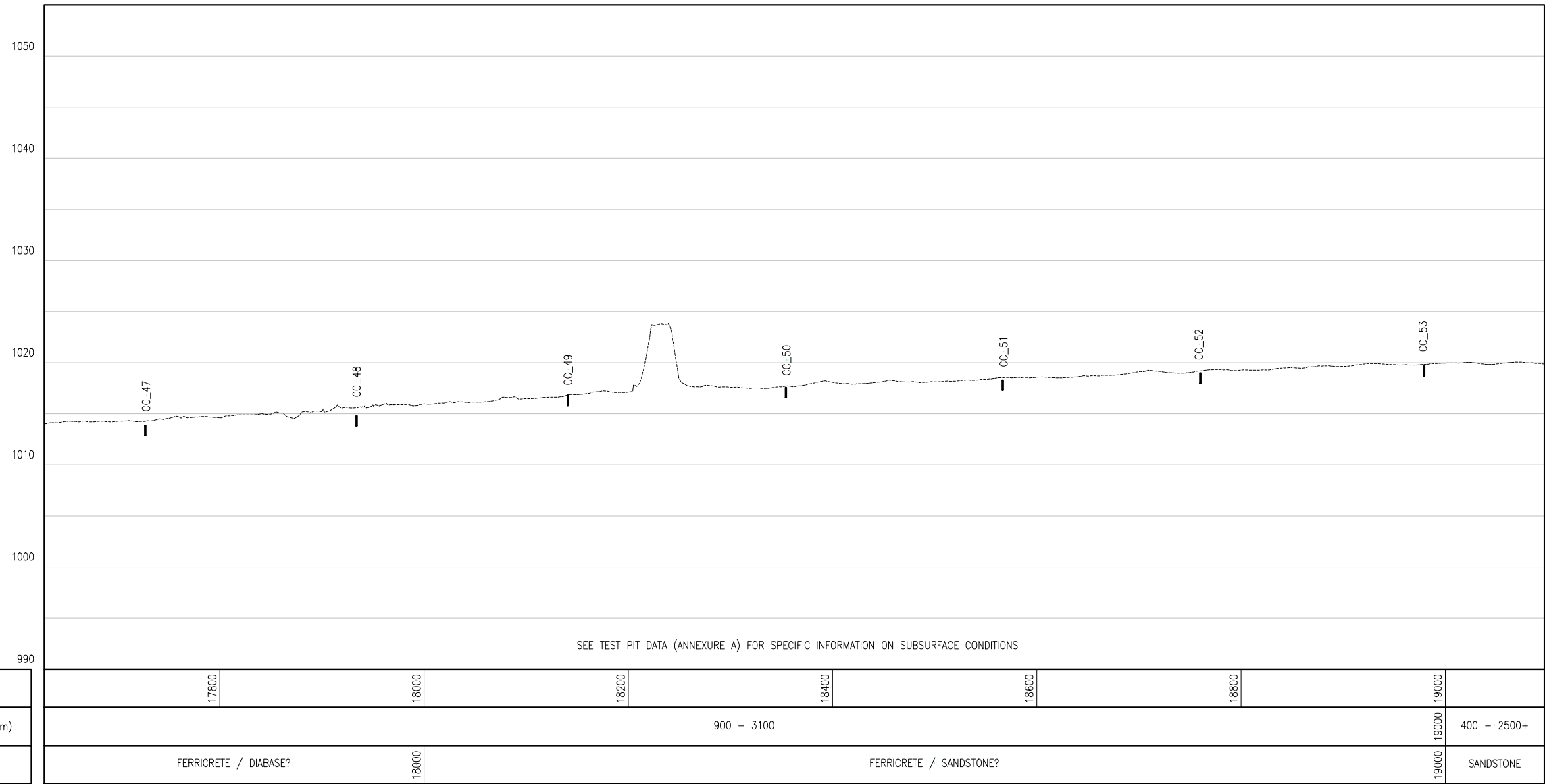
LEGEND:

- CHAINAGE MARKER (PLAN ONLY)
- POINT OF INTERSECTION (PI)
- TEST PIT
- BOREHOLE
- PIPELINE
- OVERHEAD POWERLINE
- FARM BOUNDARY
- FARM PORTION BOUNDARY
- CROSSING - SURFACED ROAD
- CROSSING - GRAVEL ROAD
- CROSSING - PRIVATE DIRT ROAD
- CROSSING - POWERLINE
- AREA OF INTERMITTENT OUTCROP
- AREA OF OUTCROP
- AREA OF IMPEDED DRAINAGE
- POTENTIAL BORROW PIT
- EXISTING BORROW PIT / SPOIL SITE

REFERENCE DRAWINGS		REVISIONS				DESIGNED:		PROJECT ENGINEER:	P LE ROUX		MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)				
DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:			GEOTECHNICAL PROFILE STAGE 1: TARANTAALPAN TO OPERATIONAL RESERVOIR				
		A	24/02/11	FOR INFORMATION		CHECKED:	J MULDER				PLAN & LONG SECTION				
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SCALE 1:5000







SCALE HOR 1:5000
VERT 1:500

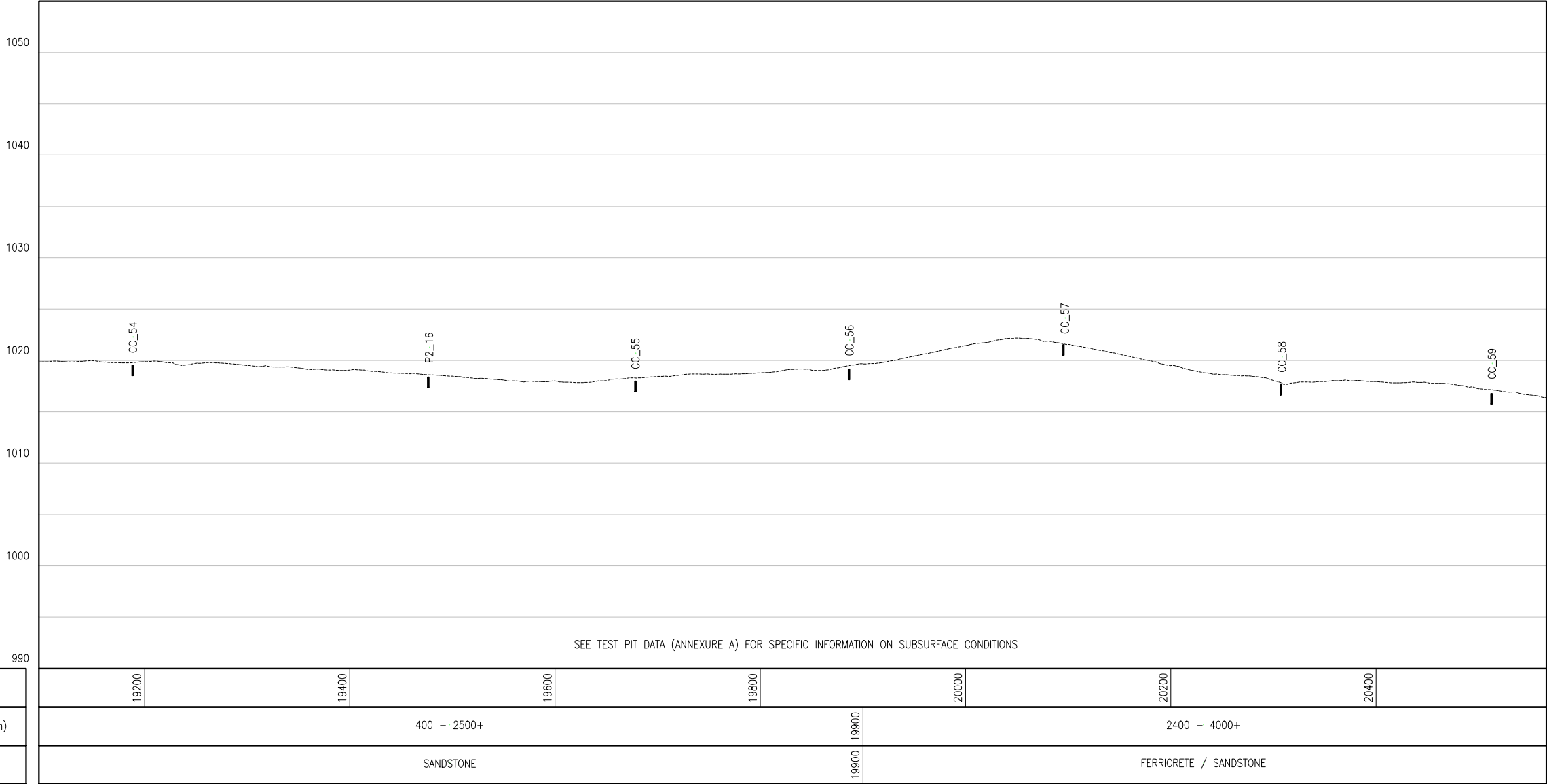
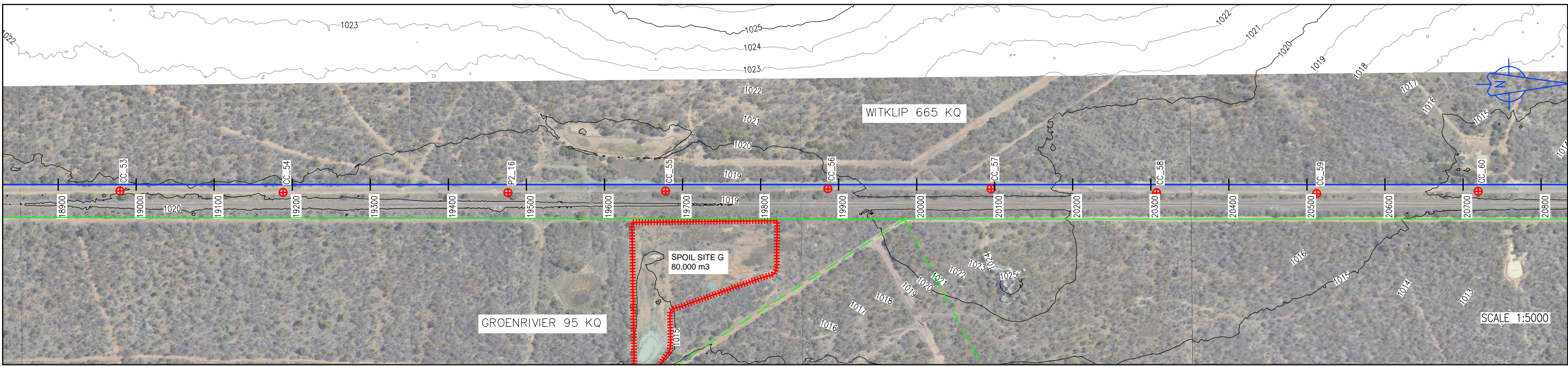
CHAINAGE (m)
REFUSAL DEPTH RANGE (mm)
GEOLOGY

17800	18000	18200	18400	18600	18800	19000
900 - 3100						400 - 2500+
FERRICRETE / DIABASE?						SANDSTONE

LEGEND:

- CHAINAGE MARKER (PLAN ONLY)
- POINT OF INTERSECTION (PI)
- TEST PIT
- BOREHOLE
- PIPELINE
- OVERHEAD POWERLINE
- FARM BOUNDARY
- FARM PORTION BOUNDARY
- CROSSING - SURFACED ROAD
- CROSSING - GRAVEL ROAD
- CROSSING - PRIVATE DIRT ROAD
- CROSSING - POWERLINE
- AREA OF INTERMITTENT OUTCROP
- AREA OF OUTCROP
- AREA OF IMPEDED DRAINAGE
- POTENTIAL BORROW PIT
- EXISTING BORROW PIT / SPOIL SITE

REFERENCE DRAWINGS		REVISIONS				DESIGNED:		PROJECT ENGINEER:	P LE ROUX		MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)				
DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:			GEOTECHNICAL PROFILE STAGE 1: TARANTAALPAN TO OPERATIONAL RESERVOIR				
		A	24/02/11	FOR INFORMATION		CHECKED:	J MULDER				PLAN & LONG SECTION				
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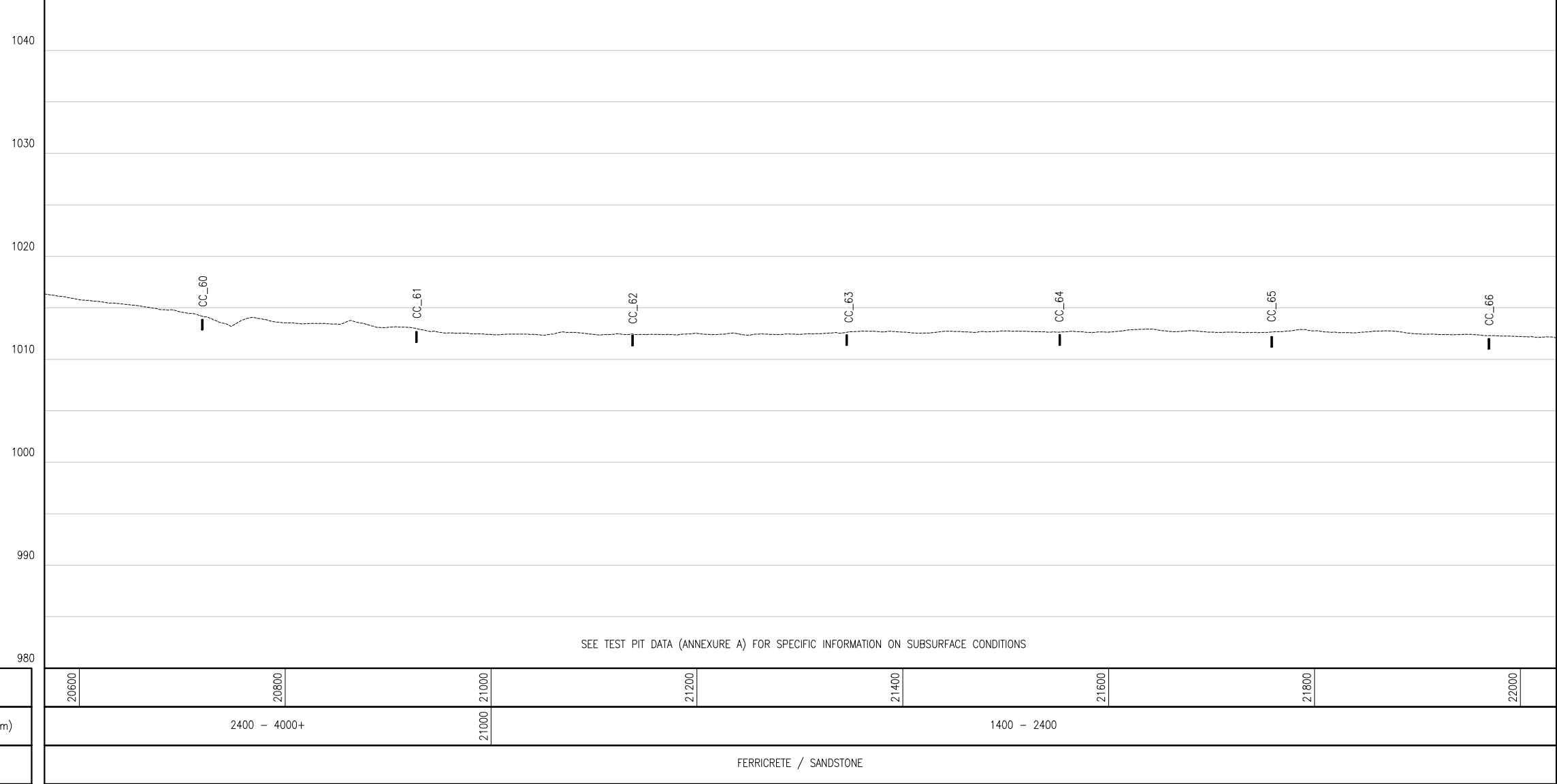
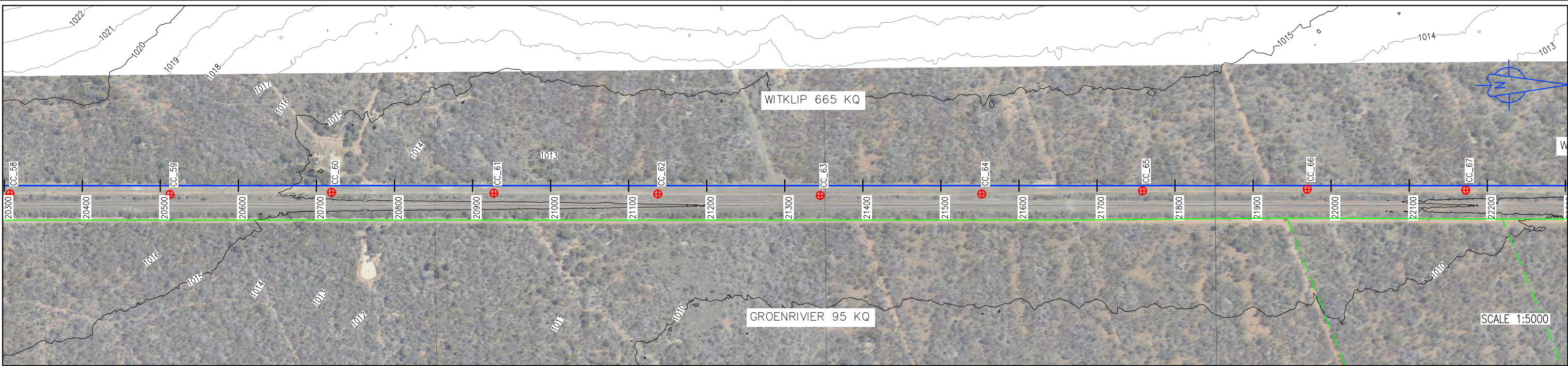
LEGEND:

- CHAINAGE MARKER (PLAN ONLY)
- POINT OF INTERSECTION (PI)
- TEST PIT
- BOREHOLE
- PIPELINE
- OVERHEAD POWERLINE
- FARM BOUNDARY
- FARM PORTION BOUNDARY
- CROSSING – SURFACED ROAD
- CROSSING – GRAVEL ROAD
- CROSSING – PRIVATE DIRT ROAD
- CROSSING – POWERLINE
- AREA OF INTERMITTENT OUTCROP
- AREA OF OUTCROP
- AREA OF IMPEDED DRAINAGE
- POTENTIAL BORROW PIT
- EXISTING BORROW PIT / SPOIL SITE

CHAINAGE (m)
REFUSAL DEPTH RANGE (mm)
GEOLOGY

19200	19400	19600	19800	20000	20200	20400
400 – 2500+				19900	2400 – 4000+	
SANDSTONE				19900	FERRICRETE / SANDSTONE	

REFERENCE DRAWINGS			REVISIONS			DESIGNED:		PROJECT ENGINEER:	P LE ROUX	 	MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)						
DRG. No.	TITLE		REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:		GEOTECHNICAL PROFILE STAGE 1: TARANTAALPAN TO OPERATIONAL RESERVOIR						
			A	24/02/11	FOR INFORMATION		CHECKED:	J MULDER			PLAN & LONG SECTION						
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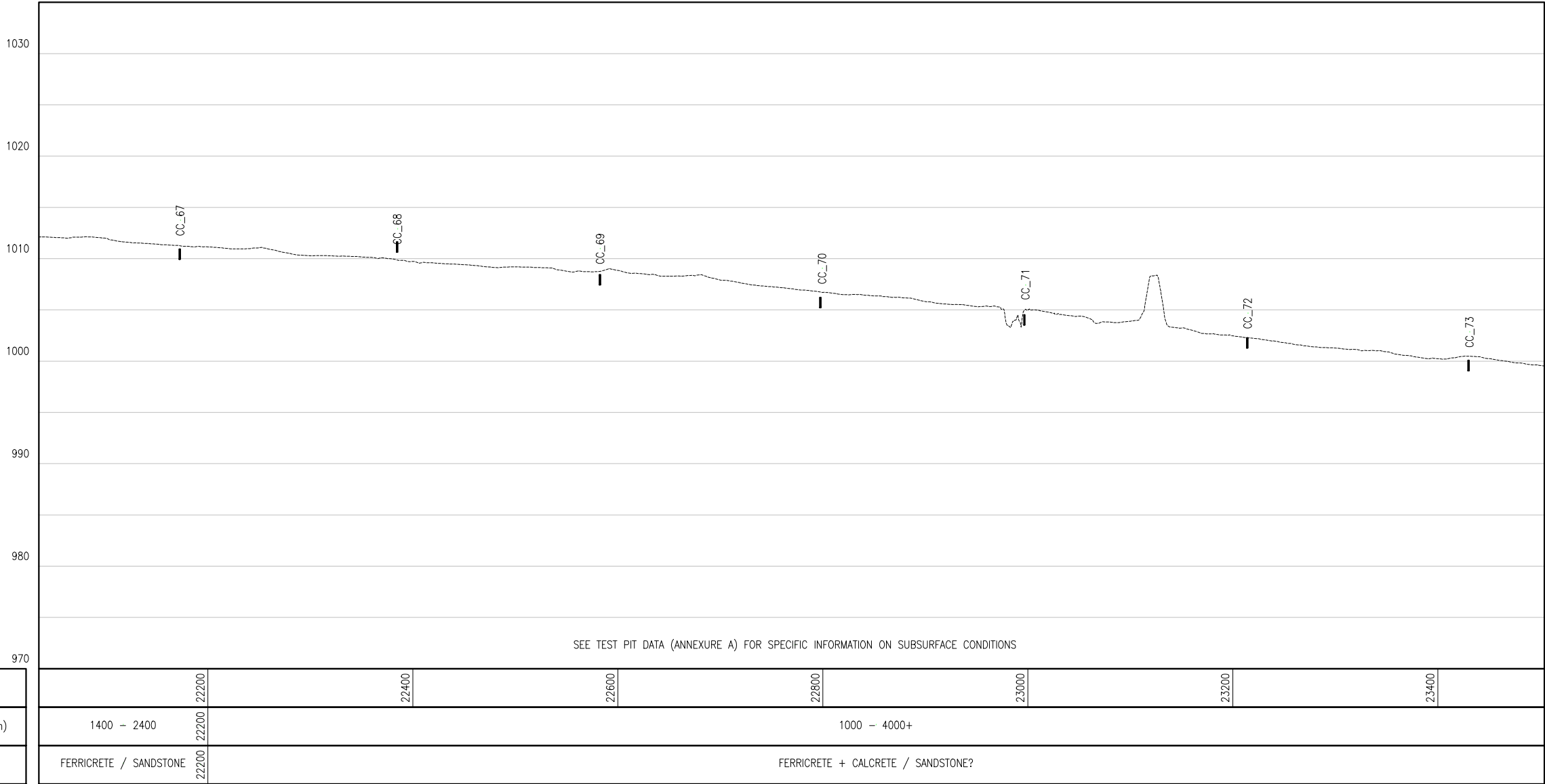
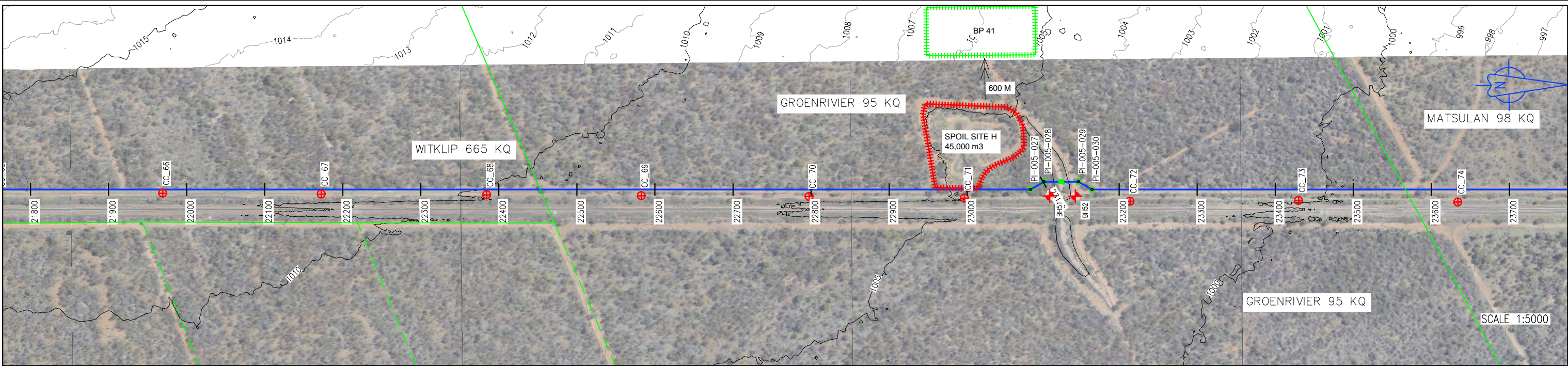
LEGEND:

- CHAINAGE MARKER (PLAN ONLY)
- POINT OF INTERSECTION (PI)
- TEST PIT
- BOREHOLE
- PIPELINE
- OVERHEAD POWERLINE
- FARM BOUNDARY
- FARM PORTION BOUNDARY
- CROSSING – SURFACED ROAD
- CROSSING – GRAVEL ROAD
- CROSSING – PRIVATE DIRT ROAD
- CROSSING – POWERLINE
- AREA OF INTERMITTENT OUTCROP
- AREA OF OUTCROP
- AREA OF IMPEDED DRAINAGE
- POTENTIAL BORROW PIT
- EXISTING BORROW PIT / SPOIL SITE

CHAINAGE (m)
REFUSAL DEPTH RANGE (mm)
GEOLOGY

20600		20800		21000		21200		21400		21600		21800		22000	
2400 – 4000+			21000	1400 – 2400											
FERRICRETE / SANDSTONE															

REFERENCE DRAWINGS			REVISIONS			DESIGNED:		PROJECT ENGINEER:	P LE ROUX	 	MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)					
DRG. No.	TITLE		REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:		GEOTECHNICAL PROFILE STAGE 1: TARANTAALPAN TO OPERATIONAL RESERVOIR					
			A	24/02/11	FOR INFORMATION		CHECKED:	J MULDER			PLAN & LONG SECTION					
							CHIEF DESIGNER:	E SERFONTEIN	SCALE:	AS SHOWN						
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							SCALE: 1:5000									
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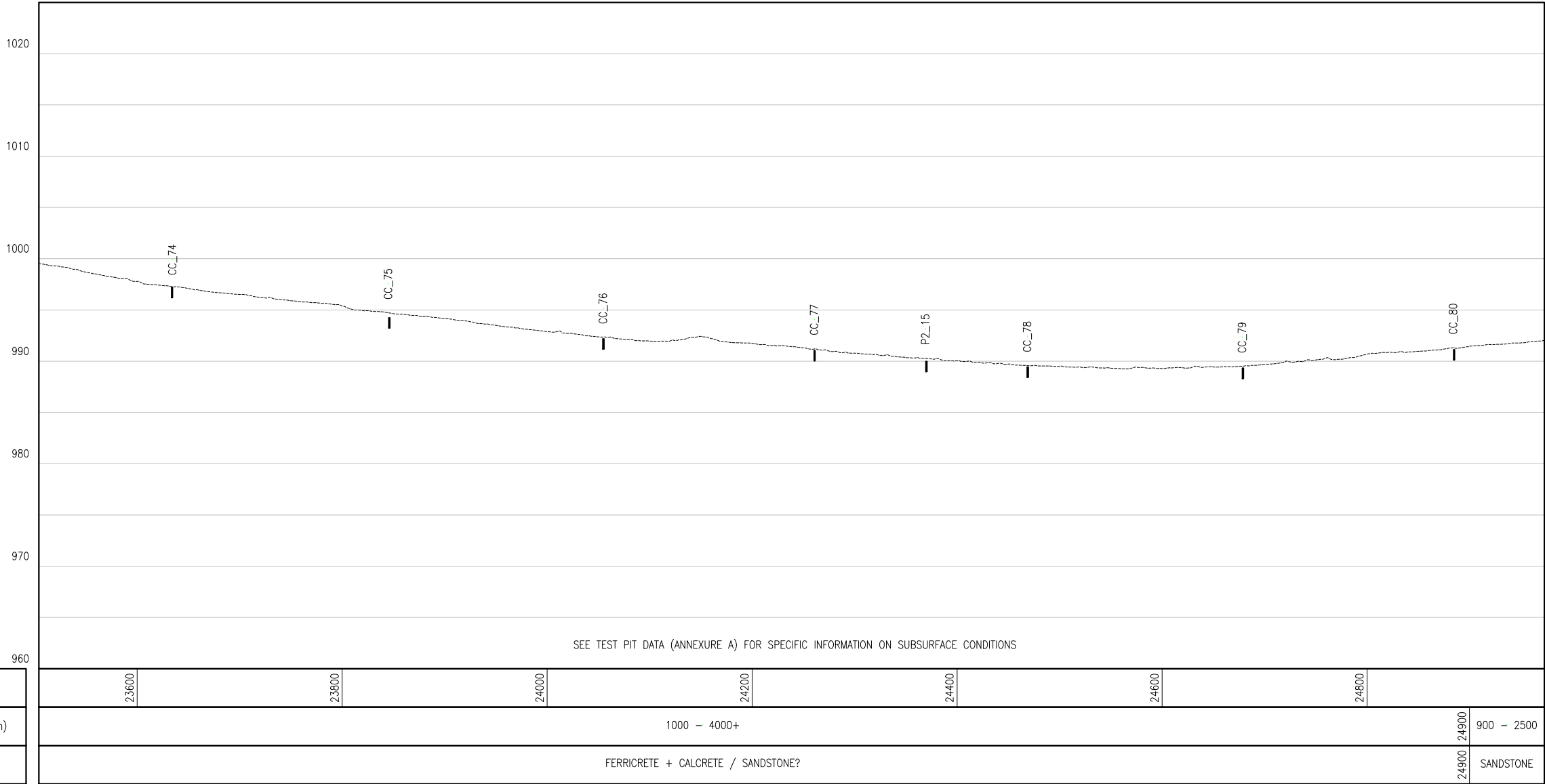
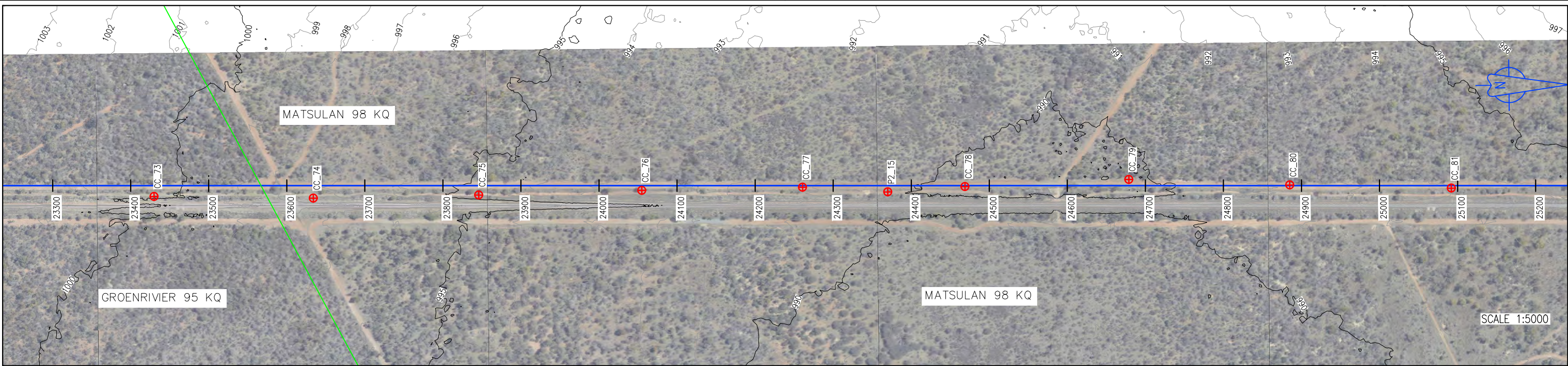
LEGEND:

- CHAINAGE MARKER (PLAN ONLY)
- POINT OF INTERSECTION (PI)
- TEST PIT
- BOREHOLE
- PIPELINE
- OVERHEAD POWERLINE
- FARM BOUNDARY
- FARM PORTION BOUNDARY
- CROSSING - SURFACED ROAD
- CROSSING - GRAVEL ROAD
- CROSSING - PRIVATE DIRT ROAD
- CROSSING - POWERLINE
- AREA OF INTERMITTENT OUTCROP
- AREA OF OUTCROP
- AREA OF IMPEDED DRAINAGE
- POTENTIAL BORROW PIT
- EXISTING BORROW PIT / SPOIL SITE

CHAINAGE (m)
REFUSAL DEPTH RANGE (mm)
GEOLOGY

	22200	22400	22600	22800	23000	23200	23400
1400 - 2400	22200						
FERRICRETE / SANDSTONE	22200						

REFERENCE DRAWINGS				REVISIONS			DESIGNED:		PROJECT ENGINEER:	P LE ROUX		MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP) GEOTECHNICAL PROFILE STAGE 1: TARANTAALPAN TO OPERATIONAL RESERVOIR PLAN & LONG SECTION					
DRG. No.	TITLE			REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:							
				A	24/02/11	FOR INFORMATION		CHECKED:	J MULDER								
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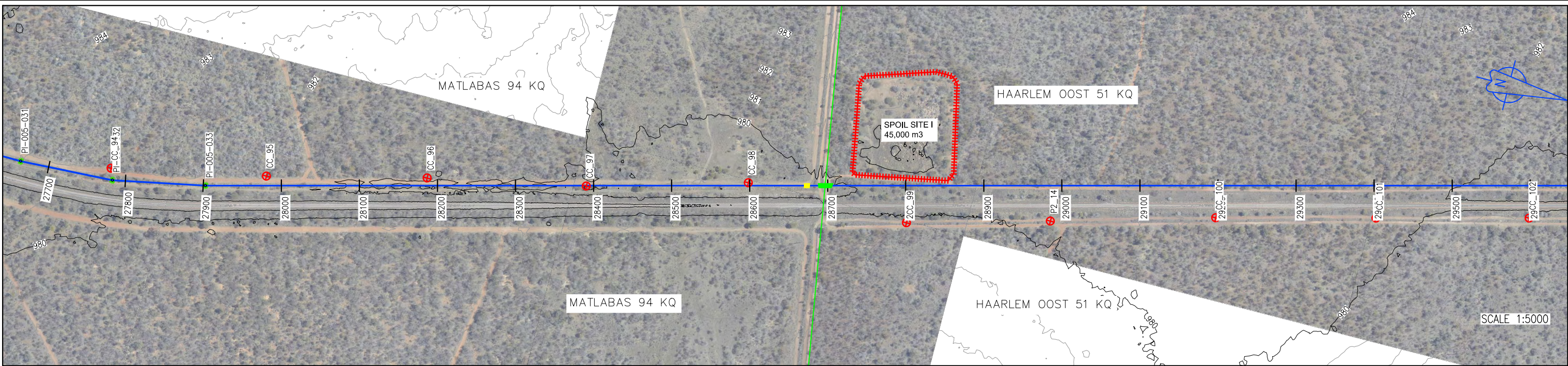


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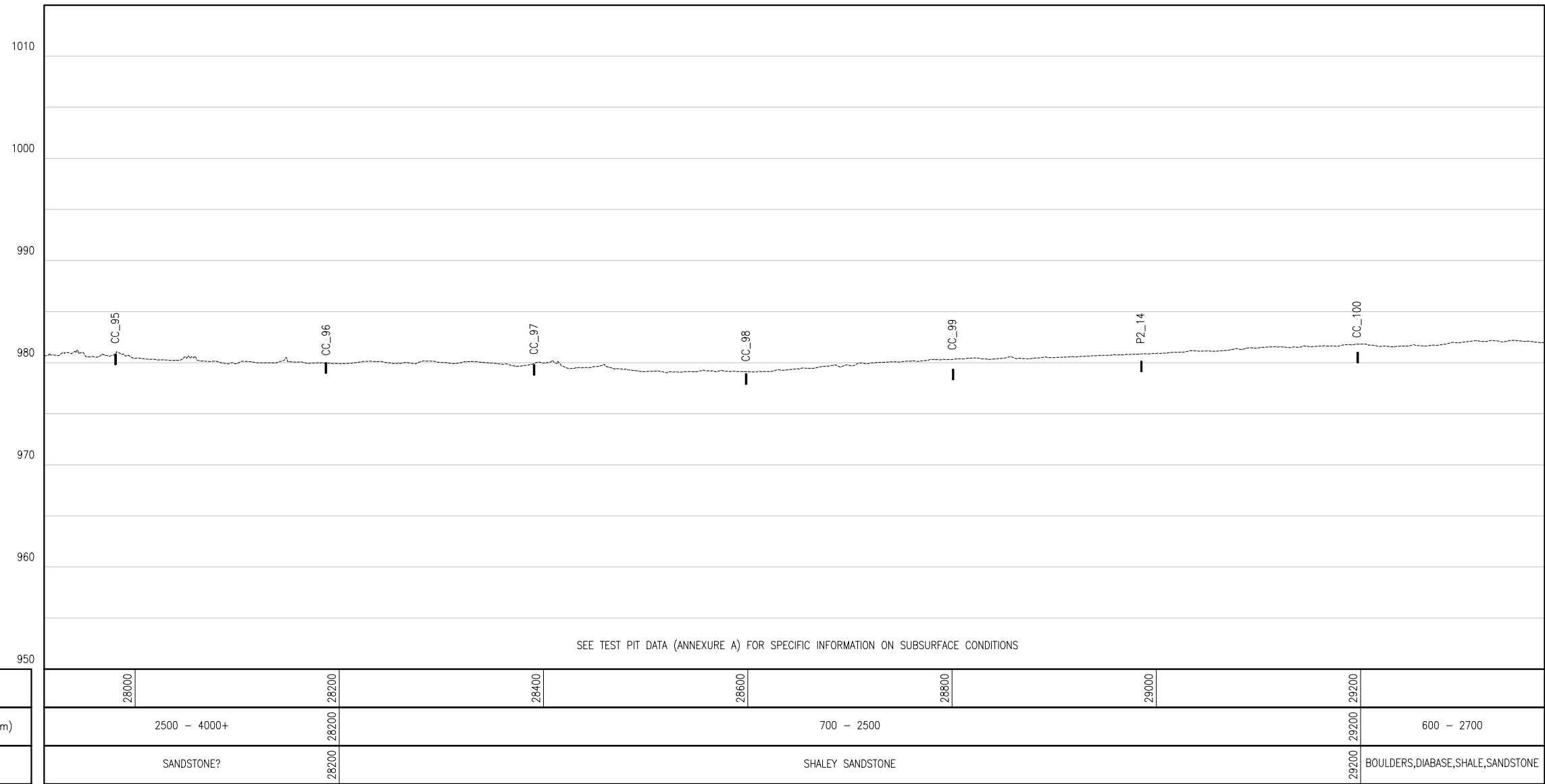
- CHAINAGE MARKER (PLAN ONLY)
- POINT OF INTERSECTION (PI)
- TEST PIT
- BOREHOLE
- PIPELINE
- OVERHEAD POWERLINE
- FARM BOUNDARY
- FARM PORTION BOUNDARY
- CROSSING – SURFACED ROAD
- CROSSING – GRAVEL ROAD
- CROSSING – PRIVATE DIRT ROAD
- CROSSING – POWERLINE
- AREA OF INTERMITTENT OUTCROP
- AREA OF OUTCROP
- AREA OF IMPEDED DRAINAGE
- POTENTIAL BORROW PIT
- EXISTING BORROW PIT / SPOIL SITE

CHAINAGE (m)
REFUSAL DEPTH RANGE (mm)
GEOLOGY

REFERENCE DRAWINGS				REVISIONS			DESIGNED:		PROJECT ENGINEER:	P LE ROUX		MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP) GEOTECHNICAL PROFILE STAGE 1: TARANTAALPAN TO OPERATIONAL RESERVOIR PLAN & LONG SECTION				
DRG. No.	TITLE			REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:						
				A	24/02/11	FOR INFORMATION		CHECKED:	J MULDER							
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								SCALE: 1:500 SCALE: 1:5000								
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SCALE 1:5000



SCALE HOR 1:5000
VERT 1:500





SEE TEST PIT DATA (ANNEXURE A) FOR SPECIFIC INFORMATION ON SUBSURFACE CONDITIONS

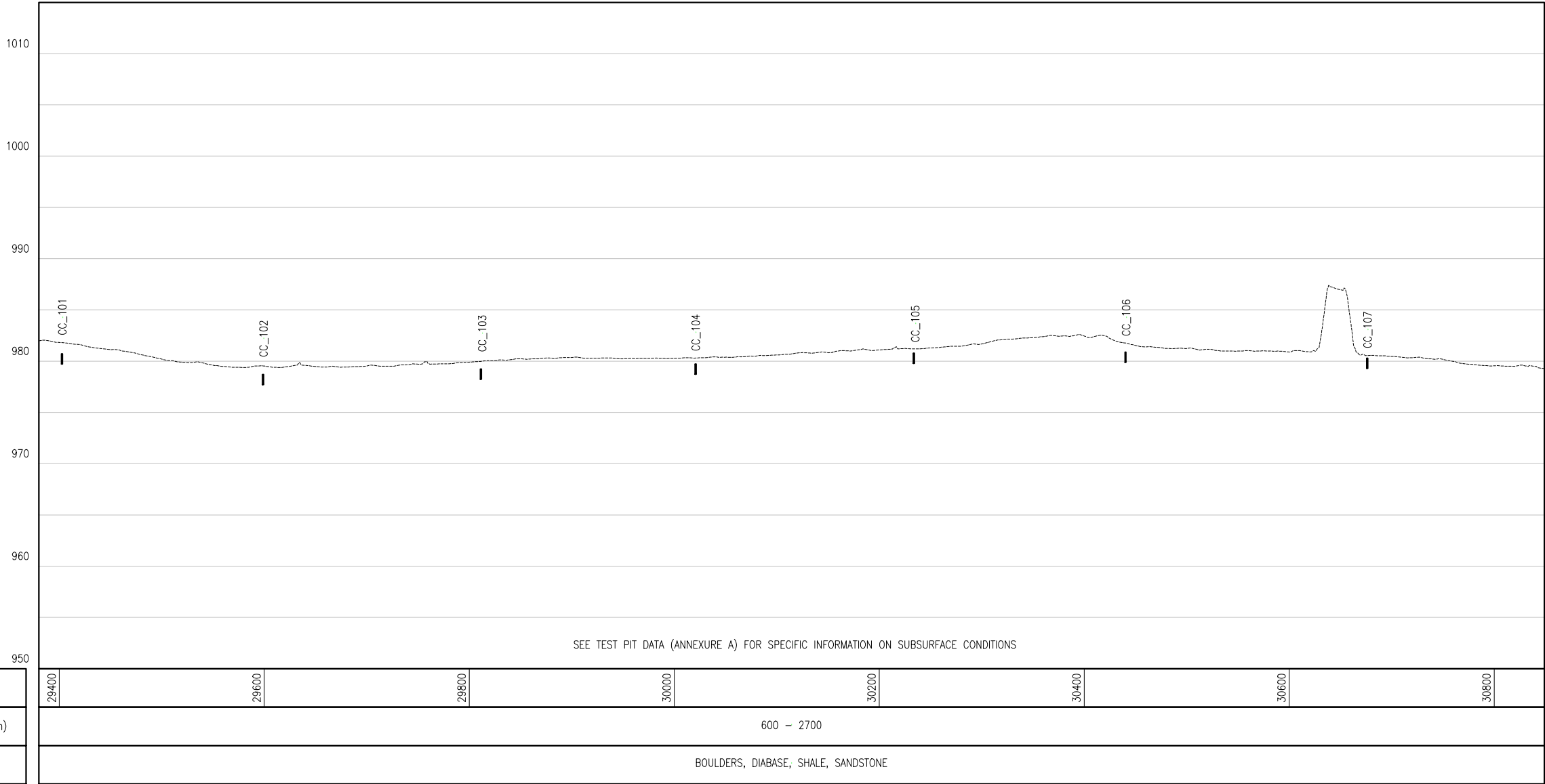
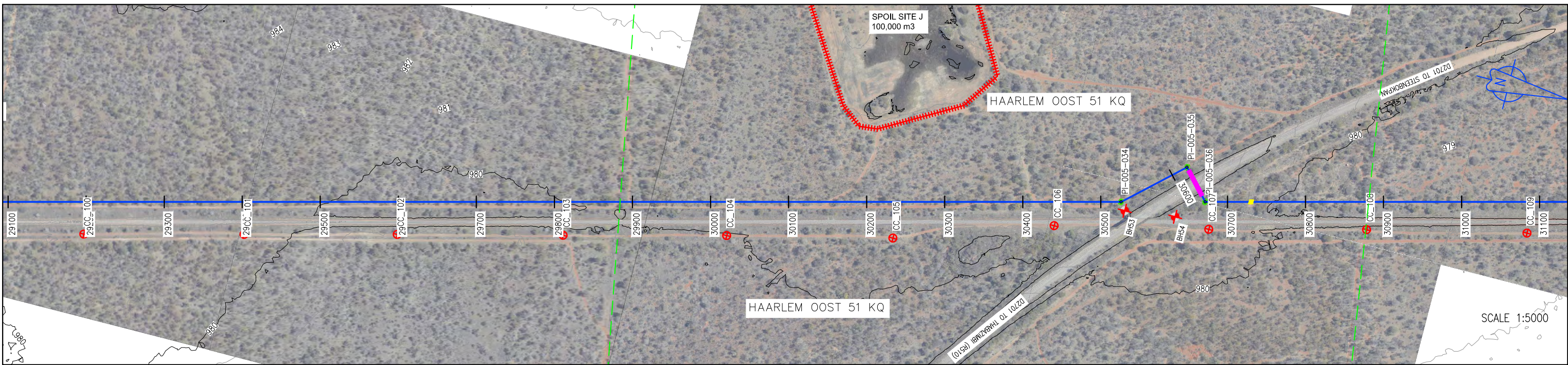
CHAINAGE (m)
REFUSAL DEPTH RANGE (mm)
GEOLOGY

28000	28200	28400	28600	28800	29000	29200	29400
2500 - 4000+		28200	700 - 2500			29200	600 - 2700
SANDSTONE?		28200	SHALEY SANDSTONE			29200	BOULDERS, DIABASE, SHALE, SANDSTONE

LEGEND:

- CHAINAGE MARKER (PLAN ONLY)
- POINT OF INTERSECTION (PI)
- TEST PIT
- BOREHOLE
- PIPELINE
- OVERHEAD POWERLINE
- FARM BOUNDARY
- FARM PORTION BOUNDARY
- CROSSING - SURFACED ROAD
- CROSSING - GRAVEL ROAD
- CROSSING - PRIVATE DIRT ROAD
- CROSSING - POWERLINE
- AREA OF INTERMITTENT OUTCROP
- AREA OF OUTCROP
- AREA OF IMPEDED DRAINAGE
- POTENTIAL BORROW PIT
- EXISTING BORROW PIT / SPOIL SITE

REFERENCE DRAWINGS		REVISIONS				DESIGNED:		PROJECT ENGINEER:	P LE ROUX		MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)				
DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:			GEOTECHNICAL PROFILE STAGE 1: TARANTAALPAN TO OPERATIONAL RESERVOIR				
		A	24/02/11	FOR INFORMATION		CHECKED:	J MULDER				PLAN & LONG SECTION				
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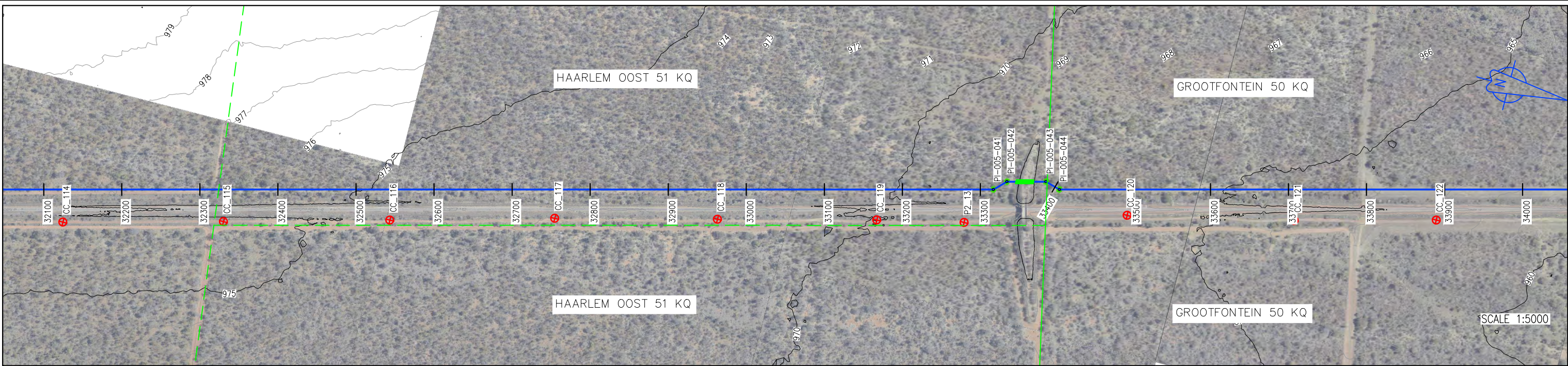
LEGEND:

- CHAINAGE MARKER (PLAN ONLY)
- POINT OF INTERSECTION (PI)
- TEST PIT
- BOREHOLE
- PIPELINE
- OVERHEAD POWERLINE
- FARM BOUNDARY
- FARM PORTION BOUNDARY
- CROSSING – SURFACED ROAD
- CROSSING – GRAVEL ROAD
- CROSSING – PRIVATE DIRT ROAD
- CROSSING – POWERLINE
- AREA OF INTERMITTENT OUTCROP
- AREA OF OUTCROP
- AREA OF IMPEDED DRAINAGE
- POTENTIAL BORROW PIT
- EXISTING BORROW PIT / SPOIL SITE

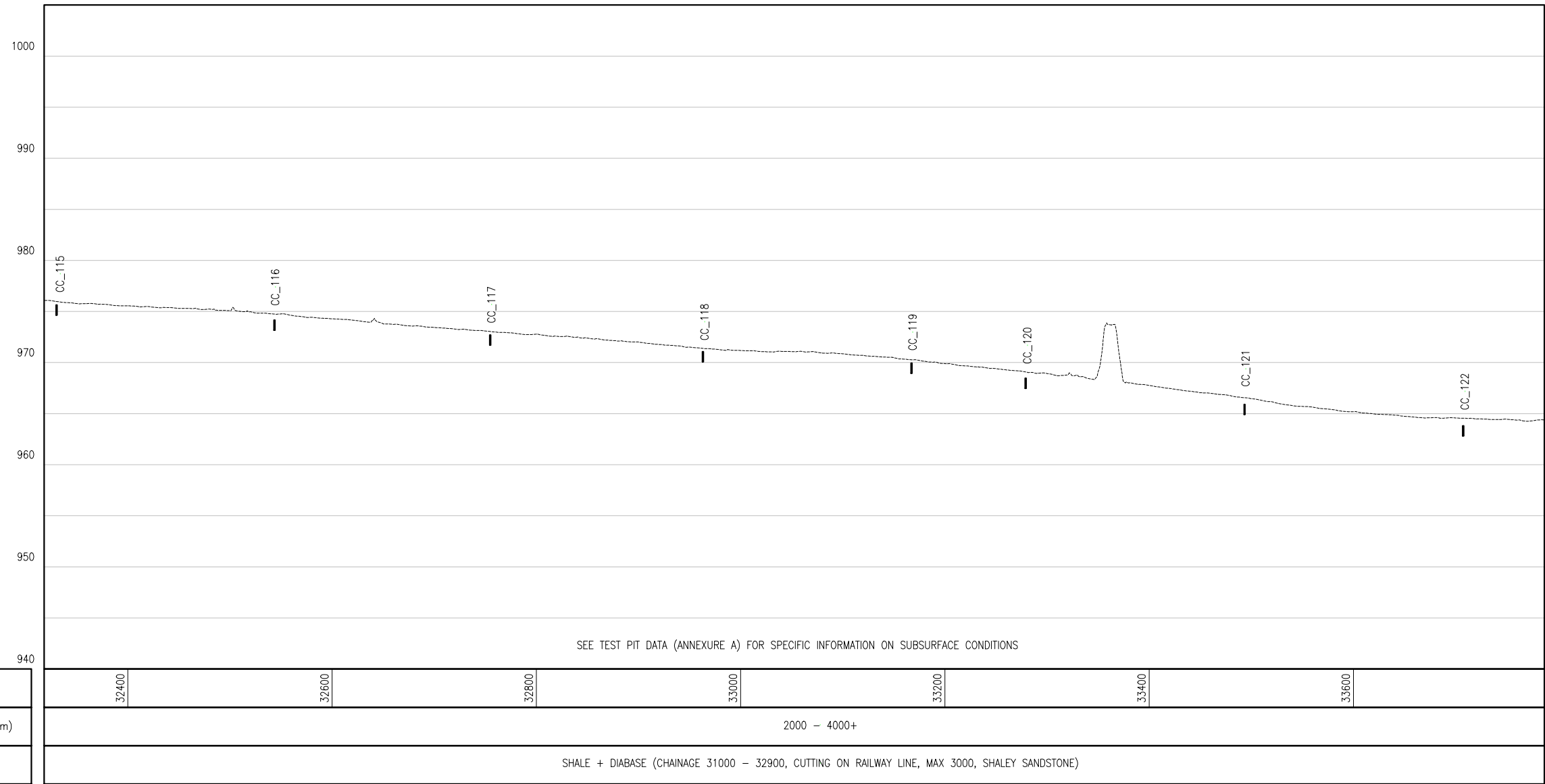
CHAINAGE (m)
REFUSAL DEPTH RANGE (mm)
GEOLOGY

29400	29600	29800	30000	30200	30400	30600	30800
600 – 2700							
BOULDERS, DIABASE, SHALE, SANDSTONE							

REFERENCE DRAWINGS		REVISIONS				DESIGNED:		PROJECT ENGINEER:	P LE ROUX		MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)				
DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:				GEOTECHNICAL PROFILE STAGE 1: TARANTAALPAN TO OPERATIONAL RESERVOIR			
		A	24/02/11	FOR INFORMATION		CHECKED:	J MULDER					PLAN & LONG SECTION			
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SCALE 1:5000





SCALE HOR 1:5000
VERT 1:500

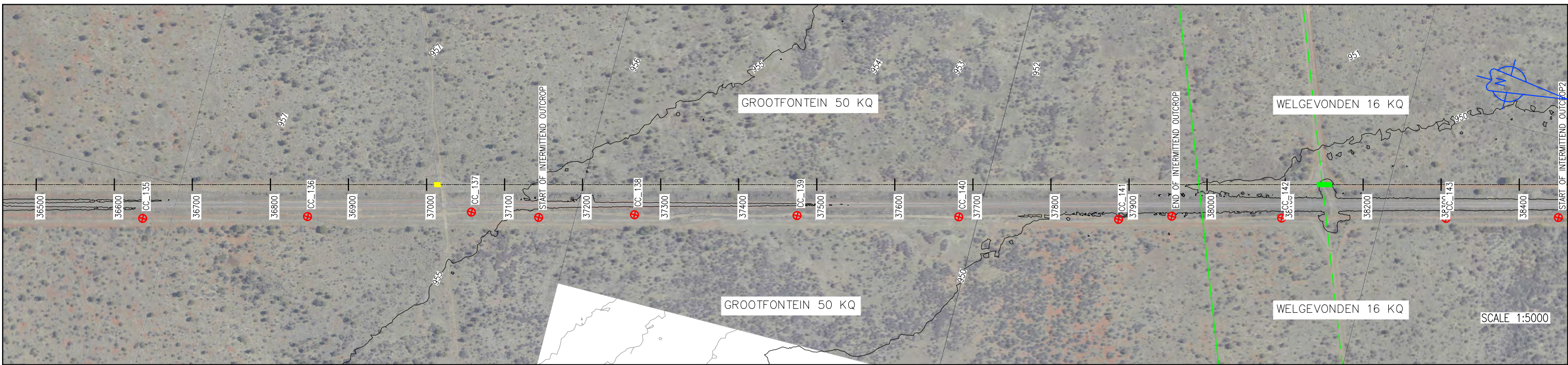
CHAINAGE (m)
REFUSAL DEPTH RANGE (mm)
GEOLOGY

32400	32600	32800	33000	33200	33400	33600
2000 - 4000+						
SHALE + DIABASE (CHAINAGE 31000 - 32900, CUTTING ON RAILWAY LINE, MAX 3000, SHALEY SANDSTONE)						

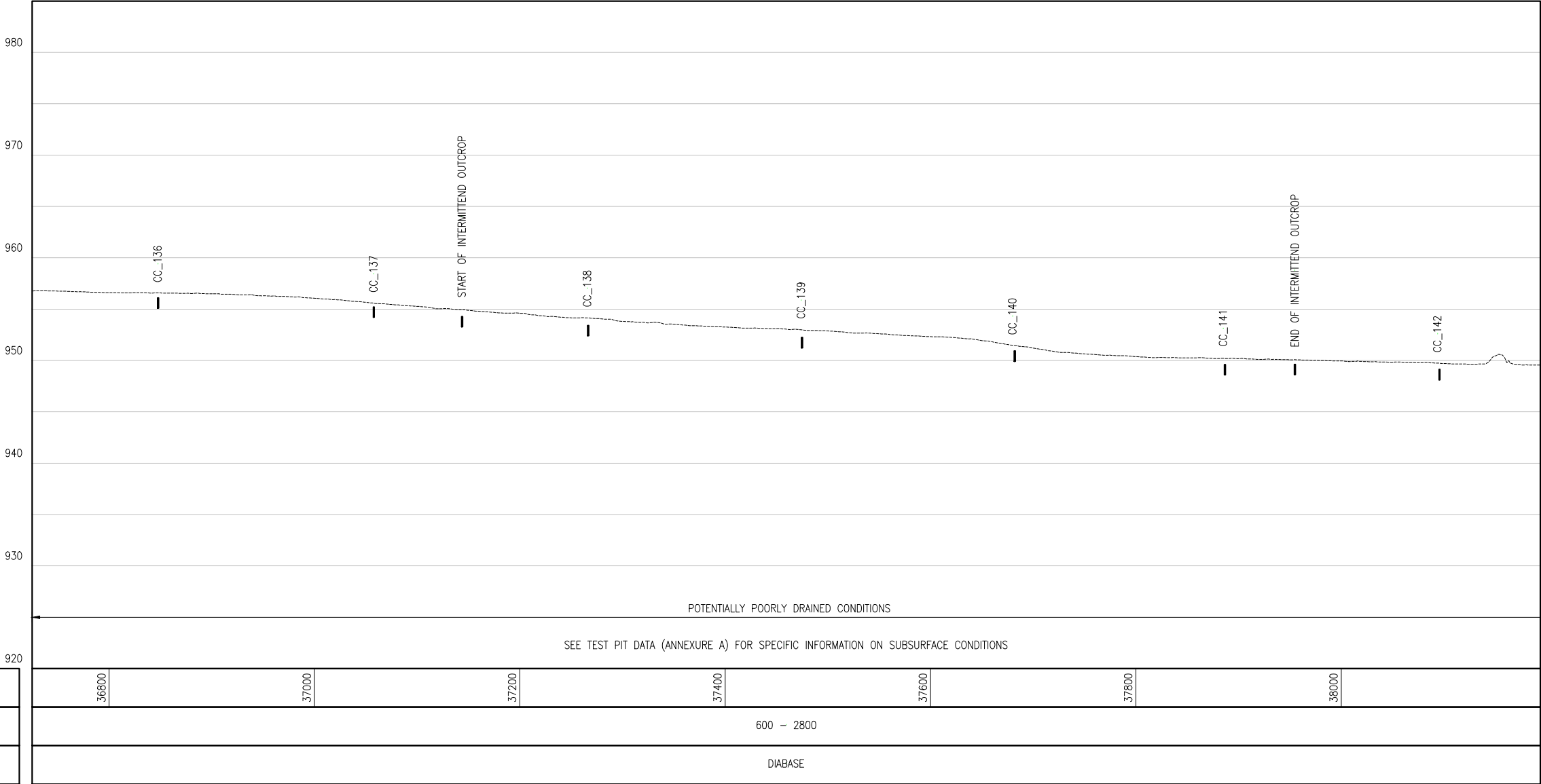
LEGEND:

- CHAINAGE MARKER (PLAN ONLY)
- POINT OF INTERSECTION (PI)
- TEST PIT
- BOREHOLE
- PIPELINE
- OVERHEAD POWERLINE
- FARM BOUNDARY
- FARM PORTION BOUNDARY
- CROSSING - SURFACED ROAD
- CROSSING - GRAVEL ROAD
- CROSSING - PRIVATE DIRT ROAD
- CROSSING - POWERLINE
- AREA OF INTERMITTENT OUTCROP
- AREA OF OUTCROP
- AREA OF IMPEDED DRAINAGE
- POTENTIAL BORROW PIT
- EXISTING BORROW PIT / SPOIL SITE

REFERENCE DRAWINGS		REVISIONS				DESIGNED:		PROJECT ENGINEER:	P LE ROUX		MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)				
DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:				GEOTECHNICAL PROFILE STAGE 1: TARANTAALPAN TO OPERATIONAL RESERVOIR			
		A	24/02/11	FOR INFORMATION		CHECKED:	J MULDER					PLAN & LONG SECTION			
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SCALE 1:5000







SCALE HOR 1:5000
VERT 1:500

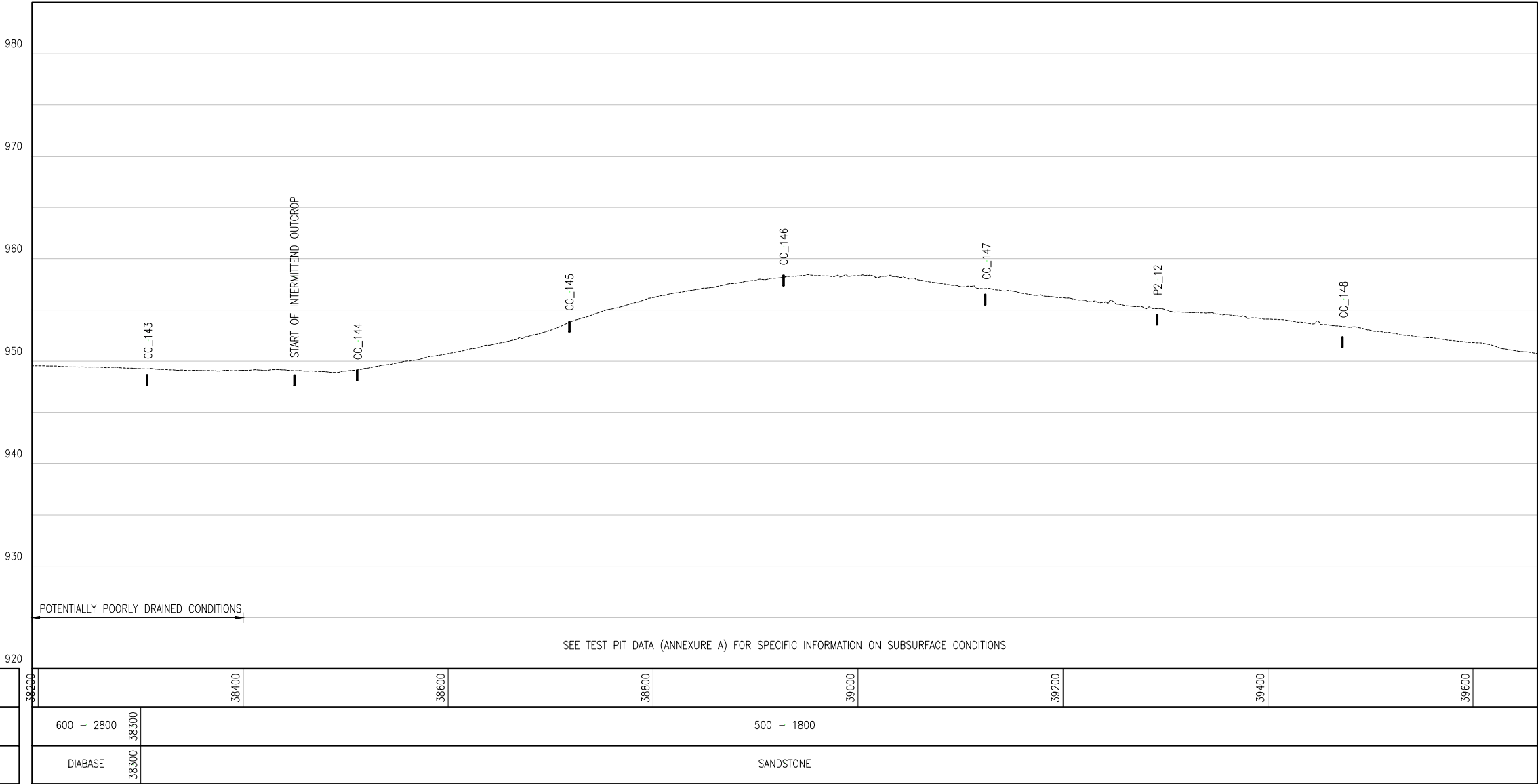
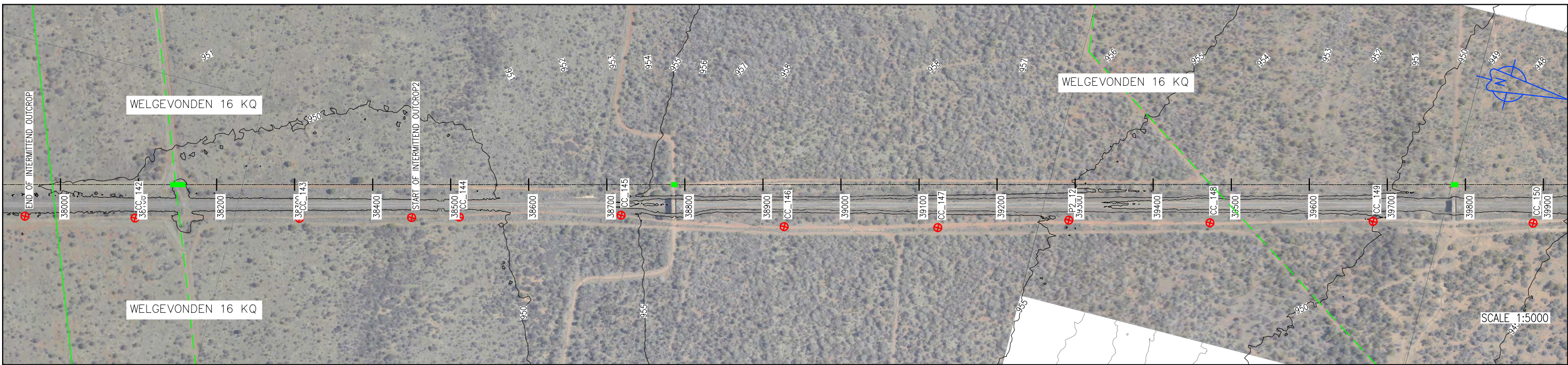
CHAINAGE (m)
REFUSAL DEPTH RANGE (mm)
GEOLOGY

36800	37000	37200	37400	37600	37800	38000
600 – 2800						
DIABASE						

LEGEND:

- CHAINAGE MARKER (PLAN ONLY)
- POINT OF INTERSECTION (PI)
- TEST PIT
- BOREHOLE
- PIPELINE
- OVERHEAD POWERLINE
- FARM BOUNDARY
- FARM PORTION BOUNDARY
- CROSSING – SURFACED ROAD
- CROSSING – GRAVEL ROAD
- CROSSING – PRIVATE DIRT ROAD
- CROSSING – POWERLINE
- AREA OF INTERMITTENT OUTCROP
- AREA OF OUTCROP
- AREA OF IMPEDED DRAINAGE
- POTENTIAL BORROW PIT
- EXISTING BORROW PIT / SPOIL SITE

REFERENCE DRAWINGS		REVISIONS				DESIGNED:		PROJECT ENGINEER:	P LE ROUX		MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)				
DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:			GEOTECHNICAL PROFILE STAGE 1: TARANTAALPAN TO OPERATIONAL RESERVOIR				
		A	24/02/11	FOR INFORMATION		CHECKED:	J MULDER				PLAN & LONG SECTION				
						CHIEF DESIGNER:	E SERFONTEIN	SCALE:	AS SHOWN						
						SCALE: 1:500									
						SCALE: 1:5000									
															
											A3	DWAF DRG. No.	DRAWING NUMBER	2E – G7 – 026	REV N A



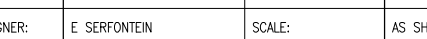


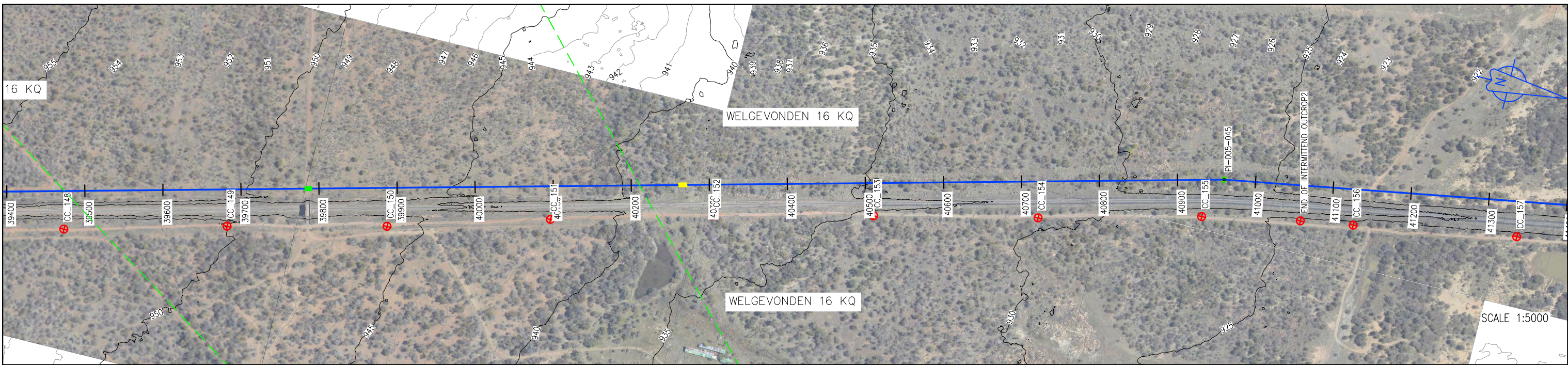
LEGEND:

- CHAINAGE MARKER (PLAN ONLY)
- POINT OF INTERSECTION (PI)
- TEST PIT
- BOREHOLE
- PIPELINE
- OVERHEAD POWERLINE
- FARM BOUNDARY
- FARM PORTION BOUNDARY
- CROSSING – SURFACED ROAD
- CROSSING – GRAVEL ROAD
- CROSSING – PRIVATE DIRT ROAD
- CROSSING – POWERLINE
- AREA OF INTERMITTENT OUTCROP
- AREA OF OUTCROP
- AREA OF IMPEDED DRAINAGE
- POTENTIAL BORROW PIT
- EXISTING BORROW PIT / SPOIL SITE

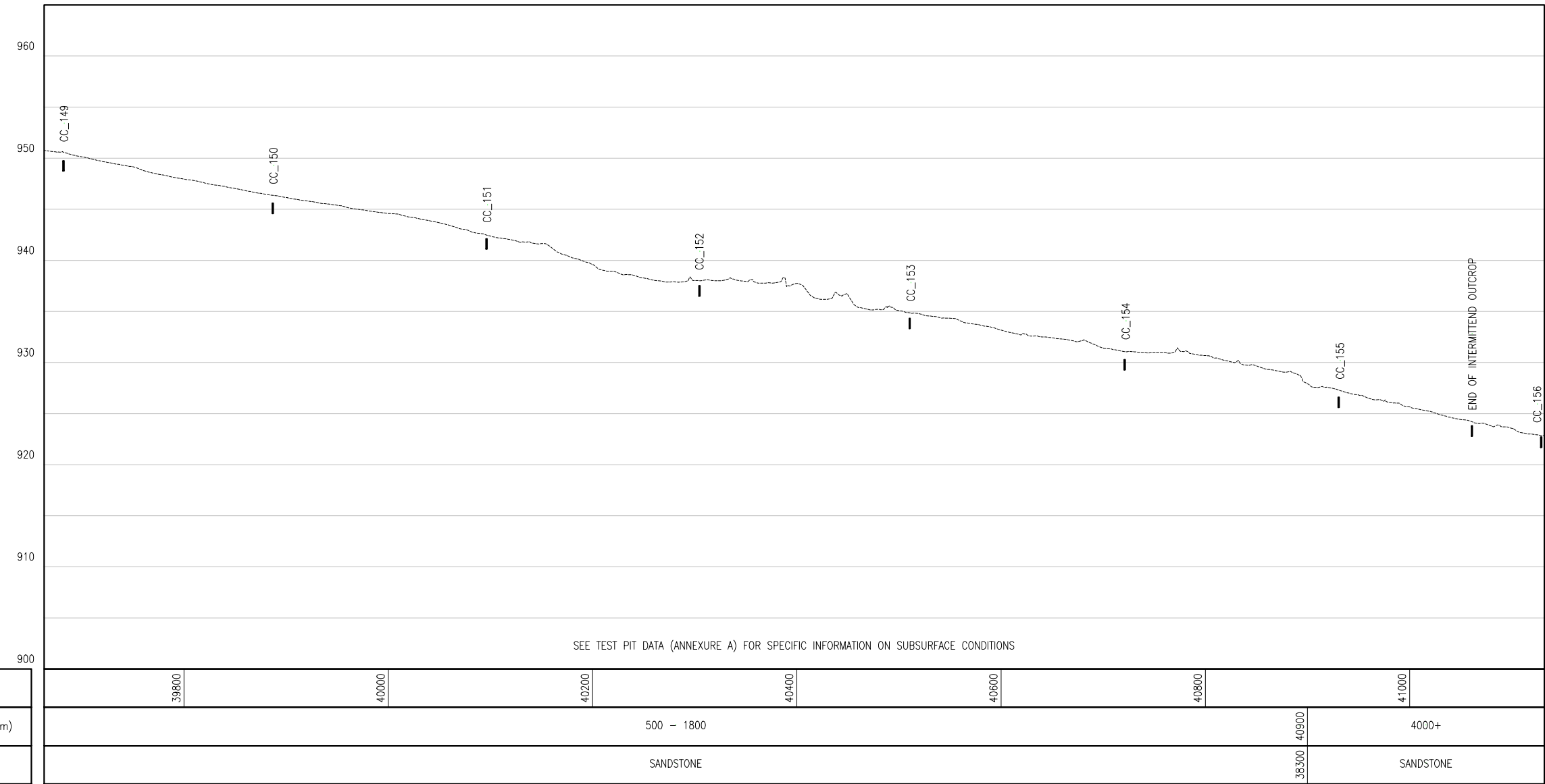
CHAINAGE (m)
REFUSAL DEPTH RANGE (mm)
GEOLOGY

38200	38400	38600	38800	39000	39200	39400	39600
600 – 2800	500 – 1800						
DIABASE	SANDSTONE						

REFERENCE DRAWINGS		REVISIONS				DESIGNED:		PROJECT ENGINEER:	P LE ROUX		MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)				
DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:			GEOTECHNICAL PROFILE STAGE 1: TARANTAALPAN TO OPERATIONAL RESERVOIR				
		A	24/02/11	FOR INFORMATION		CHECKED:	J MULDER				PLAN & LONG SECTION				
						CHIEF DESIGNER:	E SERFONTEIN	SCALE:	AS SHOWN		A3	DWAF DRG. No.	DRAWING NUMBER	2E – G7 – 027	REV N A
						SCALE: 1:500									
						SCALE: 1:5000									
															



SCALE 1:5000



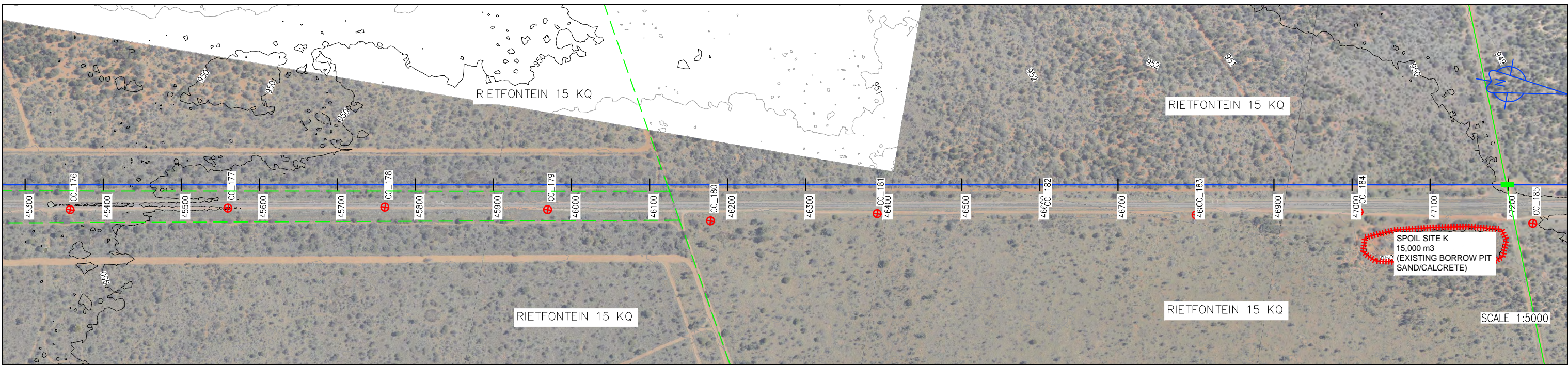
SCALE HOR 1:5000
VERT 1:500

SEE TEST PIT DATA (ANNEXURE A) FOR SPECIFIC INFORMATION ON SUBSURFACE CONDITIONS

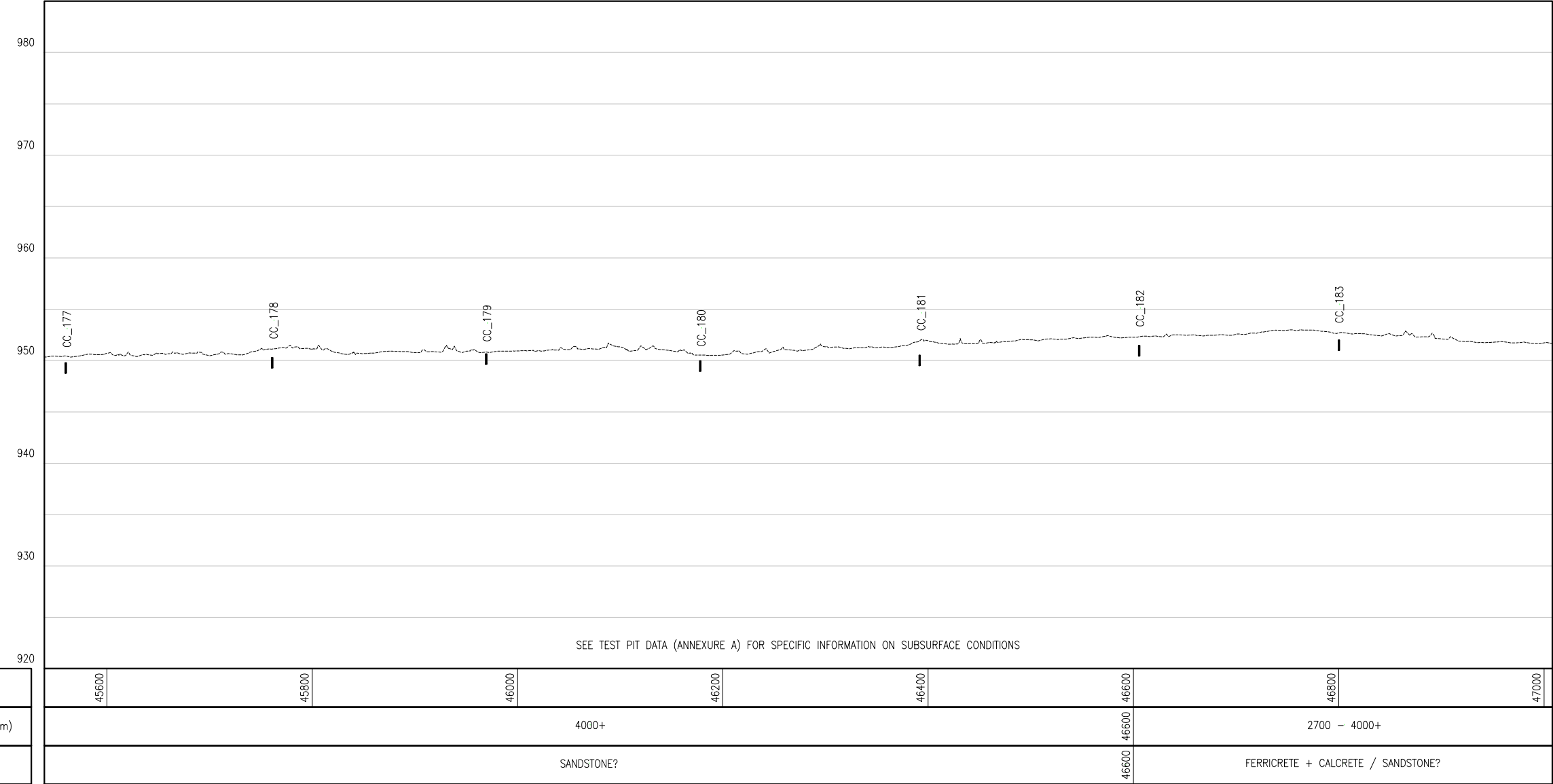
LEGEND:

- CHAINAGE MARKER (PLAN ONLY)
- POINT OF INTERSECTION (PI)
- TEST PIT
- BOREHOLE
- PIPELINE
- OVERHEAD POWERLINE
- FARM BOUNDARY
- FARM PORTION BOUNDARY
- CROSSING - SURFACED ROAD
- CROSSING - GRAVEL ROAD
- CROSSING - PRIVATE DIRT ROAD
- CROSSING - POWERLINE
- AREA OF INTERMITTENT OUTCROP
- AREA OF OUTCROP
- AREA OF IMPEDED DRAINAGE
- POTENTIAL BORROW PIT
- EXISTING BORROW PIT / SPOIL SITE

REFERENCE DRAWINGS		REVISIONS				DESIGNED:		PROJECT ENGINEER:	P LE ROUX	<div><div>MOKOLO CROCODILE Consultants</div></div>		MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)					
DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:				GEOTECHNICAL PROFILE STAGE 1: TARANTAALPAN TO OPERATIONAL RESERVOIR					
		A	24/02/11	FOR INFORMATION		CHECKED:	J MULDER			<div><div>TCTA</div><div>A new word for water</div></div>		PLAN & LONG SECTION					
						CHIEF DESIGNER:	E SERFONTEIN	SCALE:	AS SHOWN								
						SCALE: 1:500			0 2,5 5 10 15 20 25								
						SCALE: 1:5000			0 25 50 100 150 200 250								
										A3	DWAF DRG. No.		DRAWING NUMBER	2E - G7 - 028	REV No. A		



SCALE 1:5000



SCALE HOR 1:5000
VERT 1:500

SEE TEST PIT DATA (ANNEXURE A) FOR SPECIFIC INFORMATION ON SUBSURFACE CONDITIONS

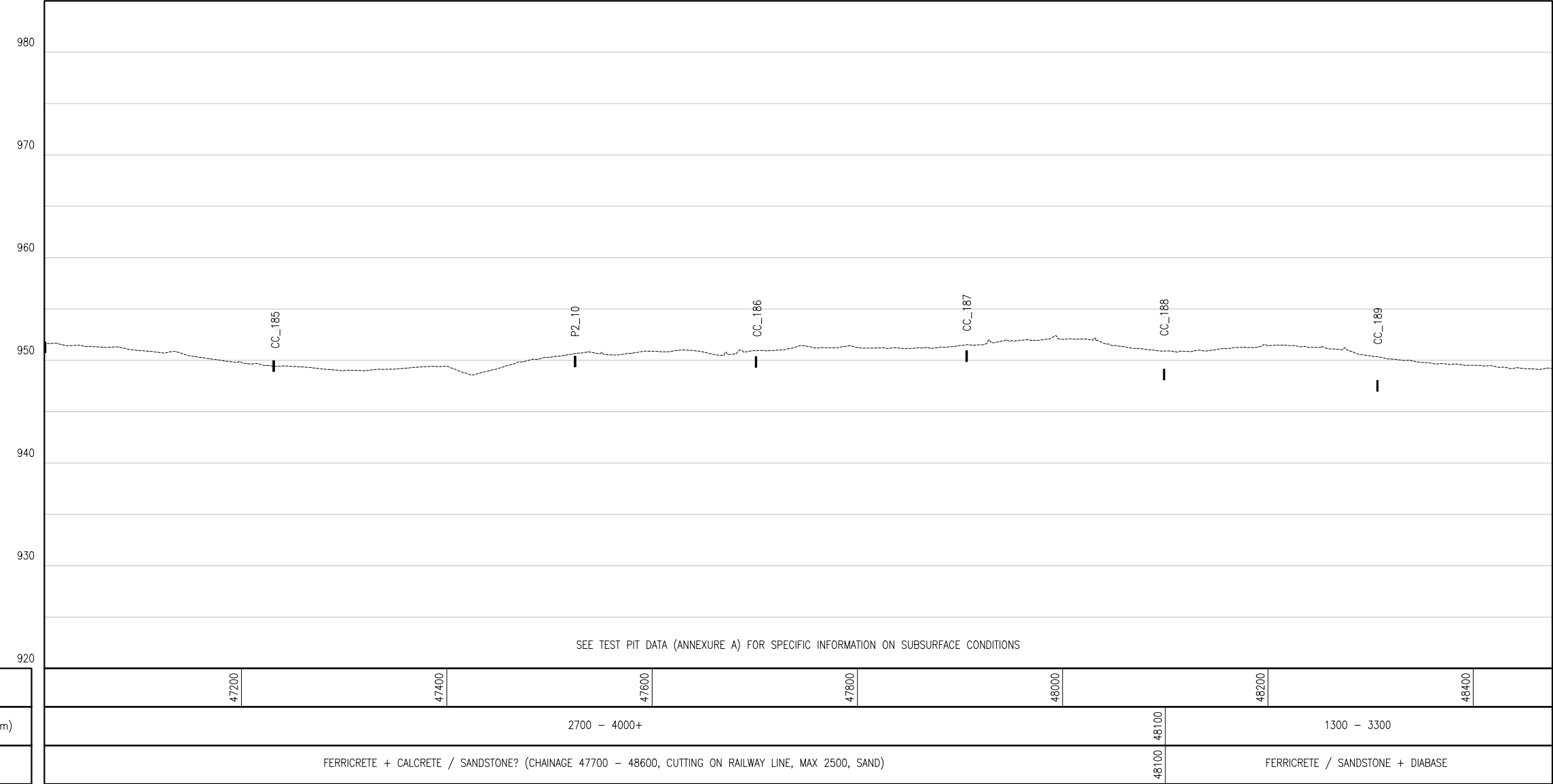
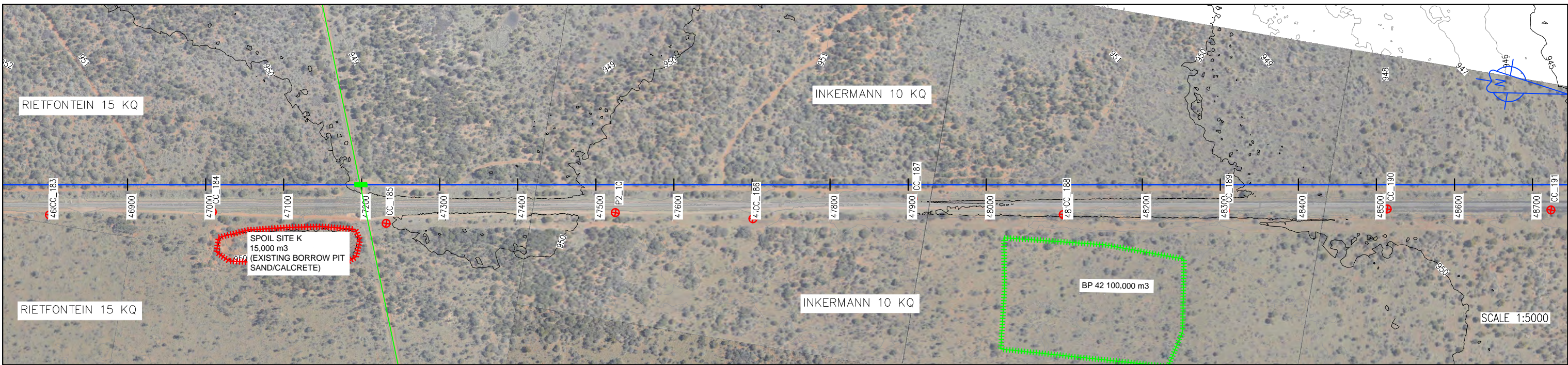
CHAINAGE (m)
REFUSAL DEPTH RANGE (mm)
GEOLOGY

45600	45800	46000	46200	46400	46600	46800	47000
4000+				2700 - 4000+			
SANDSTONE?				FERRICRETE + CALCRETE / SANDSTONE?			

LEGEND:

- CHAINAGE MARKER (PLAN ONLY)
- POINT OF INTERSECTION (PI)
- TEST PIT
- BOREHOLE
- PIPELINE
- OVERHEAD POWERLINE
- FARM BOUNDARY
- FARM PORTION BOUNDARY
- CROSSING - SURFACED ROAD
- CROSSING - GRAVEL ROAD
- CROSSING - PRIVATE DIRT ROAD
- CROSSING - POWERLINE
- AREA OF INTERMITTENT OUTCROP
- AREA OF OUTCROP
- AREA OF IMPEDED DRAINAGE
- POTENTIAL BORROW PIT
- EXISTING BORROW PIT / SPOIL SITE

REFERENCE DRAWINGS			REVISIONS			DESIGNED:	PROJECT ENGINEER:	MOKOLO CROCODILE Consultants		MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)		
DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	TCTA:	TCTA		GEOTECHNICAL PROFILE STAGE 1: TARANTAALPAN TO OPERATIONAL RESERVOIR		
		A	24/02/11	FOR INFORMATION		J MULDER		A new word for water		PLAN & LONG SECTION		
						E SERFONTEIN	SCALE:	AS SHOWN		A3 DWAF DRG. No.		
								SCALE: 1:5000		DRAWING NUMBER		
								0 2,5 5 10 15 20 25		2E - G7 - 032		
								0 25 50 100 150 200 250		REV No. A		



LEGEND:

- CHAINAGE MARKER (PLAN ONLY)
- POINT OF INTERSECTION (PI)
- TEST PIT
- BOREHOLE
- PIPELINE
- OVERHEAD POWERLINE
- FARM BOUNDARY
- FARM PORTION BOUNDARY
- CROSSING - SURFACED ROAD
- CROSSING - GRAVEL ROAD
- CROSSING - PRIVATE DIRT ROAD
- CROSSING - POWERLINE
- AREA OF INTERMITTENT OUTCROP
- AREA OF OUTCROP
- AREA OF IMPEDED DRAINAGE
- POTENTIAL BORROW PIT
- EXISTING BORROW PIT / SPOIL SITE

CHAINAGE (m)
REFUSAL DEPTH RANGE (mm)
GEOLOGY

REFERENCE DRAWINGS			REVISIONS			DESIGNED:	PROJECT ENGINEER:
DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	P LE ROUX
		A	24/02/11	FOR INFORMATION		CHECKED:	
						CHIEF DESIGNER:	SCALE:
							AS SHOWN
						SCALE: 1:500	
						SCALE: 1:5000	

MOKOLO CROCODILE Consultants

TCTA
A new word for water

MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)

GEOTECHNICAL PROFILE STAGE 1: TARANTAALPAN TO OPERATIONAL RESERVOIR

PLAN & LONG SECTION

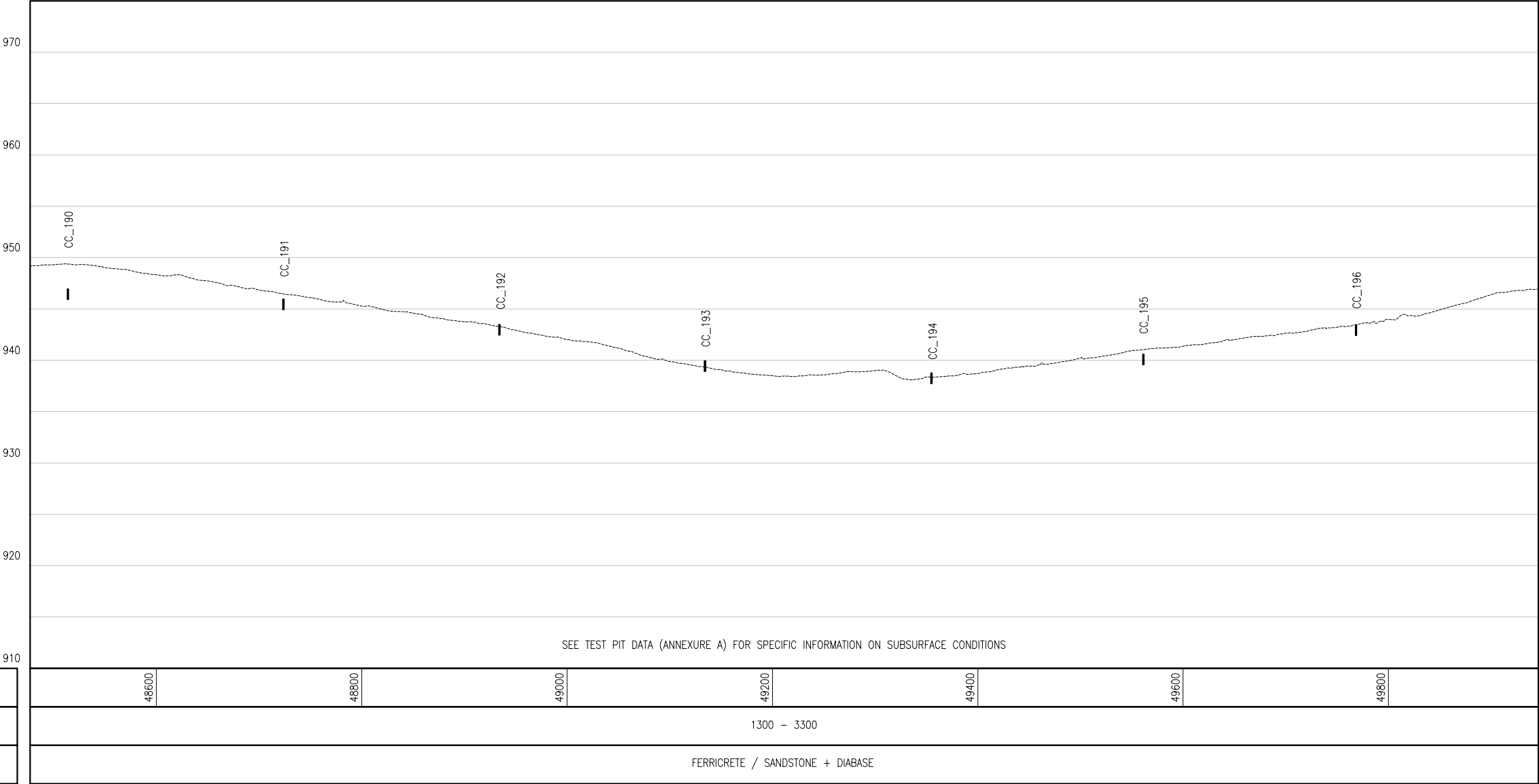
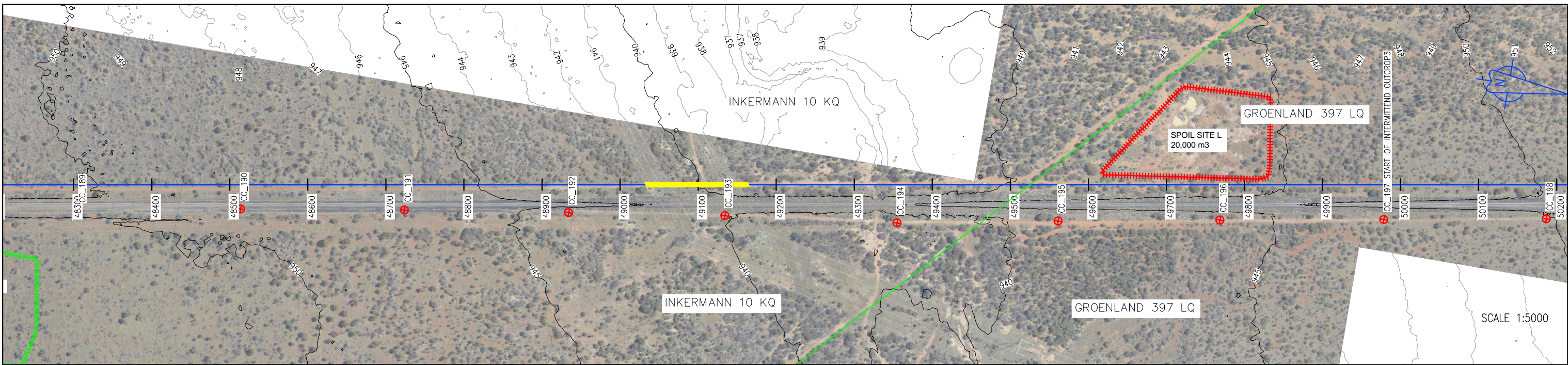
A3

DWAF DRG. No.

DRAWING NUMBER

2E - G7 - 033


REV No. A

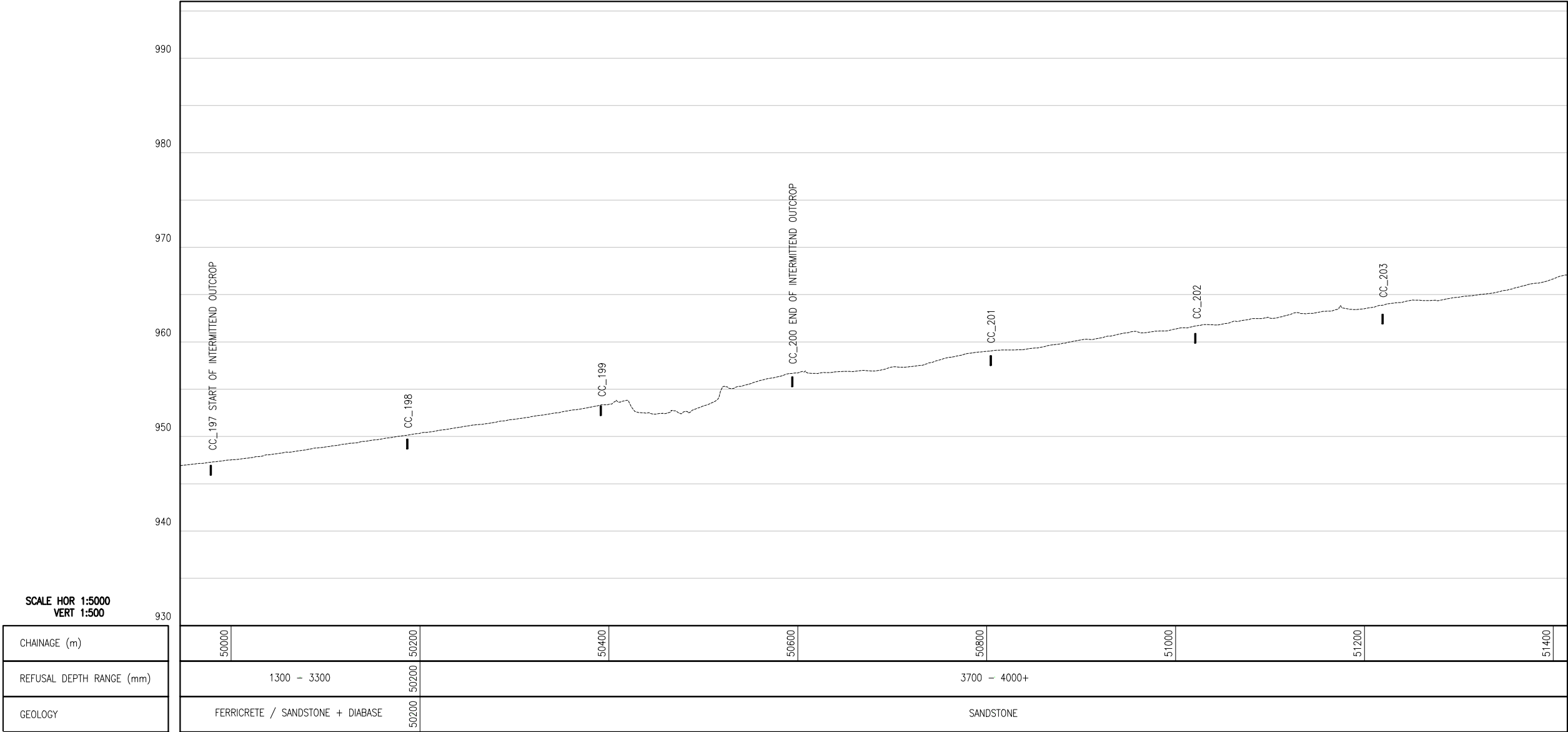
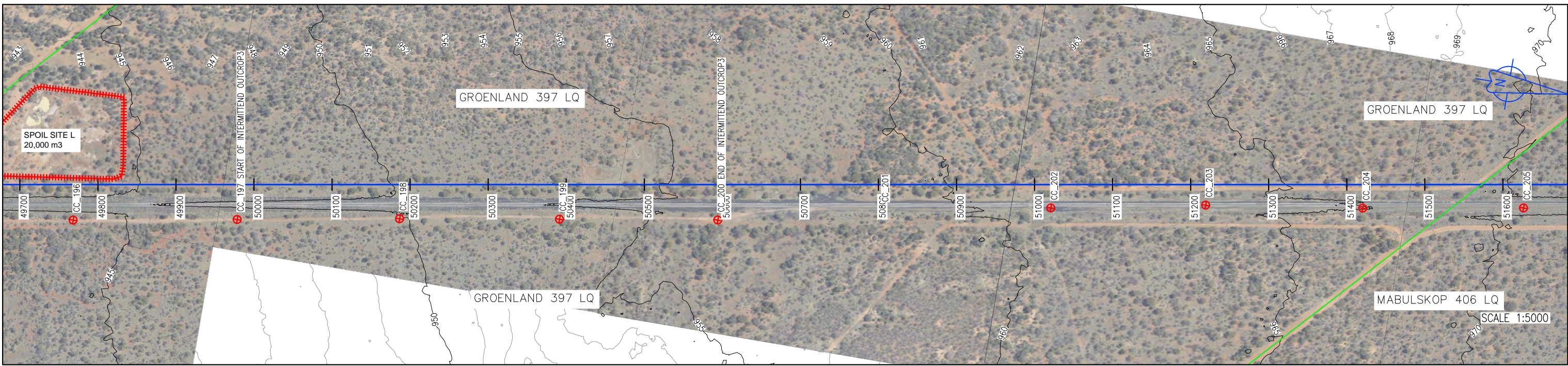


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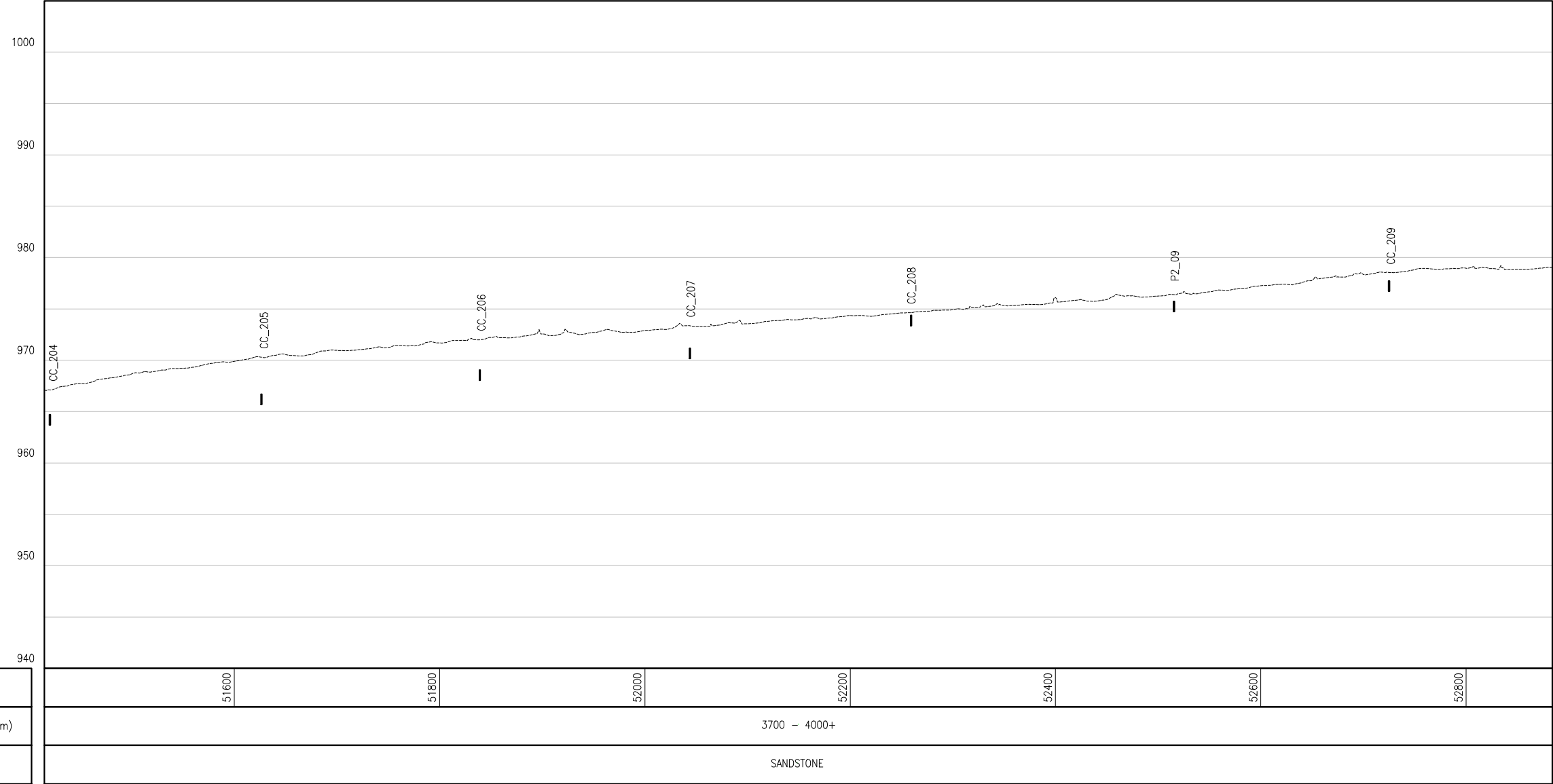
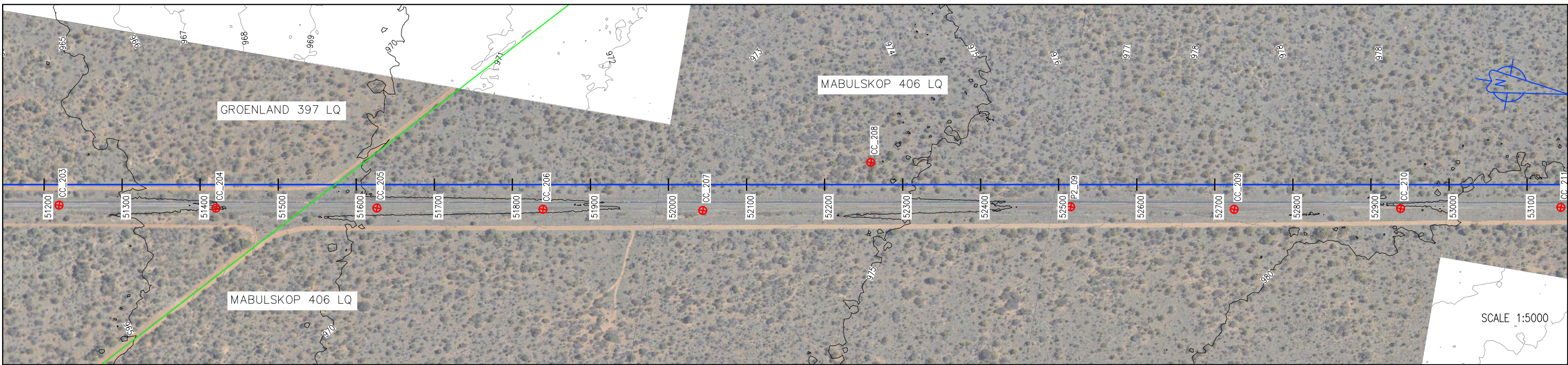
- CHAINAGE MARKER (PLAN ONLY)
- POINT OF INTERSECTION (PI)
- TEST PIT
- BOREHOLE
- PIPELINE
- OVERHEAD POWERLINE
- FARM BOUNDARY
- FARM PORTION BOUNDARY
- CROSSING – SURFACED ROAD
- CROSSING – GRAVEL ROAD
- CROSSING – PRIVATE DIRT ROAD
- CROSSING – POWERLINE
- AREA OF INTERMITTENT OUTCROP
- AREA OF OUTCROP
- AREA OF IMPEDED DRAINAGE
- POTENTIAL BORROW PIT
- EXISTING BORROW PIT / SPOIL SITE

CHAINAGE (m)
REFUSAL DEPTH RANGE (mm)
GEOLOGY

REFERENCE DRAWINGS		REVISIONS				DESIGNED:		PROJECT ENGINEER:	P LE ROUX	<div>MOKOLO CROCODILE Consultants</div> <div><div>TCTA A new word for water</div></div>	MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)					
DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:			GEOTECHNICAL PROFILE STAGE 1: TARANTAALPAN TO OPERATIONAL RESERVOIR					
		A	24/02/11	FOR INFORMATION	PLR	CHECKED:	J MULDER				PLAN & LONG SECTION					
						CHIEF DESIGNER:	E SERFONTEIN	SCALE:	AS SHOWN		<div>A3</div> <div>DWAF DRG. No.</div> <div>DRAWING NUMBER</div> <div>2E – G7 – 034</div> <div>REV N A</div>					
						SCALE: 1:500			0 2,5 5 10 15 20 25							
						SCALE: 1:5000			0 25 50 100 150 200 250							







REFERENCE DRAWINGS			REVISIONS			DESIGNED:		PROJECT ENGINEER:	P LE ROUX	<div>MOKOLO CROCODILE Consultants</div> <div>TCTA A new word for water</div>	MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)		
DRG. No.	TITLE		REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:		GEOTECHNICAL PROFILE STAGE 1: TARANTAALPAN TO OPERATIONAL RESERVOIR		
			A	24/02/11	FOR INFORMATION		CHECKED:	J MULDER			PLAN & LONG SECTION		
							CHIEF DESIGNER:	E SERFONTEIN	SCALE:	AS SHOWN			
							SCALE: 1:500	0 2,5 5 10 15 20 25			A3	DWAF DRG. No.	DRAWING NUMBER
							SCALE: 1:5000	0 25 50 100 150 200 250					
												2E - G7 - 035	REV No. A

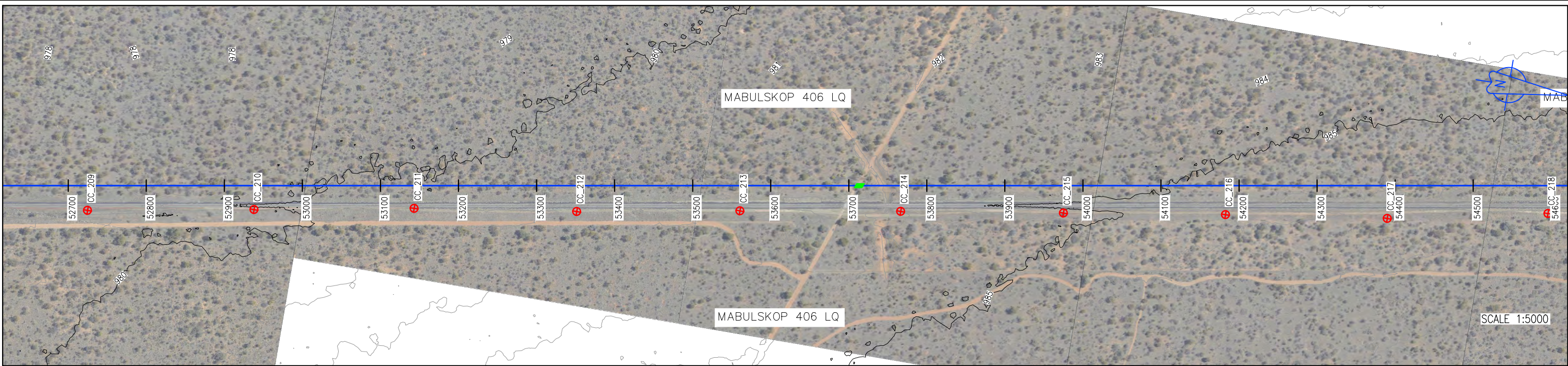


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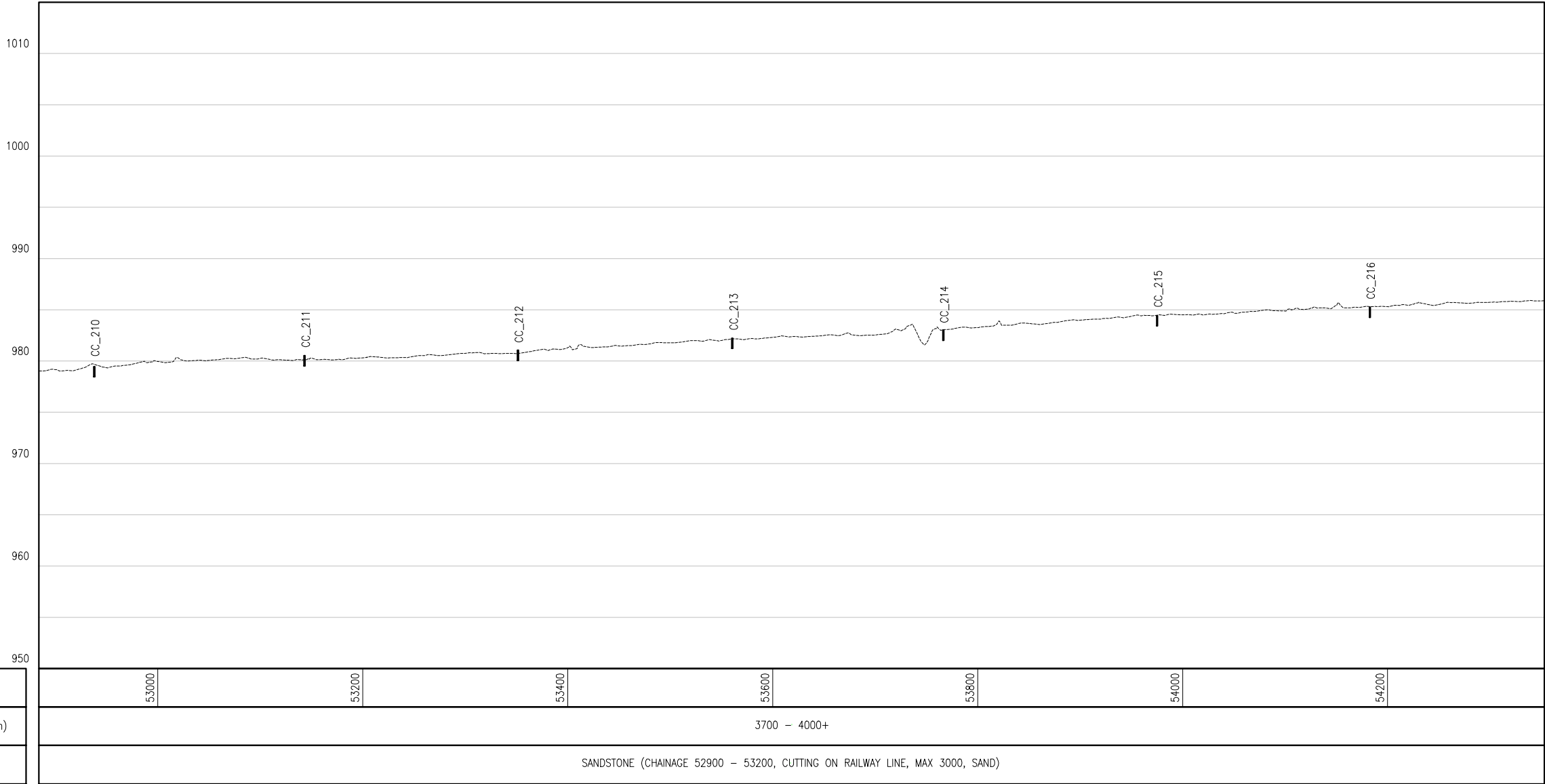
- CHAINAGE MARKER (PLAN ONLY)
- POINT OF INTERSECTION (PI)
- TEST PIT
- BOREHOLE
- PIPELINE
- OVERHEAD POWERLINE
- FARM BOUNDARY
- FARM PORTION BOUNDARY
- CROSSING – SURFACED ROAD
- CROSSING – GRAVEL ROAD
- CROSSING – PRIVATE DIRT ROAD
- CROSSING – POWERLINE
- AREA OF INTERMITTENT OUTCROP
- AREA OF OUTCROP
- AREA OF IMPEDED DRAINAGE
- POTENTIAL BORROW PIT
- EXISTING BORROW PIT / SPOIL SITE

CHAINAGE (m)
REFUSAL DEPTH RANGE (mm)
GEOLOGY

REFERENCE DRAWINGS		REVISIONS				DESIGNED:		PROJECT ENGINEER:	P LE ROUX		MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)				
DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:			GEOTECHNICAL PROFILE STAGE 1: TARANTAALPAN TO OPERATIONAL RESERVOIR				
		A	24/02/11	FOR INFORMATION		CHECKED:	J MULDER	SCALE:	AS SHOWN		PLAN & LONG SECTION				
						CHIEF DESIGNER:	E SERFONTEIN								
						SCALE: 1:500									
						SCALE: 1:5000									
											A3	DWAF DRG. No.	DRAWING NUMBER	2E – G7 – 036	REV N A






SCALE 1:5000

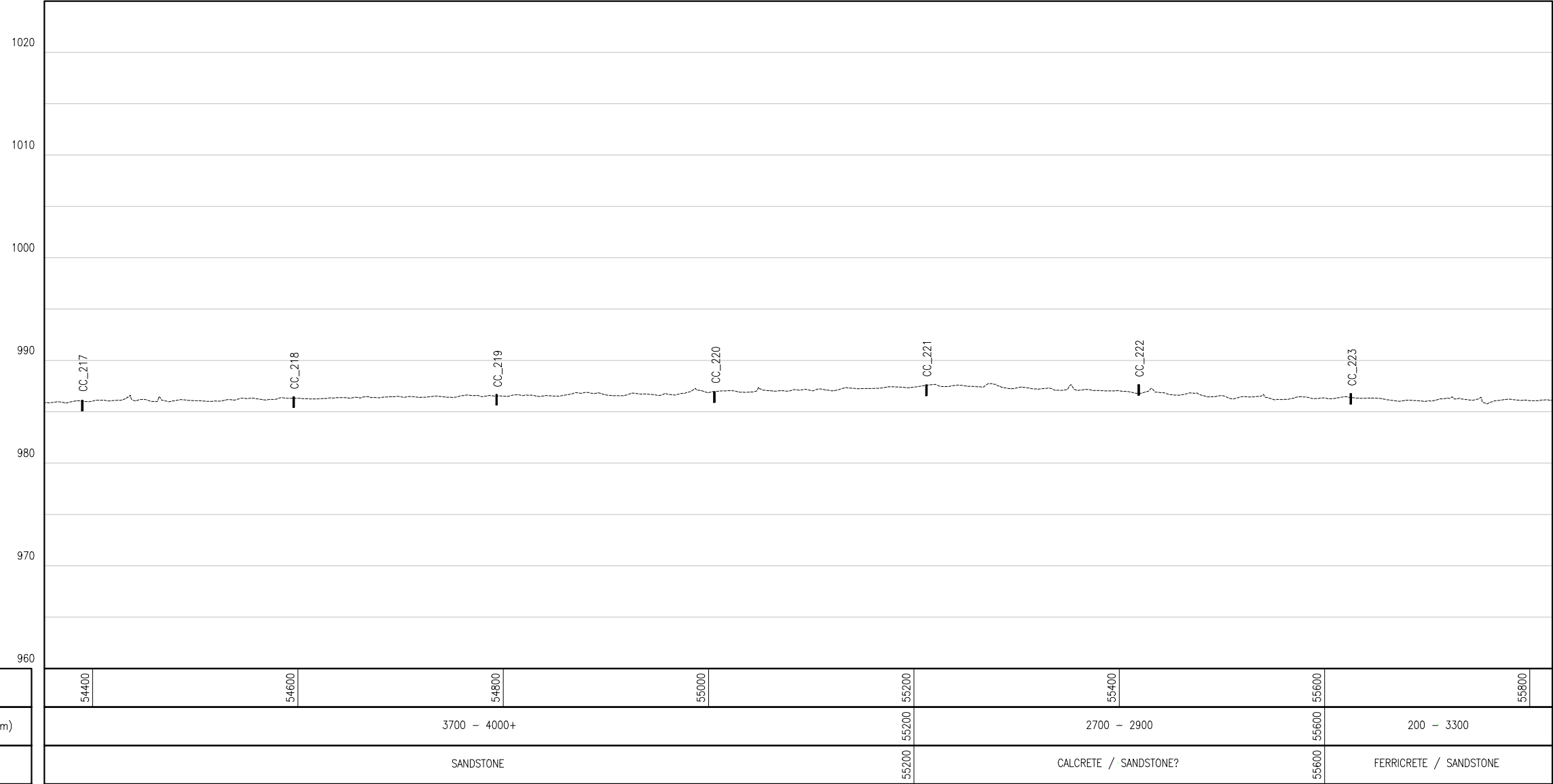
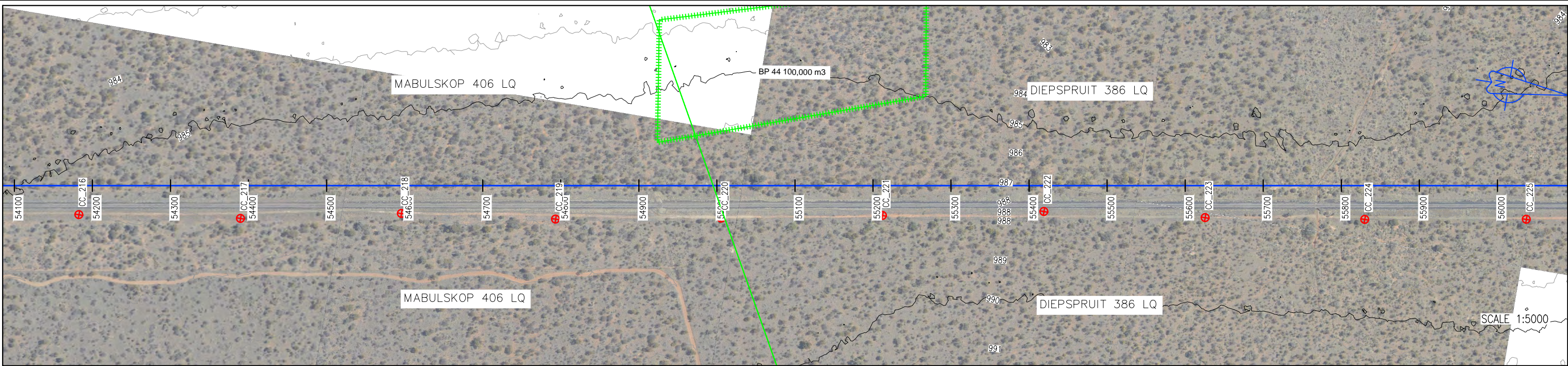


SCALE HOR 1:5000
VERT 1:500

LEGEND:

- CHAINAGE MARKER (PLAN ONLY)
- POINT OF INTERSECTION (PI)
- TEST PIT
- BOREHOLE
- PIPELINE
- OVERHEAD POWERLINE
- FARM BOUNDARY
- FARM PORTION BOUNDARY
- CROSSING - SURFACED ROAD
- CROSSING - GRAVEL ROAD
- CROSSING - PRIVATE DIRT ROAD
- CROSSING - POWERLINE
- AREA OF INTERMITTENT OUTCROP
- AREA OF OUTCROP
- AREA OF IMPEDED DRAINAGE
- POTENTIAL BORROW PIT
- EXISTING BORROW PIT / SPOIL SITE

REFERENCE DRAWINGS		REVISIONS				DESIGNED:		PROJECT ENGINEER:	P LE ROUX	<div>MOKOLO CROCODILE Consultants</div> <div> A new word for water</div>	MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)				
DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:			GEOTECHNICAL PROFILE STAGE 1: TARANTAALPAN TO OPERATIONAL RESERVOIR				
		A	24/02/11	FOR INFORMATION		CHECKED:	J MULDER				PLAN & LONG SECTION				
						CHIEF DESIGNER:	E SERFONTEIN	SCALE:	AS SHOWN						
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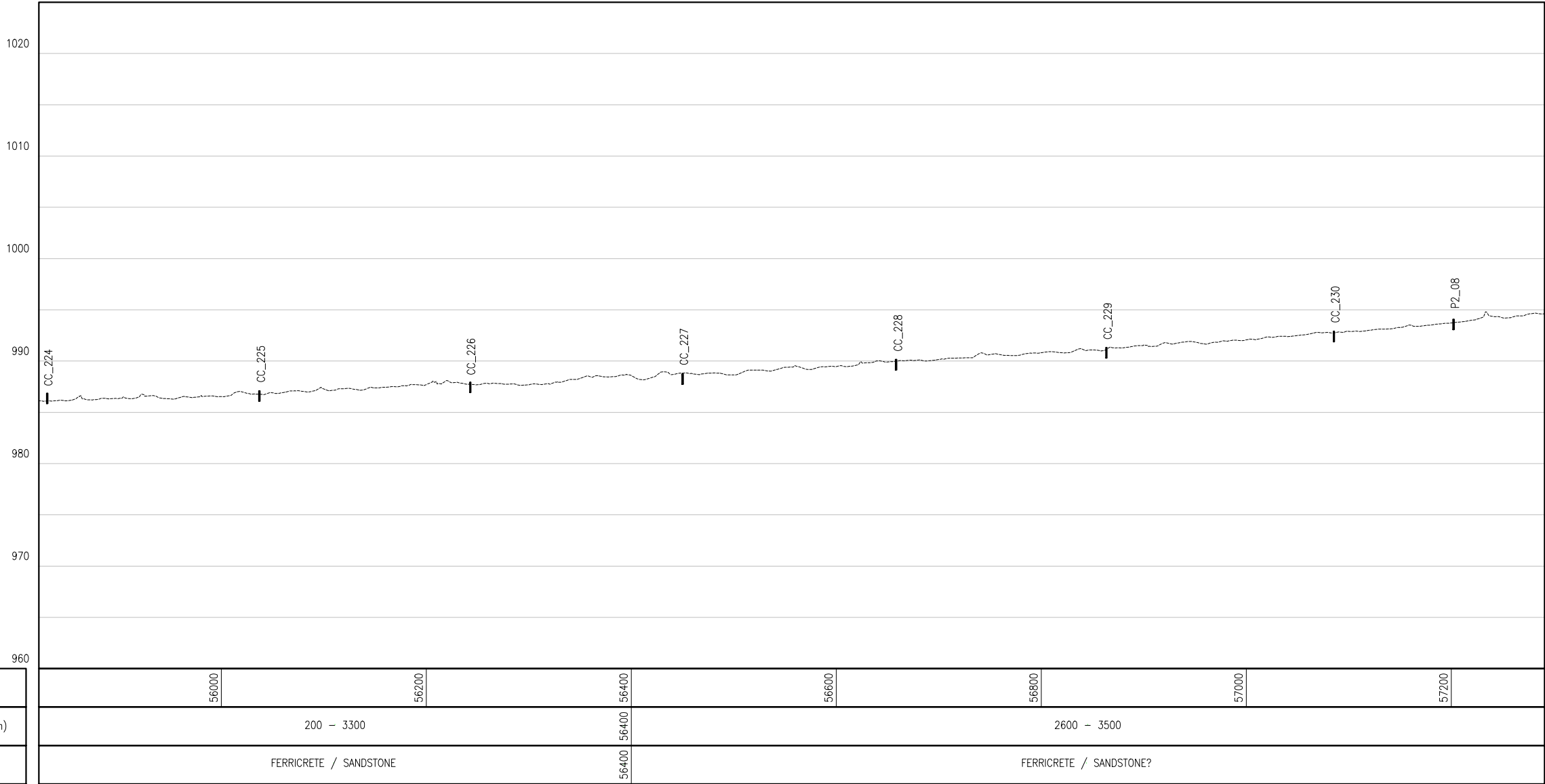
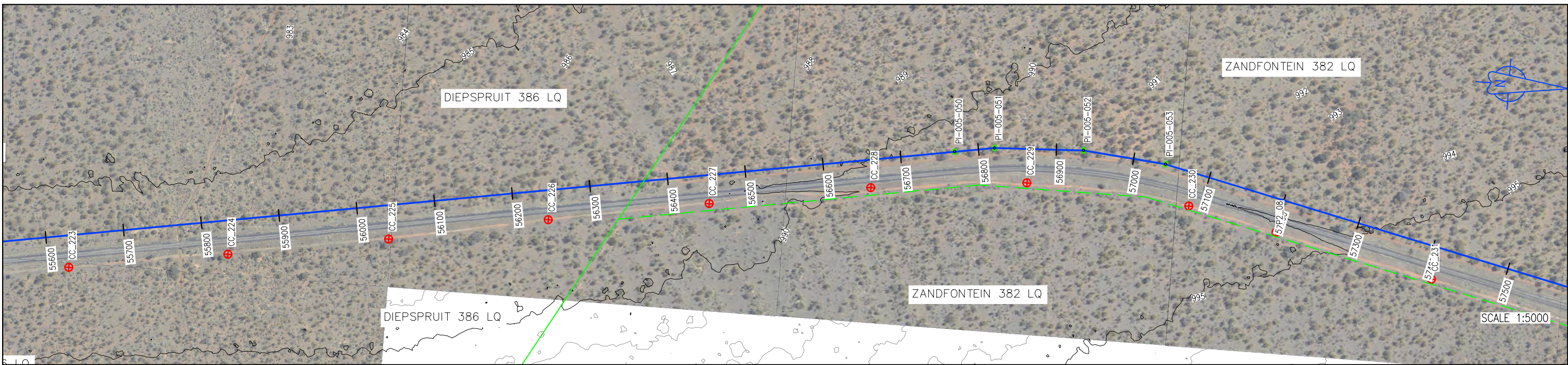
LEGEND:

- CHAINAGE MARKER (PLAN ONLY)
- POINT OF INTERSECTION (PI)
- TEST PIT
- BOREHOLE
- PIPELINE
- OVERHEAD POWERLINE
- FARM BOUNDARY
- FARM PORTION BOUNDARY
- CROSSING – SURFACED ROAD
- CROSSING – GRAVEL ROAD
- CROSSING – PRIVATE DIRT ROAD
- CROSSING – POWERLINE
- AREA OF INTERMITTENT OUTCROP
- AREA OF OUTCROP
- AREA OF IMPEDED DRAINAGE
- POTENTIAL BORROW PIT
- EXISTING BORROW PIT / SPOIL SITE

CHAINAGE (m)
REFUSAL DEPTH RANGE (mm)
GEOLOGY

54400	54600	54800	55000	55200	55400	55600	55800
3700 – 4000+				2700 – 2900	200 – 3300		
SANDSTONE				CALCRETE / SANDSTONE?		FERRICRETE / SANDSTONE	



REFERENCE DRAWINGS		REVISIONS				DESIGNED:		PROJECT ENGINEER:	P LE ROUX		MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP) GEOTECHNICAL PROFILE STAGE 1: TARANTAALPAN TO OPERATIONAL RESERVOIR PLAN & LONG SECTION			
DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:						
		A	24/02/11	FOR INFORMATION		CHECKED:	J MULDER				<div>A3</div> <div>DWAF DRG. No.</div> <div>DRAWING NUMBER</div> <div>2E – G7 – 038</div> <div>REV N A</div>			
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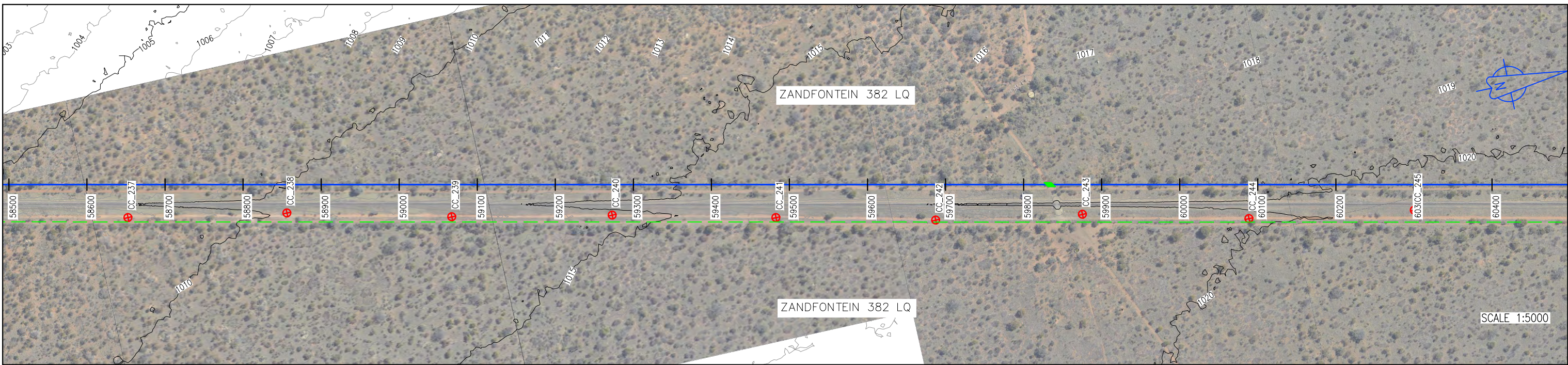


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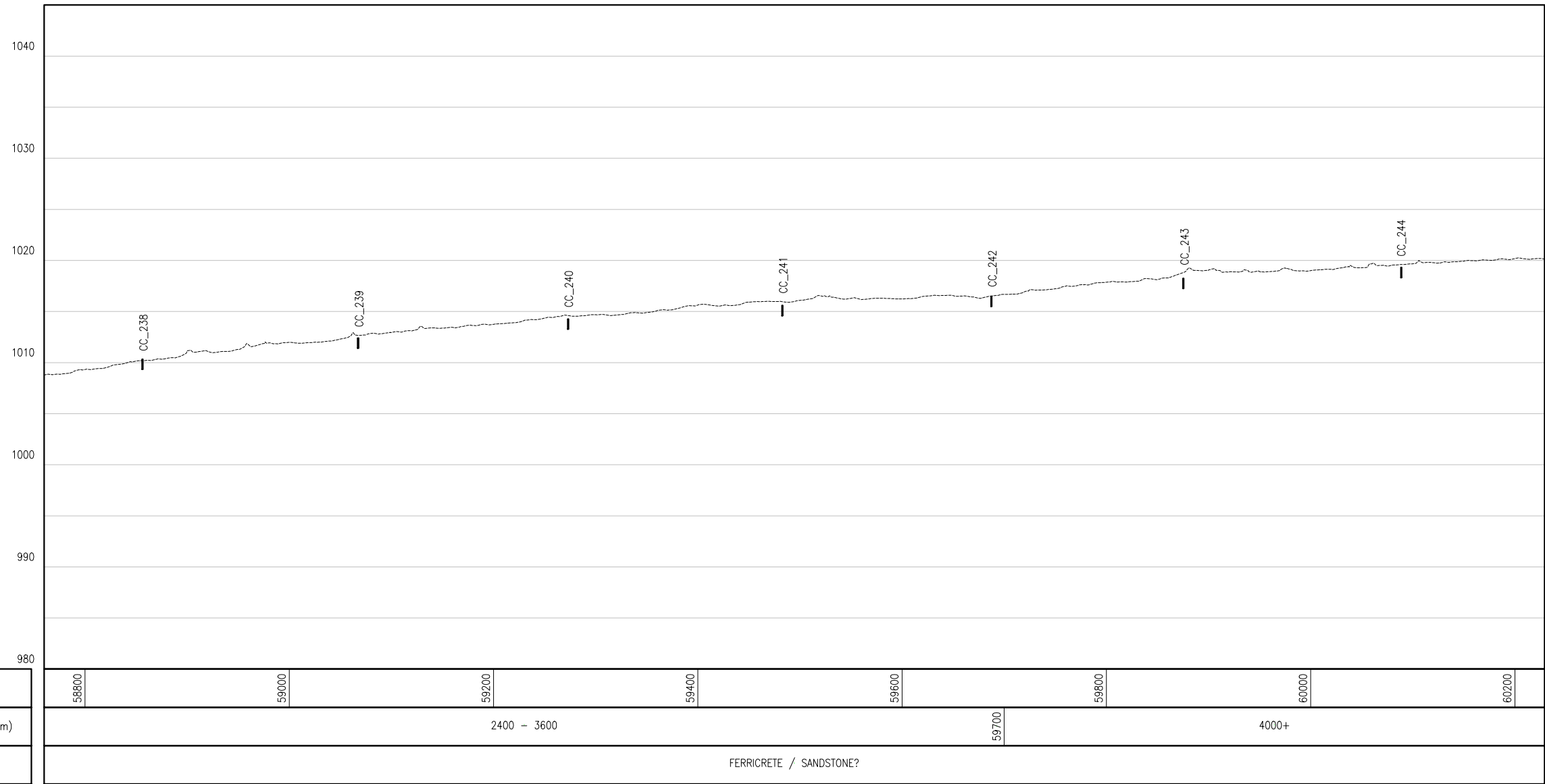
- CHAINAGE MARKER (PLAN ONLY)
- POINT OF INTERSECTION (PI)
- TEST PIT
- BOREHOLE
- PIPELINE
- OVERHEAD POWERLINE
- FARM BOUNDARY
- FARM PORTION BOUNDARY
- CROSSING – SURFACED ROAD
- CROSSING – GRAVEL ROAD
- CROSSING – PRIVATE DIRT ROAD
- CROSSING – POWERLINE
- AREA OF INTERMITTENT OUTCROP
- AREA OF OUTCROP
- AREA OF IMPEDED DRAINAGE
- POTENTIAL BORROW PIT
- EXISTING BORROW PIT / SPOIL SITE

CHAINAGE (m)
REFUSAL DEPTH RANGE (mm)
GEOLOGY

REFERENCE DRAWINGS		REVISIONS				DESIGNED:		PROJECT ENGINEER:	P LE ROUX		MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)				
DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:			GEOTECHNICAL PROFILE STAGE 1: TARANTAALPAN TO OPERATIONAL RESERVOIR				
		A	24/02/11	FOR INFORMATION		CHECKED:	J MULDER				PLAN & LONG SECTION				
						CHIEF DESIGNER:	E SERFONTEIN	SCALE:	AS SHOWN						
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SCALE 1:5000






SCALE HOR 1:5000
VERT 1:500

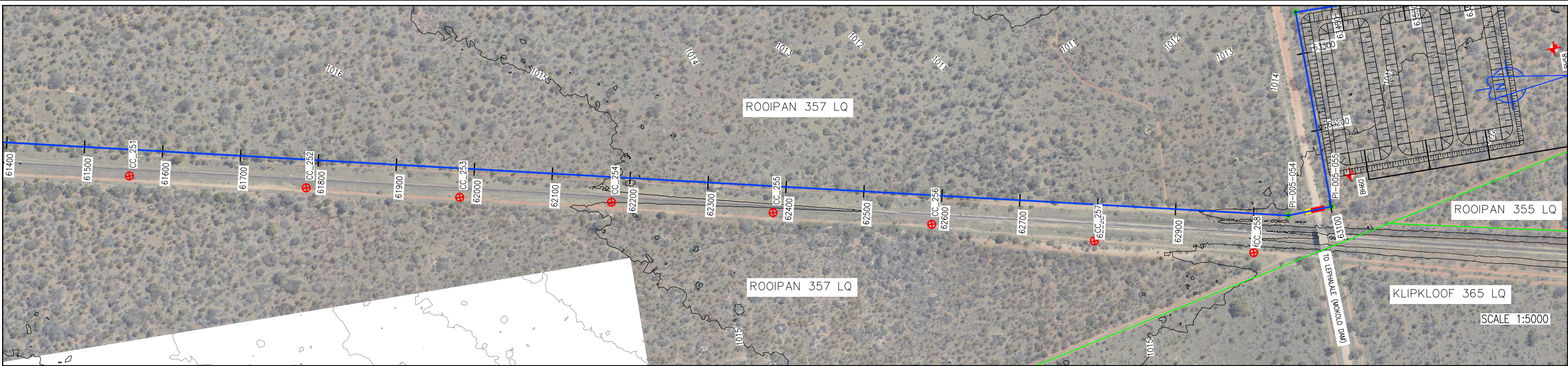
CHAINAGE (m)
REFUSAL DEPTH RANGE (mm)
GEOLOGY

58800	59000	59200	59400	59600	59800	60000	60200
2400 - 3600					59700	4000+	
FERRICRETE / SANDSTONE?							

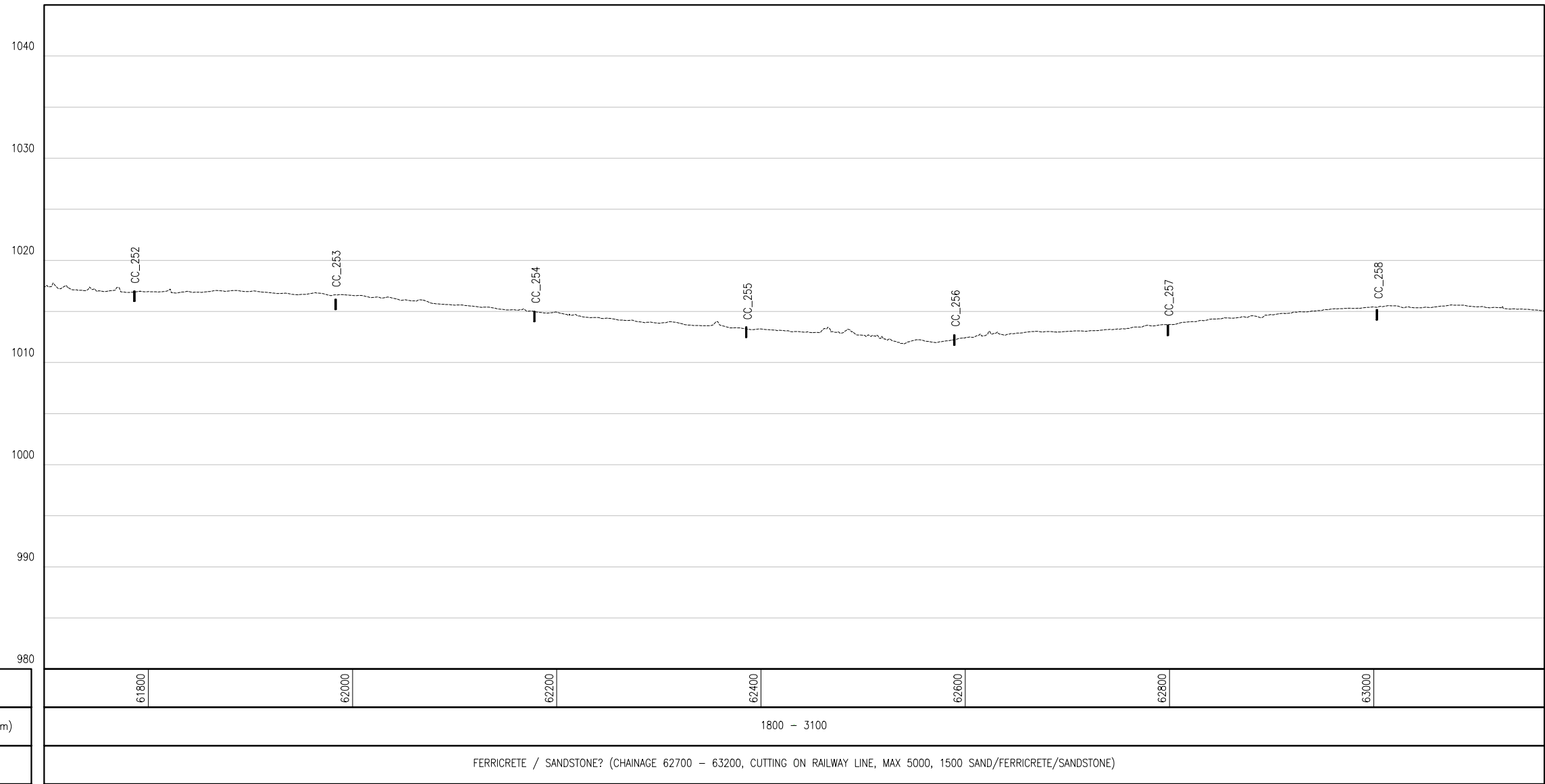
LEGEND:

- CHAINAGE MARKER (PLAN ONLY)
- POINT OF INTERSECTION (PI)
- TEST PIT
- BOREHOLE
- PIPELINE
- OVERHEAD POWERLINE
- FARM BOUNDARY
- FARM PORTION BOUNDARY
- CROSSING - SURFACED ROAD
- CROSSING - GRAVEL ROAD
- CROSSING - PRIVATE DIRT ROAD
- CROSSING - POWERLINE
- AREA OF INTERMITTENT OUTCROP
- AREA OF OUTCROP
- AREA OF IMPEDED DRAINAGE
- POTENTIAL BORROW PIT
- EXISTING BORROW PIT / SPOIL SITE

REFERENCE DRAWINGS		REVISIONS				DESIGNED:		PROJECT ENGINEER:	P LE ROUX		MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)					
DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:			GEOTECHNICAL PROFILE STAGE 1: TARANTAALPAN TO OPERATIONAL RESERVOIR					
		A	24/02/11	FOR INFORMATION		CHECKED:	J MULDER				PLAN & LONG SECTION					
						CHIEF DESIGNER:	E SERFONTEIN	SCALE:	AS SHOWN			A3	DWAF DRG. No.	DRAWING NUMBER	2E – G7 – 041	REV N A
						SCALE: 1:500										
						SCALE: 1:5000										



SCALE 1:5000







SCALE HOR 1:5000
VERT 1:500

CHAINAGE (m)
REFUSAL DEPTH RANGE (mm)
GEOLOGY

LEGEND:

- CHAINAGE MARKER (PLAN ONLY)
- POINT OF INTERSECTION (PI)
- TEST PIT
- BOREHOLE
- PIPELINE
- OVERHEAD POWERLINE
- FARM BOUNDARY
- FARM PORTION BOUNDARY
- CROSSING - SURFACED ROAD
- CROSSING - GRAVEL ROAD
- CROSSING - PRIVATE DIRT ROAD
- CROSSING - POWERLINE
- AREA OF INTERMITTENT OUTCROP
- AREA OF OUTCROP
- AREA OF IMPEDED DRAINAGE
- POTENTIAL BORROW PIT
- EXISTING BORROW PIT / SPOIL SITE

REFERENCE DRAWINGS			REVISIONS				DESIGNED:		PROJECT ENGINEER:	P LE ROUX		MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)				
DRG. No.	TITLE		REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:			GEOTECHNICAL PROFILE STAGE 1: TARANTAALPAN TO OPERATIONAL RESERVOIR				
			A	24/02/11	FOR INFORMATION		CHECKED:	J MULDER				PLAN & LONG SECTION				
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							SCALE: 1:5000									



TCTA

**MOKOLO AND CROCODILE
WATER AUGMENTATION PROJECT
(MCWAP)**

CONTRACT № TCTA 07-041

CONSULTING SERVICES FOR MCWAP

**PHASE 2: GEOTECHNICAL INVESTIGATIONS
Stage 2: Vlieëpoort Weir – Transnet Rail Line**

VOLUME 2.4: ANNEXURES D AND E

AUGUST 2011

MOKOLO CROCODILE CONSULTANTS

Report No: 2A-R-111E-53 (Rev A)


**MOKOLO AND CROCODILE
WATER AUGMENTATION PROJECT**

CONTRACT № TCTA 07-041

DOCUMENT CONTROL SHEET

Report No. : 2A-R-111E-53

Title : Phase 2: Geotechnical Investigations
Stage 2: Vlieëpoort Weir – Transnet Rail Line
Volume 2.4: Annexures D and E

Rev No	Date of Issue	Originator		Checked		Approved		Description
		Initials	Signature	Initials	Signature	Initials	Signature	
A	Aug 2011	AJS GND GJH BHJS MCW RV		SM PJIR		JPie		1 st Issue for discussion ¹

¹ Finalisation pending outstanding Phase 2 Geotechnical Results

**MOKOLO AND CROCODILE
WATER AUGMENTATION PROJECT**

CONTRACT № TCTA 07-041

**PHASE 2: GEOTECHNICAL INVESTIGATIONS
Stage 2: Vlieëpoort Weir – Transnet Rail Line**

LIST OF VOLUMES

Volume 1	Phase 2, Stage 2: Geotechnical Data Report
Volume 2	Phase 2, Stage 2: Geotechnical Report – Annexures
	2.1 Annexure A
	2.2 Annexure B
	2.3 Annexure C
	2.4 Annexures D and E
Volume 3	Phase 2, Stage 2: Geotechnical Interpretive Report

MOKOLO AND CROCODILE WATER AUGMENTATION PROJECT

CONTRACT № TCTA 07-041

PHASE 2: GEOTECHNICAL INVESTIGATIONS Stage 2: Vlieëpoort Weir – Transnet Rail Line

VOLUME 2.4: ANNEXURES D and E

EXECUTIVE SUMMARY

Volumes 2.1, 2.2, 2.3 and 2.4 of Geotechnical Report No. 2A-R-111E-53 contain the Annexures referred to in Volume 1 and should be read in conjunction with the latter referenced Volume.

**MOKOLO AND CROCODILE
WATER AUGMENTATION PROJECT**

CONTRACT № TCTA 07-041

**PHASE 2: GEOTECHNICAL INVESTIGATIONS
Stage 2: Vlieëpoort Weir – Transnet Rail Line**

VOLUME 2.4: ANNEXURES D and E

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A2:	Test pit profiles
A3	Laboratory test results
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 - C3: Geophysical surveys
 - C3.1 Vlieëpoort Wier site geophysics
 - C3.2 Vlieëpoort Wier site Radon survey
 - C3.3 Balancing reservoir geophysics
 - C3.4 Pipeline geophysics
 - C3.5 Break pressure reservoir pipeline geophysics

- C4: Laboratory test results
 - C4.1 Balancing reservoir
 - C4.2 Break Pressure reservoir
- C5: Test pit profiles
 - C5.1 Balancing reservoir test pit profiles
 - C5.2 Break pressure reservoir test pit profiles

Volume 2.4: Annexures D and E (This Volume)

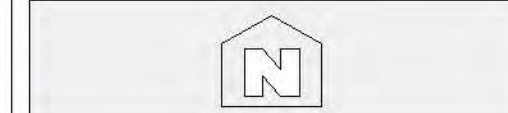
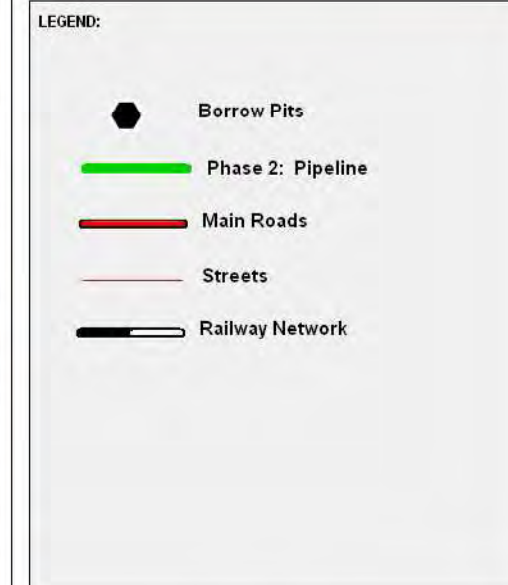
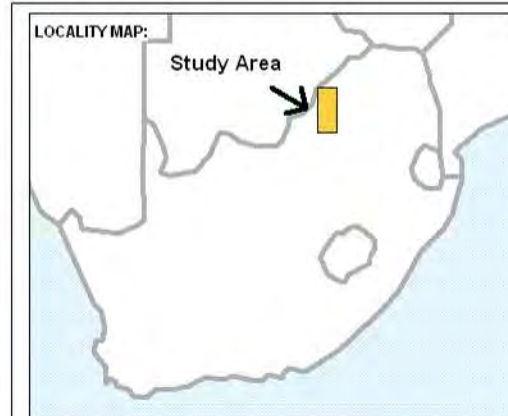
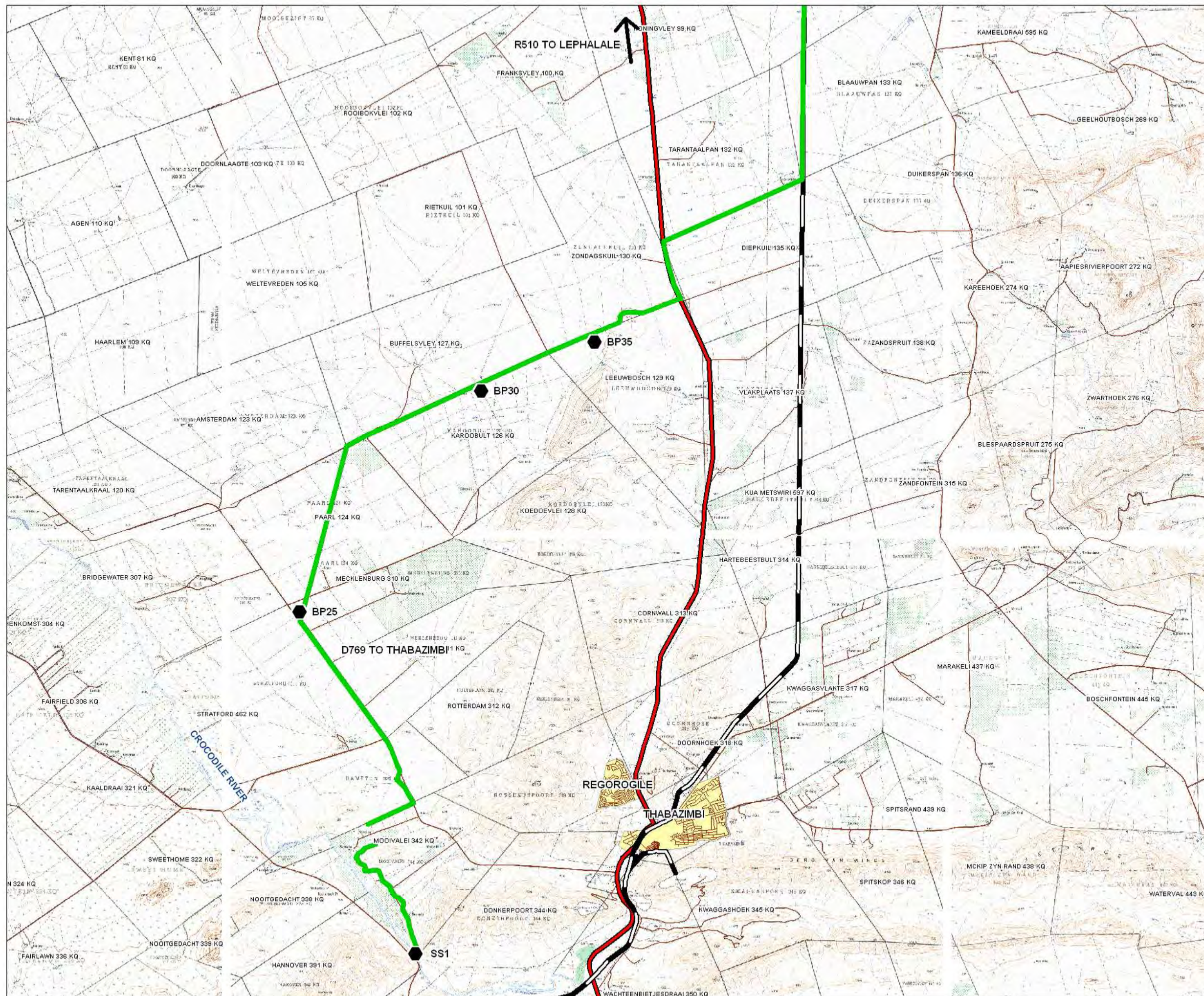
List of Annexures

- Annexure D: Borrow Pit Plans
- Annexure E: Geotechnical Maps

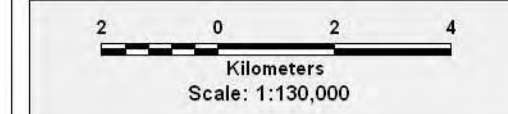
Volume 3: Geotechnical Interpretive Report (Bound Separately)

ANNEXURE D

BORROW PIT PLANS



PROJECTION:
Transverse Mercator
LO 27



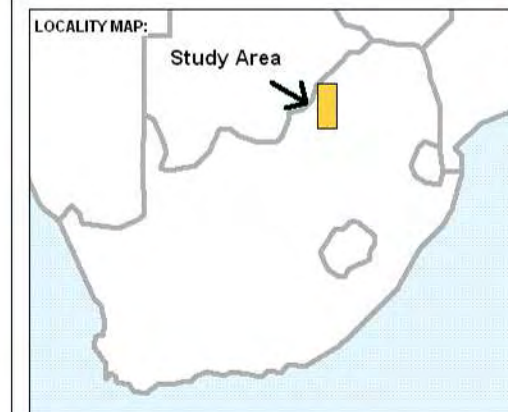
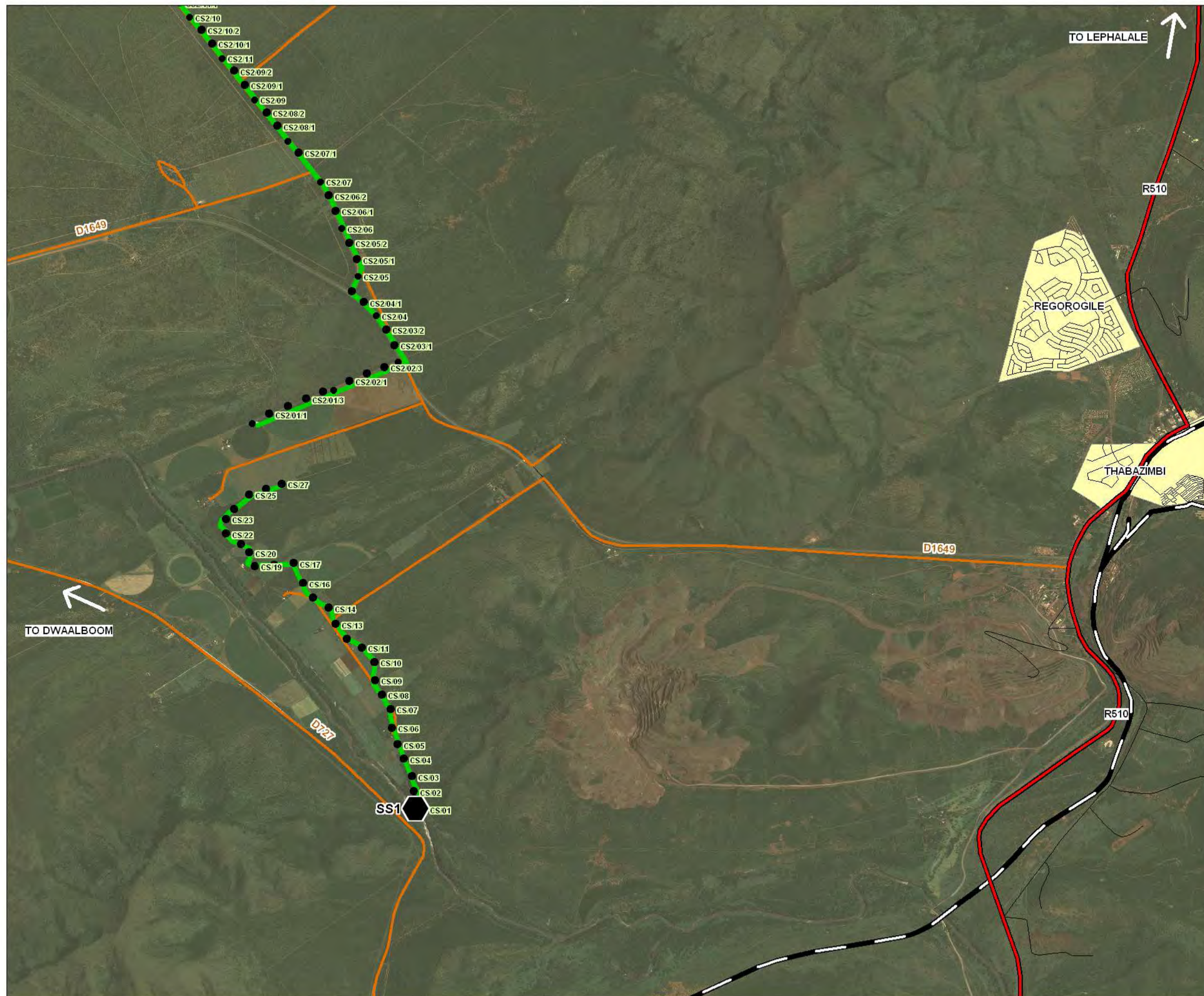
PREPARED BY:

PREPARED FOR:

PROJECT:
Mokolo and Crocodile Water
Augmentation Project (MCWAP)

DRAWING TITLE:
Locality Plan of Borrow Pits:
Phase 2 Stage 2

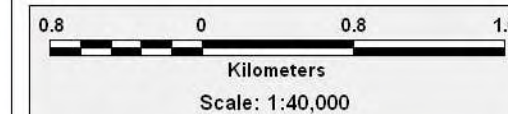
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- LEGEND:
- Centre Line Test Pits
 - Borrow Pit
 - Main Roads
 - Gravel Roads
 - Railway Network
 - Phase 2: Pipeline Route

BORROW PIT DESCRIPTION:

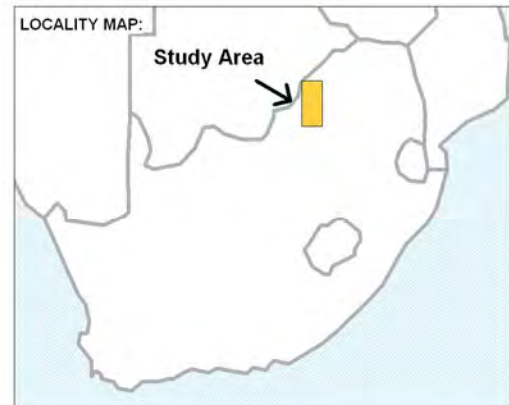
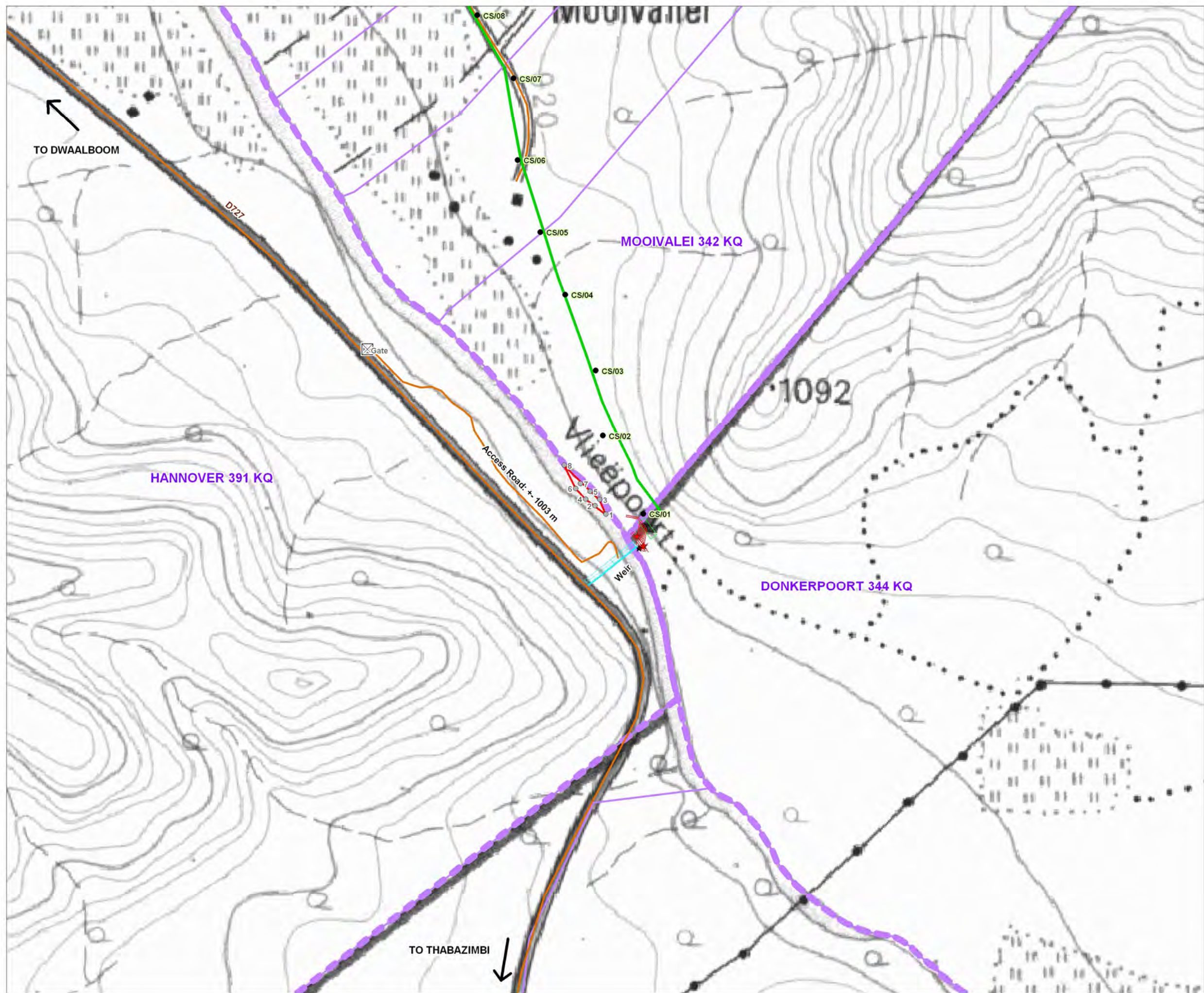
Description	Borrowpit_SS1
Location of Borrowpit	X2725427 Y-31956
Shortest distance relative to pipeline	± 120 m
Distance to access road	± 1000 m from Access Gate
Farm name	Hannover 341 KQ
Farm number	Portion 9
Owner name	P van Rensburg
Contact details: Mobile no	082 600 0233
Telephone no	011 754 5895
Estimated quantity (m³)	8000
Suitability of the material	Sand



PROJECT:
Mokolo and Crocodile Water Augmentation Project (MCWAP)

DRAWING TITLE:
**Borrow Pit SS1
Locality Plan**

DRAWING NR:
SS1_1



LEGEND:

- Centre Line Test Pits
- Gate
- Borrow Pit Corner Points
- Gravel Road
- Weir
- Main Roads
- Phase 2: Pipeline Route
- Railway Network
- Parent Farm Boundary

BORROW PIT DESCRIPTION:

Description	Borrowpit_SS1
Location of Borrow pit	X2725427 Y-31956
Shortest distance relative to pipeline	± 120 m
Distance to access road	± 1003 m from Access Gate
Farm name	Hannover 341 KQ
Farm number	Portion 0
Owner name	P van Rensburg
Contact details: Mobile no	082 600 0233
Telephone no	011 794 9895
Estimated quantity (m³)	8000
Suitability of the material	Sand

DATUM: WGS 84
PROJECTION: LO 27

0.2 0 0.2 0.4
Kilometers
Scale: 1:10,000

PREPARED BY:

PREPARED FOR:

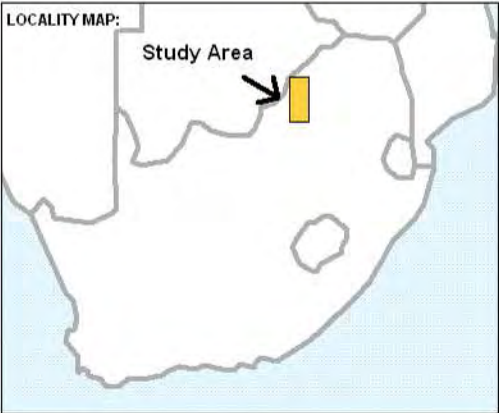
PROJECT:
Mokolo and Crocodile Water Augmentation Project (MCWAP)

DRAWING TITLE:
Borrow Pit SS1 Layout Plan

DRAWING NR:
SS1_2



BORROW PIT SS1 TEST PIT COORDINATES:		
BP_ID	_27_Y	X
1	-031956	2725427
2	-031926	2725404
3	-031939	2725387
4	-031901	2725386
5	-031913	2725365
6	-031874	2725357
7	-031887	2725344
8	-031843	2725294



LEGEND:

- Centre Line Test Pits
- ⊙ Borrow Pit Test Pits
- ⊠ Gate
- Gravel Roads
- Borrow Pit Border
- Weir
- Railway Line
- Phase 2: Pipeline Route

BORROW PIT DESCRIPTION:	
Description	Borrowpit_SS1
Location of Borrow pit	X2725427 Y-031956
Shortest distance relative to pipeline	-- 120 m
Distance to access road	-- 1003 m from Access Gate
Farm name	Hannover 341 I/G
Farm number	Portion 9
Owner name	P van Rensburg
Contact details: Mobile no	082 696 9233
Telephone no	011 754 5655
Estimated quantity (m³)	8000
Suitability of the material	Sand

DATUM: WGS 84
PROJECTION: LO 27

0.04 0 0.04 0.08
Kilometers
Scale: 1:2,000

PREPARED BY:

MOKOLO CROCODILE
Consultants

GEOSTRADA
Engineering, water and environment

PREPARED FOR:

TCTA
A NEW WORLD FOR WATER

PROJECT:

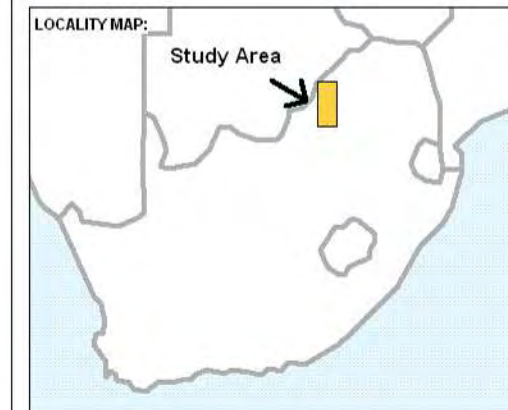
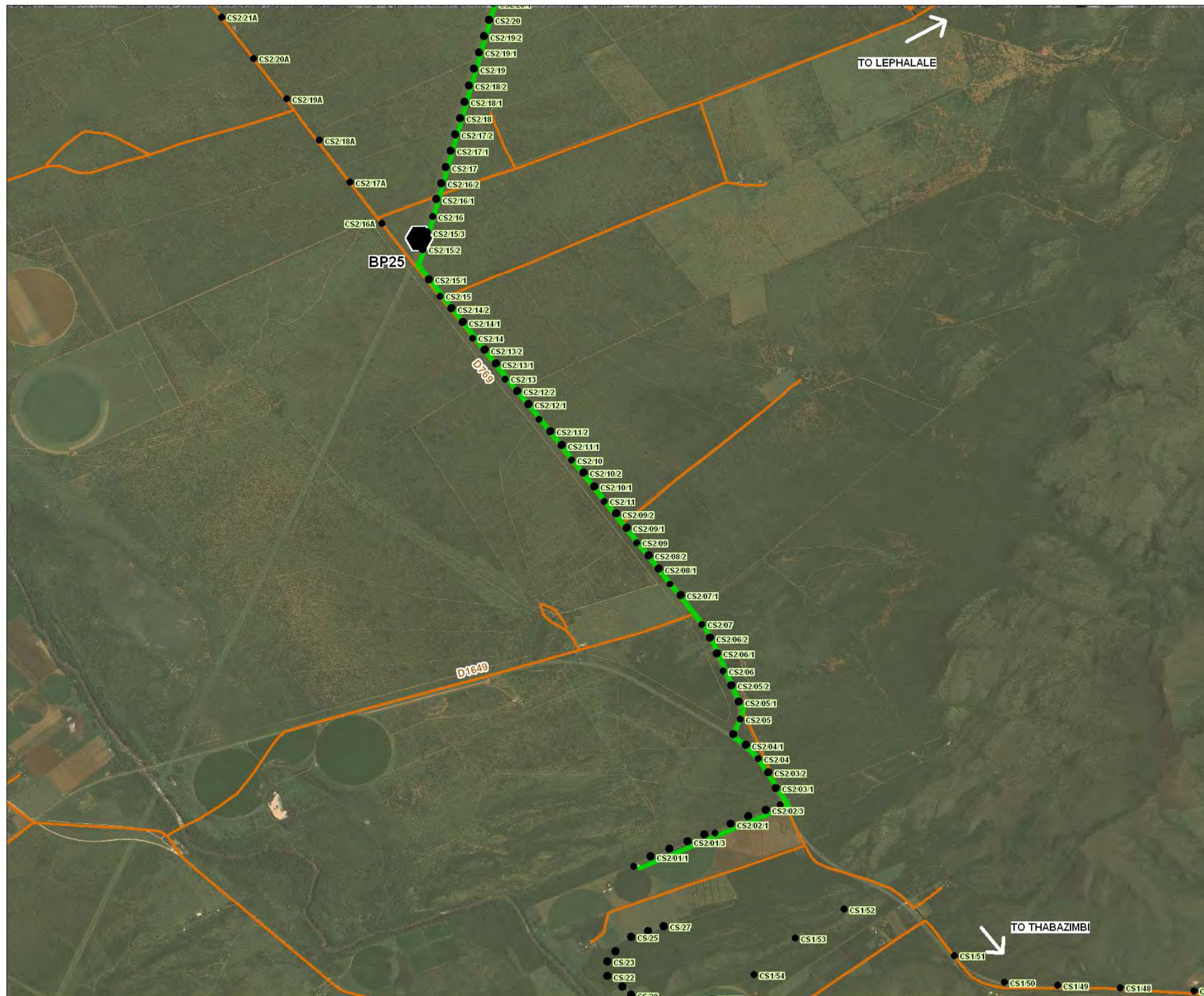
Mokolo and Crocodile Water
Augmentation Project (MCWAP)

DRAWING TITLE:

Borrow Pit SS1
Test Pit Positions

DRAWING NR:

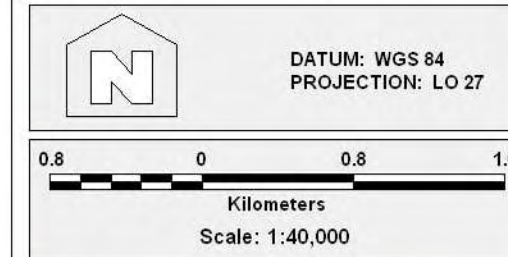
SS1_3



- LEGEND:
- Centre Line Test Pits
 - Borrow Pit
 - Main Roads
 - Gravel Roads
 - Railway Network
 - Phase 2: Pipeline Route

BORROW PIT DESCRIPTION:

Description	Borrowpit_25
Location of Borrow pit	X2713313 Y-27740
Shortest distance relative to pipeline	+20 m
Distance to access road	+150 m
Farm name	Mecklenburg 310KQ
Farm number	Ptn RE/1/310
Owner name	Johan Prinsloo
Contact details: Mobile no	0828051852
Estimated quantity (m ³)	370000
Suitability of the material	Sand



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CONSULTANTS

GEOSTRADA
REGISTERED PROFESSIONAL ENGINEERS

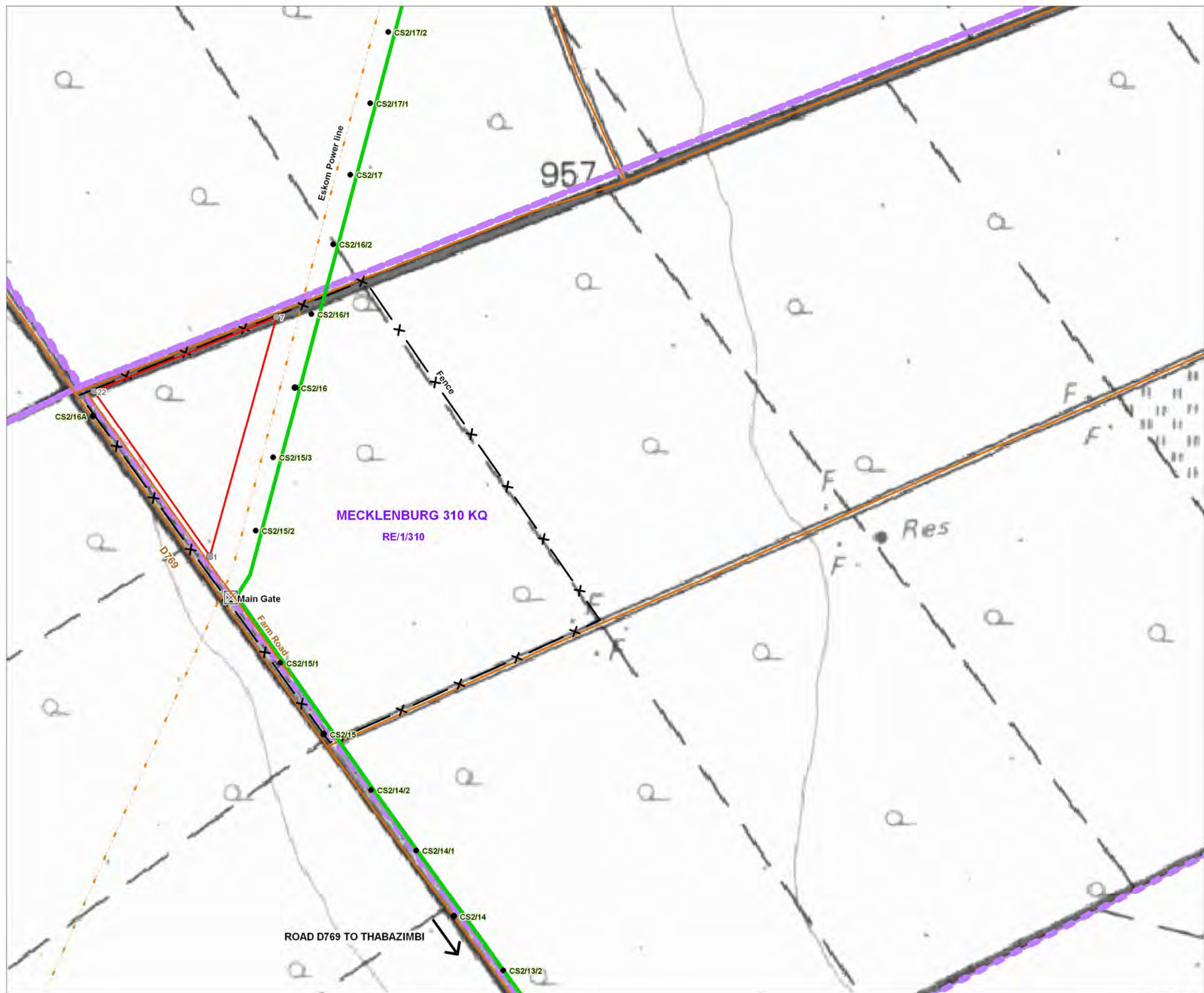
PREPARED FOR:

TCTA
A NEW WORLD FOR WATER

PROJECT:
Mokolo and Crocodile Water Augmentation Project (MCWAP)

DRAWING TITLE:
**Borrow Pit 25 Extension
Locality Plan**

DRAWING NR:
25_1

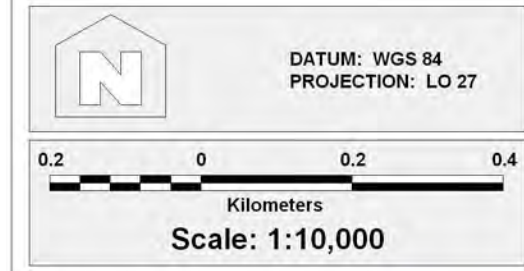


LEGEND:

●	Centre Line Test Pits
●	Borrow Pit Corner Points
—	Main Roads
— x —	Fence
—	Gravel Road
- - -	Power Line
—	Phase 2: Pipeline Route
—	Railway Network
⊗	Main Gate

BORROW PIT DESCRIPTION:

Description	Borrowpit_25
Location of Borrow pit	X2713313 Y-27740
Shortest distance relative to pipeline	+20 m
Distance to access road	+150 m
Farm name	Mecklenburg 310KQ
Farm number	Ptn RE/1/310
Owner name	Johan Prinsloo
Contact details: Mobile no	0828051852
Estimated quantity (m³)	370000
Suitability of the material	Sand



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MOKOLO CROCODILE Consultants

GEOSTRADA engineering & construction solutions

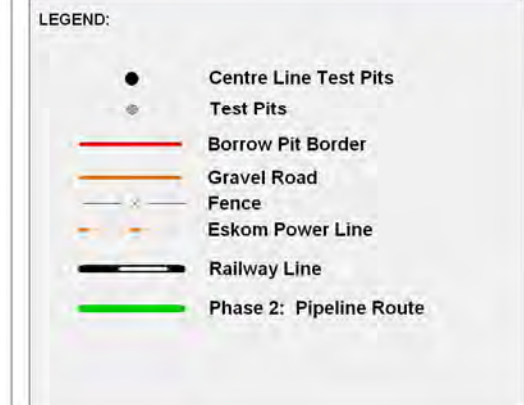
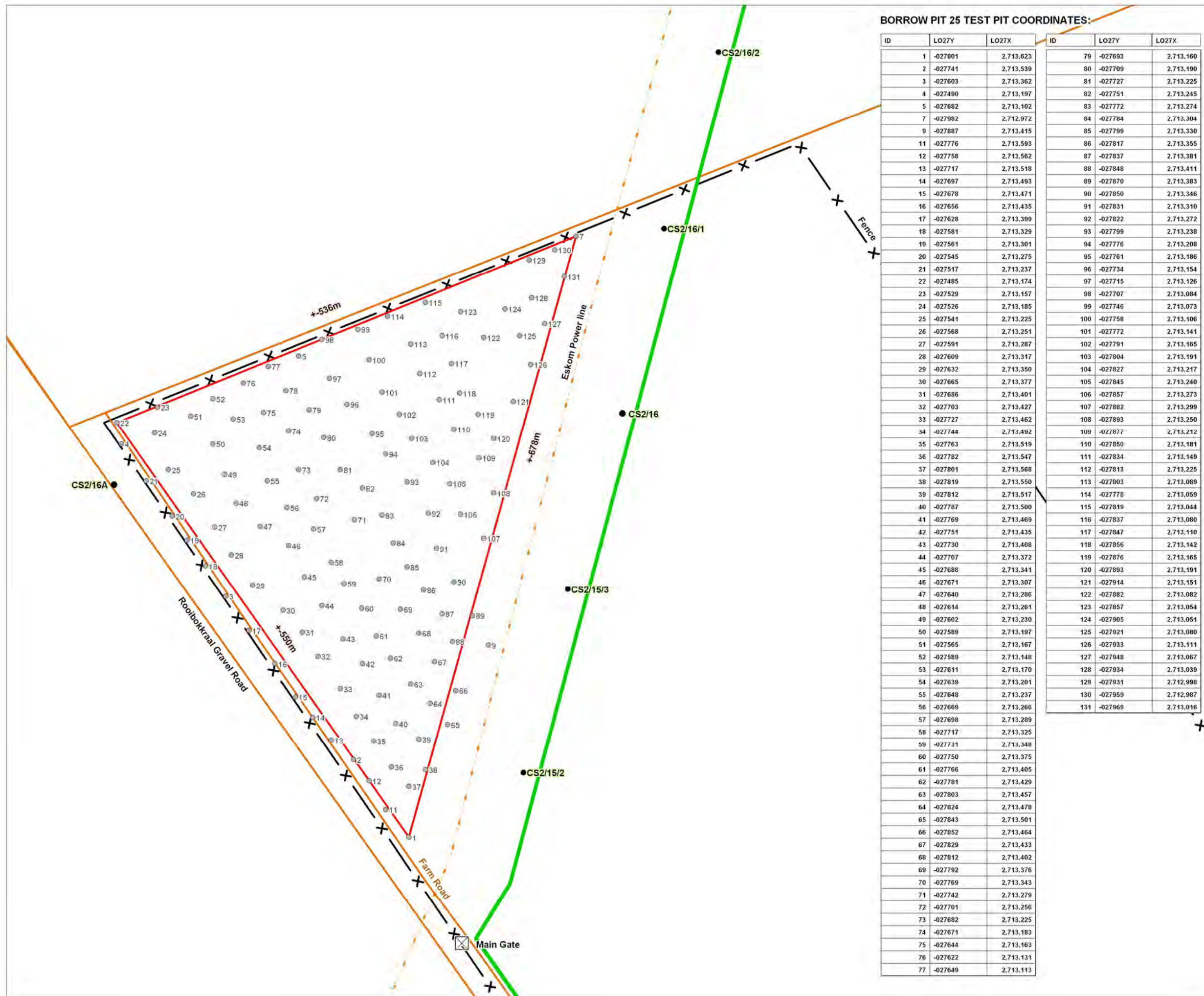
PREPARED FOR:

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PROJECT:
Mokolo and Crocodile Water Augmentation Project (MCWAP)

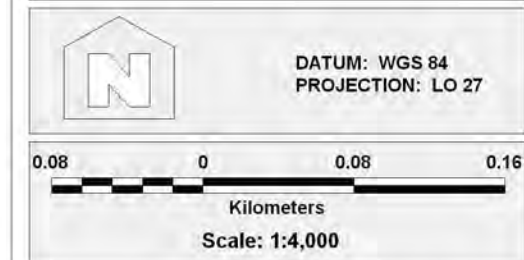
DRAWING TITLE:
Borrow Pit 25 Extension Layout Plan

DRAWING NR:
25_2



BORROW PIT DESCRIPTION:

Description	Borrowpit_25
Location of Borrow pit	X2713313 Y-27740
Shortest distance relative to pipeline	+20 m
Distance to access road	+150 m
Farm name	Mecklenburg 310KQ
Farm number	Ptn RE/1/310
Owner name	Johan Prinsloo
Contact details: Mobile no	0828051852
Estimated quantity (m³)	370000
Suitability of the material	Sand



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TCTA
A new world for water

PROJECT:

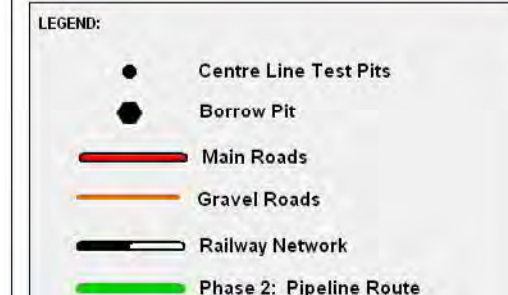
**Mokolo and Crocodile Water
Augmentation Project (MCWAP)**

DRAWING TITLE:

**Borrow Pit 25 Extension
Test Pit Positions**

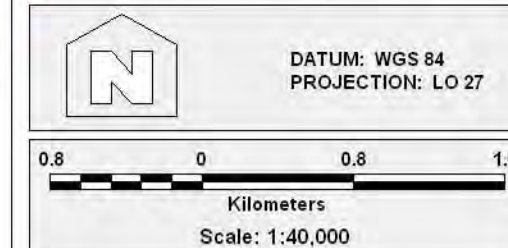
DRAWING NR:

25_3



BORROW PIT DESCRIPTION:

Description	Borrowpit_30Ext
Location of Borrow pit	X2705490 Y-34122
Shortest distance relative to pipeline	+52.7 m
Distance to access road	+7.85 km (from R510)
Farm name	Karoobult 126KQ
Farm number	Ptn of 126
Owner name	P Visser
Contact details: Mobile no	0827166702
Estimated quantity (m ³)	170000
Suitability of the material	Sand



PREPARED BY:

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Consultants

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Engineering & Construction

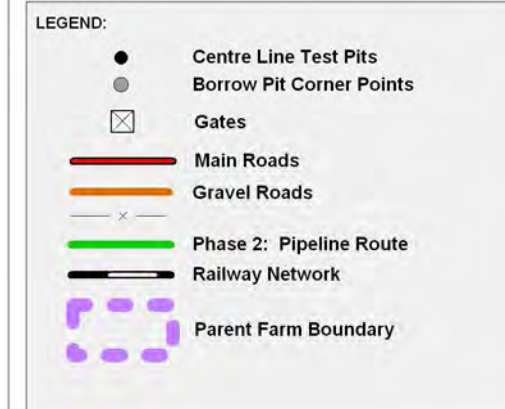
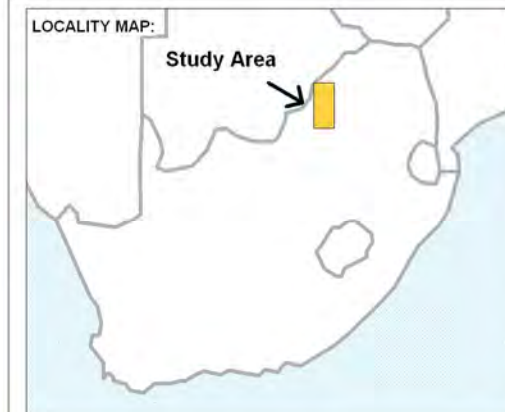
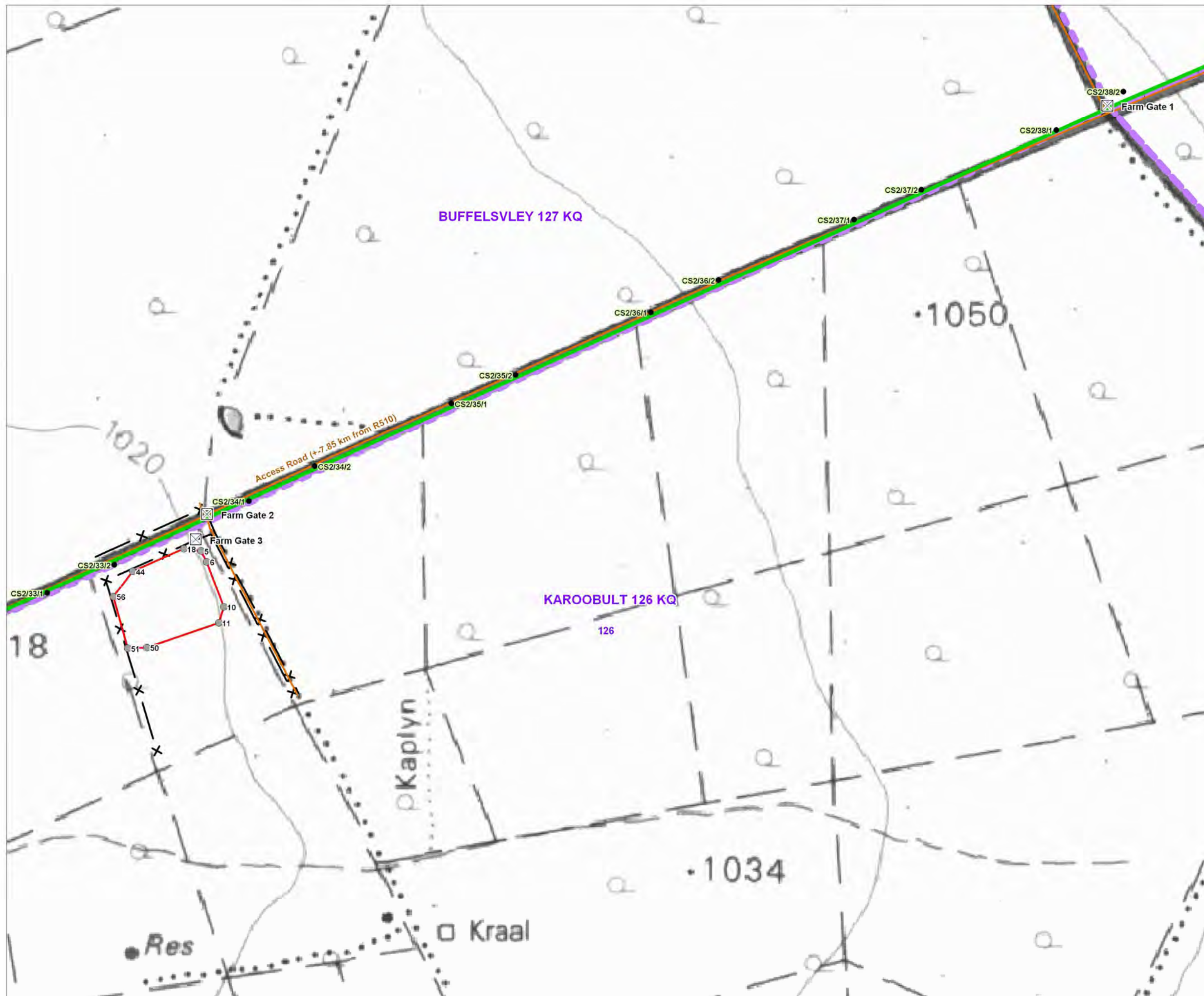
PREPARED FOR:

TCTA
A NEW WAY TO WATER

PROJECT:
Mokolo and Crocodile Water Augmentation Project (MCWAP)

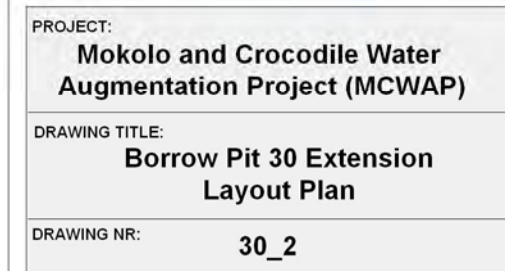
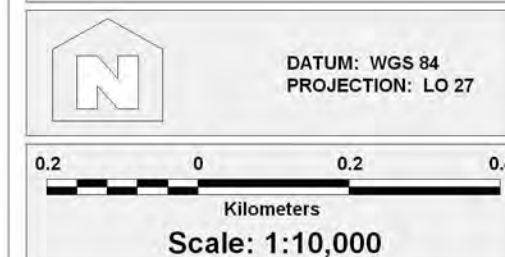
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Borrow Pit 30 Extension Locality Plan

DRAWING NR:
30_1



BORROW PIT DESCRIPTION:

Description	Borrowpit_30Ext
Location of Borrow pit	X2705490 Y-34122
Shortest distance relative to pipeline	+52.7 m
Distance to access road	+7.85 km (from R510)
Farm name	Karoobult 126KQ
Farm number	Ptn of 126
Owner name	P Visser
Contact details: Mobile no	0827166702
Estimated quantity (m³)	170000
Suitability of the material	Sand





BORROW PIT 30 TEST PIT COORDINATES:

ID	LO27Y	LO27X
1	-034126	2705490
2	-033909	2705590
3	-033957	2705854
4	-034274	2705650
5	-034148	2705515
6	-034163	2705544
7	-034172	2705578
8	-034181	2705612
9	-034199	2705637
10	-034210	2705667
11	-034196	2705710
12	-034168	2705698
13	-034174	2705656
14	-034168	2705629
15	-034155	2705597
16	-034155	2705568
17	-034134	2705537
18	-034101	2705509
19	-034061	2705527
20	-034083	2705562
21	-034095	2705583
22	-034128	2705599
23	-034127	2705635
24	-034132	2705673
25	-034143	2705719
26	-034119	2705734
27	-034108	2705681
28	-034094	2705652
29	-034085	2705624
30	-034066	2705592
31	-034034	2705559
32	-034001	2705571
33	-034017	2705593
34	-034019	2705623
35	-034046	2705641
36	-034054	2705672
37	-034070	2705692
38	-034068	2705735
39	-034033	2705752
40	-034037	2705703
41	-034023	2705663
42	-033992	2705643
43	-033976	2705604
44	-033963	2705570
45	-033939	2705611
46	-033965	2705642
47	-033977	2705675
48	-033987	2705708
49	-034000	2705736
50	-034001	2705777
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53	-033936	2705715
54	-033923	2705690
56	-033911	2705639

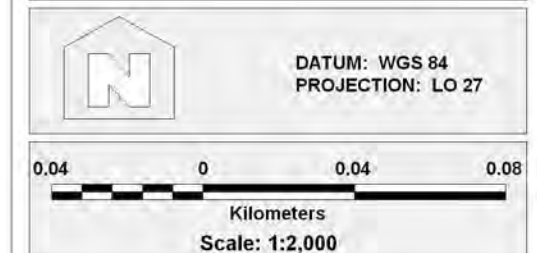


LEGEND:

- Centre Line Test Pits
- Test Pits
- ⊠ Gates
- Borrow Pit Border
- Gravel Road
- Fence
- Railway Line
- Phase 2: Pipeline Route

BORROW PIT DESCRIPTION:

Description	Borrowpit_30Ext
Location of Borrow pit	X2705490 Y-34122
Shortest distance relative to pipeline	+52.7 m
Distance to access road	+7.85 km (from R510)
Farm name	Karobult 126KQ
Farm number	Ptn of 126
Owner name	P Visser
Contact details: Mobile no	0827166702
Estimated quantity (m³)	170000
Suitability of the material	Sand



PREPARED BY:

MOKOLO CROCODILE Consultants

GEOSTRADA Engineering & Construction

PREPARED FOR:

TCTA

A NEW WORLD FOR WATER

PROJECT:

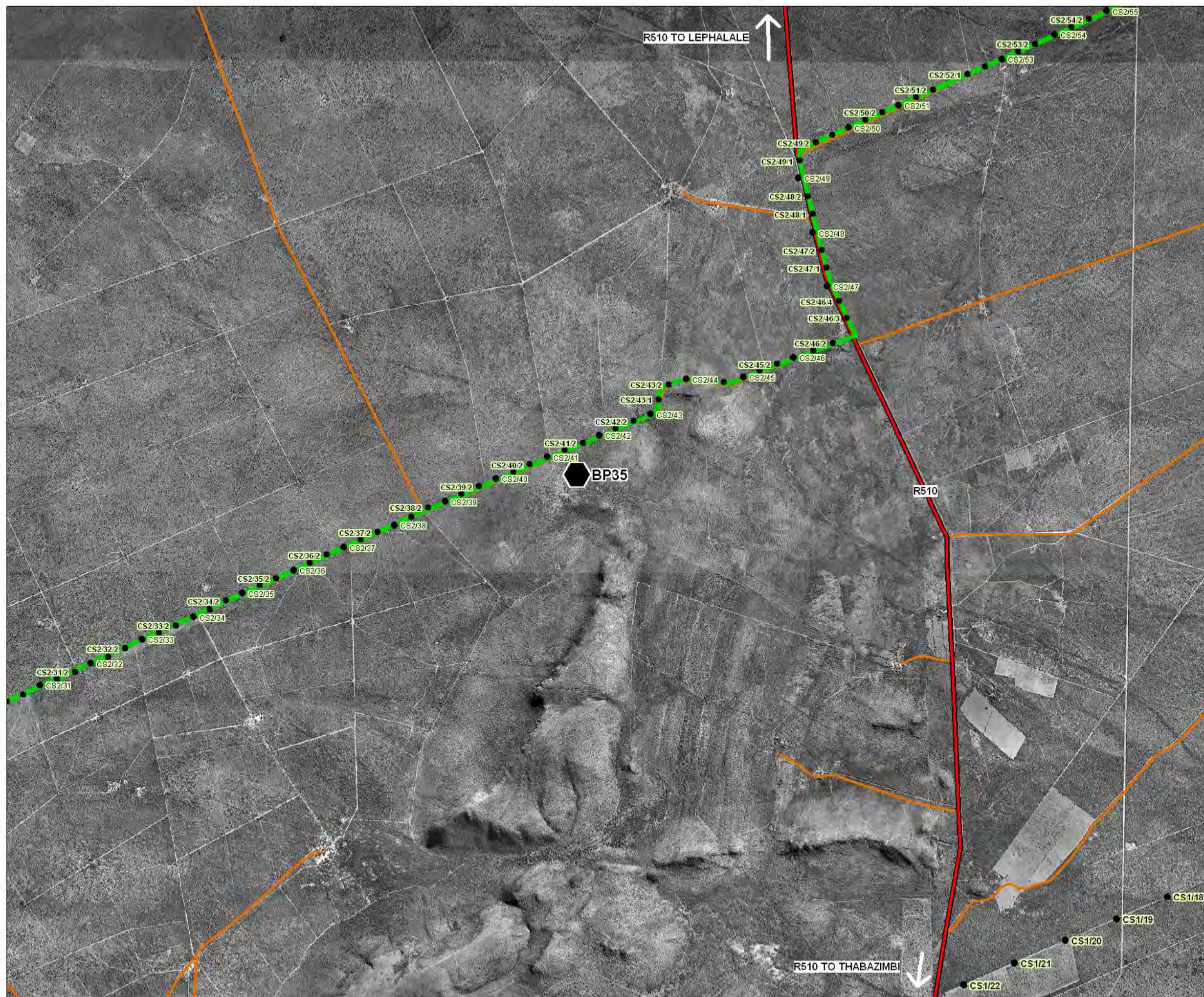
Mokolo and Crocodile Water Augmentation Project (MCWAP)

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Borrow Pit 30 Extension Test Pit Positions

DRAWING NR:

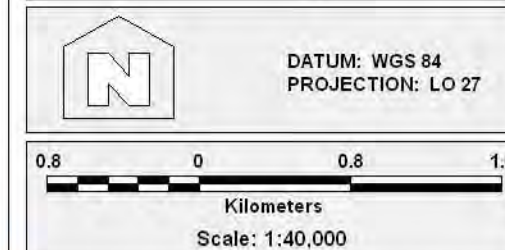
30_3



- LEGEND:
- Centre Line Test Pits
 - ⬡ Borrow Pit
 - Main Roads
 - Gravel Roads
 - Railway Network
 - Phase 2: Pipeline Route

BORROW PIT DESCRIPTION:

Description	Borrowpit_35
Location of Borrow pit	X2703766 Y:38204
Shortest distance relative to pipeline	+86 m
Distance to access road	+3.7 km (from R510)
Farm name	Leeuwbosch 129KQ
Farm number	Ptn 1/129
Owner name	Coetzee
Contact details: Mobile no	0797935180
Estimated quantity (m³)	65000
Suitability of the material	Sand



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Consultants

GEOSTRADA
Engineering & Construction Services

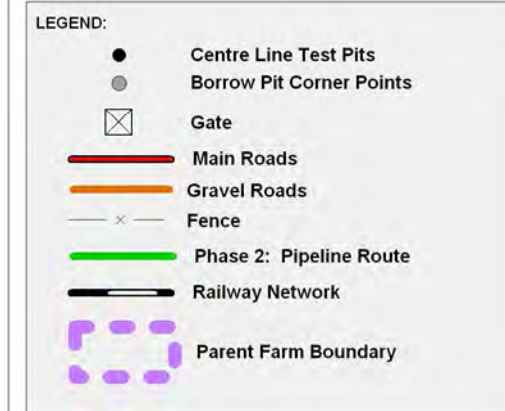
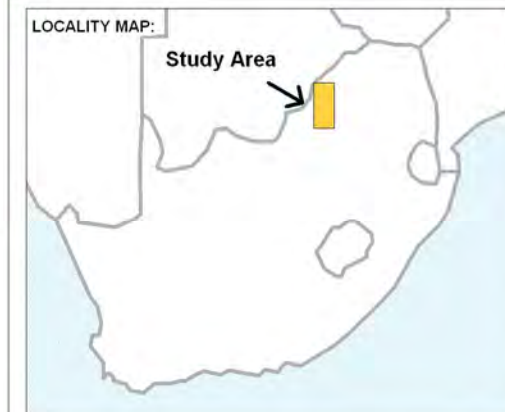
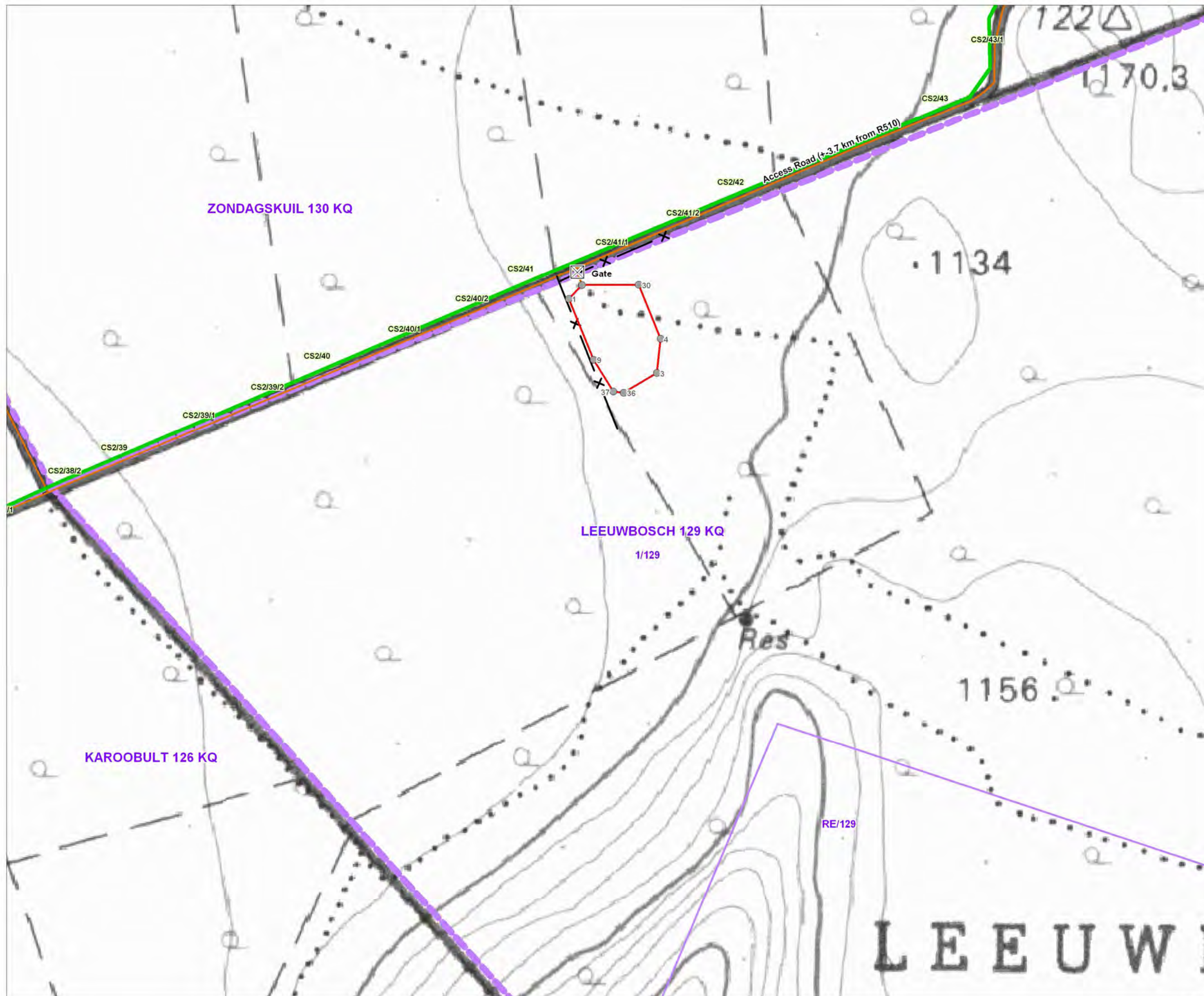
PREPARED FOR:

TCTA
A NEW WAY TO WATER

PROJECT:
Mokolo and Crocodile Water Augmentation Project (MCWAP)

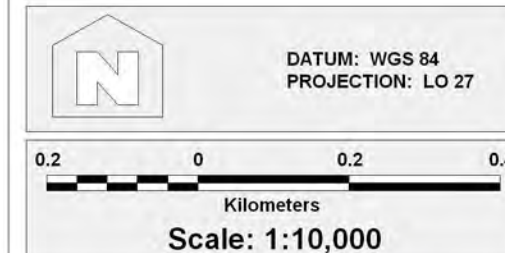
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**Borrow Pit 35 Extension
Locality Plan**

DRAWING NR:
35_1



BORROW PIT DESCRIPTION:

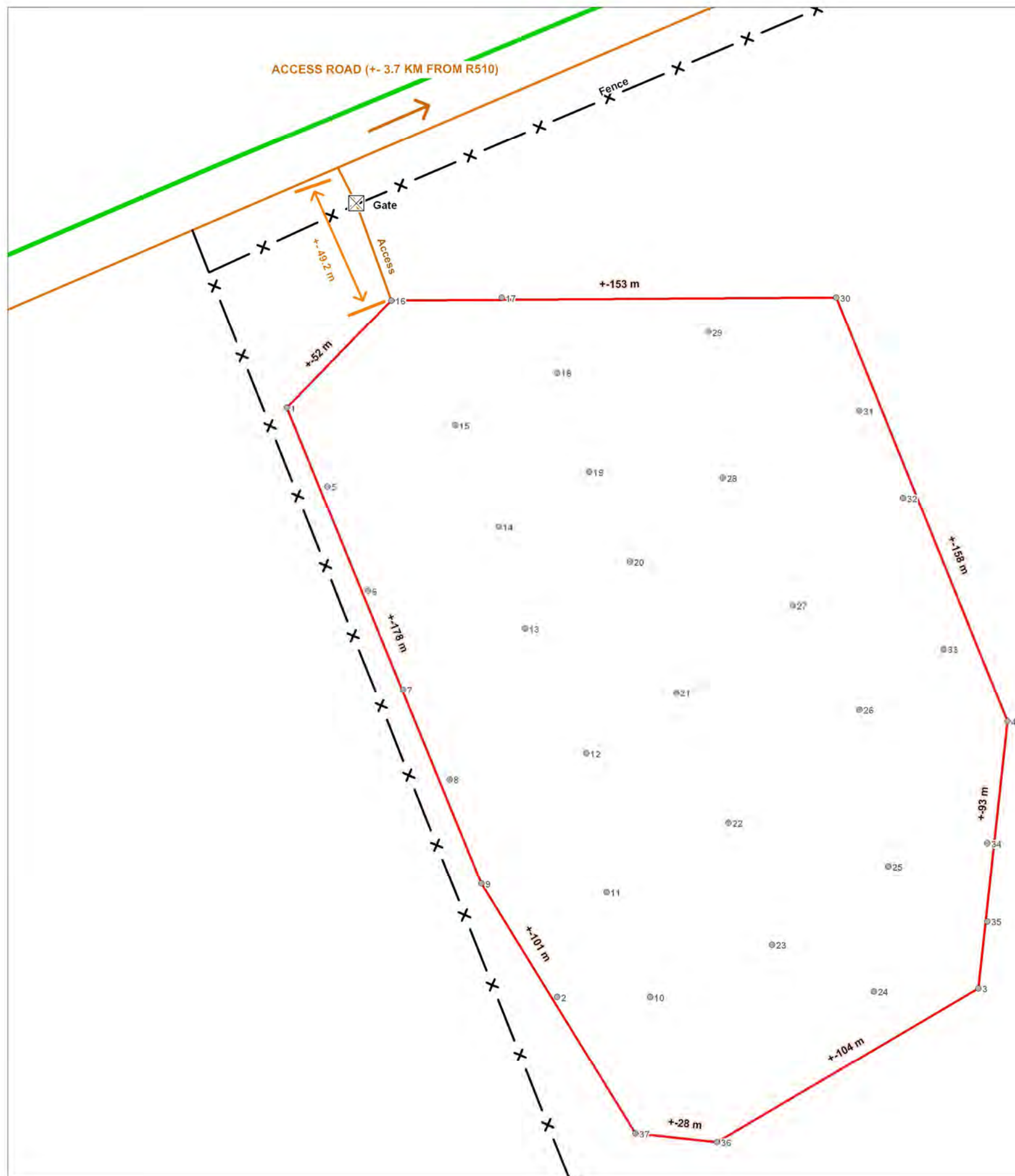
Description	Borrowpit_35
Location of Borrow pit	X2703766 Y-38204
Shortest distance relative to pipeline	+86 m
Distance to access road	+3.7 km (from R510)
Farm name	Leeuwbosch 129KQ
Farm number	Ptn 1/129
Owner name	Coetzee
Contact details: Mobile no	0797935180
Estimated quantity (m³)	65000
Suitability of the material	Sand



PROJECT:
Mokolo and Crocodile Water Augmentation Project (MCWAP)

DRAWING TITLE:
Borrow Pit 35 Extension Layout Plan

DRAWING NR:
35_2



BORROW PIT 35 TEST PIT COORDINATES:

ID	LO27Y	LO27X
1	-038007	2703809
2	-038100	2704012
3	-038245	2704009
4	-038255	2703917
5	-038021	2703836
6	-038035	2703872
7	-038047	2703906
8	-038063	2703937
9	-038074	2703973
10	-038132	2704012
11	-038117	2703976
12	-038110	2703928
13	-038089	2703885
14	-038080	2703850
15	-038065	2703815
16	-038043	2703772
17	-038081	2703771
18	-038100	2703797
19	-038111	2703831
20	-038125	2703862
21	-038141	2703907
22	-038159	2703952
23	-038174	2703994
24	-038209	2704010
25	-038214	2703967
26	-038204	2703913
27	-038181	2703877
28	-038157	2703833
29	-038152	2703783
30	-038196	2703771
31	-038204	2703810
32	-038219	2703840
33	-038233	2703892
34	-038248	2703959
35	-038248	2703986
36	-038155	2704062
37	-038127	2704059



LEGEND:

- Borrow Pit Test Pits
- Gate
- Borrow Pit Border
- Gravel Road
- Fence
- Railway Line
- Phase 2: Pipeline Route

BORROW PIT DESCRIPTION:

Description	Borrowpit_35
Location of Borrow pit	X2703766 Y-38204
Shortest distance relative to pipeline	+86 m
Distance to access road	+3.7 km (from R510)
Farm name	Leeuwbosch 129KQ
Farm number	Ptn 1/129
Owner name	Coetzee
Contact details: Mobile no	0797935180
Estimated quantity (m³)	65000
Suitability of the material	Sand

DATUM: WGS 84
PROJECTION: LO 27

0.04 0 0.04 0.08
Kilometers
Scale: 1:2,000

PREPARED BY:

MOKOLO CROCODILE Consultants
GEOSTRADA Engineering, Consulting, Construction

PREPARED FOR:

TCTA
A new world for water

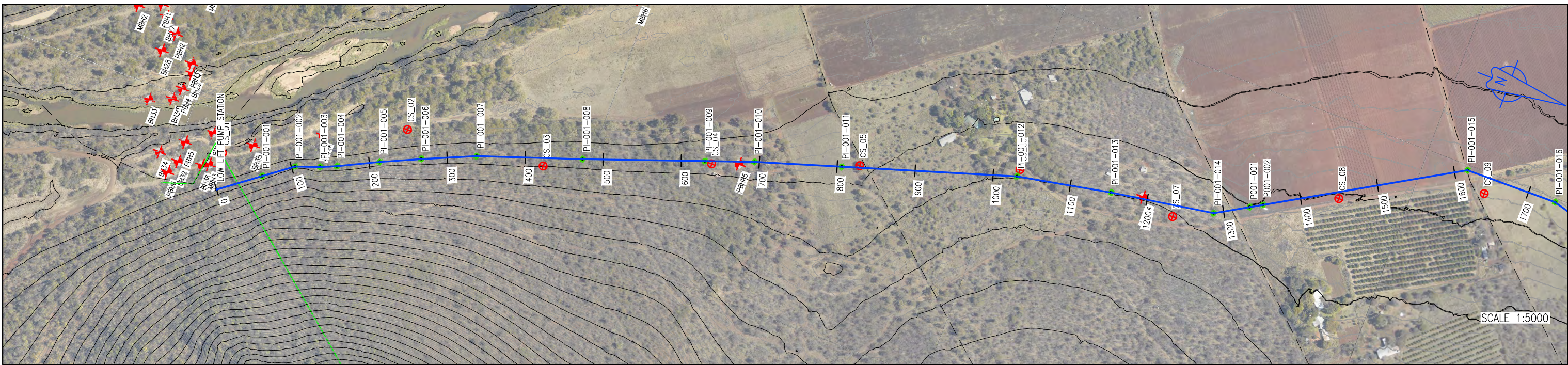
PROJECT:
Mokolo and Crocodile Water Augmentation Project (MCWAP)

DRAWING TITLE:
Borrow Pit 35 Extension Test Pit Positions

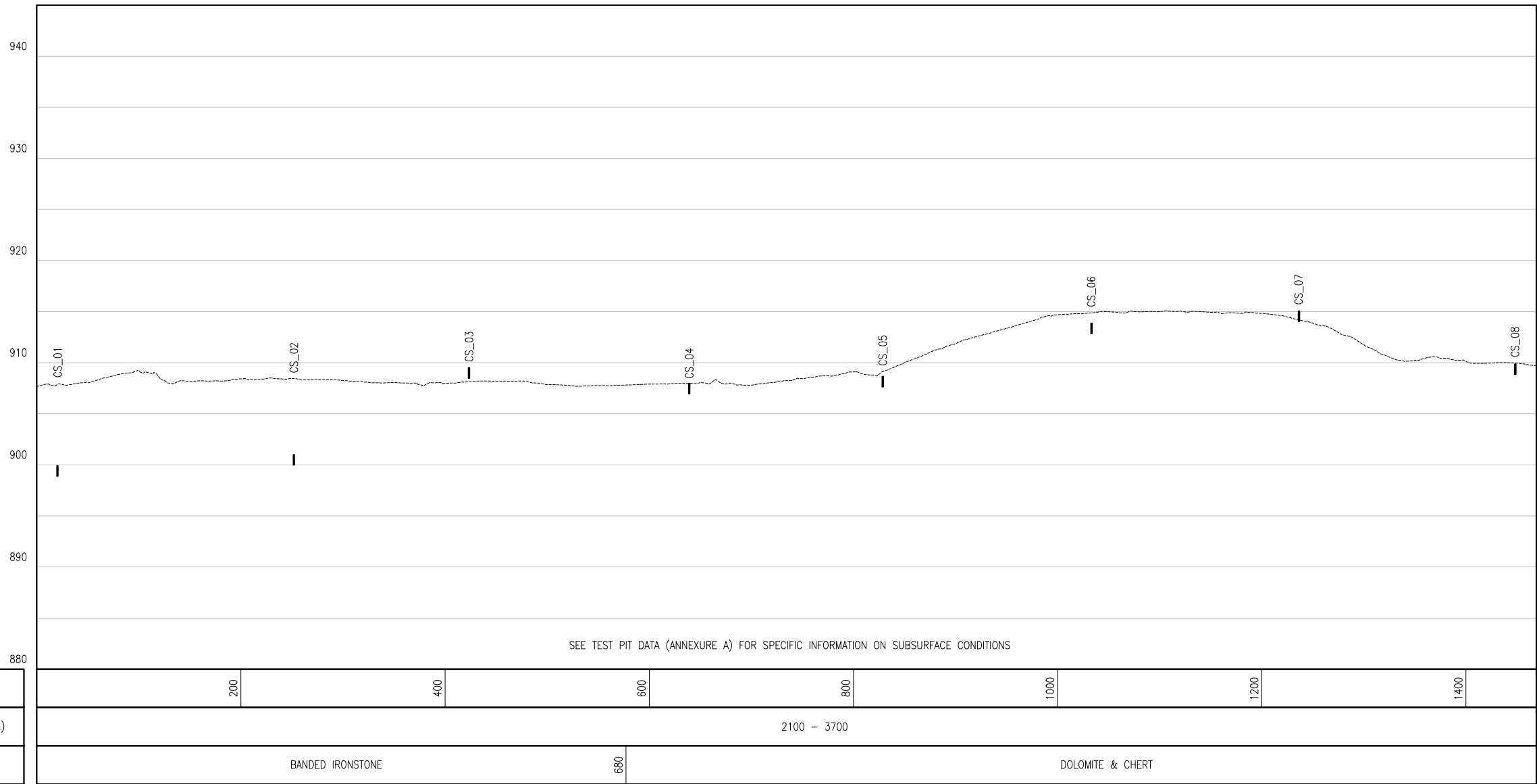
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35_3

ANNEXURE E

GEOTECHNICAL MAPS



SCALE 1:5000





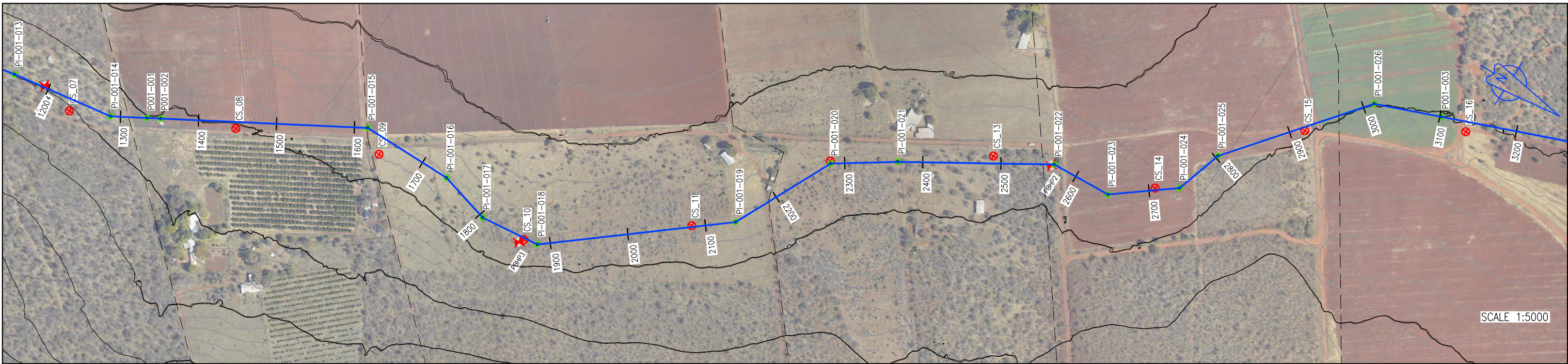
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CHAINAGE (m)
REFUSAL DEPTH RANGE (mm)
GEOLOGY

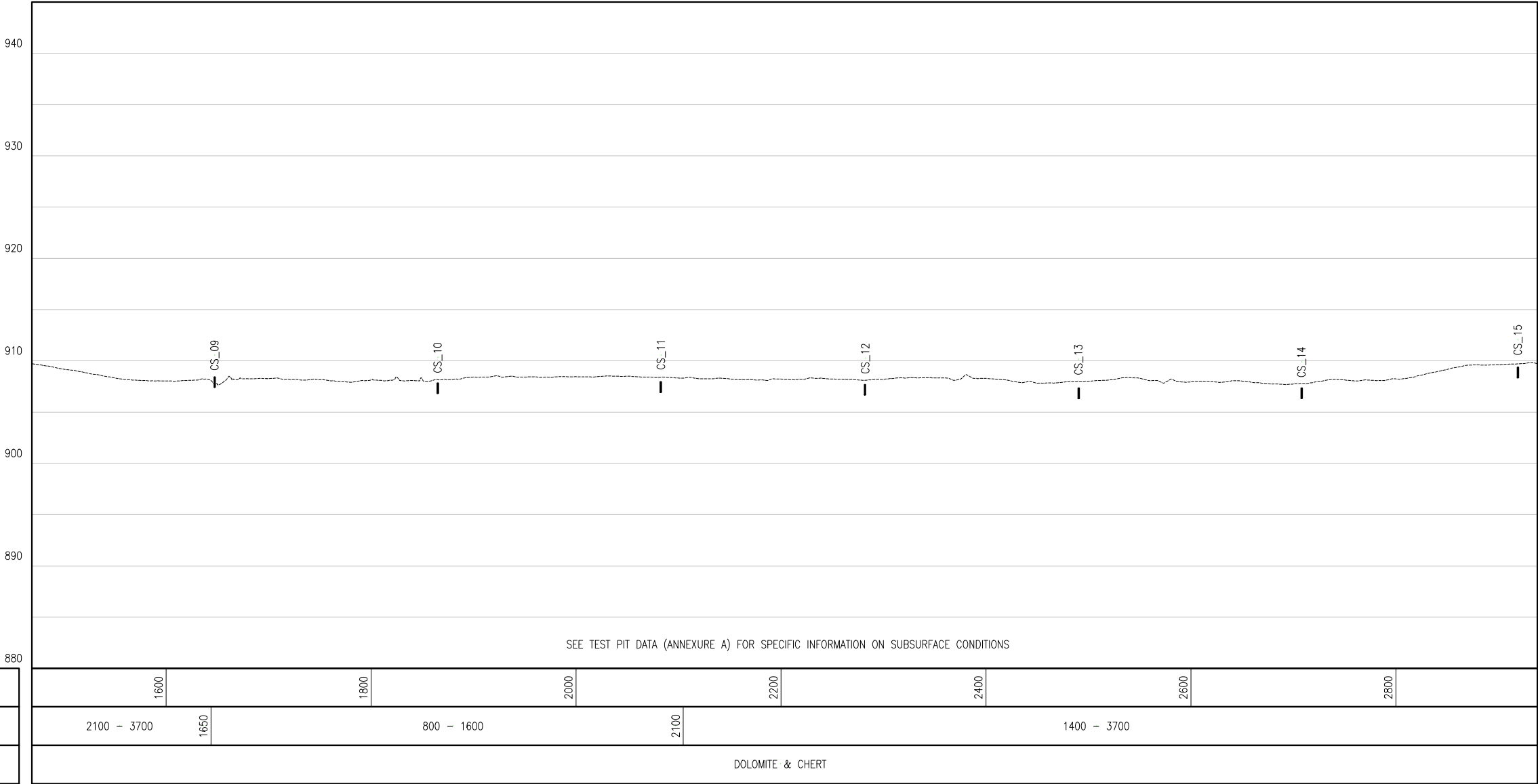
LEGEND:

- CHAINAGE MARKER (PLAN ONLY)
- POINT OF INTERSECTION (PI)
- TEST PIT
- BOREHOLE
- PIPELINE
- OVERHEAD POWERLINE
- FARM BOUNDARY
- FARM PORTION BOUNDARY
- CROSSING - SURFACED ROAD
- CROSSING - GRAVEL ROAD
- CROSSING - PRIVATE DIRT ROAD
- CROSSING - POWERLINE
- AREA OF INTERMITTENT OUTCROP
- AREA OF OUTCROP
- AREA OF IMPEDED DRAINAGE
- POTENTIAL BORROW PIT
- EXISTING BORROW PIT / SPOIL SITE

REFERENCE DRAWINGS		REVISIONS				DESIGNED:		PROJECT ENGINEER:	P LE ROUX		MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)			
DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:			GEOTECHNICAL PROFILE STAGE 2: LOW LIFT PUMP STATION TO HIGH LIFT PUMP STATION			
		A	24/02/11	FOR INFORMATION		CHECKED:	J MULDER				PLAN & LONG SECTION			
						CHIEF DESIGNER:	E SERFONTEIN	SCALE:	AS SHOWN					
						<div>SCALE: 1:500</div> <div>0 2,5 5 10 15 20 25</div>					A3 DWAF DRG. No. DRAWING NUMBER 2C - G7 - 001 REV No. A			
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SCALE 1:5000







SCALE HOR 1:5000
VERT 1:500

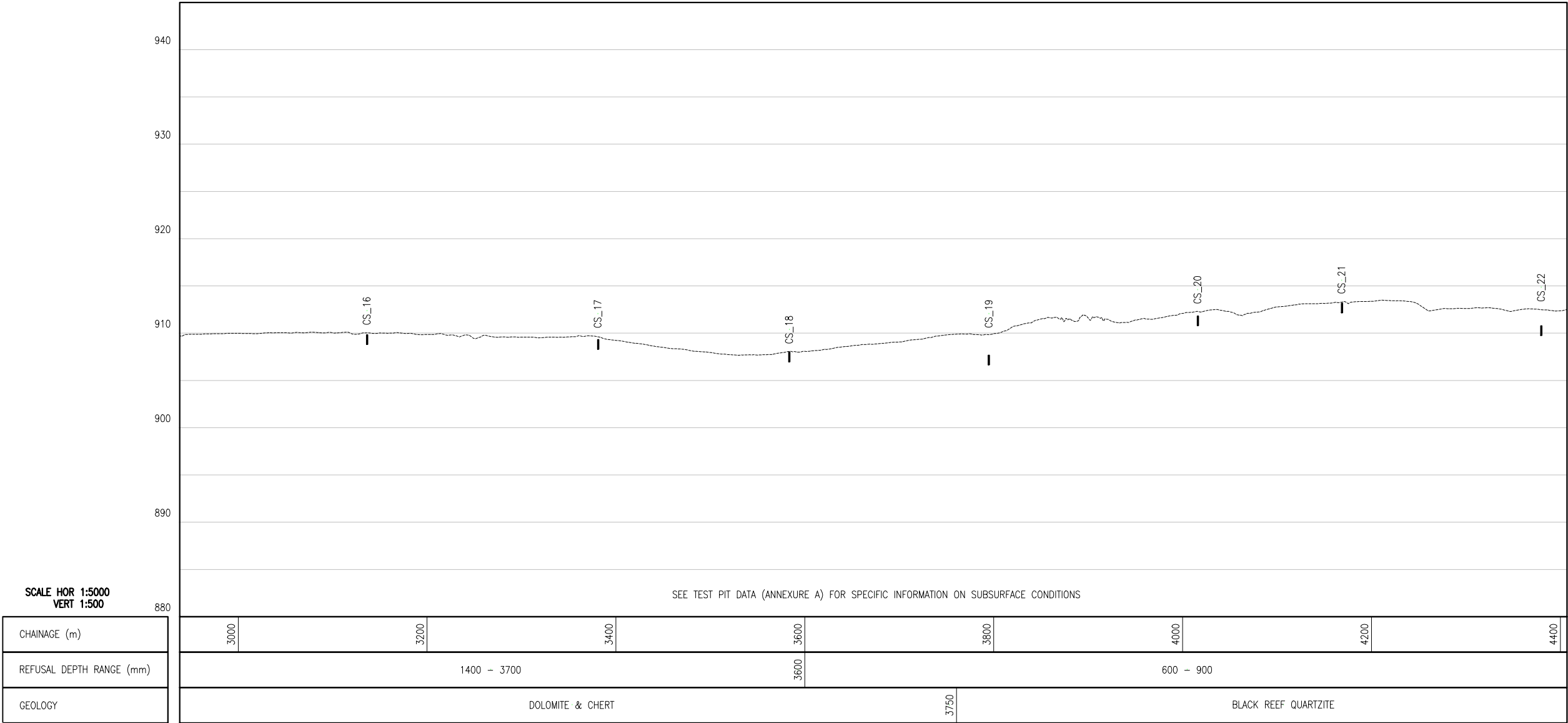
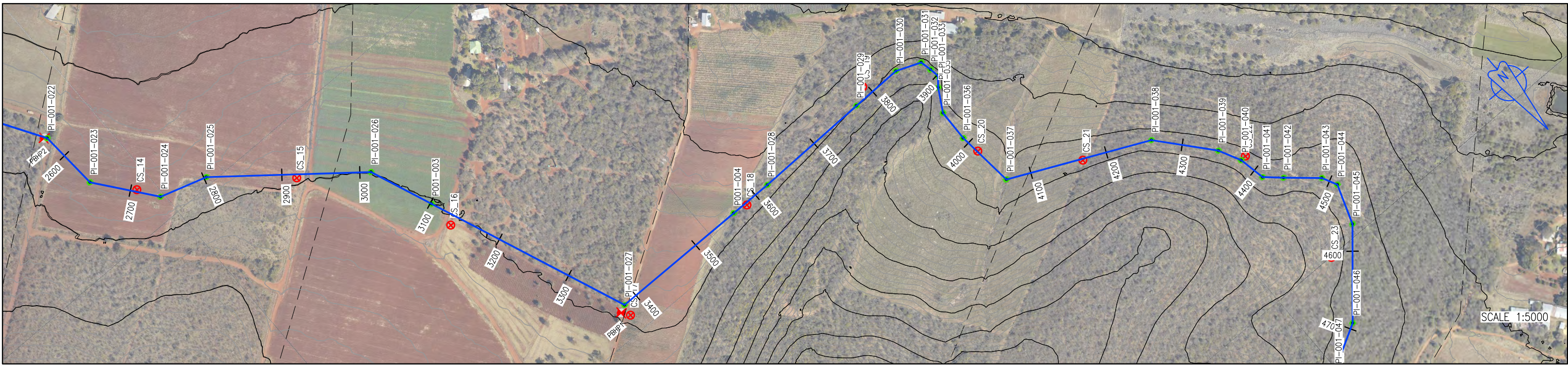
CHAINAGE (m)
REFUSAL DEPTH RANGE (mm)
GEOLOGY

1600	1800	2000	2200	2400	2600	2800
2100 - 3700	1650	800 - 1600	2100	1400 - 3700		
DOLOMITE & CHERT						

LEGEND:

- CHAINAGE MARKER (PLAN ONLY)
- POINT OF INTERSECTION (PI)
- TEST PIT
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- PIPELINE
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- FARM BOUNDARY
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DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:			GEOTECHNICAL PROFILE STAGE 2: LOW LIFT PUMP STATION TO HIGH LIFT PUMP STATION				
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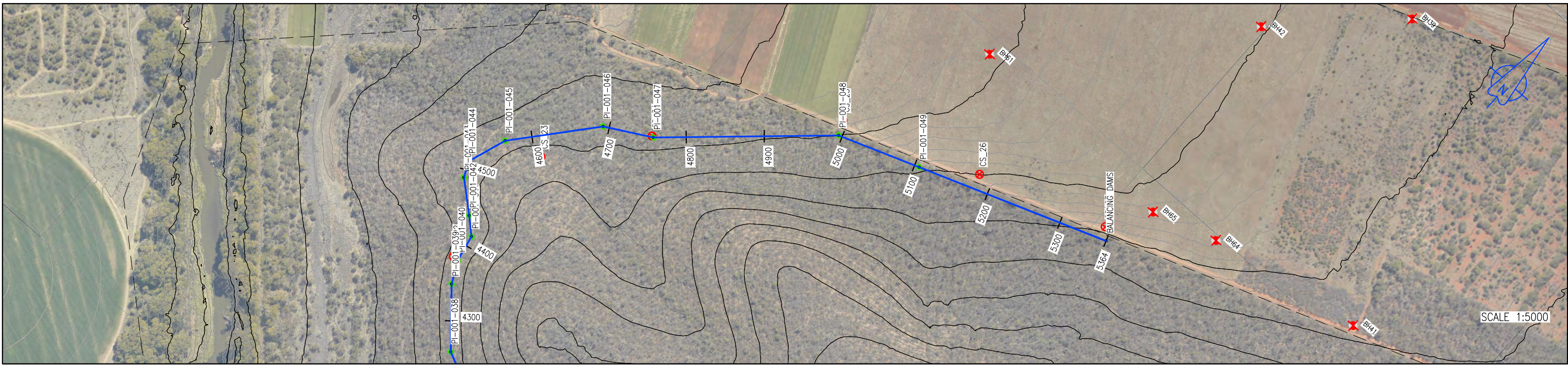
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- POINT OF INTERSECTION (PI)
- TEST PIT
- BOREHOLE
- PIPELINE
- OVERHEAD POWERLINE
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- POTENTIAL BORROW PIT
- EXISTING BORROW PIT / SPOIL SITE

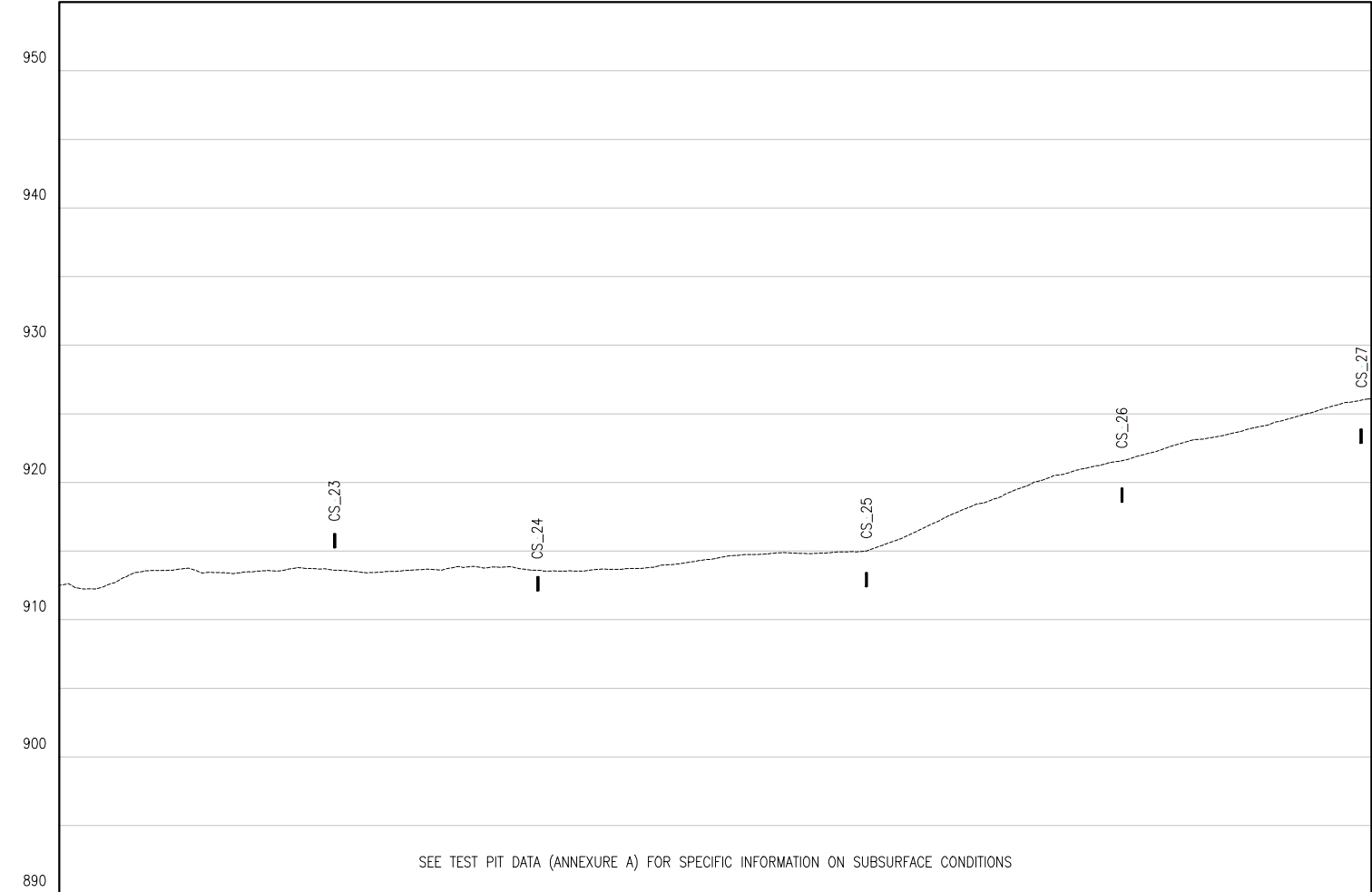
CHAINAGE (m)
REFUSAL DEPTH RANGE (mm)
GEOLOGY

3000	3200	3400	3600	3800	4000	4200	4400
1400 - 3700			3600	600 - 900			
DOLOMITE & CHERT				3750	BLACK REEF QUARTZITE		

REFERENCE DRAWINGS		REVISIONS				DESIGNED:		PROJECT ENGINEER:	P LE ROUX		MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)			
DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:			GEOTECHNICAL PROFILE STAGE 2: LOW LIFT PUMP STATION TO HIGH LIFT PUMP STATION			
		A	24/02/11	FOR INFORMATION		CHECKED:	J MULDER				PLAN & LONG SECTION			
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						SCALE: 1:500								
						SCALE: 1:5000								
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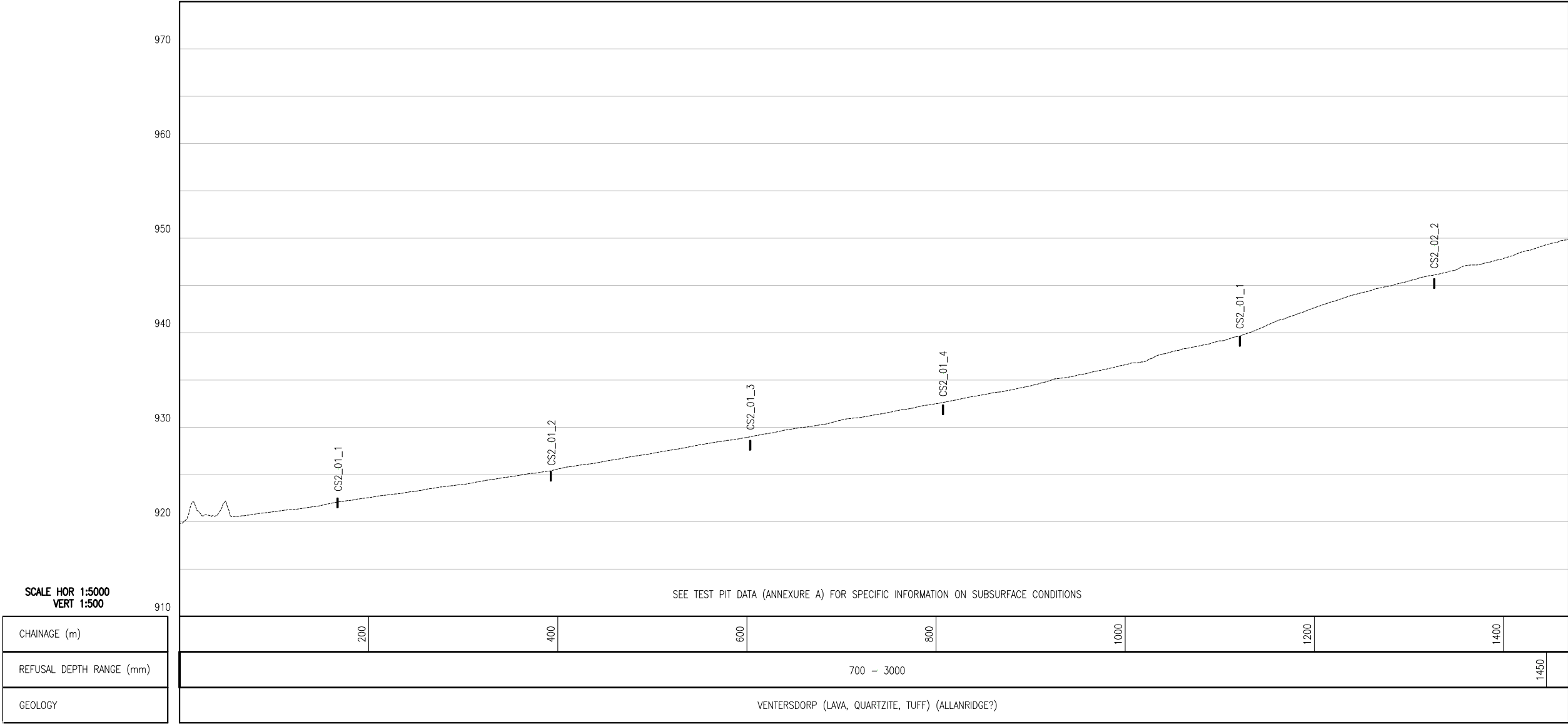
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VERT 1:500

CHAINAGE (m)	4500	4600	4800	5000	5200	5400
REFUSAL DEPTH RANGE (mm)	600 - 900	4600	3300 - 4000	5400		
GEOLOGY	BLACK REEF QUARTZITE	VENTERSDORP (LAVA, QUARTZITE, TUFF) (ALLANRIDGE?)				

LEGEND:



- CHAINAGE MARKER (PLAN ONLY)
- POINT OF INTERSECTION (PI)
- TEST PIT
- BOREHOLE
- PIPELINE
- OVERHEAD POWERLINE
- FARM BOUNDARY
- FARM PORTION BOUNDARY
- CROSSING - SURFACED ROAD
- CROSSING - GRAVEL ROAD
- CROSSING - PRIVATE DIRT ROAD
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- AREA OF OUTCROP
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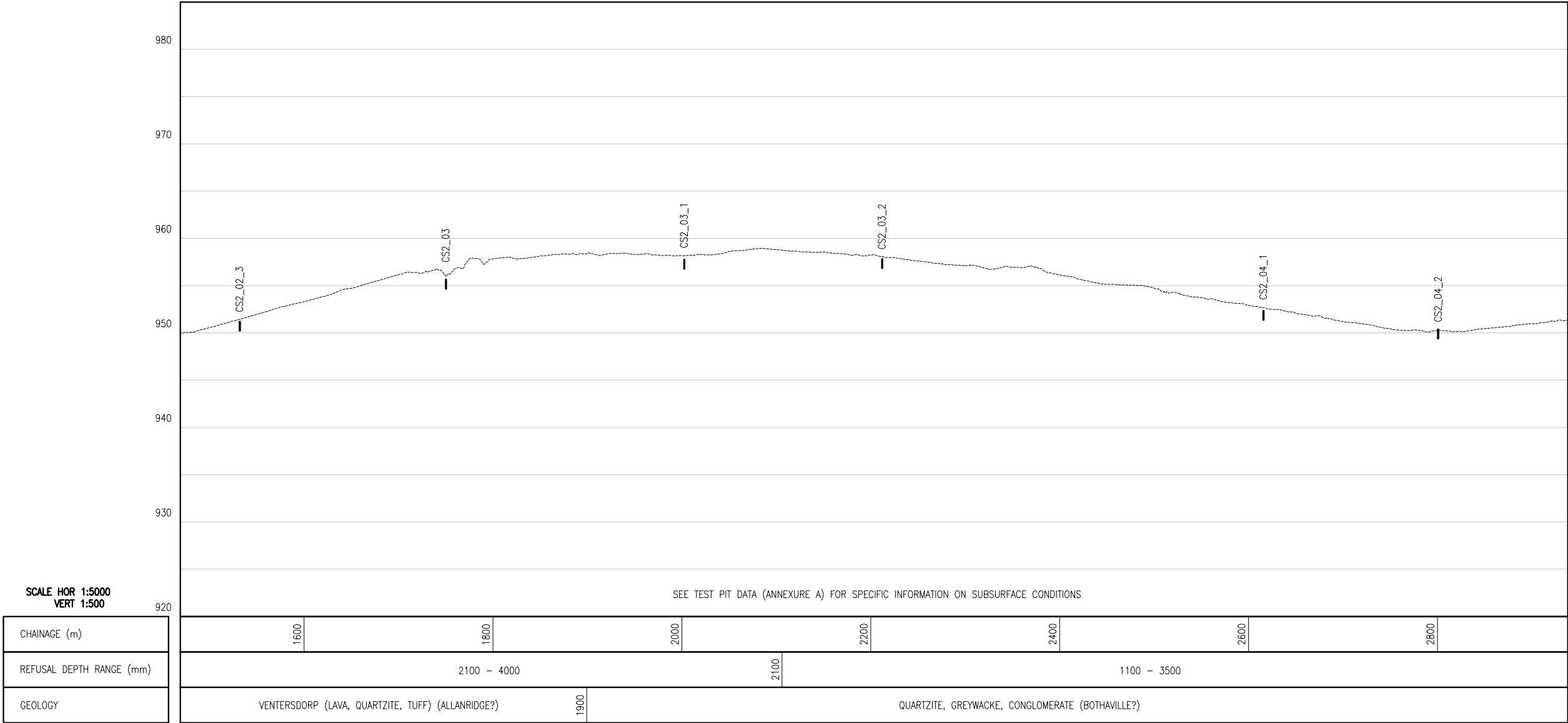
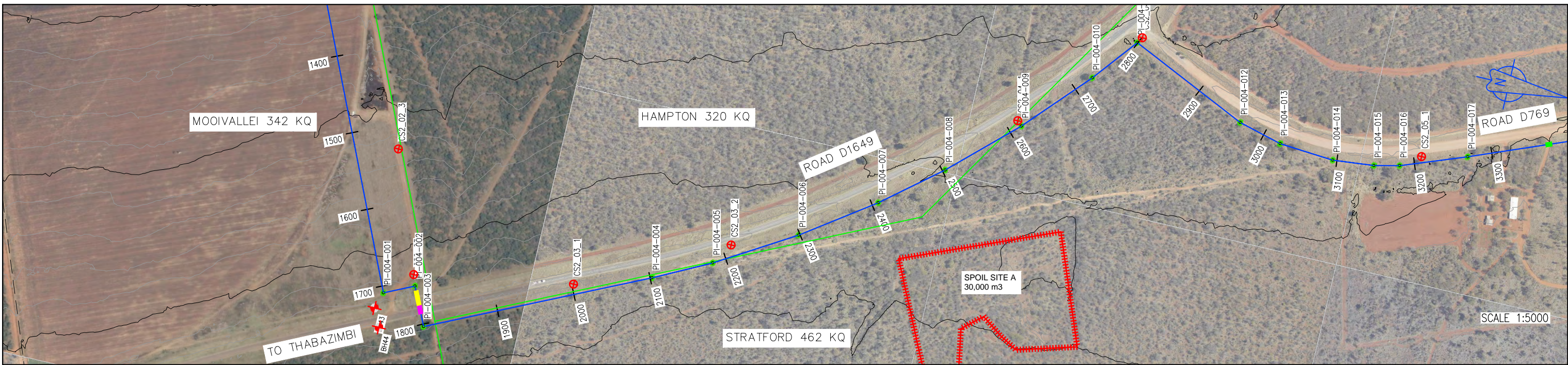
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DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:			GEOTECHNICAL PROFILE STAGE 2: LOW LIFT PUMP STATION TO HIGH LIFT PUMP STATION					
		A	24/02/11	FOR INFORMATION		CHECKED:	J MULDER				PLAN & LONG SECTION					
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							SCALE: 1:5000									
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LEGEND:





- CHAINAGE MARKER (PLAN ONLY)
- POINT OF INTERSECTION (PI)
- TEST PIT
- BOREHOLE
- PIPELINE
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- FARM PORTION BOUNDARY
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- EXISTING BORROW PIT / SPOIL SITE

REFERENCE DRAWINGS			REVISIONS				DESIGNED:		PROJECT ENGINEER:	P LE ROUX		MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)				
DRG. No.	TITLE		REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:			GEOTECHNICAL PROFILE STAGE 2: HIGH LIFT PUMP STATION TO TARANTAALPAN				
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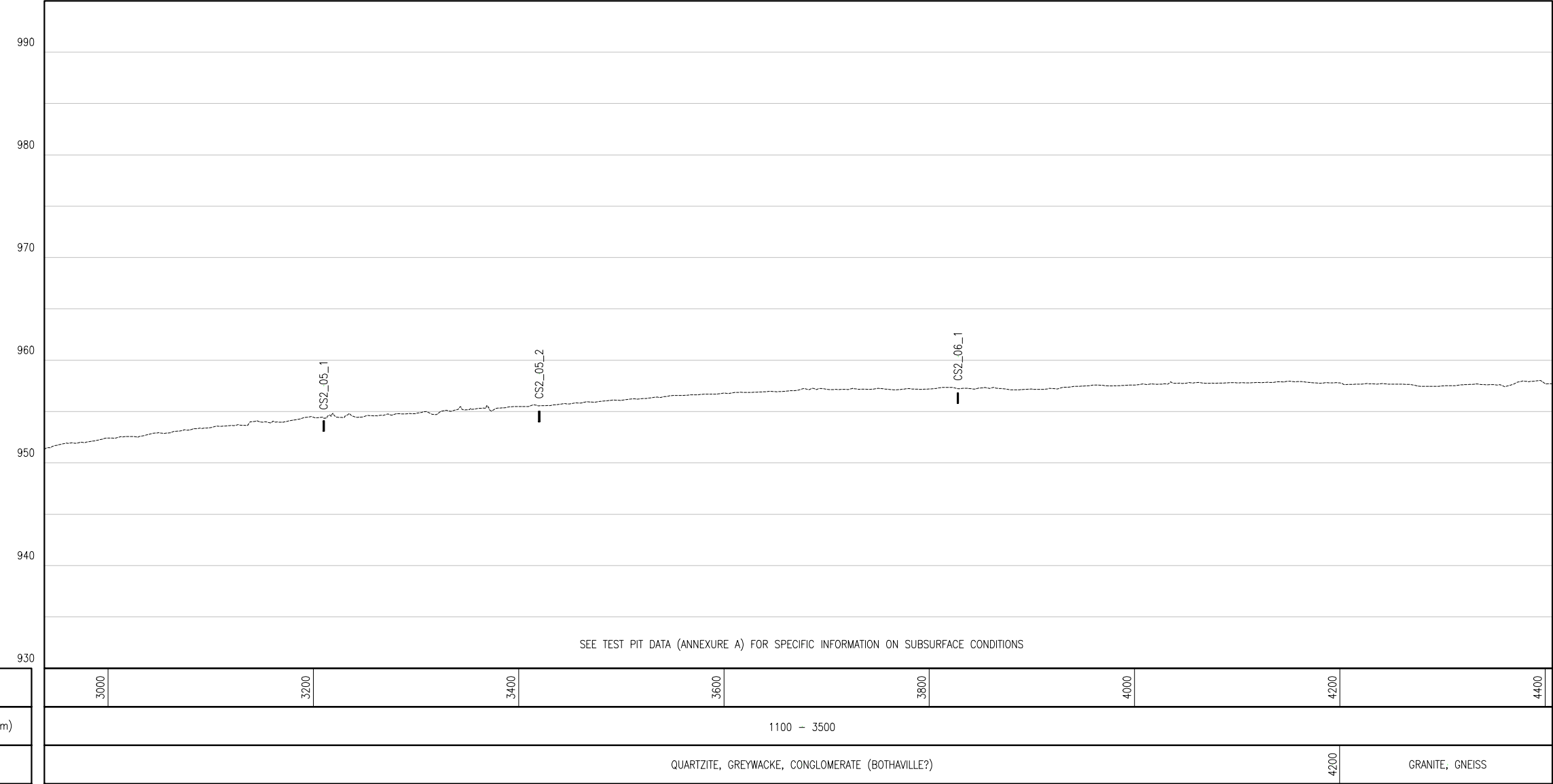
LEGEND:

- CHAINAGE MARKER (PLAN ONLY)
- POINT OF INTERSECTION (PI)
- TEST PIT
- BOREHOLE
- PIPELINE
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- AREA OF OUTCROP
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- POTENTIAL BORROW PIT
- EXISTING BORROW PIT / SPOIL SITE

REFERENCE DRAWINGS		REVISIONS				DESIGNED:		PROJECT ENGINEER:	P LE ROUX		MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)				
DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:			GEOTECHNICAL PROFILE STAGE 2: HIGH LIFT PUMP STATION TO TARANTAALPAN				
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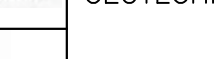


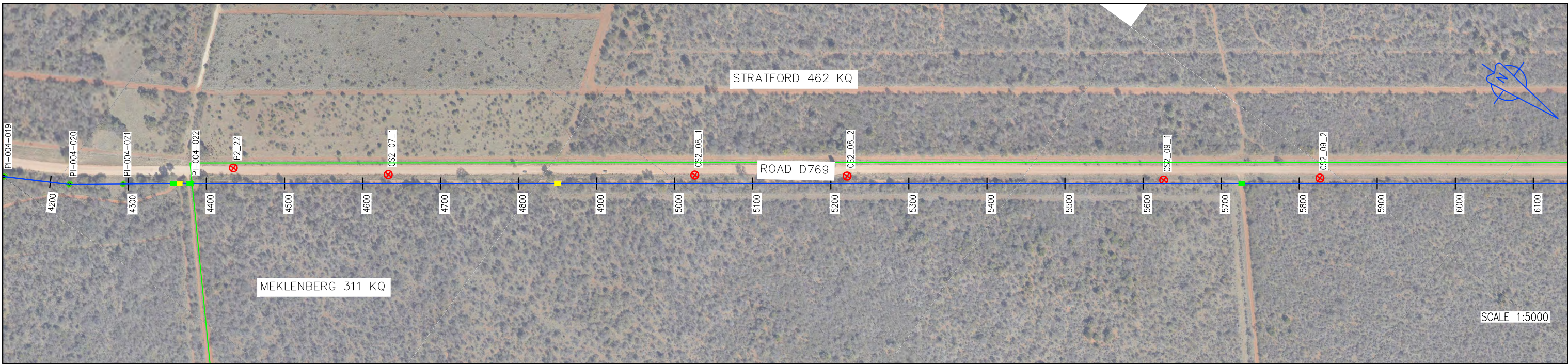
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CHAINAGE (m)
REFUSAL DEPTH RANGE (mm)
GEOLOGY

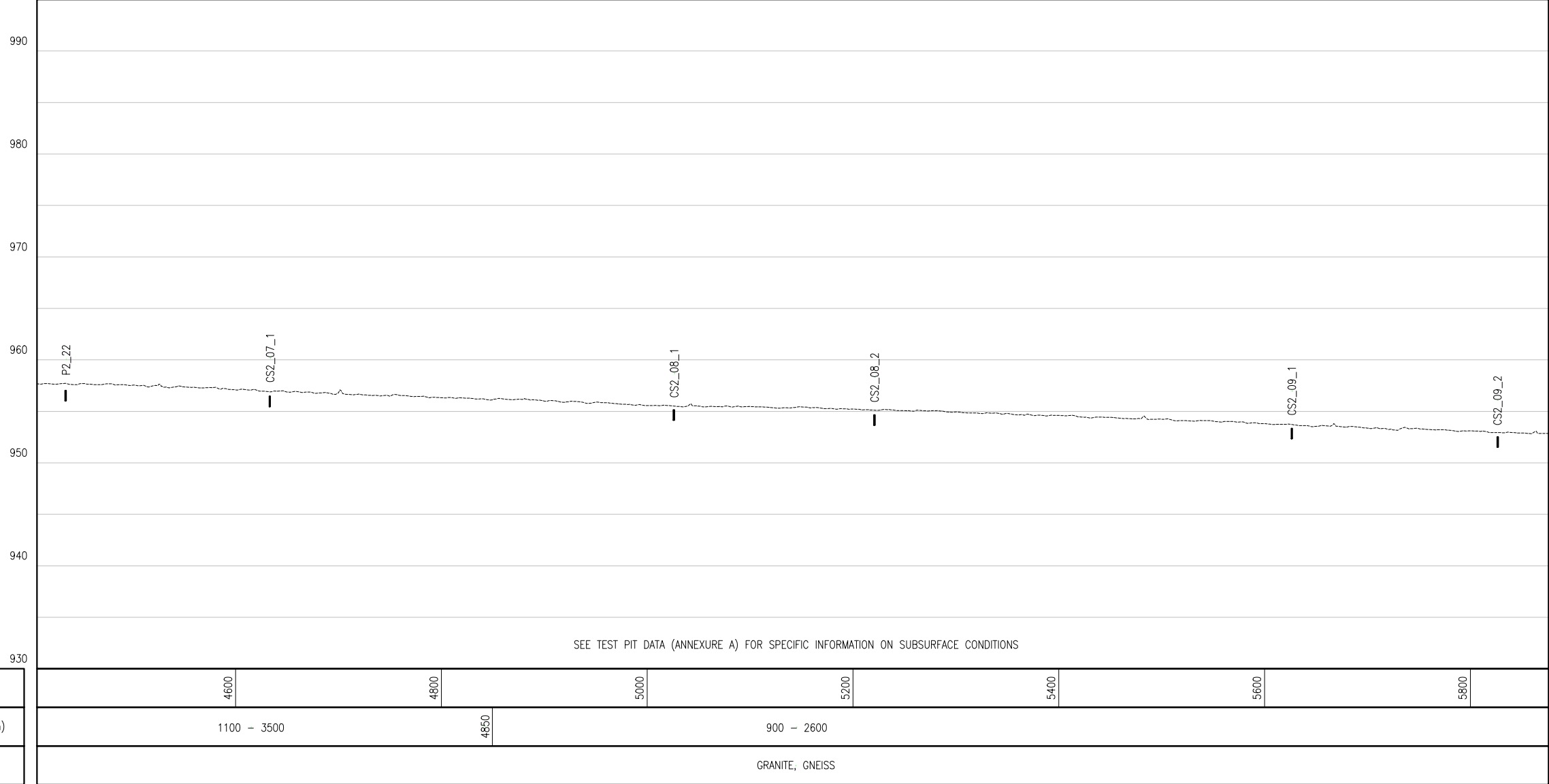
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- CHAINAGE MARKER (PLAN ONLY)
- POINT OF INTERSECTION (PI)
- TEST PIT
- BOREHOLE
- PIPELINE
- OVERHEAD POWERLINE
- FARM BOUNDARY
- FARM PORTION BOUNDARY
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REFERENCE DRAWINGS		REVISIONS				DESIGNED:		PROJECT ENGINEER:	P LE ROUX		MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)				
DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:			GEOTECHNICAL PROFILE STAGE 2: HIGH LIFT PUMP STATION TO TARANTAALPAN				
		A	24/02/11	FOR INFORMATION		CHECKED:	J MULDER				PLAN & LONG SECTION				
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SCALE 1:5000



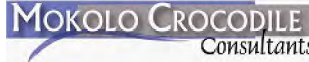



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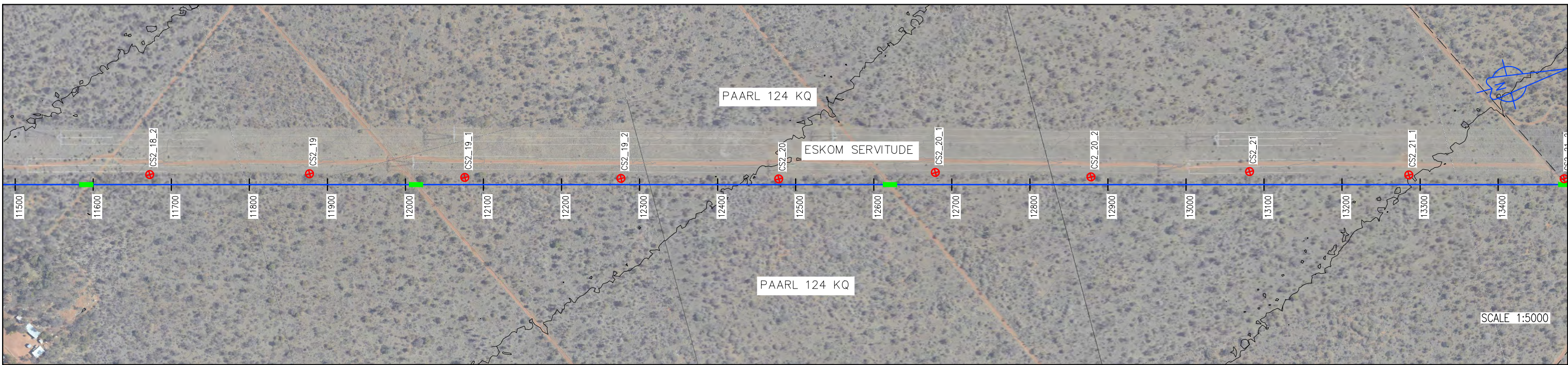
CHAINAGE (m)
REFUSAL DEPTH RANGE (mm)
GEOLOGY

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1100 - 3500		4850	900 - 2600				
GRANITE, GNEISS							

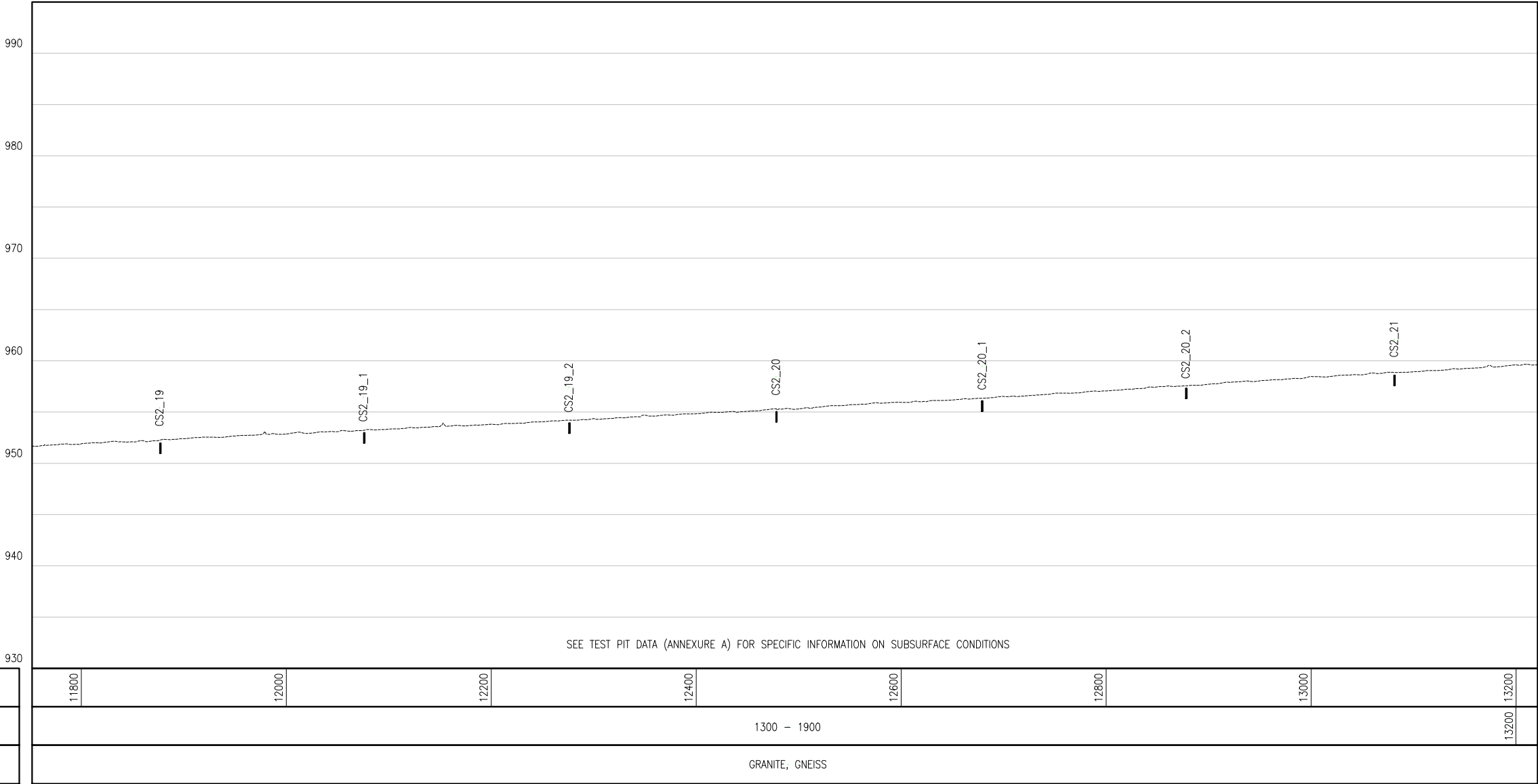
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- POINT OF INTERSECTION (PI)
- TEST PIT
- BOREHOLE
- PIPELINE
- OVERHEAD POWERLINE
- FARM BOUNDARY
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- AREA OF IMPEDED DRAINAGE
- POTENTIAL BORROW PIT
- EXISTING BORROW PIT / SPOIL SITE

REFERENCE DRAWINGS		REVISIONS				DESIGNED:		PROJECT ENGINEER:	P LE ROUX		MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP) GEOTECHNICAL PROFILE STAGE 2: HIGH LIFT PUMP STATION TO TARANTAALPAN PLAN & LONG SECTION							
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						SCALE: 1:5000												



SCALE 1:5000



SCALE HOR 1:5000
VERT 1:500

CHAINAGE (m)
REFUSAL DEPTH RANGE (mm)
GEOLOGY

LEGEND:

CHAINAGE MARKER (PLAN ONLY)

POINT OF INTERSECTION (Pi)

TEST PIT

BOREHOLE

PIPELINE

OVERHEAD POWERLINE

FARM BOUNDARY

FARM PORTION BOUNDARY

CROSSING – SURFACED ROAD

CROSSING – GRAVEL ROAD

CROSSING – PRIVATE DIRT ROAD

CROSSING – POWERLINE

AREA OF INTERMITTENT OUTCROP

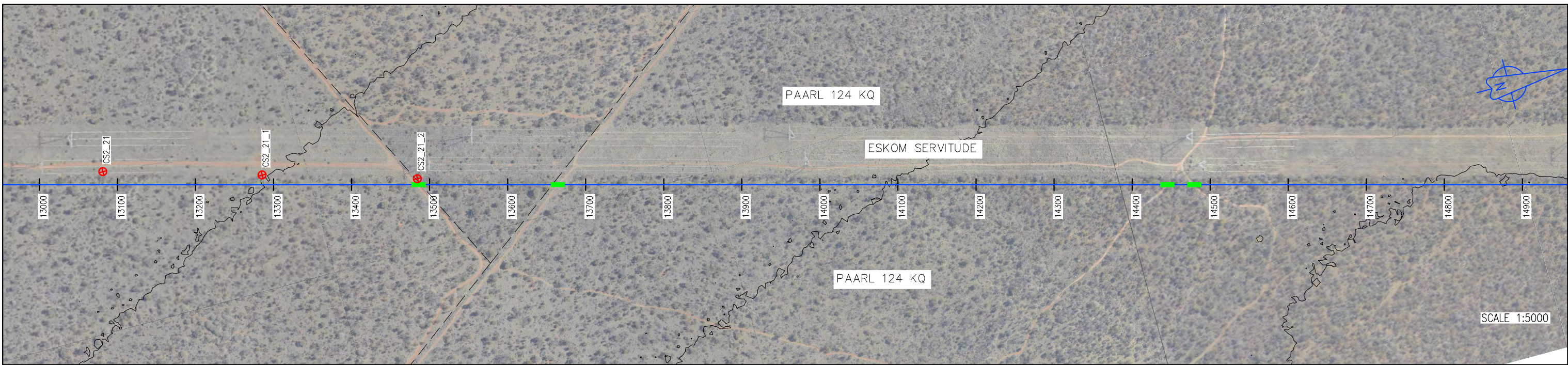
AREA OF OUTCROP

AREA OF IMPEDED DRAINAGE

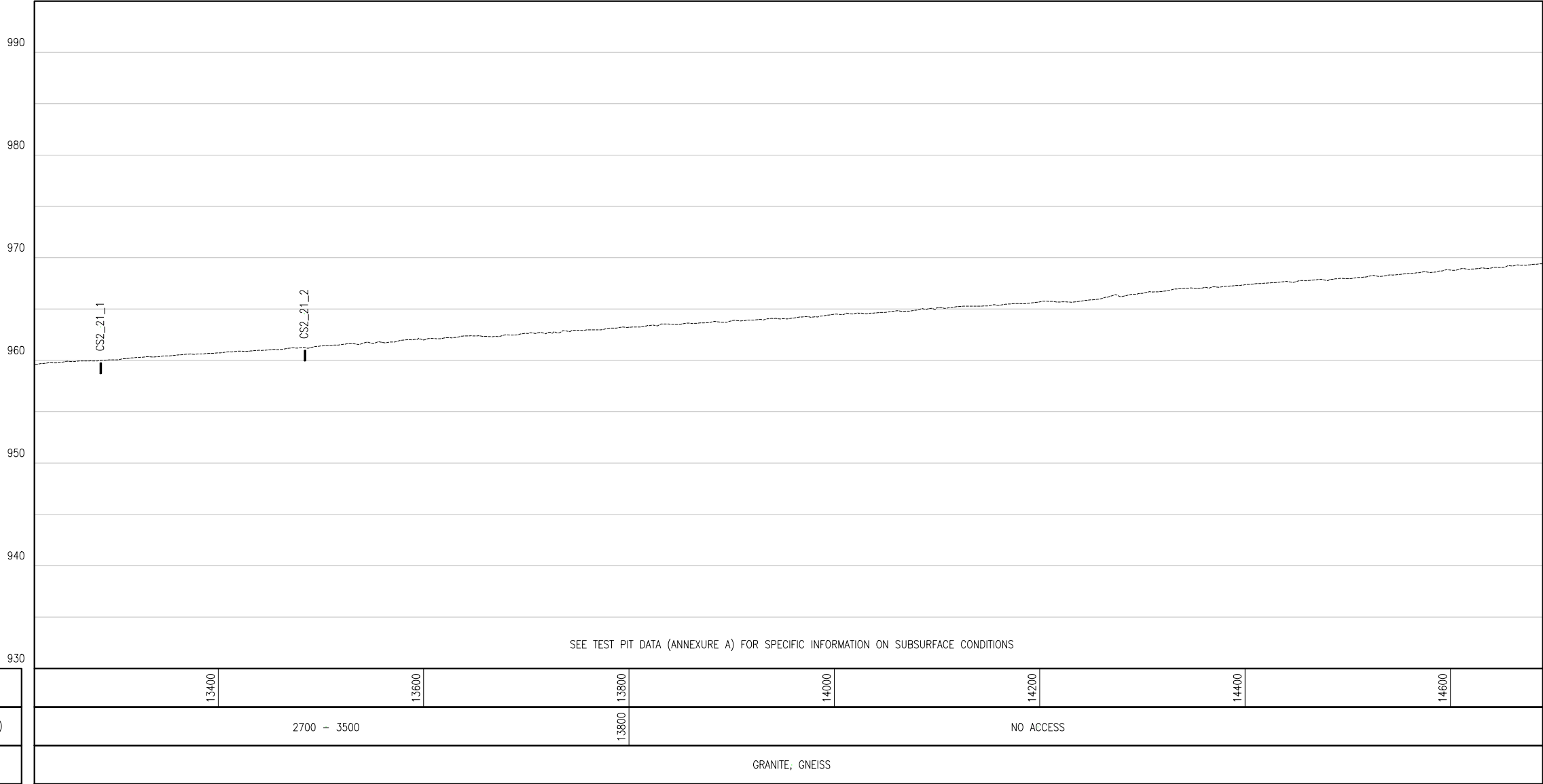
POTENTIAL BORROW PIT

EXISTING BORROW PIT / SPOIL SITE

REFERENCE DRAWINGS			REVISIONS			DESIGNED:		PROJECT ENGINEER:	P LE ROUX	<div>MOKOLO CROCODILE Consultants</div> <div>TCTA A new word for water</div>	MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)		
DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:			GEOTECHNICAL PROFILE STAGE 2: HIGH LIFT PUMP STATION TO TARANTAALPAN		
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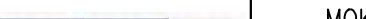
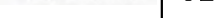


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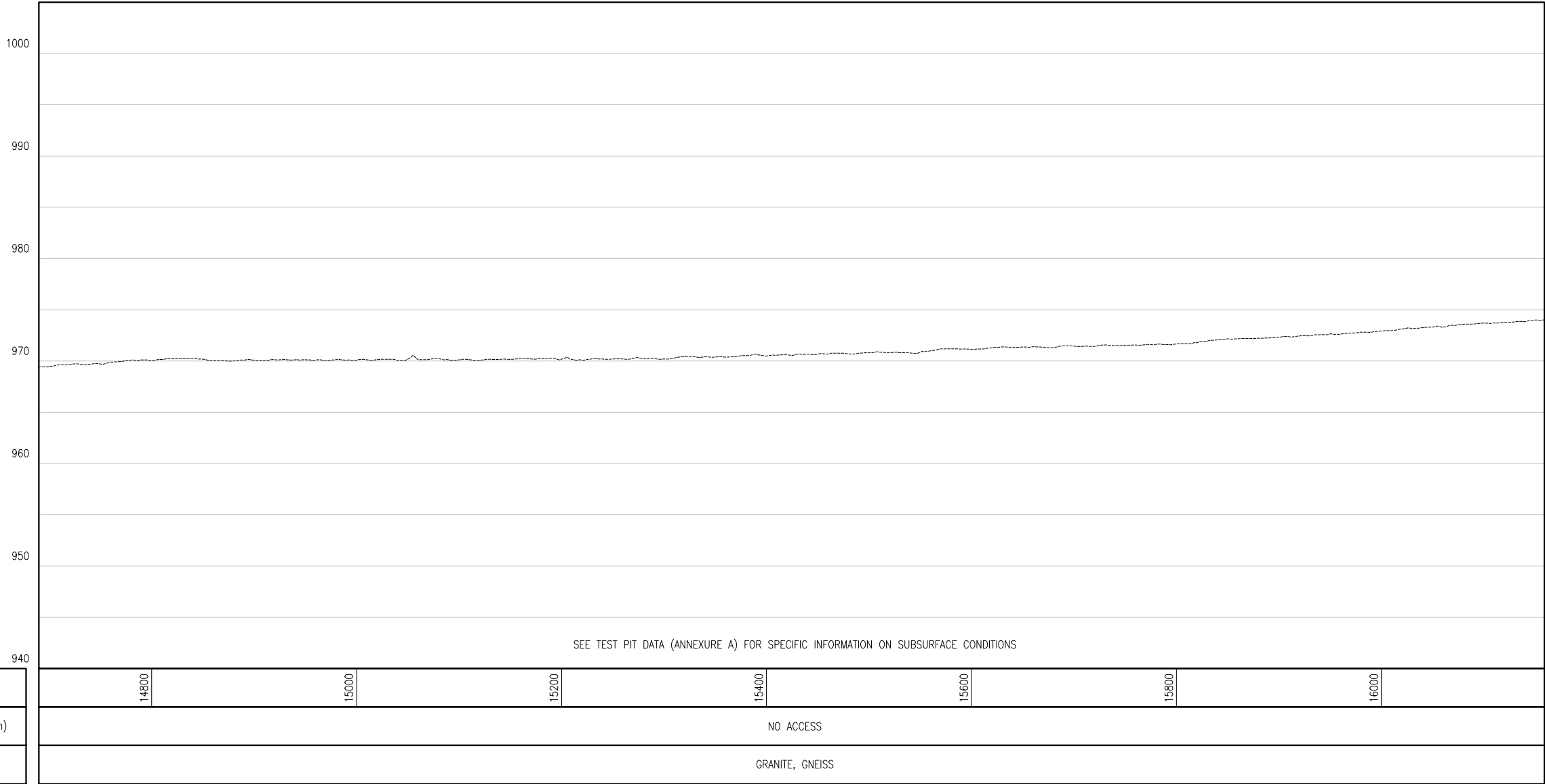
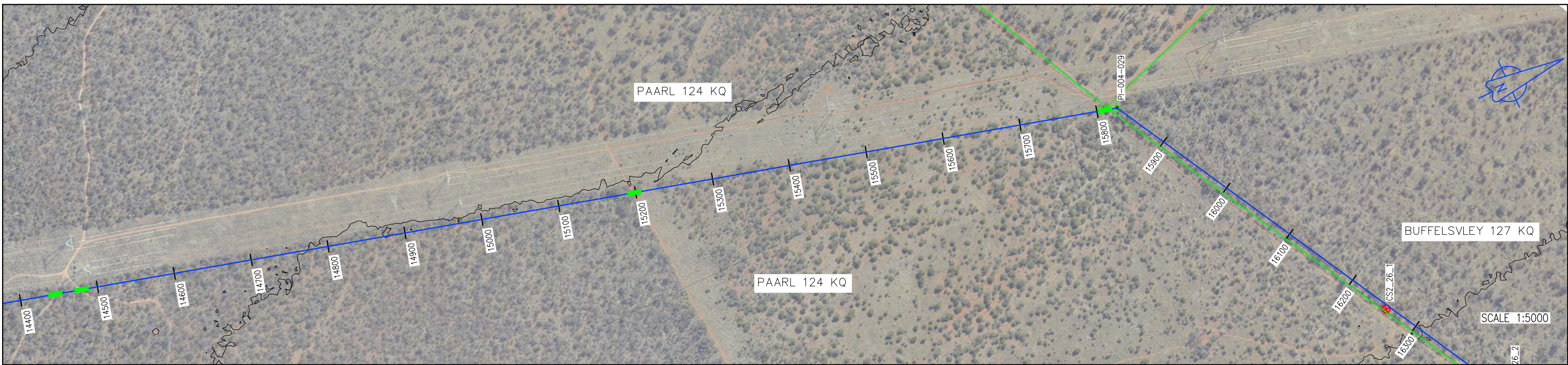


SCALE HOR 1:5000
VERT 1:500

CHAINAGE (m)
REFUSAL DEPTH RANGE (mm)
GEOLOGY

LEGEND:	
	CHAINAGE MARKER (PLAN ONLY)
	POINT OF INTERSECTION (PI)
	TEST PIT
	BOREHOLE
	PIPELINE
	OVERHEAD POWERLINE
	FARM BOUNDARY
	FARM PORTION BOUNDARY
	CROSSING - SURFACED ROAD
	CROSSING - GRAVEL ROAD
	CROSSING - PRIVATE DIRT ROAD
	CROSSING - POWERLINE
	AREA OF INTERMITTENT OUTCROP
	AREA OF OUTCROP
	AREA OF IMPEDED DRAINAGE
	POTENTIAL BORROW PIT
	EXISTING BORROW PIT / SPOIL SITE

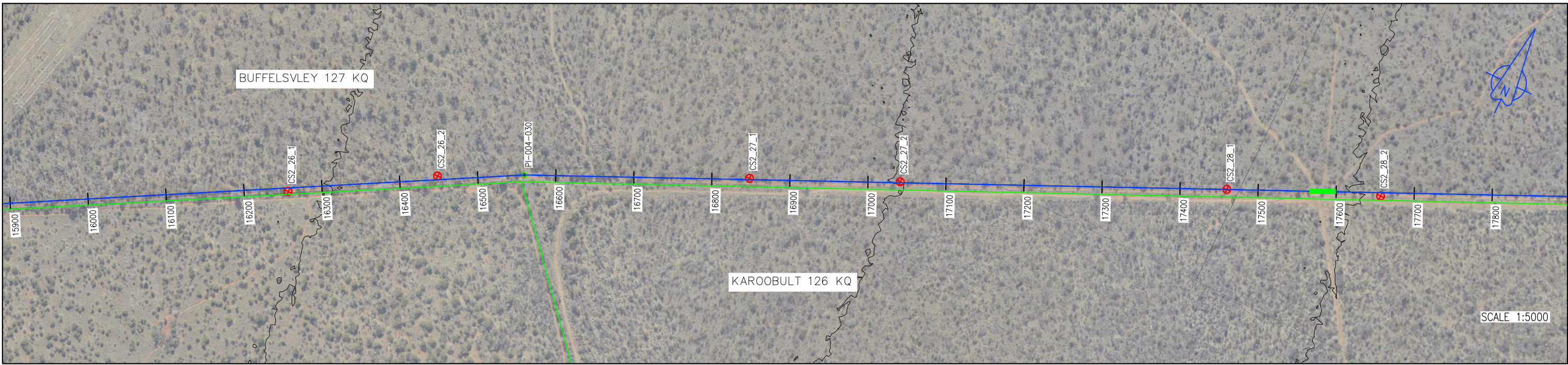
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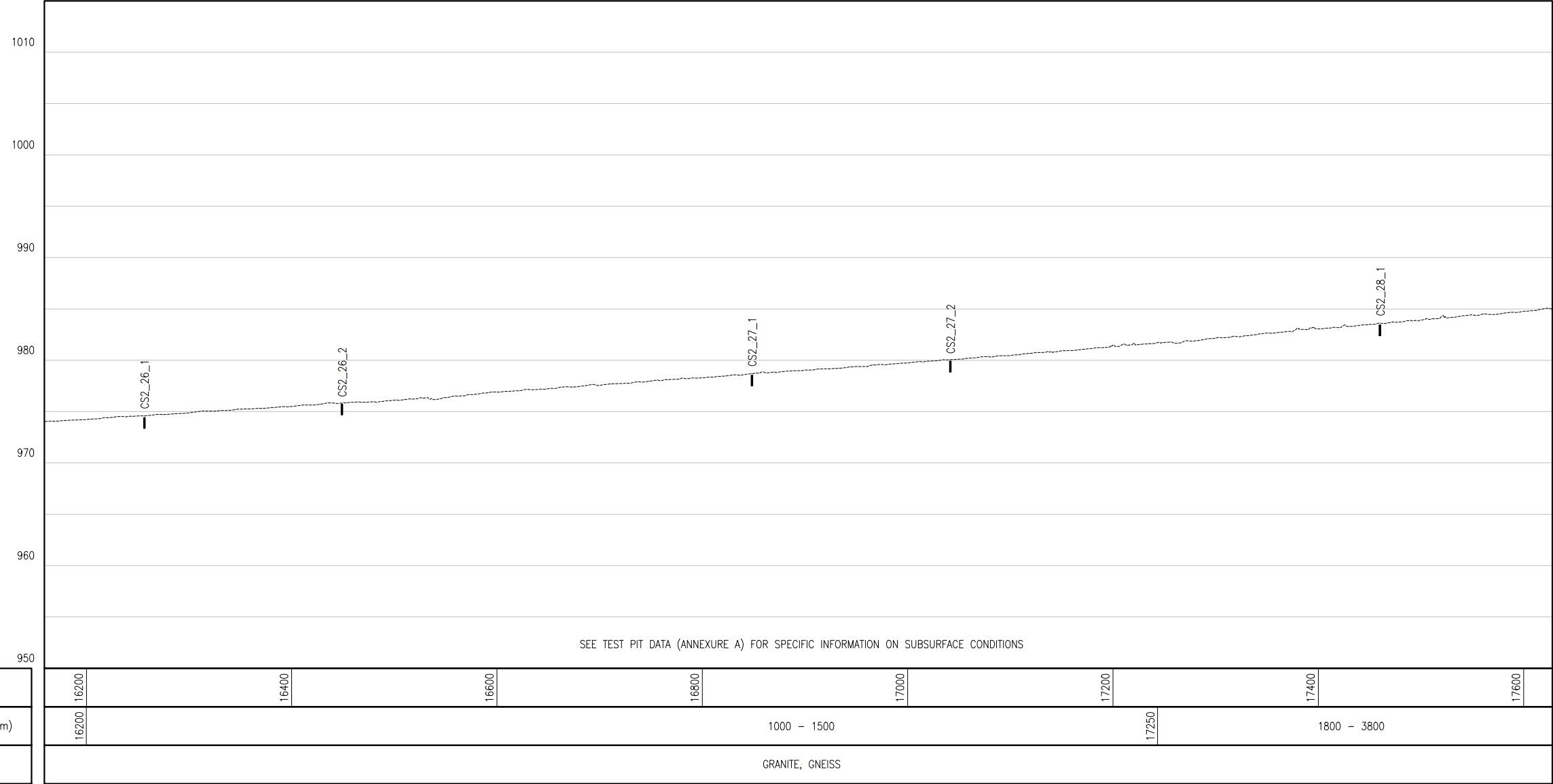
LEGEND:

- CHAINAGE MARKER (PLAN ONLY)
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- TEST PIT
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- POTENTIAL BORROW PIT
- EXISTING BORROW PIT / SPOIL SITE

REFERENCE DRAWINGS			REVISIONS			DESIGNED:		PROJECT ENGINEER:	P LE ROUX	<div>MOKOLO CROCODILE Consultants</div> <div>TCTA A new word for water</div>	MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)		
DRG. No.	TITLE		REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:		GEOTECHNICAL PROFILE STAGE 2: HIGH LIFT PUMP STATION TO TARANTAALPAN		
			A	24/02/11	FOR INFORMATION		CHECKED:	J MULDER			PLAN & LONG SECTION		
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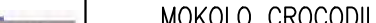



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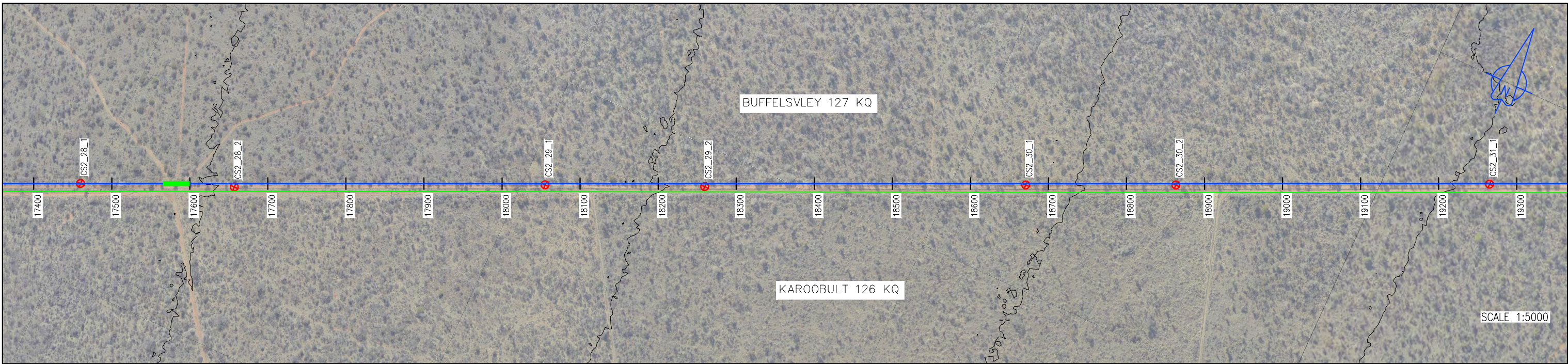


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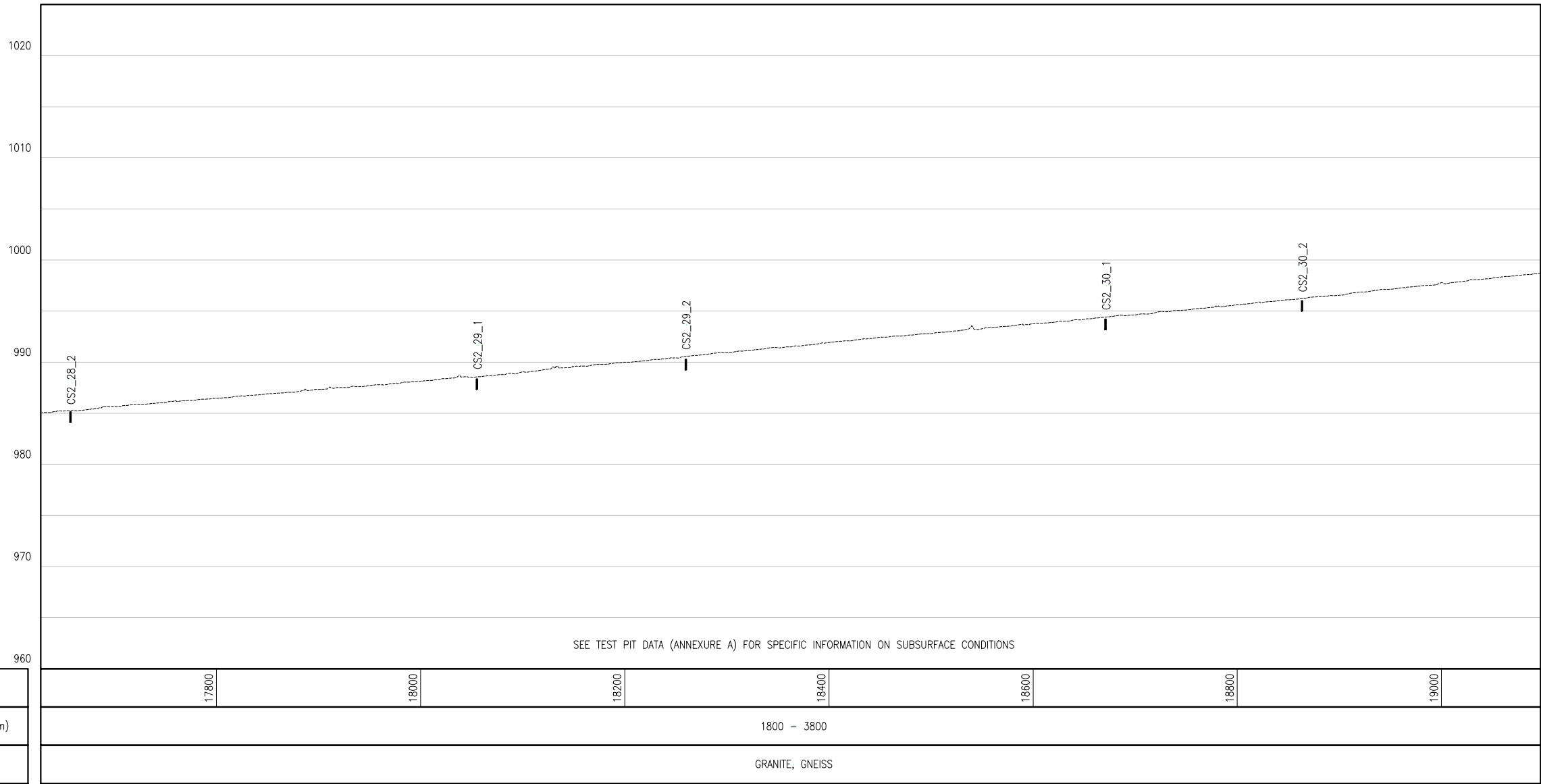
CHAINAGE (m)
REFUSAL DEPTH RANGE (mm)
GEOLOGY

LEGEND:	
	CHAINAGE MARKER (PLAN ONLY)
	POINT OF INTERSECTION (PI)
	TEST PIT
	BOREHOLE
	PIPELINE
	OVERHEAD POWERLINE
	FARM BOUNDARY
	FARM PORTION BOUNDARY
	CROSSING - SURFACED ROAD
	CROSSING - GRAVEL ROAD
	CROSSING - PRIVATE DIRT ROAD
	CROSSING - POWERLINE
	AREA OF INTERMITTENT OUTCROP
	AREA OF OUTCROP
	AREA OF IMPEDED DRAINAGE
	POTENTIAL BORROW PIT
	EXISTING BORROW PIT / SPOIL SITE

REFERENCE DRAWINGS		REVISIONS				DESIGNED:		PROJECT ENGINEER:	P LE ROUX		MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)					
DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:			GEOTECHNICAL PROFILE STAGE 2: HIGH LIFT PUMP STATION TO TARANTAALPAN					
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						CHIEF DESIGNER:	E SERFONTEIN	SCALE:	AS SHOWN							
						SCALE: 1:500					 A new word for water	A3	DWAF DRG. No.	DRAWING NUMBER	2C - G7 - 016	REV No. A
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SCALE 1:5000



SCALE HOR 1:5000
VERT 1:500

CHAINAGE (m)
REFUSAL DEPTH RANGE (mm)
GEOLOGY

LEGEND:

CHAINAGE MARKER (PLAN ONLY)

POINT OF INTERSECTION (PI)

TEST PIT

BOREHOLE

PIPELINE

OVERHEAD POWERLINE

FARM BOUNDARY

FARM PORTION BOUNDARY

CROSSING – SURFACED ROAD

CROSSING – GRAVEL ROAD

CROSSING – PRIVATE DIRT ROAD

CROSSING – POWERLINE

AREA OF INTERMITTENT OUTCROP

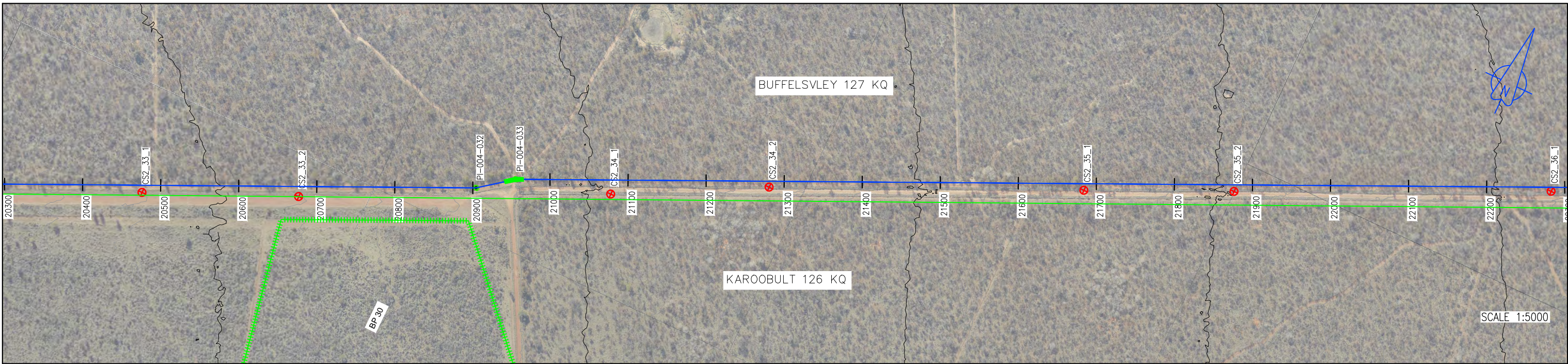
AREA OF OUTCROP

AREA OF IMPEDED DRAINAGE

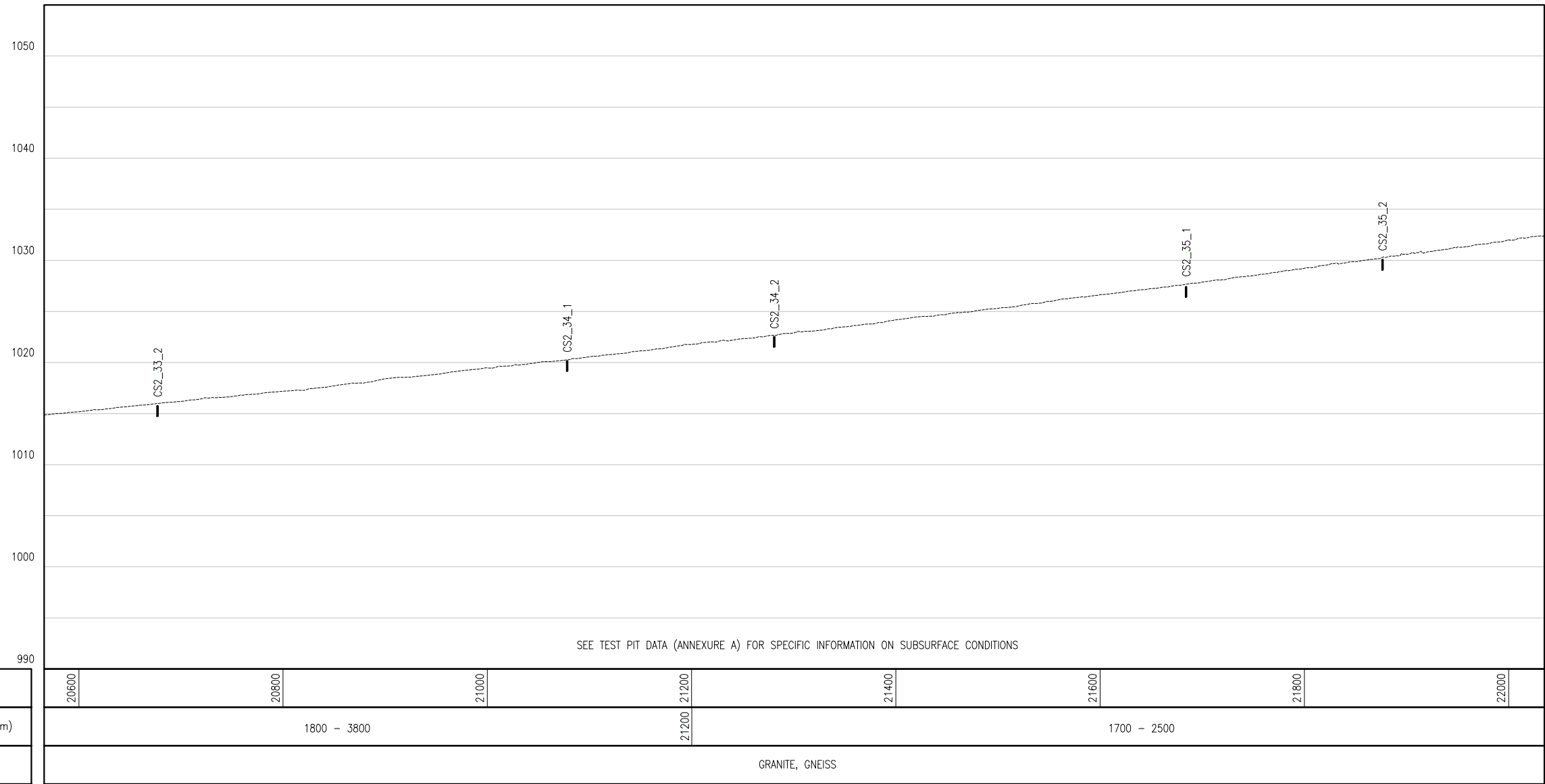
POTENTIAL BORROW PIT

EXISTING BORROW PIT / SPOIL SITE

REFERENCE DRAWINGS		REVISIONS				DESIGNED:		PROJECT ENGINEER:	P LE ROUX	<div><div>MOKOLO CROCODILE Consultants</div><div> A new word for water</div></div>	MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)				
DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:			GEOTECHNICAL PROFILE STAGE 2: HIGH LIFT PUMP STATION TO TARANTAALPAN PLAN & LONG SECTION				
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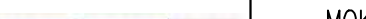





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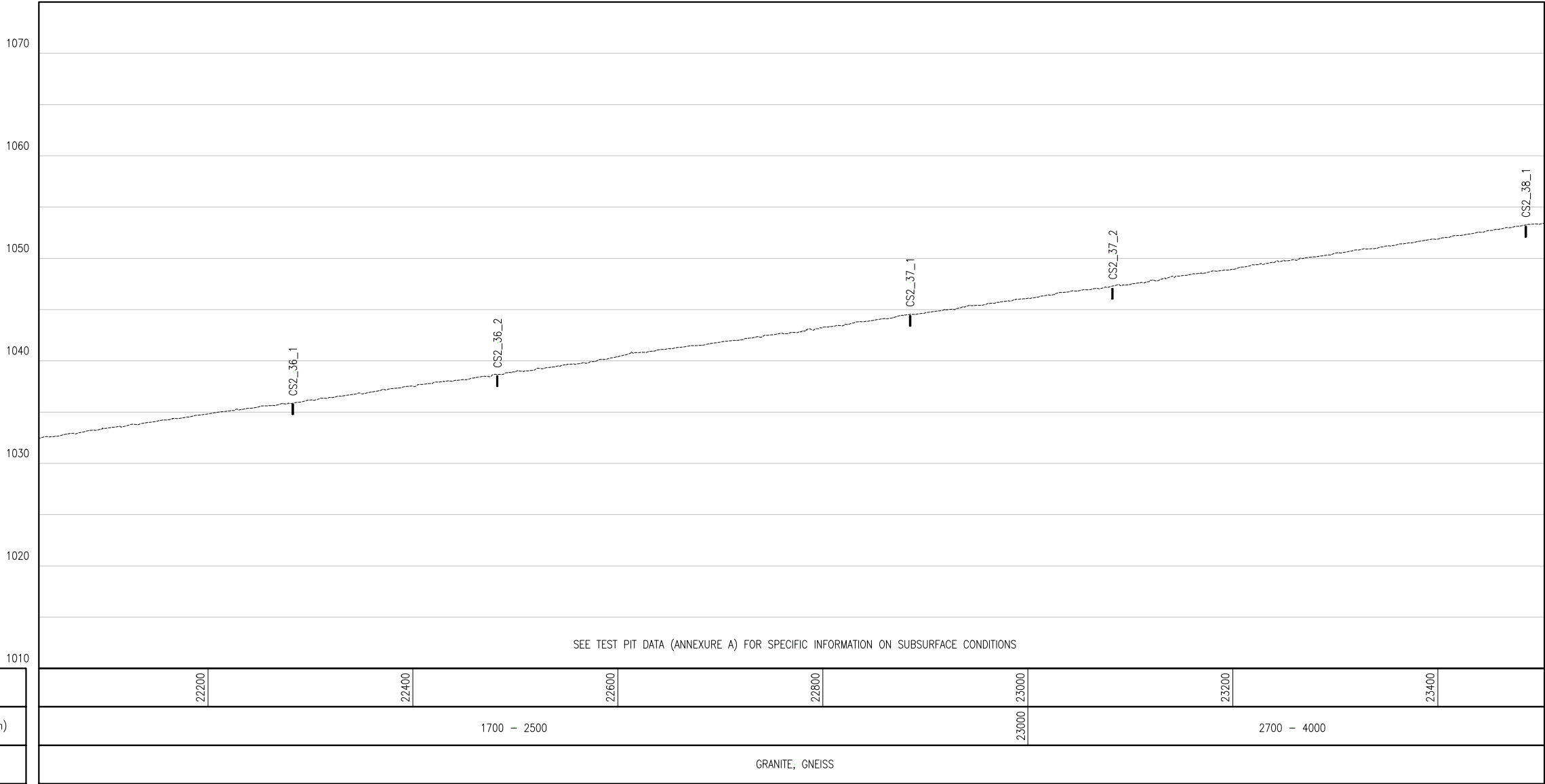
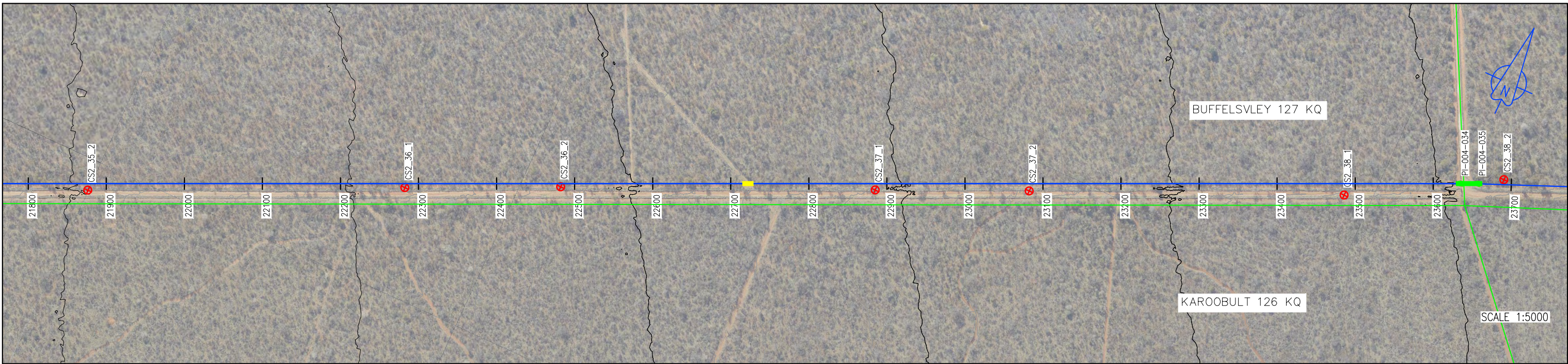
SEE TEST PIT DATA (ANNEXURE A) FOR SPECIFIC INFORMATION ON SUBSURFACE CONDITIONS

LEGEND:

- CHAINAGE MARKER (PLAN ONLY)
- POINT OF INTERSECTION (PI)
- TEST PIT
- BOREHOLE
- PIPELINE
- OVERHEAD POWERLINE
- FARM BOUNDARY
- FARM PORTION BOUNDARY
- CROSSING - SURFACED ROAD
- CROSSING - GRAVEL ROAD
- CROSSING - PRIVATE DIRT ROAD
- CROSSING - POWERLINE
- AREA OF INTERMITTENT OUTCROP
- AREA OF OUTCROP
- AREA OF IMPEDED DRAINAGE
- POTENTIAL BORROW PIT
- EXISTING BORROW PIT / SPOIL SITE

REFERENCE DRAWINGS		REVISIONS				DESIGNED:		PROJECT ENGINEER:	P LE ROUX		MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)				
DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:				GEOTECHNICAL PROFILE STAGE 2: HIGH LIFT PUMP STATION TO TARANTAALPAN			
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A3	DWAF	DRAWING	2C - G7 - 019	REV N
	DRG. No.			




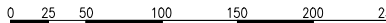


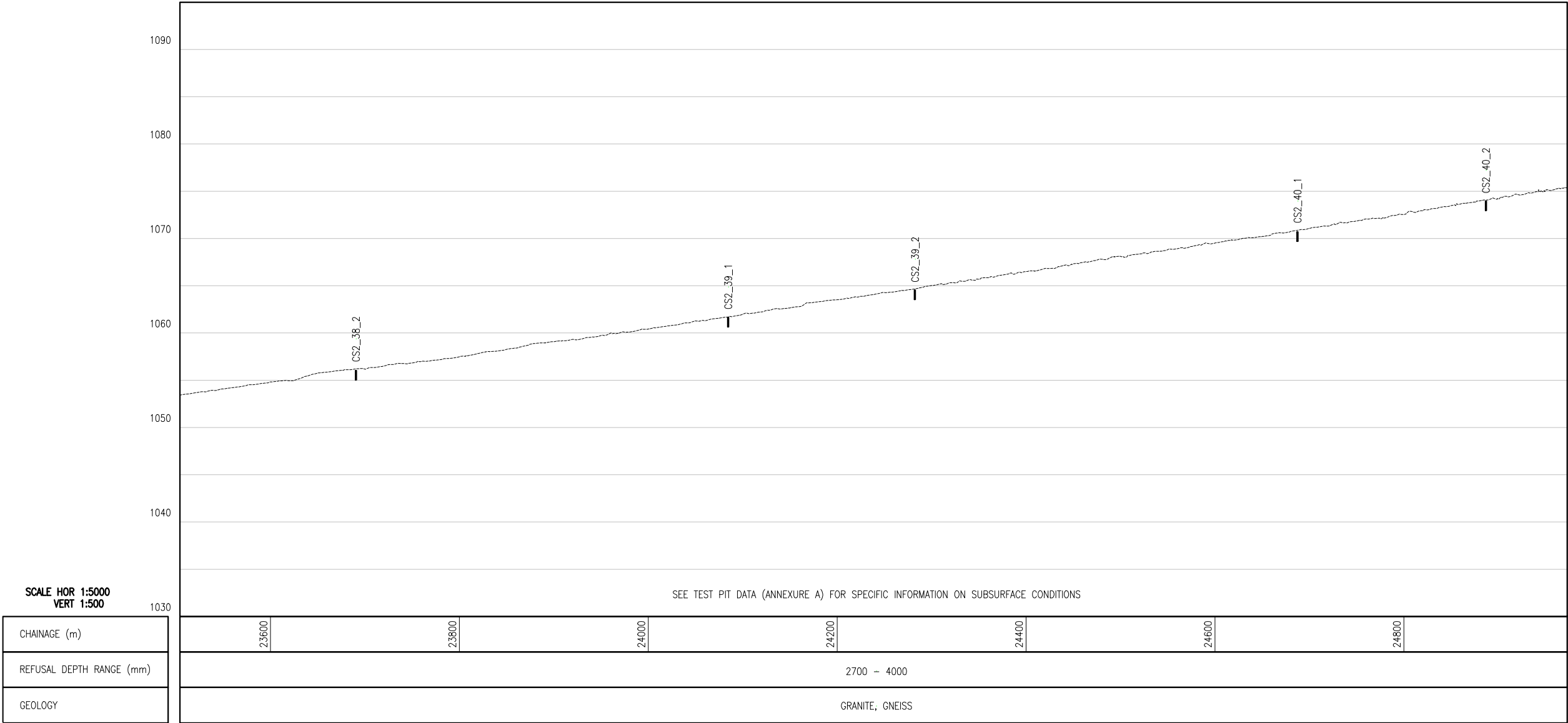
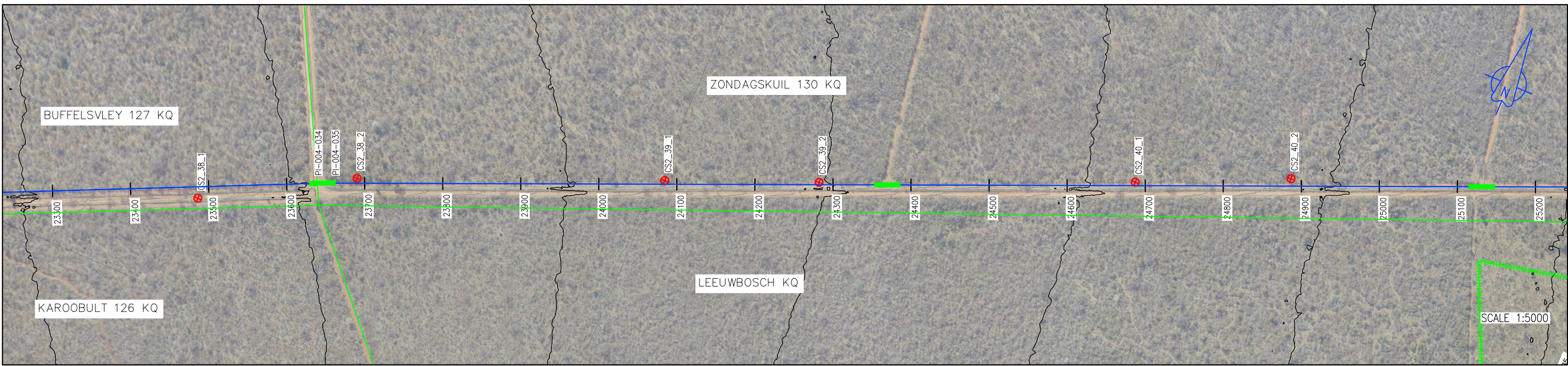
LEGEND:

- CHAINAGE MARKER (PLAN ONLY)
- POINT OF INTERSECTION (PI)
- TEST PIT
- BOREHOLE
- PIPELINE
- OVERHEAD POWERLINE
- FARM BOUNDARY
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- AREA OF OUTCROP
- AREA OF IMPEDED DRAINAGE
- POTENTIAL BORROW PIT
- EXISTING BORROW PIT / SPOIL SITE

CHAINAGE (m)
REFUSAL DEPTH RANGE (mm)
GEOLOGY





22200	22400	22600	22800	23000	23200	23400
1700 – 2500				23000	2700 – 4000	
GRANITE, GNEISS						

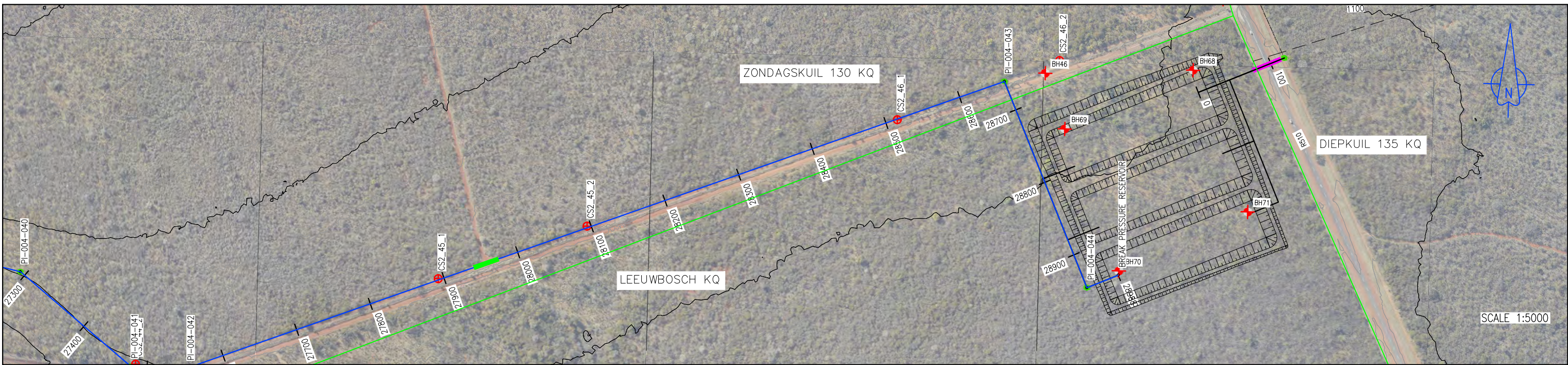
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		A	24/02/11	FOR INFORMATION		CHECKED:	J MULDER				PLAN & LONG SECTION				
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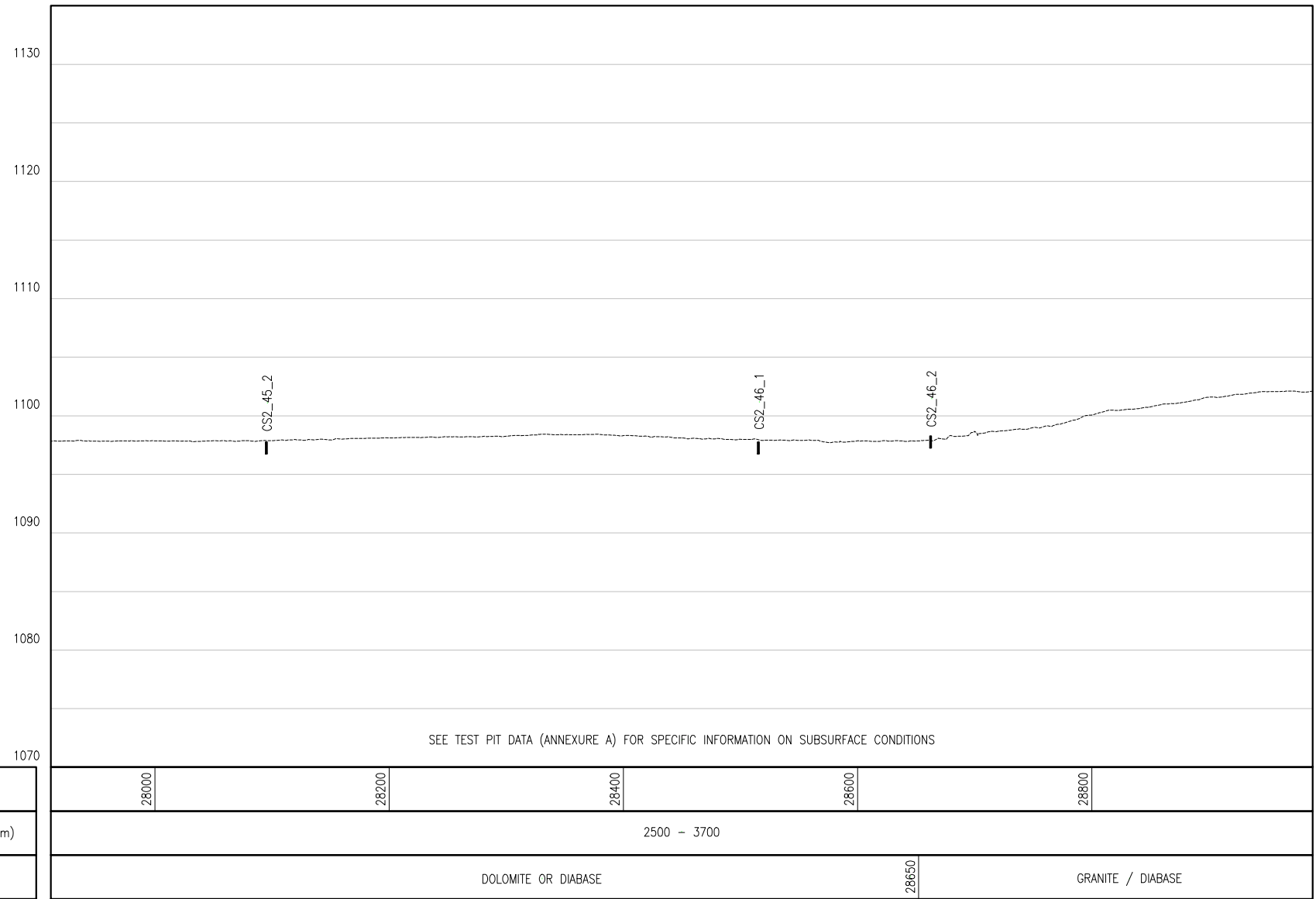
LEGEND:

- CHAINAGE MARKER (PLAN ONLY)
- POINT OF INTERSECTION (PI)
- TEST PIT
- BOREHOLE
- PIPELINE
- OVERHEAD POWERLINE
- FARM BOUNDARY
- FARM PORTION BOUNDARY
- CROSSING - SURFACED ROAD
- CROSSING - GRAVEL ROAD
- CROSSING - PRIVATE DIRT ROAD
- CROSSING - POWERLINE
- AREA OF INTERMITTENT OUTCROP
- AREA OF OUTCROP
- AREA OF IMPEDED DRAINAGE
- POTENTIAL BORROW PIT
- EXISTING BORROW PIT / SPOIL SITE

REFERENCE DRAWINGS		REVISIONS				DESIGNED:		PROJECT ENGINEER:	P LE ROUX		MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)				
DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:			GEOTECHNICAL PROFILE STAGE 2: HIGH LIFT PUMP STATION TO TARANTAALPAN				
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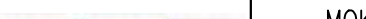
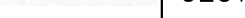


SCALE 1:5000



SCALE HOR 1:5000
VERT 1:500

CHAINAGE (m)
REFUSAL DEPTH RANGE (mm)
GEOLOGY

LEGEND:	
	CHAINAGE MARKER (PLAN ONLY)
	POINT OF INTERSECTION (PI)
	TEST PIT
	BOREHOLE
	PIPELINE
	OVERHEAD POWERLINE
	FARM BOUNDARY
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	EXISTING BORROW PIT / SPOIL SITE

REFERENCE DRAWINGS		REVISIONS				DESIGNED:		PROJECT ENGINEER:	P LE ROUX	 	MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)					
DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:			GEOTECHNICAL PROFILE STAGE 2: HIGH LIFT PUMP STATION TO TARANTAALPAN					
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TCTA

**MOKOLO AND CROCODILE
WATER AUGMENTATION PROJECT
(MCWAP)**

CONTRACT № TCTA 07-041

CONSULTING SERVICES FOR MCWAP

**PHASE 2: GEOTECHNICAL INVESTIGATIONS
Stage 3: Operational Reservoir - Steenbokpan**

VOLUME 2.3: ANNEXURES C AND D

AUGUST 2011

MOKOLO CROCODILE CONSULTANTS

Report No: 2A-R-111E-54 (Rev A)

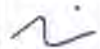
**MOKOLO AND CROCODILE
WATER AUGMENTATION PROJECT**

CONTRACT № TCTA 07-041

DOCUMENT CONTROL SHEET

Report No : 2A-R-111E-54

Title : Phase 2: Geotechnical Investigations
Stage 3: Operational Reservoir - Steenbokpan
Volume 2.3: Annexures C and D

Rev No	Date of Issue	Originator		Checked		Approved		Description
		Initials	Signature	Initials	Signature	Initials	Signature	
A	Aug 2011	AJS GND GJH BHJS MCW RV		SM PJIR		JPie		1 st Issue for discussion ¹

¹ Finalisation pending outstanding Phase 2 Geotechnical Results

**MOKOLO AND CROCODILE
WATER AUGMENTATION PROJECT**

CONTRACT № TCTA 07-041

**PHASE 2: GEOTECHNICAL INVESTIGATIONS
Stage 3: Operational Reservoir - Steenbokpan**

LIST OF VOLUMES

Volume 1	Phase 2, Stage 3: Geotechnical Data Report
Volume 2	Phase 2, Stage 3: Geotechnical Report – Annexures
	2.1 Annexure A
	2.2 Annexure B
	2.3 Annexures C and D
Volume 3	Phase 2, Stage 3: Geotechnical Interpretive Report

MOKOLO AND CROCODILE WATER AUGMENTATION PROJECT

CONTRACT № TCTA 07-041

PHASE 2: GEOTECHNICAL INVESTIGATIONS Stage 3: Operational Reservoir - Steenbokpan

VOLUME 2.3: ANNEXURES C and D

EXECUTIVE SUMMARY

Volumes 2.1, 2.2 and 2.3 of Geotechnical Report No. 2A-R-111E-54 contain the Annexures referred to in Volume 1 and should be read in conjunction with the latter referenced Volume.

**MOKOLO AND CROCODILE
WATER AUGMENTATION PROJECT**

CONTRACT № TCTA 07-041

**PHASE 2: GEOTECHNICAL INVESTIGATIONS
Stage 3: Operational Reservoir - Steenbokpan**

VOLUME 2.3: ANNEXURES C AND D

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Volume 2: Geotechnical Report – Annexures

Volume 2.1: Annexure A (Bound Separately)

List of Annexures

Annexure A:	Centreline data
A1:	Summary of centreline test pit data
A2:	Test pit profiles
A3	Laboratory test results
A3.1	Indicator, pH, conductivity, compactability
A3.2	Geotechnical tests
A3.2.1	Triaxial tests
A3.2.2	Shearbox tests
A3.2.3	Constrained Soil Modulus (M _s) tests
A3.3	SRB tests
A3.4	Fertility tests
A4:	Test pit photographs
A5:	Soil profiling parameters

Volume 2.2: Annexures B (Bound Separately)

List of Annexures

- Annexure B: Borrow pit data
 - B1: Summary of borrow pits investigated
 - B2: Laboratory test results
 - B2.1 Indicator, pH, conductivity, compactability
 - B2.2 Geotechnical tests
 - B2.2.1 Triaxial tests
 - B2.2.2 Constrained Soil Modulus (Ms) tests
 - B2.2.3 Hydrostatic compression tests
 - B2.3 SRB tests
 - B2.4 Fertility tests
 - B3: Test pit photographs

Volume 2.3: Annexures C and D (This Volume)

List of Annexures

- Annexure C: Borrow Pit Plans
- Annexure D: Geotechnical Maps

Volume 3: Geotechnical Interpretive Report (Bound Separately)

ANNEXURE C

BORROW PIT PLANS

OUTSTANDING MATTERS ON BP PLANS

BP 48:

48_2

- Excavated land needs to be explained; and
- What is the significance of “gravel road 322 m from access road”? Is this the distance from the gate on D175 or what? Does “access road” mean the D175? Please clarify.

48_3

- How do you get from D175 to BP?;
- What is significance of orange roads N and S of BP?;
- Show detail of gates on D175, and how to get from there to BP;
- Check co-ordinate value for TP99; and
- Is distance “322m” from gate on D175?

BP 49:

49_3

- Is distance “582m” from gate on D175? Clarify.

BP 50:

50_2

- What is significance of orange roads which seem to lead nowhere?

50_3

- Is distance “190m” from gate on D175?
- Show how to get from D175 to BP.

BP 52:

52_1

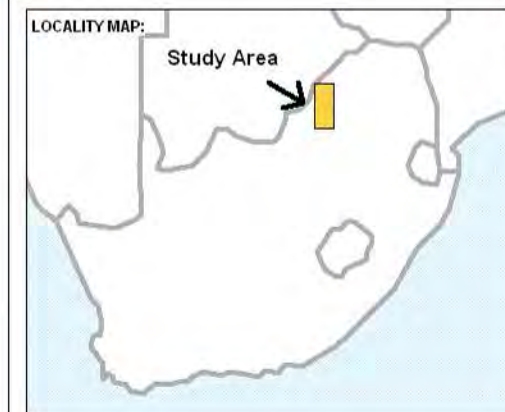
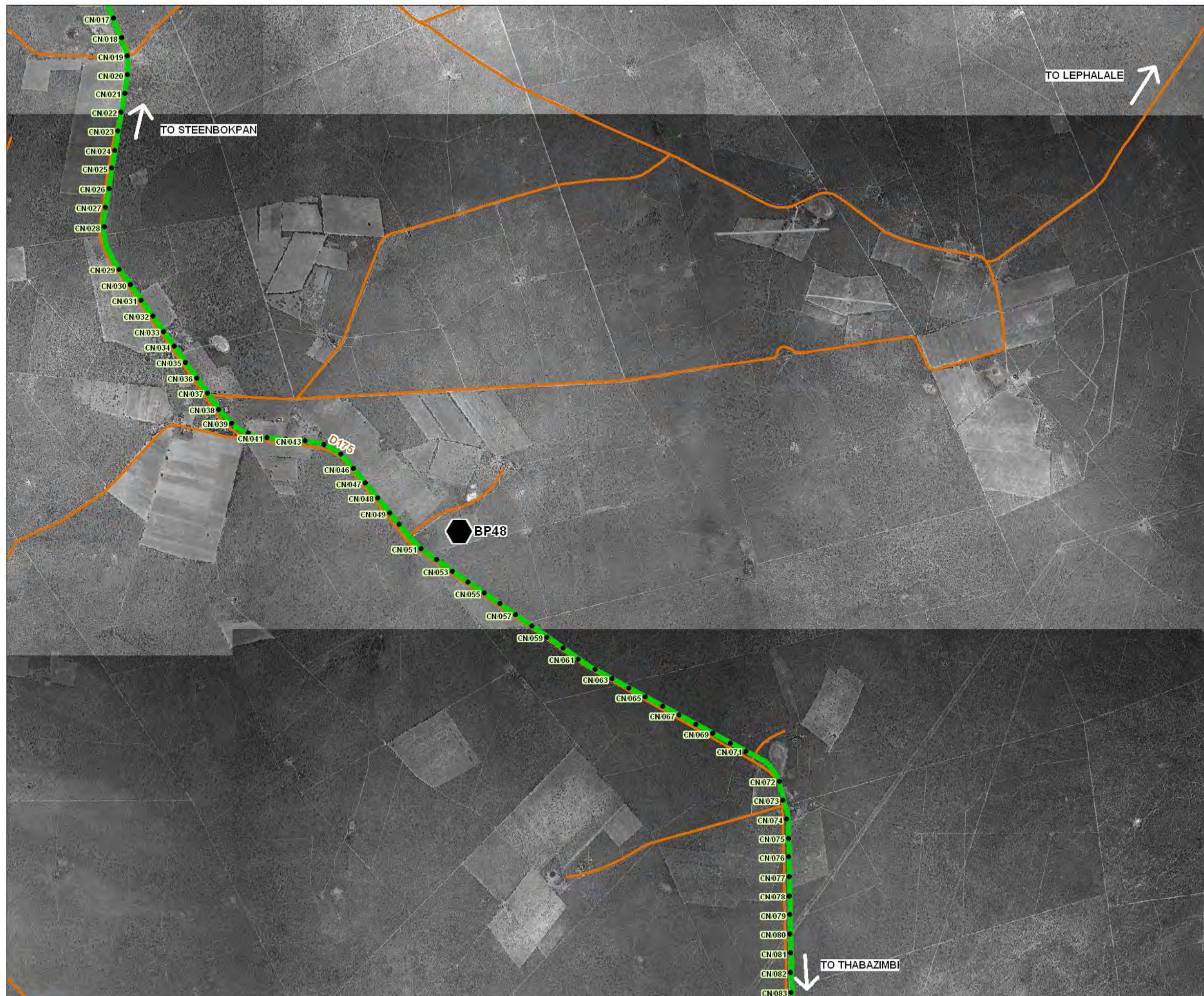
- Show test pits dug along southern loop of D175 from CN128 to CN093.

52_2

- Is distance 1857m from gate on D175? Clarify

52_3

- Where is TP19? Include in co-ordinate list.



LEGEND:

- Centre Line Test Pits
- ⬡ Borrow Pit
- Main Roads
- Gravel Roads
- Phase 2: Pipeline
- Railway Network

BORROW PIT DESCRIPTION:

Description	Borrowpit_48
Location of Borrow pit	X2632164 Y-032678
Shortest distance relative to pipeline	+/- 140 m
Distance to access road	+/- 10.48 km from D1675
Farm name	Zandheuwel 356 LQ
Farm number	Ptn 1/356
Owner name	Ms A Steenkamp
Contact details: Mobile no	0827716925
Estimated quantity (m³)	100000
Suitability of the material	Sand

DATUM: WGS 84
PROJECTION: LO 27

0.8 0 0.8 1.6
Kilometers
Scale: 1:40,000

PREPARED BY:

MOKOLO CROCODILE CONSULTANTS
GEOSTRADA

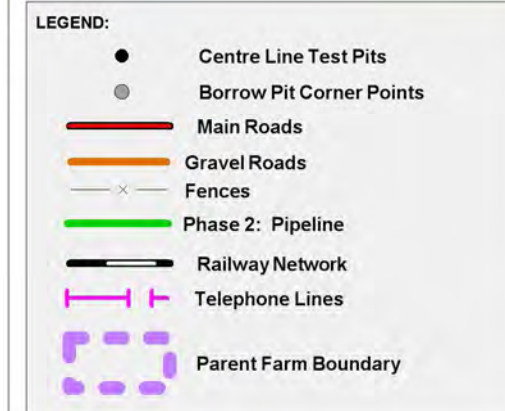
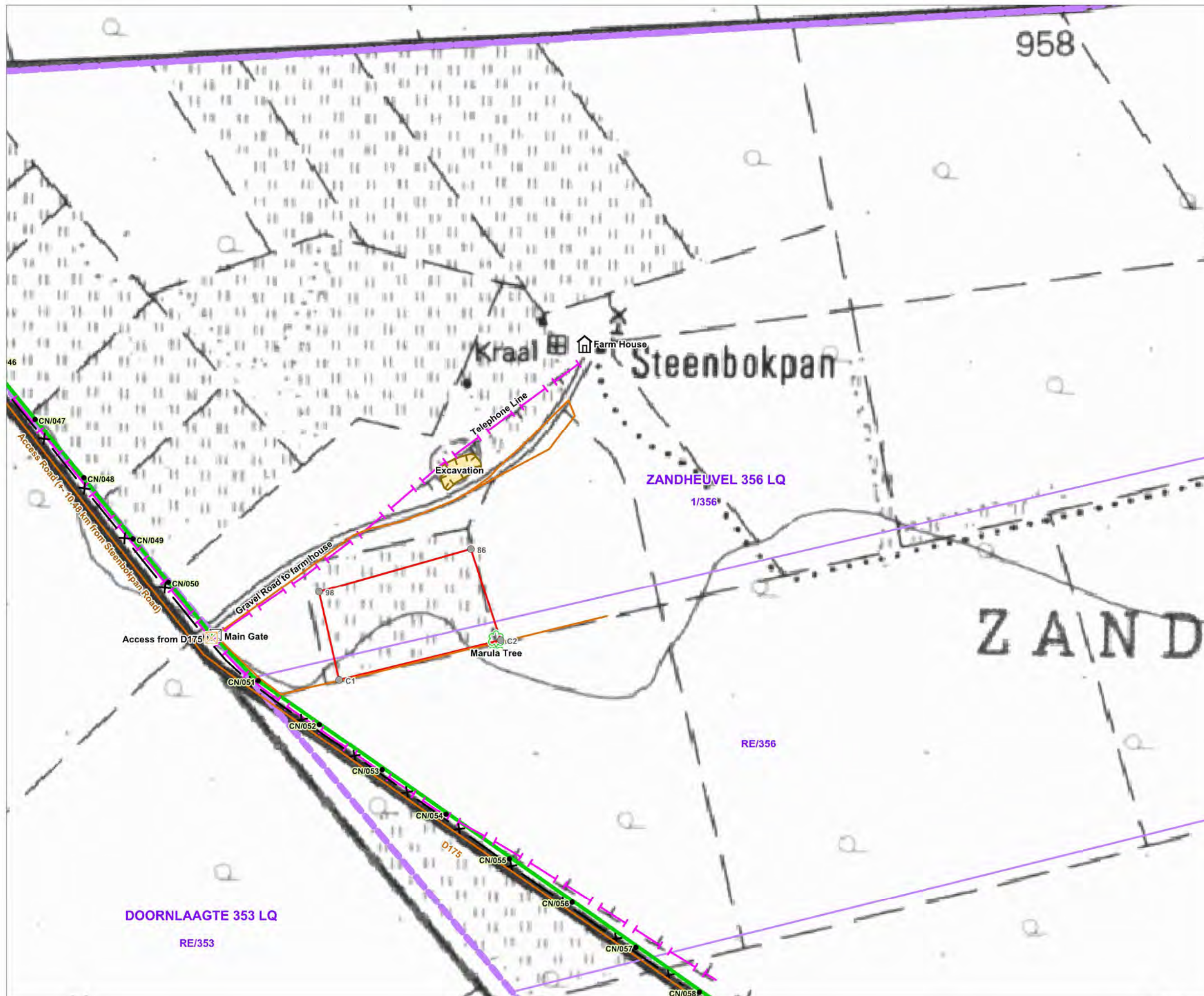
PREPARED FOR:

TCTA
A NEW WORLD FOR WATER

PROJECT:
Mokolo and Crocodile Water Augmentation Project (MCWAP)

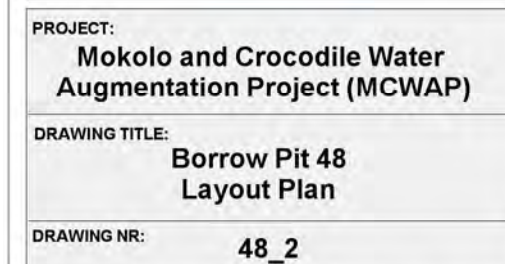
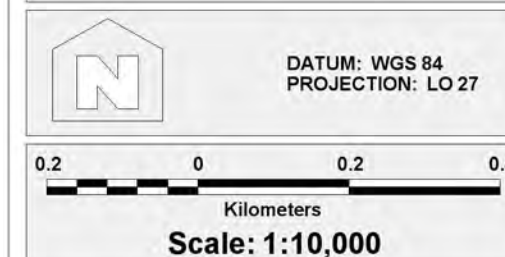
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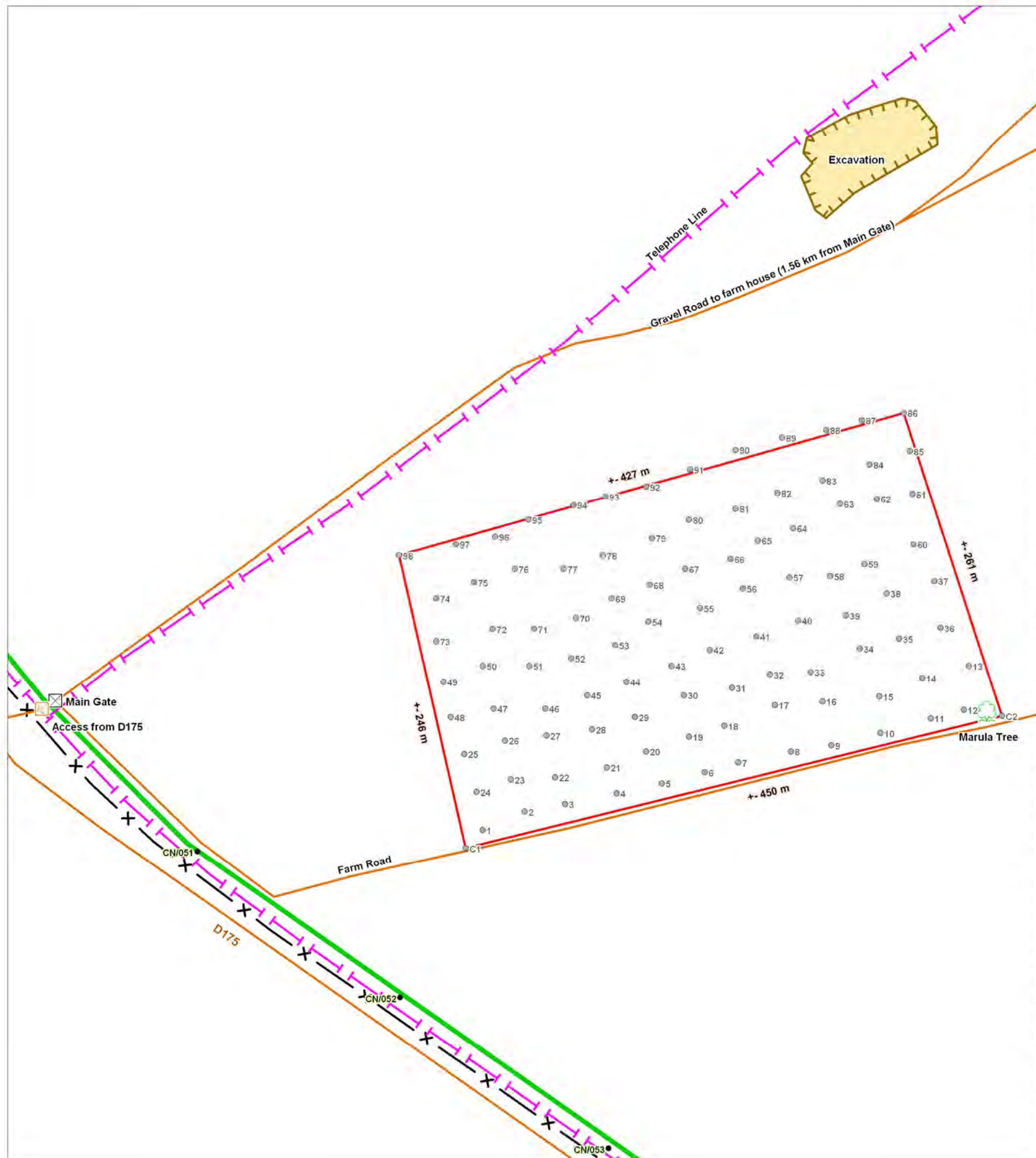
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BORROW PIT DESCRIPTION:

Description	Borrowpit_48
Location of Borrow pit	X2632164 Y-032678
Shortest distance relative to pipeline	± 140 m
Distance to access road	± 10.48 km from D1675
Farm name	Zandheuwel 356 LQ
Farm number	Ptn 1/356
Owner name	Ms A Steenkamp
Contact details: Mobile no	0827716925
Estimated quantity (m³)	100000
Suitability of the material	Sand





BORROW PIT 48 TEST PIT COORDINATES:

ID	_27_Y	X
1	-032692	2632149
2	-032726	2632134
3	-032759	2632128
4	-032801	2632119
5	-032838	2632111
6	-032873	2632102
7	-032900	2632094
8	-032943	2632085
9	-032976	2632080
10	-033016	2632070
11	-033057	2632058
12	-033084	2632051
13	-033088	2632015
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18	-032889	2632064
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26	-032710	2632076
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97	-032670	2631916
98	-032624	2631925

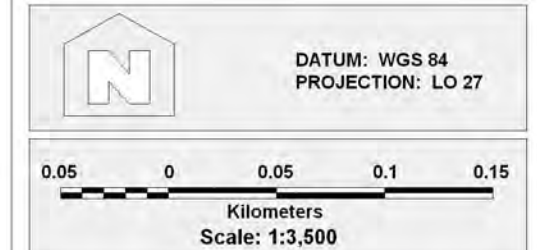


LEGEND:

- Centre Line Test Pits
- Test Pits
- Borrow Pit Border
- Gravel Road
- Fences
- Railway Line
- Phase 2: Pipeline
- Telephone Lines

BORROW PIT DESCRIPTION:

Description	Borrowpit_48
Location of Borrow pit	X2632164 Y-032678
Shortest distance relative to pipeline	± 140 m
Distance to access road	± 10.48 km from D1675
Farm name	Zandheuwel 356 LQ
Farm number	Ptn 1/356
Owner name	Ms A Steenkamp
Contact details: Mobile no	0827716925
Estimated quantity (m³)	100000
Suitability of the material	Sand



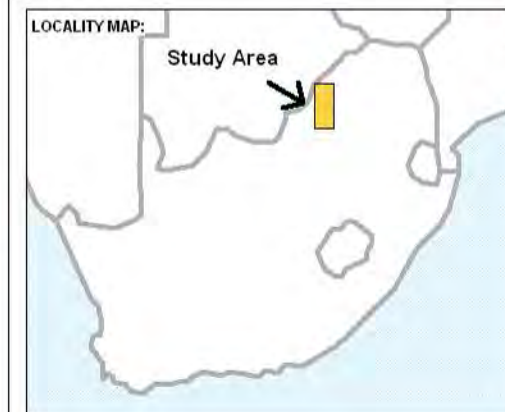
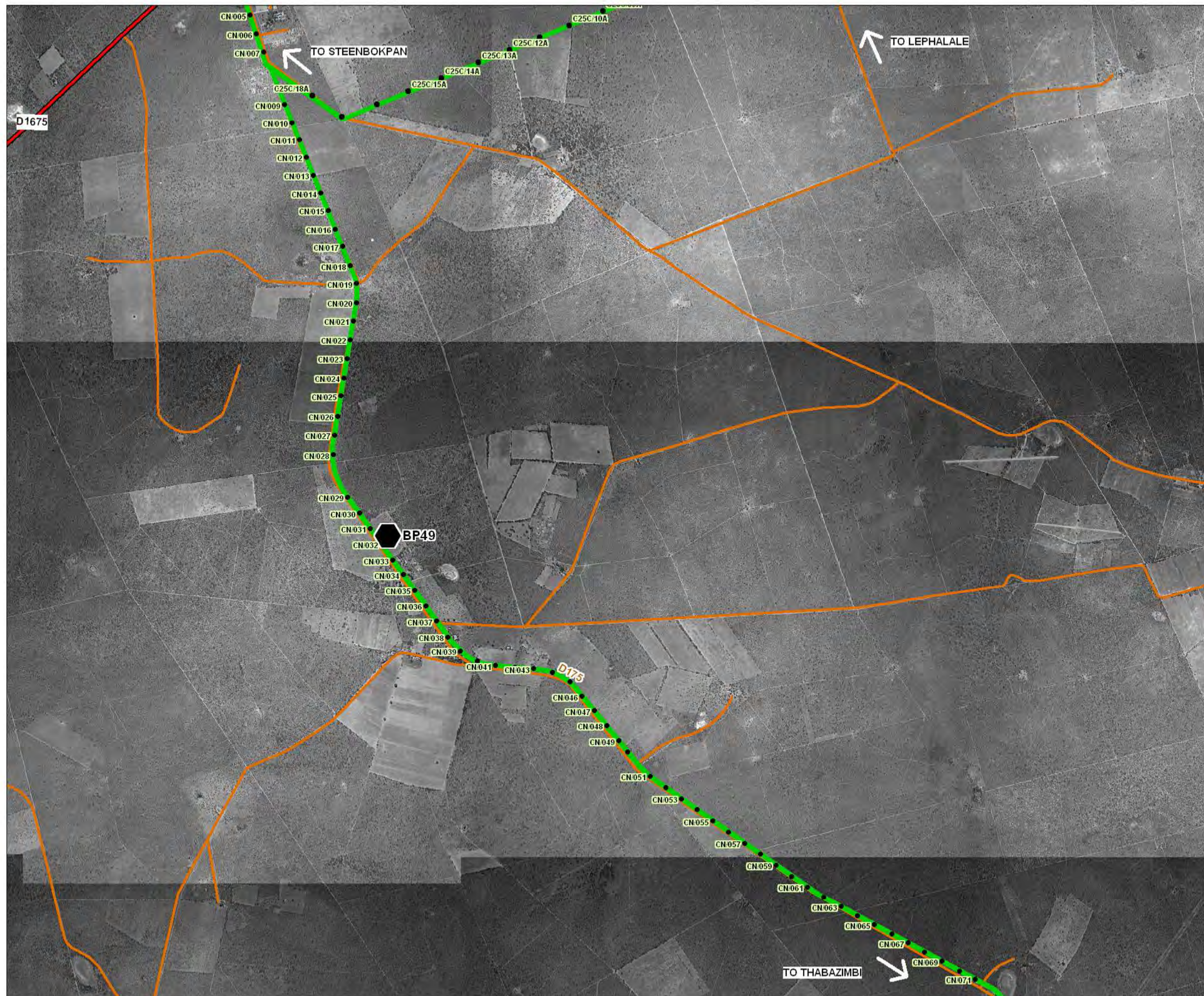
PREPARED BY:
MOKOLO CROCODILE
Consultants

PREPARED FOR:
TCTA
A new world for water

PROJECT:
**Mokolo and Crocodile Water
Augmentation Project (MCWAP)**

DRAWING TITLE:
**Borrow Pit 48
Test Pit Positions**

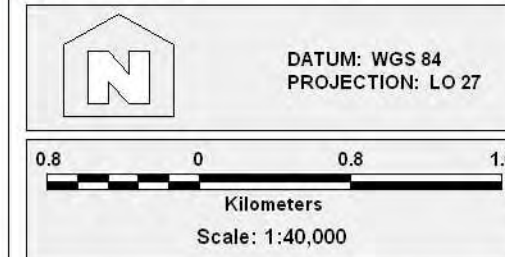
DRAWING NR:
48_3



- LEGEND:
- Centre Line Test Pits
 - Borrow Pit
 - Main Roads
 - Gravel Roads
 - Phase 2: Pipeline
 - Railway Network

BORROW PIT DESCRIPTION:

Description	Borrowpit_49
Location of Borrow pit	X2629990 Y-029936
Shortest distance relative to pipeline	+/- 61 m
Distance to access road	+/- 582 m
Farm name	Schulpaadfontein 328 LQ
Farm number	RE/328
Owner name	Mr J Conradie
Contact details: Tel no	0117621973/5
Estimated quantity (m³)	+/-100000
Suitability of the material	Sand



PREPARED BY:

MOKOLO CROCODILE
Consultants

GEOSTRADA
REGISTERED ENGINEERING CONSULTANTS

PREPARED FOR:

TCTA
A NEW WORLD FOR WATER

PROJECT:

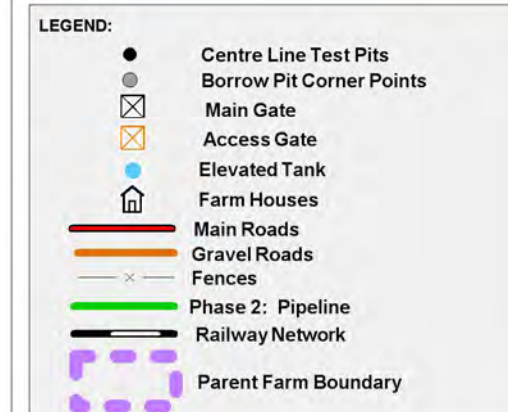
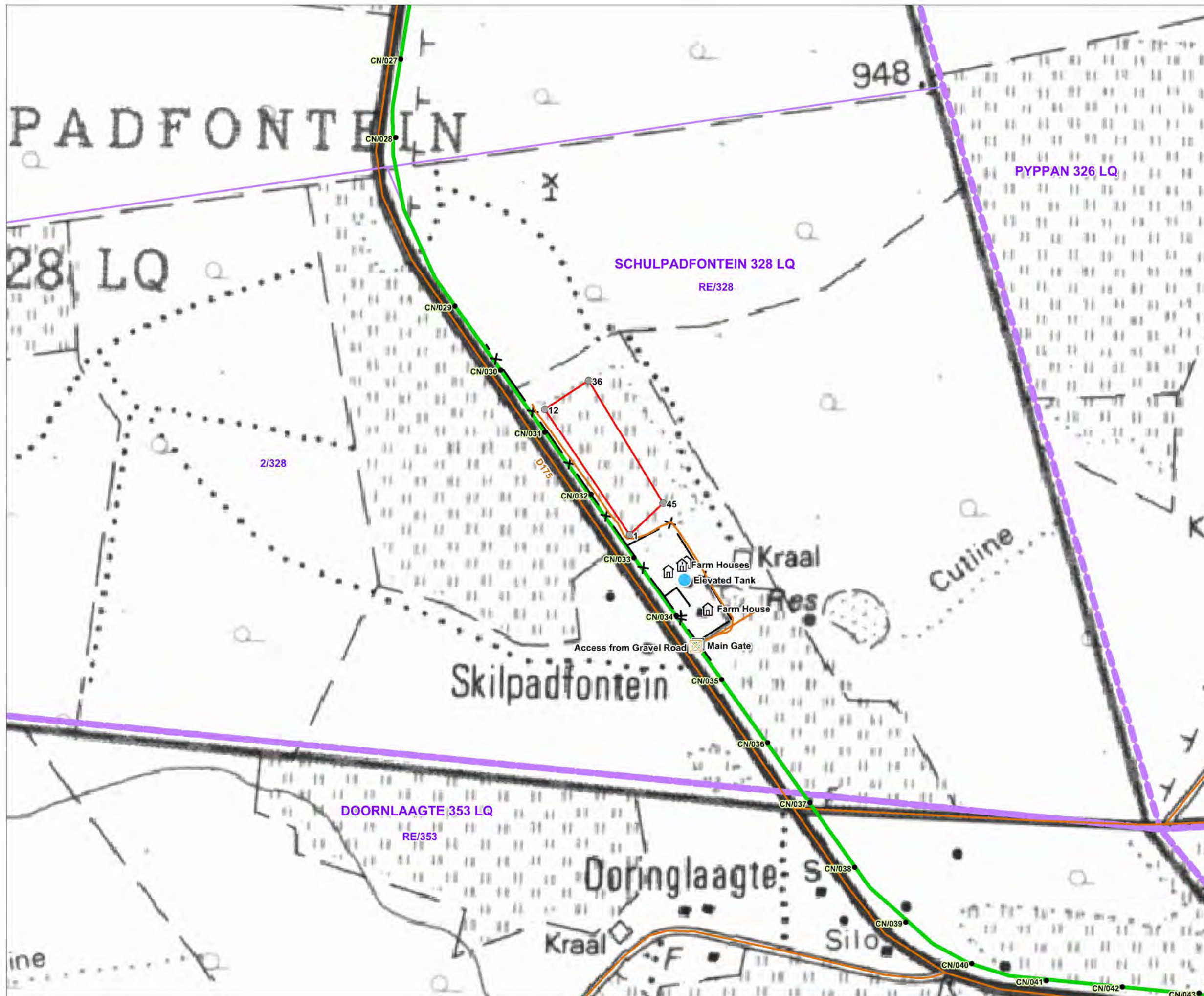
Mokolo and Crocodile Water Augmentation Project (MCWAP)

DRAWING TITLE:

**Borrow Pit 49
Locality Plan**

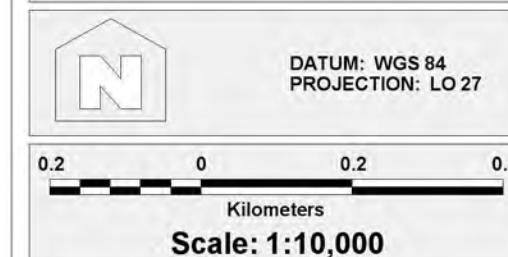
DRAWING NR:

49_1



BORROW PIT DESCRIPTION:

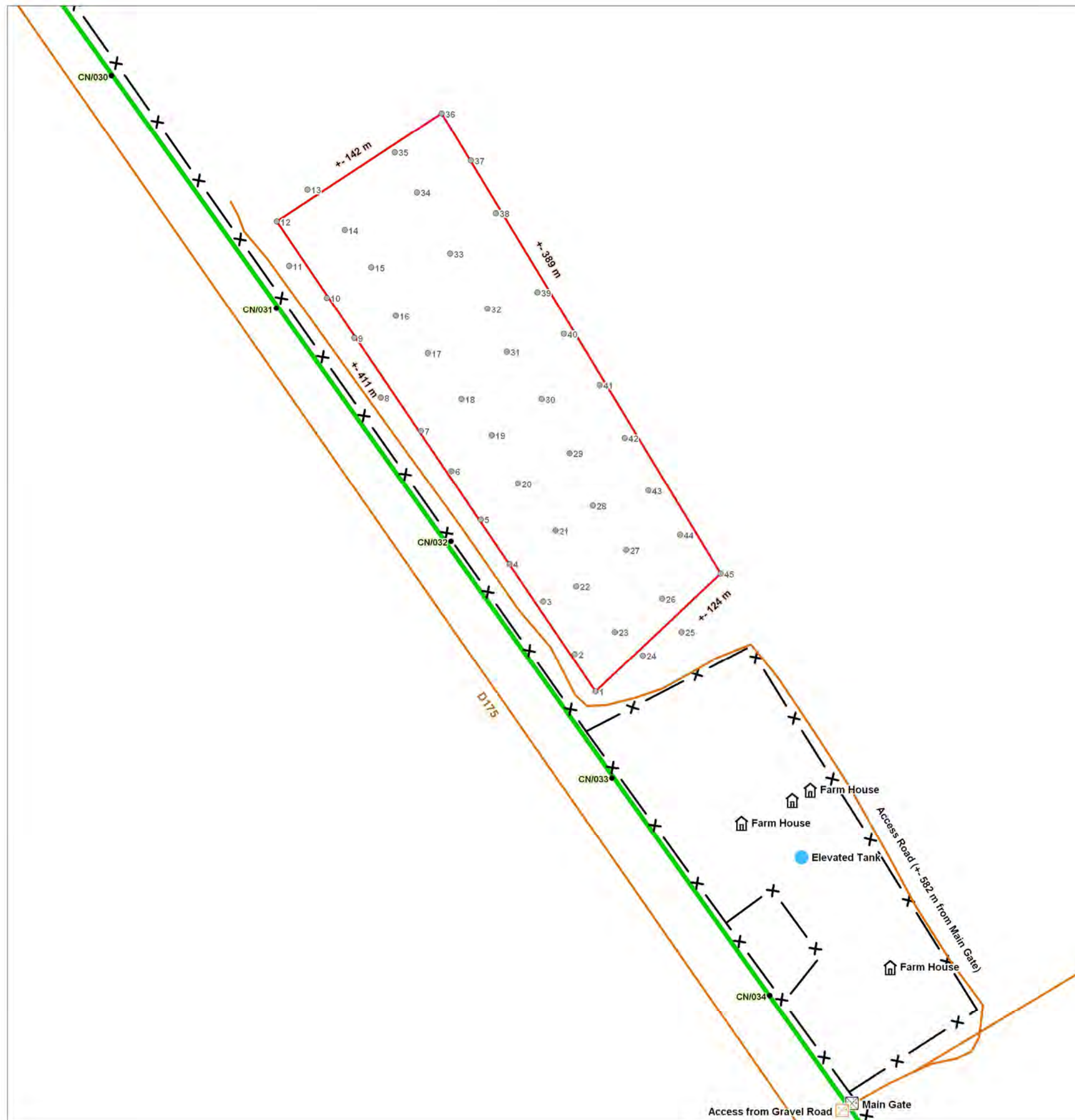
Description	Borrowpit_49
Location of Borrow pit	X2629990 Y-029936
Shortest distance relative to pipeline	+/- 61 m
Distance to access road	+/- 582 m
Farm name	Schulpadfontein 328 LQ
Farm number	RE/328
Owner name	Mr J Conradie
Contact details: Tel no	0117621973/5
Estimated quantity (m³)	+/-100000
Suitability of the material	Sand



PROJECT:
Mokolo and Crocodile Water Augmentation Project (MCWAP)

DRAWING TITLE:
Borrow Pit 49 Layout Plan

DRAWING NR:
49_2



BORROW PIT 49 TEST PIT COORDINATES:

ID	LO27Y	LO27X
1	-029661	2629760
2	-029646	2629733
3	-029623	2629695
4	-029599	2629668
5	-029578	2629636
6	-029557	2629601
7	-029535	2629572
8	-029506	2629548
9	-029487	2629505
10	-029467	2629476
11	-029440	2629453
12	-029431	2629421
13	-029453	2629398
14	-029480	2629427
15	-029499	2629454
16	-029517	2629489
17	-029540	2629516
18	-029564	2629549
19	-029586	2629575
20	-029605	2629610
21	-029632	2629644
22	-029647	2629684
23	-029675	2629717
24	-029695	2629734
25	-029723	2629717
26	-029709	2629693
27	-029683	2629658
28	-029659	2629626
29	-029642	2629588
30	-029622	2629549
31	-029597	2629515
32	-029583	2629484
33	-029556	2629444
34	-029532	2629400
35	-029516	2629371
36	-029550	2629343
37	-029571	2629377
38	-029589	2629415
39	-029619	2629472
40	-029638	2629502
41	-029664	2629539
42	-029682	2629577
43	-029699	2629615
44	-029722	2629647
45	-029751	2629675

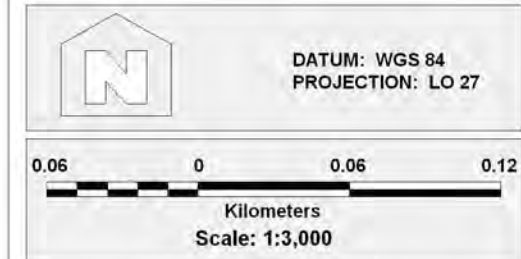


LEGEND:

- Centre Line Test Pits
- Test Pits
- ⊠ Main Gate
- ⊠ Access Gate
- ⊠ Elevated Tank
- ⊠ Farm Houses
- Borrow Pit Border
- Gravel Road
- Fences
- Railway Line
- Phase 2: Pipeline

BORROW PIT DESCRIPTION:

Description	Borrowpit_49
Location of Borrow pit	X2629990 Y-029936
Shortest distance relative to pipeline	+ 61 m
Distance to access road	+ 582 m
Farm name	Schulpadfontein 328 LQ
Farm number	RE/328
Owner name	Mr J Conradie
Contact details: Tel no	0117621973/5
Estimated quantity (m ³)	+100000
Suitability of the material	Sand



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MOKOLO CROCODILE Consultants

GEOSTRADA

PREPARED FOR:

TCTA

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PROJECT:

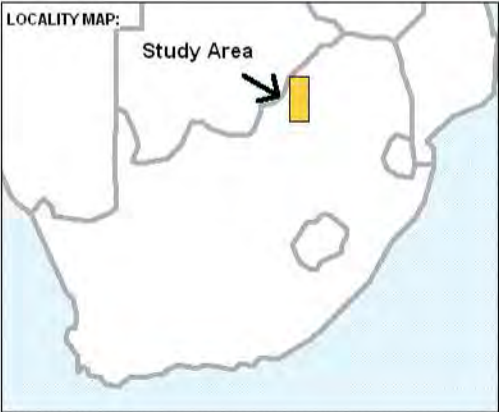
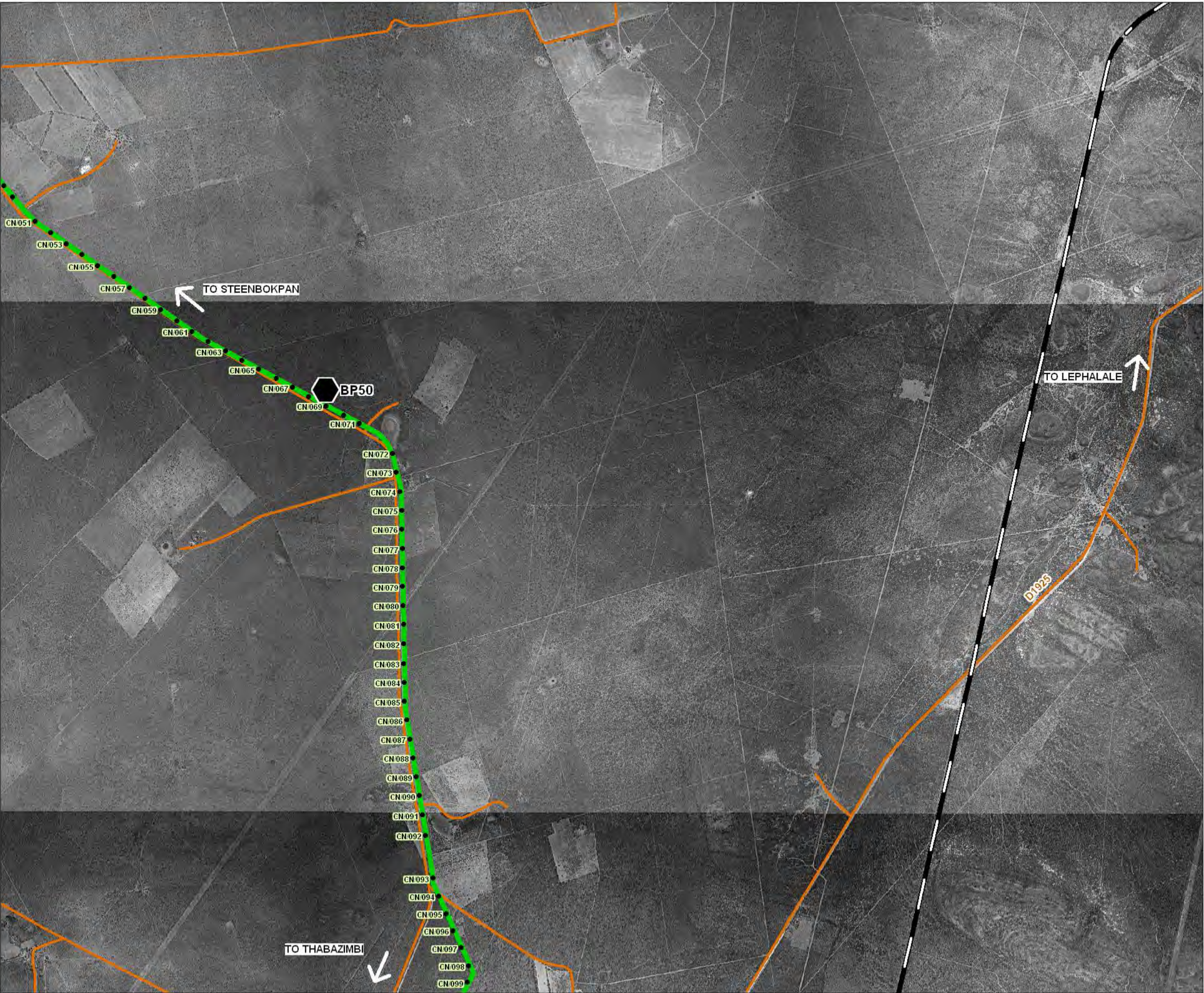
Mokolo and Crocodile Water Augmentation Project (MCWAP)

DRAWING TITLE:

Borrow Pit 49 Test Pit Positions

DRAWING NR:

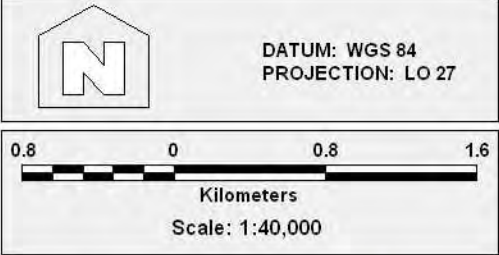
49_3



- LEGEND:
- Centre Line Test Pits
 - Borrow Pit
 - Main Roads
 - Gravel Roads
 - Phase 2: Pipeline
 - Railway Network

BORROW PIT DESCRIPTION:

Description	Borrowpit_50
Location of Borrow pit	X2634270 Y-035812
Shortest distance relative to pipeline	+/- 47 m
Distance to access road	+/- 190 m
Farm name	Leliefontein 672 LQ
Farm number	Ptn 1/672
Owner name	Mr P Botha
Contact details: Mobile no	0834508687
Estimated quantity (m³)	+/- 100000
Suitability of the material	Sand



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GEOSTRADA Engineering & Consulting Services

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PROJECT:

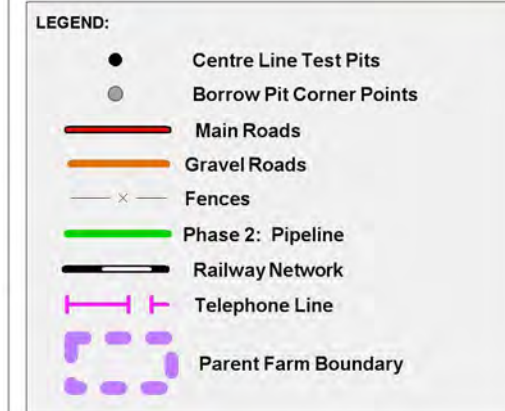
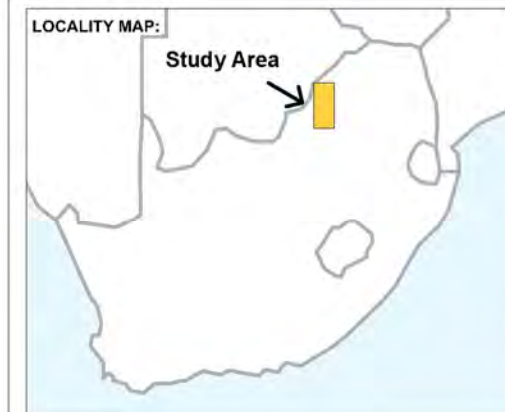
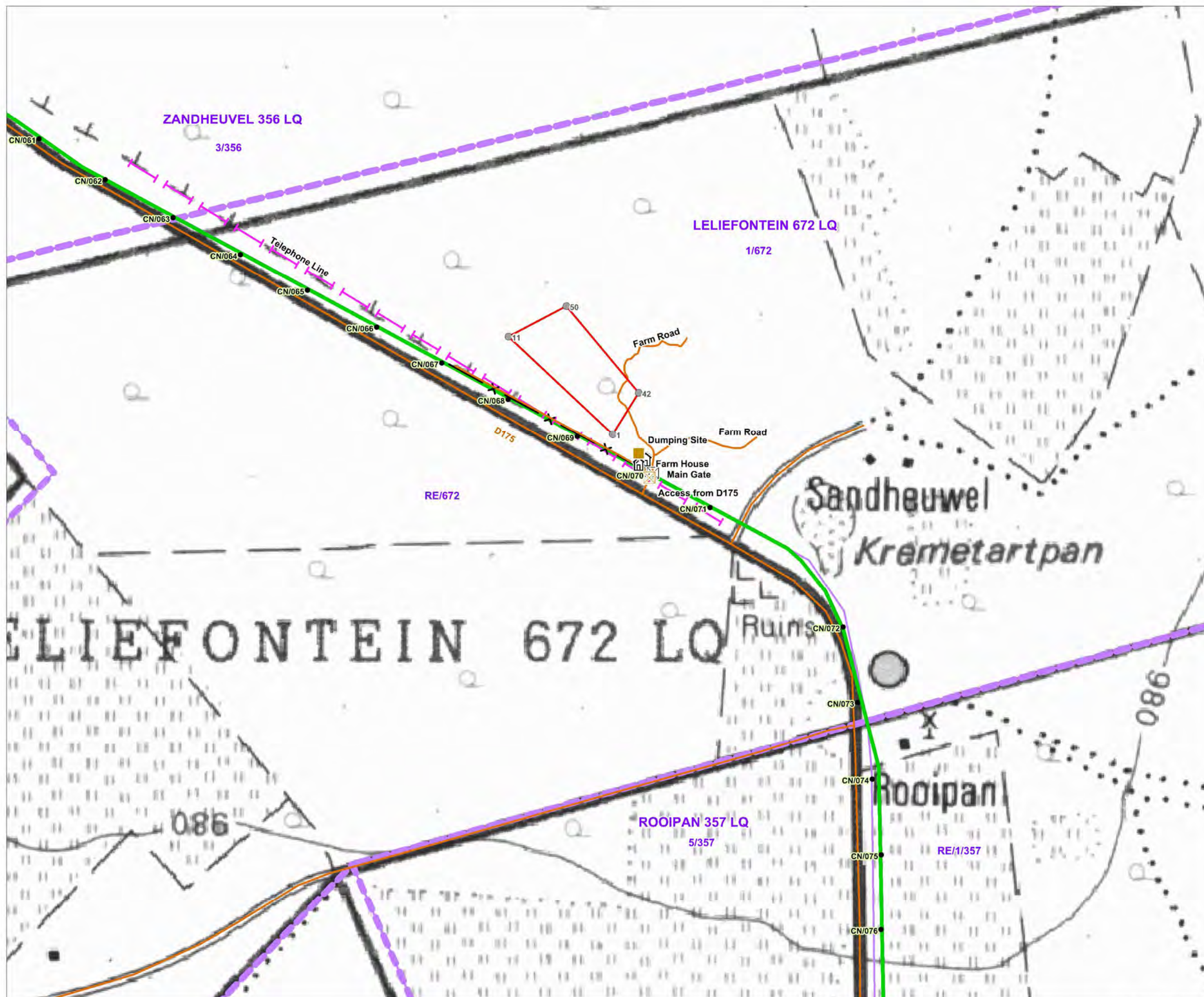
Mokolo and Crocodile Water Augmentation Project (MCWAP)

DRAWING TITLE:

Borrow Pit 50 Locality Plan

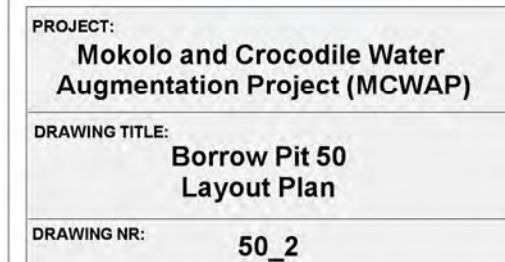
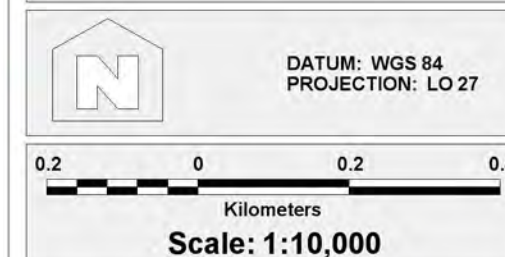
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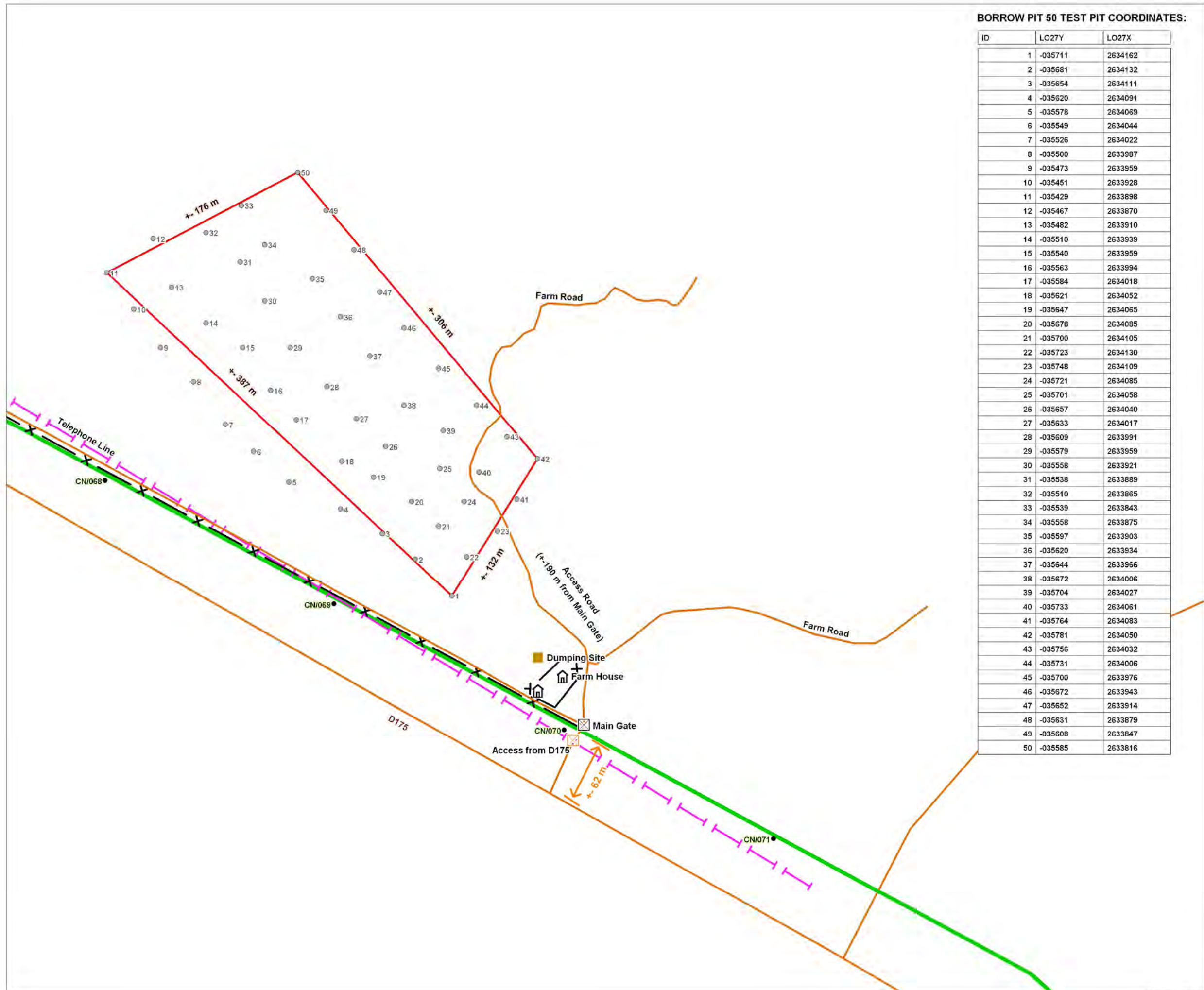
50_1



BORROW PIT DESCRIPTION:

Description	Borrowpit_50
Location of Borrow pit	X2634270 Y-035812
Shortest distance relative to pipeline	± 47 m
Distance to access road	± 190 m
Farm name	Leliefontein 672 LQ
Farm number	Ptn 1/672
Owner name	Mr P Botha
Contact details: Mobile no	0834508687
Estimated quantity (m³)	± 100000
Suitability of the material	Sand





BORROW PIT 50 TEST PIT COORDINATES:

ID	LO27Y	LO27X
1	-035711	2634162
2	-035681	2634132
3	-035654	2634111
4	-035620	2634091
5	-035578	2634069
6	-035549	2634044
7	-035526	2634022
8	-035500	2633987
9	-035473	2633959
10	-035451	2633928
11	-035429	2633898
12	-035467	2633870
13	-035482	2633910
14	-035510	2633939
15	-035540	2633959
16	-035563	2633994
17	-035584	2634018
18	-035621	2634052
19	-035647	2634065
20	-035678	2634085
21	-035700	2634105
22	-035723	2634130
23	-035748	2634109
24	-035721	2634085
25	-035701	2634058
26	-035657	2634040
27	-035633	2634017
28	-035609	2633991
29	-035579	2633959
30	-035558	2633921
31	-035538	2633889
32	-035510	2633865
33	-035539	2633843
34	-035558	2633875
35	-035597	2633903
36	-035620	2633934
37	-035644	2633966
38	-035672	2634006
39	-035704	2634027
40	-035733	2634061
41	-035764	2634083
42	-035781	2634050
43	-035756	2634032
44	-035731	2634006
45	-035700	2633976
46	-035672	2633943
47	-035652	2633914
48	-035631	2633879
49	-035608	2633847
50	-035585	2633816



LEGEND:

- Centre Line Test Pits
- Test Pits
- Main Gate
- Access Gate
- Farm Houses
- Dumping Site
- Borrow Pit Border
- Gravel Road
- Fences
- Railway Line
- Phase 2: Pipeline
- Telephone Line

BORROW PIT DESCRIPTION:

Description	Borrowpit_50
Location of Borrow pit	X2634270 Y-035812
Shortest distance relative to pipeline	± 47 m
Distance to access road	± 190 m
Farm name	Leliefontein 672 LQ
Farm number	Ptn 1/672
Owner name	Mr P Botha
Contact details: Mobile no	0834508687
Estimated quantity (m³)	± 100000
Suitability of the material	Sand

DATUM: WGS 84
PROJECTION: LO 27

0.06 0 0.06 0.12
Kilometers
Scale: 1:3,000

PREPARED BY:

MOKOLO CROCODILE Consultants

GEOSTRADA

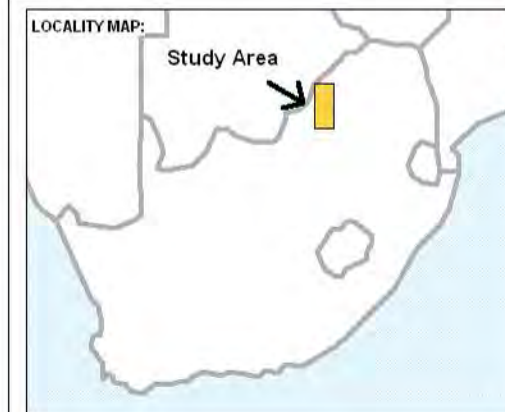
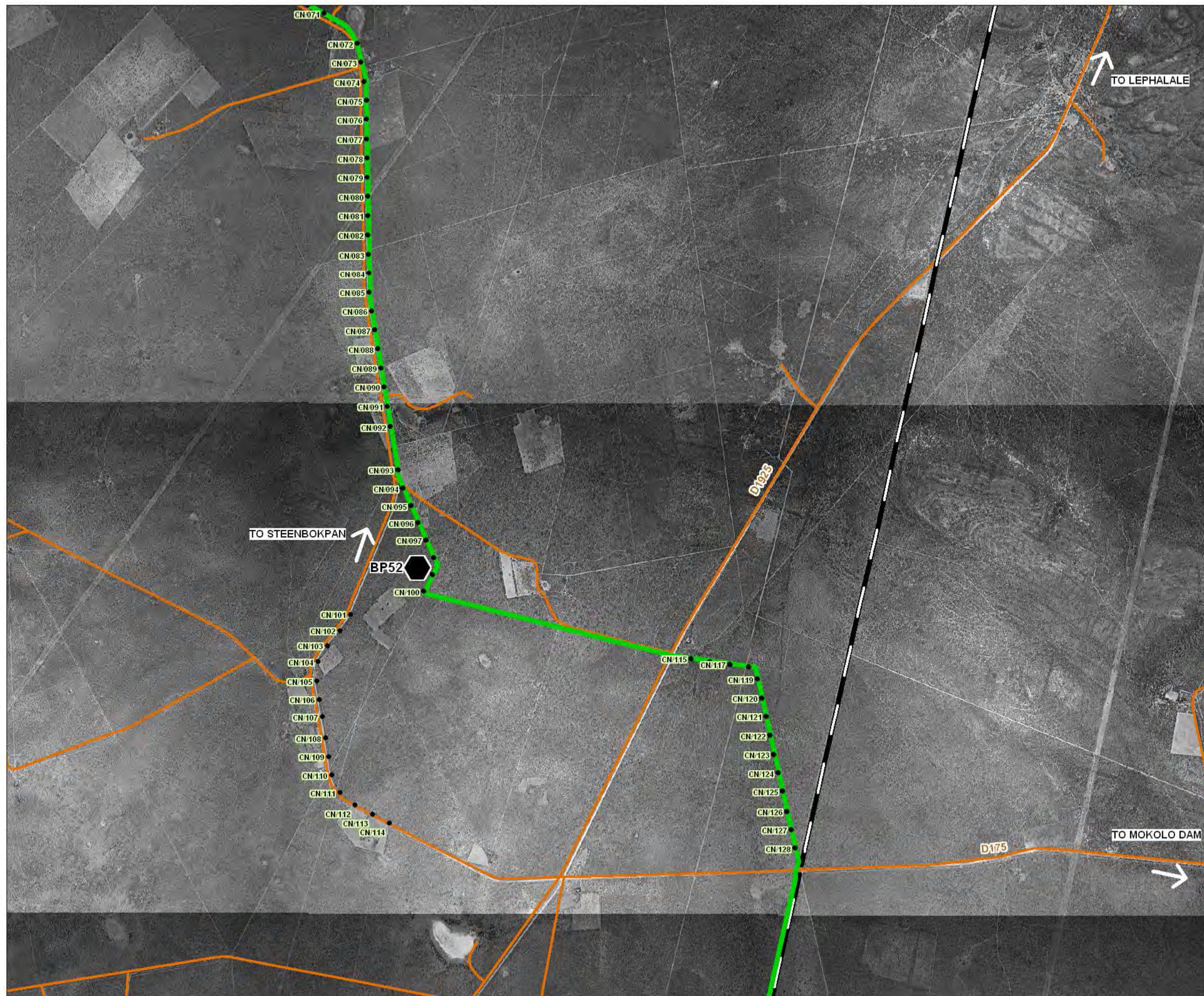
PREPARED FOR:

TCTA

PROJECT:
Mokolo and Crocodile Water Augmentation Project (MCWAP)

DRAWING TITLE:
Borrow Pit 50 Test Pit Positions

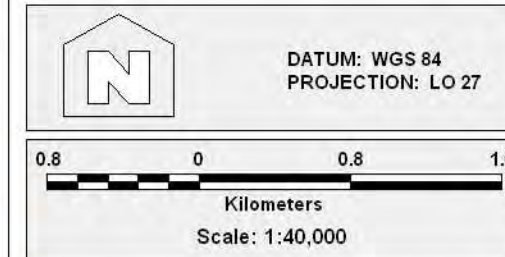
DRAWING NR:
50_3



- LEGEND:
- Centre Line Test Pits
 - ⬡ Borrow Pit
 - Main Roads
 - Gravel Roads
 - Phase 2: Pipeline
 - Railway Network

BORROW PIT DESCRIPTION:

Description	Borrowpit_52
Location of Borrow pit	X2640453 Y-037097
Shortest distance relative to pipeline	+/- 40 m
Distance to access road	+/- 1857 m
Farm name	Grootlaagte 354 LQ
Farm number	Ptn 354
Owner name	Ms JC de Waal
Contact details: Mobile no	0828977542
Estimated quantity (m³)	+/- 100000
Suitability of the material	Sand



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GEOSTRADA
Engineering & Construction Services

PREPARED FOR:

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PROJECT:

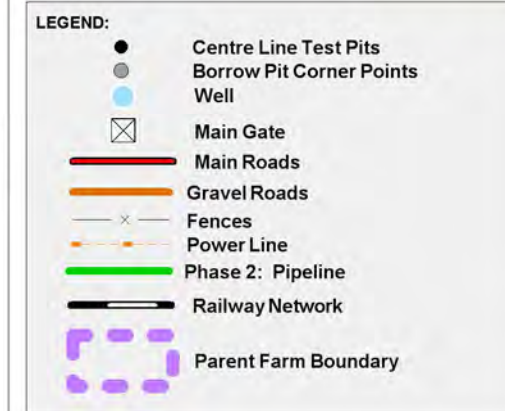
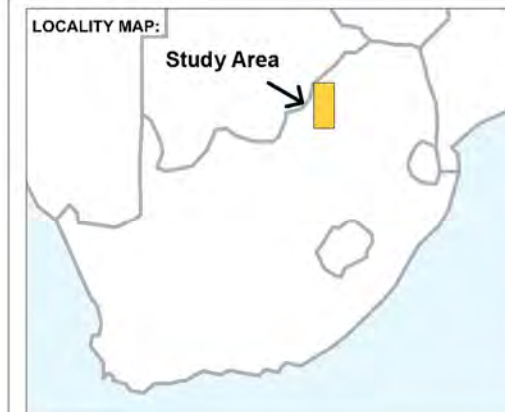
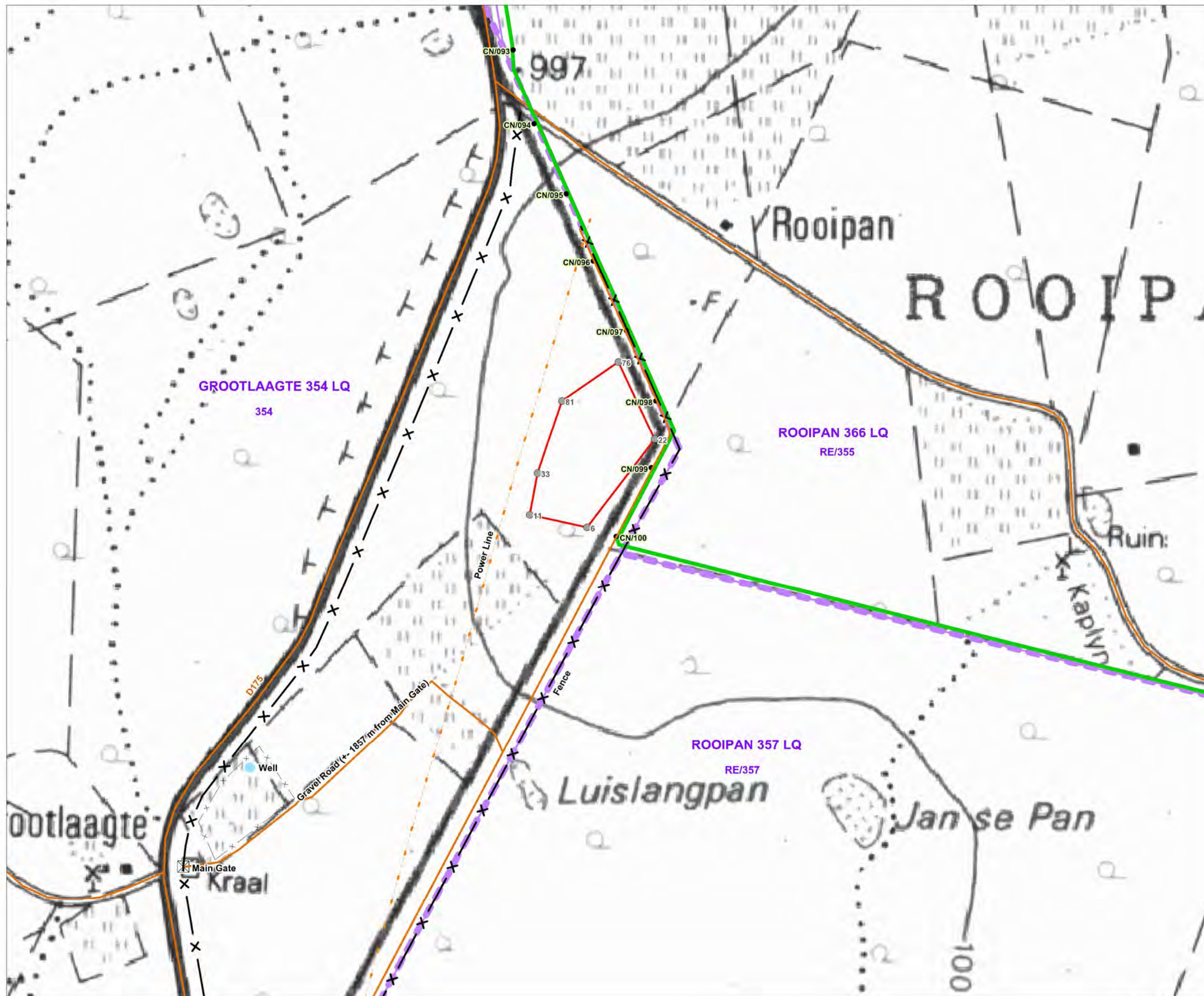
Mokolo and Crocodile Water Augmentation Project (MCWAP)

DRAWING TITLE:

**Borrow Pit 52
Locality Plan**

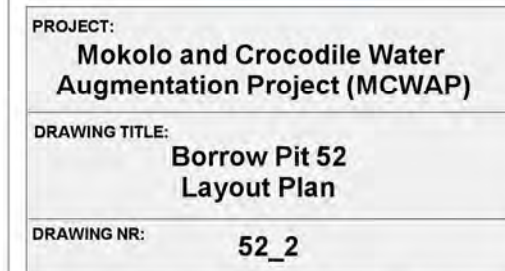
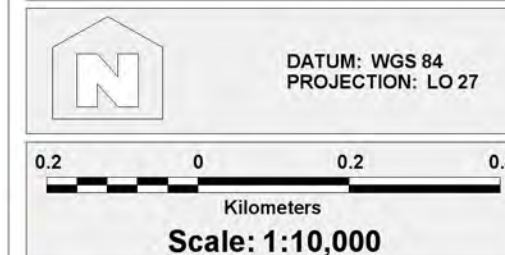
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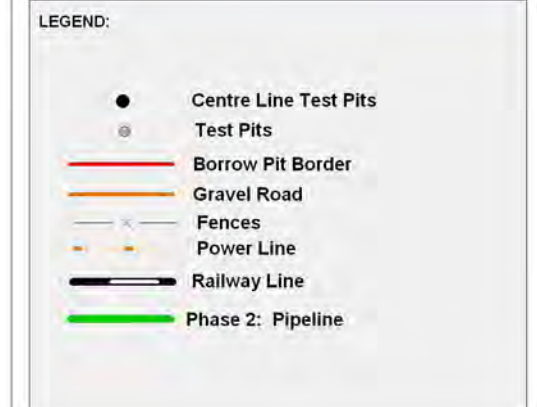
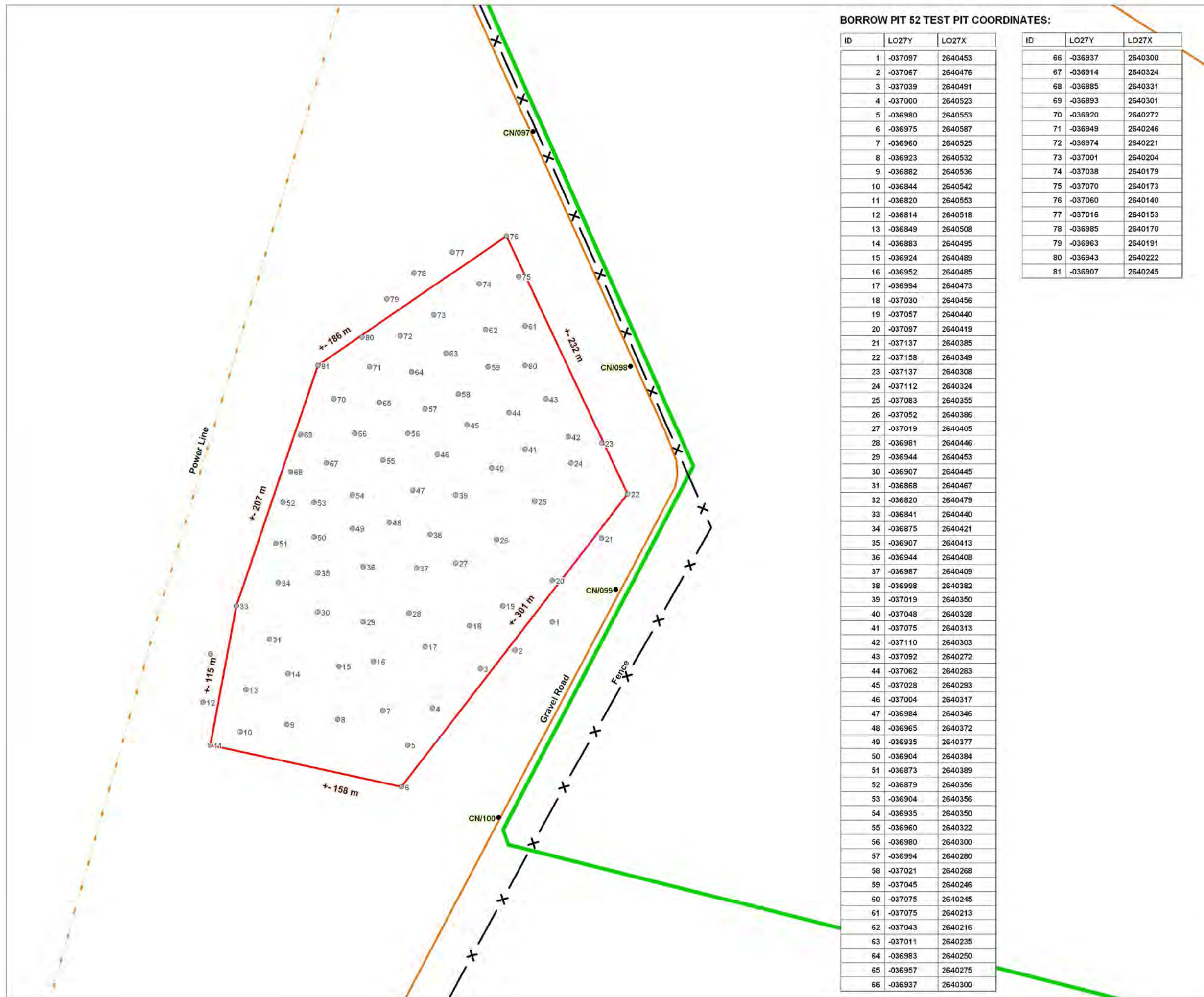
52_1



BORROW PIT DESCRIPTION:

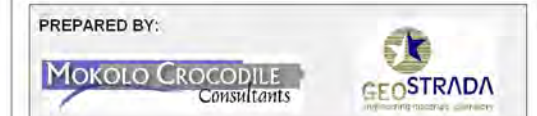
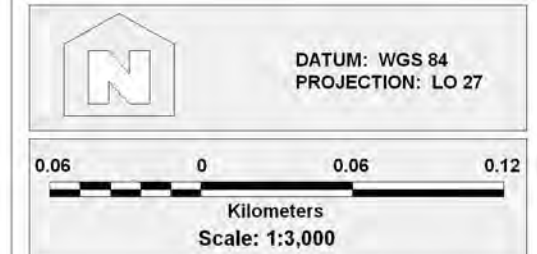
Description	Borrowpit_52
Location of Borrow pit	X2640453 Y-037097
Shortest distance relative to pipeline	± 40 m
Distance to access road	± 1857 m
Farm name	Grootlaagte 354 LQ
Farm number	Ptn 354
Owner name	Ms JC de Waal
Contact details: Mobile no	0828977542
Estimated quantity (m³)	± 100000
Suitability of the material	Sand





BORROW PIT DESCRIPTION:

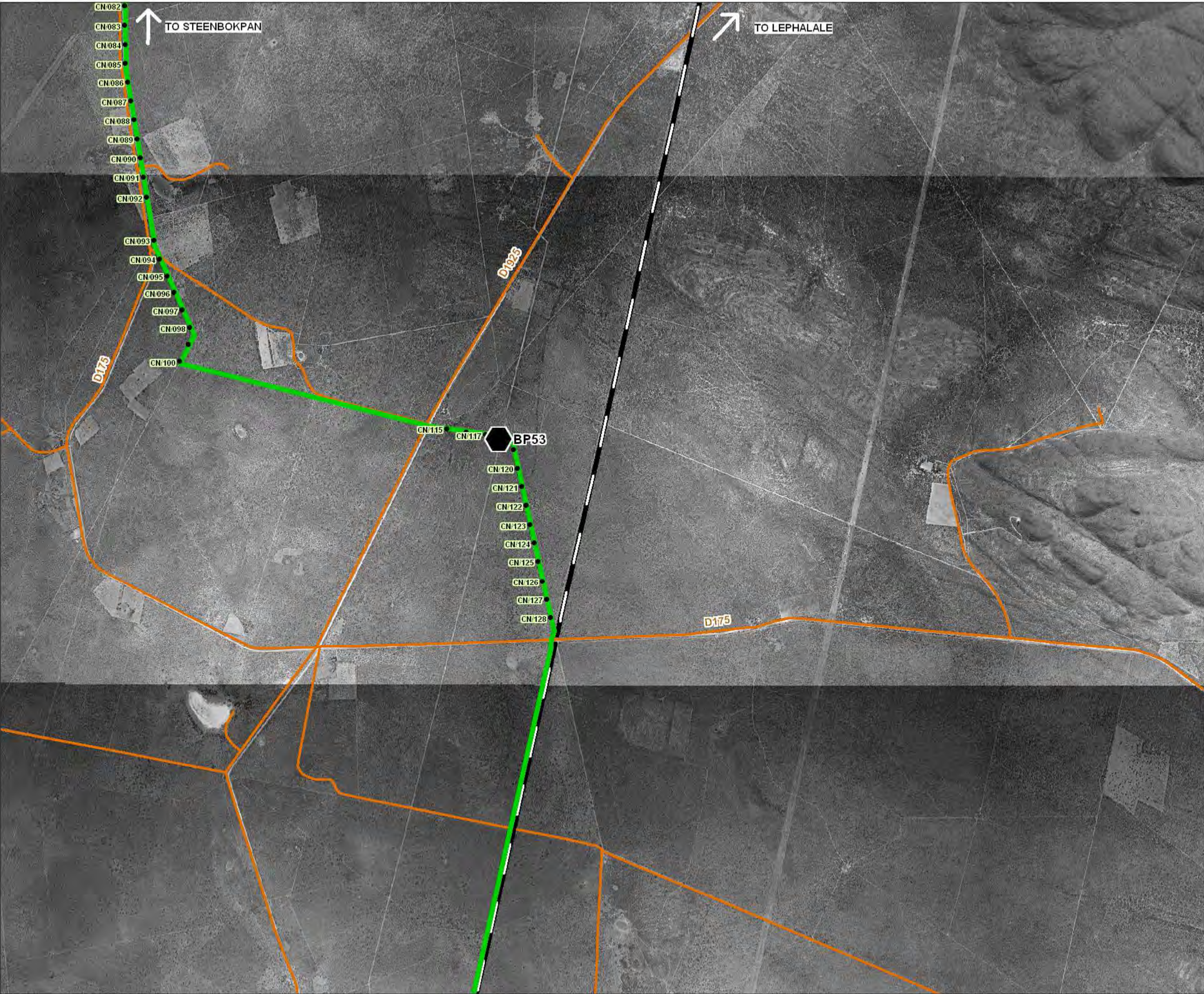
Description	Borrowpit_52
Location of Borrow pit	X2640453 Y-037097
Shortest distance relative to pipeline	± 40 m
Distance to access road	± 1857 m
Farm name	Grootlaagte 354 LQ
Farm number	Ptn 354
Owner name	Ms JC de Waal
Contact details: Mobile no	0828977542
Estimated quantity (m³)	± 100000
Suitability of the material	Sand



PROJECT:
Mokolo and Crocodile Water Augmentation Project (MCWAP)

DRAWING TITLE:
Borrow Pit 52 Test Pit Positions

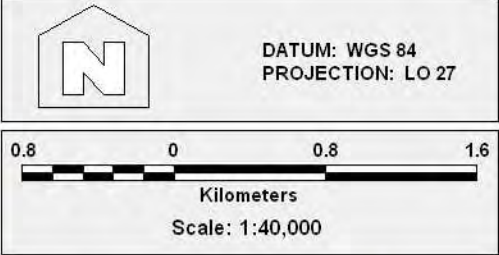
DRAWING NR:
52_3



- LEGEND:
- Centre Line Test Pits
 - Borrow Pit
 - Main Roads
 - Gravel Roads
 - Phase 2: Pipeline
 - Railway Network

BORROW PIT DESCRIPTION:

Description	Borrowpit_53
Location of Borrow pit	X2641445 Y:040508
Shortest distance relative to pipeline	+/- 11 m
Distance to access road	+/- 2030 m
Farm name	Rooipan 357 LQ
Farm number	Ptn 4/357
Owner name	Mr J Erasmus
Contact details: Tel no	0147660032
Estimated quantity (m³)	< 100000
Suitability of the material	Shallow Rock



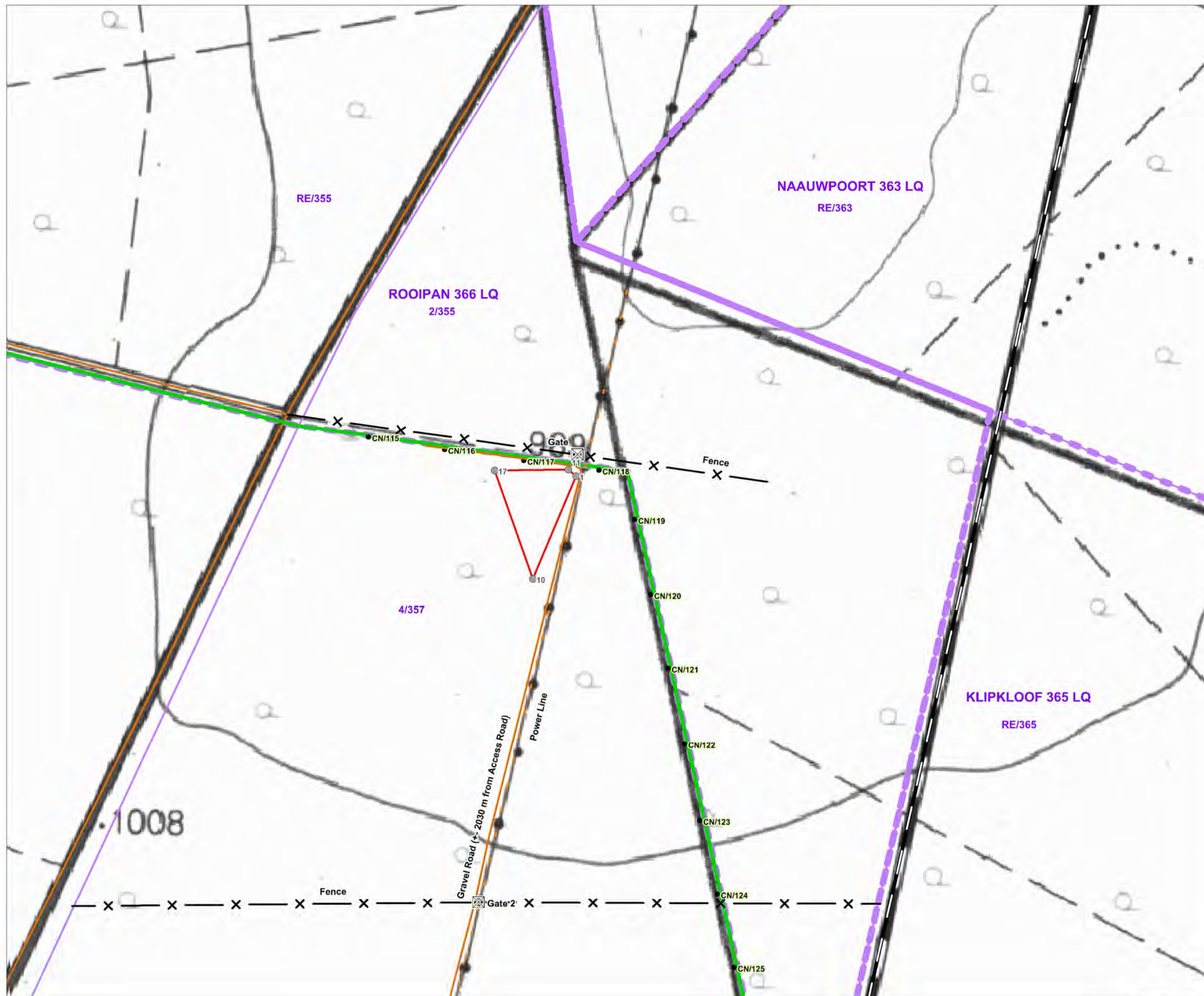
PREPARED BY:

PREPARED FOR:

PROJECT:
Mokolo and Crocodile Water Augmentation Project (MCWAP)

DRAWING TITLE:
Borrow Pit 53 Locality Plan

DRAWING NR:
53_1



LEGEND:

- Centre Line Test Pits
- Borrow Pit Corner Points
- ⊠ Gates
- Main Roads
- Gravel Roads
- Fences
- Power Line
- Phase 2: Pipeline
- Railway Network
- ⬡ Parent Farm Boundary

BORROW PIT DESCRIPTION:

Description	Borrowpit_53
Location of Borrow pit	X2641445 Y-040508
Shortest distance relative to pipeline	± 11 m
Distance to access road	± 2030 m
Farm name	Rooipan 357 LQ
Farm number	Ptn 4/357
Owner name	Mr J Erasmus
Contact details: Tel no	0147660032
Estimated quantity (m³)	< 100000
Suitability of the material	Shallow Rock

DATUM: WGS 84
PROJECTION: LO 27

0.2 0 0.2 0.4
Kilometers
Scale: 1:10,000

PREPARED BY:

MOKOLO CROCODILE Consultants

GEOSTRADA

PREPARED FOR:

TCTA

PROJECT:

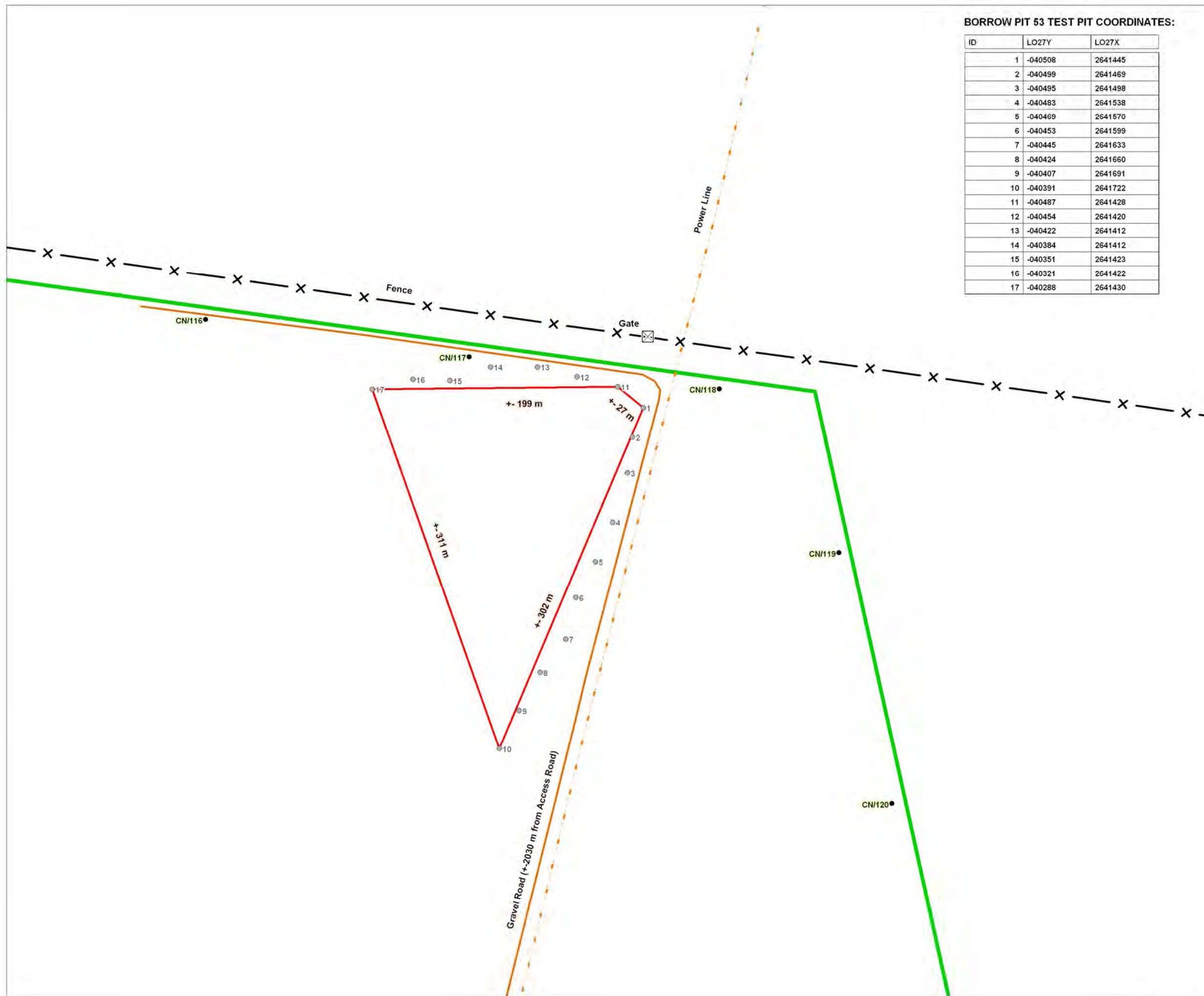
Mokolo and Crocodile Water Augmentation Project (MCWAP)

DRAWING TITLE:

Borrow Pit 53 Layout Plan

DRAWING NR:

53_2



BORROW PIT 53 TEST PIT COORDINATES:

ID	LO27Y	LO27X
1	-040508	2641445
2	-040499	2641469
3	-040495	2641498
4	-040483	2641538
5	-040469	2641570
6	-040453	2641599
7	-040445	2641633
8	-040424	2641660
9	-040407	2641691
10	-040391	2641722
11	-040487	2641428
12	-040454	2641420
13	-040422	2641412
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16	-040321	2641422
17	-040288	2641430

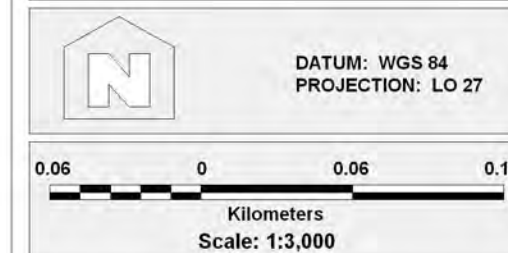


LEGEND:

- Centre Line Test Pits
- Test Pits
- ⊠ Gates
- Borrow Pit Border
- Gravel Road
- - - Fences
- . - . Power Line
- Railway Line
- Phase 2: Pipeline

BORROW PIT DESCRIPTION:

Description	Borrowpit_53
Location of Borrow pit	X2641445 Y-040508
Shortest distance relative to pipeline	+/- 11 m
Distance to access road	+/- 2030 m
Farm name	Rooipan 357 LQ
Farm number	Ptn 4/357
Owner name	Mr J Erasmus
Contact details: Tel no	0147660032
Estimated quantity (m ³)	< 100000
Suitability of the material	Shallow Rock



PREPARED BY:

MOKOLO CROCODILE Consultants 

PREPARED FOR:

 **TCTA**
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PROJECT:
Mokolo and Crocodile Water Augmentation Project (MCWAP)

DRAWING TITLE:
Borrow Pit 53 Test Pit Positions

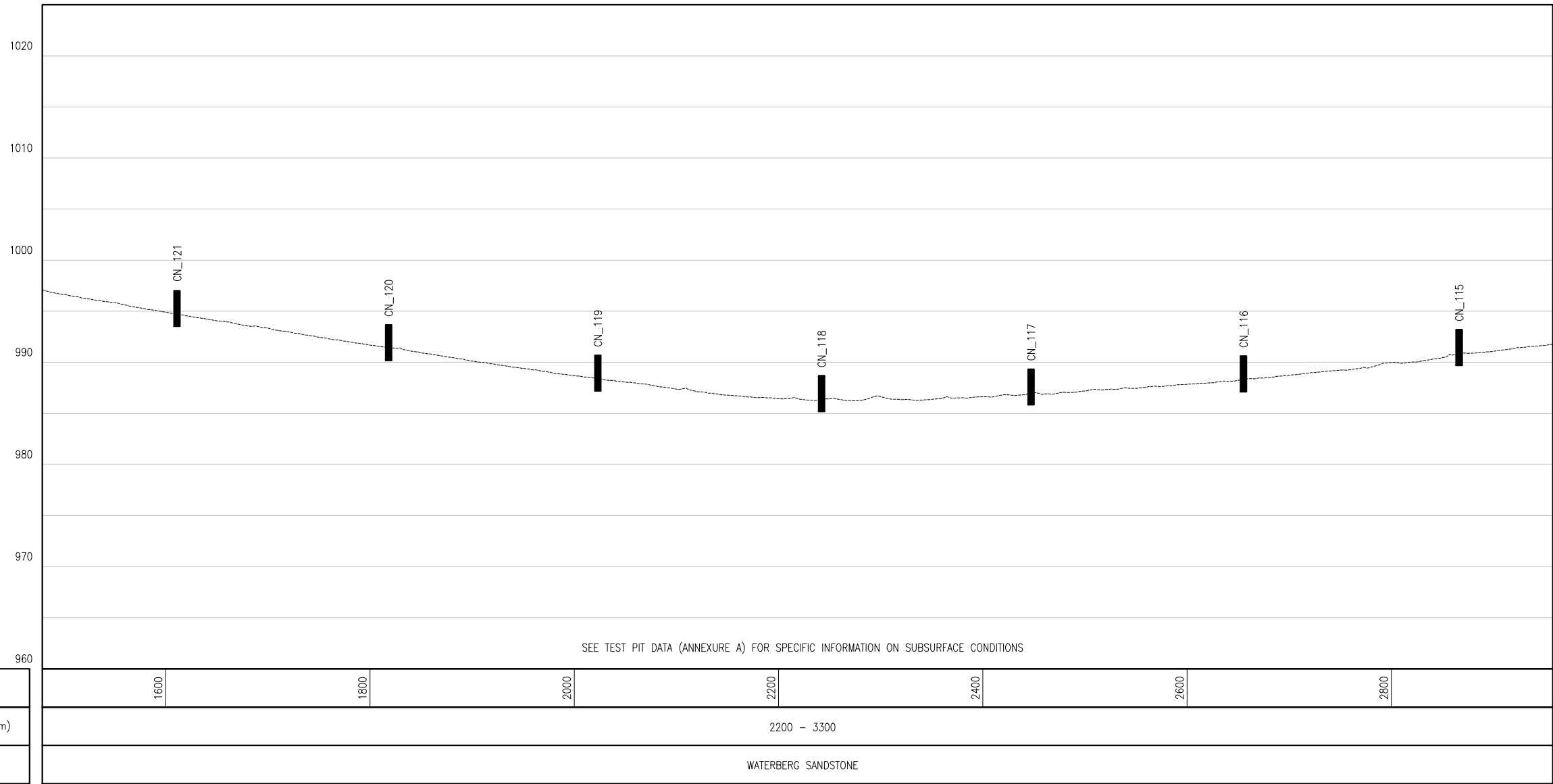
DRAWING NR.:
53_3

ANNEXURE D

GEOTECHNICAL MAPS



SCALE 1:5000





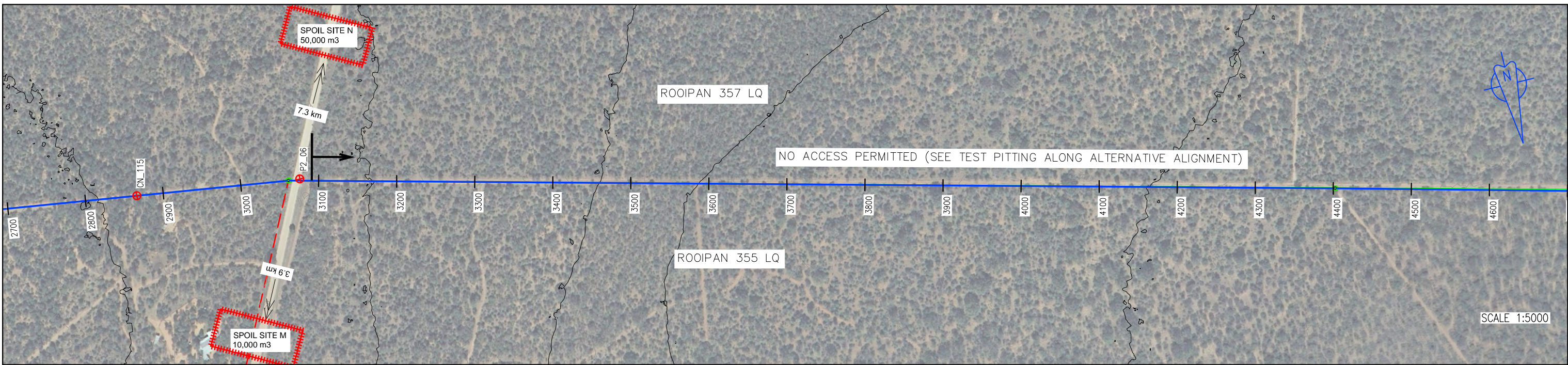
SCALE HOR 1:5000
VERT 1:500

CHAINAGE (m)
REFUSAL DEPTH RANGE (mm)
GEOLOGY

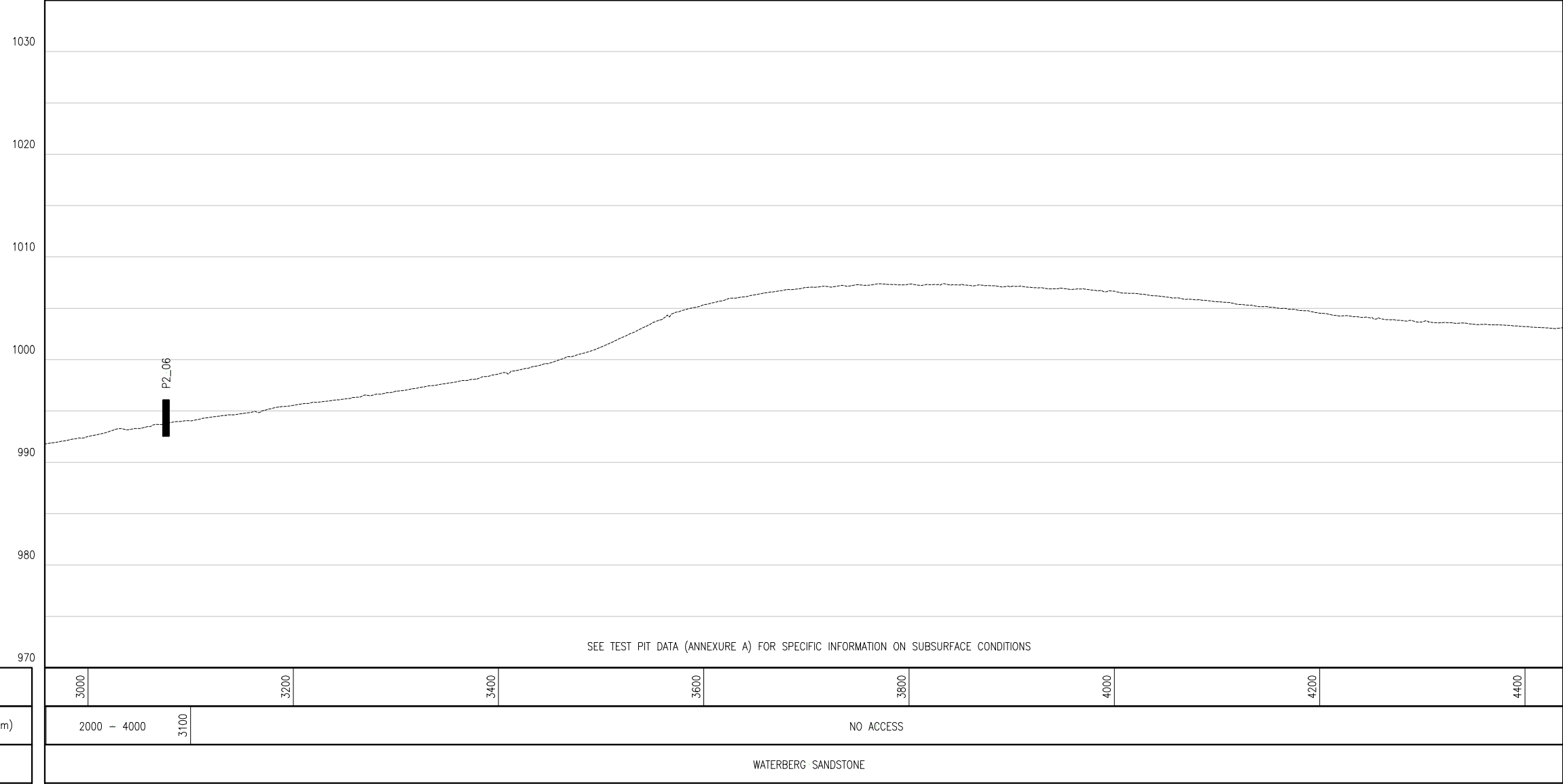
LEGEND:

- CHAINAGE MARKER (PLAN ONLY)
- POINT OF INTERSECTION (PI)
- TEST PIT
- BOREHOLE
- PIPELINE
- OVERHEAD POWERLINE
- FARM BOUNDARY
- FARM PORTION BOUNDARY
- CROSSING - SURFACED ROAD
- CROSSING - GRAVEL ROAD
- CROSSING - PRIVATE DIRT ROAD
- CROSSING - POWERLINE
- AREA OF INTERMITTENT OUTCROP
- AREA OF OUTCROP
- AREA OF IMPEDED DRAINAGE
- POTENTIAL BORROW PIT
- EXISTING BORROW PIT / SPOIL SITE

REFERENCE DRAWINGS		REVISIONS				DESIGNED:		PROJECT ENGINEER:	P LE ROUX		MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)				
DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:			GEOTECHNICAL PROFILE STAGE 3: OPERATIONAL RESERVOIR TO STEENBOKPAN				
		A	24/02/11	FOR INFORMATION		CHECKED:	J MULDER				PLAN & LONG SECTION				
						CHIEF DESIGNER:	E SERFONTEIN	SCALE:	AS SHOWN						
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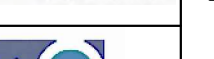

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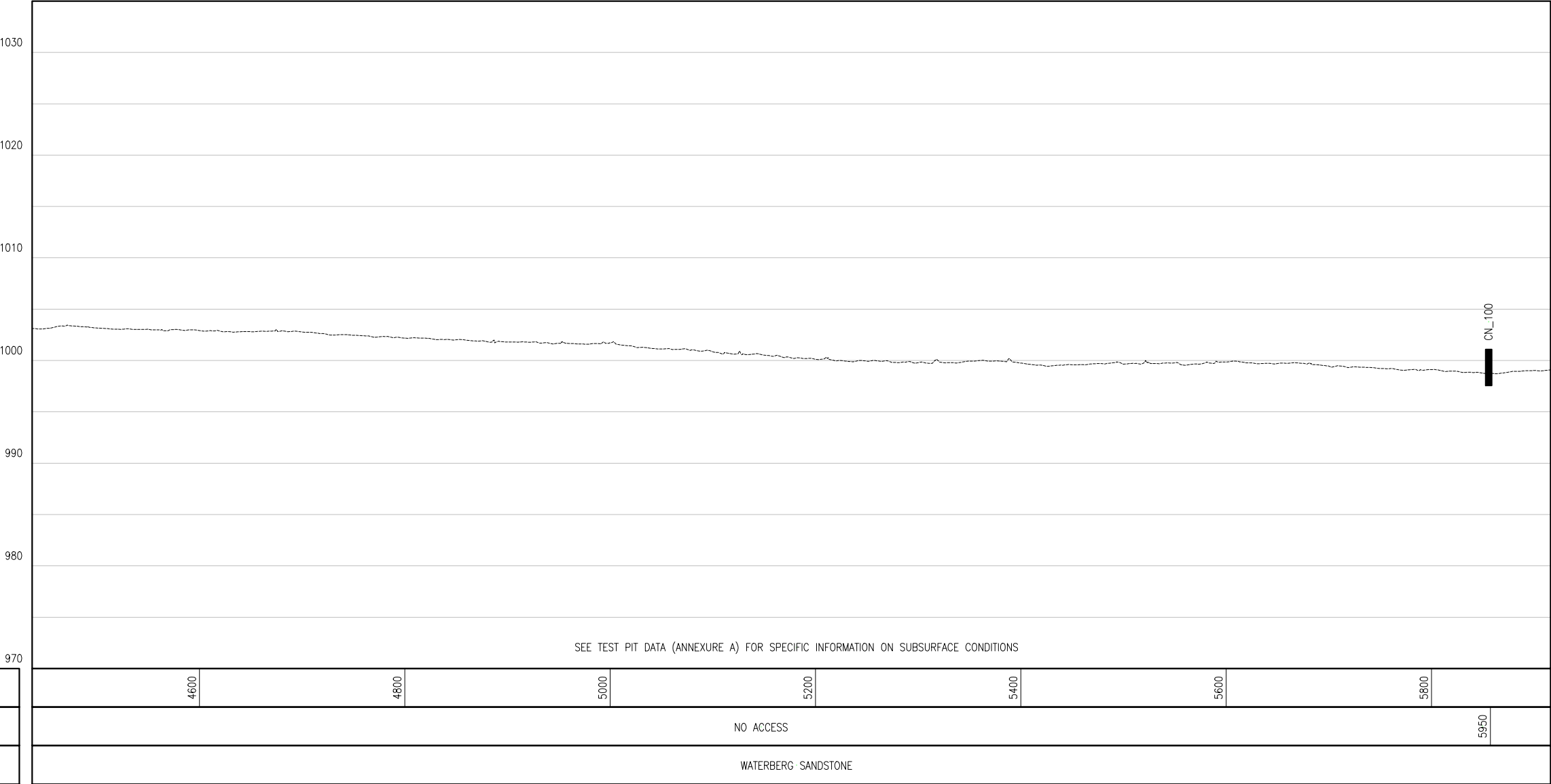
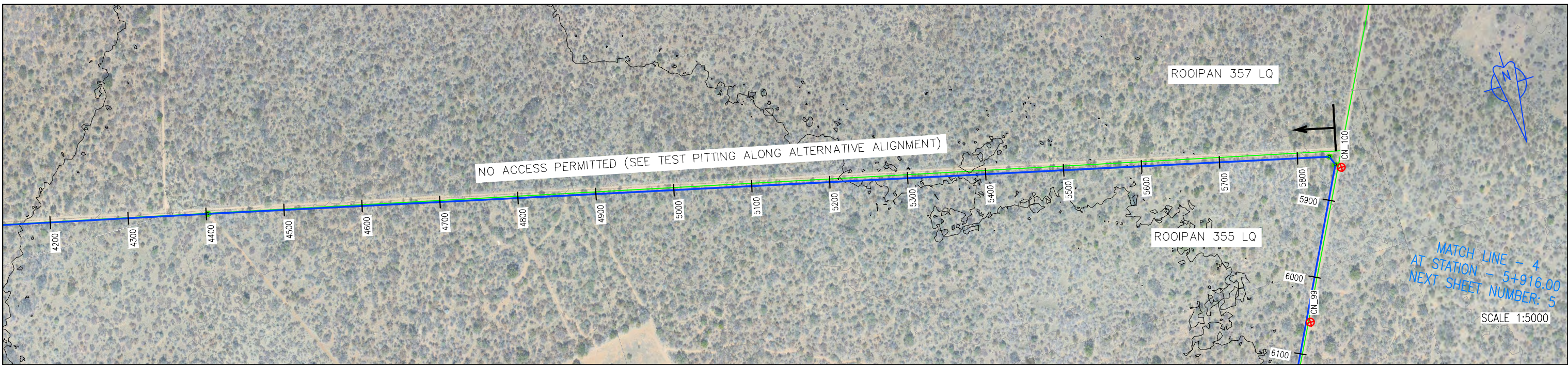


SCALE HOR 1:5000
VERT 1:500

LEGEND:

- CHAINAGE MARKER (PLAN ONLY)
- POINT OF INTERSECTION (PI)
- TEST PIT
- BOREHOLE
- PIPELINE
- OVERHEAD POWERLINE
- FARM BOUNDARY
- FARM PORTION BOUNDARY
- CROSSING - SURFACED ROAD
- CROSSING - GRAVEL ROAD
- CROSSING - PRIVATE DIRT ROAD
- CROSSING - POWERLINE
- AREA OF INTERMITTENT OUTCROP
- AREA OF OUTCROP
- AREA OF IMPEDED DRAINAGE
- POTENTIAL BORROW PIT
- EXISTING BORROW PIT / SPOIL SITE





REFERENCE DRAWINGS		REVISIONS				DESIGNED:		PROJECT ENGINEER:	P LE ROUX		MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)				
DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:			GEOTECHNICAL PROFILE STAGE 3: OPERATIONAL RESERVOIR TO STEENBOKPAN				
		A	24/02/11	FOR INFORMATION		CHECKED:	J MULDER				PLAN & LONG SECTION				
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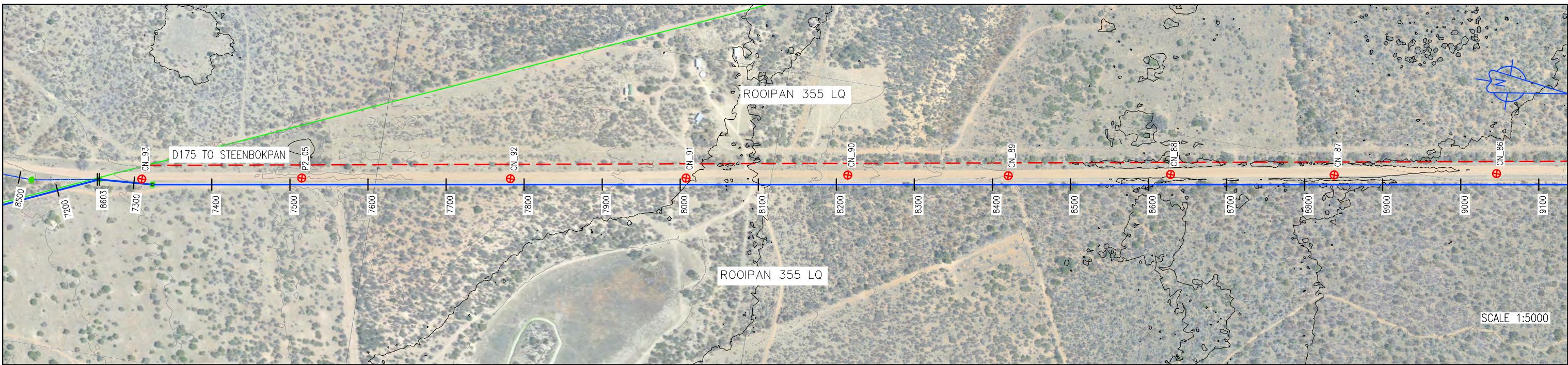


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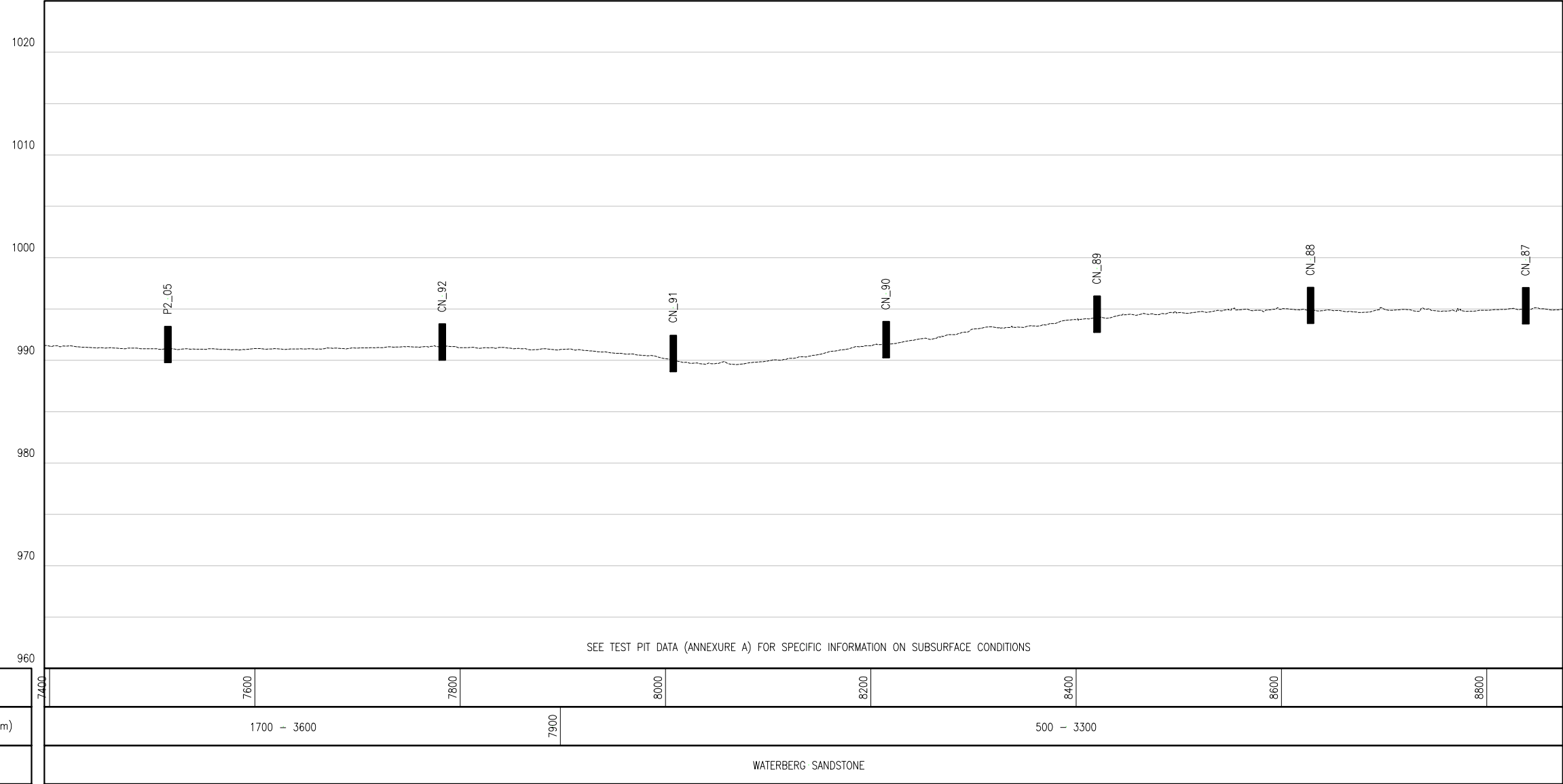
- CHAINAGE MARKER (PLAN ONLY)
- POINT OF INTERSECTION (PI)
- TEST PIT
- BOREHOLE
- PIPELINE
- OVERHEAD POWERLINE
- FARM BOUNDARY
- FARM PORTION BOUNDARY
- CROSSING - SURFACED ROAD
- CROSSING - GRAVEL ROAD
- CROSSING - PRIVATE DIRT ROAD
- CROSSING - POWERLINE
- AREA OF INTERMITTENT OUTCROP
- AREA OF OUTCROP
- AREA OF IMPEDED DRAINAGE
- POTENTIAL BORROW PIT
- EXISTING BORROW PIT / SPOIL SITE

CHAINAGE (m)
REFUSAL DEPTH RANGE (mm)
GEOLOGY

REFERENCE DRAWINGS		REVISIONS				DESIGNED:		PROJECT ENGINEER:	P LE ROUX		MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)				
DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:			GEOTECHNICAL PROFILE STAGE 3: OPERATIONAL RESERVOIR TO STEENBOKPAN				
		A	24/02/11	FOR INFORMATION		CHECKED:	J MULDER				PLAN & LONG SECTION				
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SCALE 1:5000



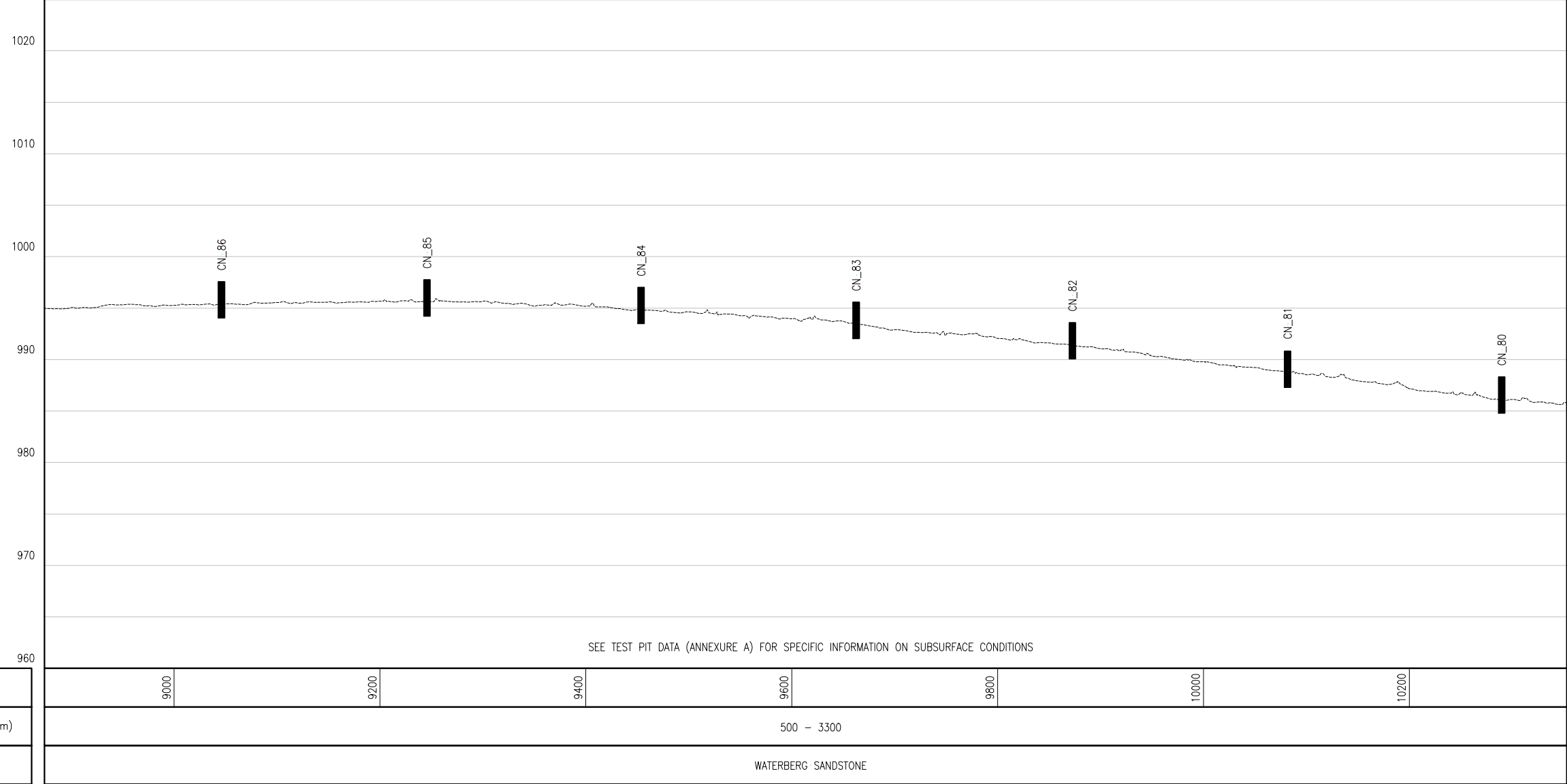
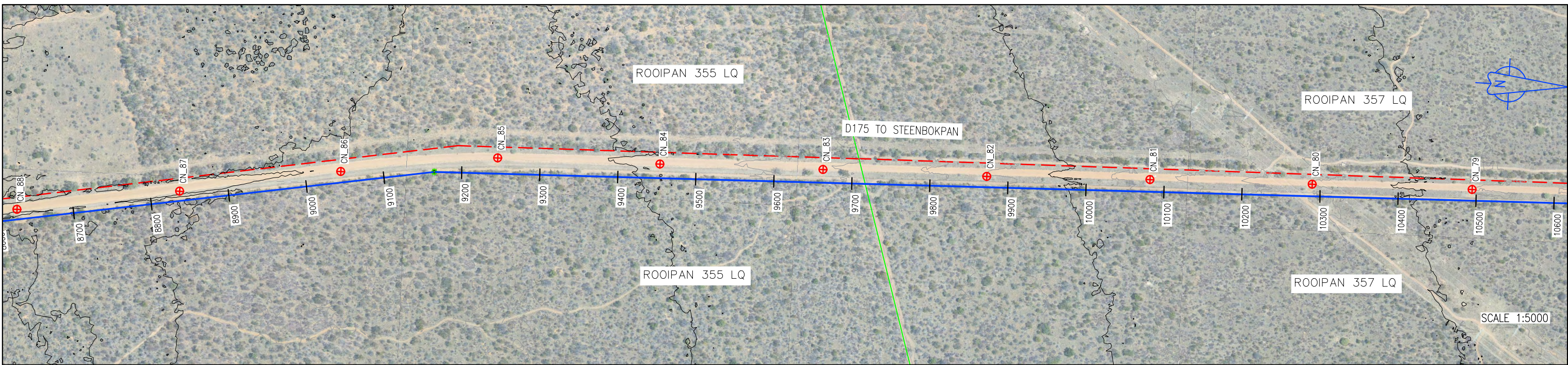
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VERT 1:500

CHAINAGE (m)
REFUSAL DEPTH RANGE (mm)
GEOLOGY

	7600	7800	8000	8200	8400	8600	8800	
1700 – 3600			7900	500 – 3300				
WATERBERG SANDSTONE								

LEGEND:	
	CHAINAGE MARKER (PLAN ONLY)
	POINT OF INTERSECTION (PI)
	TEST PIT
	BOREHOLE
	PIPELINE
	OVERHEAD POWERLINE
	FARM BOUNDARY
	FARM PORTION BOUNDARY
	CROSSING - SURFACED ROAD
	CROSSING - GRAVEL ROAD
	CROSSING - PRIVATE DIRT ROAD
	CROSSING - POWERLINE
	AREA OF INTERMITTENT OUTCROP
	AREA OF OUTCROP
	AREA OF IMPEDED DRAINAGE
	POTENTIAL BORROW PIT
	EXISTING BORROW PIT / SPOIL SITE








































































































REFERENCE DRAWINGS				REVISIONS			DESIGNED:		PROJECT ENGINEER:	P LE ROUX	 	MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)		
DRG. No.	TITLE			REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:		GEOTECHNICAL PROFILE STAGE 3: OPERATIONAL RESERVOIR TO STEENBOKPAN		
				A	24/02/11	FOR INFORMATION		CHECKED:	J MULDER			PLAN & LONG SECTION		
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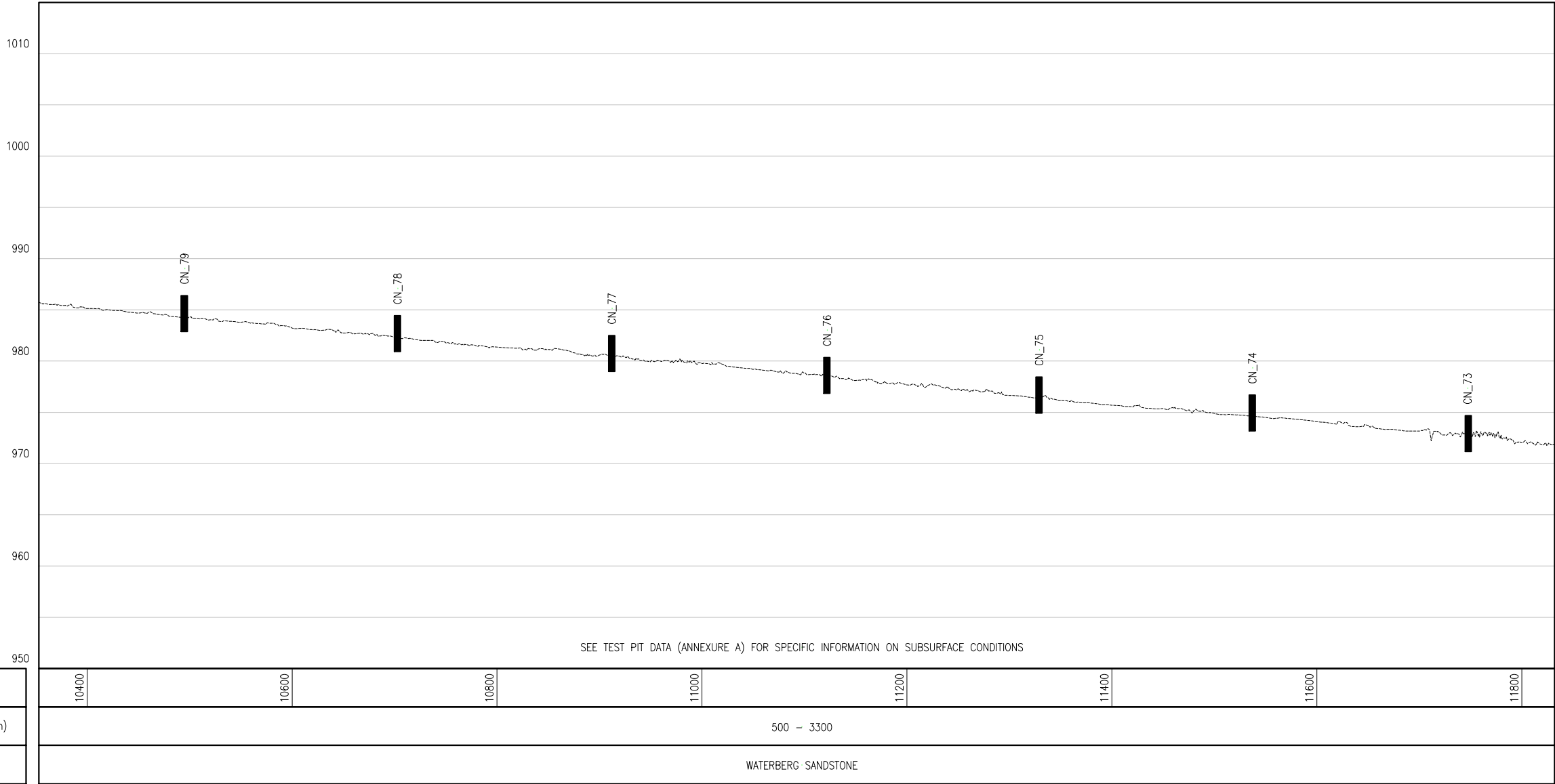
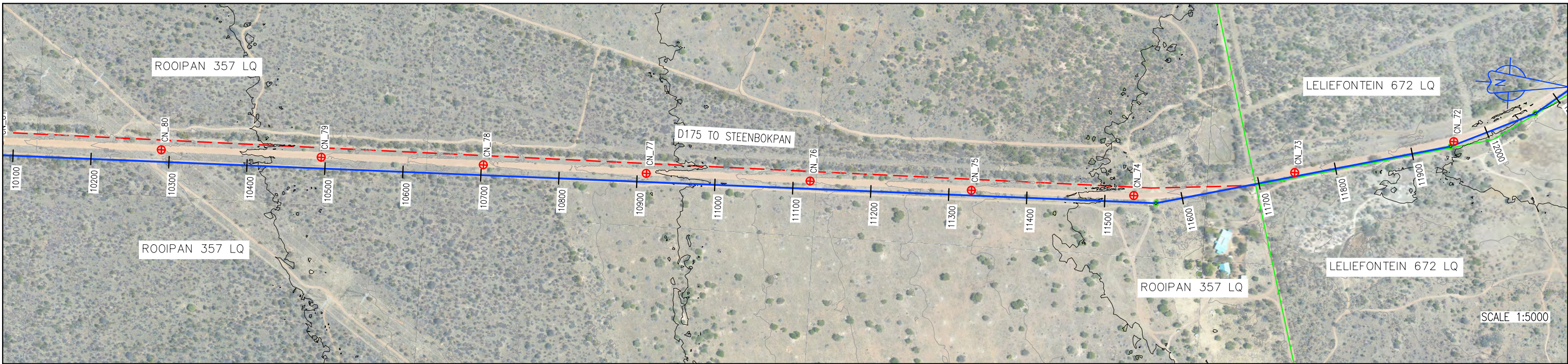


LEGEND:

- CHAINAGE MARKER (PLAN ONLY)
- POINT OF INTERSECTION (PI)
- TEST PIT
- BOREHOLE
- PIPELINE
- OVERHEAD POWERLINE
- FARM BOUNDARY
- FARM PORTION BOUNDARY
- CROSSING – SURFACED ROAD
- CROSSING – GRAVEL ROAD
- CROSSING – PRIVATE DIRT ROAD
- CROSSING – POWERLINE
- AREA OF INTERMITTENT OUTCROP
- AREA OF OUTCROP
- AREA OF IMPEDED DRAINAGE
- POTENTIAL BORROW PIT
- EXISTING BORROW PIT / SPOIL SITE

SCALE HOR 1:5000 VERT 1:500
CHAINAGE (m)
REFUSAL DEPTH RANGE (mm)
GEOLOGY



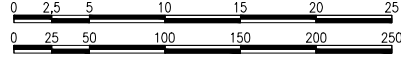
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DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:			GEOTECHNICAL PROFILE STAGE 3: OPERATIONAL RESERVOIR TO STEENBOKPAN					
		A	24/02/11	FOR INFORMATION		CHECKED:	J MULDER				PLAN & LONG SECTION					
						CHIEF DESIGNER:	E SERFONTEIN	SCALE:	AS SHOWN							
						SCALE: 1:500										
						SCALE: 1:5000										
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
																
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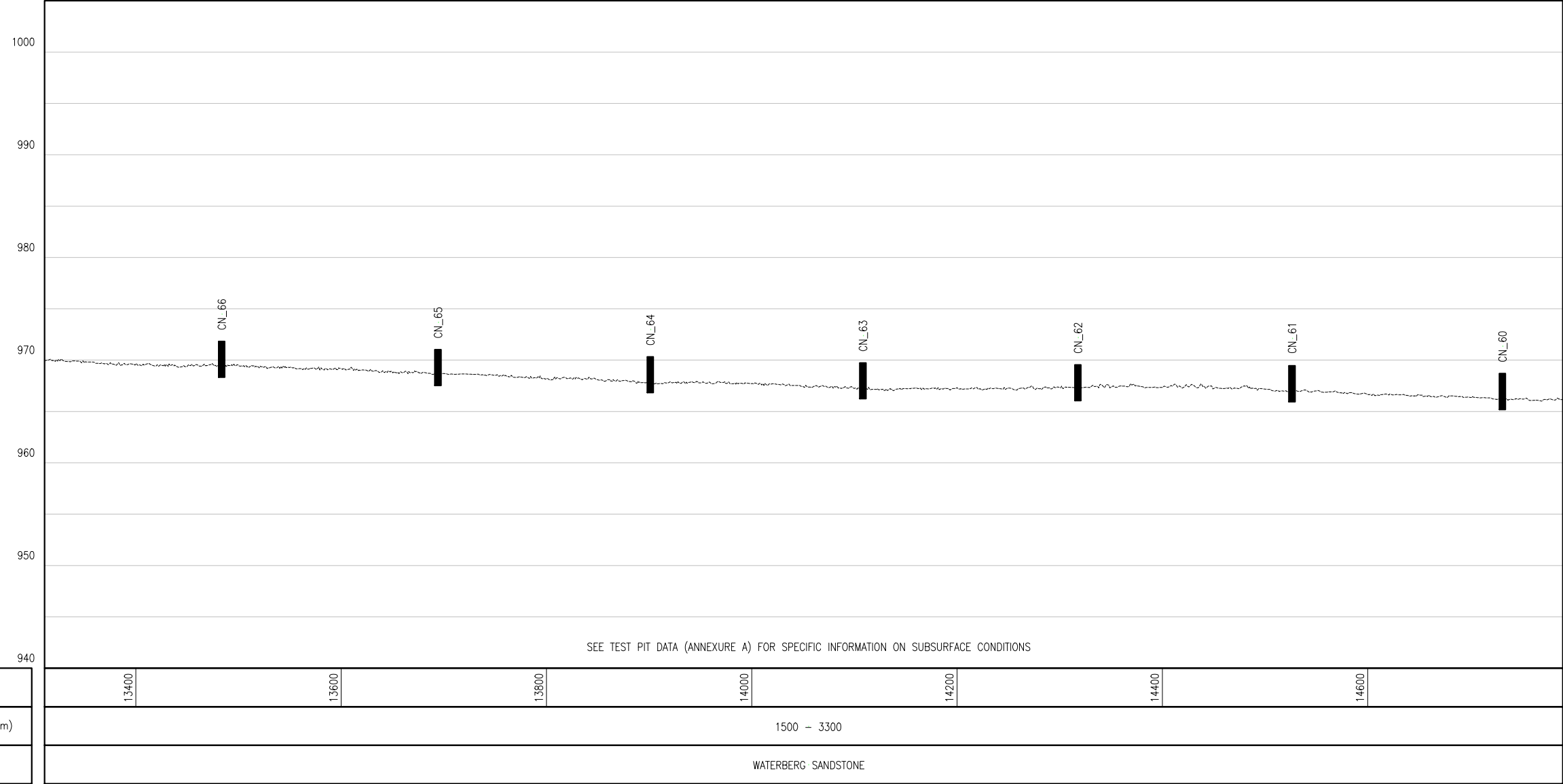


LEGEND:

- CHAINAGE MARKER (PLAN ONLY)
- POINT OF INTERSECTION (PI)
- TEST PIT
- BOREHOLE
- PIPELINE
- OVERHEAD POWERLINE
- FARM BOUNDARY
- FARM PORTION BOUNDARY
- CROSSING – SURFACED ROAD
- CROSSING – GRAVEL ROAD
- CROSSING – PRIVATE DIRT ROAD
- CROSSING – POWERLINE
- AREA OF INTERMITTENT OUTCROP
- AREA OF OUTCROP
- AREA OF IMPEDED DRAINAGE
- POTENTIAL BORROW PIT
- EXISTING BORROW PIT / SPOIL SITE

CHAINAGE (m)
REFUSAL DEPTH RANGE (mm)
GEOLOGY





REFERENCE DRAWINGS			REVISIONS				DESIGNED:		PROJECT ENGINEER:	P LE ROUX		MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)					
DRG. No.	TITLE		REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:			GEOTECHNICAL PROFILE STAGE 3: OPERATIONAL RESERVOIR TO STEENBOKPAN					
			A	24/02/11	FOR INFORMATION		CHECKED:	J MULDER				PLAN & LONG SECTION					
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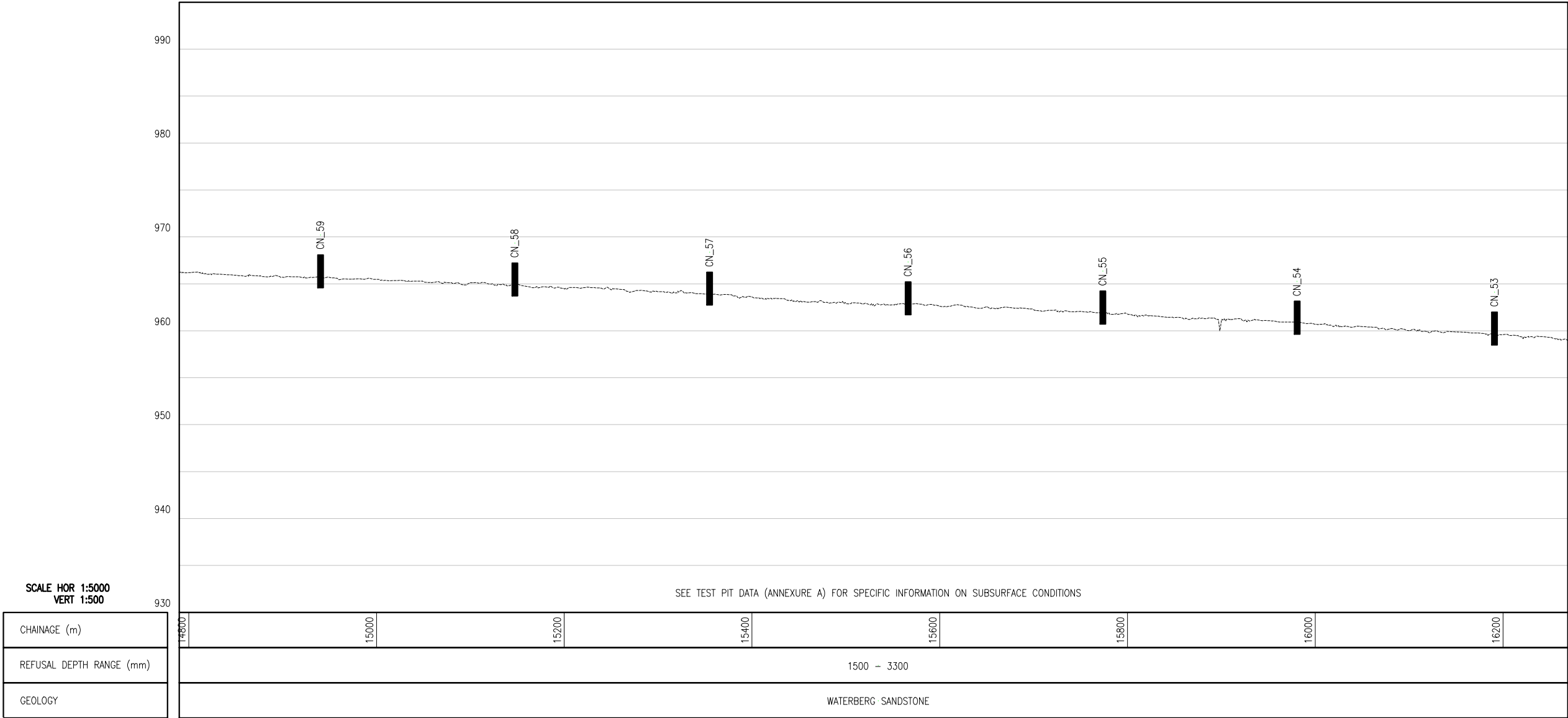
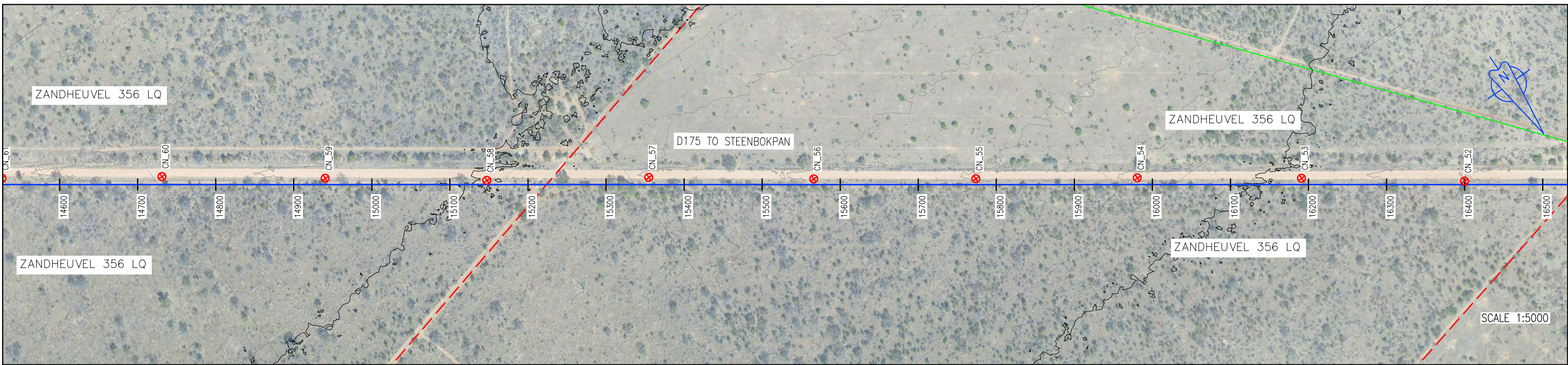


LEGEND:

- CHAINAGE MARKER (PLAN ONLY)
- POINT OF INTERSECTION (PI)
- TEST PIT
- BOREHOLE
- PIPELINE
- OVERHEAD POWERLINE
- FARM BOUNDARY
- FARM PORTION BOUNDARY
- CROSSING – SURFACED ROAD
- CROSSING – GRAVEL ROAD
- CROSSING – PRIVATE DIRT ROAD
- CROSSING – POWERLINE
- AREA OF INTERMITTENT OUTCROP
- AREA OF OUTCROP
- AREA OF IMPEDED DRAINAGE
- POTENTIAL BORROW PIT
- EXISTING BORROW PIT / SPOIL SITE

CHAINAGE (m)
REFUSAL DEPTH RANGE (mm)
GEOLOGY

REFERENCE DRAWINGS			REVISIONS			DESIGNED:		PROJECT ENGINEER:	P LE ROUX	 	MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)		
DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:			GEOTECHNICAL PROFILE STAGE 3: OPERATIONAL RESERVOIR TO STEENBOKPAN		
		A	24/02/11	FOR INFORMATION		CHECKED:	J MULDER				PLAN & LONG SECTION		
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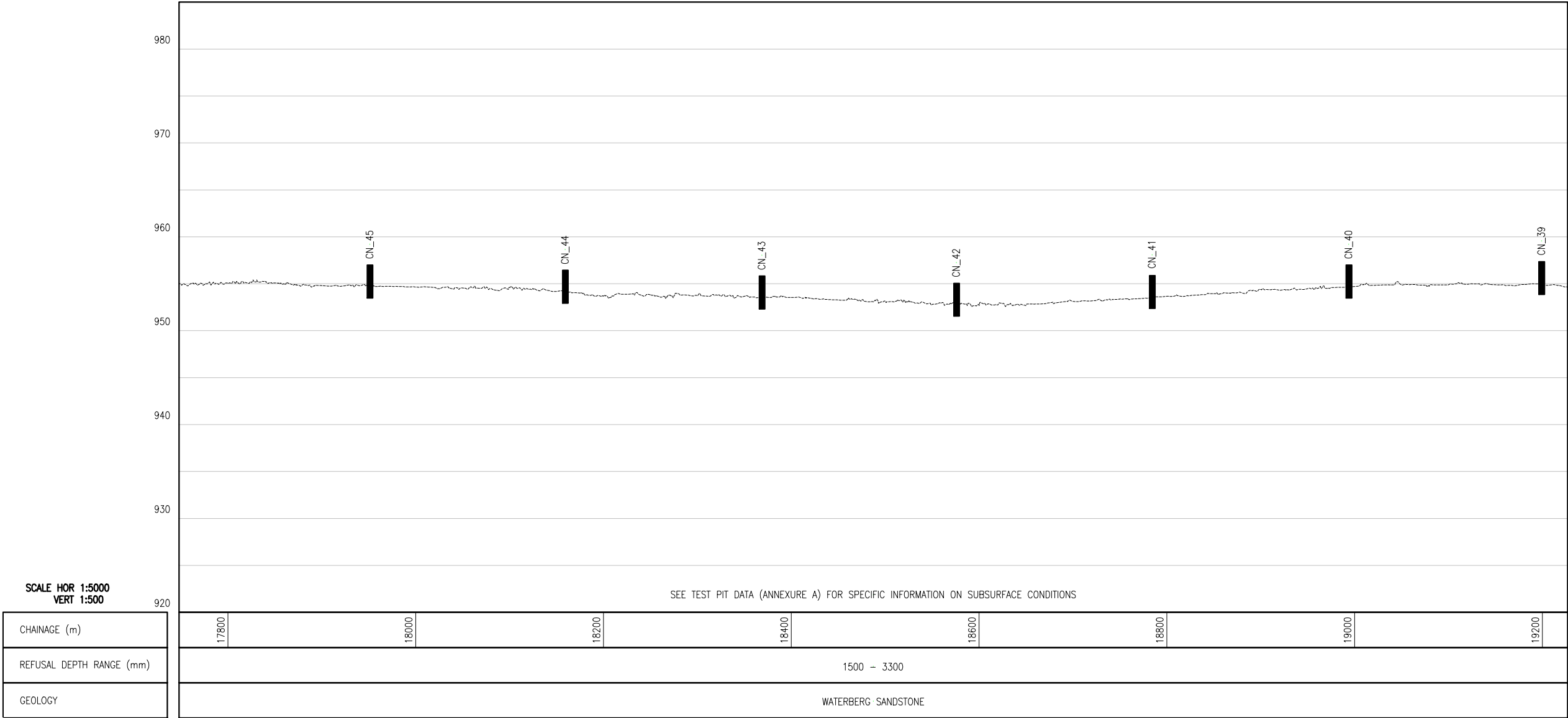


LEGEND:

- CHAINAGE MARKER (PLAN ONLY)
- POINT OF INTERSECTION (PI)
- TEST PIT
- BOREHOLE
- PIPELINE
- OVERHEAD POWERLINE
- FARM BOUNDARY
- FARM PORTION BOUNDARY
- CROSSING – SURFACED ROAD
- CROSSING – GRAVEL ROAD
- CROSSING – PRIVATE DIRT ROAD
- CROSSING – POWERLINE
- AREA OF INTERMITTENT OUTCROP
- AREA OF OUTCROP
- AREA OF IMPEDED DRAINAGE
- POTENTIAL BORROW PIT
- EXISTING BORROW PIT / SPOIL SITE


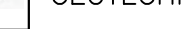


CHAINAGE (m)
REFUSAL DEPTH RANGE (mm)
GEOLOGY

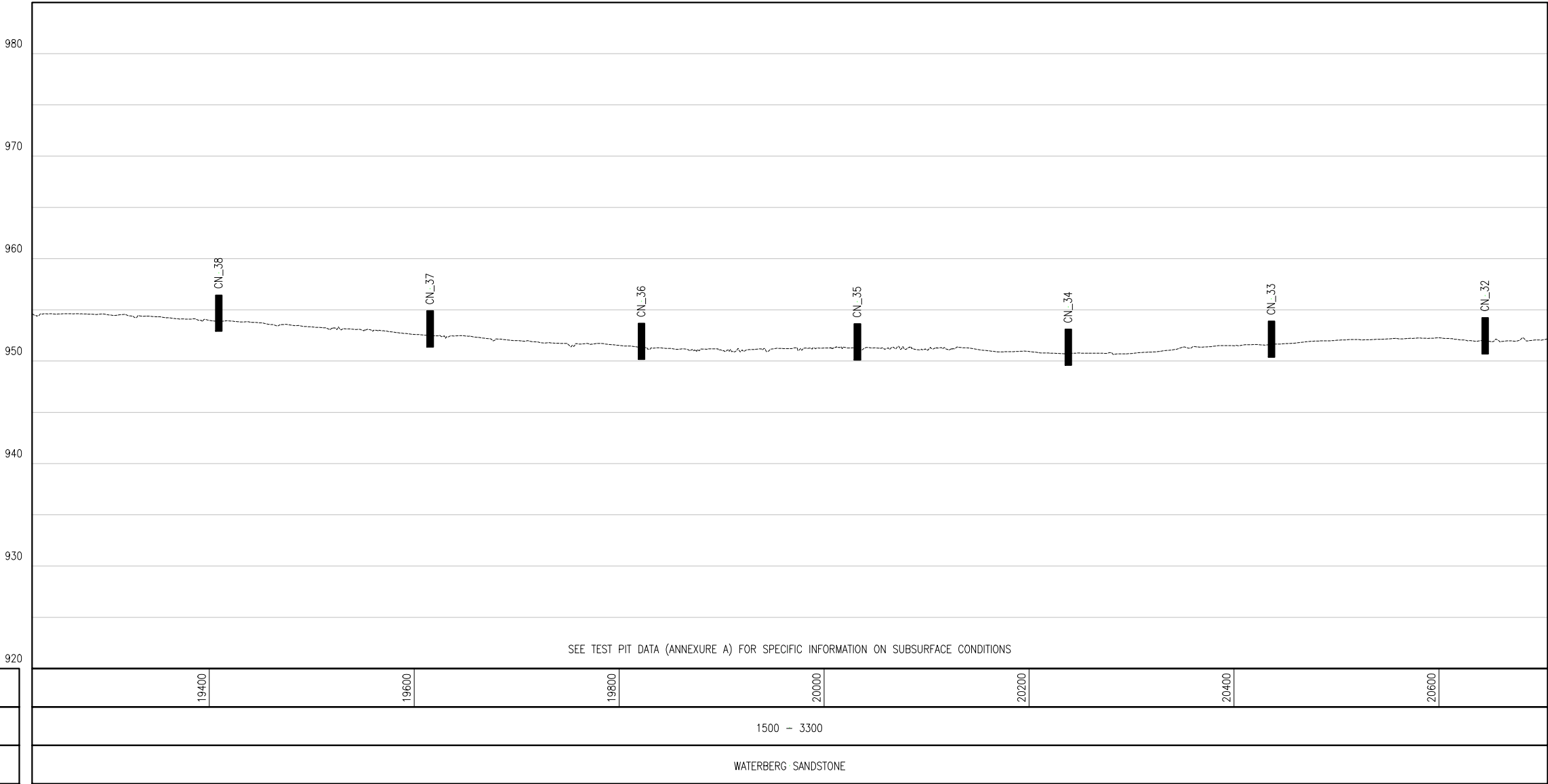
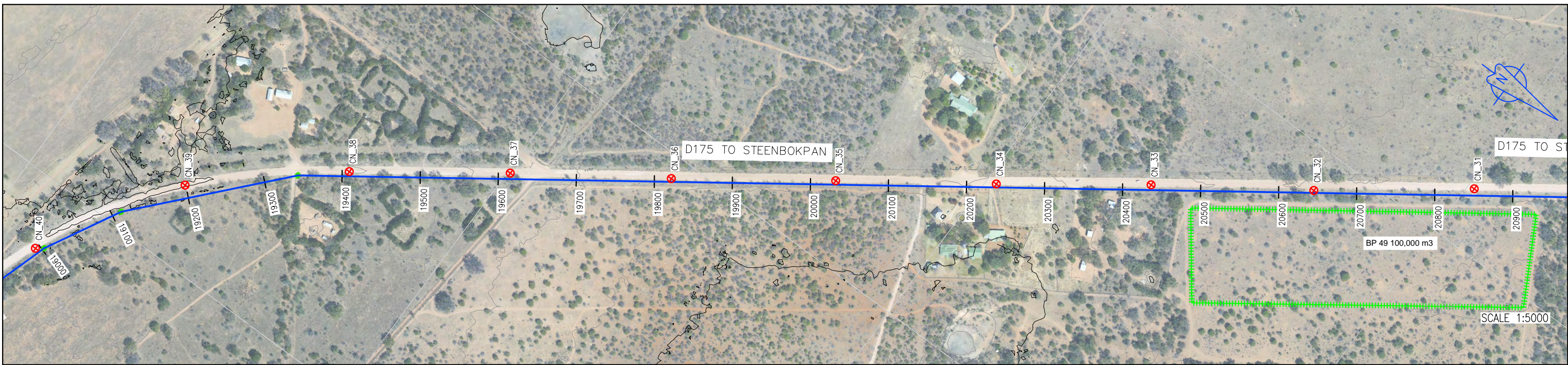
REFERENCE DRAWINGS			REVISIONS				DESIGNED:		PROJECT ENGINEER:	P LE ROUX	<div>MOKOLO CROCODILE Consultants</div> <div>TCTA A new word for water</div>	MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)		
DRG. No.	TITLE		REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:			GEOTECHNICAL PROFILE STAGE 3: OPERATIONAL RESERVOIR TO STEENBOKPAN		
			A	24/02/11	FOR INFORMATION		CHECKED:	J MULDER				PLAN & LONG SECTION		
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LEGEND:

- CHAINAGE MARKER (PLAN ONLY)
- POINT OF INTERSECTION (PI)
- TEST PIT
- BOREHOLE
- PIPELINE
- OVERHEAD POWERLINE
- FARM BOUNDARY
- FARM PORTION BOUNDARY
- CROSSING – SURFACED ROAD
- CROSSING – GRAVEL ROAD
- CROSSING – PRIVATE DIRT ROAD
- CROSSING – POWERLINE
- AREA OF INTERMITTENT OUTCROP
- AREA OF OUTCROP
- AREA OF IMPEDED DRAINAGE
- POTENTIAL BORROW PIT
- EXISTING BORROW PIT / SPOIL SITE




REFERENCE DRAWINGS			REVISIONS				DESIGNED:		PROJECT ENGINEER:	P LE ROUX		MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)				
DRG. No.	TITLE		REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:			GEOTECHNICAL PROFILE STAGE 3: OPERATIONAL RESERVOIR TO STEENBOKPAN				
			A	24/02/11	FOR INFORMATION		CHECKED:	J MULDER				PLAN & LONG SECTION				
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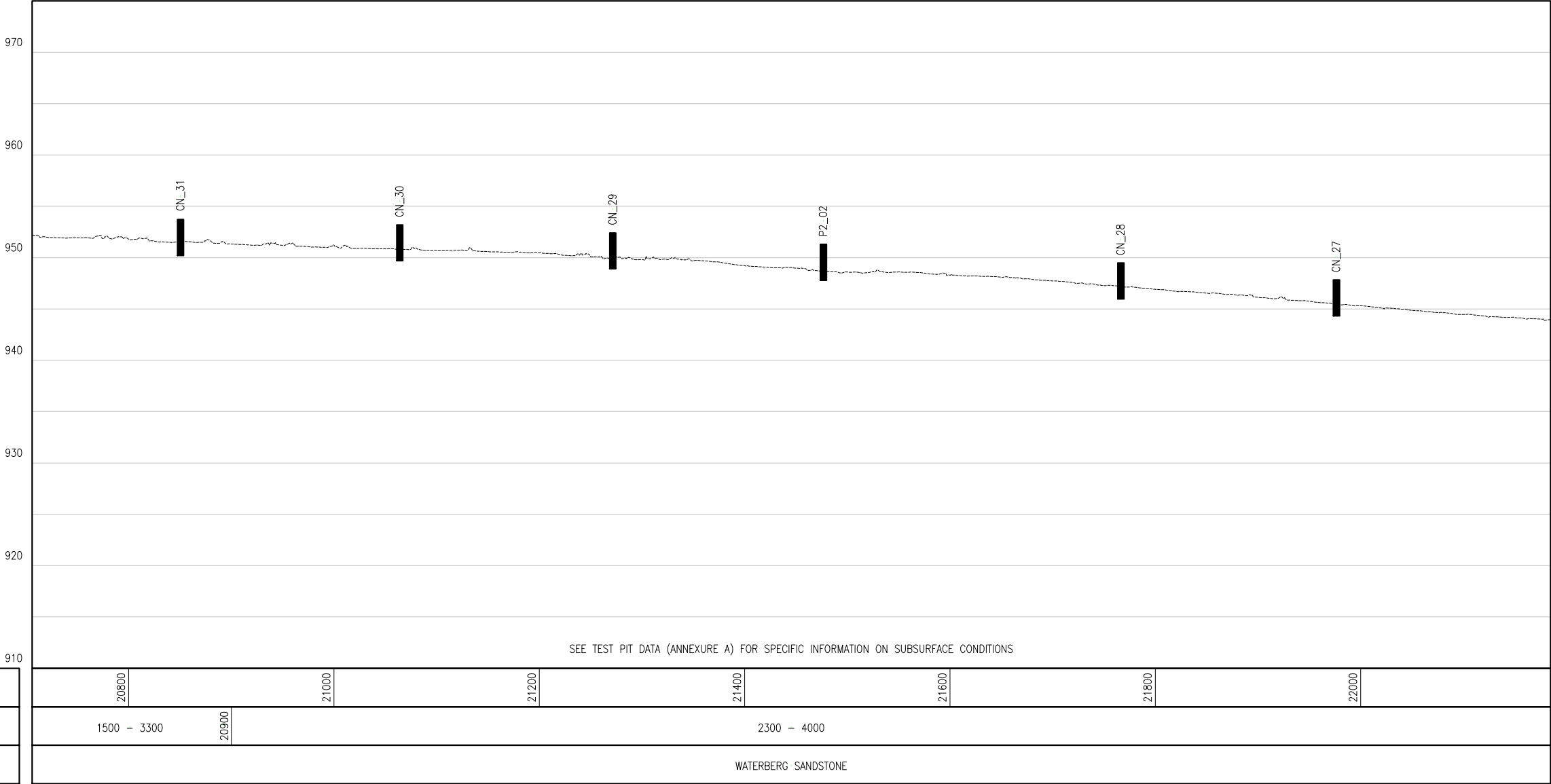


LEGEND:

- CHAINAGE MARKER (PLAN ONLY)
- POINT OF INTERSECTION (PI)
- TEST PIT
- BOREHOLE
- PIPELINE
- OVERHEAD POWERLINE
- FARM BOUNDARY
- FARM PORTION BOUNDARY
- CROSSING – SURFACED ROAD
- CROSSING – GRAVEL ROAD
- CROSSING – PRIVATE DIRT ROAD
- CROSSING – POWERLINE
- AREA OF INTERMITTENT OUTCROP
- AREA OF OUTCROP
- AREA OF IMPEDED DRAINAGE
- POTENTIAL BORROW PIT
- EXISTING BORROW PIT / SPOIL SITE

CHAINAGE (m)
REFUSAL DEPTH RANGE (mm)
GEOLOGY

REFERENCE DRAWINGS		REVISIONS				DESIGNED:		PROJECT ENGINEER:	P LE ROUX	<div>MOKOLO CROCODILE Consultants</div> <div><div>TCTA A new word for water</div></div>	MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)			
DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:			GEOTECHNICAL PROFILE STAGE 3: OPERATIONAL RESERVOIR TO STEENBOKPAN			
		A	24/02/11	FOR INFORMATION		CHECKED:	J MULDER				PLAN & LONG SECTION			
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										REV N A				







LEGEND:

- CHAINAGE MARKER (PLAN ONLY)
- POINT OF INTERSECTION (PI)
- TEST PIT
- BOREHOLE
- PIPELINE
- OVERHEAD POWERLINE
- FARM BOUNDARY
- FARM PORTION BOUNDARY
- CROSSING - SURFACED ROAD
- CROSSING - GRAVEL ROAD
- CROSSING - PRIVATE DIRT ROAD
- CROSSING - POWERLINE
- AREA OF INTERMITTENT OUTCROP
- AREA OF OUTCROP
- AREA OF IMPEDED DRAINAGE
- POTENTIAL BORROW PIT
- EXISTING BORROW PIT / SPOIL SITE

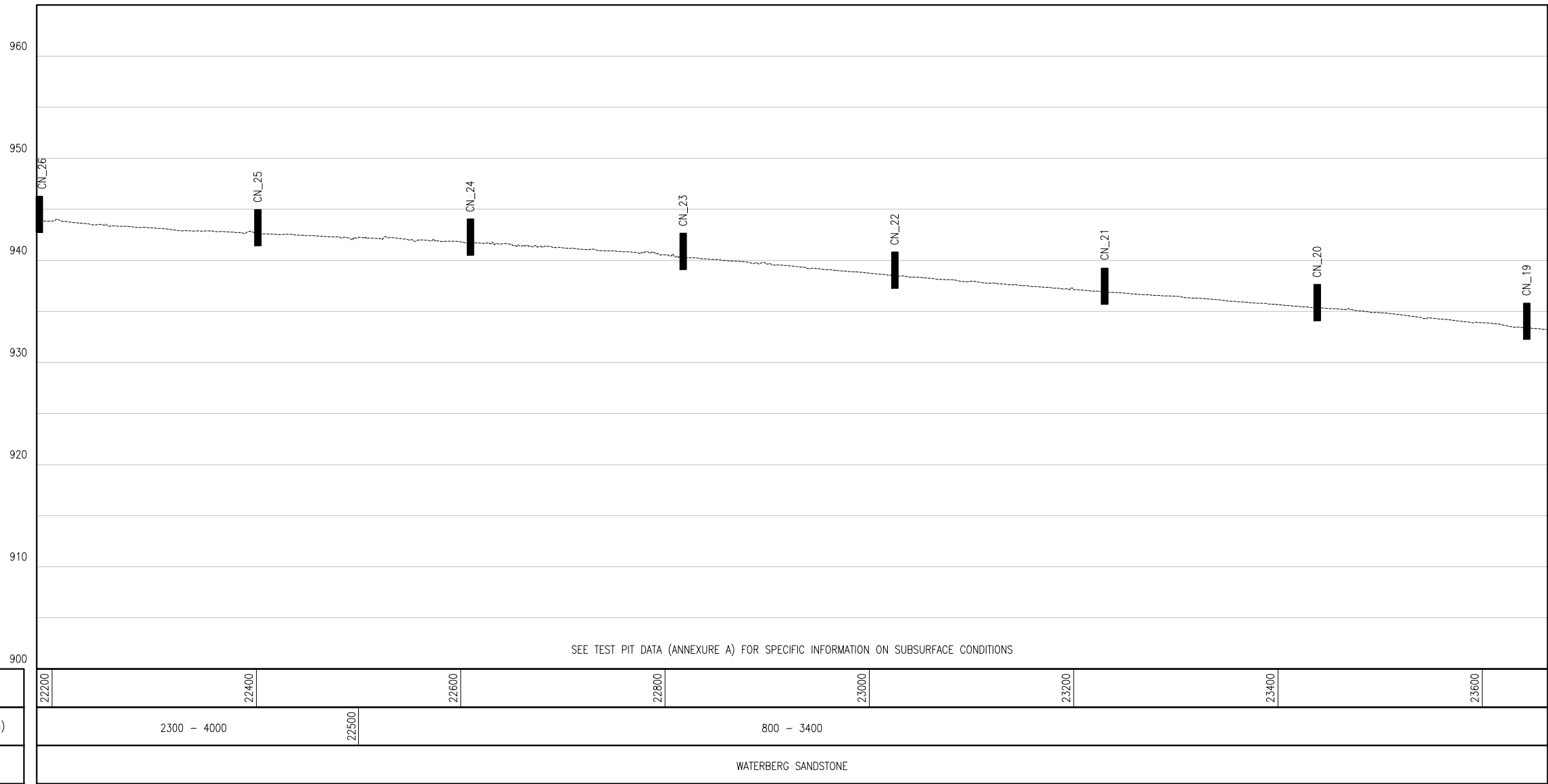
CHAINAGE (m)
REFUSAL DEPTH RANGE (mm)
GEOLOGY

20800	21000	21200	21400	21600	21800	22000
1500 - 3300	20900	2300 - 4000				
WATERBERG SANDSTONE						

REFERENCE DRAWINGS		REVISIONS				DESIGNED:		PROJECT ENGINEER:	P LE ROUX		MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)				
DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:			GEOTECHNICAL PROFILE STAGE 3: OPERATIONAL RESERVOIR TO STEENBOKPAN				
		A	24/02/11	FOR INFORMATION		CHECKED:	J MULDER				PLAN & LONG SECTION				
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						SCALE: 1:500				 A new word for water	A3	DWAF DRG. No.	DRAWING NUMBER	2E – G7 – 059	REV N A
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SCALE 1:5000







SCALE HOR 1:5000
VERT 1:500

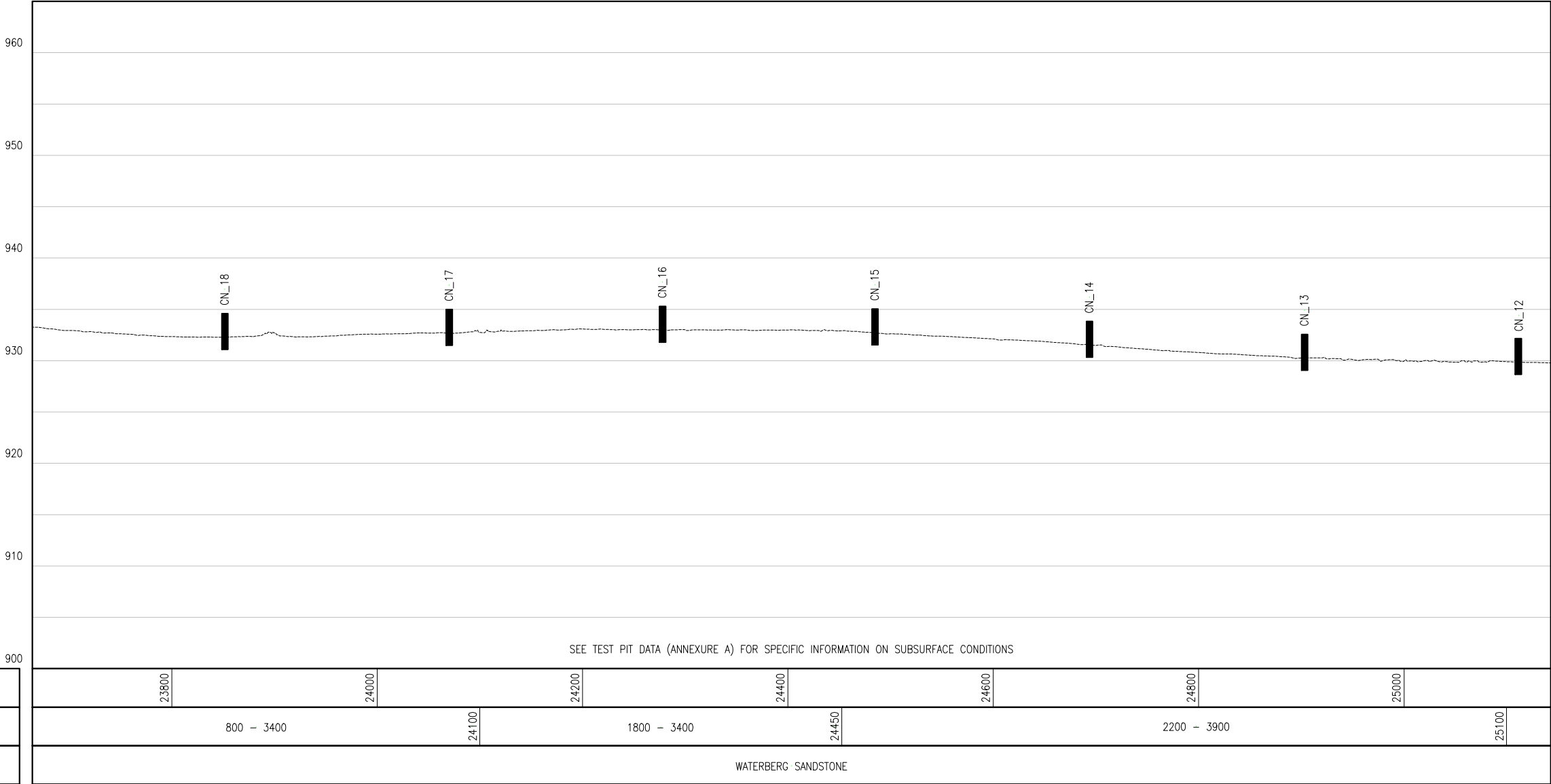
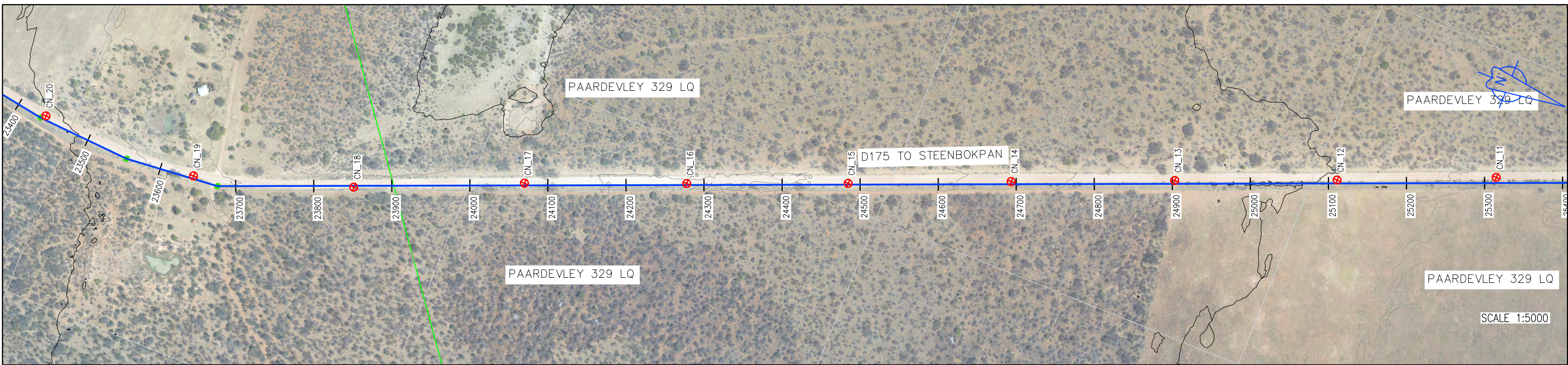
CHAINAGE (m)
REFUSAL DEPTH RANGE (mm)
GEOLOGY

22200	22400	22600	22800	23000	23200	23400	23600	
2300 - 4000		22500	800 - 3400					
WATERBERG SANDSTONE								

LEGEND:

- CHAINAGE MARKER (PLAN ONLY)
- POINT OF INTERSECTION (PI)
- TEST PIT
- BOREHOLE
- PIPELINE
- OVERHEAD POWERLINE
- FARM BOUNDARY
- FARM PORTION BOUNDARY
- CROSSING - SURFACED ROAD
- CROSSING - GRAVEL ROAD
- CROSSING - PRIVATE DIRT ROAD
- CROSSING - POWERLINE
- AREA OF INTERMITTENT OUTCROP
- AREA OF OUTCROP
- AREA OF IMPEDED DRAINAGE
- POTENTIAL BORROW PIT
- EXISTING BORROW PIT / SPOIL SITE





REFERENCE DRAWINGS			REVISIONS				DESIGNED:		PROJECT ENGINEER:	P LE ROUX		MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)					
DRG. No.	TITLE		REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:			GEOTECHNICAL PROFILE STAGE 3: OPERATIONAL RESERVOIR TO STEENBOKPAN					
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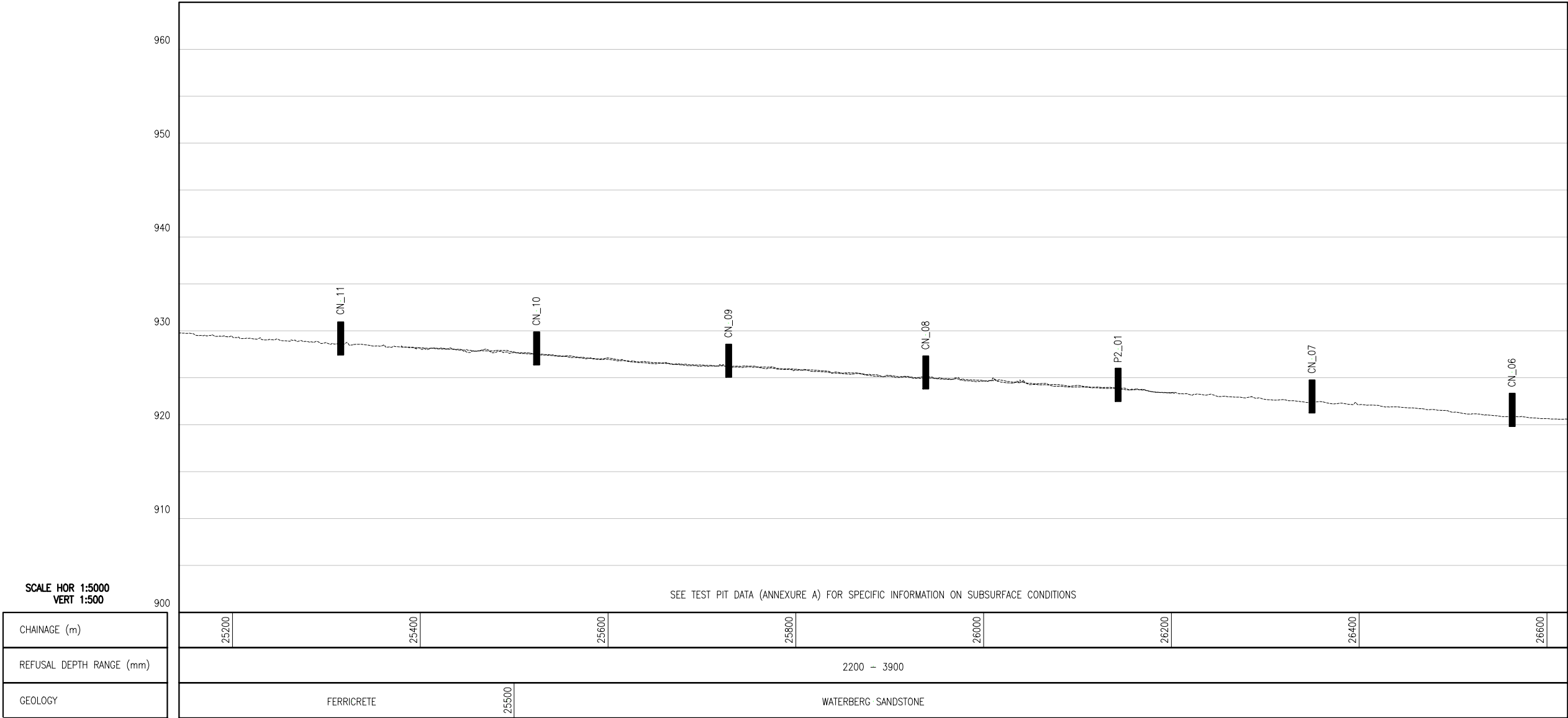
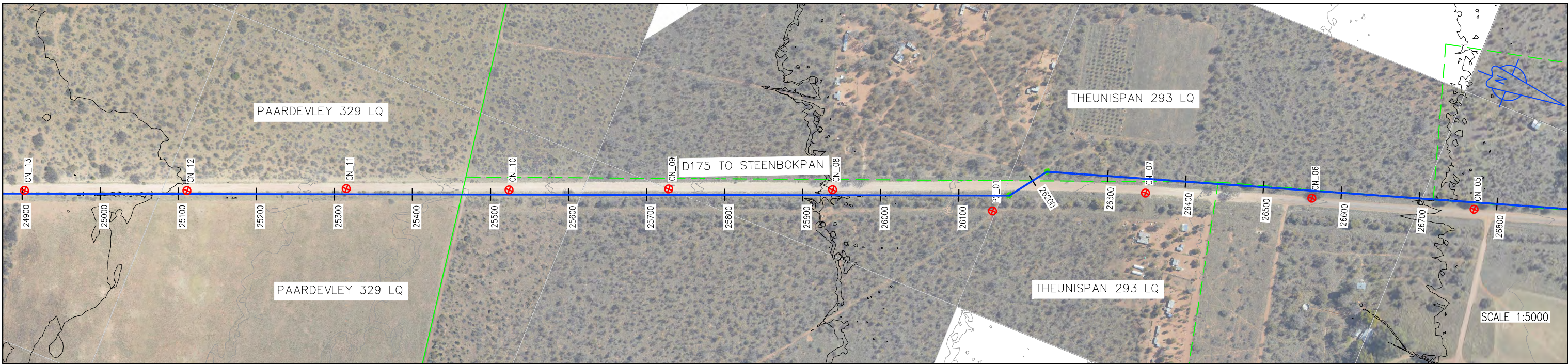


LEGEND:

- CHAINAGE MARKER (PLAN ONLY)
- POINT OF INTERSECTION (PI)
- TEST PIT
- BOREHOLE
- PIPELINE
- OVERHEAD POWERLINE
- FARM BOUNDARY
- FARM PORTION BOUNDARY
- CROSSING – SURFACED ROAD
- CROSSING – GRAVEL ROAD
- CROSSING – PRIVATE DIRT ROAD
- CROSSING – POWERLINE
- AREA OF INTERMITTENT OUTCROP
- AREA OF OUTCROP
- AREA OF IMPEDED DRAINAGE
- POTENTIAL BORROW PIT
- EXISTING BORROW PIT / SPOIL SITE




SCALE HOR 1:5000 VERT 1:500
CHAINAGE (m)
REFUSAL DEPTH RANGE (mm)
GEOLOGY

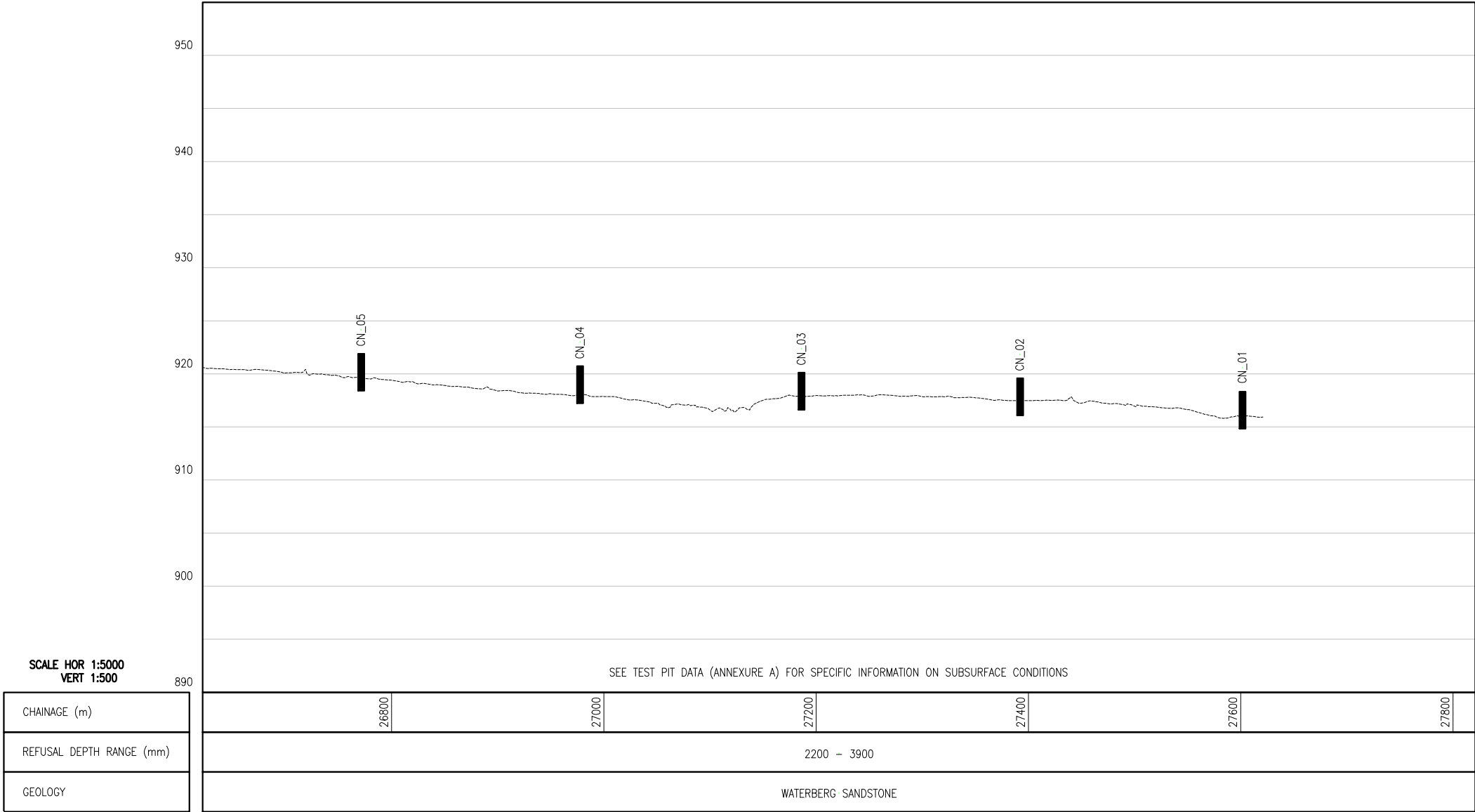
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		A	24/02/11	FOR INFORMATION		CHECKED:	J MULDER				PLAN & LONG SECTION				
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LEGEND:


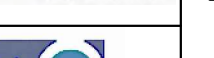
- CHAINAGE MARKER (PLAN ONLY)
- POINT OF INTERSECTION (PI)
- TEST PIT
- BOREHOLE
- PIPELINE
- OVERHEAD POWERLINE
- FARM BOUNDARY
- FARM PORTION BOUNDARY
- CROSSING – SURFACED ROAD
- CROSSING – GRAVEL ROAD
- CROSSING – PRIVATE DIRT ROAD
- CROSSING – POWERLINE
- AREA OF INTERMITTENT OUTCROP
- AREA OF OUTCROP
- AREA OF IMPEDED DRAINAGE
- POTENTIAL BORROW PIT
- EXISTING BORROW PIT / SPOIL SITE

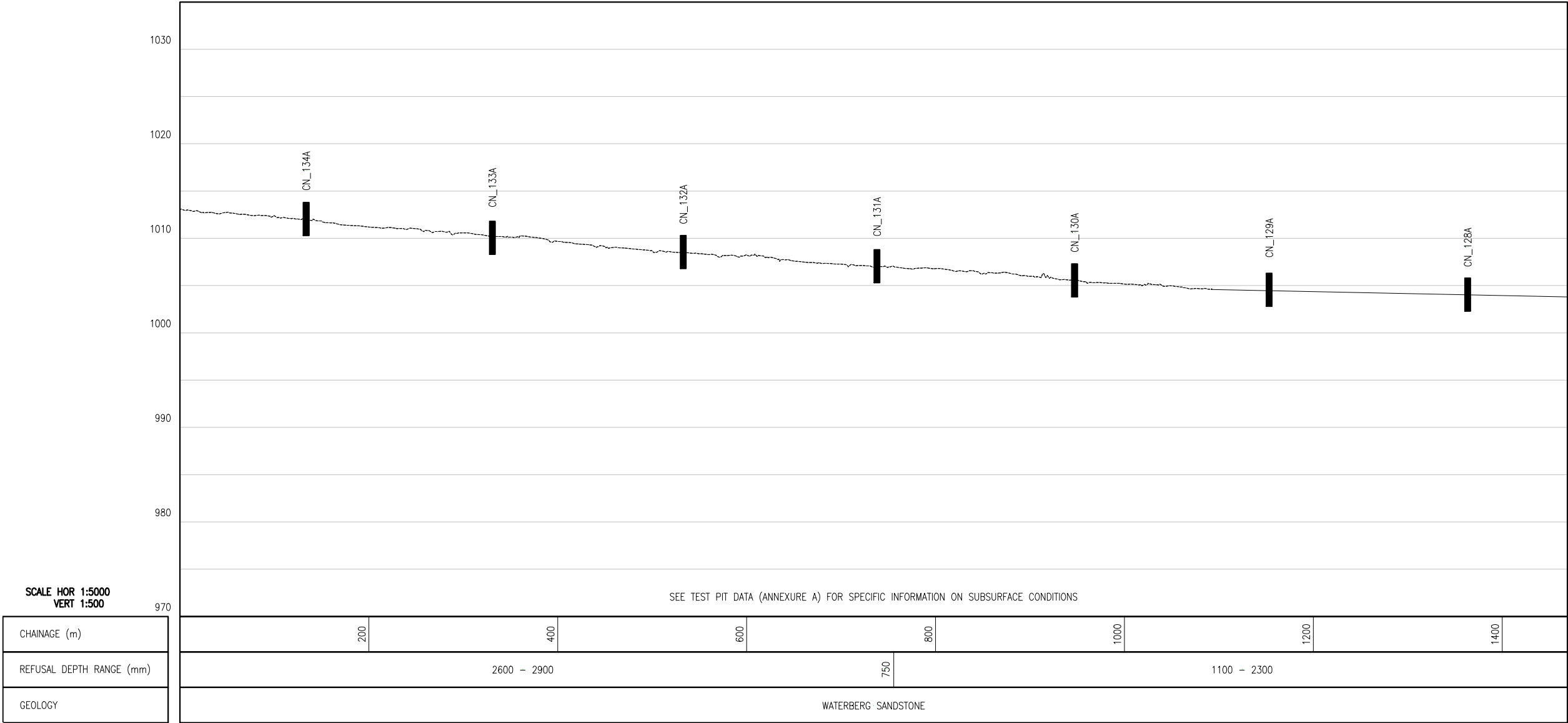
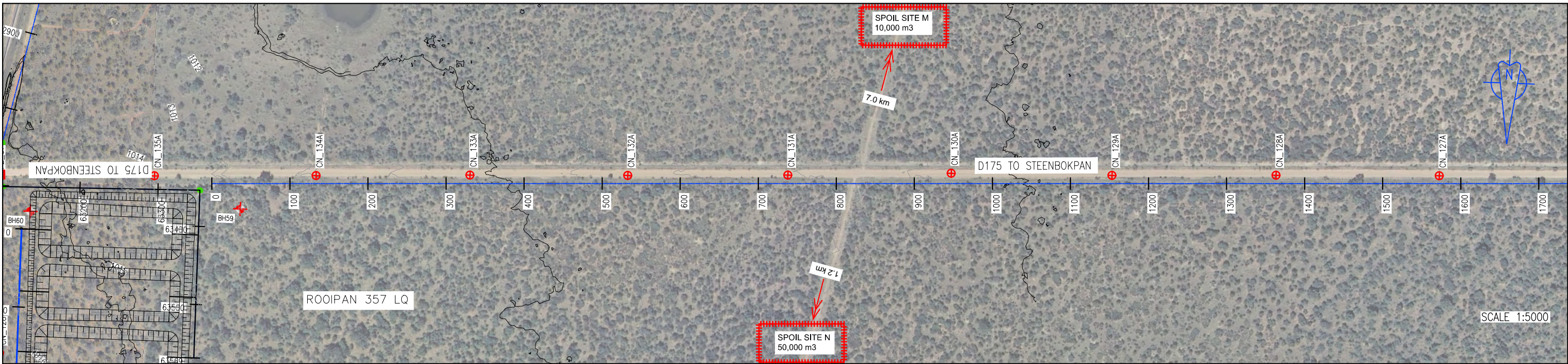
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DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:			GEOTECHNICAL PROFILE STAGE 3: OPERATIONAL RESERVOIR TO STEENBOKPAN				
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LEGEND:

- CHAINAGE MARKER (PLAN ONLY)
- POINT OF INTERSECTION (PI)
- TEST PIT
- BOREHOLE
- PIPELINE
- OVERHEAD POWERLINE
- FARM BOUNDARY
- FARM PORTION BOUNDARY
- CROSSING – SURFACED ROAD
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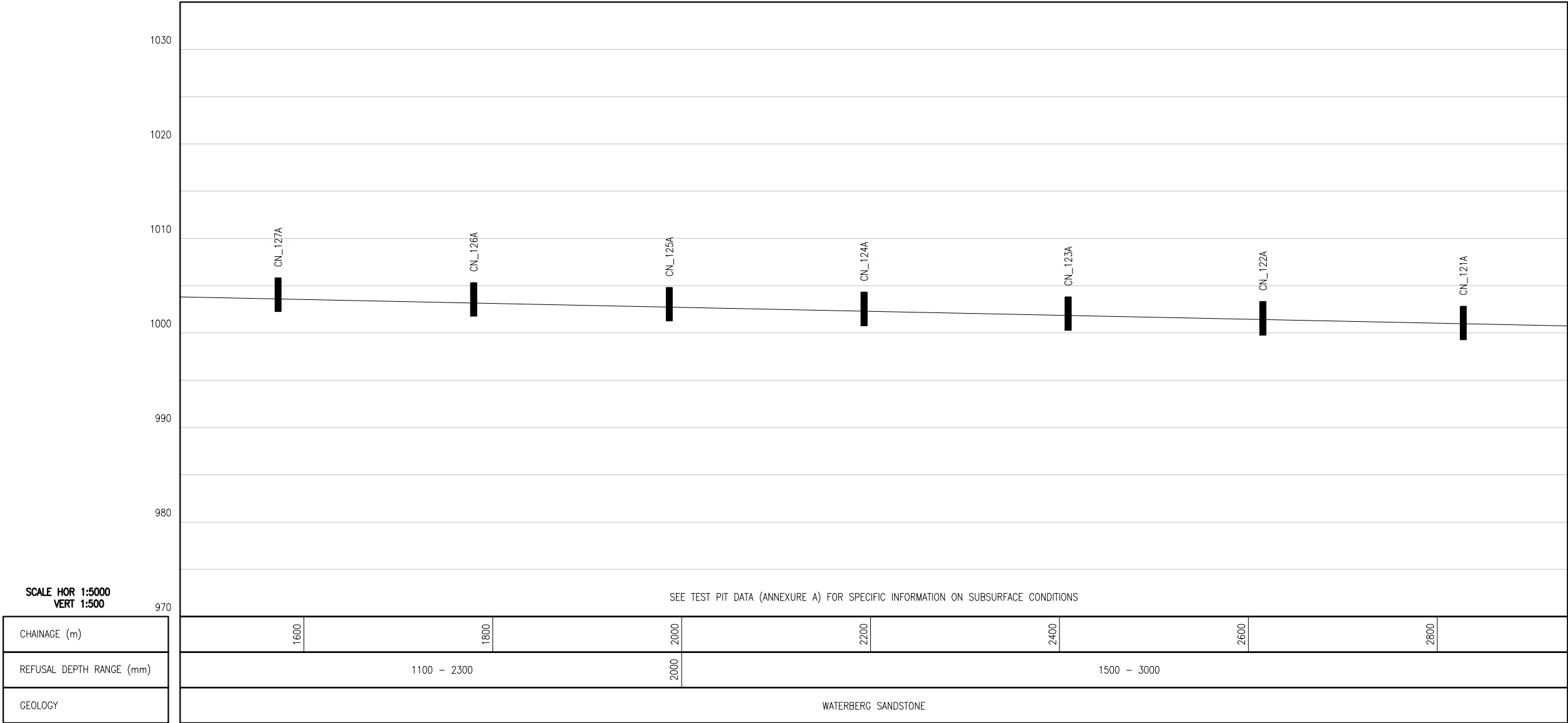
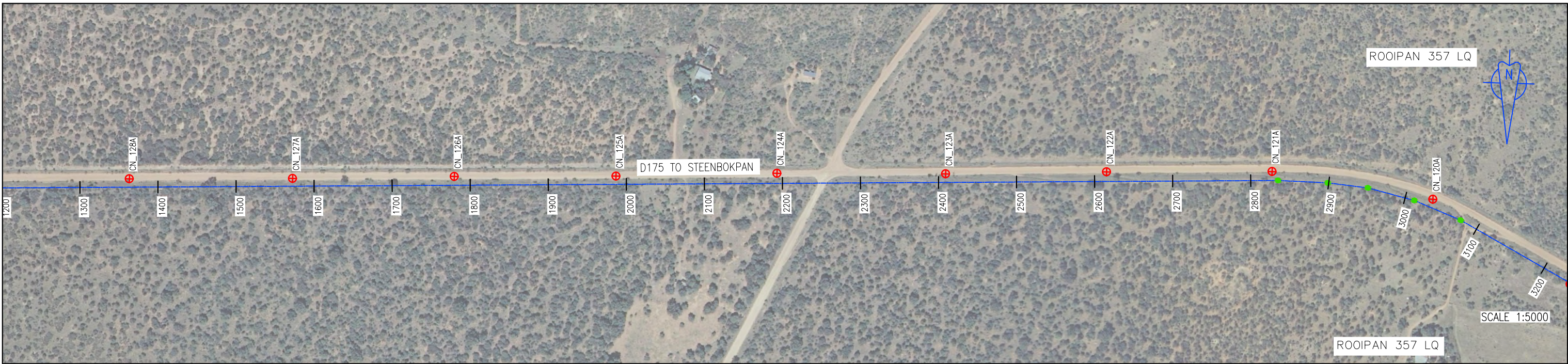
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LEGEND:





- CHAINAGE MARKER (PLAN ONLY)
- POINT OF INTERSECTION (PI)
- TEST PIT
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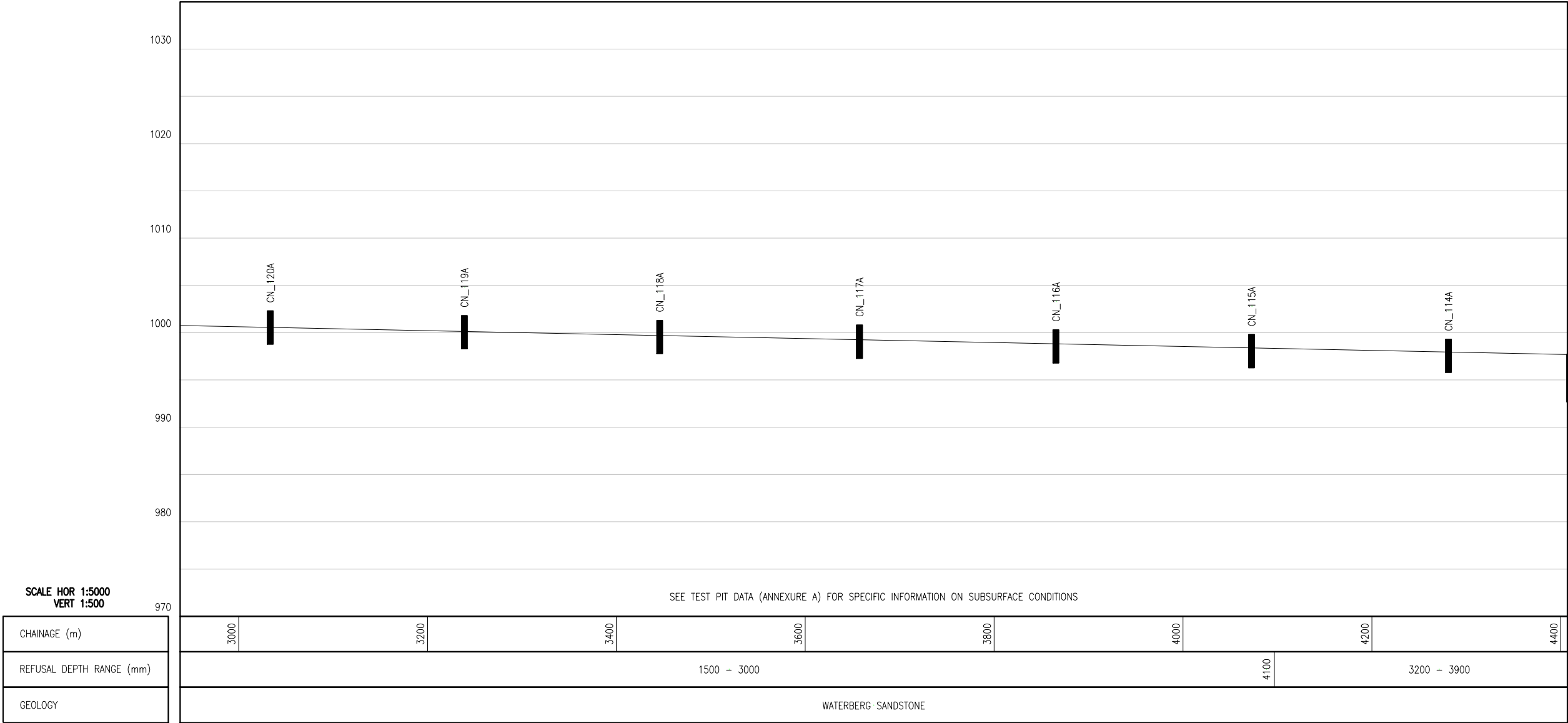
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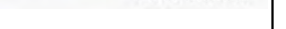
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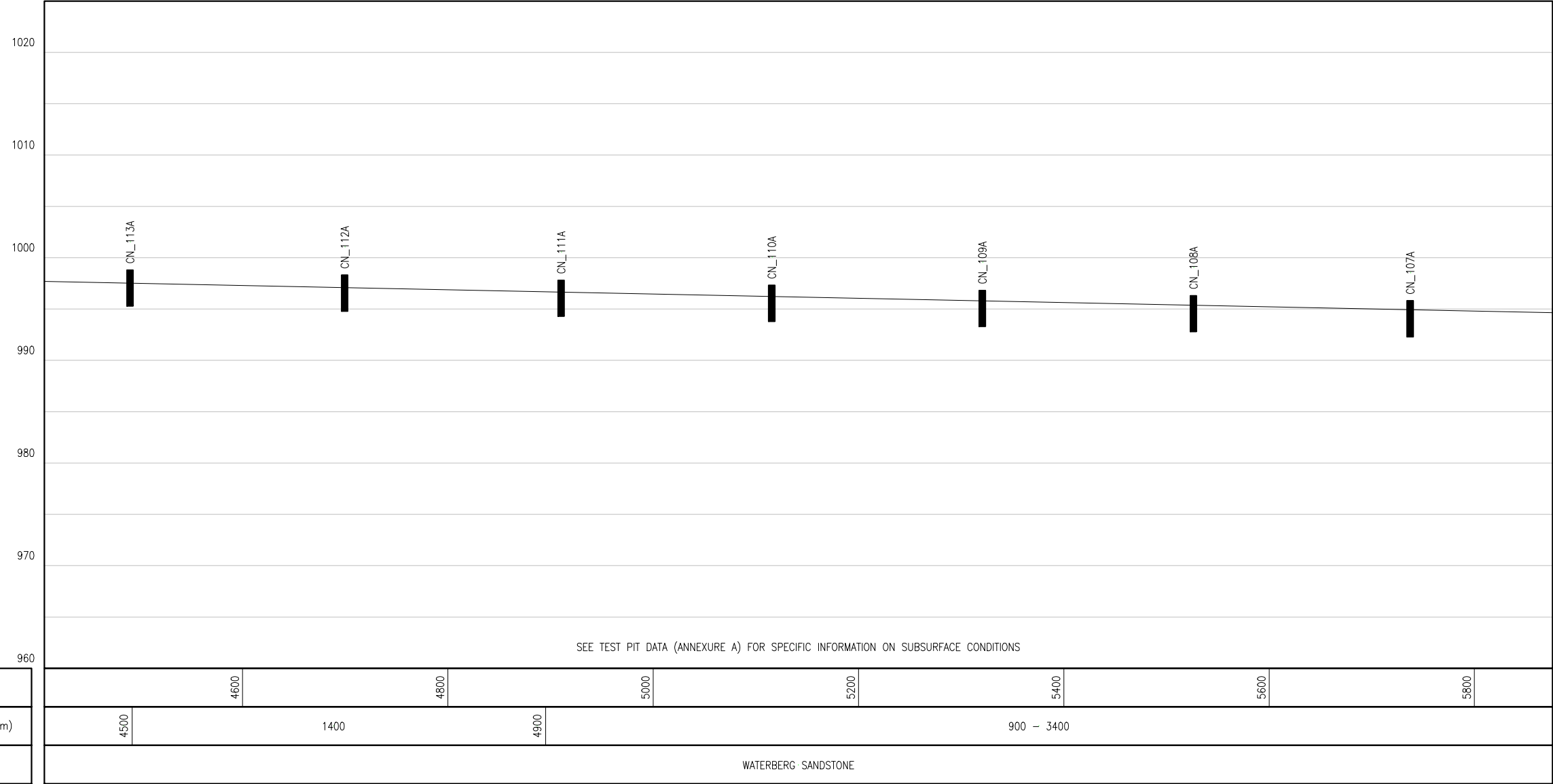
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LEGEND:

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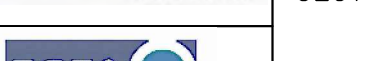
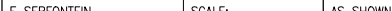
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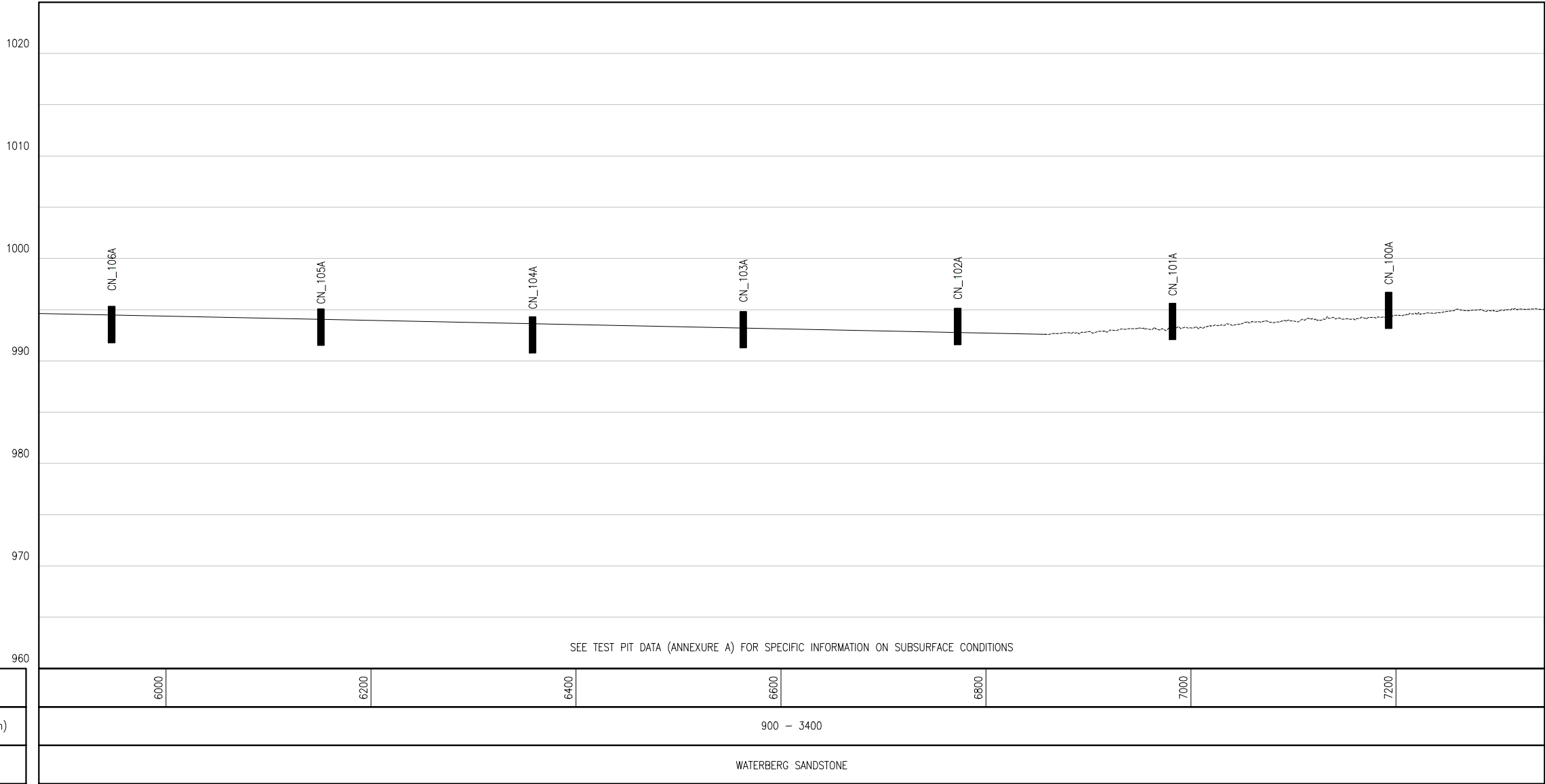


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CHAINAGE (m)
REFUSAL DEPTH RANGE (mm)
GEOLOGY

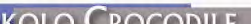
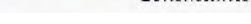


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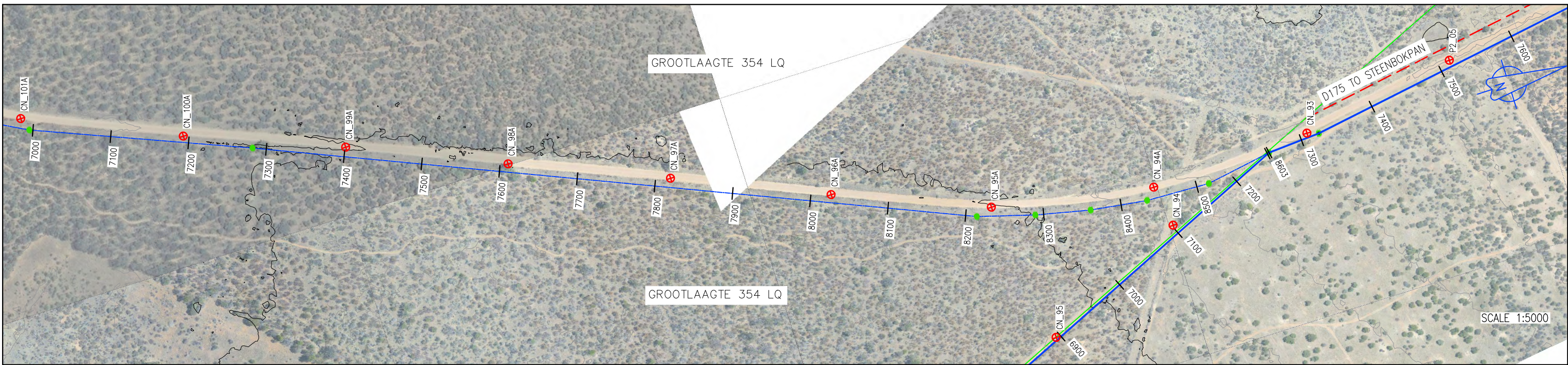


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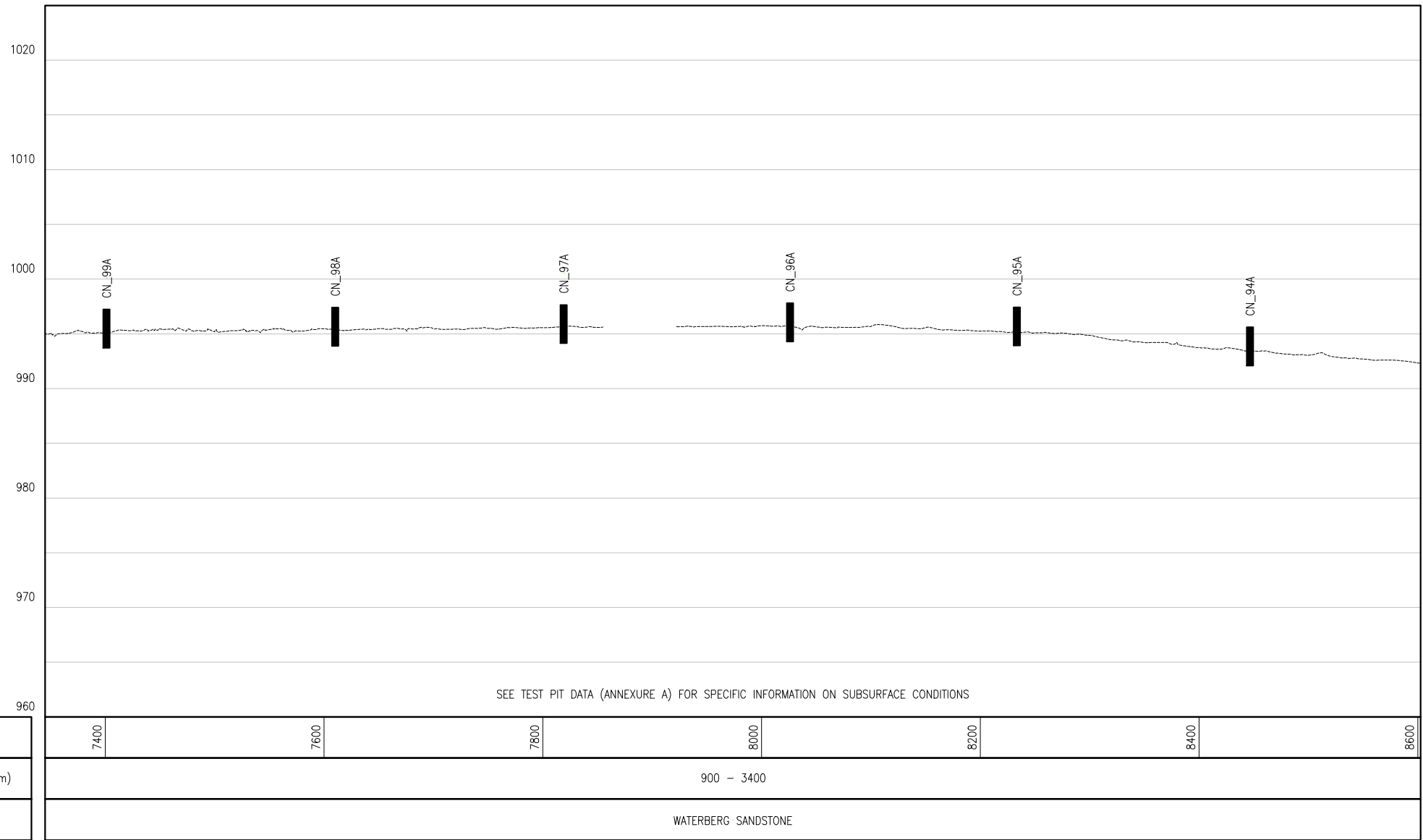
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SCALE HOR 1:5000 VERT 1:500
CHAINAGE (m)
REFUSAL DEPTH RANGE (mm)
GEOLOGY

REFERENCE DRAWINGS		REVISIONS				DESIGNED:		PROJECT ENGINEER:	P LE ROUX		MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)					
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SCALE 1:5000



SCALE HOR 1:5000
VERT 1:500





SEE TEST PIT DATA (ANNEXURE A) FOR SPECIFIC INFORMATION ON SUBSURFACE CONDITIONS

CHAINAGE (m)
REFUSAL DEPTH RANGE (mm)
GEOLOGY

7400	7600	7800	8000	8200	8400	8600
900 - 3400						
WATERBERG SANDSTONE						

LEGEND:

- CHAINAGE MARKER (PLAN ONLY)
- POINT OF INTERSECTION (PI)
- TEST PIT
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- OVERHEAD POWERLINE
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TCTA

**MOKOLO AND CROCODILE
WATER AUGMENTATION PROJECT
(MCWAP)**

CONTRACT № TCTA 07-041

CONSULTING SERVICES FOR MCWAP

**PHASE 2: GEOTECHNICAL INVESTIGATIONS
Stage 4: Steenbokpan - Matimba**

VOLUME 2.4: ANNEXURES G AND H

AUGUST 2011

MOKOLO CROCODILE CONSULTANTS

Report No: 2A-R-111E-55 (Rev A)


**MOKOLO AND CROCODILE
WATER AUGMENTATION PROJECT**

CONTRACT № TCTA 07-041

DOCUMENT CONTROL SHEET

Report No : 2A-R-111E-55

Title : **Phase 2: Geotechnical Investigations
Stage 4: Steenbokpan - Matimba
Volume 2.4: Annexures G and H**

Rev No	Date of Issue	Originator		Checked		Approved		Description
		Initials	Signature	Initials	Signature	Initials	Signature	
A	Aug 2011	AJS GND GJH BHJS MCW RV		SM PJIR		JPie		1 st Issue for discussion ¹

¹ Finalisation pending outstanding Phase 2 Geotechnical Results

**MOKOLO AND CROCODILE
WATER AUGMENTATION PROJECT**

CONTRACT № TCTA 07-041

**PHASE 2: GEOTECHNICAL INVESTIGATIONS
Stage 4: Steenbokpan - Matimba**

LIST OF VOLUMES

Volume 1	Phase 2, Stage 4: Geotechnical Data Report
Volume 2	Phase 2, Stage 4: Geotechnical Report – Annexures
	2.1 Annexures A to C
	2.2 Annexure D
	2.3 Annexures E and F
	2.4 Annexures G and H
Volume 3	Phase 2, Stage 4: Geotechnical Interpretive Report

MOKOLO AND CROCODILE WATER AUGMENTATION PROJECT

CONTRACT № TCTA 07-041

PHASE 2: GEOTECHNICAL INVESTIGATIONS

Stage 4: Steenbokpan - Matimba

VOLUME 2.4: ANNEXURES G and H

EXECUTIVE SUMMARY

Volumes 2.1, 2.2, 2.3 and 2.4 of Geotechnical Report No. 2A-R-111E-55 contain the Annexures referred to in Volume 1 and should be read in conjunction with the latter referenced Volume.

**MOKOLO AND CROCODILE
WATER AUGMENTATION PROJECT**

CONTRACT № TCTA 07-041

**PHASE 2: GEOTECHNICAL INVESTIGATIONS
Stage 4: Steenbokpan - Matimba**

VOLUME 2.4: ANNEXURES G and H

TABLE OF CONTENTS

Volume 1: Geotechnical Data Report (Bound Separately)

Volume 2: Geotechnical Report – Annexures

Volume 2.1: Annexures A to C (Bound Separately)

List of Annexures

- Annexure A: Summary of centreline test pit data
- Annexure B: Centreline test pit profiles
- Annexure C: Centreline report by Civilab
 - C1: Laboratory test results
 - C2: Test pit photographs

Volume 2.2: Annexure D (Bound Separately)

List of Annexures

- Annexure D: Laboratory test results
 - D1: Laboratory test results
 - D1.1 Indicator, pH, conductivity, compactability
 - D1.2 Geotechnical test results
 - D1.2.1 Triaxial tests
 - D1.2.2 Shearbox tests
 - D1.2.3 Constrained Soil Modulus Tests (Ms)

- D1.3 SRB tests
- D1.4 Fertility tests
- D2: Test pit photographs
- D3 Soil profiling parameters

Volume 2.3 Annexures E and F (Bound Separately)

List of Annexures

- Annexure E: Borrow pit data
 - E1: Summary of borrow pits investigated
 - E2: Laboratory test results
 - E2.1 Indicator, pH, conductivity, compactability
 - E2.2 Geotechnical tests
 - E2.2.1 Triaxial tests
 - E2.2.2 Shearbox tests
 - E2.2.3 Constrained Soil Modulus Tests (Ms)
 - E2.3 SRB tests
 - E2.4 Fertility tests
 - E2.5 CBR tests
 - E2.6 Commercial sources
 - E3: Test pit photographs
- Annexure F: Site specific investigations
 - F1: Rotary core drilling
 - F1.1: Borehole logs
 - F1.2: Core box photographs
 - F1.3 Core logging parameters

Volume 2.4: Annexures G and H (This Volume)

List of Annexures

- Annexure G: Borrow pit plans
- Annexure H: Geotechnical maps

Volume 3: Geotechnical Interpretive Report (Bound Separately)

ANNEXURE G

BORROW PIT PLANS

OUTSTANDING MATTERS ON BP PLANS

BP 11:

11_1

- Add TP to CL.

11_2

- How do you get to BP from service road/Road D1675? Distance 4694m must be from somewhere.

11_3

- Re-arrange co-ordinate list to group “C” points; and
- Put co-ordinates into number sequence.

BP 12:

- Maps still to be supplied.

BP 13:

13_1

- Show ALL TP on CL.

13_3

- Where is TP35? Co-ordinates?; and
- Where are TP4, 5, 6? If necessary explain their omission.

BP 14:

14_1

- Show ALL TP on CL.

14_2

- Distance (298m) does not tie up with scale of map. What does this distance refer to? (from ... to ...)?

14_3

- Where are TP 12 & 17? Co-ordinates?; and
- Orange line from top/centre: what is it? Is the 298m shown on 14_2 along this line?

BP 15:

15_1

- Show ALL TP on CL.

15_2

- Give actual route followed to the BP. “Proposed access road” is OK if the actual route is also shown.

15_3

- Give actual_route followed to the BP. “Proposed access road” is OK if the actual route is also shown.

BP 46:

46_1

- Show ALL TP on CL; and
- There is no Portion on this farm.

46_2

- I assume that “main access” actually means D1675. If so, change wording.

BP 51

51_1

- Show ALL TP on CL on Phase 2.

51_2

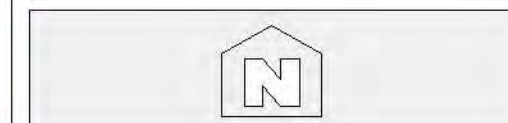
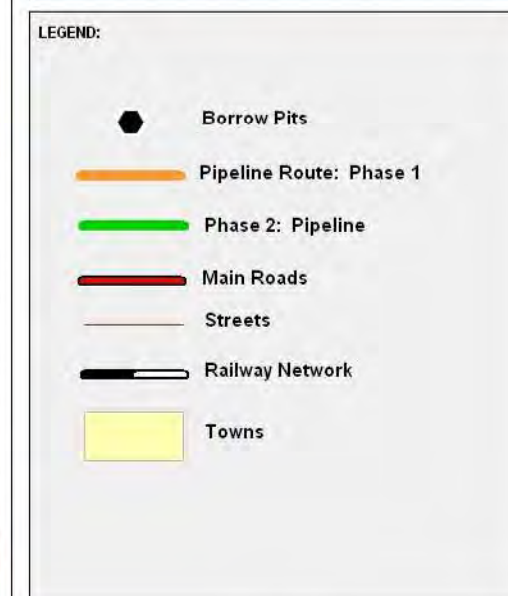
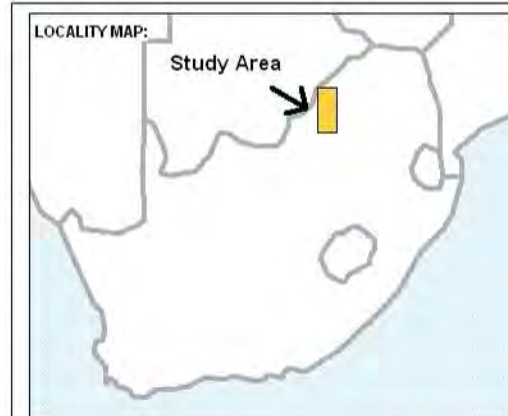
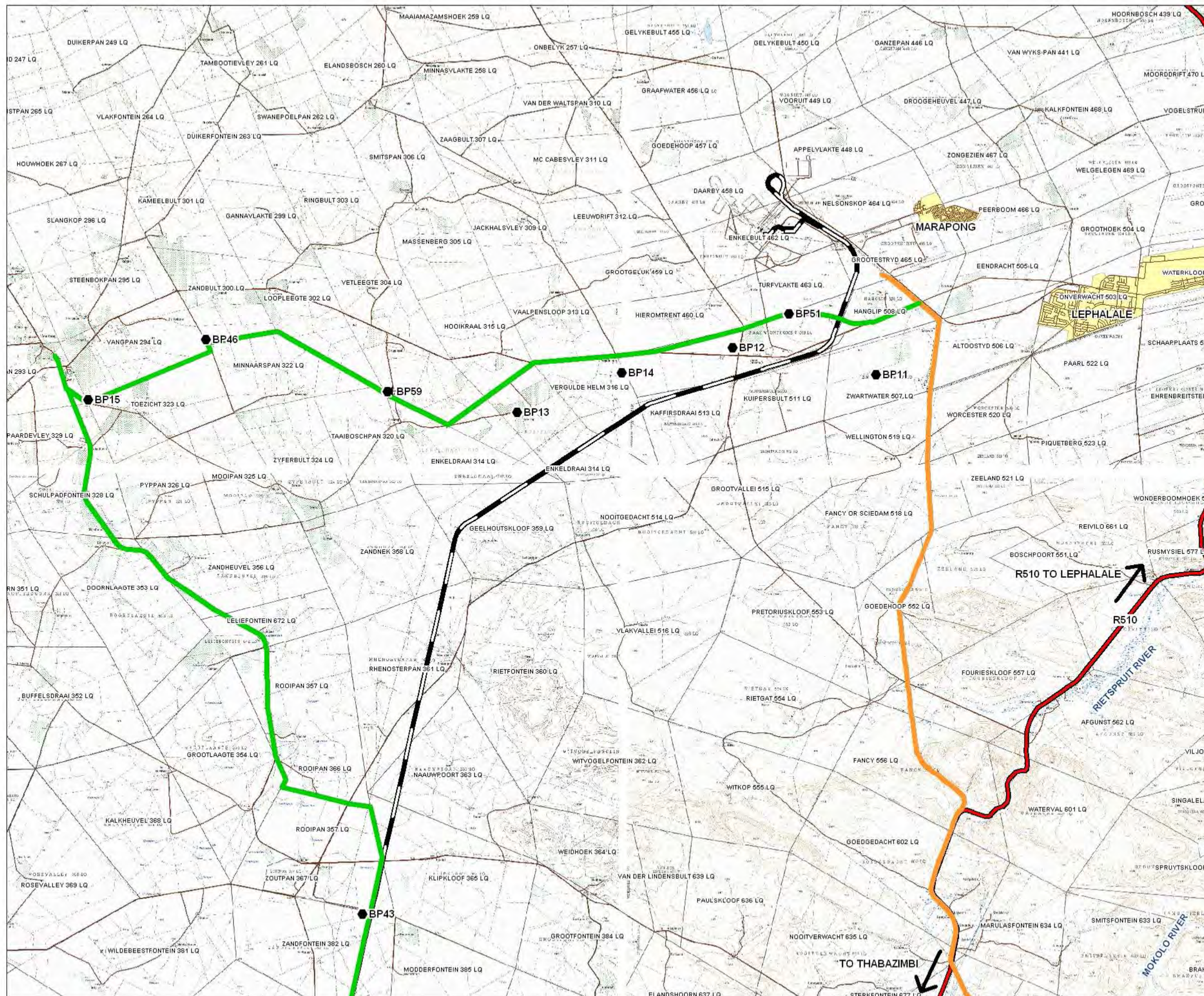
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- Amend note regarding access to the BP.

51_3

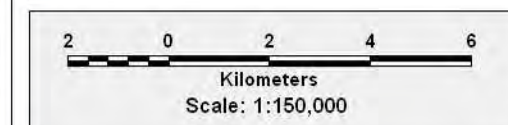
- See comments about roads that do not or no longer exist; and
- Amend note regarding access to the BP.

BP 59:

- Maps still to be supplied.



PROJECTION:
Transverse Mercator
LO 27



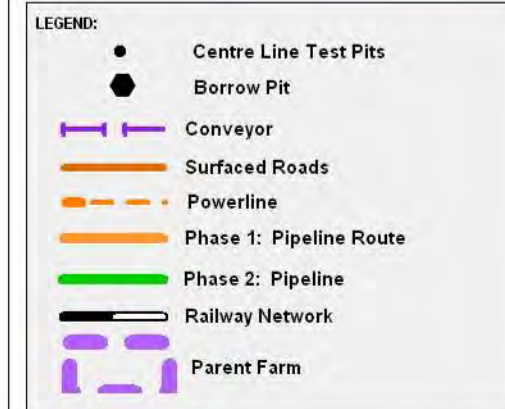
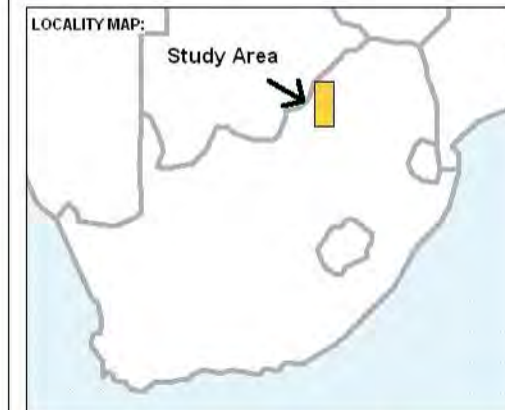
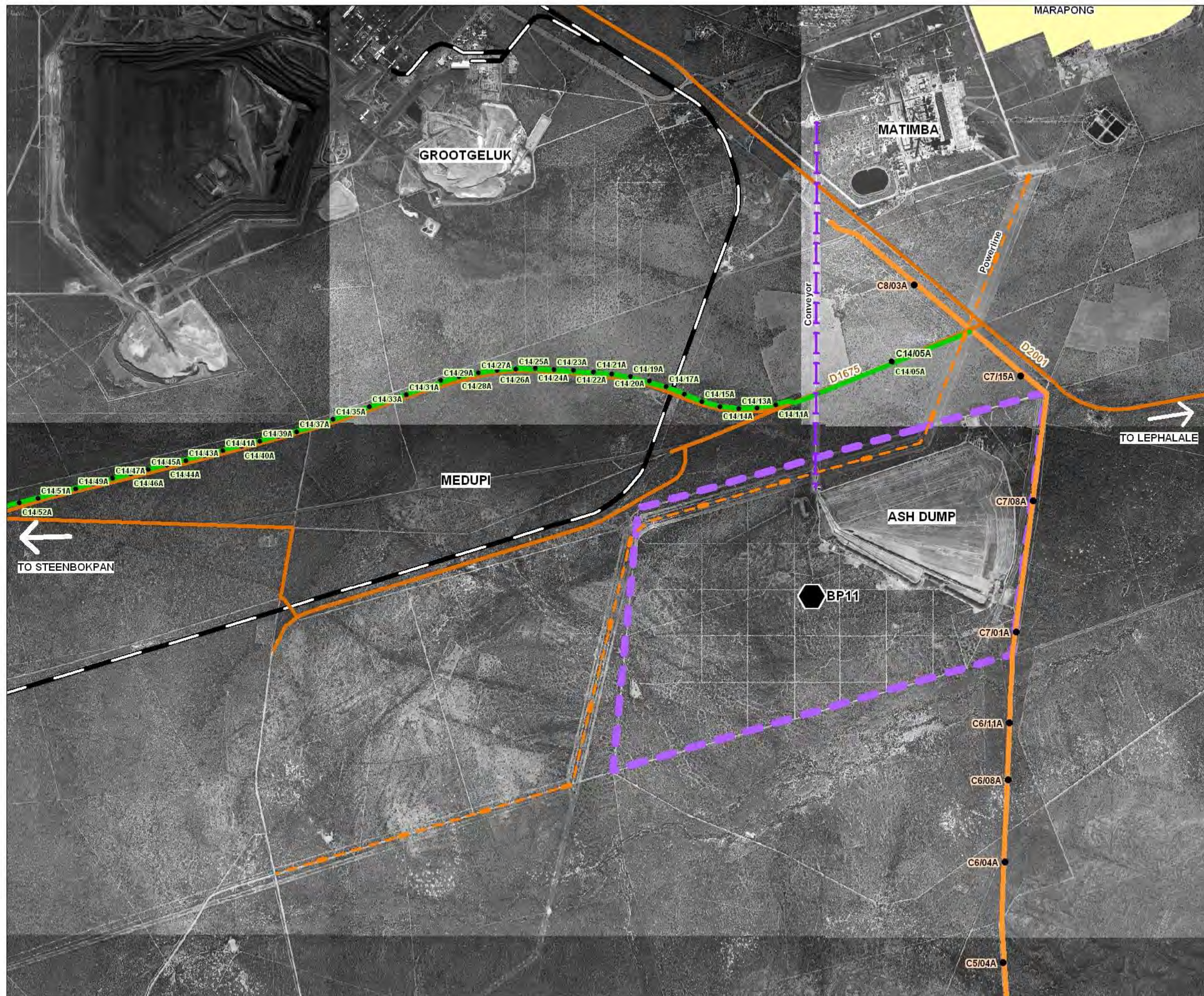
PREPARED BY:

PREPARED FOR:

PROJECT:
Mokolo and Crocodile Water Augmentation Project (MCWAP)

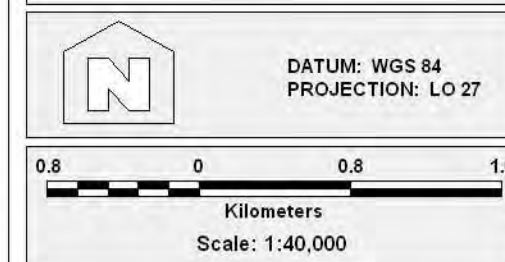
DRAWING TITLE:
Locality Plan of Borrow Pits:
Phase 2 Stage 4

DRAWING NO:



BORROW PIT DESCRIPTION:

Description	Borrowpit_11
Location of Borrowpit	32523769 -461100
Shortest distance relative to pipeline	+/-1750 m
Distance to access road	+/-4.6 km from C0001
Farm name	Overwater 507 LQ
Farm number	Pho 507
Owner name	Mr Alan Borman (Eskom)
Contact details: Mobile no	9832265569
Contact details: Tel no	0147682264
Estimated quantity (m³)	100000
Suitability of the material	Sand



PROJECT:
Mokolo and Crocodile Water Augmentation Project (MCWAP)

DRAWING TITLE:
Borrow Pit 11 Locality Plan

DRAWING NR:
11_1

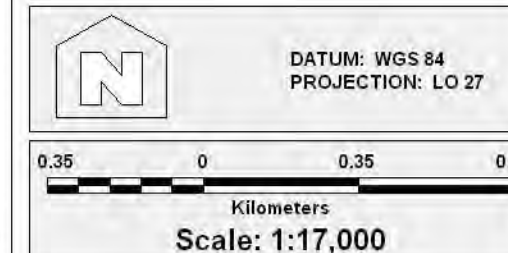


LEGEND:

●	Centre Line Test Pits
○	Borrow Pit Corner Points
—	Access Route/Surfaced Road
- - -	Conveyor
- - -	Powerline
—	Phase 1: Pipeline
—	Phase 2: Pipeline
—	Railway Network
- - -	Parent Farm Boundary

BORROW PIT DESCRIPTION:

Description	Borrowpit_11
Location of Borrow pit	X2623700 Y-061100
Shortest distance relative to pipeline	+1790 m
Distance to access road	+4.8 km from D2001
Farm name	Zwartwater 507 LQ
Farm number	Ptn 507
Owner name	Mr Alan Bosman (Eskom)
Contact details: Mobile no	0832269589
Contact details: Tel no	0147682204
Estimated quantity (m³)	100000



PROJECT:

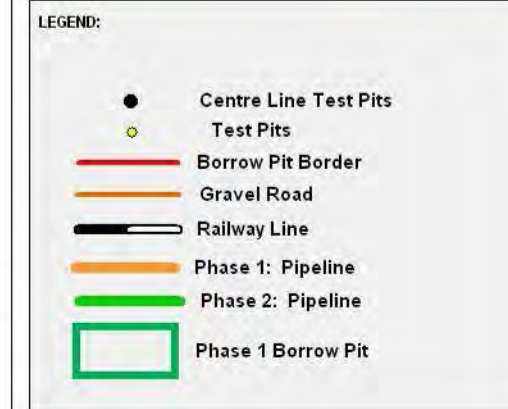
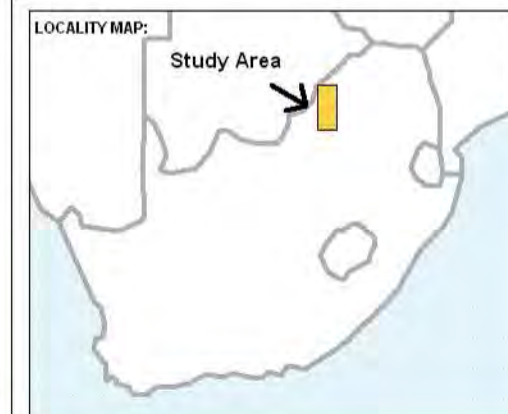
Mokolo and Crocodile Water Augmentation Project (MCWAP)

DRAWING TITLE:

Borrow Pit 11 Layout Plan

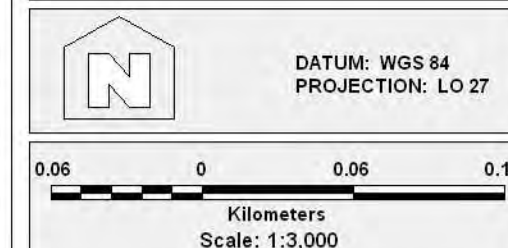
DRAWING NR:

11_2



BORROW PIT DESCRIPTION:

Description	Borrowpit_11
Location of Borrowpit	X2623700 Y-061100
Shortest distance relative to pipeline	± 0750 m
Distance to access road	± 4.6 km from D2001
Pit name	Charwater 507 LG
Pit number	Pit 507
Owner name	Mr Alan Bowman (Eskom)
Contact details: Mobile no	0832263555
Contact details: Tel no	0142482204
Estimated quantity (m³)	100000
Suitability of the material	Sand



PREPARED BY:

MOKOLO CROCODILE
Consultants

GeoSTRADA
Geotechnical Engineering & Construction

PREPARED FOR:

TCTA
A NEW WORLD FOR WATER

PROJECT:

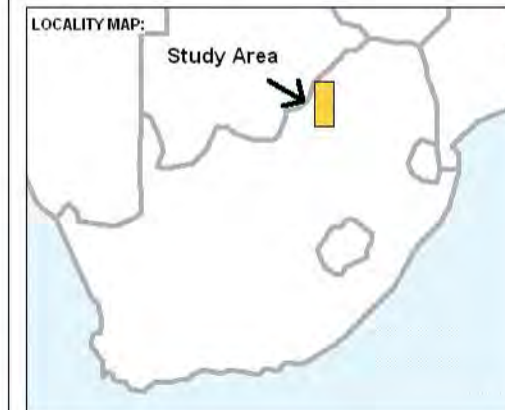
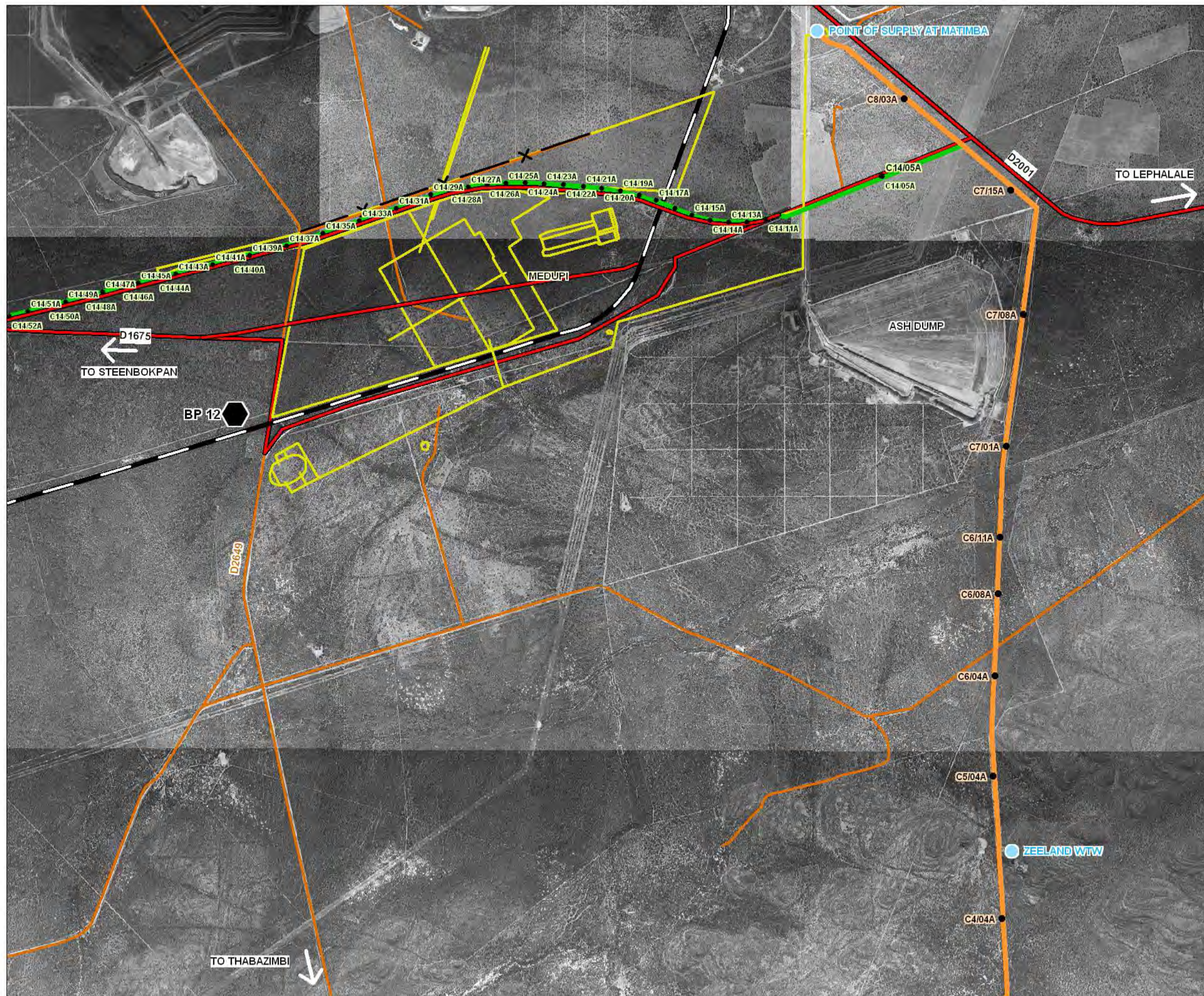
Mokolo and Crocodile Water
Augmentation Project (MCWAP)

DRAWING TITLE:

Borrow Pit 11
Test Pit Positions

DRAWING NR:

11_3



LEGEND:

- Centre Line Test Pits
- Borrow Pit
- Main Roads
- Phase 1: Pipeline Route
- Phase 2: Pipeline
- Railway Network
- Medupi Power Station

BORROW PIT DESCRIPTION:

Description	Borrowpit_12
Location of Borrowpit	X2629325 Y-465256
Shortest distance relative to pipeline	±1500 m
Distance to access road	±765 m from D1675
Farm name	Bethlehem 512 LQ
Farm number	Ph 587
Owner name	Mr Alan Boman (Eskom)
Contact details: Mobile no	0832265569
Contact details: Tel no	0147502204
Estimated quantity (m³)	100000
Suitability of the material	Sand

DATUM: WGS 84
PROJECTION: LO 27

0.8 0 0.8 1.6
Kilometers
Scale: 1:40,000

PREPARED BY:

MOKOLO CROCODILE CONSULTANTS
GEOSTRADA

PREPARED FOR:

TCTA
A NEW WORLD FOR WATER

PROJECT:

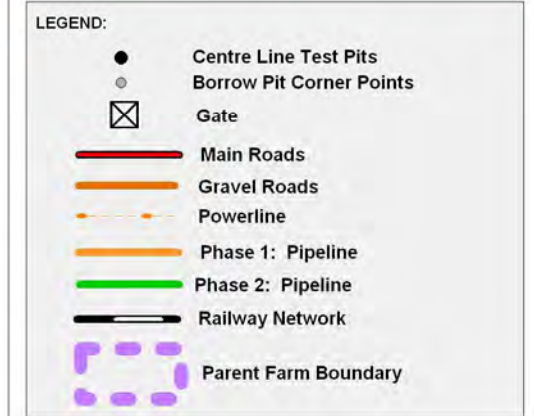
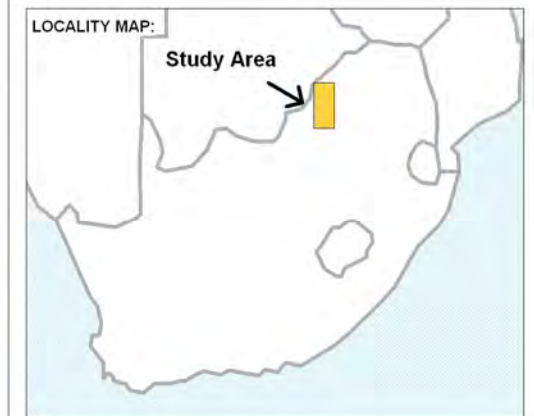
Mokolo and Crocodile Water Augmentation Project (MCWAP)

DRAWING TITLE:

**Borrow Pit 12
Locality Plan**

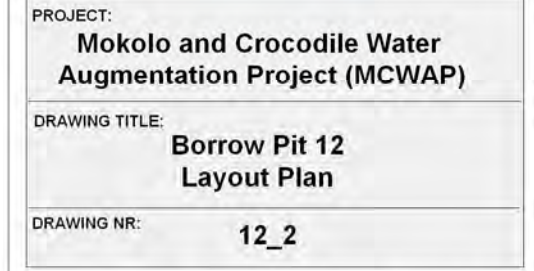
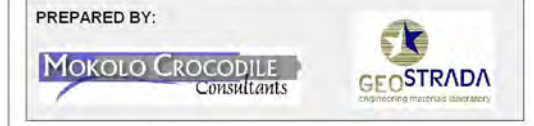
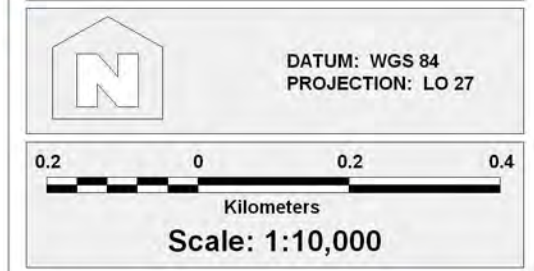
DRAWING NR:

12_1



BORROW PIT DESCRIPTION:

Description	Borrowpit_12
Location of Borrow pit	X2623926 Y-055256
Shortest distance relative to pipeline	±1590 m
Distance to access road	±789 m from D1675
Farm name	Eenzaamheid 512 LQ
Farm number	Ptn 687
Owner name	Mr Alan Bosman (Eskom)
Contact details: Mobile no	0832269589
Contact details: Tel no	0147682204
Estimated quantity (m³)	100000
Suitability of the material	Sand



Please note:
TP 1 to TP 6 falls outside the
boundaries of BP 12.

BORROW PIT 12 TEST PIT COORDINATES:

Label	LO27_Y	LO27_X
7	-055256	2623926
8	-055219	2623941
9	-055184	2623943
10	-055156	2623961
11	-055143	2623944
12	-055073	2623991
13	-055046	2623996
14	-055007	2624010
15	-054973	2624018
16	-054946	2624027
17	-054881	2624018
18	-054914	2623997
19	-054940	2623981
20	-054978	2623985
21	-055013	2623974
22	-055041	2623950
23	-055062	2623933
24	-055107	2623928
25	-055142	2623923
26	-055188	2623910
27	-055216	2623899
28	-055242	2623884
29	-055281	2623865
30	-055281	2623838
31	-055249	2623854
32	-055203	2623871
33	-055171	2623876
34	-055145	2623875
35	-055108	2623889
36	-055073	2623899
37	-055042	2623911
38	-055014	2623910
39	-054971	2623915
40	-054944	2623925
41	-054900	2623935
42	-054857	2623960
43	-054821	2623932
44	-054845	2623906
45	-054873	2623891
46	-054908	2623879
47	-054951	2623873
48	-054986	2623869
49	-055020	2623851
50	-055068	2623853
51	-055094	2623848
52	-055142	2623831
53	-055151	2623843
54	-055211	2623813
55	-055237	2623793
56	-055232	2623761
57	-055204	2623769
58	-055168	2623779
59	-055119	2623771
60	-055088	2623804
61	-055051	2623809
62	-055018	2623820
63	-054944	2623839
64	-054907	2623846
65	-054872	2623850
66	-054841	2623851
67	-054811	2623873



LEGEND:

- Centre Line Test Pits
- Test Pits
- Borrow Pit Boundary
- Gravel Road
- Powerline
- Railway Line
- Phase 1: Pipeline
- Phase 2: Pipeline

BORROW PIT DESCRIPTION:

Description	Borrowpit_12
Location of Borrow pit	X2623926 Y-055256
Shortest distance relative to pipeline	+1590 m
Distance to access road	+789 m from D1675
Farm name	Eenzaamheid 512 LQ
Farm number	Ptn 687
Owner name	Mr Alan Bosman (Eskom)
Contact details: Mobile no	0832269589
Contact details: Tel no	0147682204
Estimated quantity (m³)	100000
Suitability of the material	Sand

DATUM: WGS 84
PROJECTION: LO 27

0.06 0 0.06 0.12
Kilometers
Scale: 1:3,000

PREPARED BY:

MOKOLO CROCODILE Consultants

GEOSTRADA

PREPARED FOR:

TCTA

PROJECT:

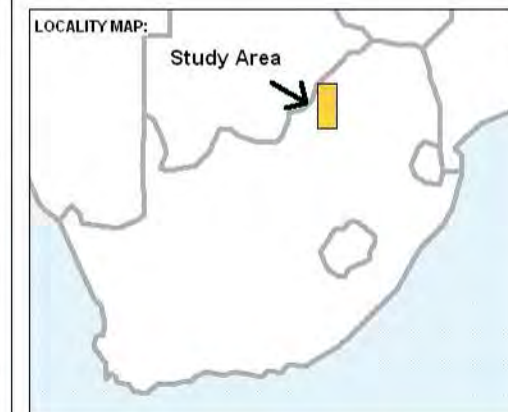
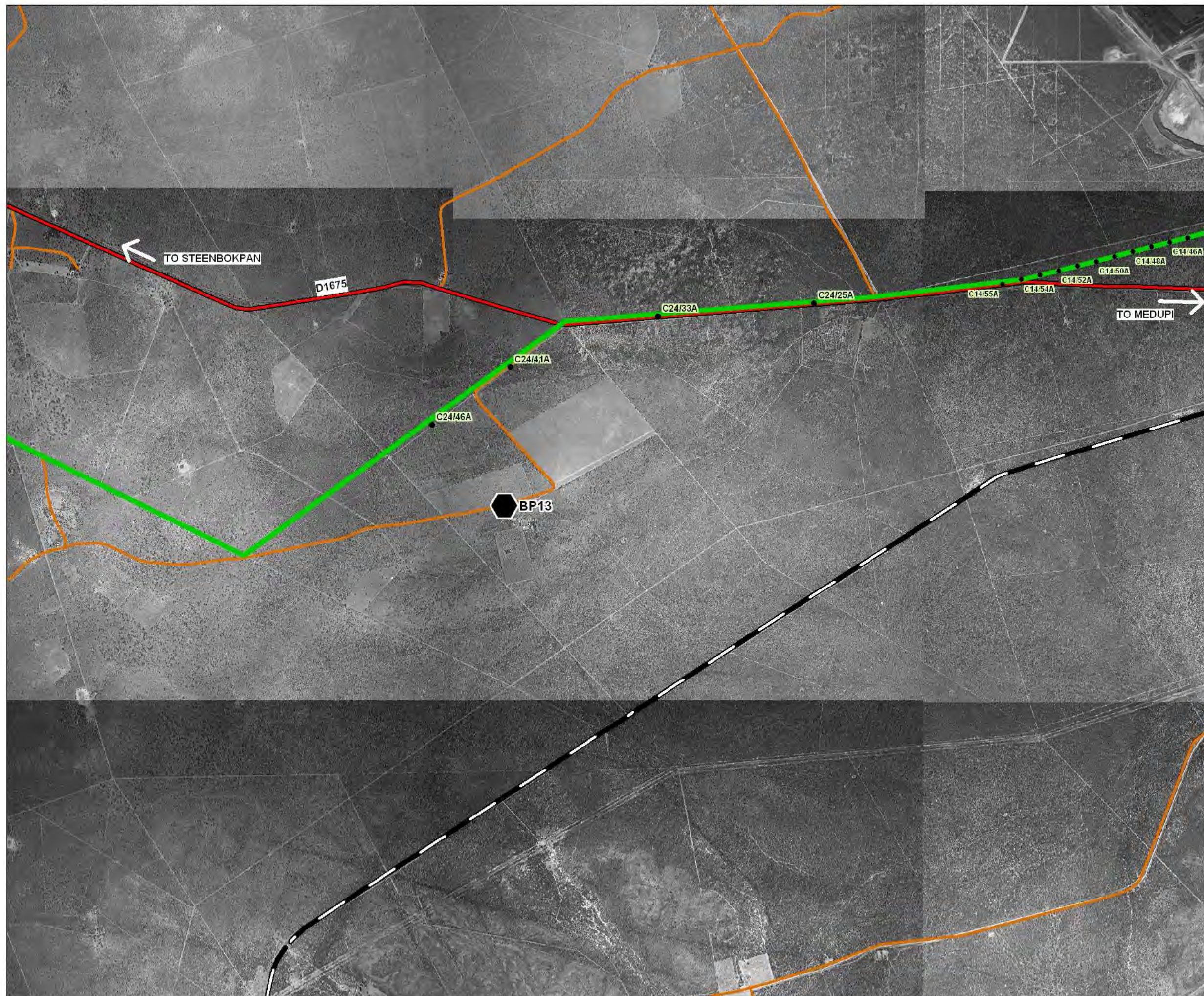
Mokolo and Crocodile Water Augmentation Project (MCWAP)

DRAWING TITLE:

Borrow Pit 12 Test Pit Positions

DRAWING NR:

12_3




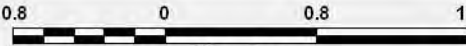
LEGEND:

- Centre Line Test Pits
- Borrow Pit
- Main Roads
- Gravel Roads
- Phase 2: Pipeline
- Railway Network



BORROW PIT DESCRIPTION:

Description	Borrowpit_13
Location of Borrow pit	X2625400 Y-046800
Shortest distance relative to pipeline	+1040 m
Distance to access road	+2.9 km from Gate on D1675
Farm name	Buffelsjagt 317 LQ
Farm number	Ptn RE/317
Owner name	Hennie Hills
Contact details: Mobile no	0823764242
Estimated quantity (m ³)	100000
Suitability of the material	Sand

 DATUM: WGS 84
PROJECTION: LO 27

 Kilometers
Scale: 1:40,000

PREPARED BY:

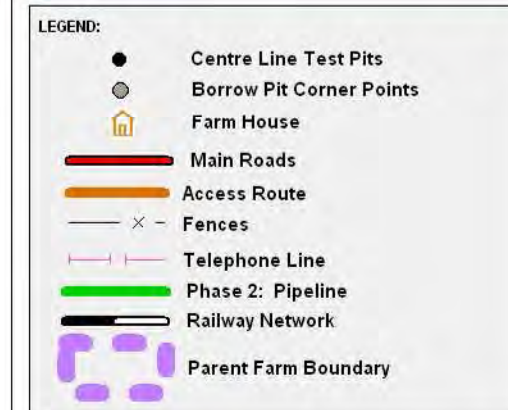
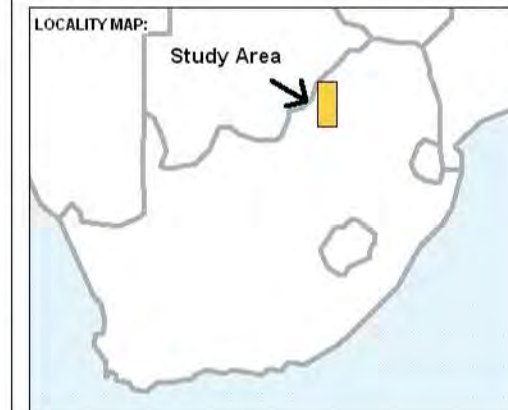
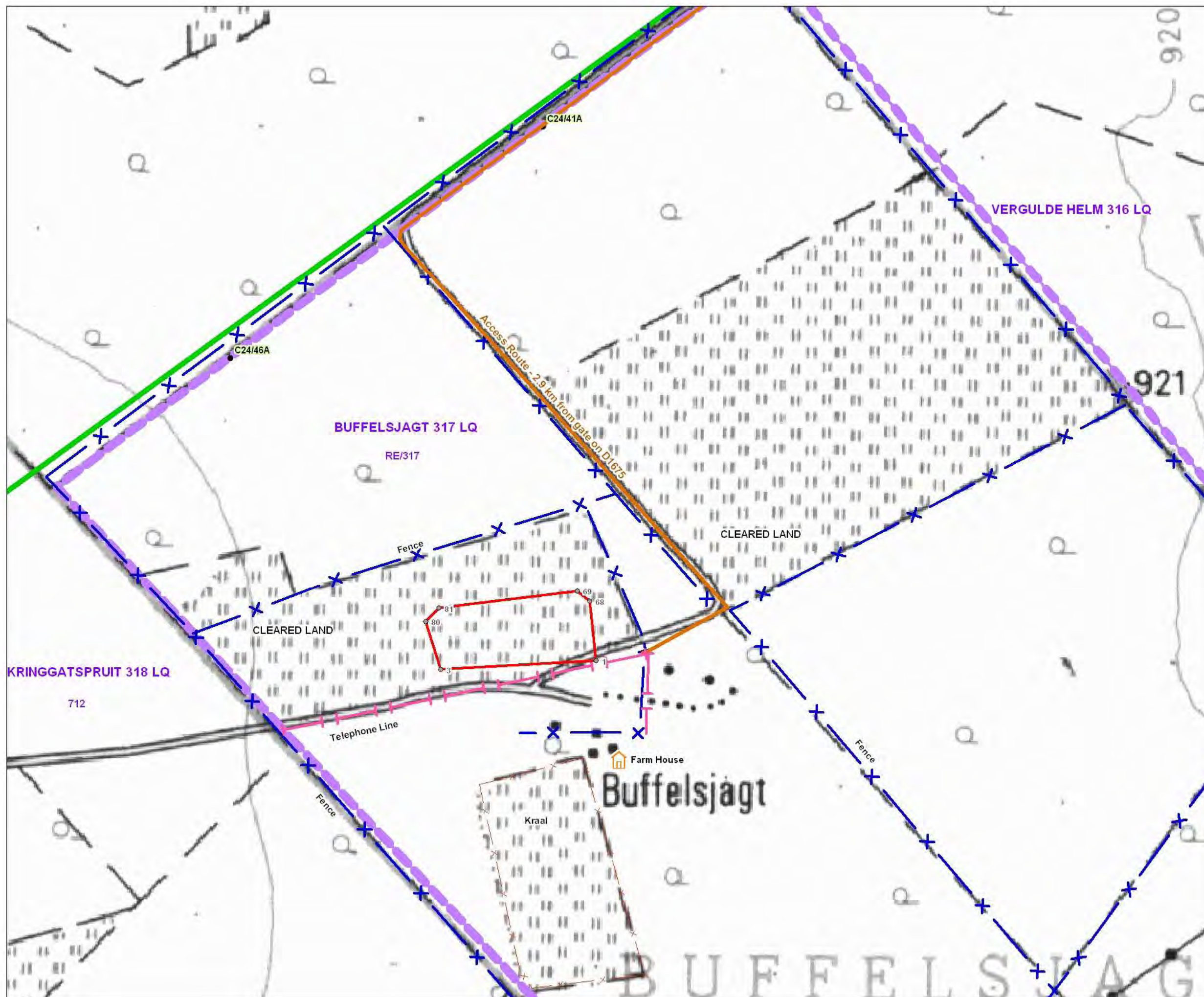
PREPARED FOR:



PROJECT:
Mokolo and Crocodile Water Augmentation Project (MCWAP)

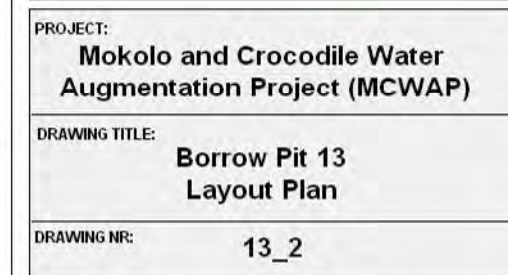
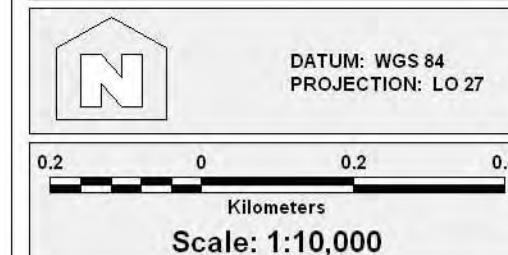
DRAWING TITLE:
Borrow Pit 13 Locality Plan

DRAWING NR:
13_1



BORROW PIT DESCRIPTION:

Description	Borrowpit_13
Location of Borrow pit	X2625400 Y-046600
Shortest distance relative to pipeline	+1040 m
Distance to access road	+2.9 km from Gate on D1675
Farm name	Buffelsjagt 317 LQ
Farm number	Ptn RE/317
Owner name	Hennie Hills
Contact details: Mobile no	0823764242
Estimated quantity (m³)	100000
Suitability of the material	Sand



Please Note:
TP 4, 5 & 6 fall outside the boundaries of BP 13.

BORROW PIT 13 TEST PIT COORDINATES:

ID	LO27Y	LO27X	ID	LO27Y	LO27X
1	-046811	2625473	68	-046795	2625312
2	-046601	2625464	69	-046760	2625284
3	-046391	2625497	70	-046722	2625288
7	-046771	2625477	71	-046686	2625296
8	-046744	2625481	72	-046656	2625313
9	-046696	2625487	73	-046620	2625318
10	-046669	2625486	74	-046580	2625326
11	-046625	2625480	75	-046544	2625337
12	-046566	2625468	76	-046509	2625354
13	-046529	2625477	77	-046471	2625358
14	-046502	2625476	78	-046430	2625366
15	-046470	2625486	79	-046393	2625358
16	-046435	2625489	80	-046351	2625367
17	-046379	2625468	81	-046386	2625331
18	-046410	2625463	82	-046431	2625331
19	-046449	2625459	83	-046479	2625324
20	-046491	2625449	84	-046512	2625316
21	-046526	2625447	85	-046586	2625297
22	-046564	2625438			
23	-046596	2625435			
24	-046636	2625442			
25	-046670	2625448			
26	-046700	2625454			
27	-046733	2625453			
28	-046773	2625445			
29	-046806	2625444			
30	-046840	2625437			
31	-046874	2625431			
32	-046911	2625440			
33	-046809	2625412			
34	-046766	2625415			
35	-046734	2625413			
36	-046707	2625422			
37	-046672	2625417			
38	-046637	2625422			
39	-046696	2625396			
40	-046725	2625382			
41	-046764	2625376			
42	-046803	2625380			
43	-046801	2625345			
44	-046764	2625349			
45	-046731	2625353			
46	-046699	2625367			
47	-046668	2625382			
48	-046633	2625388			
49	-046605	2625398			
50	-046569	2625395			
51	-046521	2625412			
52	-046483	2625421			
53	-046452	2625425			
54	-046405	2625429			
55	-046366	2625433			
56	-046362	2625398			
57	-046394	2625398			
58	-046429	2625396			
59	-046465	2625388			
60	-046504	2625388			
61	-046540	2625366			
62	-046580	2625357			



LEGEND:

- Centre Line Test Pits
- Test Pits
- Farm House
- Borrow Pit Boundary
- Access Route
- Fences
- Telephone Line
- Railway Line
- Phase 2: Pipeline

BORROW PIT DESCRIPTION:

Description	Borrowpit_13
Location of Borrow pit	X2625400 Y-046800
Shortest distance relative to pipeline	+1040 m
Distance to access road	+2.9 km from Gate on D1675
Farm name	Buffelsjagt 317 LQ
Farm number	Ptn RE/317
Owner name	Hennie Hills
Contact details: Mobile no	0823764242
Estimated quantity (m³)	100000
Suitability of the material	Sand

DATUM: WGS 84
PROJECTION: LO 27

0.09 0 0.09 0.18
Kilometers
Scale: 1:4,500

PREPARED BY:

MOKOLO CROCODILE
CONSULTANTS

GEOSTRADA
CONSULTANTS

PREPARED FOR:

TCTA
A NEW WORLD FOR WATER

PROJECT:

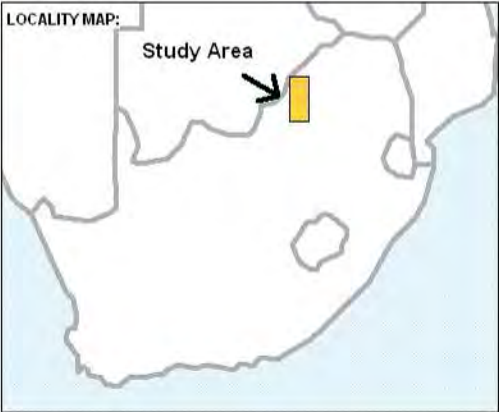
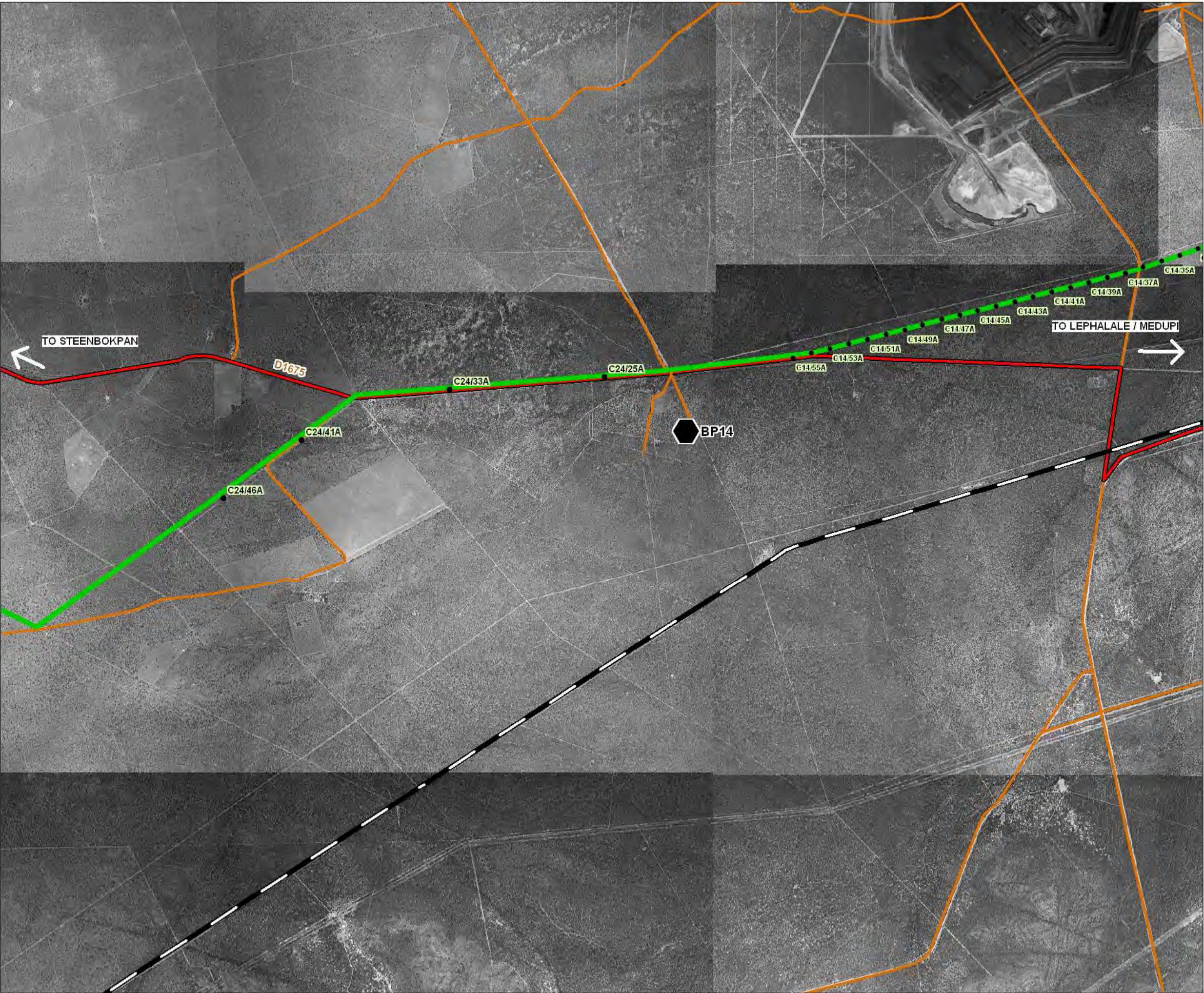
Mokolo and Crocodile Water
Augmentation Project (MCWAP)

DRAWING TITLE:

Borrow Pit 13
Test Pit Positions

DRAWING NR:

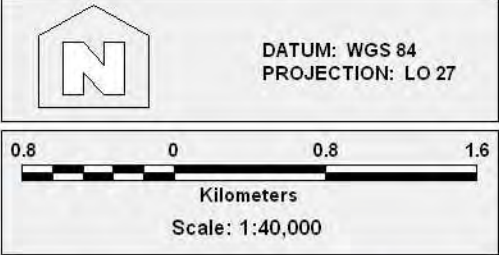
13_3



- LEGEND:
- Centre Line Test Pits
 - ⬡ Borrow Pit
 - Main Roads
 - Gravel Roads
 - Phase 2: Pipeline
 - Railway Network

BORROW PIT DESCRIPTION:

Description	Borrowpit_14
Location of Borrow pit	X2623800 Y-050000
Shortest distance relative to pipeline	+330 m
Distance to access road	+300 m from D1675
Farm name	Vergulde Helm 316 LQ
Farm number	Ptn 321
Owner name	Hennie Hills
Contact details: Mobile no	0823764242
Estimated quantity (m³)	100000
Suitability of the material	Sand



PREPARED BY:

MOKOLO CROCODILE
Consultants

GEOSTRADA
Engineering & Construction Services

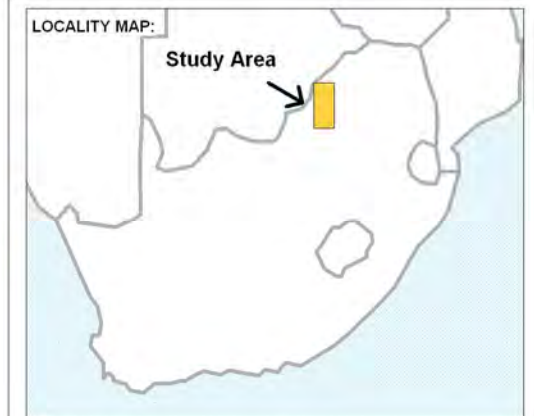
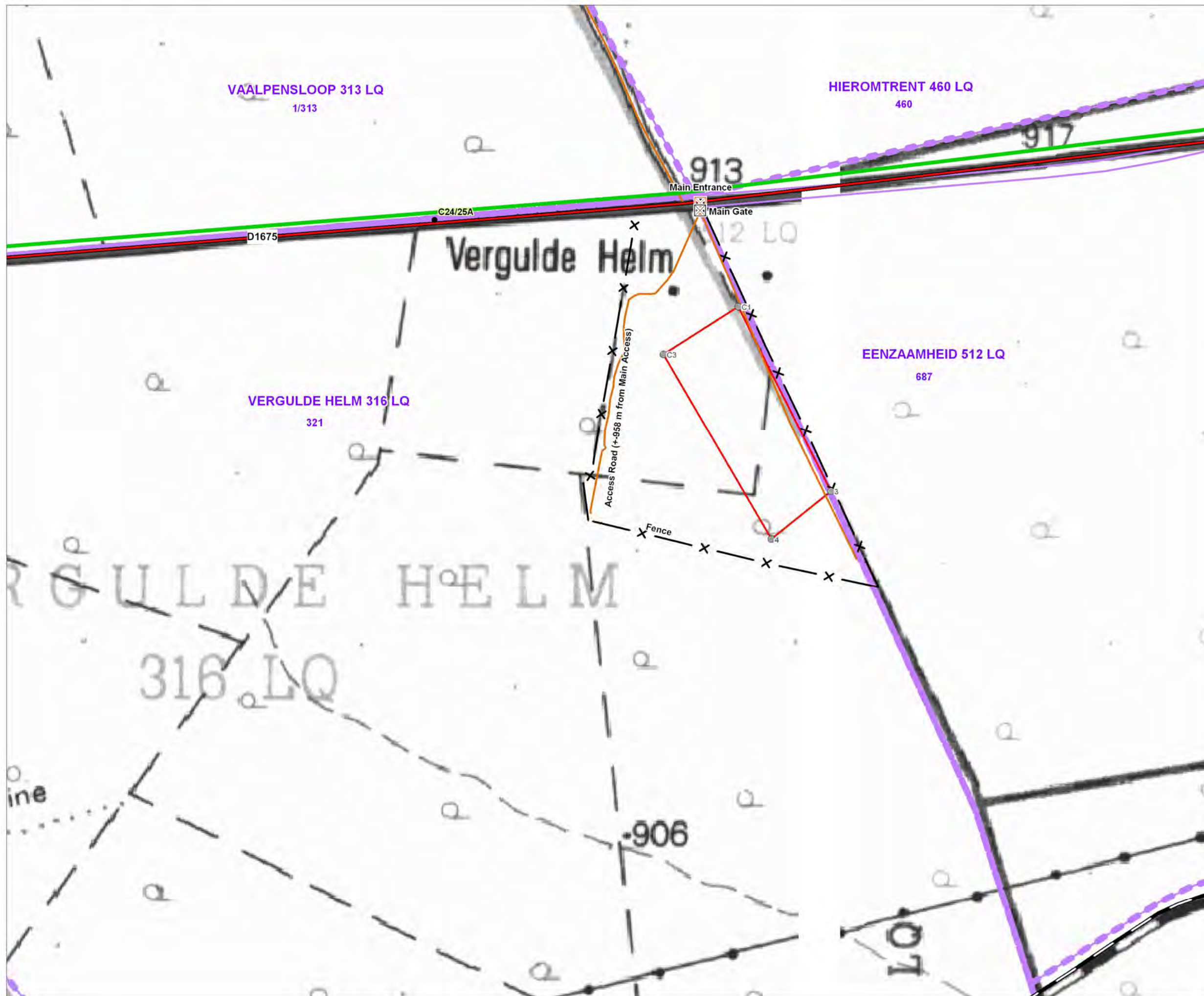
PREPARED FOR:

TCTA
A NEW WORLD FOR WATER

PROJECT:
Mokolo and Crocodile Water Augmentation Project (MCWAP)

DRAWING TITLE:
Borrow Pit 14 Locality Plan

DRAWING NR:
14_1

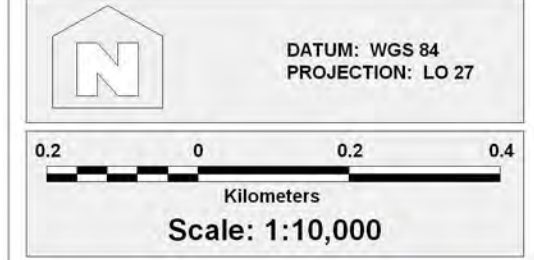


LEGEND:

●	Centre Line Test Pits
●	Borrow Pit Corner Points
⊠	Main Gate
⊞	Main Entrance
—	Main Roads
—	Gravel Roads
—	Fences
—	Phase 2: Pipeline
—	Railway Network
⬡	Parent Farm Boundary

BORROW PIT DESCRIPTION:

Description	Borrowpit_14
Location of Borrow pit	X2623195 Y-050677
Shortest distance relative to pipeline	+330 m
Distance to access road	+958 m (from Main Access)
Farm name	Vergulde Helm 316 LQ
Farm number	Ptn 321
Owner name	Hennie Hills
Contact details: Mobile no	0823764242
Estimated quantity (m³)	100000
Suitability of the material	Sand



PREPARED BY:

MOKOLO CROCODILE Consultants

GEOSTRADA

PREPARED FOR:

TCTA

PROJECT:

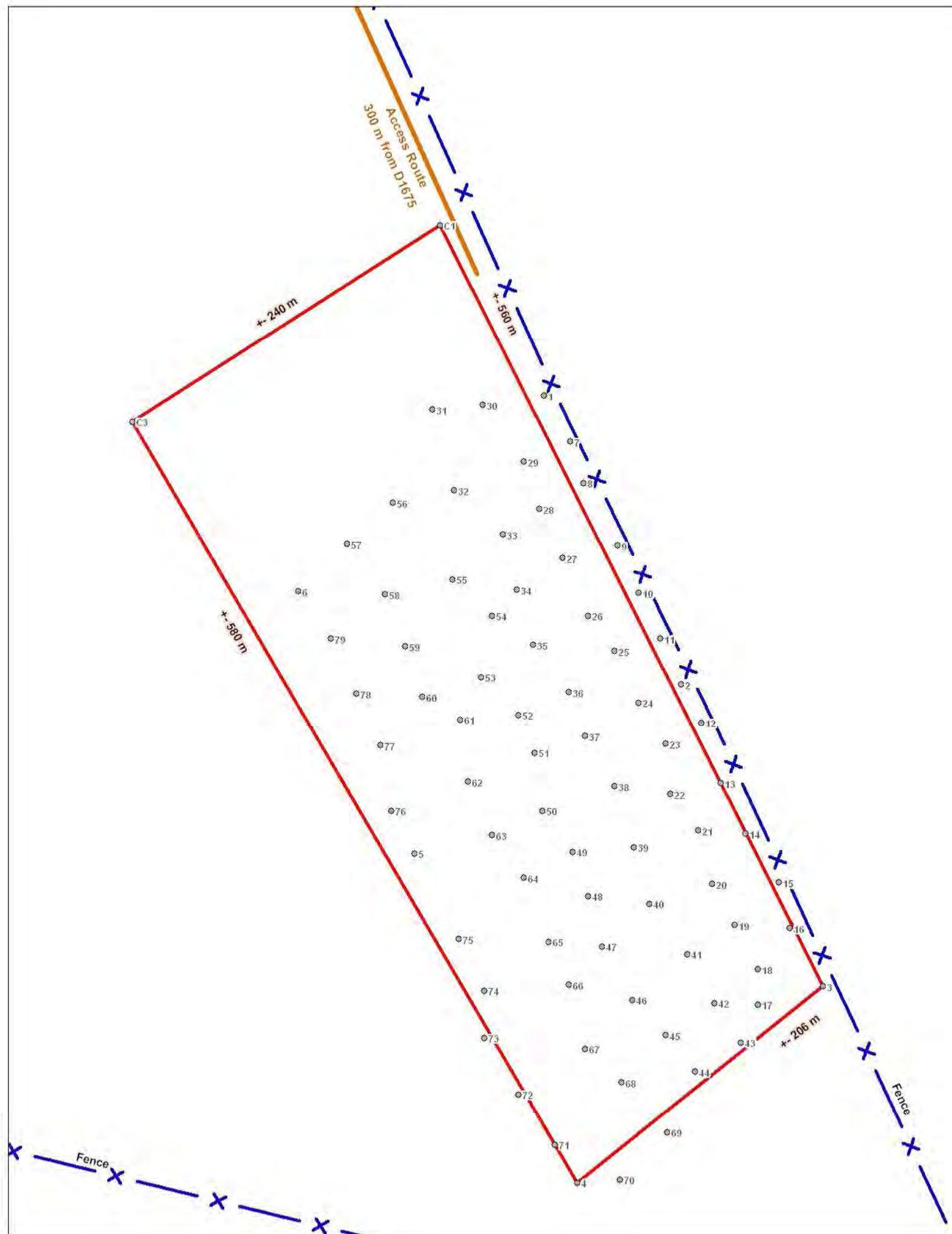
Mokolo and Crocodile Water Augmentation Project (MCWAP)

DRAWING TITLE:

Borrow Pit 14 Layout Plan

DRAWING NR:

14_2



BORROW PIT 14 TEST PIT COORDINATES:

ID	LO27Y	LO27X
1	-050847	2623956
2	-050937	2623755
3	-051030	2623953
4	-050869	2624082
5	-050762	2623866
6	-050686	2623694
7	-050664	2623596
8	-050873	2623623
9	-050895	2623664
10	-050909	2623695
11	-050923	2623725
12	-050950	2623780
13	-050963	2623820
14	-050979	2623853
15	-051001	2623885
16	-051008	2623915
17	-050987	2623965
18	-050987	2623942
19	-050972	2623913
20	-050957	2623886
21	-050948	2623851
22	-050930	2623827
23	-050927	2623794
24	-050909	2623767
25	-050893	2623733
26	-050876	2623710
27	-050859	2623672
28	-050844	2623640
29	-050834	2623609
30	-050807	2623572
31	-050774	2623575
32	-050788	2623628
33	-050820	2623657
34	-050829	2623693
35	-050840	2623729
36	-050863	2623760
37	-050874	2623789
38	-050893	2623822
39	-050906	2623862
40	-050916	2623899
41	-050941	2623932
42	-050959	2623964
43	-050976	2623990
44	-050946	2624009
45	-050927	2623985
46	-050905	2623962
47	-050885	2623927
48	-050876	2623894
49	-050866	2623865
50	-050846	2623838
51	-050841	2623800
52	-050830	2623775
53	-050806	2623750
54	-050813	2623710
55	-050787	2623686
56	-050748	2623636
57	-050718	2623663
58	-050743	2623696
59	-050756	2623730
60	-050767	2623763
61	-050792	2623778
62	-050797	2623819
63	-050813	2623854
64	-050834	2623882
65	-050850	2623924
66	-050863	2623952

ID	LO27Y	LO27X
74	-050808	2623956
75	-050791	2623922
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77	-050740	2623795
78	-050724	2623761
79	-050707	2623725
C1	-050779	2623454

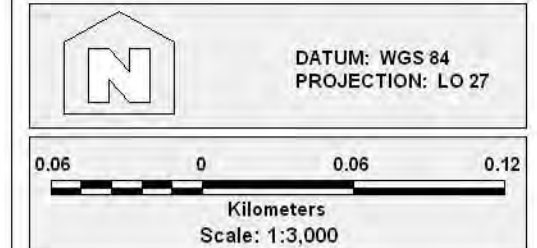


LEGEND:

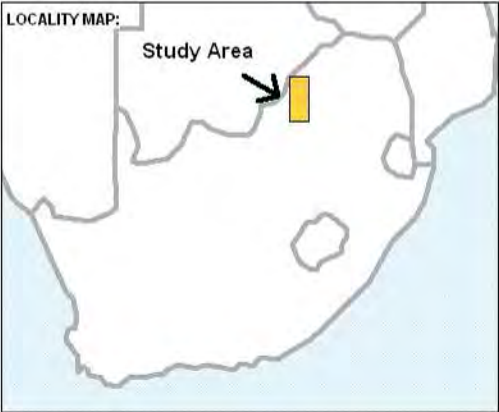
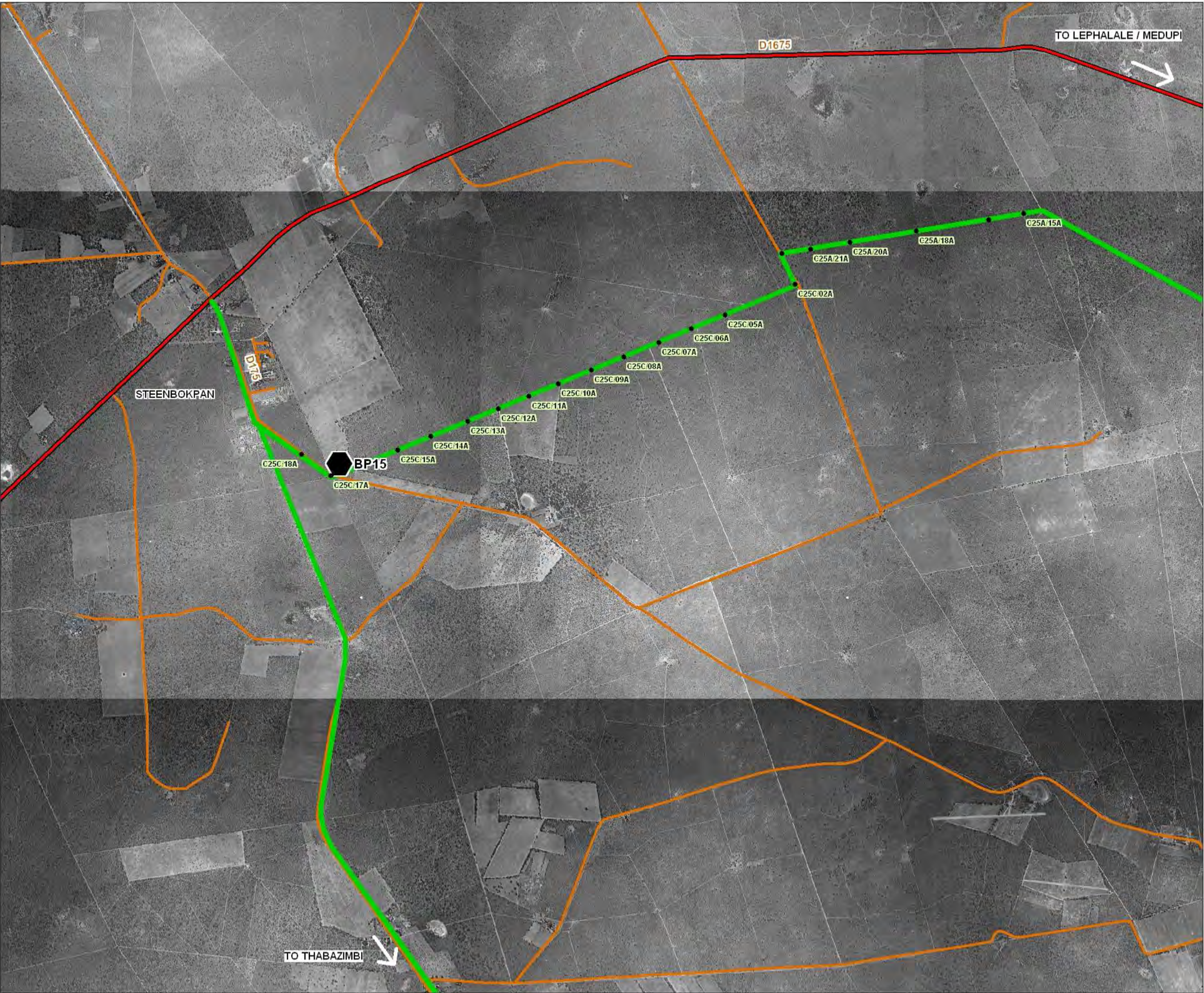
- Centre Line Test Pits
- Test Pits
- Borrow Pit Border
- Gravel Road
- Fences
- Railway Line
- Phase 2: Pipeline

BORROW PIT DESCRIPTION:

Description	Borrowpit_14
Location of Borrow pit	X2623800 Y-050000
Shortest distance relative to pipeline	+330 m
Distance to access road	+300 m from D1675
Farm name	Vergulde Helm 316 LG
Farm number	Ptn 321
Owner name	Hennie Hills
Contact details: Mobile no	0823764242
Estimated quantity (m³)	100000
Suitability of the material	Sand



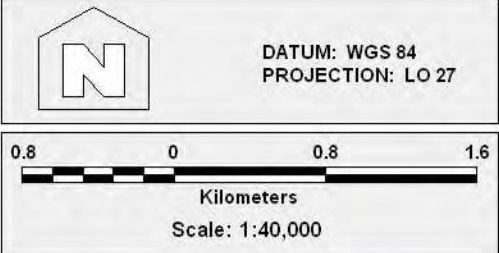
PROJECT:	Mokolo and Crocodile Water Augmentation Project (MCWAP)
DRAWING TITLE:	Borrow Pit 14 Test Pit Positions
DRAWING NR:	14_3



- LEGEND:
- Centre Line Test Pits
 - Borrow Pit
 - Main Roads
 - Gravel Roads
 - Phase 2: Pipeline
 - Railway Network

BORROW PIT DESCRIPTION:

Description	Borrowpit_15
Location of Borrow pit	X2624996 Y-429200
Shortest distance relative to pipeline	+/- 4.4m
Distance to access road	+/- 3.4km from D1675
Farm name	Vangpan 294 LO
Farm number	Pm 1254
Owner name	Jannie Pistor
Contact details: Mobile no	0828070924
Contact details: Tel no	0142660245
Estimated quantity (m ³)	100000
Suitability of the material	Sand



PREPARED BY:

MOKOLO CROCODILE
CONSULTANTS

GEOSTRADA
REGISTERED PROFESSIONAL ENGINEERS

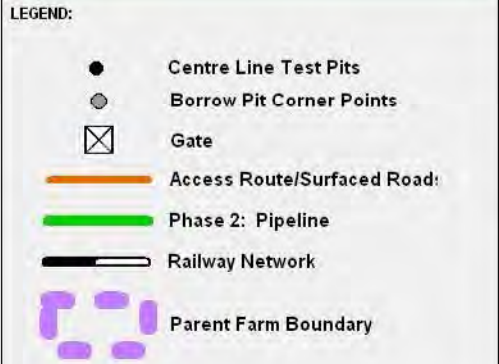
PREPARED FOR:

TCTA
A NEW WORLD FOR WATER

PROJECT:
Mokolo and Crocodile Water Augmentation Project (MCWAP)

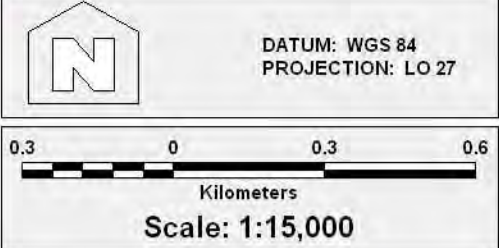
DRAWING TITLE:
Borrow Pit 15 Locality Plan

DRAWING NR:
15_1



BORROW PIT DESCRIPTION:

Description	Borrowpit_15
Location of Borrow pit	X2624900 Y-029200
Shortest distance relative to pipeline	+6.4 m
Distance to access road	+3.4 km from D1675
Farm name	Vanpan 294 LQ
Farm number	Ptn 1/294
Owner name	Jannie Pelsner
Contact details: Mobile no	0828070924
Contact details: Tel no	0147660245
Estimated quantity (m³)	100000



PROJECT:

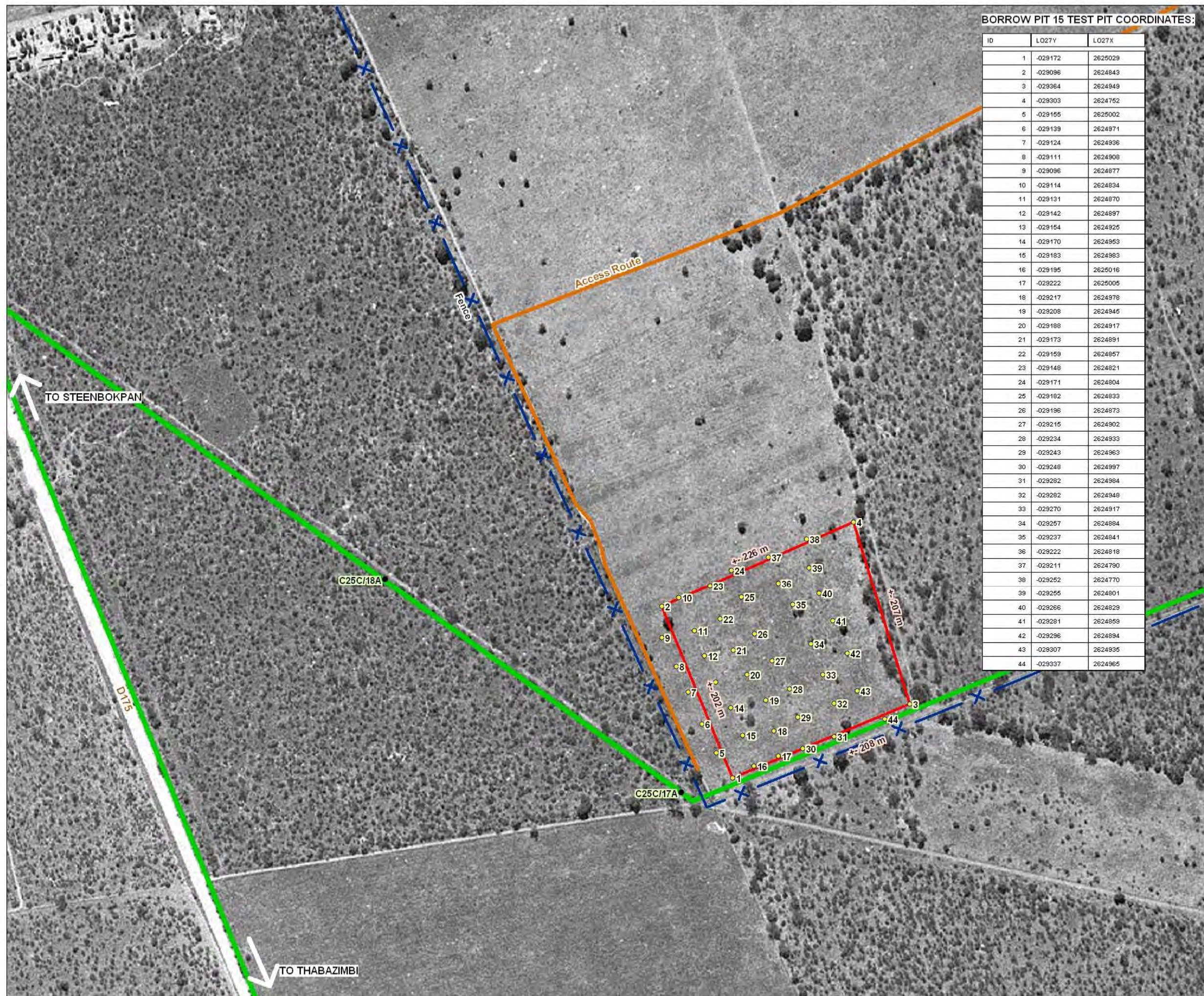
Mokolo and Crocodile Water Augmentation Project (MCWAP)

DRAWING TITLE:

Borrow Pit 15 Layout Plan

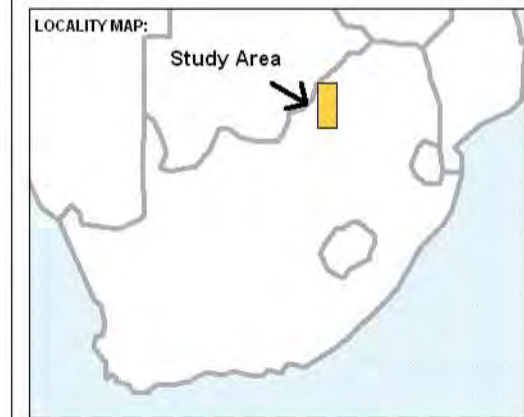
DRAWING NR:

15_2



BORROW PIT 15 TEST PIT COORDINATES:

ID	LO27Y	LO27X
1	-029172	2625029
2	-029096	2624843
3	-029364	2624949
4	-029303	2624752
5	-029155	2625002
6	-029139	2624971
7	-029124	2624936
8	-029111	2624908
9	-029096	2624877
10	-029114	2624834
11	-029131	2624870
12	-029142	2624897
13	-029154	2624925
14	-029170	2624953
15	-029183	2624983
16	-029195	2625016
17	-029222	2625005
18	-029217	2624978
19	-029208	2624945
20	-029188	2624917
21	-029173	2624891
22	-029159	2624857
23	-029148	2624821
24	-029171	2624804
25	-029182	2624833
26	-029196	2624873
27	-029215	2624902
28	-029234	2624933
29	-029243	2624963
30	-029248	2624997
31	-029282	2624984
32	-029282	2624948
33	-029270	2624917
34	-029257	2624884
35	-029237	2624841
36	-029222	2624818
37	-029211	2624790
38	-029252	2624770
39	-029255	2624801
40	-029266	2624829
41	-029281	2624859
42	-029296	2624894
43	-029307	2624935
44	-029337	2624965



LEGEND:

- Centre Line Test Pits
- Test Pits
- Borrow Pit Border
- Gravel Road
- Fences
- Railway Line
- Phase 2: Pipeline

BORROW PIT DESCRIPTION:

Description	Borrowpit_15
Location of Borrowpit	X2624900 Y-029200
Shortest distance relative to pipeline	+/-4.4m
Distance to access road	+/-3.4km from D1675
Farm name	Langman 294 LG
Farm number	Ph 1294
Owner name	Jannie Pelter
Contact details: Mobile no	9828078924
Contact details: Tel no	0142500245
Estimated quantity (m³)	100000
Suitability of the material	Sand

DATUM: WGS 84
PROJECTION: LO 27

0.06 0 0.06 0.12
Kilometers
Scale: 1:3,000

PREPARED BY:

MOKOLO CROCODILE
Consultants

GeoSTRADA
Engineering and Construction

PREPARED FOR:

TCTA
A NEW WORLD FOR WATER

PROJECT:

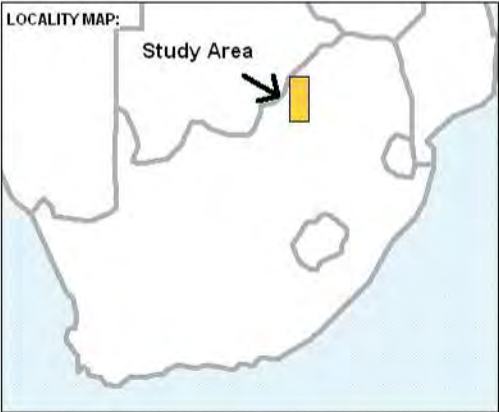
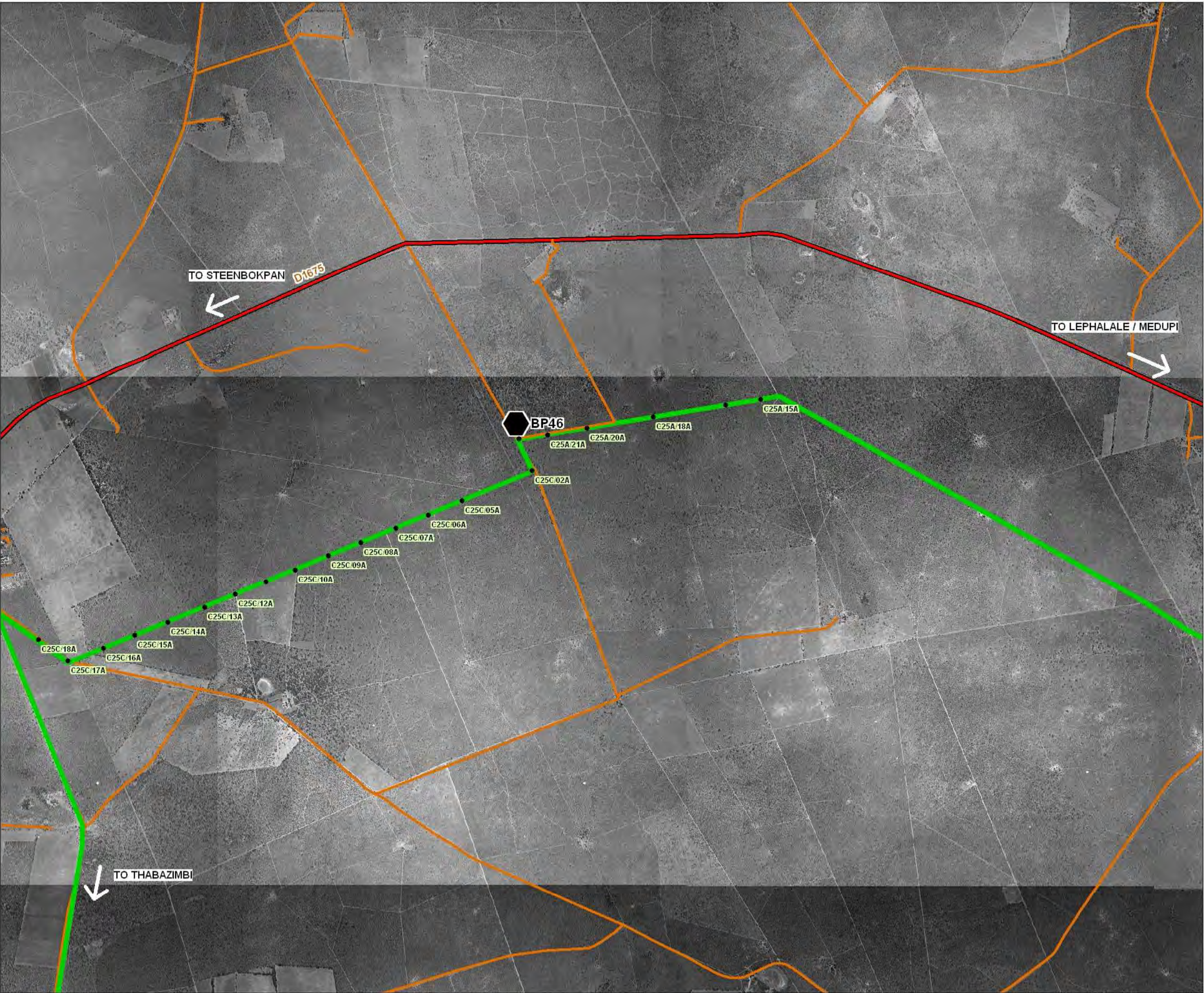
Mokolo and Crocodile Water
Augmentation Project (MCWAP)

DRAWING TITLE:

Borrow Pit 15
Test Pit Positions

DRAWING NR:

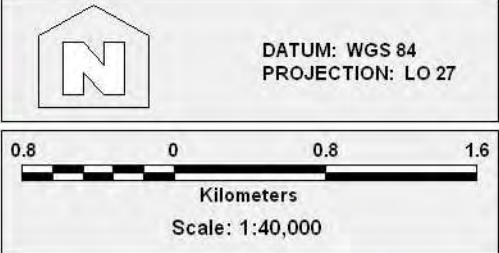
15_3



- LEGEND:
- Centre Line Test Pits
 - ⬢ Borrow Pit
 - Main Roads
 - Gravel Roads
 - Phase 2: Pipeline
 - Railway Network

BORROW PIT DESCRIPTION:

Description	Borrowpit_46
Location of Borrow pit	X2622450 Y-030950
Shortest distance relative to pipeline	+50 m
Distance to access road	+3436 m (from Main Access)
Farm name	Zandbult 300 LQ
Farm number	
Owner name	Megan Delport (Harden)
Contact details: Mobile no	0824984986
Estimated quantity (m³)	100000
Suitability of the material	Sand



PREPARED BY:

MOKOLO CROCODILE
CONSULTANTS

GEOSTRADA
REGISTERED PROFESSIONAL ENGINEERS

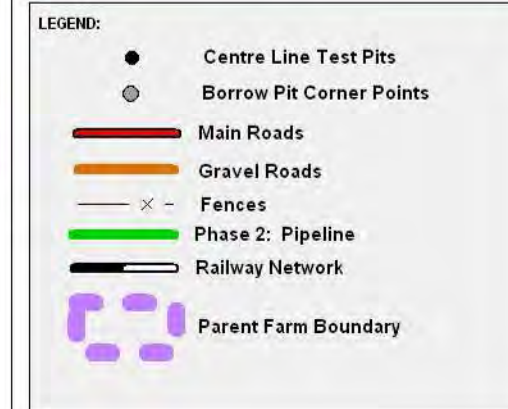
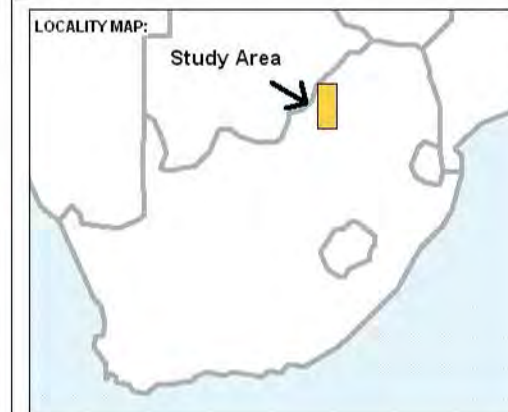
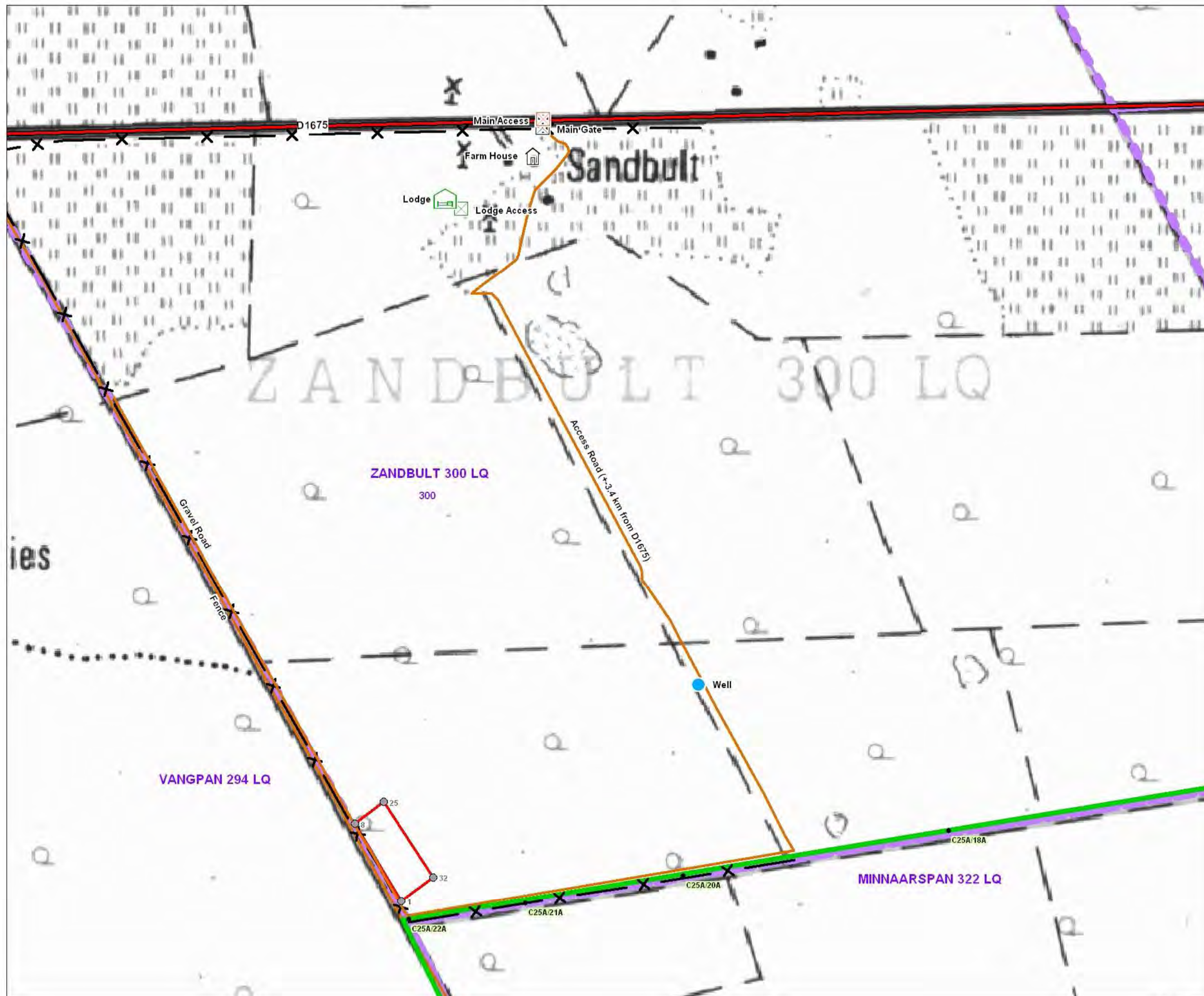
PREPARED FOR:

TCTA
A NEW WORLD FOR WATER

PROJECT:
Mokolo and Crocodile Water Augmentation Project (MCWAP)

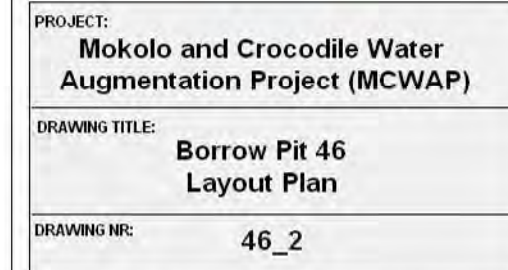
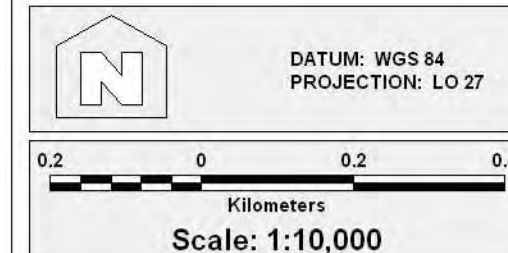
DRAWING TITLE:
Borrow Pit 46 Locality Plan

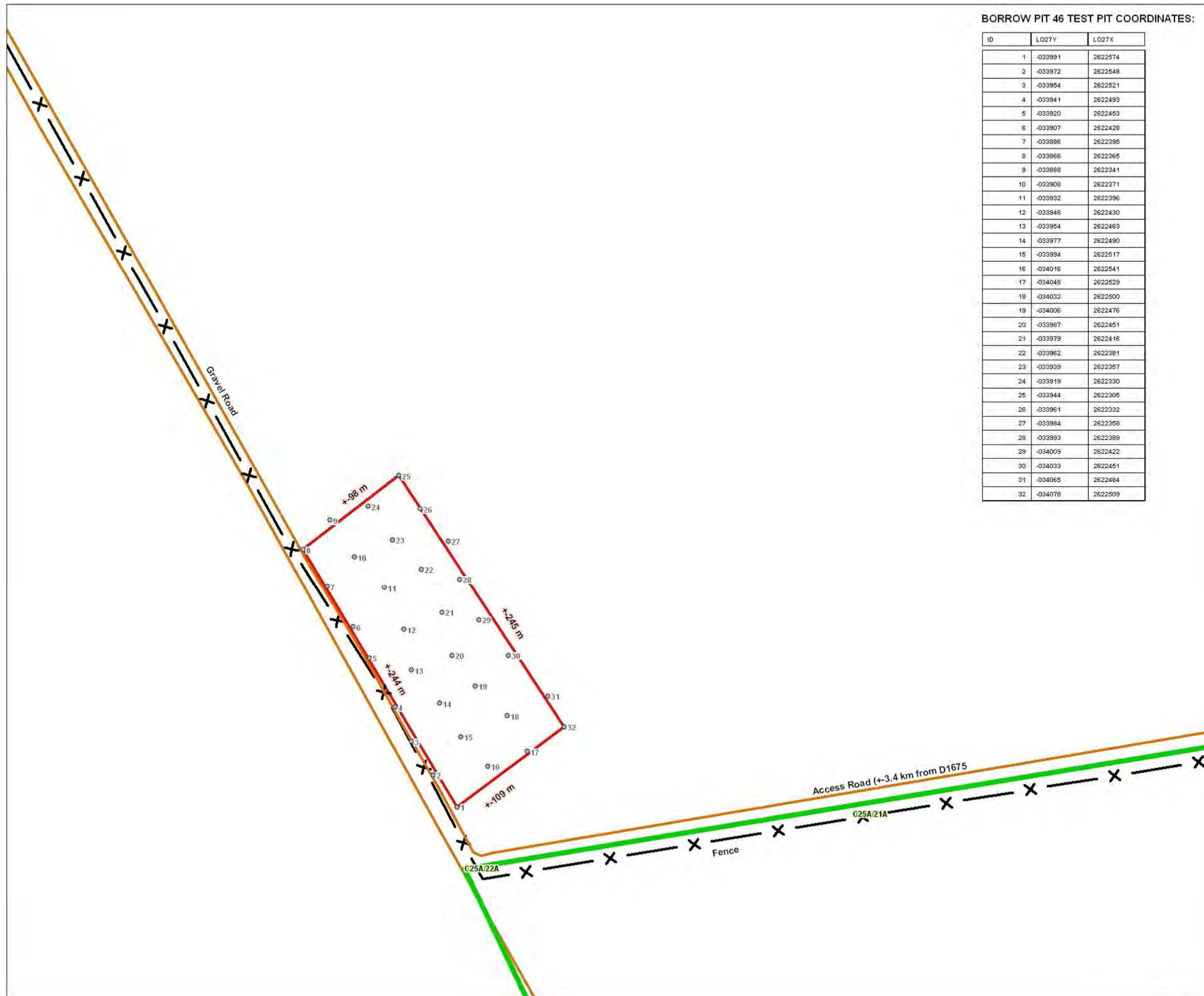
DRAWING NR:
46_1



BORROW PIT DESCRIPTION:

Description	Borrowpit_46
Location of Borrow pit	X2622450 Y-030950
Shortest distance relative to pipeline	+50 m
Distance to access road	+3436 m (from Main Access)
Farm name	Zandbult 300 LQ
Farm number	
Owner name	Megan Delport (Harden)
Contact details: Mobile no	0824984996
Estimated quantity (m³)	100000
Suitability of the material	Sand





BORROW PIT 46 TEST PIT COORDINATES:

ID	LO27Y	LO27X
1	-033991	2622574
2	-033972	2622548
3	-033964	2622521
4	-033941	2622493
5	-033920	2622463
6	-033907	2622428
7	-033886	2622395
8	-033866	2622365
9	-033888	2622341
10	-033908	2622371
11	-033932	2622396
12	-033948	2622430
13	-033964	2622463
14	-033977	2622490
15	-033994	2622517
16	-034016	2622541
17	-034048	2622529
18	-034032	2622500
19	-034006	2622476
20	-033987	2622451
21	-033979	2622416
22	-033962	2622381
23	-033939	2622357
24	-033919	2622330
25	-033944	2622305
26	-033961	2622332
27	-033984	2622358
28	-033993	2622389
29	-034009	2622422
30	-034033	2622451
31	-034065	2622484
32	-034078	2622509



LEGEND:

- Centre Line Test Pits
- ⊙ Test Pits
- Borrow Pit Border
- Gravel Road
- Fences
- Railway Line
- Phase 2: Pipeline

BORROW PIT DESCRIPTION:

Description	Borrowpit_46
Location of Borrow pit	X2622450 Y-030950
Shortest distance relative to pipeline	+50 m
Distance to access road	+3436 m (from Main Access)
Farm name	Zandbult 300 LQ
Farm number	
Owner name	Megan Delport (Harden)
Contact details: Mobile no	0824984986
Estimated quantity (m³)	100000
Suitability of the material	Sand

DATUM: WGS 84
PROJECTION: LO 27

0.06 0 0.06 0.12
Kilometers
Scale: 1:3,000

PREPARED BY:

MOKOLO CROCODILE
Consultants

GeoSTRADA
Engineering and Construction

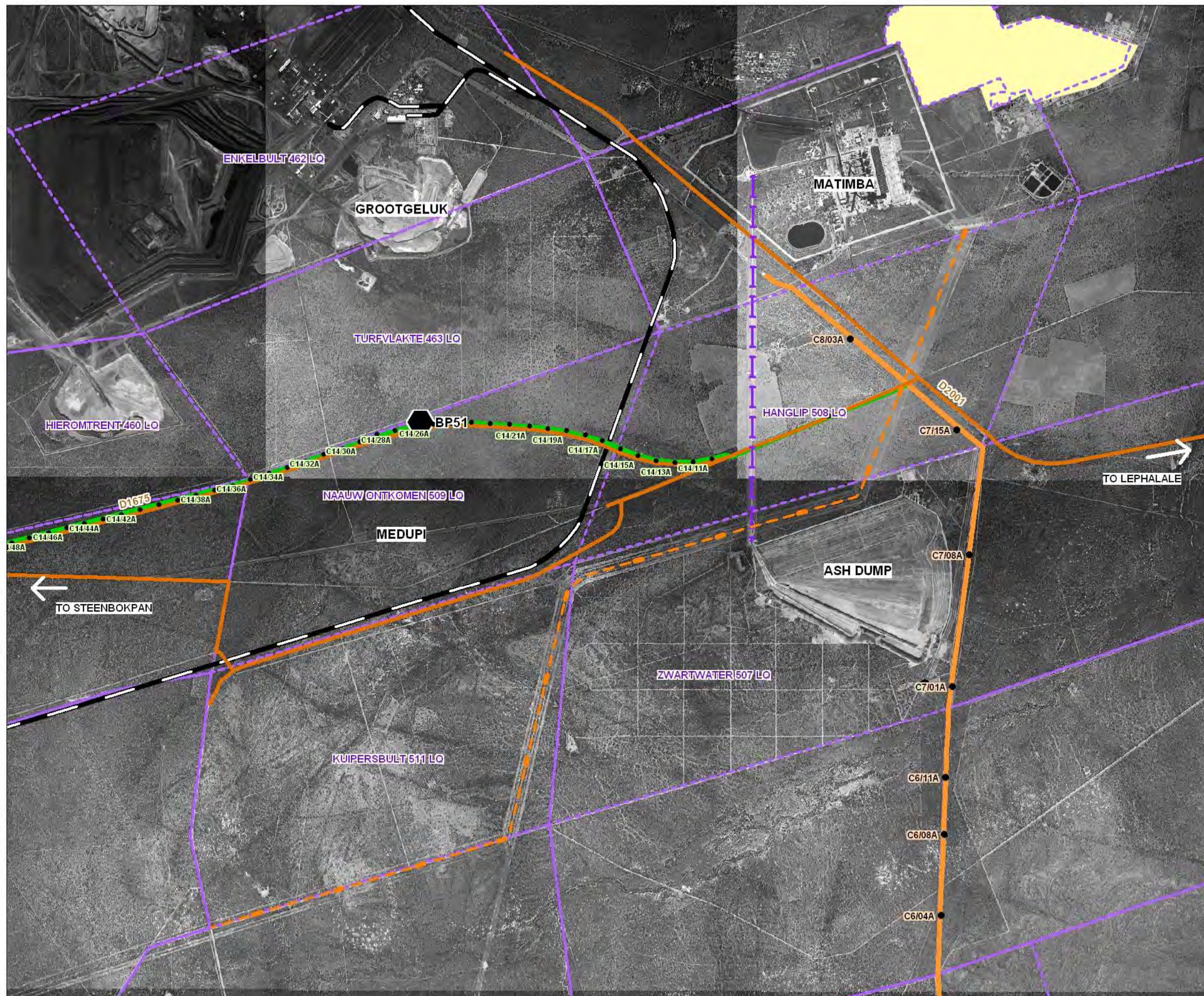
PREPARED FOR:

TCTA
A NEW WORLD FOR WATER

PROJECT:
Mokolo and Crocodile Water
Augmentation Project (MCWAP)

DRAWING TITLE:
Borrow Pit 46
Test Pit Positions

DRAWING NR:
46_3



LEGEND:

- Centre Line Test Pits
- Borrow Pit
- Conveyor
- Surfaced Roads
- Phase 1: Pipeline Route
- Phase 3: Pipeline
- Railway Network
- Parent Farm

BORROW PIT DESCRIPTION:

Description	Borrowpit_51
Location of Borrow pit	S2621439 Y=467365
Shortest distance relative to pipeline	~10 m
Distance to access road	Just off D1675 Medupi Bypass
Farm name	Haasa Ontkamen 509 LO
Farm number	Ph 509
Owner name	Allen Boman (Eskom Matimba)
Contact details: Mobile no	0832265559
Contact details: Tel no	0147682294
Estimated quantity (m³)	100000
Suitability of the material	Sand

DATUM: WGS 84
PROJECTION: LO 27

0.8 0 0.8 1.6
Kilometers
Scale: 1:40,000

PREPARED BY:

MOKOLO CROCODILE 
Consultants

GEOSTRADA 
Engineering & Construction Services

PREPARED FOR:

TCTA 
A NEW WORLD FOR WATER

PROJECT:

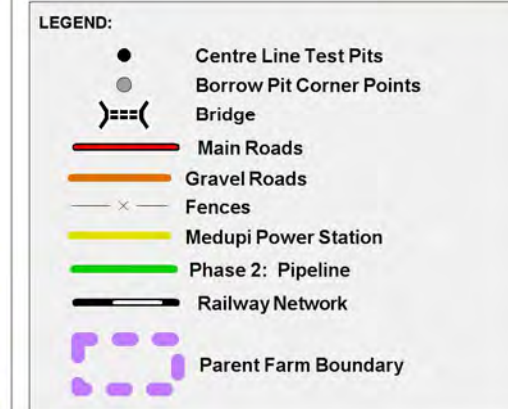
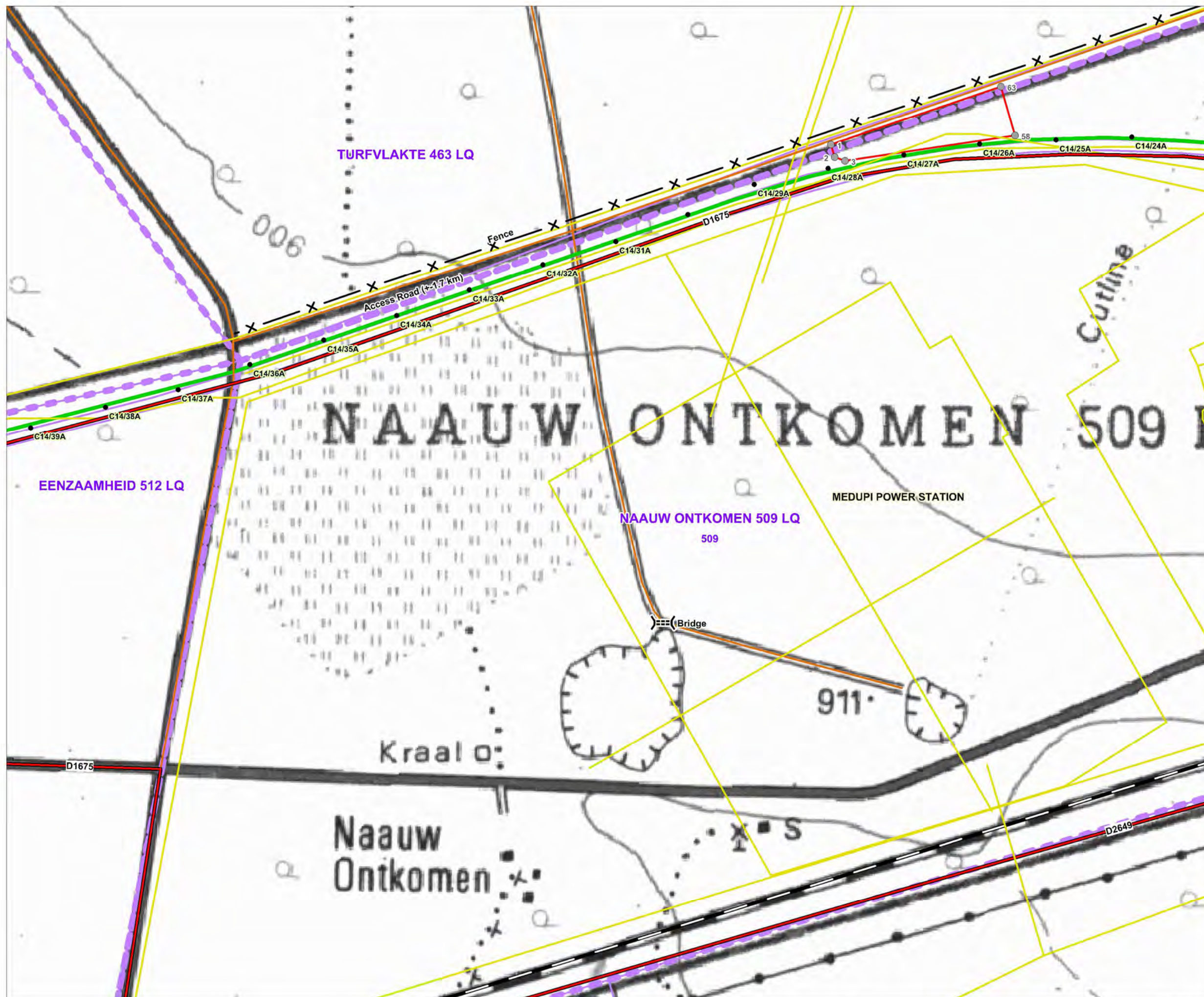
Mokolo and Crocodile Water Augmentation Project (MCWAP)

DRAWING TITLE:

Borrow Pit 51 Locality Plan

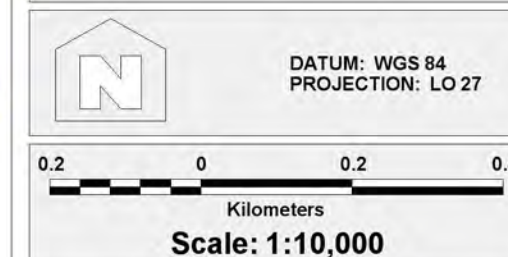
DRAWING NR:

51_1



BORROW PIT DESCRIPTION:

Description	Borrowpit_51
Location of Borrow pit	X2621430 Y-957365
Shortest distance relative to pipeline	+/-10 m
Distance to access road	+/-1.7 km
Farm name	Naauw Ontkomen 509 LQ
Farm number	Ptn 509
Owner name	Allen Bosman (Eskom Matimba)
Contact details: Mobile no	0832269589
Contact details: Tel no	0147662204
Estimated quantity (m³)	100000
Suitability of the material	Sand



PREPARED BY:

MOKOLO CROCODILE Consultants

GEOSTRADA

PREPARED FOR:

TCTA

PROJECT:

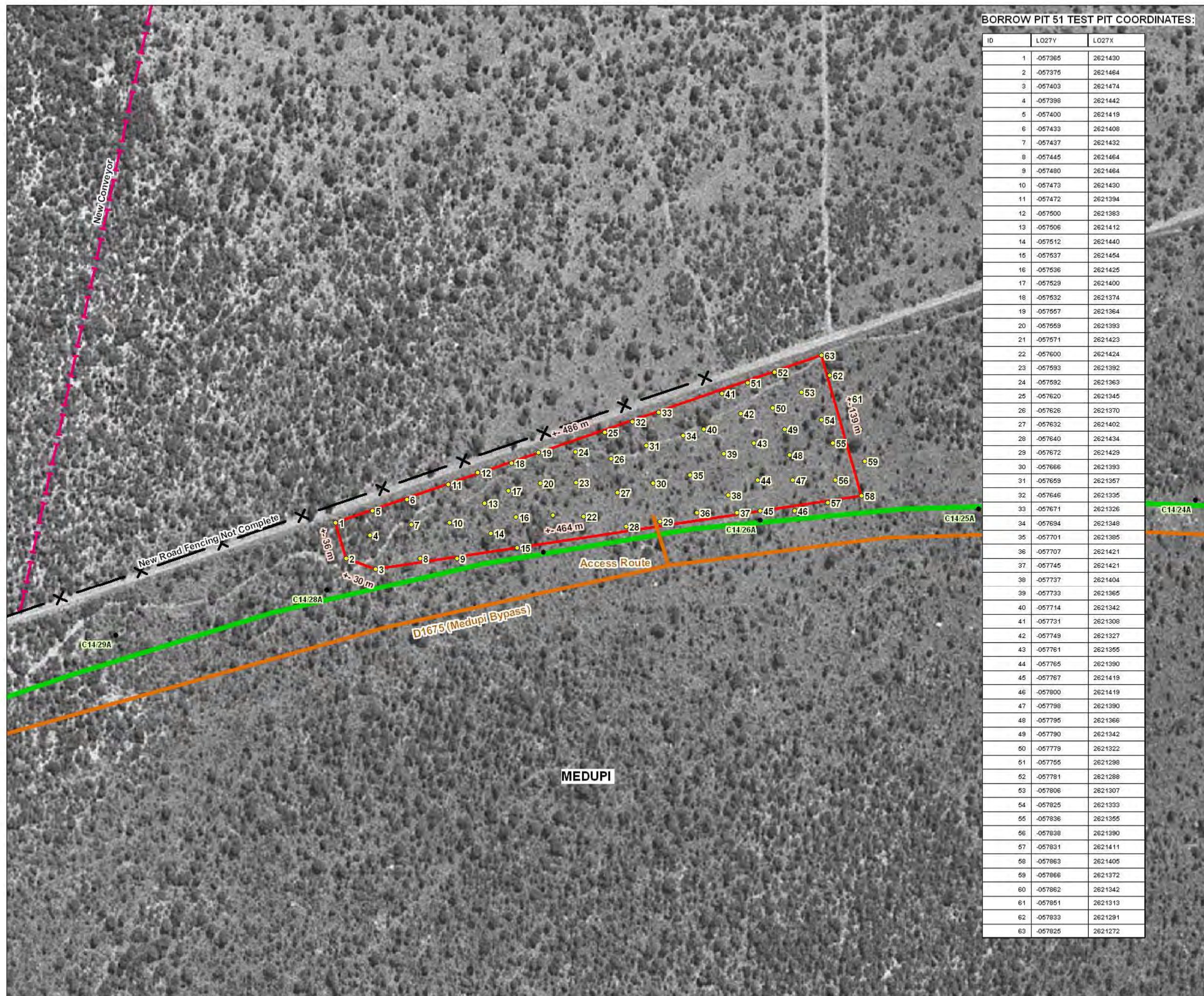
Mokolo and Crocodile Water Augmentation Project (MCWAP)

DRAWING TITLE:

Borrow Pit 51 Layout Plan

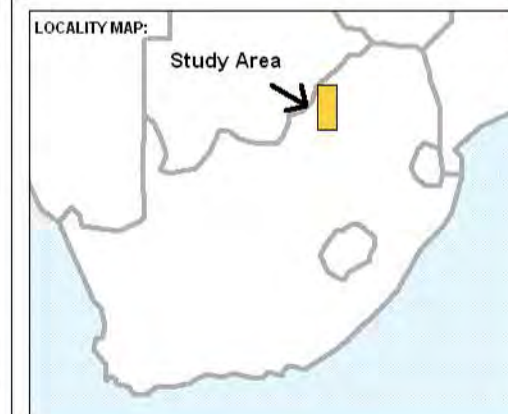
DRAWING NR:

51_2



BORROW PIT 51 TEST PIT COORDINATES:

ID	LO27Y	LO27X
1	-057365	2621430
2	-057375	2621464
3	-057403	2621474
4	-057398	2621442
5	-057400	2621419
6	-057433	2621408
7	-057437	2621432
8	-057445	2621464
9	-057480	2621484
10	-057473	2621430
11	-057472	2621394
12	-057500	2621383
13	-057506	2621412
14	-057512	2621440
15	-057537	2621454
16	-057536	2621425
17	-057529	2621400
18	-057532	2621374
19	-057557	2621364
20	-057559	2621393
21	-057571	2621423
22	-057600	2621424
23	-057593	2621392
24	-057592	2621363
25	-057620	2621345
26	-057626	2621370
27	-057632	2621402
28	-057640	2621434
29	-057672	2621429
30	-057666	2621393
31	-057659	2621367
32	-057646	2621335
33	-057671	2621326
34	-057694	2621348
35	-057701	2621385
36	-057707	2621421
37	-057745	2621421
38	-057737	2621404
39	-057733	2621365
40	-057714	2621342
41	-057731	2621308
42	-057749	2621327
43	-057761	2621355
44	-057765	2621390
45	-057767	2621419
46	-057800	2621419
47	-057798	2621390
48	-057795	2621366
49	-057790	2621342
50	-057779	2621322
51	-057755	2621298
52	-057781	2621288
53	-057806	2621307
54	-057825	2621333
55	-057836	2621355
56	-057838	2621390
57	-057831	2621411
58	-057863	2621405
59	-057866	2621372
60	-057862	2621342
61	-057851	2621313
62	-057833	2621291
63	-057825	2621272

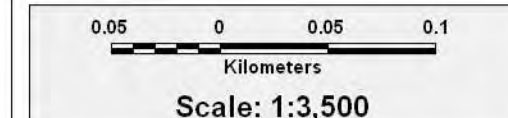


LEGEND:

- Centre Line Test Pits
- Test Pits
- Borrow Pit Border
- Gravel Road
- Fences
- Railway Line
- Phase 2: Pipeline
- New Conveyor

BORROW PIT DESCRIPTION:

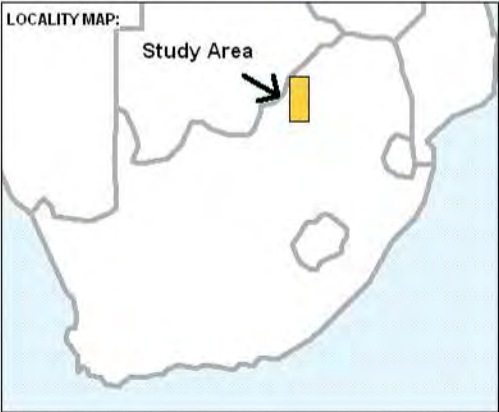
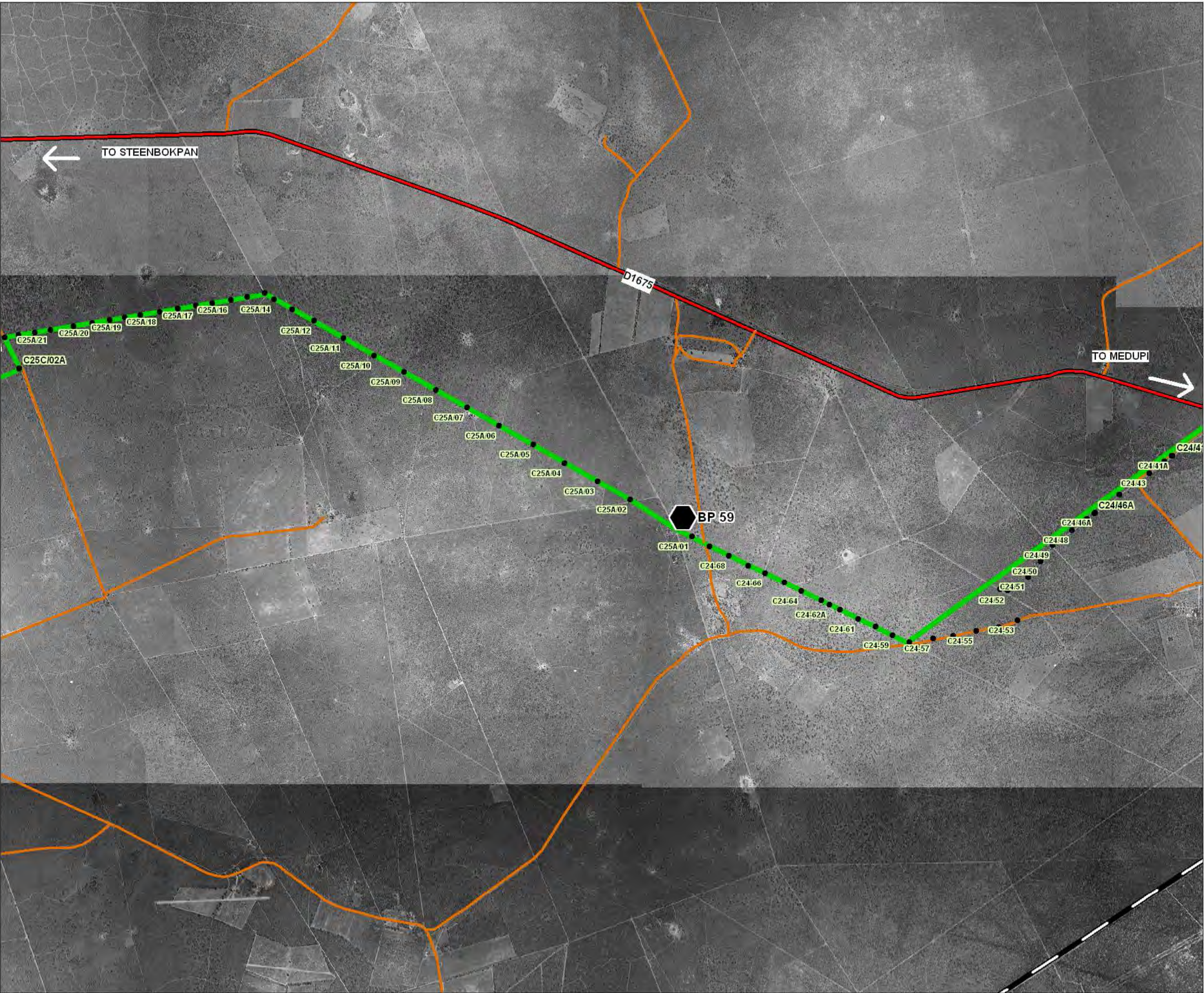
Description	Borrowpit_51
Location of Borrowpit	X2621430 Y-057365
Shortest distance relative to pipeline	±10 m
Distance to access road	Just off D1675 Medupi Bypass
Farm name	Haase Orthomem 505 LG
Farm number	Ph 505
Owner name	Allen Boman (Eskom Matimba)
Contact details: Mobile no	0832265555
Contact details: Tel no	0147602204
Estimated quantity (m³)	100000
Suitability of the material	Sand



PROJECT: Mokolo and Crocodile Water Augmentation Project (MCWAP)

DRAWING TITLE: Borrow Pit 51 Test Pit Positions

DRAWING NR: 51_3



LEGEND:

- Centre Line Test Pits
- Borrow Pit
- Main Roads
- Gravel Roads
- Phase 2: Pipeline
- Railway Network

BORROW PIT DESCRIPTION:

Description	Borrowpit_59
Location of Borrow pit	X2624690 Y-041334
Shortest distance relative to pipeline	+40 m
Distance to access road	+ 3.3 km
Farm name	Pontes Estates 712 LQ
Farm number	Portion: 0
Owner name	Assis Pontes
Contact details: Mobile no	0833253716
Estimated quantity (m ³)	+ 100000
Suitability of the material	Sand

DATUM: WGS 84
PROJECTION: LO 27

0.8 0 0.8 1.6
Kilometers
Scale: 1:40,000

PREPARED BY:

MOKOLO CROCODILE CONSULTANTS
GEOSTRADA

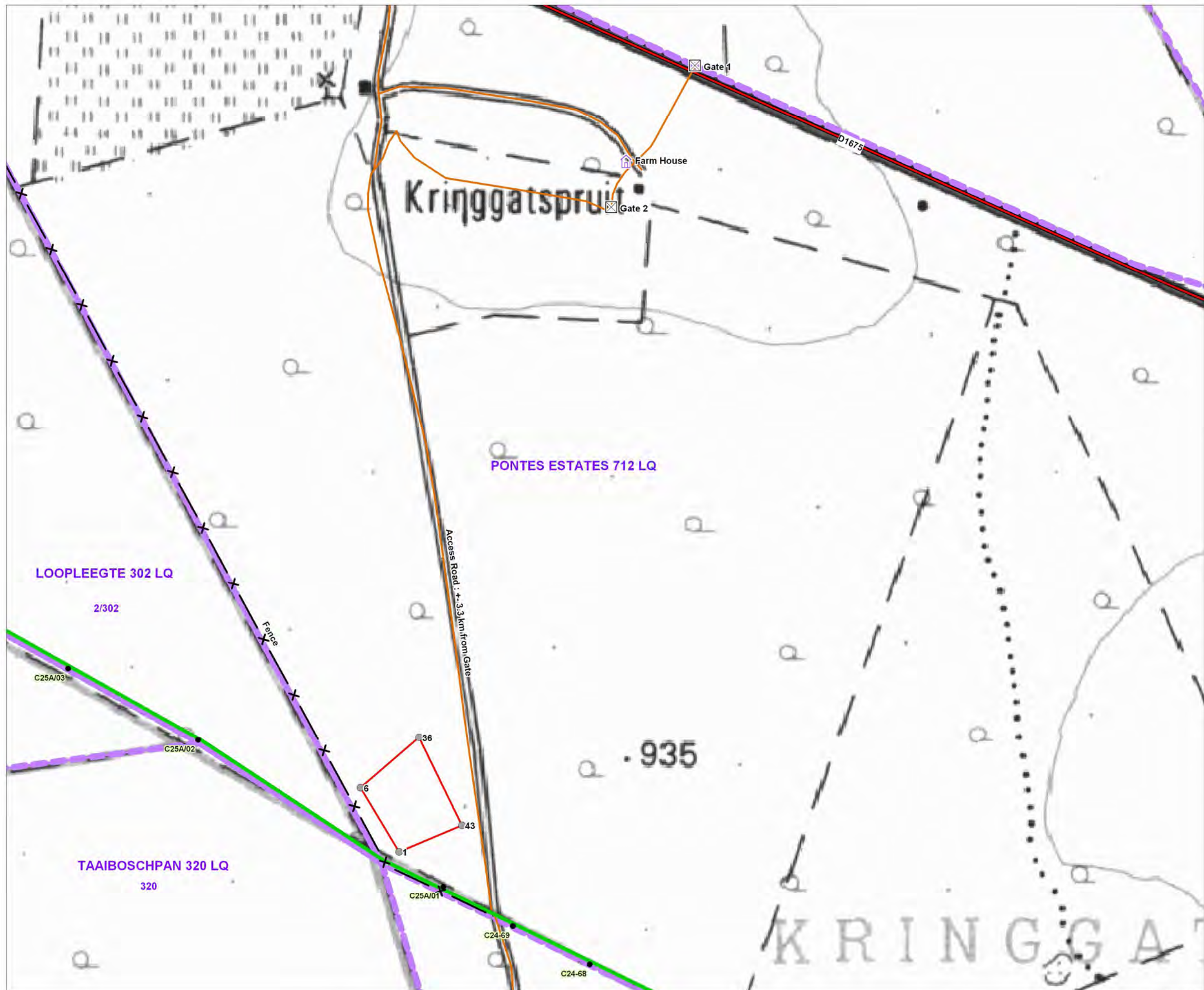
PREPARED FOR:

TCTA
A NEW WORLD FOR WATER

PROJECT:
Mokolo and Crocodile Water Augmentation Project (MCWAP)

DRAWING TITLE:
Borrow Pit 59 Locality Plan

DRAWING NR:
59_1



LEGEND:

- Centre Line Test Pits
- Borrow Pit Corner Points
- ⊠ Gates
- Main Roads
- Gravel Roads
- Fences
- Phase 2: Pipeline
- Railway Network
- Parent Farm Boundary

BORROW PIT DESCRIPTION:

Description	Borrowpit_59
Location of Borrow pit	X2624690 Y-041334
Shortest distance relative to pipeline	+~40 m
Distance to access road	+~ 3.3 km
Farm name	Pontes Estates 712 LQ
Farm number	Portion: 0
Owner name	Assis Pontes
Contact details: Mobile no	0833253716
Estimated quantity (m³)	+~ 100000
Suitability of the material	Sand

DATUM: WGS 84
PROJECTION: LO 27

0.2 0 0.2 0.4
Kilometers
Scale: 1:10,000

PREPARED BY:

MOKOLO CROCODILE Consultants

GEOSTRADA

PREPARED FOR:

TCTA

PROJECT:

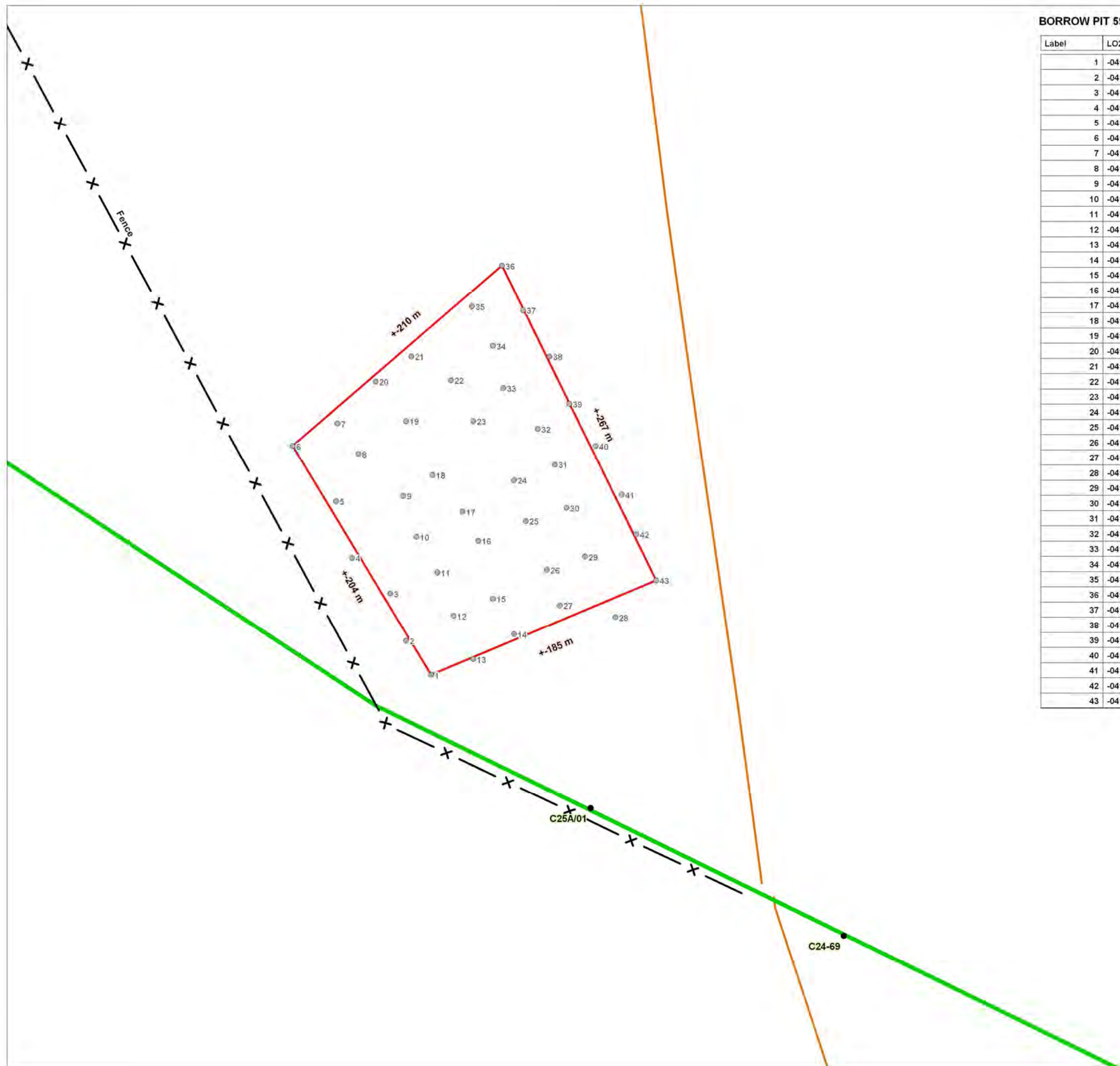
Mokolo and Crocodile Water Augmentation Project (MCWAP)

DRAWING TITLE:

Borrow Pit 59 Layout Plan

DRAWING NR:

59_2



BORROW PIT 59 TEST PIT COORDINATES:

Label	LO27_Y	LO27_X
1	-041334	2624690
2	-041315	2624664
3	-041303	2624628
4	-041274	2624601
5	-041262	2624558
6	-041229	2624516
7	-041263	2624499
8	-041279	2624522
9	-041313	2624554
10	-041323	2624585
11	-041339	2624612
12	-041351	2624645
13	-041366	2624678
14	-041397	2624659
15	-041381	2624632
16	-041370	2624588
17	-041358	2624566
18	-041335	2624538
19	-041315	2624497
20	-041292	2624467
21	-041319	2624448
22	-041349	2624466
23	-041366	2624497
24	-041397	2624542
25	-041406	2624573
26	-041422	2624610
27	-041432	2624637
28	-041474	2624646
29	-041451	2624600
30	-041437	2624563
31	-041428	2624530
32	-041415	2624503
33	-041389	2624472
34	-041381	2624440
35	-041365	2624410
36	-041388	2624379
37	-041404	2624413
38	-041424	2624448
39	-041439	2624484
40	-041459	2624516
41	-041479	2624553
42	-041490	2624583
43	-041505	2624618



LEGEND:

- Centre Line Test Pits
- ⊙ Test Pits
- Borrow Pit Boundary
- Gravel Road
- Fences
- Railway Line
- Phase 2: Pipeline

BORROW PIT DESCRIPTION:	
Description	Borrowpit_59
Location of Borrow pit	X2624690 Y-041334
Shortest distance relative to pipeline	+40 m
Distance to access road	+ 3.3 km
Farm name	Pontes Estates 712 LQ
Farm number	Portion: 0
Owner name	Assis Pontes
Contact details: Mobile no	0833253716
Estimated quantity (m³)	+ 100000
Suitability of the material	Sand

DATUM: WGS 84
PROJECTION: LO 27

0.05 0 0.05 0.1
Kilometers
Scale: 1:3,000

PREPARED BY:

MOKOLO CROCODILE Consultants

GEOSTRADA

PREPARED FOR:

TCTA

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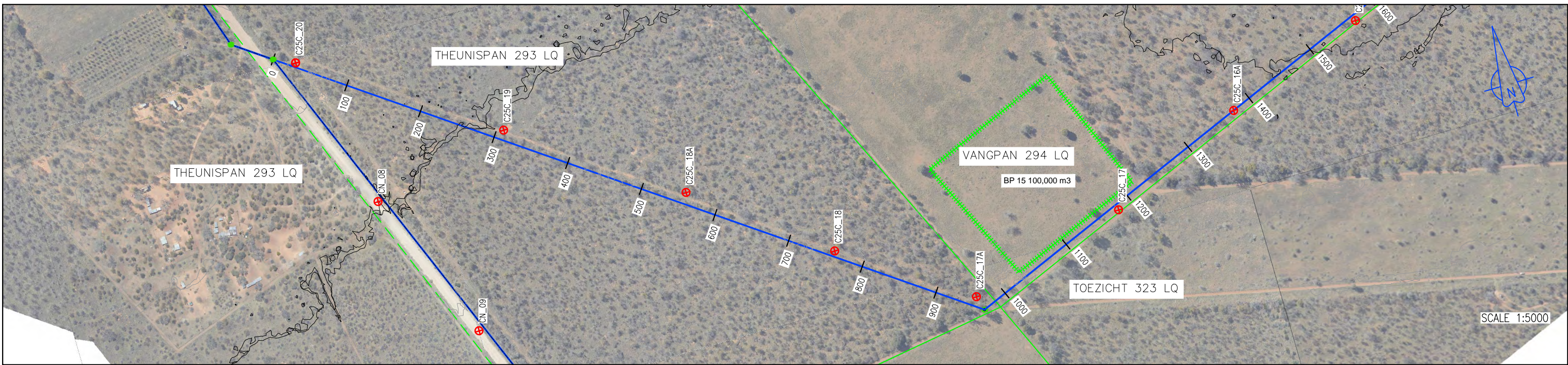
PROJECT:
Mokolo and Crocodile Water Augmentation Project (MCWAP)

DRAWING TITLE:
Borrow Pit 59 Test Pit Positions

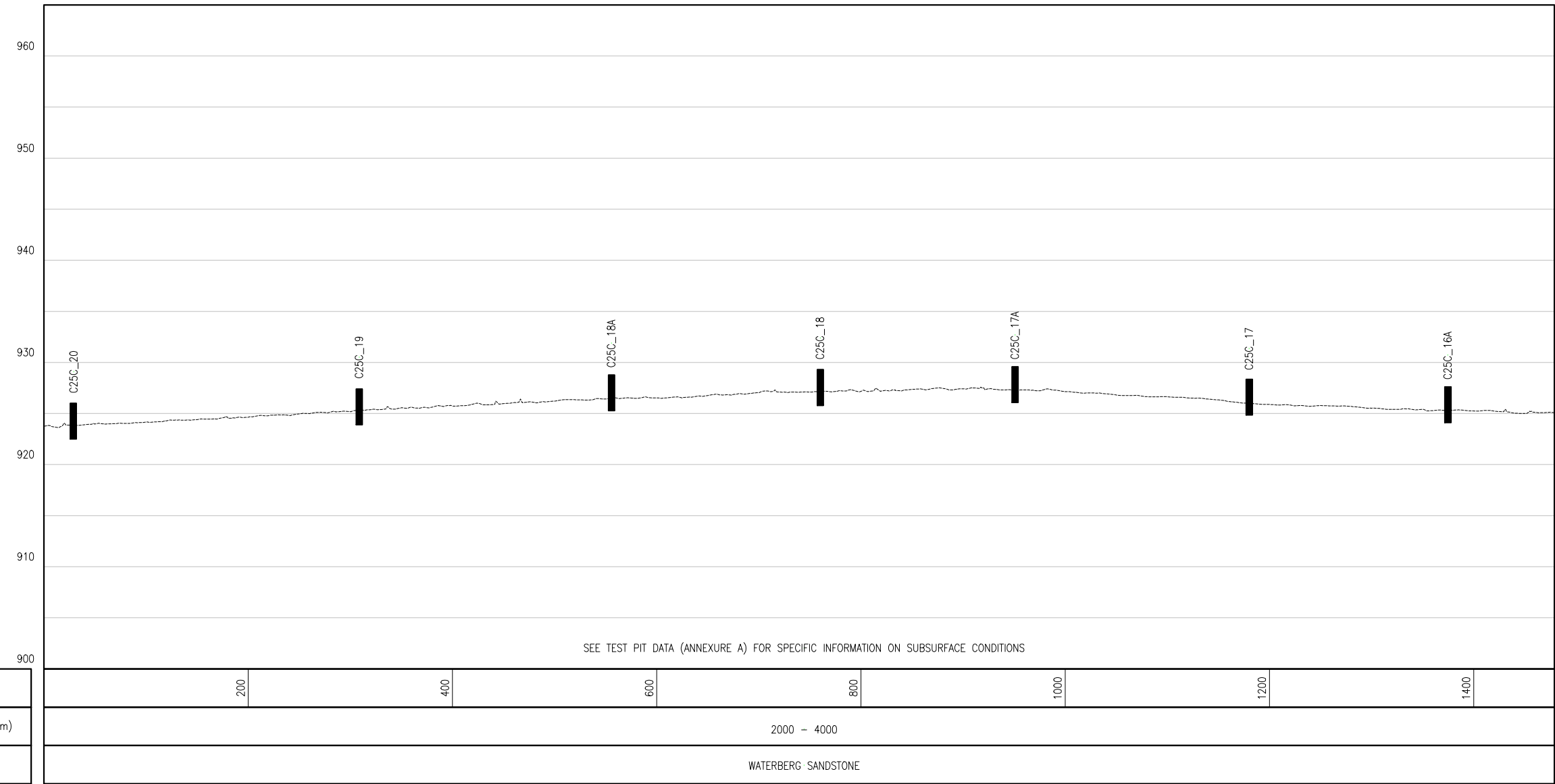
DRAWING NR:
59_3

ANNEXURE H

GEOTECHNICAL MAPS







SCALE 1:5000

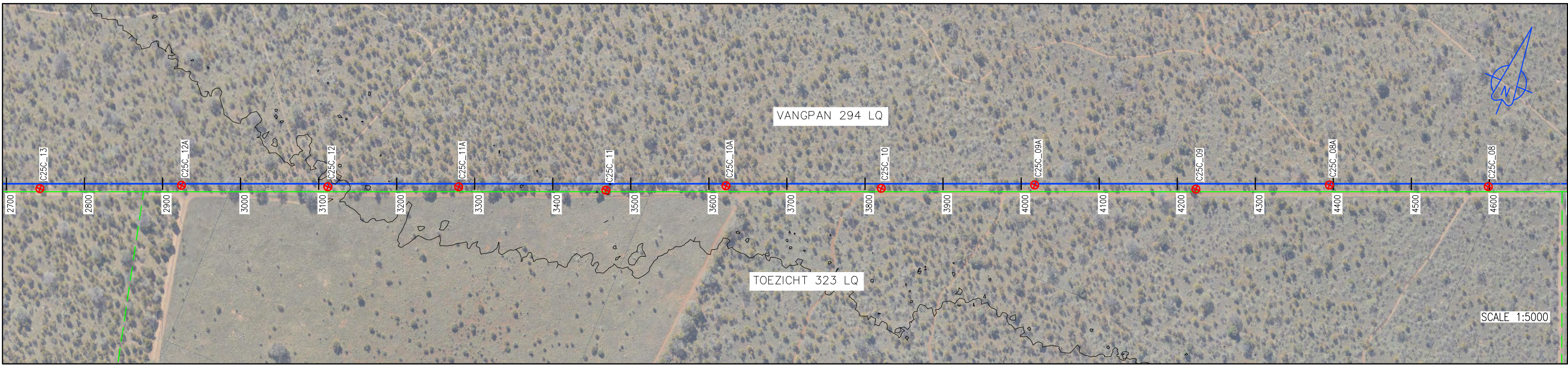


LEGEND:

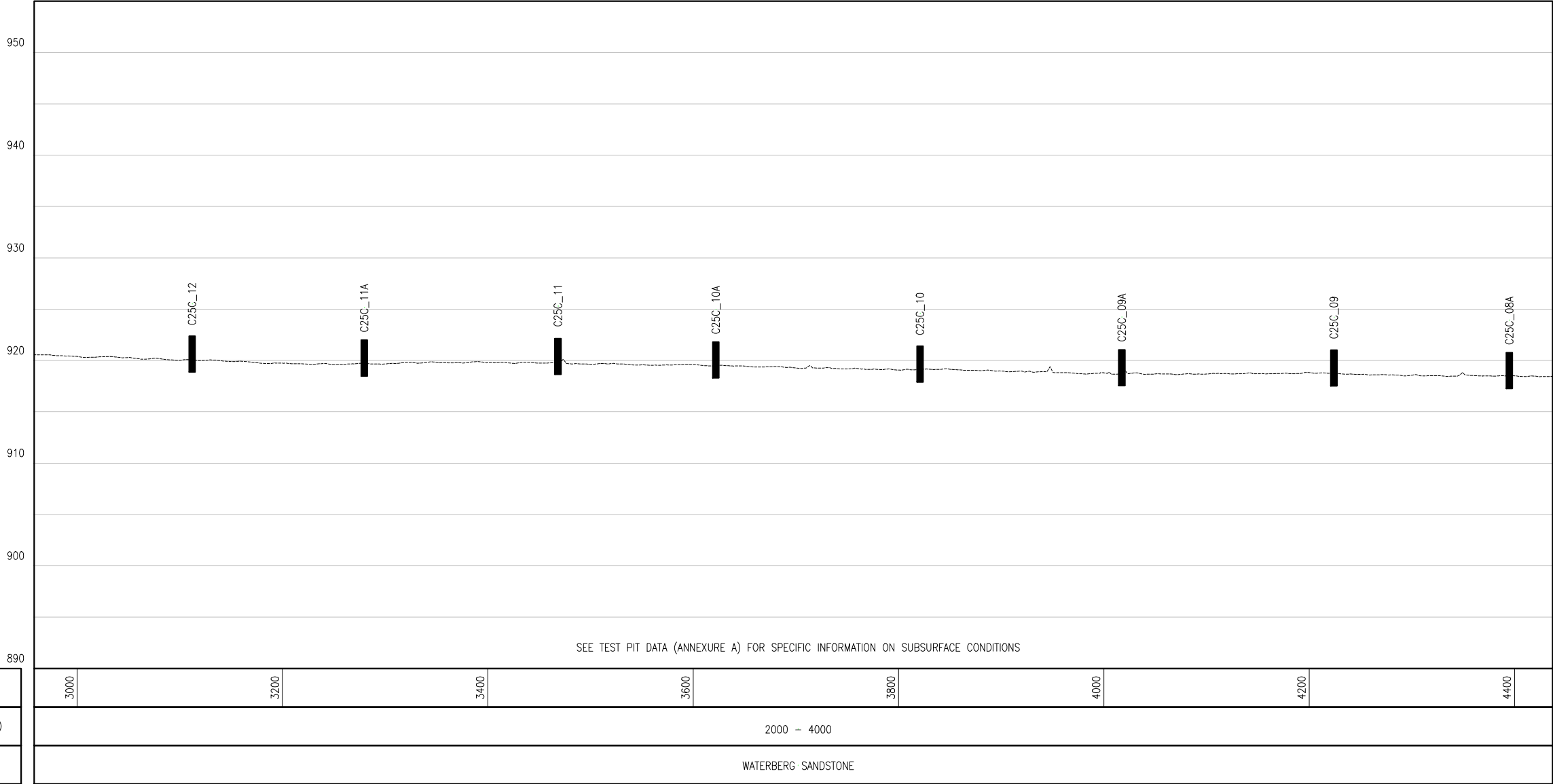
- CHAINAGE MARKER (PLAN ONLY)
- POINT OF INTERSECTION (PI)
- TEST PIT
- BOREHOLE
- PIPELINE
- OVERHEAD POWERLINE
- FARM BOUNDARY
- FARM PORTION BOUNDARY
- CROSSING - SURFACED ROAD
- CROSSING - GRAVEL ROAD
- CROSSING - PRIVATE DIRT ROAD
- CROSSING - POWERLINE
- AREA OF INTERMITTENT OUTCROP
- AREA OF OUTCROP
- AREA OF IMPEDED DRAINAGE
- POTENTIAL BORROW PIT
- EXISTING BORROW PIT / SPOIL SITE

CHAINAGE (m)
REFUSAL DEPTH RANGE (mm)
GEOLOGY

REFERENCE DRAWINGS		REVISIONS				DESIGNED:		PROJECT ENGINEER:	P LE ROUX		MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)			
DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:			GEOTECHNICAL PROFILE STAGE 4: STEENBOKPAN TO MATIMBA			
		A	24/02/11	FOR INFORMATION		CHECKED:	J MULDER				PLAN & LONG SECTION			
						CHIEF DESIGNER:	E SERFONTEIN	SCALE:	AS SHOWN					
						SCALE: 1:500								
						SCALE: 1:5000								
										A3	DWAF DRG. No.	DRAWING NUMBER	2E - G7 - 064	REV N A



SCALE 1:5000



SCALE HOR 1:5000
VERT 1:500

CHAINAGE (m)
REFUSAL DEPTH RANGE (mm)
GEOLOGY

LEGEND:

CHAINAGE MARKER (PLAN ONLY)

POINT OF INTERSECTION (PI)

TEST PIT

BOREHOLE

PIPELINE

OVERHEAD POWERLINE

FARM BOUNDARY

FARM PORTION BOUNDARY

CROSSING – SURFACED ROAD

CROSSING – GRAVEL ROAD

CROSSING – PRIVATE DIRT ROAD

CROSSING – POWERLINE


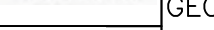


AREA OF INTERMITTENT OUTCROP

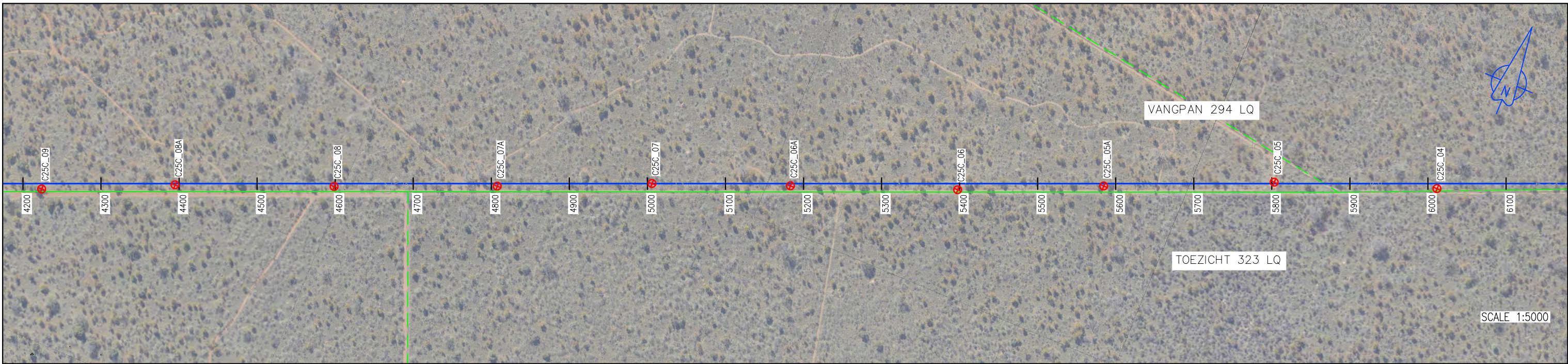
AREA OF OUTCROP

AREA OF IMPEDED DRAINAGE

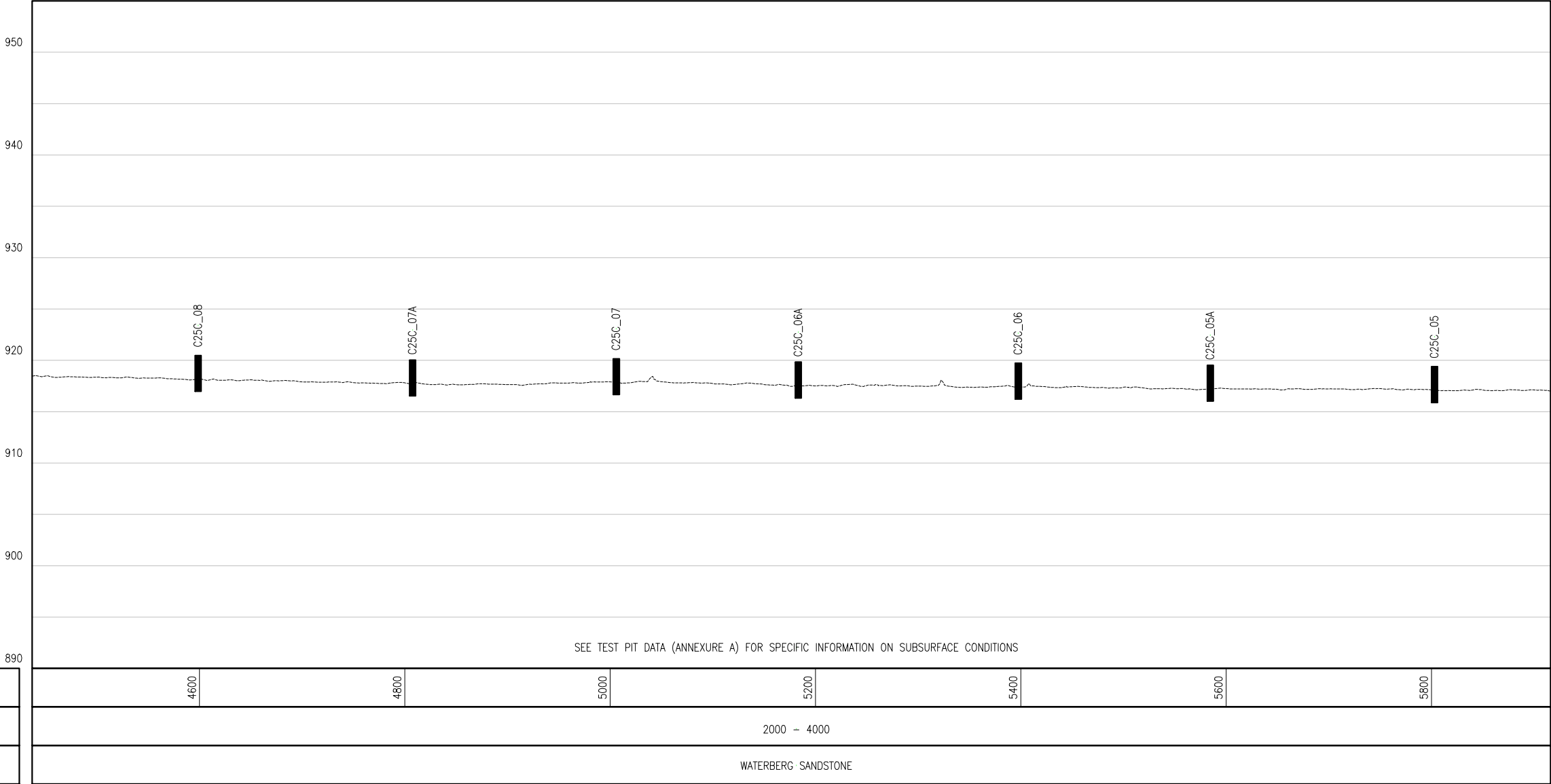
POTENTIAL BORROW PIT

EXISTING BORROW PIT / SPOIL SITE

REFERENCE DRAWINGS		REVISIONS				DESIGNED:		PROJECT ENGINEER:	P LE ROUX		MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)				
DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:			GEOTECHNICAL PROFILE STAGE 4: STEENBOKPAN TO MATIMBA				
		A	24/02/11	FOR INFORMATION		CHECKED:	J MULDER				PLAN & LONG SECTION				
						CHIEF DESIGNER:	E SERFONTEIN	SCALE:	AS SHOWN						
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											A3	DWAF DRG. No.	DRAWING NUMBER	2E – G7 – 066	REV N A



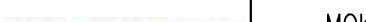

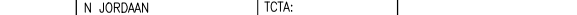
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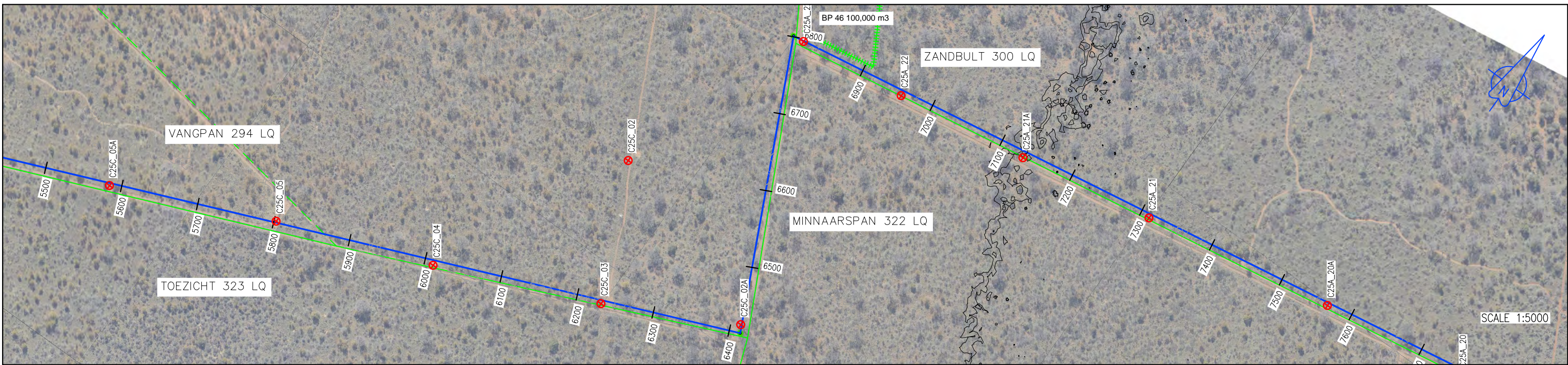


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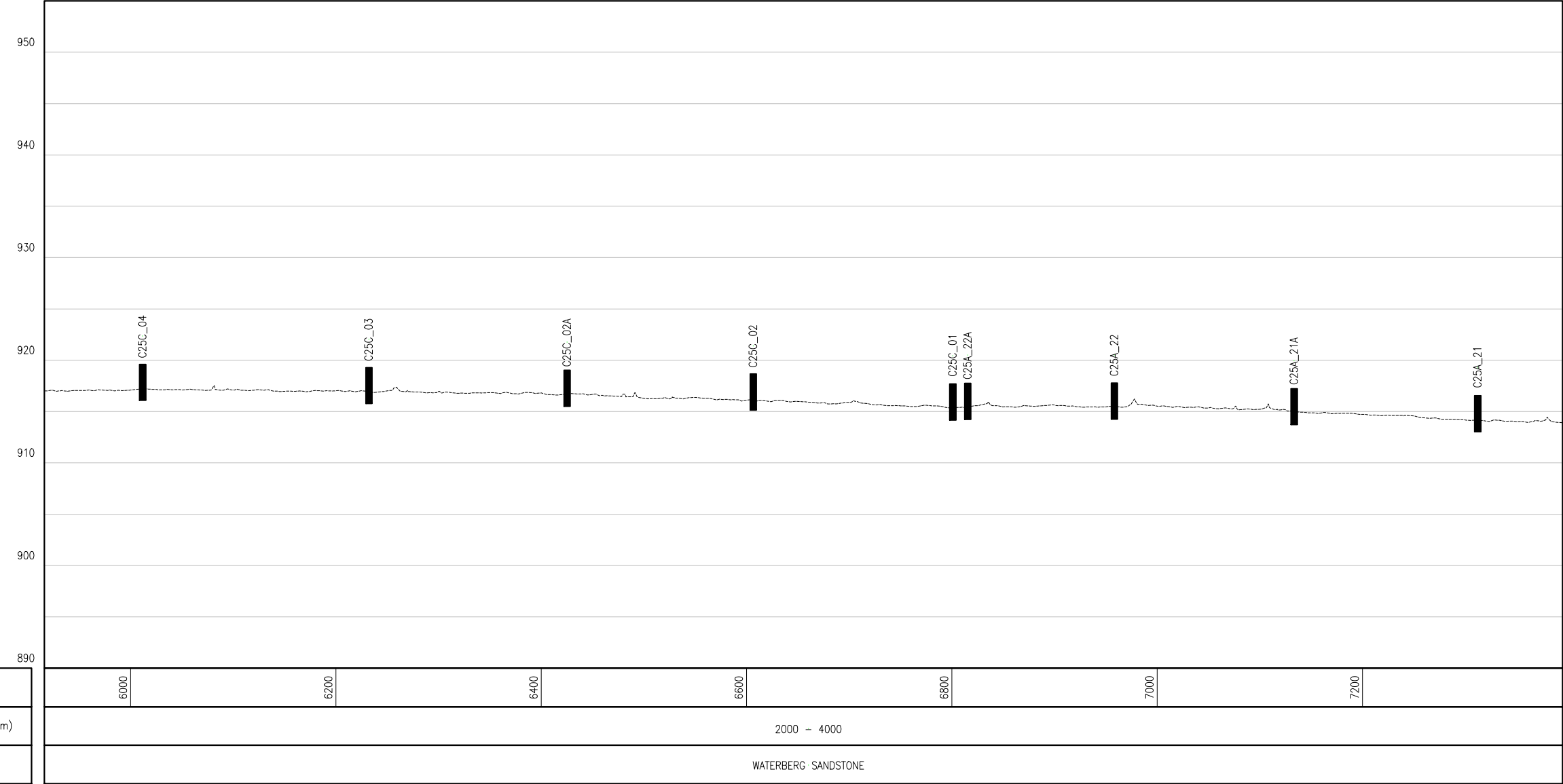
CHAINAGE (m)
REFUSAL DEPTH RANGE (mm)
GEOLOGY

LEGEND:	
	CHAINAGE MARKER (PLAN ONLY)
	POINT OF INTERSECTION (PI)
	TEST PIT
	BOREHOLE
	PIPELINE
	OVERHEAD POWERLINE
	FARM BOUNDARY
	FARM PORTION BOUNDARY
	CROSSING - SURFACED ROAD
	CROSSING - GRAVEL ROAD
	CROSSING - PRIVATE DIRT ROAD
	CROSSING - POWERLINE
	AREA OF INTERMITTENT OUTCROP
	AREA OF OUTCROP
	AREA OF IMPEDED DRAINAGE
	POTENTIAL BORROW PIT
	EXISTING BORROW PIT / SPOIL SITE

REFERENCE DRAWINGS		REVISIONS				DESIGNED:		PROJECT ENGINEER:	P LE ROUX		MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)						
DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:			GEOTECHNICAL PROFILE STAGE 4: STEENBOKPAN TO MATIMBA						
		A	24/02/11	FOR INFORMATION		CHECKED:	J MULDER				PLAN & LONG SECTION						
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SCALE 1:5000

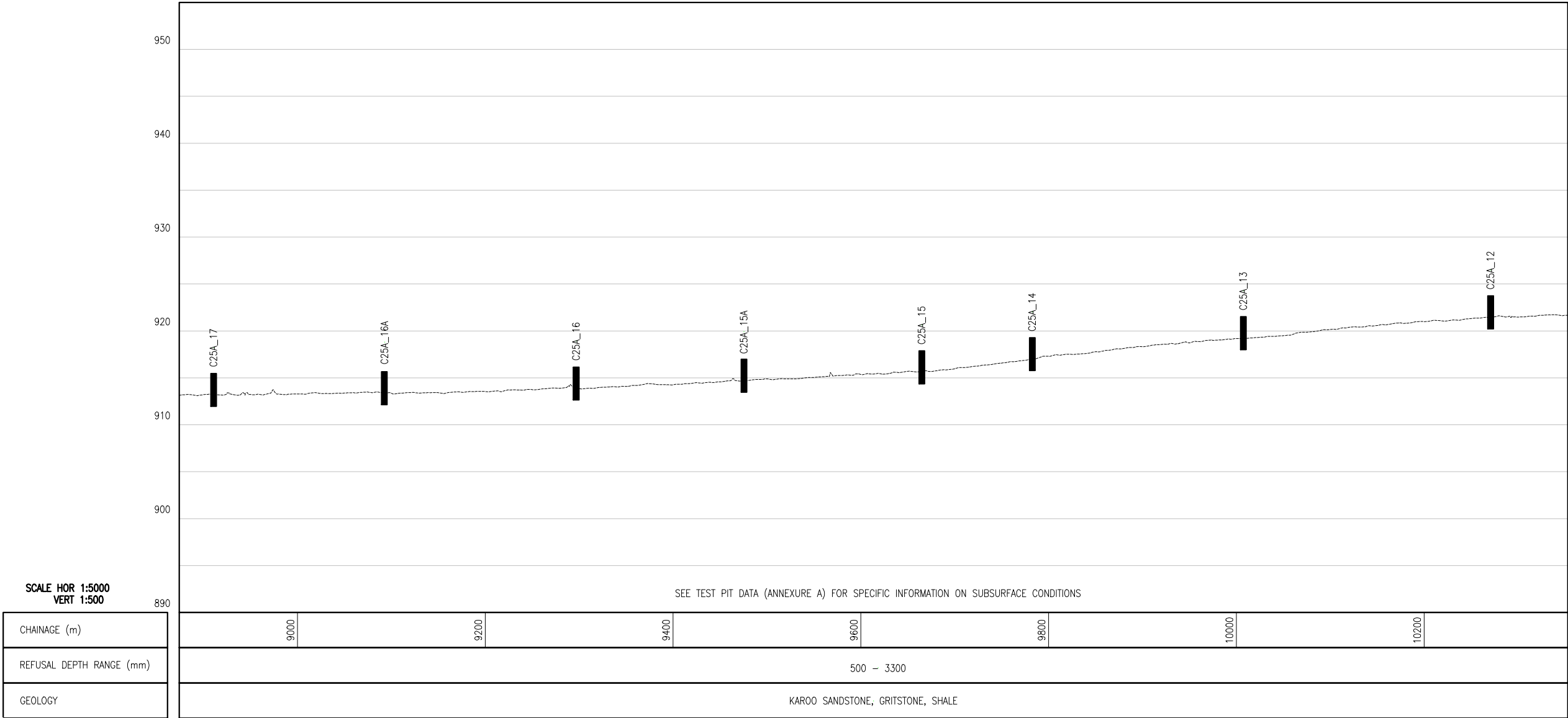
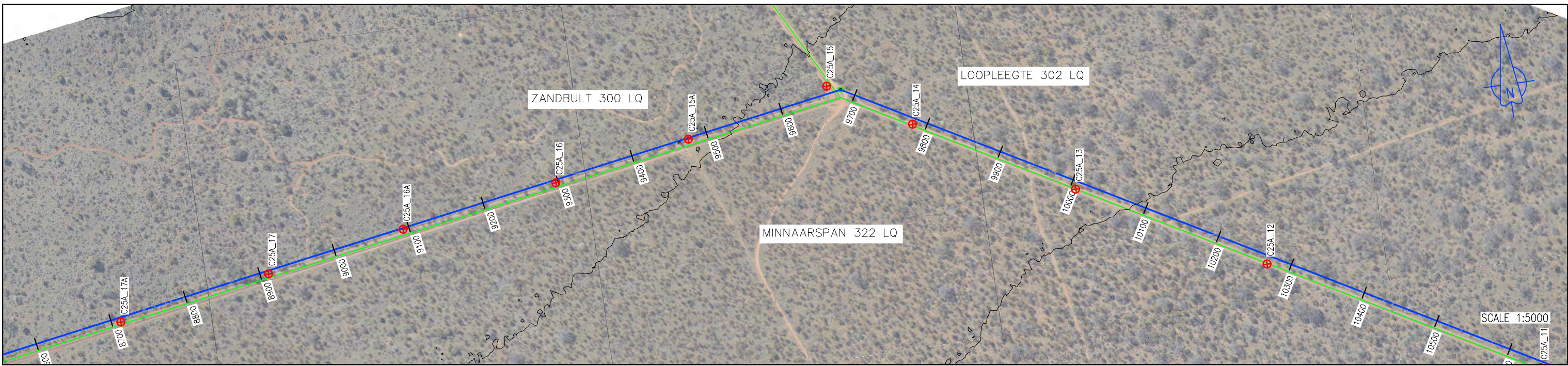


SCALE HOR 1:5000
VERT 1:500

CHAINAGE (m)
REFUSAL DEPTH RANGE (mm)
GEOLOGY





LEGEND:	
	CHAINAGE MARKER (PLAN ONLY)
	POINT OF INTERSECTION (PI)
	TEST PIT
	BOREHOLE
	PIPELINE
	OVERHEAD POWERLINE
	FARM BOUNDARY
	FARM PORTION BOUNDARY
	CROSSING - SURFACED ROAD
	CROSSING - GRAVEL ROAD
	CROSSING - PRIVATE DIRT ROAD
	CROSSING - POWERLINE
	AREA OF INTERMITTENT OUTCROP
	AREA OF OUTCROP
	AREA OF IMPEDED DRAINAGE
	POTENTIAL BORROW PIT
	EXISTING BORROW PIT / SPOIL SITE

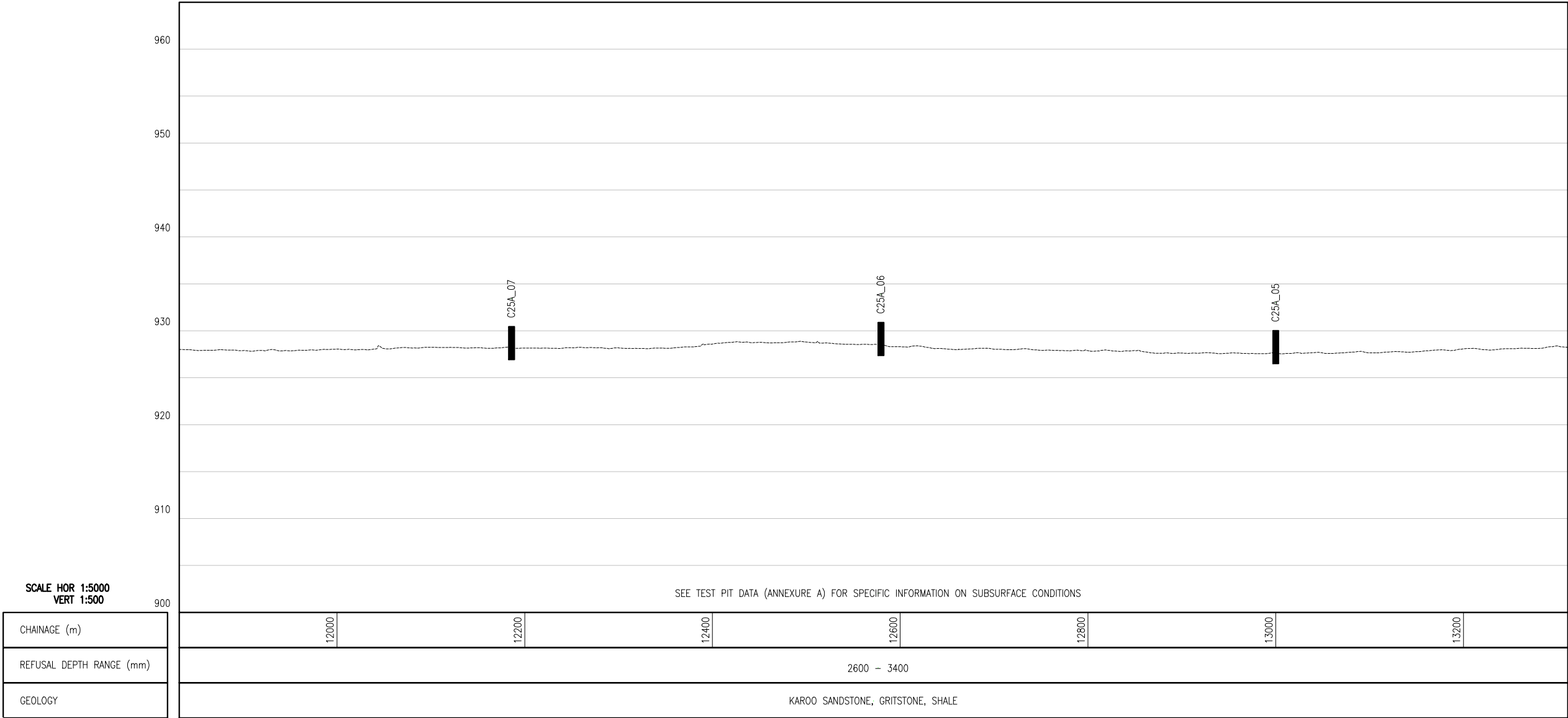
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DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:			GEOTECHNICAL PROFILE STAGE 4: STEENBOKPAN TO MATIMBA						
		A	24/02/11	FOR INFORMATION		CHECKED:	J MULDER				PLAN & LONG SECTION						
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										A3	DWAF DRG. No.		DRAWING NUMBER		2E - G7 - 068	REV N A	



LEGEND:

- CHAINAGE MARKER (PLAN ONLY)
- POINT OF INTERSECTION (PI)
- TEST PIT
- BOREHOLE
- PIPELINE
- OVERHEAD POWERLINE
- FARM BOUNDARY
- FARM PORTION BOUNDARY
- CROSSING – SURFACED ROAD
- CROSSING – GRAVEL ROAD
- CROSSING – PRIVATE DIRT ROAD
- CROSSING – POWERLINE
- AREA OF INTERMITTENT OUTCROP
- AREA OF OUTCROP
- AREA OF IMPEDED DRAINAGE
- POTENTIAL BORROW PIT
- EXISTING BORROW PIT / SPOIL SITE

REFERENCE DRAWINGS		REVISIONS				DESIGNED:		PROJECT ENGINEER:	P LE ROUX		MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)				
DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:			GEOTECHNICAL PROFILE STAGE 4: STEENBOKPAN TO MATIMBA				
		A	24/02/11	FOR INFORMATION		CHECKED:	J MULDER				PLAN & LONG SECTION				
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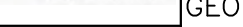


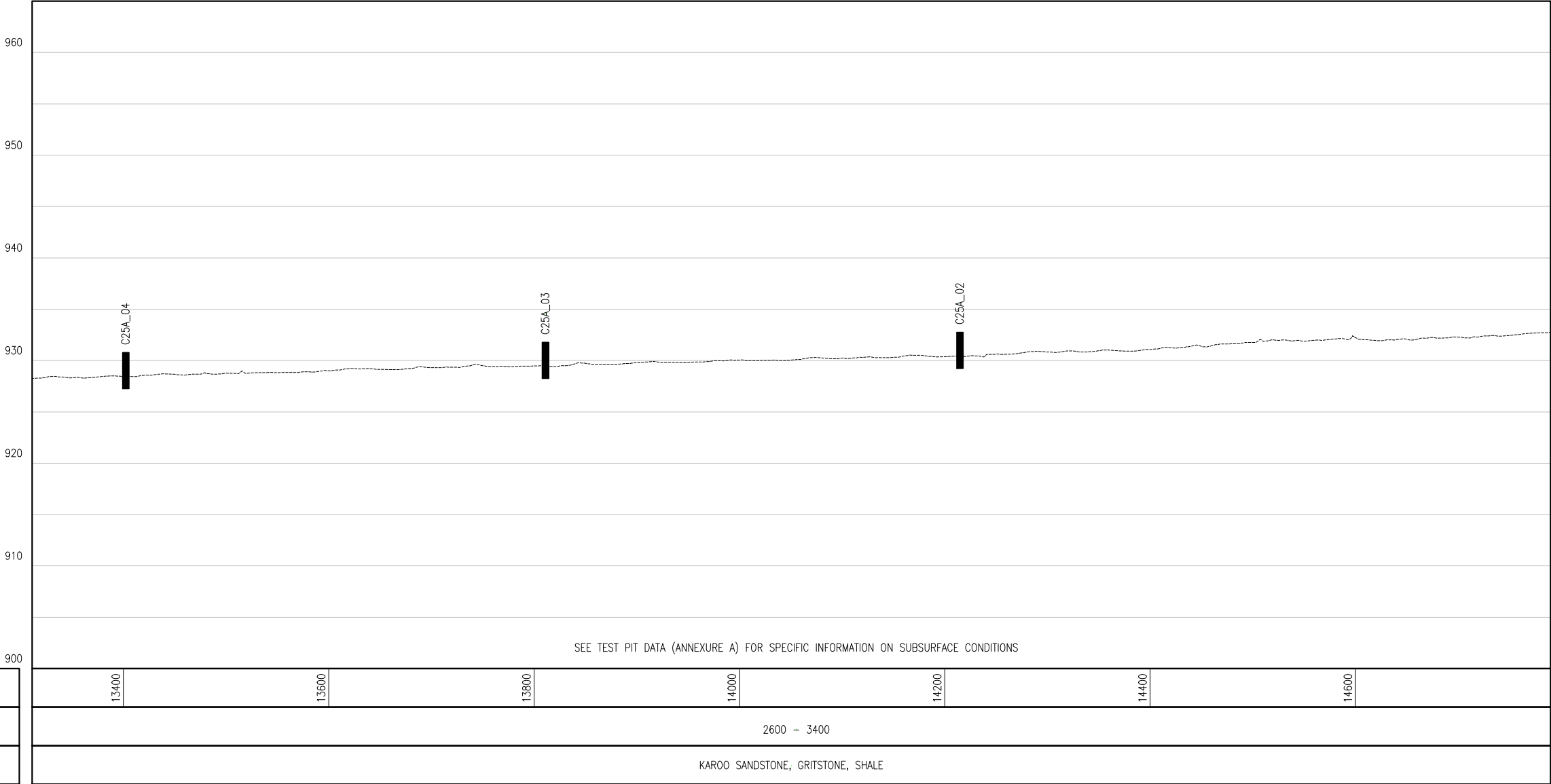
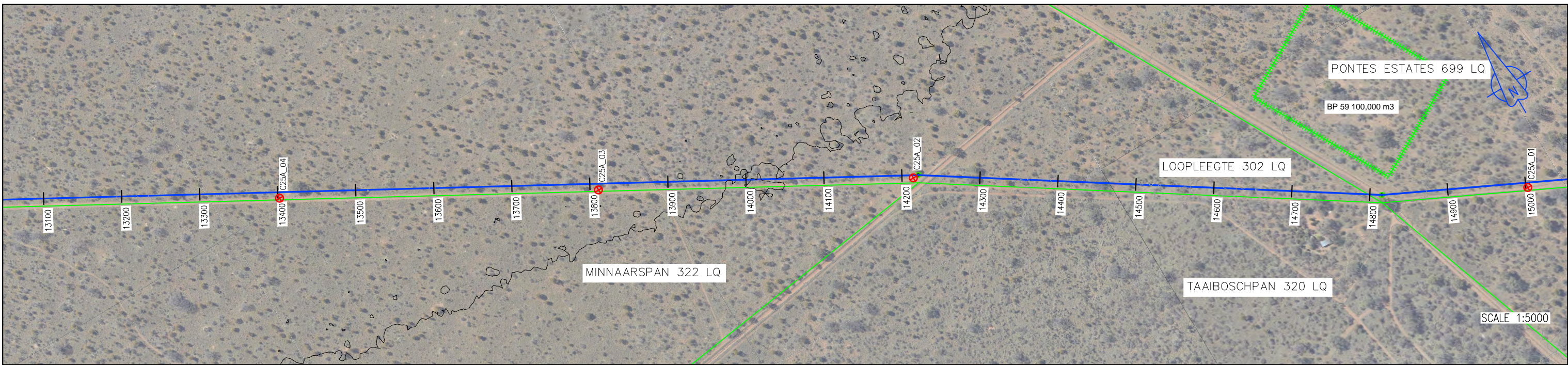
LEGEND:

- CHAINAGE MARKER (PLAN ONLY)
- POINT OF INTERSECTION (PI)
- TEST PIT
- BOREHOLE
- PIPELINE
- OVERHEAD POWERLINE
- FARM BOUNDARY
- FARM PORTION BOUNDARY
- CROSSING – SURFACED ROAD
- CROSSING – GRAVEL ROAD
- CROSSING – PRIVATE DIRT ROAD
- CROSSING – POWERLINE
- AREA OF INTERMITTENT OUTCROP
- AREA OF OUTCROP
- AREA OF IMPEDED DRAINAGE
- POTENTIAL BORROW PIT
- EXISTING BORROW PIT / SPOIL SITE

CHAINAGE (m)
REFUSAL DEPTH RANGE (mm)
GEOLOGY

12000	12200	12400	12600	12800	13000	13200
2600 – 3400						
KAROO SANDSTONE, GRITSTONE, SHALE						





REFERENCE DRAWINGS		REVISIONS				DESIGNED:		PROJECT ENGINEER:	P LE ROUX		MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)				
DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:			GEOTECHNICAL PROFILE STAGE 4: STEENBOKPAN TO MATIMBA				
		A	24/02/11	FOR INFORMATION		CHECKED:	J MULDER				PLAN & LONG SECTION				
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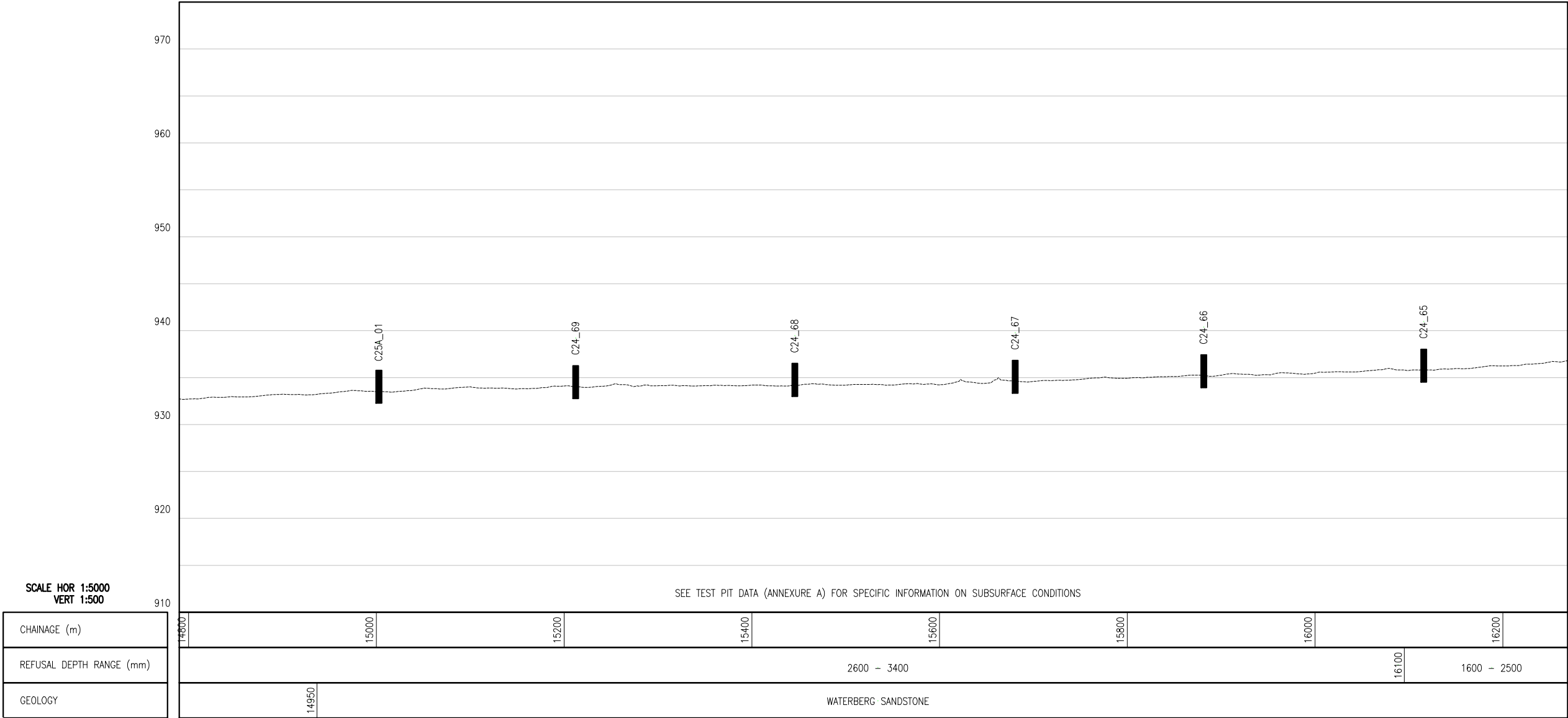
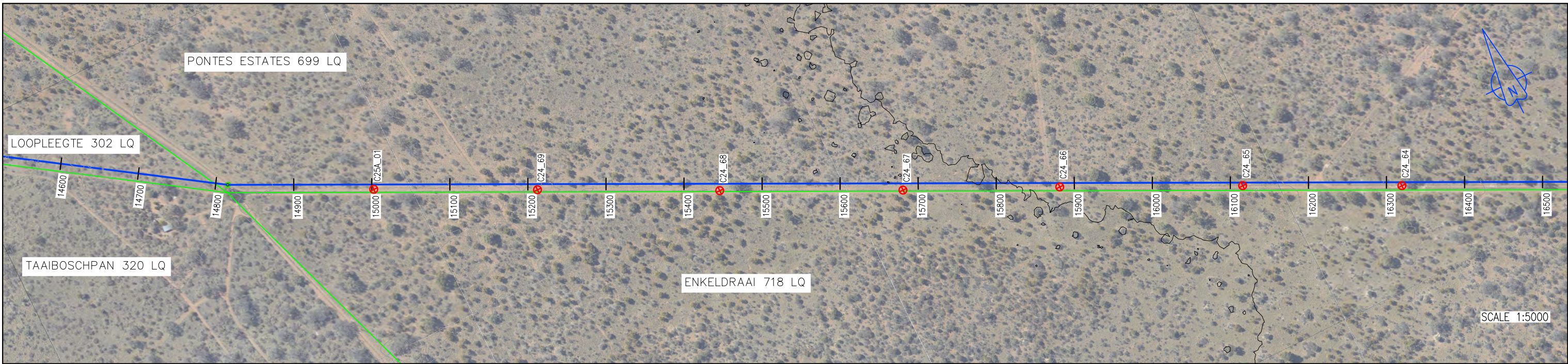


LEGEND:

- CHAINAGE MARKER (PLAN ONLY)
- POINT OF INTERSECTION (PI)
- TEST PIT
- BOREHOLE
- PIPELINE
- OVERHEAD POWERLINE
- FARM BOUNDARY
- FARM PORTION BOUNDARY
- CROSSING – SURFACED ROAD
- CROSSING – GRAVEL ROAD
- CROSSING – PRIVATE DIRT ROAD
- CROSSING – POWERLINE
- AREA OF INTERMITTENT OUTCROP
- AREA OF OUTCROP
- AREA OF IMPEDED DRAINAGE
- POTENTIAL BORROW PIT
- EXISTING BORROW PIT / SPOIL SITE

CHAINAGE (m)
REFUSAL DEPTH RANGE (mm)
GEOLOGY





REFERENCE DRAWINGS		REVISIONS				DESIGNED:		PROJECT ENGINEER:	P LE ROUX		MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)				
DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:			GEOTECHNICAL PROFILE STAGE 4: STEENBOKPAN TO MATIMBA				
		A	24/02/11	FOR INFORMATION		CHECKED:	J MULDER				PLAN & LONG SECTION				
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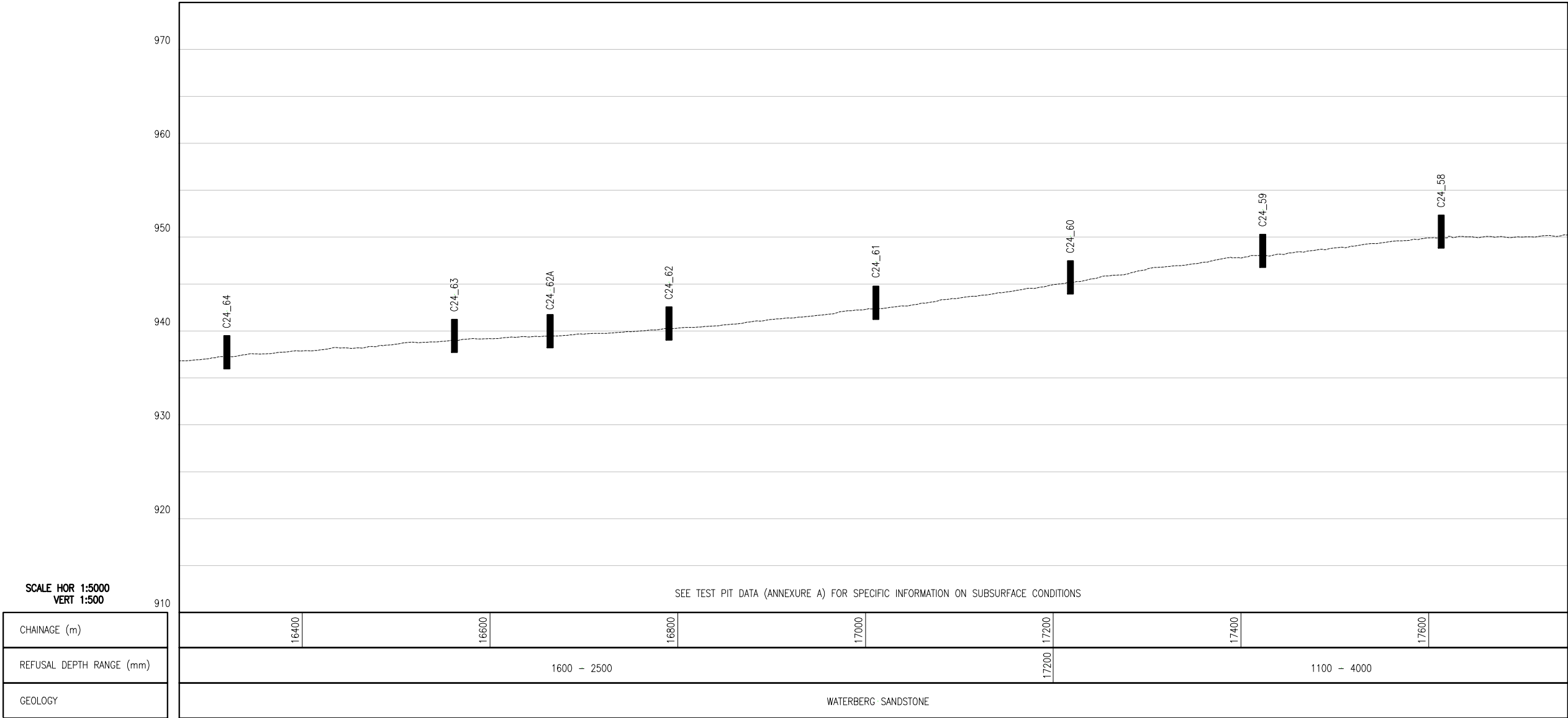


LEGEND:

- CHAINAGE MARKER (PLAN ONLY)
- POINT OF INTERSECTION (PI)
- TEST PIT
- BOREHOLE
- PIPELINE
- OVERHEAD POWERLINE
- FARM BOUNDARY
- FARM PORTION BOUNDARY
- CROSSING – SURFACED ROAD
- CROSSING – GRAVEL ROAD
- CROSSING – PRIVATE DIRT ROAD
- CROSSING – POWERLINE
- AREA OF INTERMITTENT OUTCROP
- AREA OF OUTCROP
- AREA OF IMPEDED DRAINAGE
- POTENTIAL BORROW PIT
- EXISTING BORROW PIT / SPOIL SITE



CHAINAGE (m)
REFUSAL DEPTH RANGE (mm)
GEOLOGY

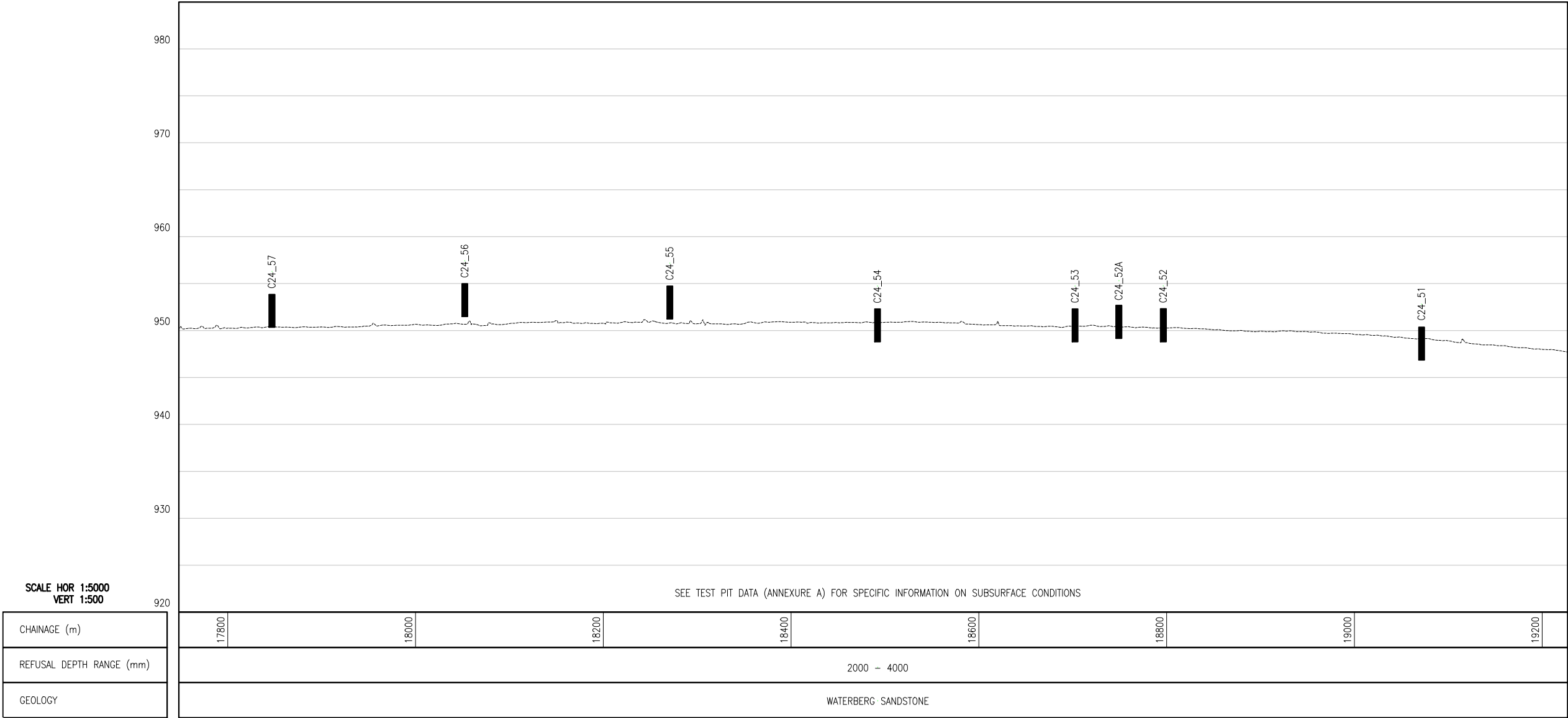
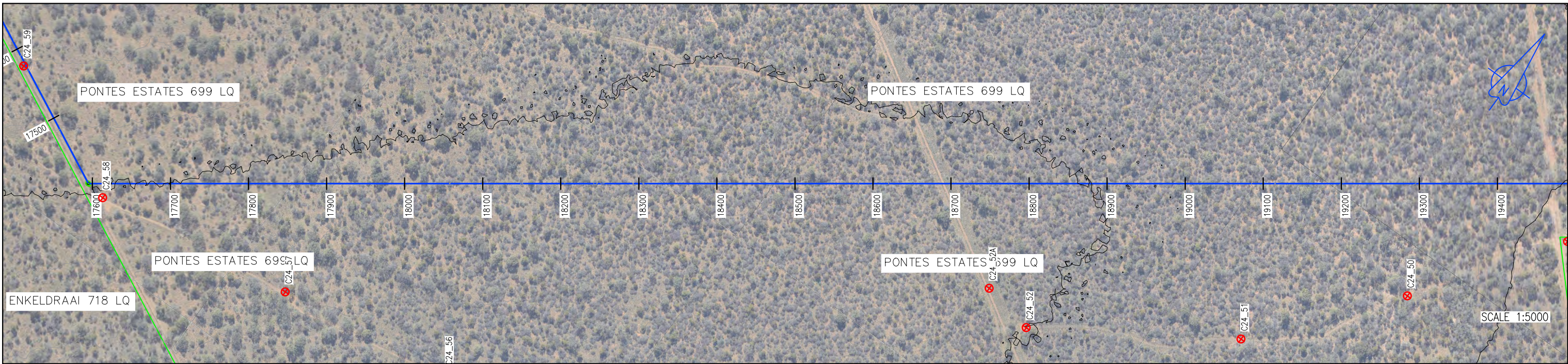
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DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:			GEOTECHNICAL PROFILE STAGE 4: STEENBOKPAN TO MATIMBA				
		A	24/02/11	FOR INFORMATION		CHECKED:	J MULDER				PLAN & LONG SECTION				
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											A3	DWAF DRG. No.	DRAWING NUMBER	2E – G7 – 074	REV N A



LEGEND:





- CHAINAGE MARKER (PLAN ONLY)
- POINT OF INTERSECTION (PI)
- TEST PIT
- BOREHOLE
- PIPELINE
- OVERHEAD POWERLINE
- FARM BOUNDARY
- FARM PORTION BOUNDARY
- CROSSING – SURFACED ROAD
- CROSSING – GRAVEL ROAD
- CROSSING – PRIVATE DIRT ROAD
- CROSSING – POWERLINE
- AREA OF INTERMITTENT OUTCROP
- AREA OF OUTCROP
- AREA OF IMPEDED DRAINAGE
- POTENTIAL BORROW PIT
- EXISTING BORROW PIT / SPOIL SITE

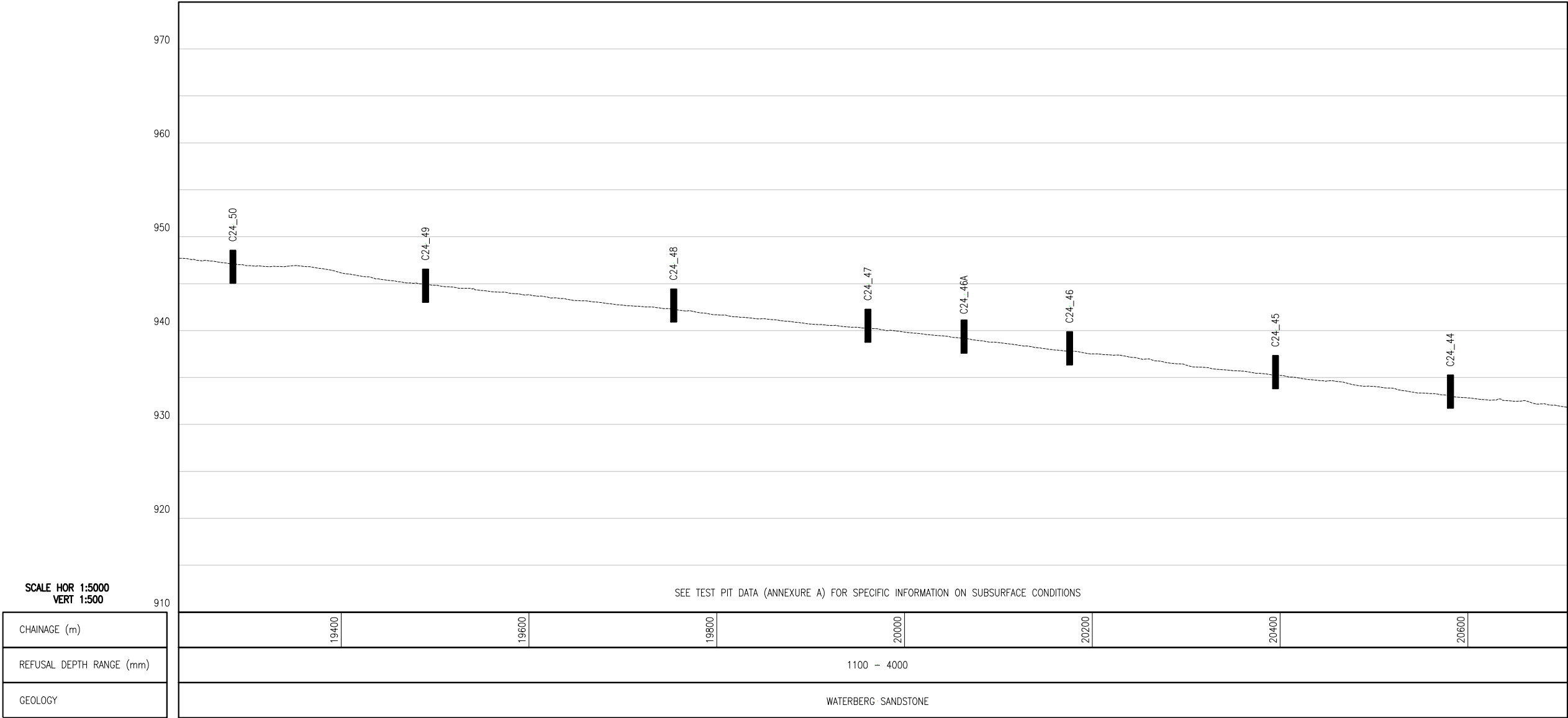
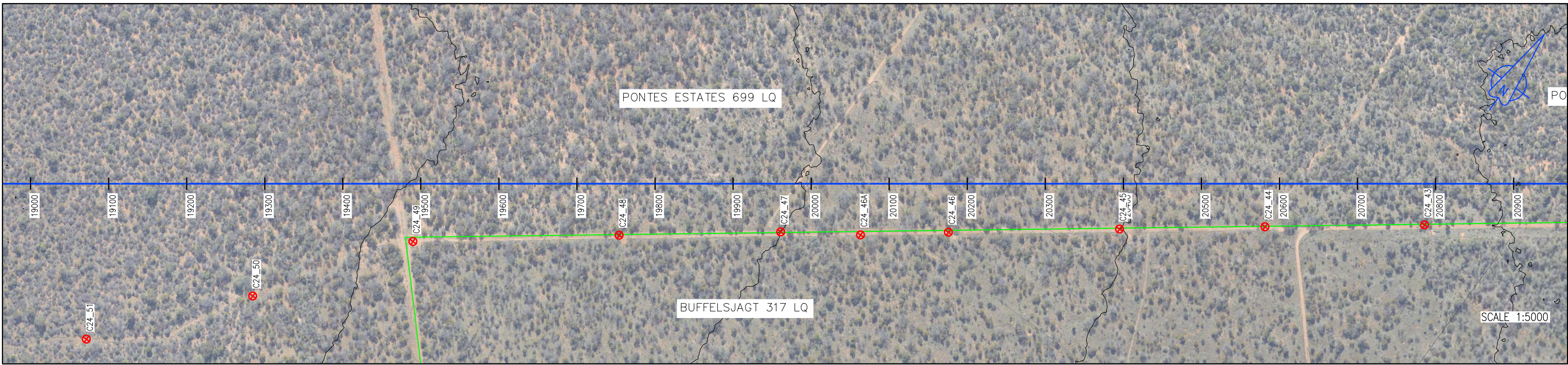
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DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:		GEOTECHNICAL PROFILE STAGE 4: STEENBOKPAN TO MATIMBA					
		A	24/02/11	FOR INFORMATION		CHECKED:	J MULDER			PLAN & LONG SECTION					
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											A3	DWAF DRG. No.	DRAWING NUMBER	2E – G7 – 075	REV N A



LEGEND:

- CHAINAGE MARKER (PLAN ONLY)
- POINT OF INTERSECTION (PI)
- TEST PIT
- BOREHOLE
- PIPELINE
- OVERHEAD POWERLINE
- FARM BOUNDARY
- FARM PORTION BOUNDARY
- CROSSING – SURFACED ROAD
- CROSSING – GRAVEL ROAD
- CROSSING – PRIVATE DIRT ROAD
- CROSSING – POWERLINE
- AREA OF INTERMITTENT OUTCROP
- AREA OF OUTCROP
- AREA OF IMPEDED DRAINAGE
- POTENTIAL BORROW PIT
- EXISTING BORROW PIT / SPOIL SITE



REFERENCE DRAWINGS		REVISIONS				DESIGNED:		PROJECT ENGINEER:	P LE ROUX		MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)					
DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:			GEOTECHNICAL PROFILE STAGE 4: STEENBOKPAN TO MATIMBA					
		A	24/02/11	FOR INFORMATION		CHECKED:	J MULDER				PLAN & LONG SECTION					
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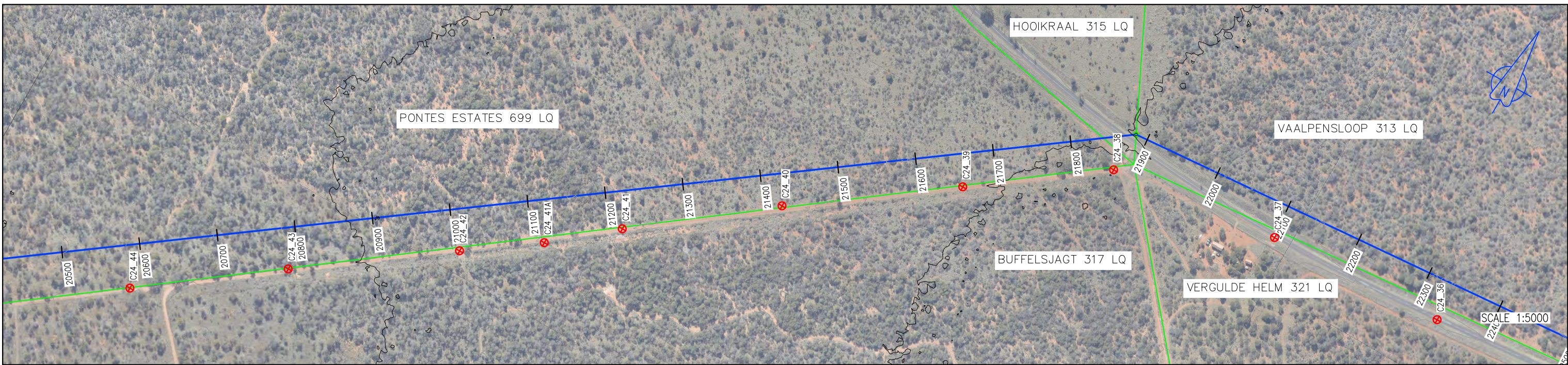


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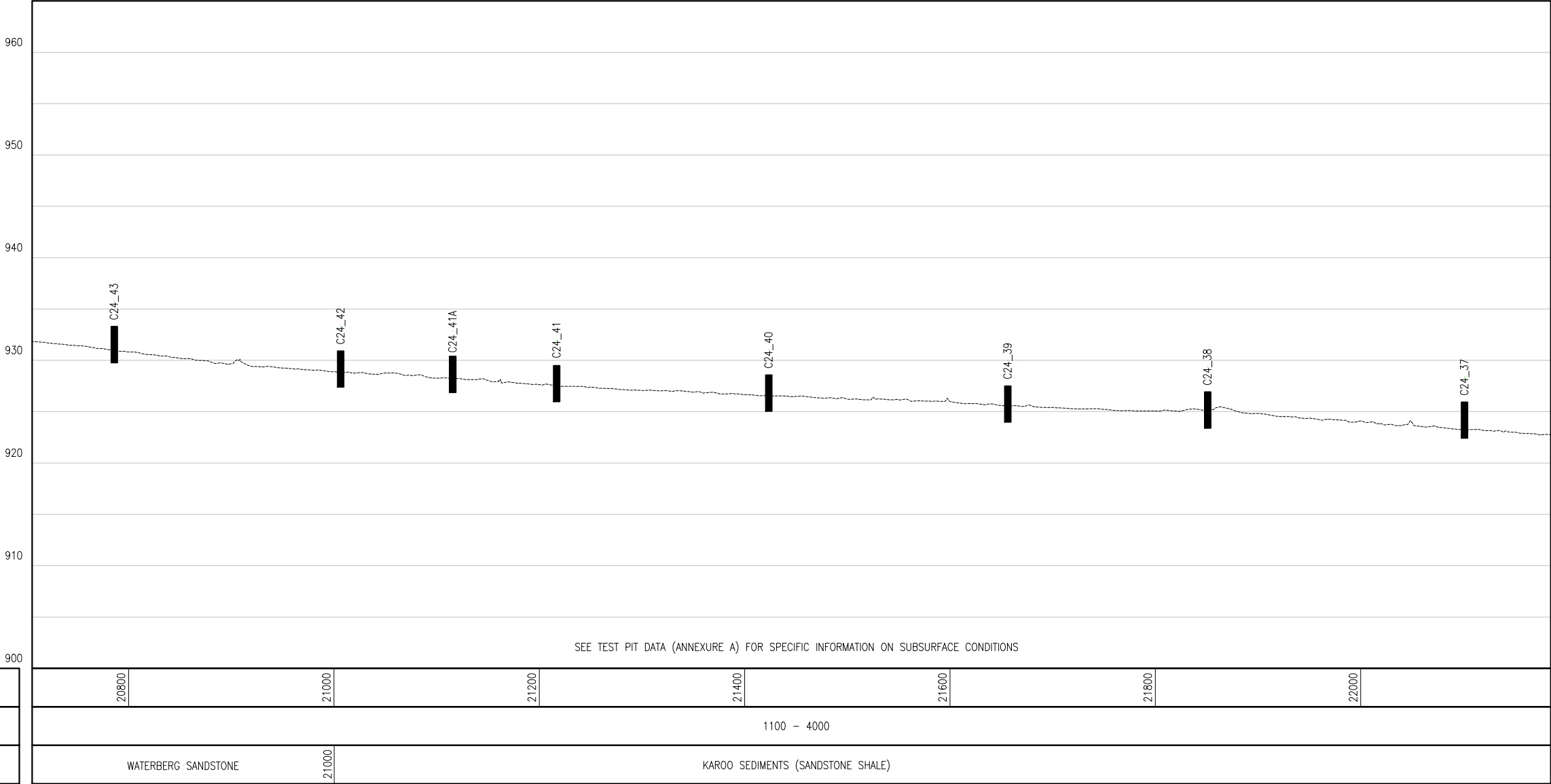
- CHAINAGE MARKER (PLAN ONLY)
- POINT OF INTERSECTION (PI)
- TEST PIT
- BOREHOLE
- PIPELINE
- OVERHEAD POWERLINE
- FARM BOUNDARY
- FARM PORTION BOUNDARY
- CROSSING – SURFACED ROAD
- CROSSING – GRAVEL ROAD
- CROSSING – PRIVATE DIRT ROAD
- CROSSING – POWERLINE
- AREA OF INTERMITTENT OUTCROP
- AREA OF OUTCROP
- AREA OF IMPEDED DRAINAGE
- POTENTIAL BORROW PIT
- EXISTING BORROW PIT / SPOIL SITE

CHAINAGE (m)
REFUSAL DEPTH RANGE (mm)
GEOLOGY

REFERENCE DRAWINGS		REVISIONS				DESIGNED:		PROJECT ENGINEER:	P LE ROUX		MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)					
DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:			GEOTECHNICAL PROFILE STAGE 4: STEENBOKPAN TO MATIMBA					
		A	24/02/11	FOR INFORMATION		CHECKED:	J MULDER				PLAN & LONG SECTION					
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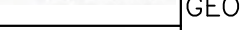


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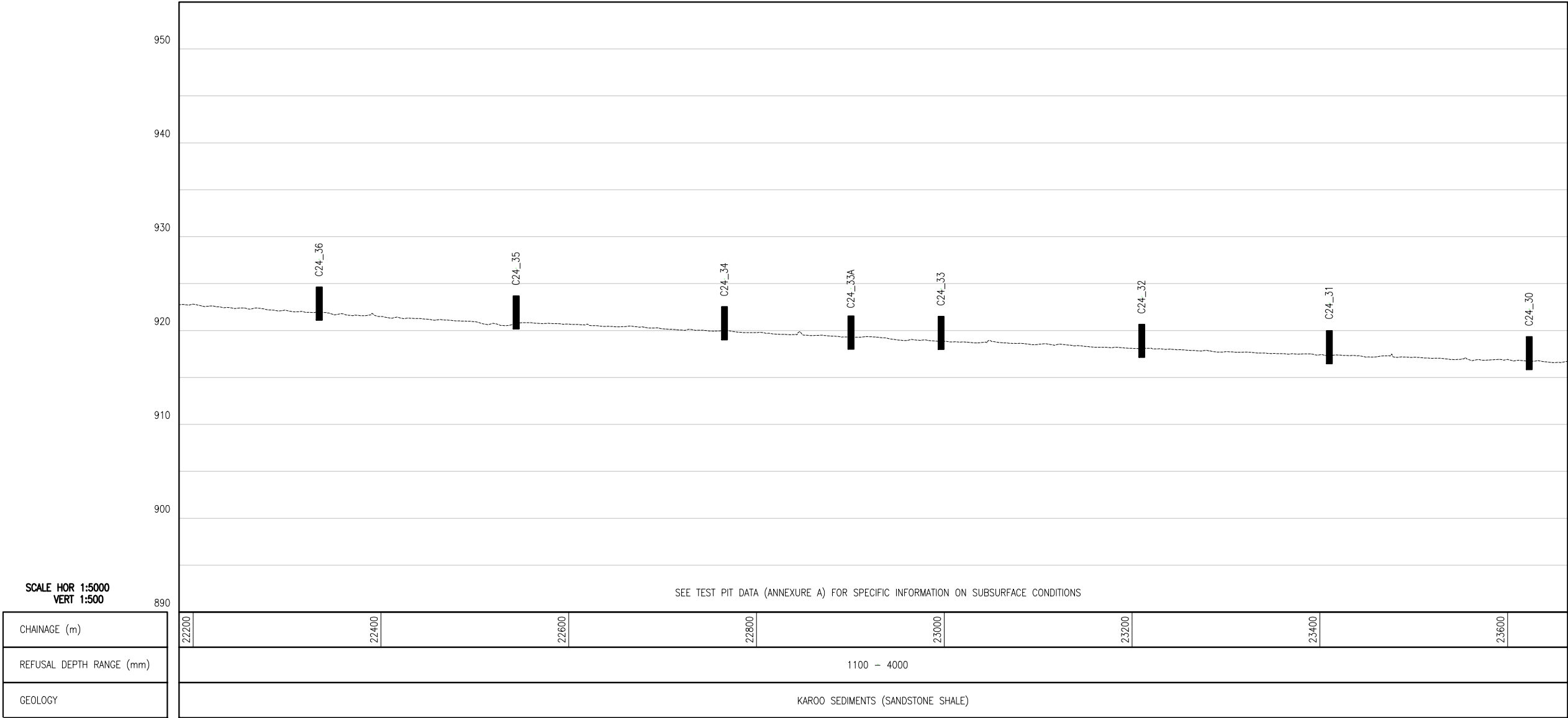
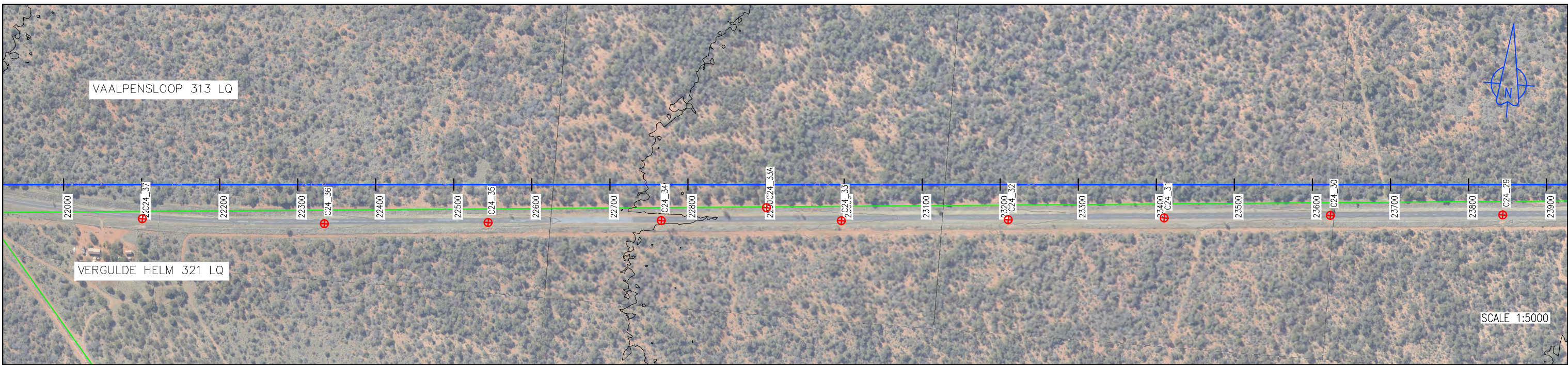


SCALE HOR 1:5000
VERT 1:500

LEGEND:





- CHAINAGE MARKER (PLAN ONLY)
- POINT OF INTERSECTION (PI)
- TEST PIT
- BOREHOLE
- PIPELINE
- OVERHEAD POWERLINE
- FARM BOUNDARY
- FARM PORTION BOUNDARY
- CROSSING - SURFACED ROAD
- CROSSING - GRAVEL ROAD
- CROSSING - PRIVATE DIRT ROAD
- CROSSING - POWERLINE
- AREA OF INTERMITTENT OUTCROP
- AREA OF OUTCROP
- AREA OF IMPEDED DRAINAGE
- POTENTIAL BORROW PIT
- EXISTING BORROW PIT / SPOIL SITE

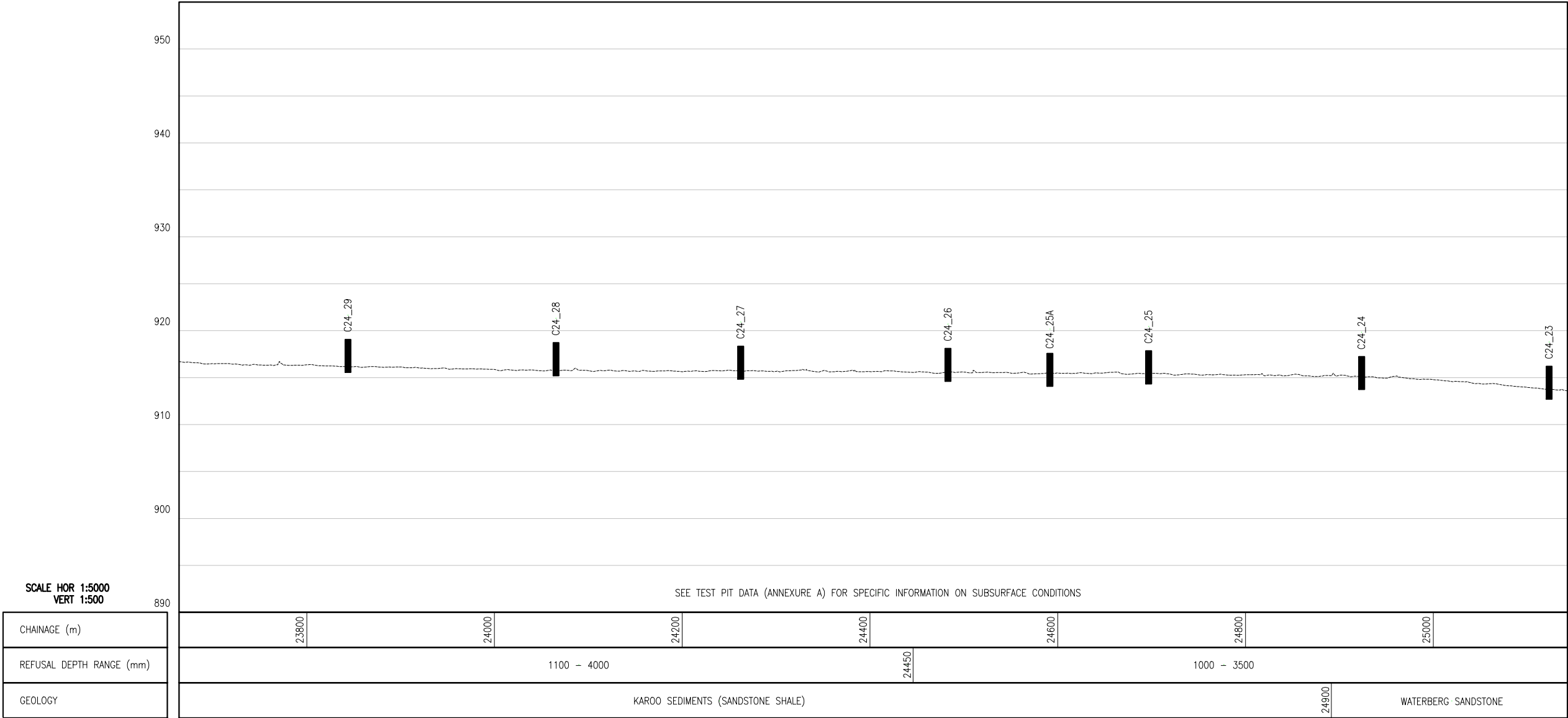
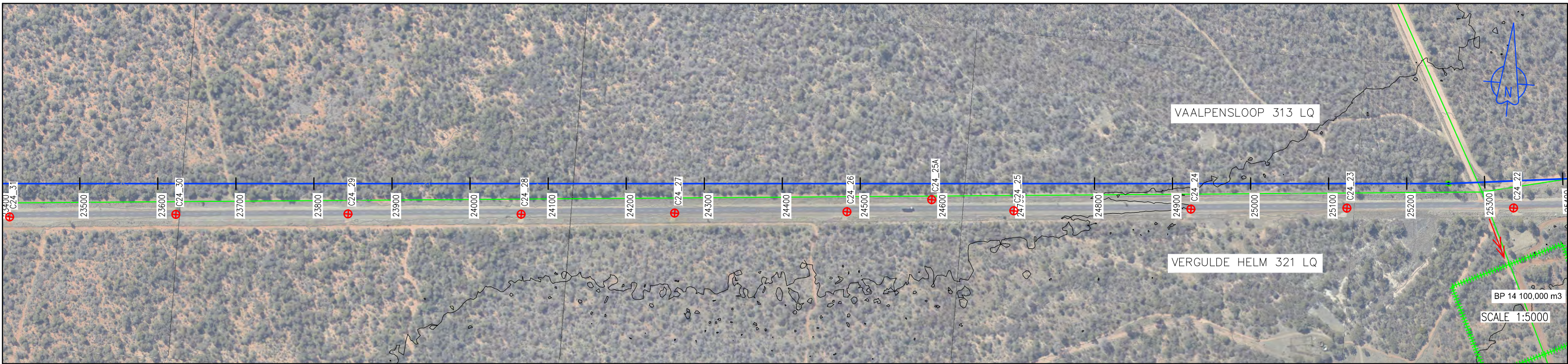
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DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:			GEOTECHNICAL PROFILE STAGE 4: STEENBOKPAN TO MATIMBA					
		A	24/02/11	FOR INFORMATION		CHECKED:	J MULDER				PLAN & LONG SECTION					
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											A3	DWAF DRG. No.		DRAWING NUMBER	2E - G7 - 078	REV N A



LEGEND:





- CHAINAGE MARKER (PLAN ONLY)
- POINT OF INTERSECTION (PI)
- TEST PIT
- BOREHOLE
- PIPELINE
- OVERHEAD POWERLINE
- FARM BOUNDARY
- FARM PORTION BOUNDARY
- CROSSING - SURFACED ROAD
- CROSSING - GRAVEL ROAD
- CROSSING - PRIVATE DIRT ROAD
- CROSSING - POWERLINE
- AREA OF INTERMITTENT OUTCROP
- AREA OF OUTCROP
- AREA OF IMPEDED DRAINAGE
- POTENTIAL BORROW PIT
- EXISTING BORROW PIT / SPOIL SITE

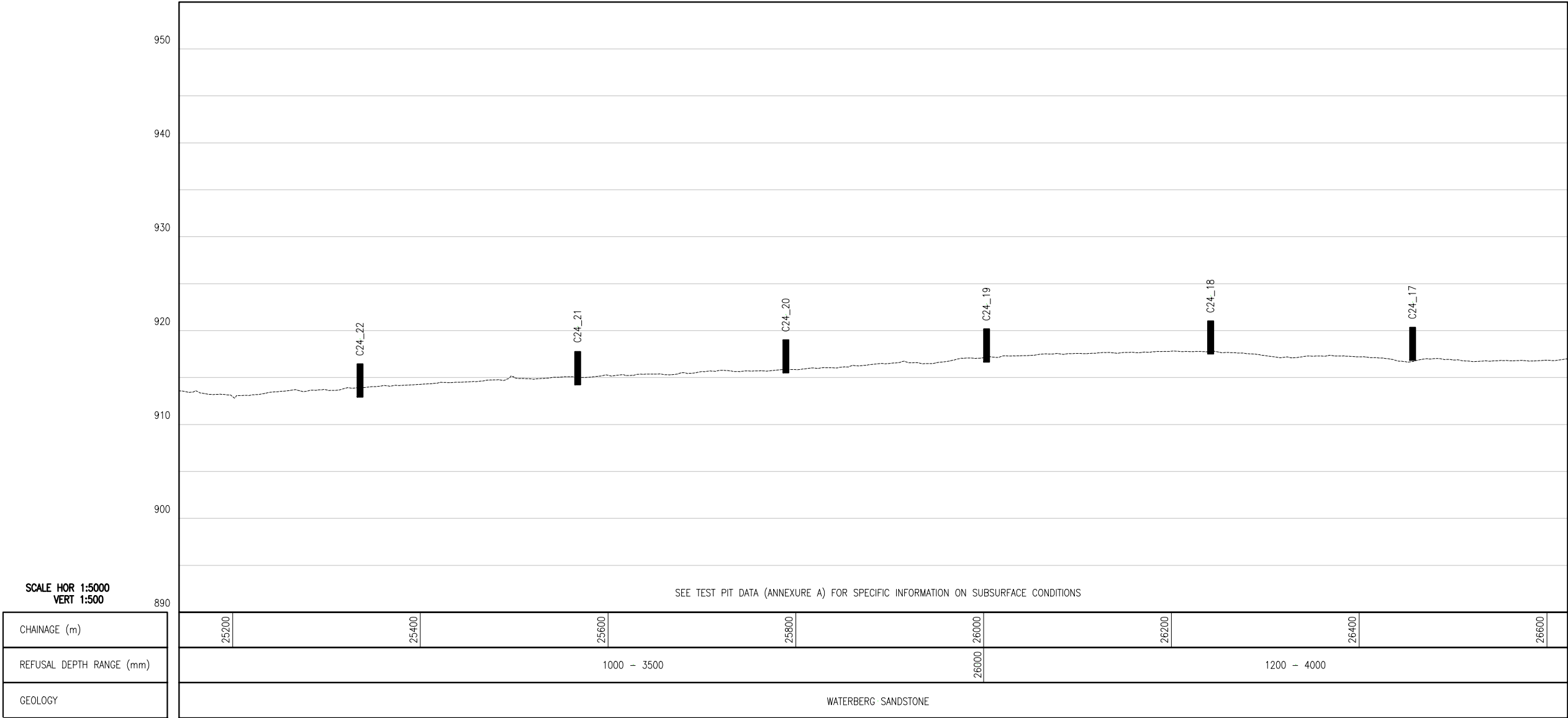
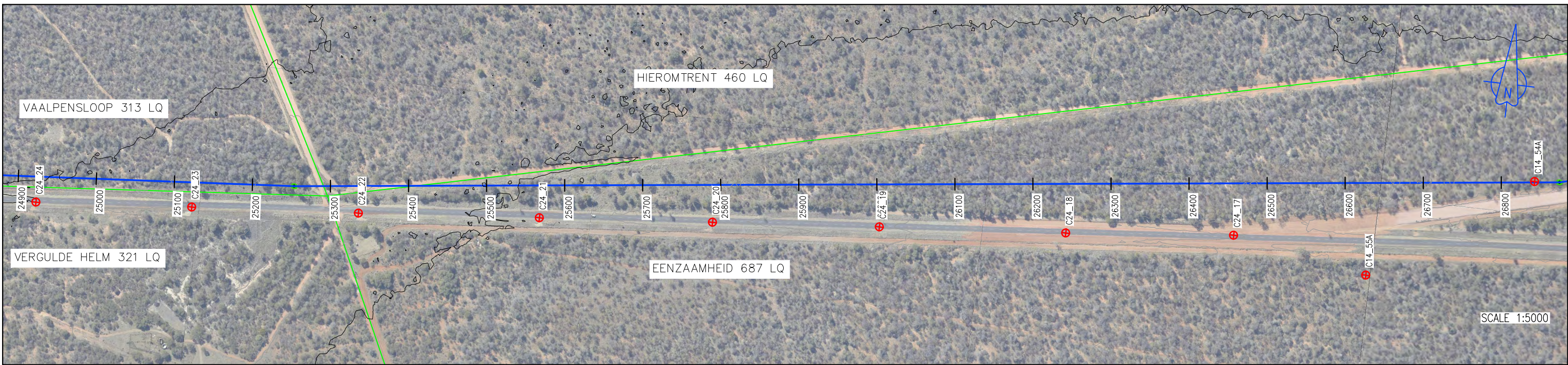
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DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:			GEOTECHNICAL PROFILE STAGE 4: STEENBOKPAN TO MATIMBA				
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						SCALE: 1:5000									



LEGEND:

- CHAINAGE MARKER (PLAN ONLY)
- POINT OF INTERSECTION (PI)
- TEST PIT
- BOREHOLE
- PIPELINE
- OVERHEAD POWERLINE
- FARM BOUNDARY
- FARM PORTION BOUNDARY
- CROSSING - SURFACED ROAD
- CROSSING - GRAVEL ROAD
- CROSSING - PRIVATE DIRT ROAD
- CROSSING - POWERLINE
- AREA OF INTERMITTENT OUTCROP
- AREA OF OUTCROP
- AREA OF IMPEDED DRAINAGE
- POTENTIAL BORROW PIT
- EXISTING BORROW PIT / SPOIL SITE

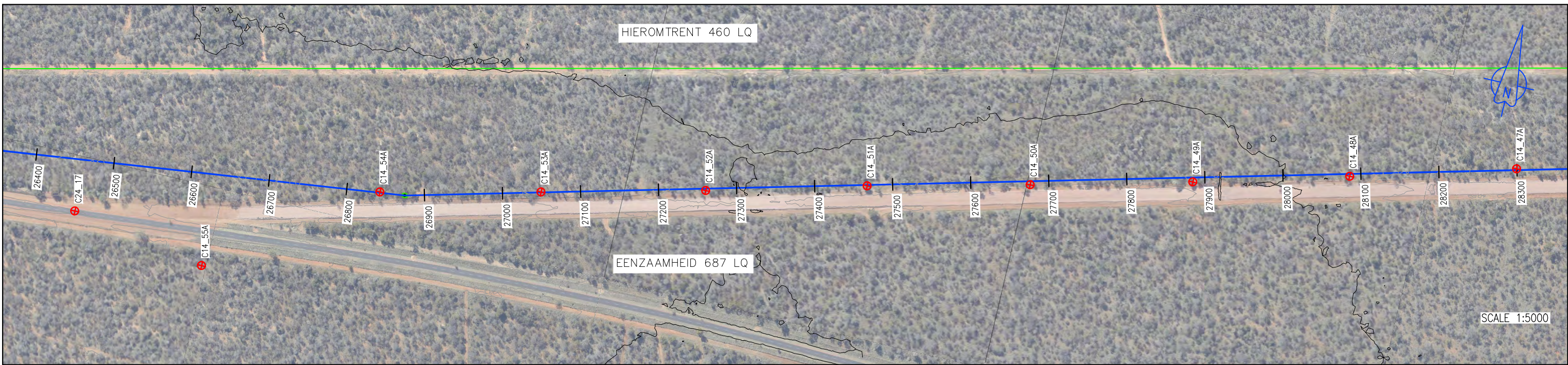
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DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:			GEOTECHNICAL PROFILE STAGE 4: STEENBOKPAN TO MATIMBA				
		A	24/02/11	FOR INFORMATION		CHECKED:	J MULDER				PLAN & LONG SECTION				
						CHIEF DESIGNER:	E SERFONTEIN	SCALE:	AS SHOWN						
						SCALE: 1:500					A3	DWAF DRG. No.	DRAWING NUMBER	2E - G7 - 080	REV N A
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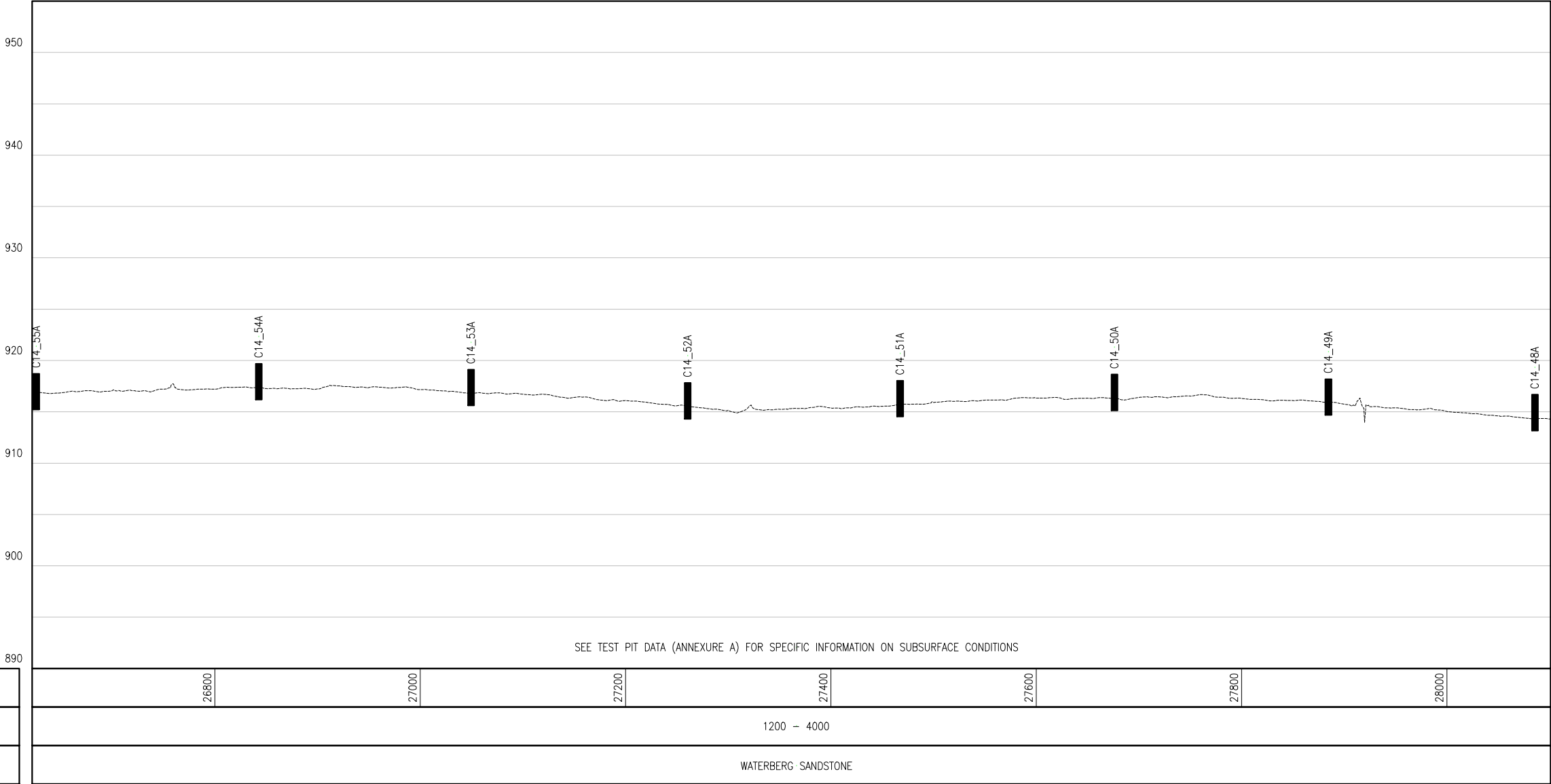
LEGEND:

- CHAINAGE MARKER (PLAN ONLY)
- POINT OF INTERSECTION (PI)
- TEST PIT
- BOREHOLE
- PIPELINE
- OVERHEAD POWERLINE
- FARM BOUNDARY
- FARM PORTION BOUNDARY
- CROSSING - SURFACED ROAD
- CROSSING - GRAVEL ROAD
- CROSSING - PRIVATE DIRT ROAD
- CROSSING - POWERLINE
- AREA OF INTERMITTENT OUTCROP
- AREA OF OUTCROP
- AREA OF IMPEDED DRAINAGE
- POTENTIAL BORROW PIT
- EXISTING BORROW PIT / SPOIL SITE

REFERENCE DRAWINGS			REVISIONS			DESIGNED:		PROJECT ENGINEER:	P LE ROUX	<div>MOKOLO CROCODILE Consultants</div>		MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)		
DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:				GEOTECHNICAL PROFILE STAGE 4: STEENBOKPAN TO MATIMBA		
		A	24/02/11	FOR INFORMATION		CHECKED:	J MULDER			<div>TCTA</div> <div>A new word for water</div>		PLAN & LONG SECTION		
						CHIEF DESIGNER:	E SERFONTEIN	SCALE:	AS SHOWN					
						SCALE: 1:500	0 2,5 5 10 15 20 25			A3 DWAF DRG. No.		DRAWING NUMBER	2E - G7 - 081	REV No. A
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SCALE 1:5000

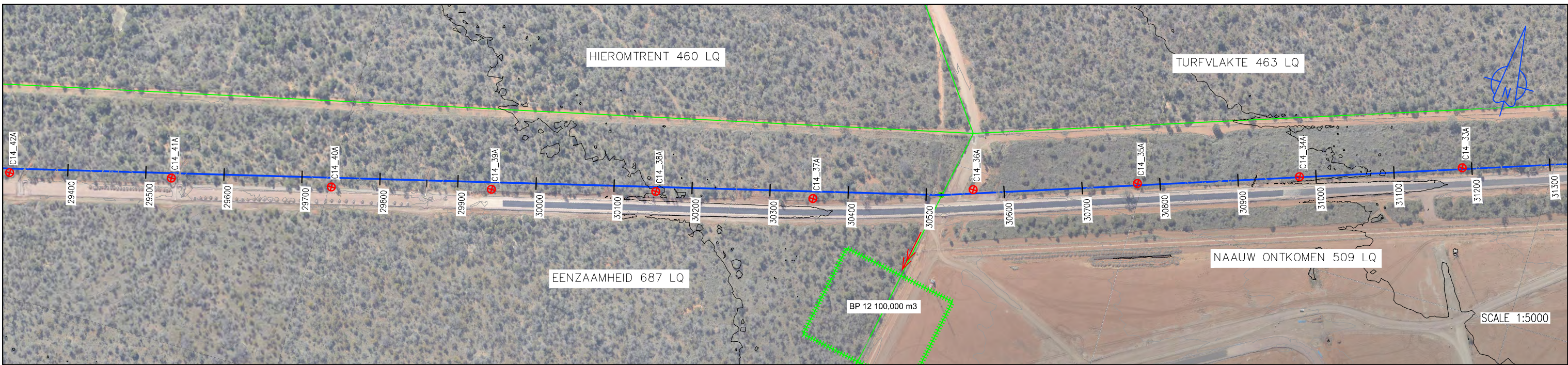


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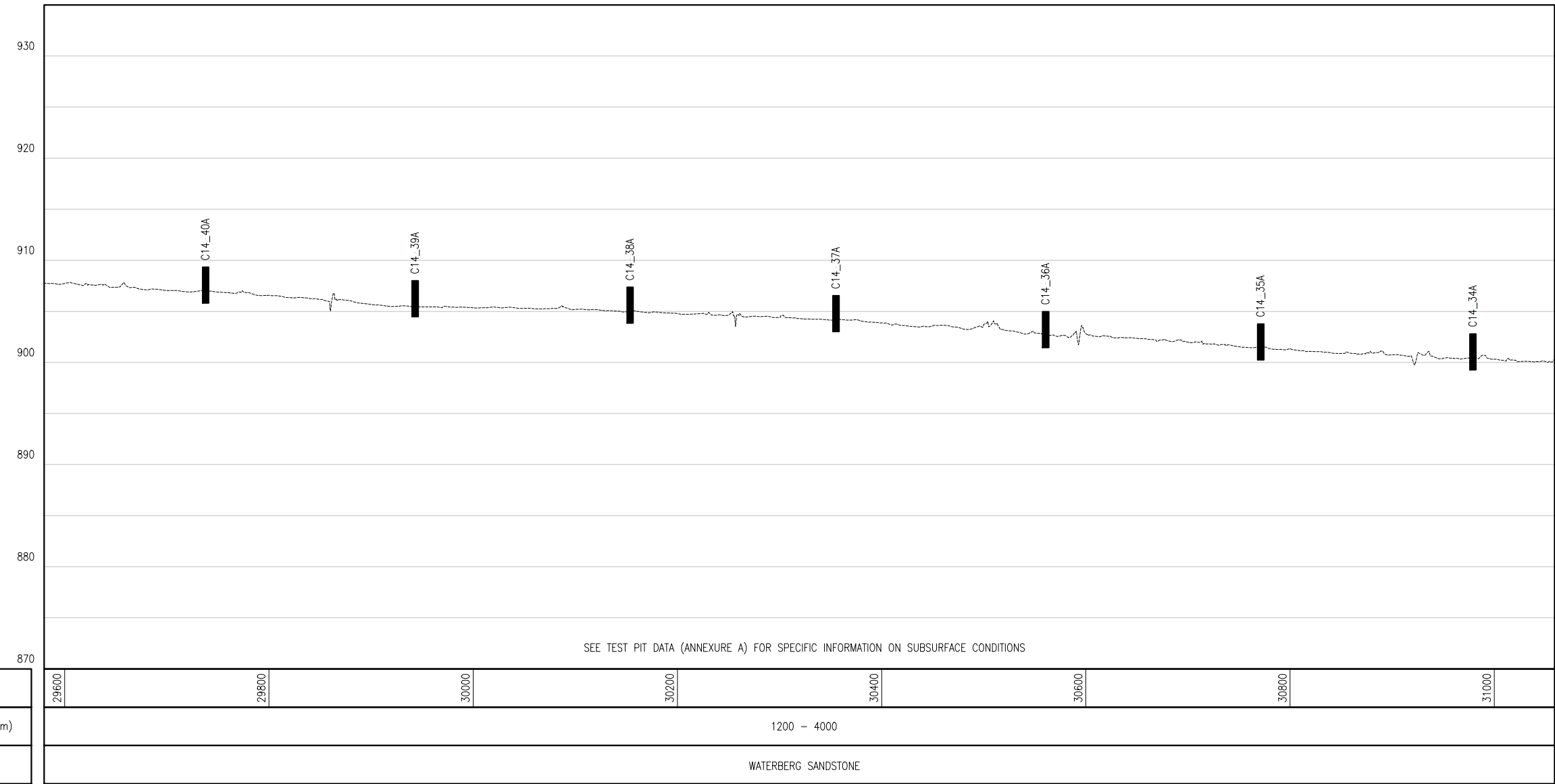
CHAINAGE (m)
REFUSAL DEPTH RANGE (mm)
GEOLOGY

LEGEND:	
	CHAINAGE MARKER (PLAN ONLY)
	POINT OF INTERSECTION (PI)
	TEST PIT
	BOREHOLE
	PIPELINE
	OVERHEAD POWERLINE
	FARM BOUNDARY
	FARM PORTION BOUNDARY
	CROSSING - SURFACED ROAD
	CROSSING - GRAVEL ROAD
	CROSSING - PRIVATE DIRT ROAD
	CROSSING - POWERLINE
	AREA OF INTERMITTENT OUTCROP
	AREA OF OUTCROP
	AREA OF IMPEDED DRAINAGE
	POTENTIAL BORROW PIT
	EXISTING BORROW PIT / SPOIL SITE

REFERENCE DRAWINGS			REVISIONS			DESIGNED:		PROJECT ENGINEER:	P LE ROUX		MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)						
DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:			GEOTECHNICAL PROFILE STAGE 4: STEENBOKPAN TO MATIMBA						
		A	24/02/11	FOR INFORMATION		CHECKED:	J MULDER				PLAN & LONG SECTION						
						CHIEF DESIGNER:	E SERFONTEIN	SCALE:	AS SHOWN								
						SCALE: 1:500						A3	DWAF DRG. No.	DRAWING NUMBER	2E - G7 - 082	REV N A	
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SCALE 1:5000



SEE TEST PIT DATA (ANNEXURE A) FOR SPECIFIC INFORMATION ON SUBSURFACE CONDITIONS

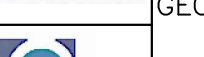
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VERT 1:500

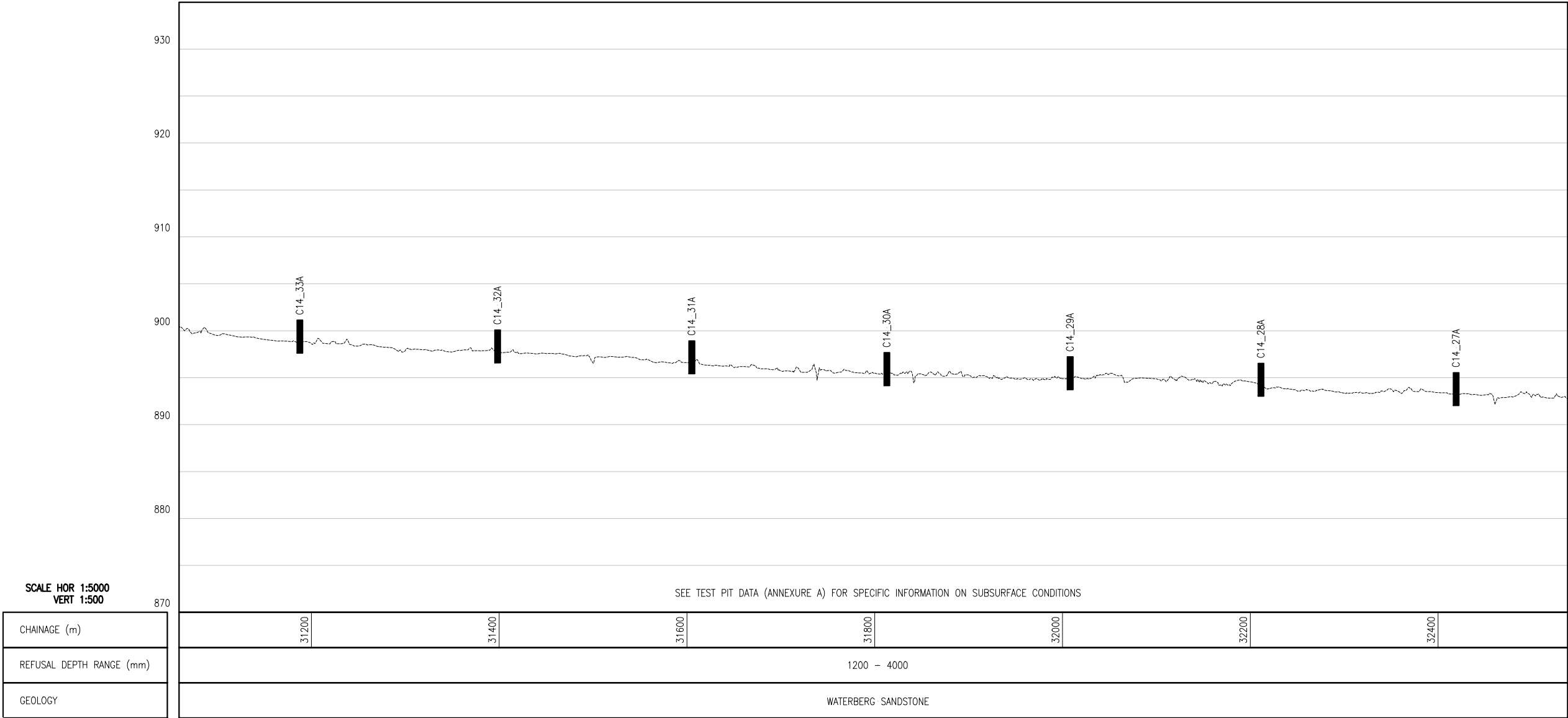
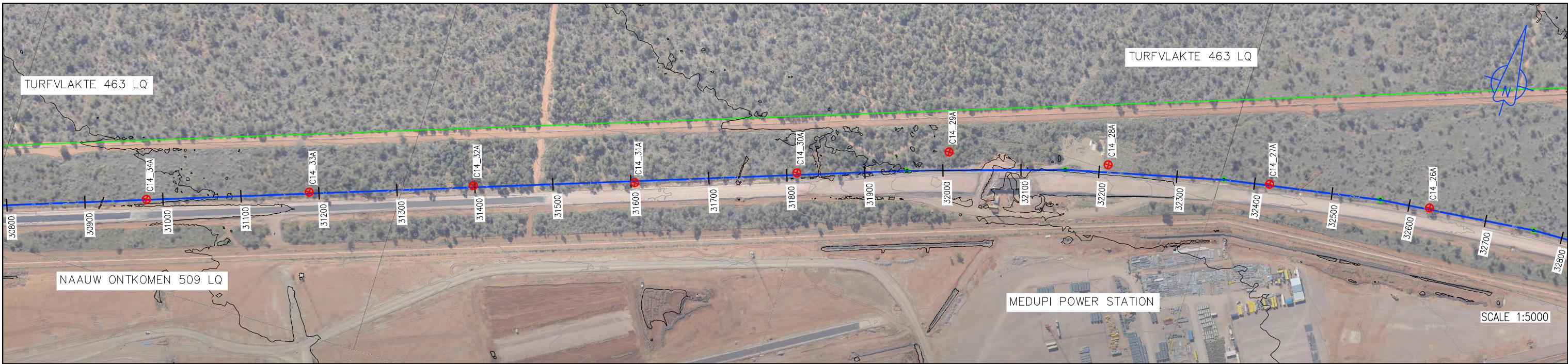
CHAINAGE (m)
REFUSAL DEPTH RANGE (mm)
GEOLOGY

29600	29800	30000	30200	30400	30600	30800	31000
1200 - 4000							
WATERBERG SANDSTONE							

LEGEND:





- CHAINAGE MARKER (PLAN ONLY)
- POINT OF INTERSECTION (PI)
- TEST PIT
- BOREHOLE
- PIPELINE
- OVERHEAD POWERLINE
- FARM BOUNDARY
- FARM PORTION BOUNDARY
- CROSSING - SURFACED ROAD
- CROSSING - GRAVEL ROAD
- CROSSING - PRIVATE DIRT ROAD
- CROSSING - POWERLINE
- AREA OF INTERMITTENT OUTCROP
- AREA OF OUTCROP
- AREA OF IMPEDED DRAINAGE
- POTENTIAL BORROW PIT
- EXISTING BORROW PIT / SPOIL SITE

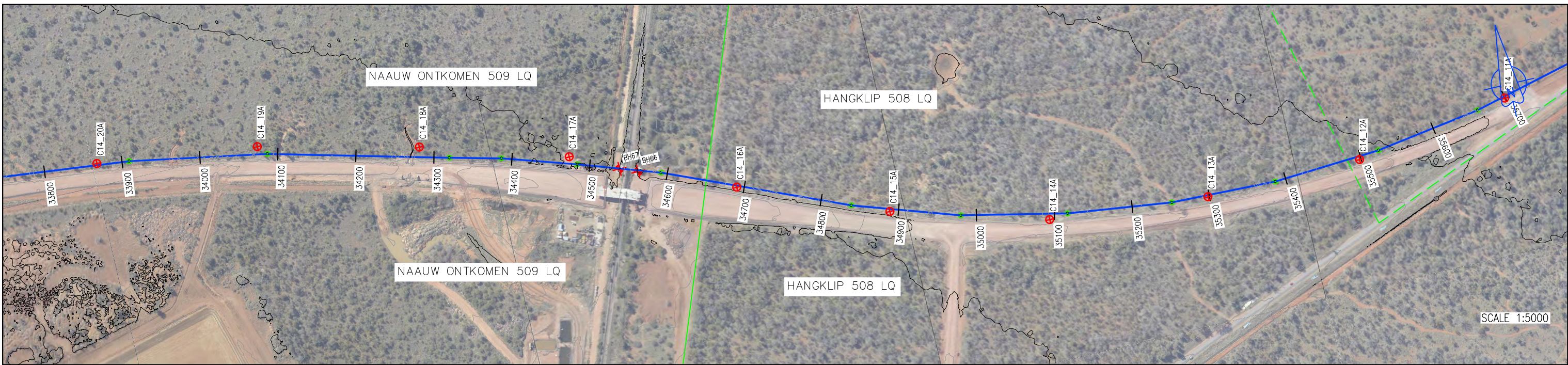
REFERENCE DRAWINGS		REVISIONS				DESIGNED:		PROJECT ENGINEER:	P LE ROUX	<div>MOKOLO CROCODILE Consultants</div> <div><div>TCTA A new word for water</div></div>	MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)			
DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:			GEOTECHNICAL PROFILE STAGE 4: STEENBOKPAN TO MATIMBA			
		A	24/02/11	FOR INFORMATION		CHECKED:	J MULDER				PLAN & LONG SECTION			
						CHIEF DESIGNER:	E SERFONTEIN	SCALE:	AS SHOWN					
						<div>SCALE: 1:500</div> <div>0 2,5 5 10 15 20 25</div> <div>SCALE: 1:5000</div> <div>0 25 50 100 150 200 250</div>								
										A3	DWAF DRG. No.	DRAWING NUMBER	2E - G7 - 084	REV N A



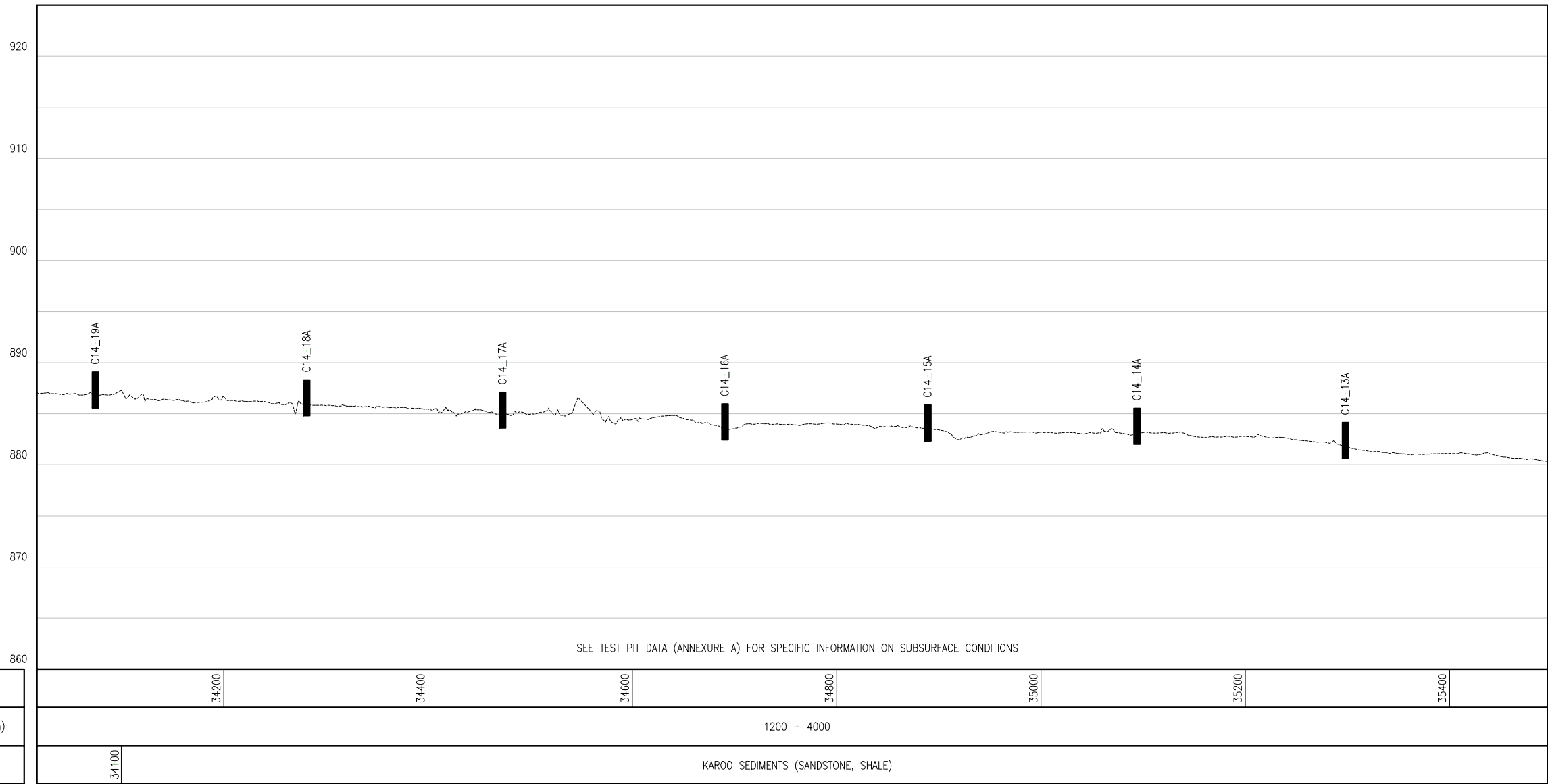
LEGEND:

- CHAINAGE MARKER (PLAN ONLY)
- POINT OF INTERSECTION (PI)
- TEST PIT
- BOREHOLE
- PIPELINE
- OVERHEAD POWERLINE
- FARM BOUNDARY
- FARM PORTION BOUNDARY
- CROSSING – SURFACED ROAD
- CROSSING – GRAVEL ROAD
- CROSSING – PRIVATE DIRT ROAD
- CROSSING – POWERLINE
- AREA OF INTERMITTENT OUTCROP
- AREA OF OUTCROP
- AREA OF IMPEDED DRAINAGE
- POTENTIAL BORROW PIT
- EXISTING BORROW PIT / SPOIL SITE

REFERENCE DRAWINGS		REVISIONS				DESIGNED:		PROJECT ENGINEER:	P LE ROUX		MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)				
DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:			GEOTECHNICAL PROFILE STAGE 4: STEENBOKPAN TO MATIMBA				
		A	24/02/11	FOR INFORMATION		CHECKED:	J MULDER				PLAN & LONG SECTION				
						CHIEF DESIGNER:	E SERFONTEIN	SCALE:	AS SHOWN						
						SCALE: 1:500									
						SCALE: 1:5000									
												A3	DWAF DRG. No.	DRAWING NUMBER	2E – G7 – 085



SCALE 1:5000






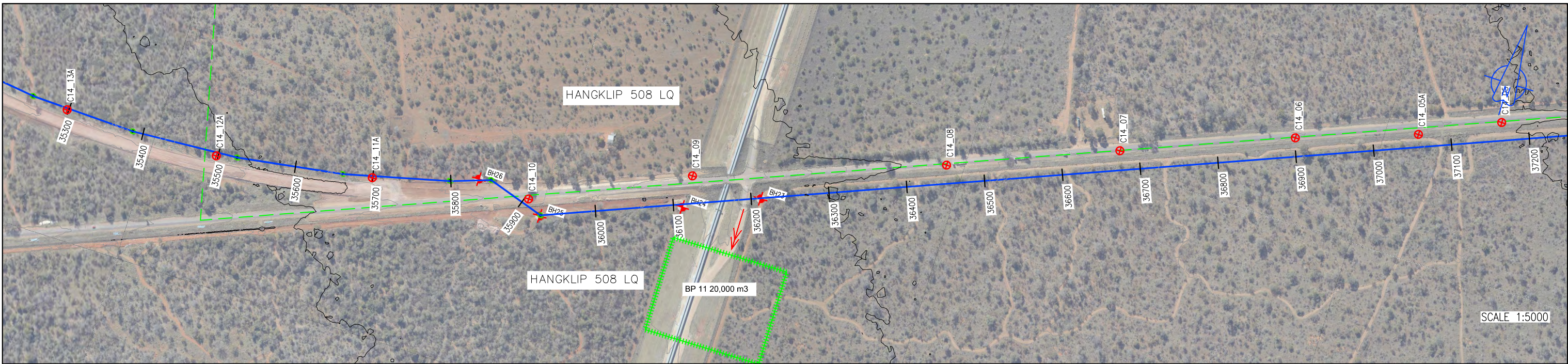
SCALE HOR 1:5000
VERT 1:500

SEE TEST PIT DATA (ANNEXURE A) FOR SPECIFIC INFORMATION ON SUBSURFACE CONDITIONS

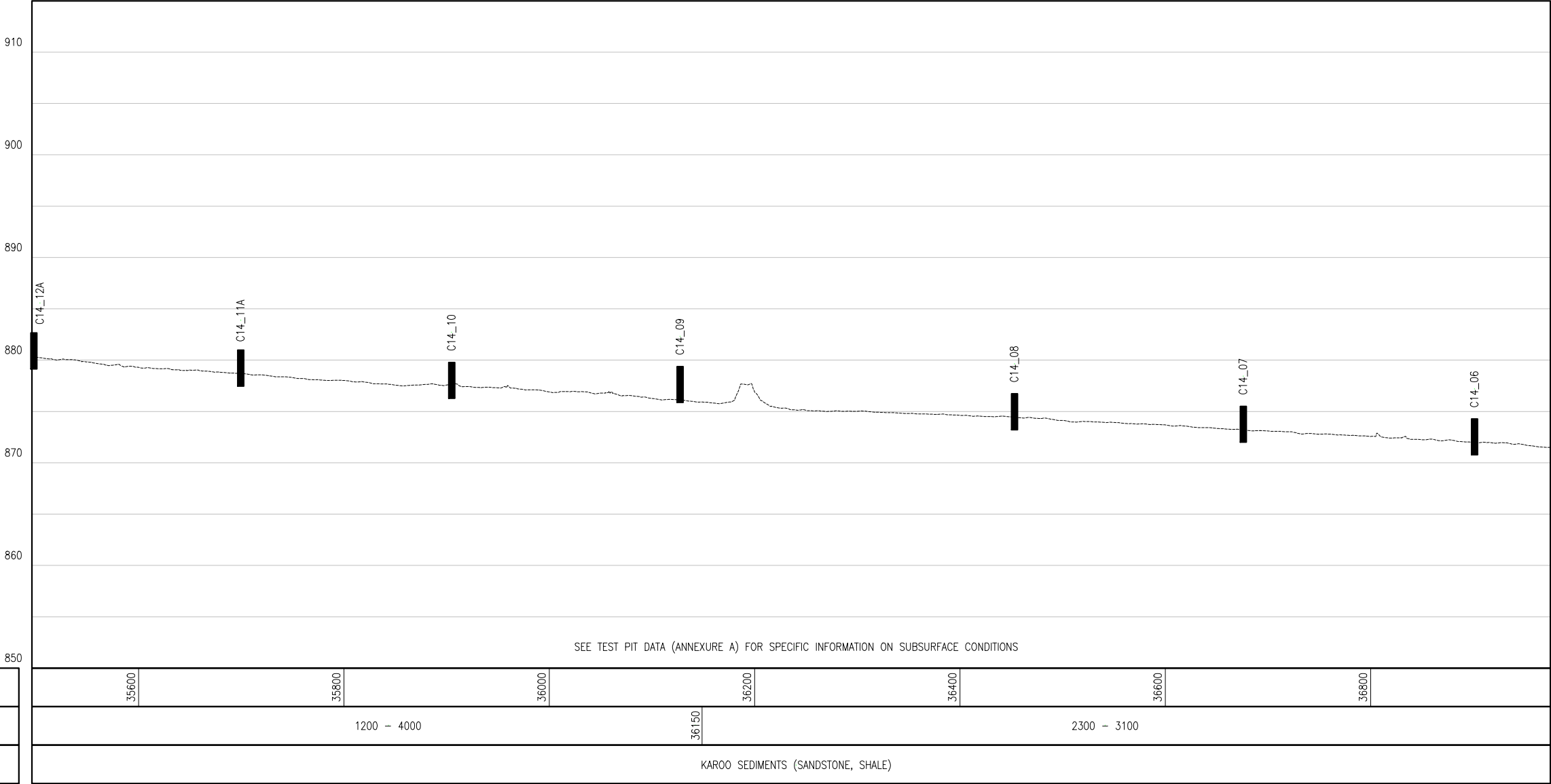
LEGEND:

- CHAINAGE MARKER (PLAN ONLY)
- POINT OF INTERSECTION (PI)
- TEST PIT
- BOREHOLE
- PIPELINE
- OVERHEAD POWERLINE
- FARM BOUNDARY
- FARM PORTION BOUNDARY
- CROSSING - SURFACED ROAD
- CROSSING - GRAVEL ROAD
- CROSSING - PRIVATE DIRT ROAD
- CROSSING - POWERLINE
- AREA OF INTERMITTENT OUTCROP
- AREA OF OUTCROP
- AREA OF IMPEDED DRAINAGE
- POTENTIAL BORROW PIT
- EXISTING BORROW PIT / SPOIL SITE

REFERENCE DRAWINGS		REVISIONS				DESIGNED:		PROJECT ENGINEER:	P LE ROUX		MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)				
DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:			GEOTECHNICAL PROFILE STAGE 4: STEENBOKPAN TO MATIMBA				
		A	24/02/11	FOR INFORMATION		CHECKED:	J MULDER				PLAN & LONG SECTION				
						CHIEF DESIGNER:	E SERFONTEIN	SCALE:	AS SHOWN						
						SCALE: 1:500					A3	DWAF DRG. No.	DRAWING NUMBER	2E - G7 - 087	REV N A
						SCALE: 1:5000									



SCALE 1:5000



SCALE HOR 1:5000
VERT 1:500

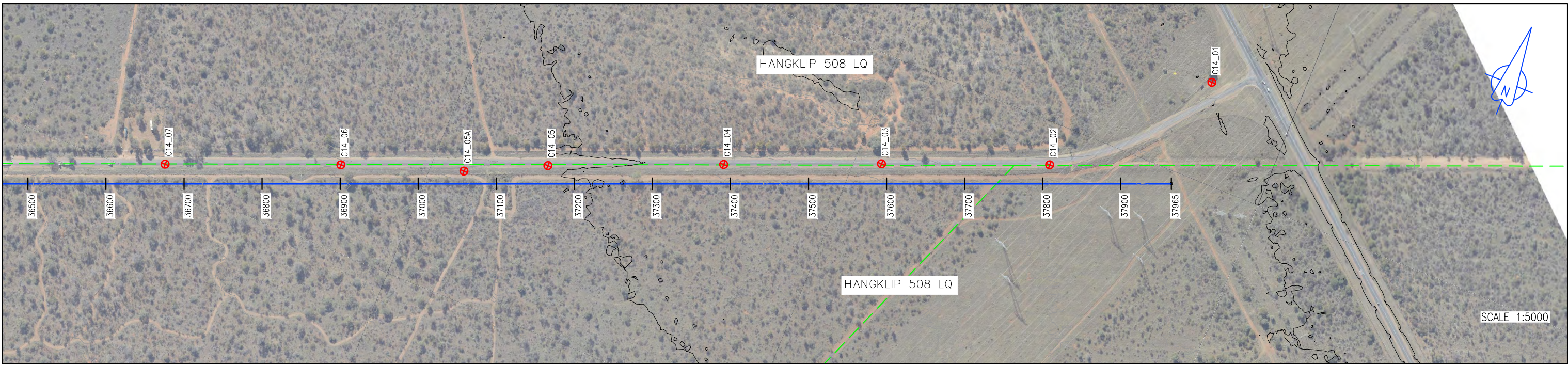
SEE TEST PIT DATA (ANNEXURE A) FOR SPECIFIC INFORMATION ON SUBSURFACE CONDITIONS

CHAINAGE (m)
REFUSAL DEPTH RANGE (mm)
GEOLOGY

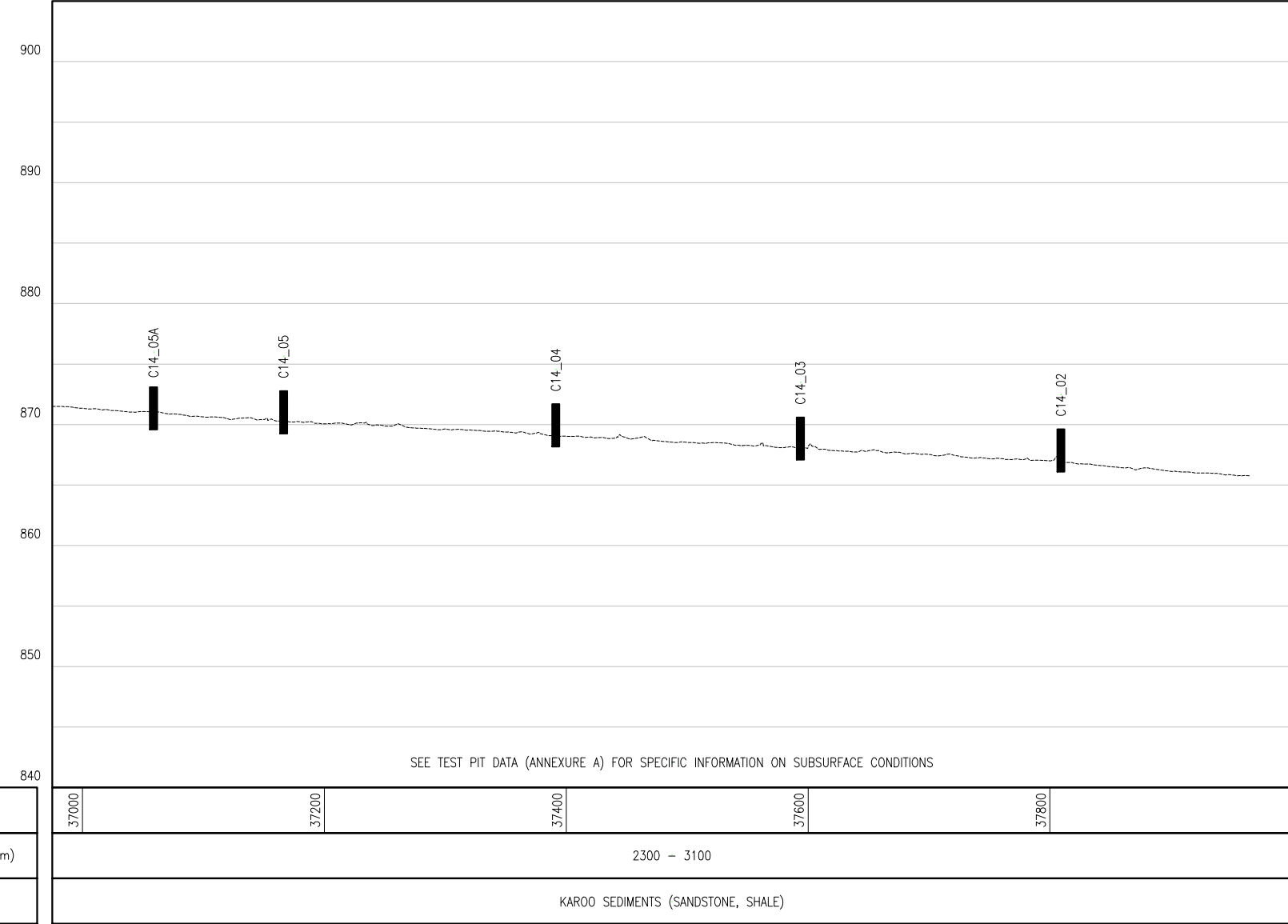
35600	35800	36000	36150	36200	36400	36600	36800
1200 - 4000					2300 - 3100		
KAROO SEDIMENTS (SANDSTONE, SHALE)							

LEGEND:	
	CHAINAGE MARKER (PLAN ONLY)
	POINT OF INTERSECTION (PI)
	TEST PIT
	BOREHOLE
	PIPELINE
	OVERHEAD POWERLINE
	FARM BOUNDARY
	FARM PORTION BOUNDARY
	CROSSING - SURFACED ROAD
	CROSSING - GRAVEL ROAD
	CROSSING - PRIVATE DIRT ROAD
	CROSSING - POWERLINE
	AREA OF INTERMITTENT OUTCROP
	AREA OF OUTCROP
	AREA OF IMPEDED DRAINAGE
	POTENTIAL BORROW PIT
	EXISTING BORROW PIT / SPOIL SITE

REFERENCE DRAWINGS			REVISIONS			DESIGNED:		PROJECT ENGINEER:	P LE ROUX		MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)	
DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:			GEOTECHNICAL PROFILE STAGE 4: STEENBOKPAN TO MATIMBA	
		A	24/02/11	FOR INFORMATION		CHECKED:	J MULDER	SCALE:	AS SHOWN		PLAN & LONG SECTION	
						CHIEF DESIGNER:	E SERFONTEIN					
						SCALE: 1:500	0 2,5 5 10 15 20 25			A3	DWAF DRG. No.	DRAWING NUMBER
						SCALE: 1:5000	0 25 50 100 150 200 250					
											2E - G7 - 088	REV No. A



SCALE 1:5000






SCALE HOR 1:5000
VERT 1:500

CHAINAGE (m)
REFUSAL DEPTH RANGE (mm)
GEOLOGY

37000	37200	37400	37600	37800
2300 - 3100				
KAROO SEDIMENTS (SANDSTONE, SHALE)				

LEGEND:

- CHAINAGE MARKER (PLAN ONLY)
- POINT OF INTERSECTION (PI)
- TEST PIT
- BOREHOLE
- PIPELINE
- OVERHEAD POWERLINE
- FARM BOUNDARY
- FARM PORTION BOUNDARY
- CROSSING - SURFACED ROAD
- CROSSING - GRAVEL ROAD
- CROSSING - PRIVATE DIRT ROAD
- CROSSING - POWERLINE
- AREA OF INTERMITTENT OUTCROP
- AREA OF OUTCROP
- AREA OF IMPEDED DRAINAGE
- POTENTIAL BORROW PIT
- EXISTING BORROW PIT / SPOIL SITE

REFERENCE DRAWINGS		REVISIONS				DESIGNED:		PROJECT ENGINEER:	P LE ROUX		MOKOLO CROCODILE WATER AUGMENTATION PROJECT (MCWAP)			
DRG. No.	TITLE	REV No.	DATE	DESCRIPTION	APPR.	DRAWN:	N JORDAAN	TCTA:			GEOTECHNICAL PROFILE STAGE 4: STEENBOKPAN TO MATIMBA			
		A	24/02/11	FOR INFORMATION		CHECKED:	J MULDER				PLAN & LONG SECTION			
						CHIEF DESIGNER:	E SERFONTEIN	SCALE:	AS SHOWN			DWAF	DRAWING	REV N
						<div>SCALE: 1:500 0 2,5 5 10 15 20 25</div> <div>SCALE: 1:5000 0 25 50 100 150 200 250</div>						DRG. No.	NUMBER	A
												2E - G7 - 089		