

APPENDIX A: MAPS AND COORDINATES

1. COORDINATES OF THE PROPOSED 132KV OVERHEAD DISTRIBUTION LINES FOR RIETKLOOF WIND ENERGY FACILITY

A. COORDINATES OF 33/132kV SUBSTATION POSITIONS

Table A: Coordinates of the proposed onsite 33/132kV substations

Alternative	Latitude	Longitude
Alternative 5 (preferred alternative)		
Centre point	-33.02480	20.50275
Corner point 1	-33.02401	20.50213
Corner point 2	-33.02425	20.50371
Corner point 3	-33.02558	20.50341
Corner point 4	-33.02534	20.50183
Alternative 6		
Centre point	-33.04088	20.50372
Corner point 1	-33.03995	20.50320
Corner point 2	-33.04004	20.50424
Corner point 3	-33.04181	20.50436
Corner point 4	-33.04171	20.50308
Central hub substation		
Centre point	-32.98874	20.48932
Corner point 1	-32.98784	20.48823
Corner point 2	-32.98783	20.49037
Corner point 3	-32.98963	20.49039
Corner point 4	-32.98965	20.48825

B. COORDINATES OF OVERHEAD 132KV DISTRIBUTION LINES

Table B: Connection to Bon Espirange Substation

200m corridor from substation 5 to Bon Espirange substation Preferred Alternative (Alternative A1: 5A+A1b+A2) 13.845km in length	Latitude	Longitude
Start	-33.02483	20.50273
Bend point 1	-32.99702	20.50895
Middle	-32.96472	20.49543
Bend point 2	-32.95701	20.49210
Bend point 3	-32.94704	20.49652
Bend point 4	-32.94667	20.49874
Bend point 5	-32.94592	20.49895
Bend point 6	-32.94348	20.51345
End	-32.91996	20.53532
200m corridor from substation 6 to Bon Espirange substation (Alternative A2: 6A+A1a+A2) 14.355km in length	Latitude	Longitude
Start	-33.04089	20.50398
Bend point 1	-33.03668	20.50577
Bend point 2	-32.99702	20.50895

Middle	-32.97687	20.50782
Bend point 3	-32.96967	20.50744
Bend point 4	-32.96556	20.51242
Bend point 5	-32.96497	20.51670
Bend point 6	-32.96174	20.52165
Bend point 7	-32.92909	20.52665
End	-32.91991	20.53535

Table C: Connection to Komsberg Substation

200m corridor from substation 5 to Komsberg substation (Alternative B1: 5B+B1) 15.72km in length	Latitude	Longitude
Start	-33.02464	20.50276
Bend point 1	-32.98899	20.55455
Middle	-32.97857	20.55288
Bend point 2	-32.95093	20.54816
Bend point 3	-32.94908	20.54949
Bend point 4	-32.94856	20.55276
Bend point 5	-32.93682	20.58975
Bend point 6	-32.93642	20.59658
End	-32.93301	20.59565
200m corridor from substation 6 to Komsberg substation (Alternative B2: 6B+B1) 16.958km in length	Latitude	Longitude
Start	-33.04077	20.50387
Bend point 1	-33.02192	20.51565
Bend point 2	-32.98898	20.55457
Middle	-32.98086	20.55318
Bend point 3	-32.95093	20.54816
Bend point 4	-32.94908	20.54949
Bend point 5	-32.94856	20.55276
Bend point 6	-32.93682	20.58975
Bend point 7	-32.93642	20.59658
End	-32.93301	20.59565

Tbale D: Connection via central hub substation

200m corridor from substation 5 via Central Hub substation to Bon Espirange substation or Komsberg substation	Latitude	Longitude
Alternative 5C 4,607km in length		
Start	-33.02478	20.50203
Bend point 1	-33.02226	20.49719
Middle	-33.00571	20.49188
Bend point 2	-32.98894	20.48621
End at Central hub substation	-32.98883	20.48915

Alternative CH1A 5,785km in length		
Start at Central hub substation	-32.98883	20.48915
Bend point 1	-32.98827	20.48784
Bend point 2	-32.98603	20.48784
Middle	-32.96721	20.49989
Bend point 3	-32.95593	20.50724
End	-32.95322	20.52403
Alternative CH2a 4.864km in length		
Start	-32.95322	20.52403
Bend point 1	-32.94662	20.52600
Middle	-32.93442	20.52640
Bend point 2	-32.92903	20.52667
End at Bon Espirange	-32.92903	20.52667
Alternative 6C 6.220km in length		
Start	-33.04073	20.50374
Bend point 1	-33.03796	20.50064
Middle	-33.01406	20.49357
Bend point 2	-32.98893	20.48619
End at Central hub substation	-32.98891	20.48922
Alternative CH1B 5.904km in length		
Start at Central hub substation	-32.98828	20.48912
Bend point 1	-32.98844	20.48796
Bend point 2	-32.98601	20.48794
Middle	-32.96965	20.50767
Bend point 3	-32.96559	20.51239
Bend point 4	-32.96497	20.51669
Bend point 5	-32.96178	20.52160
End	-32.95229	20.52973
Alternative CH2b 7.373km in length		
Start	-32.95320	20.52406
Bend point 1	-32.94858	20.55272
Middle	-32.94579	20.56147
Bend point 2	-32.93682	20.58975
Bend point 3	-32.93642	20.59658
Bend point 4	-32.93565	20.59707
End at Komsberg	-32.93390	20.59639

2. LOCALITY MAP

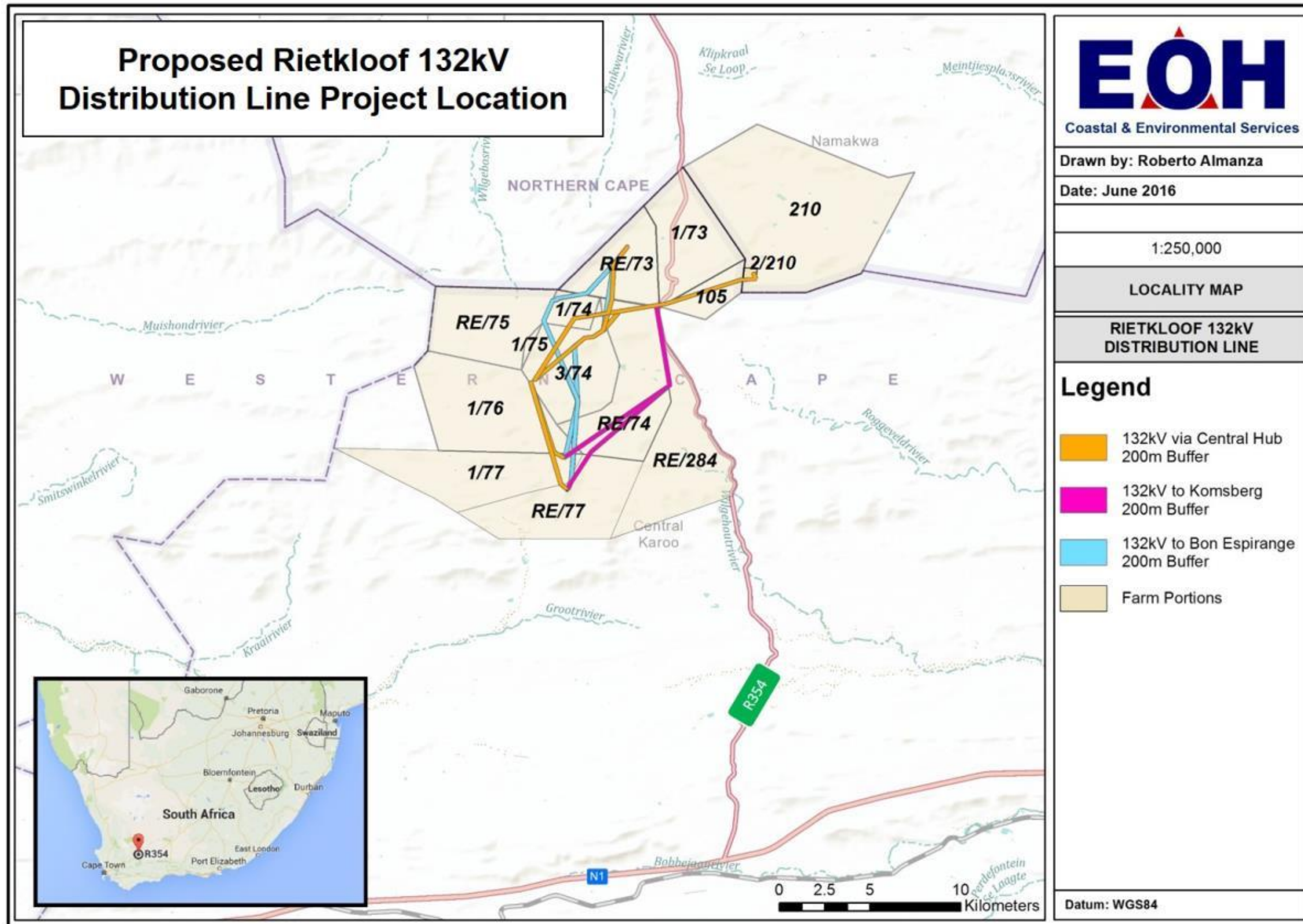


Figure 1: Project locality map, indicating the general location of the project study area, and the three substation alternatives. The property portions included in this application include all distribution lines and onsite substation alternatives

3. INITIAL PRELIMINARY LAYOUT (INCLUDING ALL SEVEN ONSITE SUBSTATION POSITIONS AND GRID CONNECTION OPTIONS AS ASSESSED BY SPECIALISTS)

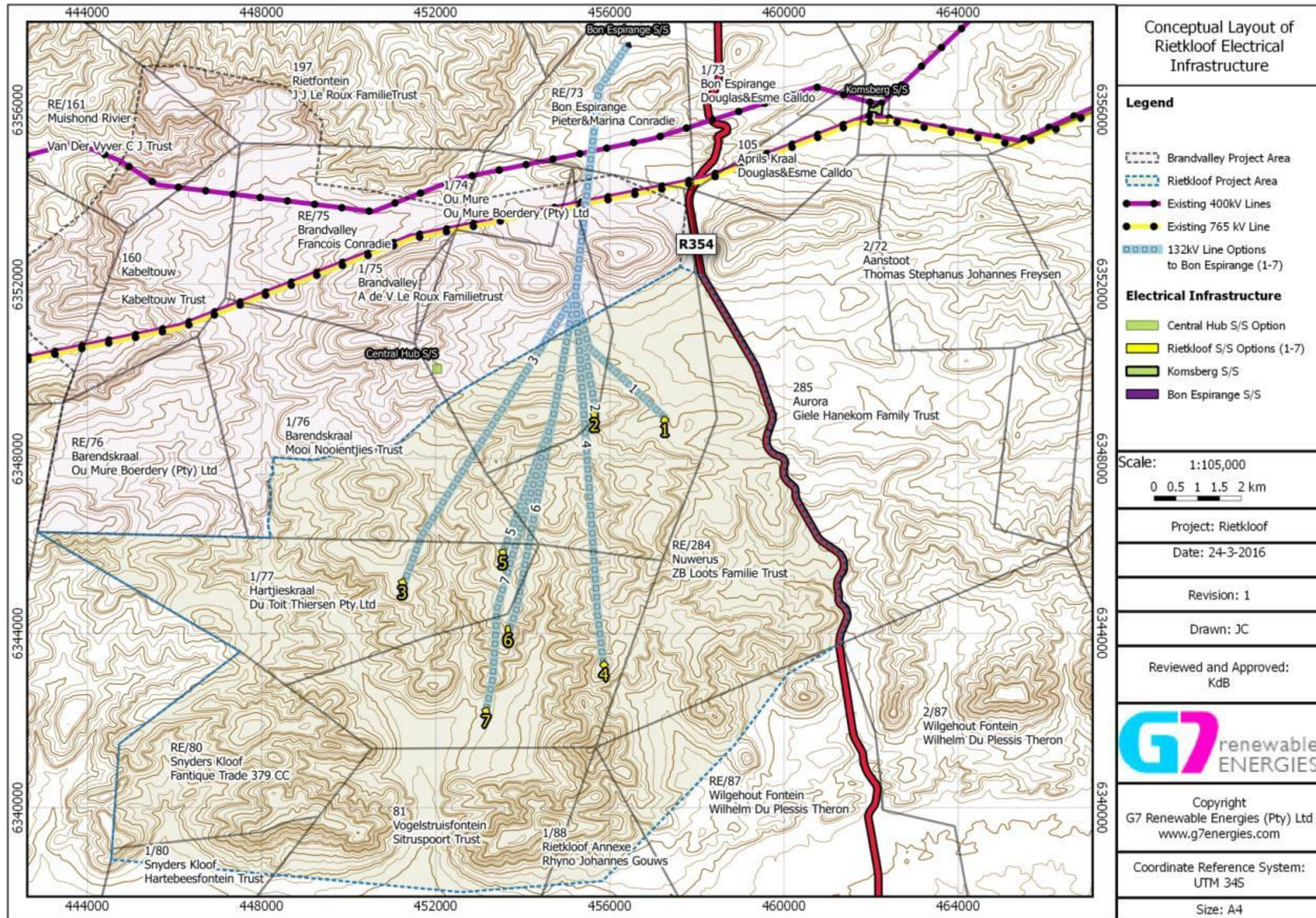


Figure 2: Preliminary layout proposed to connect to Bon Espirance Substation

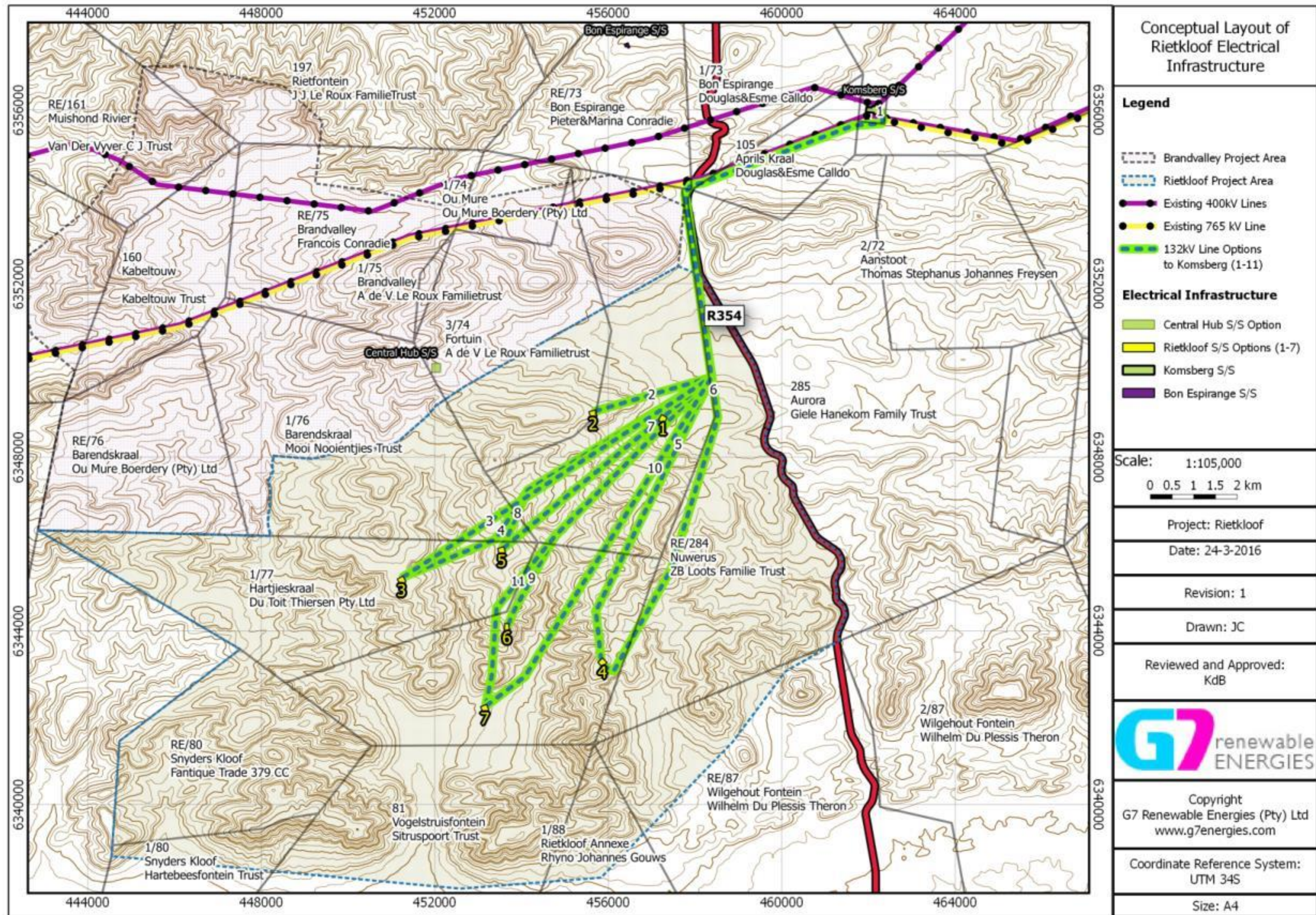


Figure 3: Preliminary layout proposed to connect to Komsberg Substation

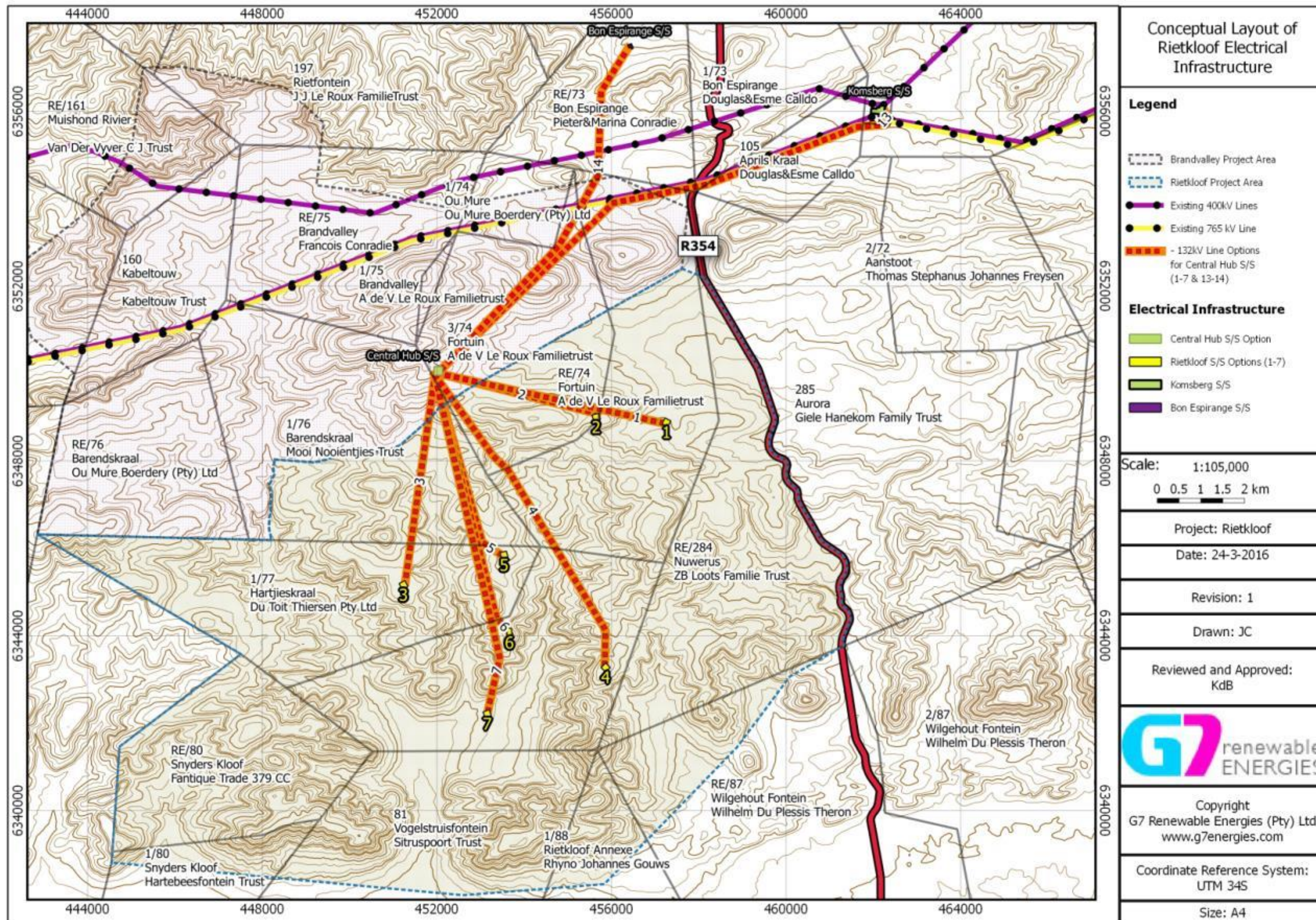


Figure 4: Preliminary layout proposed to connect to Bon Espirance or Komsberg Substation via the central hub substation

4. SCREENED LAYOUT ELIMINATING SUBSTATION POSITIONS 1, 2, 3, 4 and 7

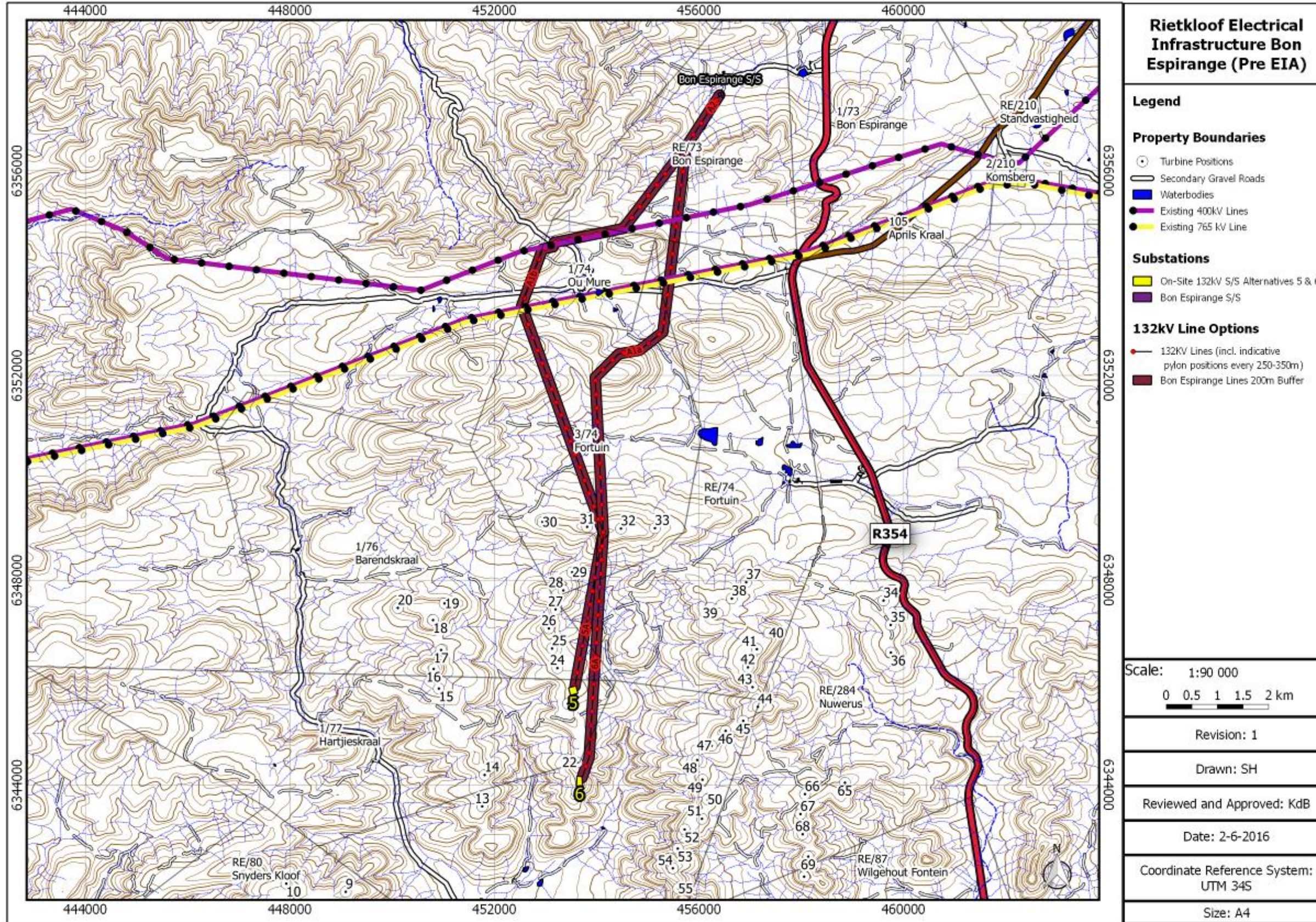


Figure 5: Proposed 132KV distribution line to connect to Bon Espirange Substation (pre-EIA)

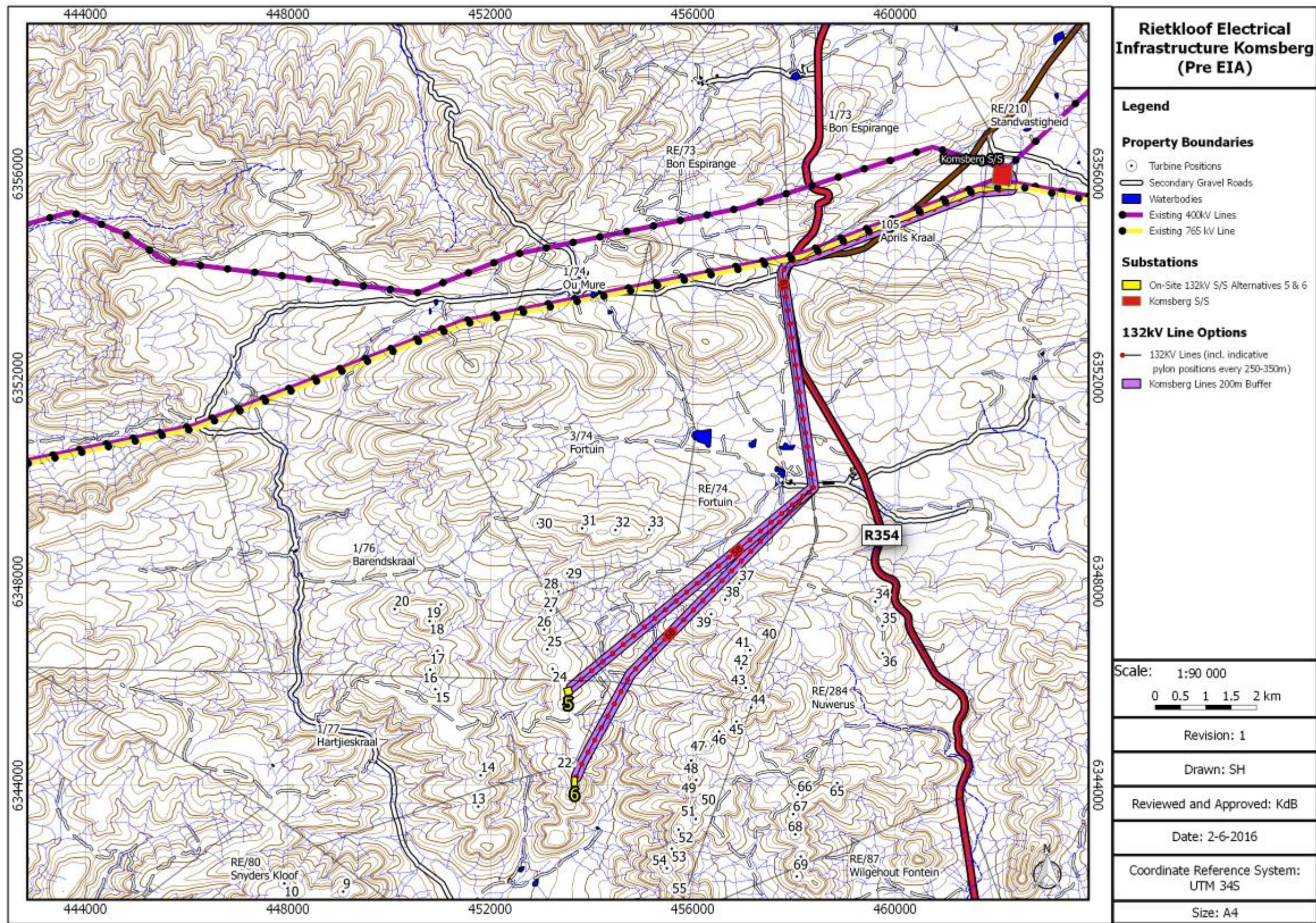


Figure 6: Proposed 132KV distribution line to connect to Komsberg Substation (pre-EIA)

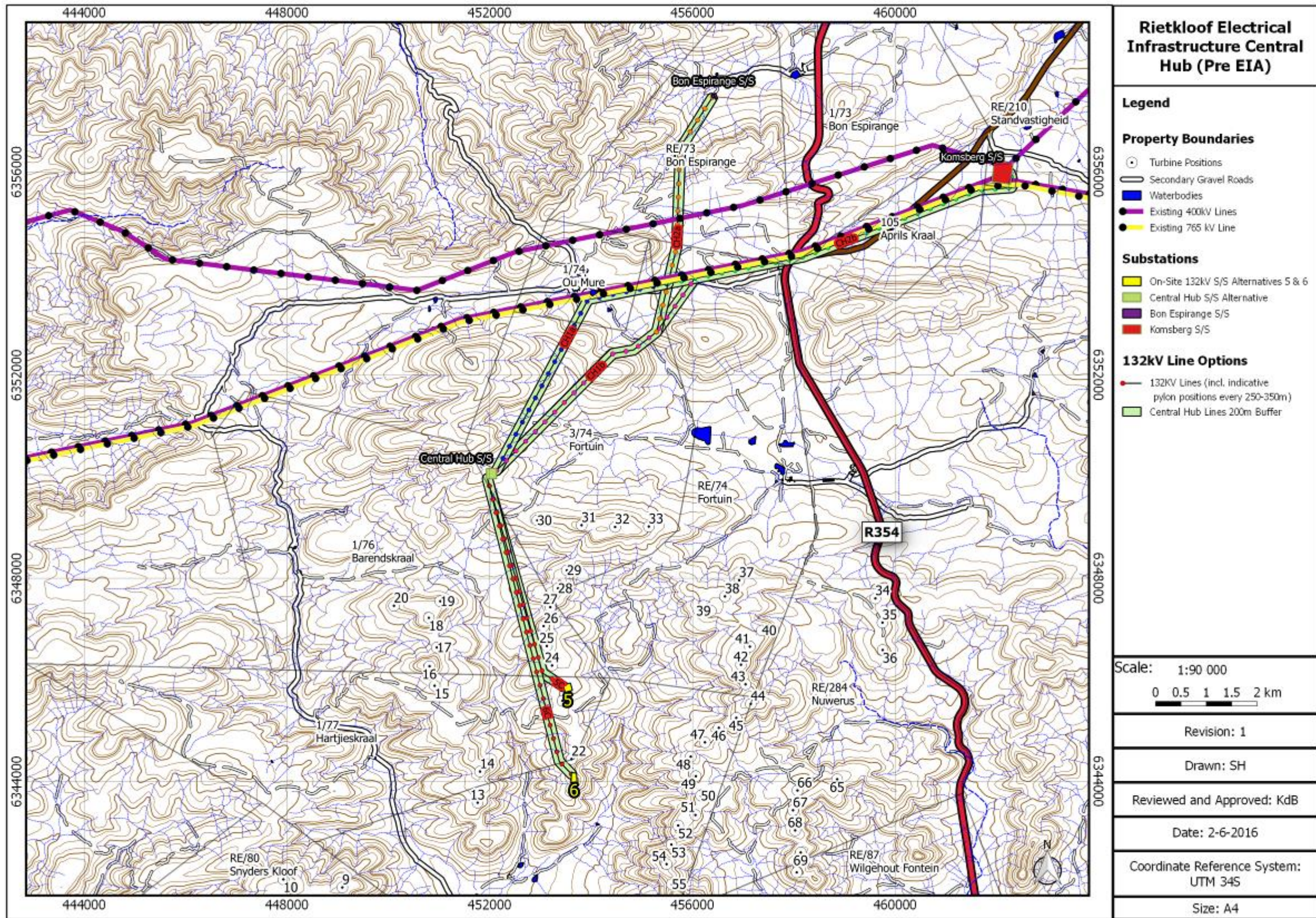


Figure 7: Proposed 132KV distribution line to connect to Bon Espirance or Komsberg Substation via the central hub substation (pre-EIA)

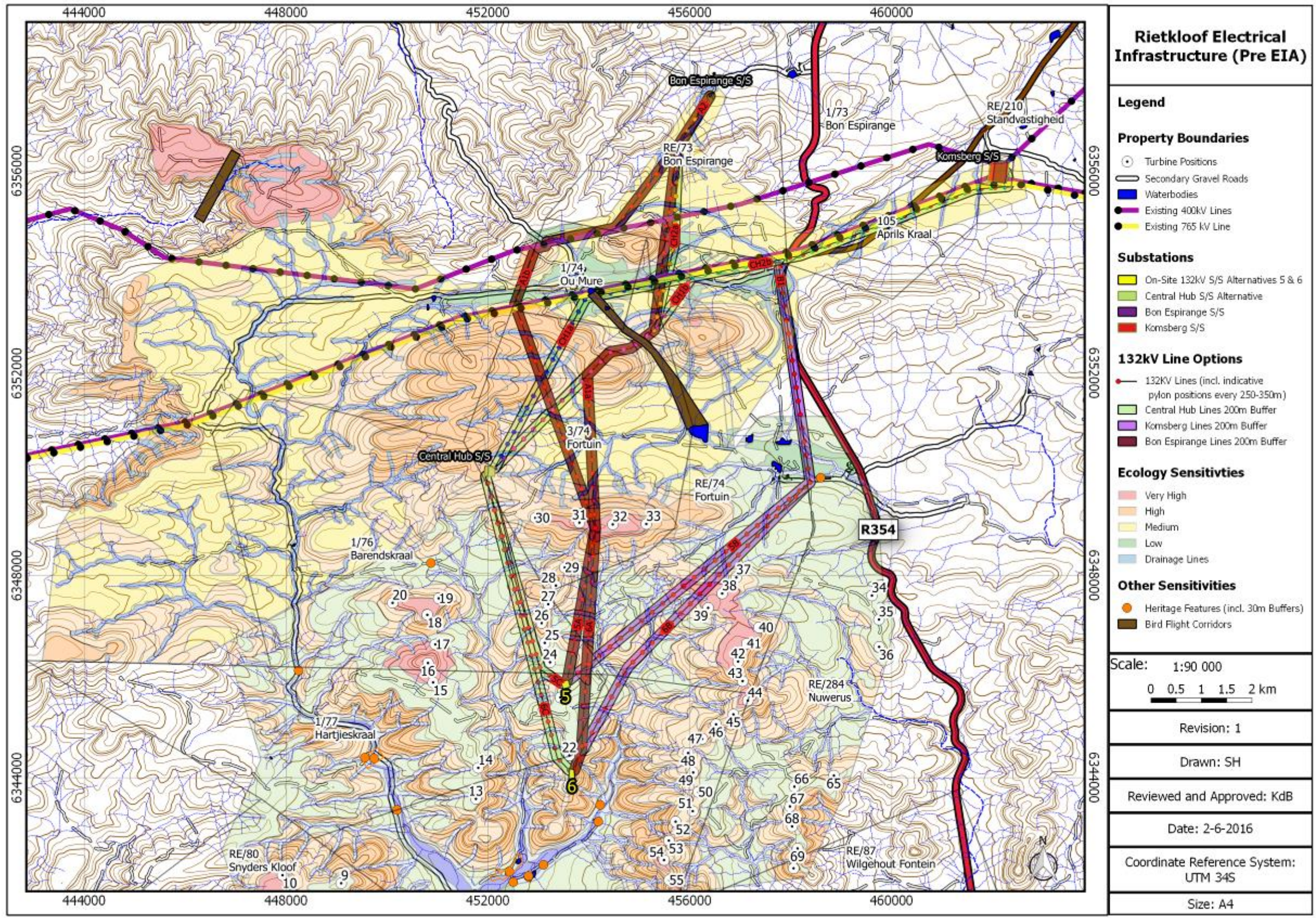


Figure 8: Proposed 132KV distribution line to connect to Komsberg Substation, Bon Espirange Substation and Central Hub Substation and environmental sensitivities (Pre-EIA layout)

5. POST EIA AMENDED LAYOUT TO AVOID SENSITIVE FEATURES

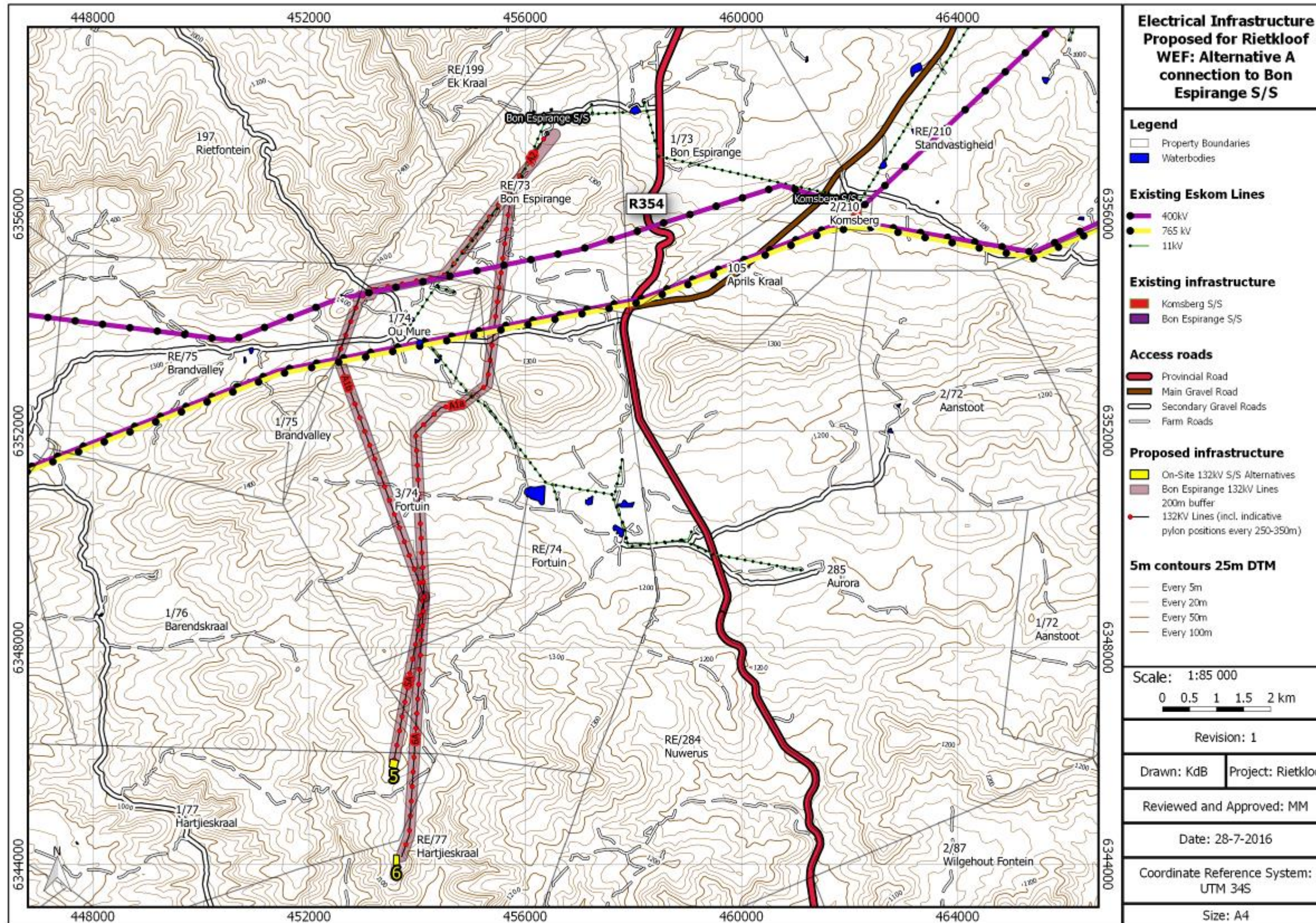


Figure 9: Proposed 132KV distribution line to connect to Bon Espirange Substation (Post-EIA layout)

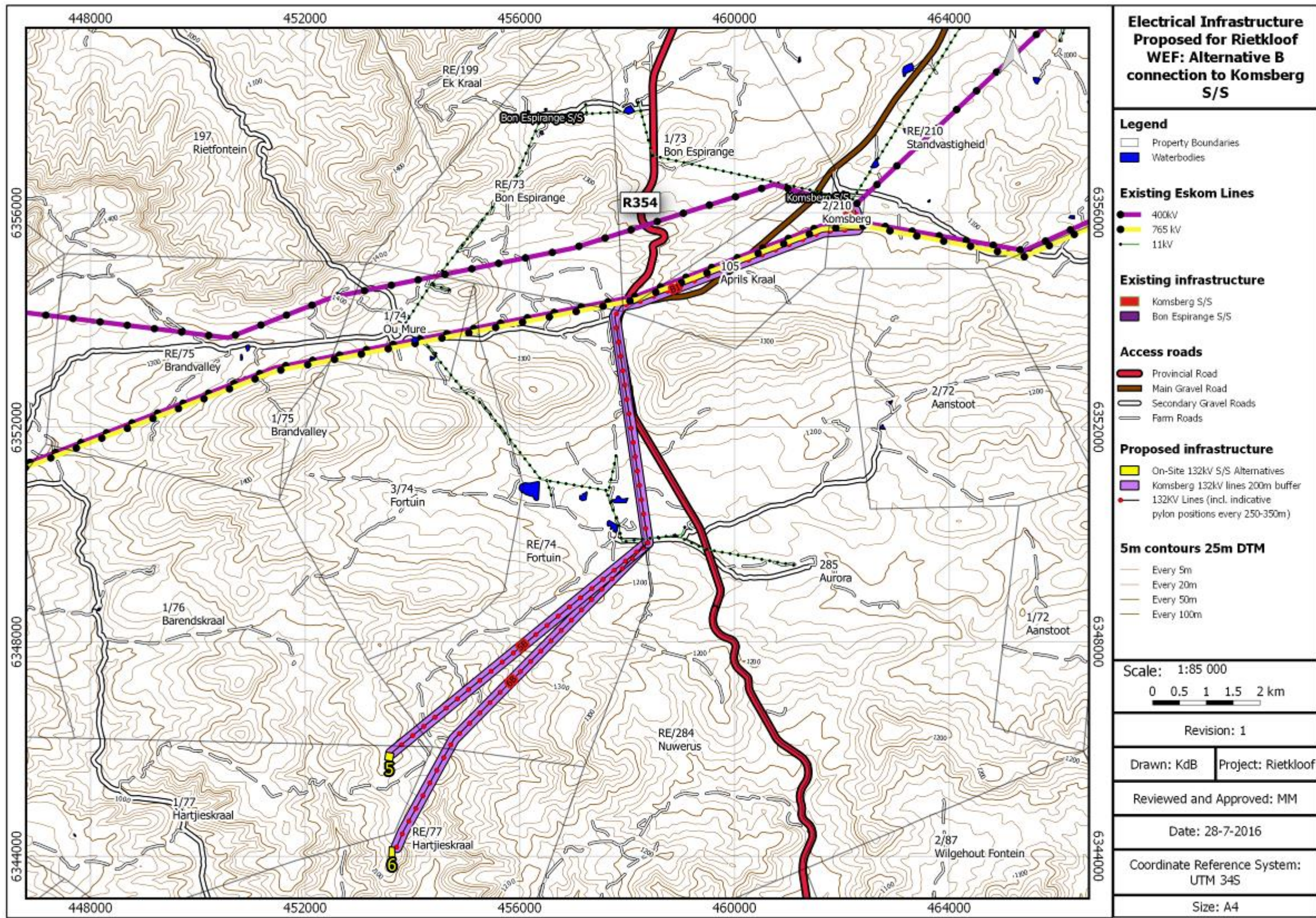


Figure 10: Proposed 132KV distribution line to connect to Komsberg Substation (Post-EIA layout)

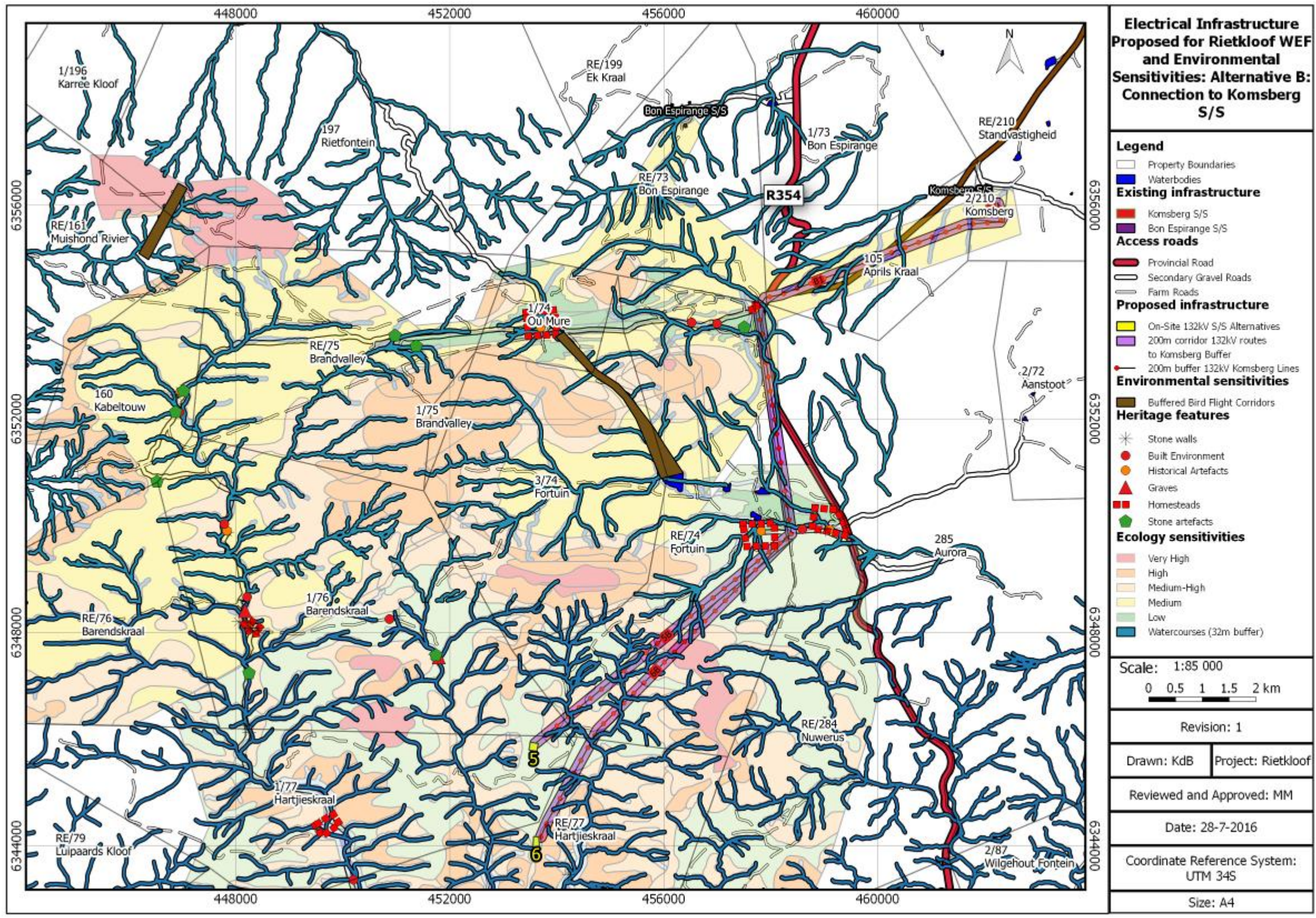


Figure 11: Proposed 132KV distribution line to connect to Komsberg Substation (Post-EIA layout) and environmental sensitivities

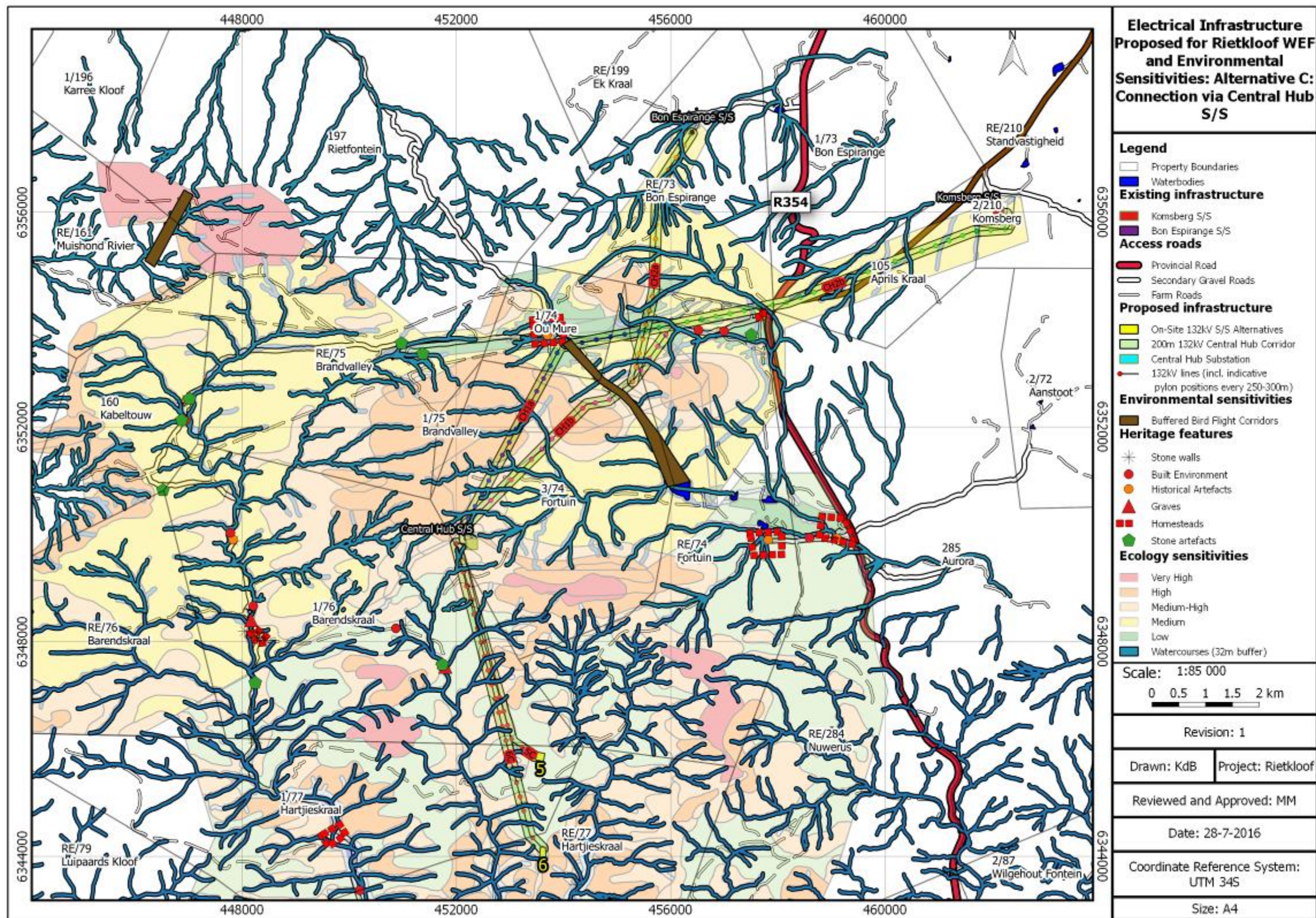


Figure 12: Proposed 132KV distribution line to connect to Komsberg Substation or Bon Espirange Substation via Central Hub Substation and environmental sensitivities (Post-EIA layout)

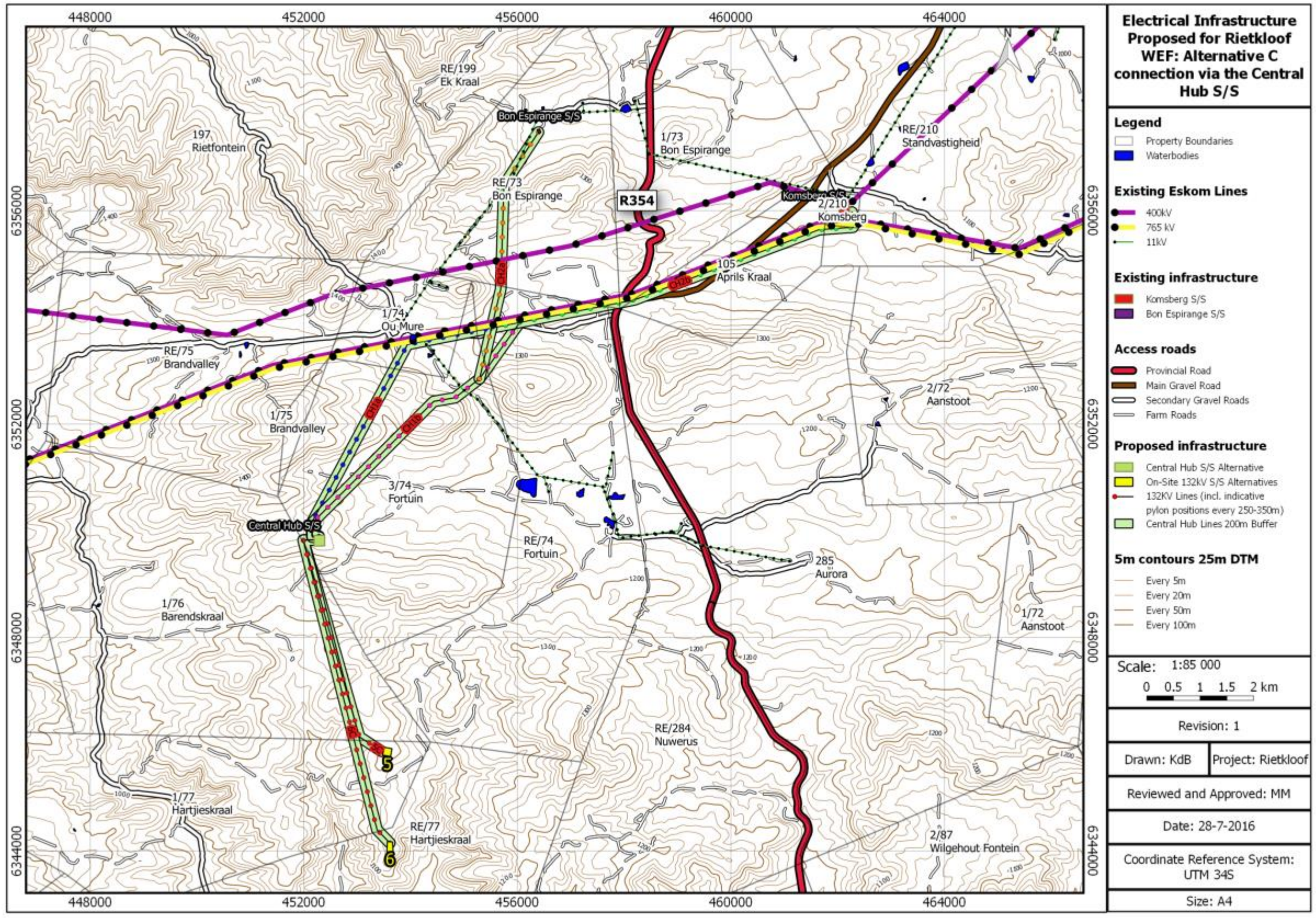


Figure 13: Proposed 132KV distribution line to connect to Komsberg Substation or Bon Espirange Substation via Central Hub Substation (Post-EIA layout)

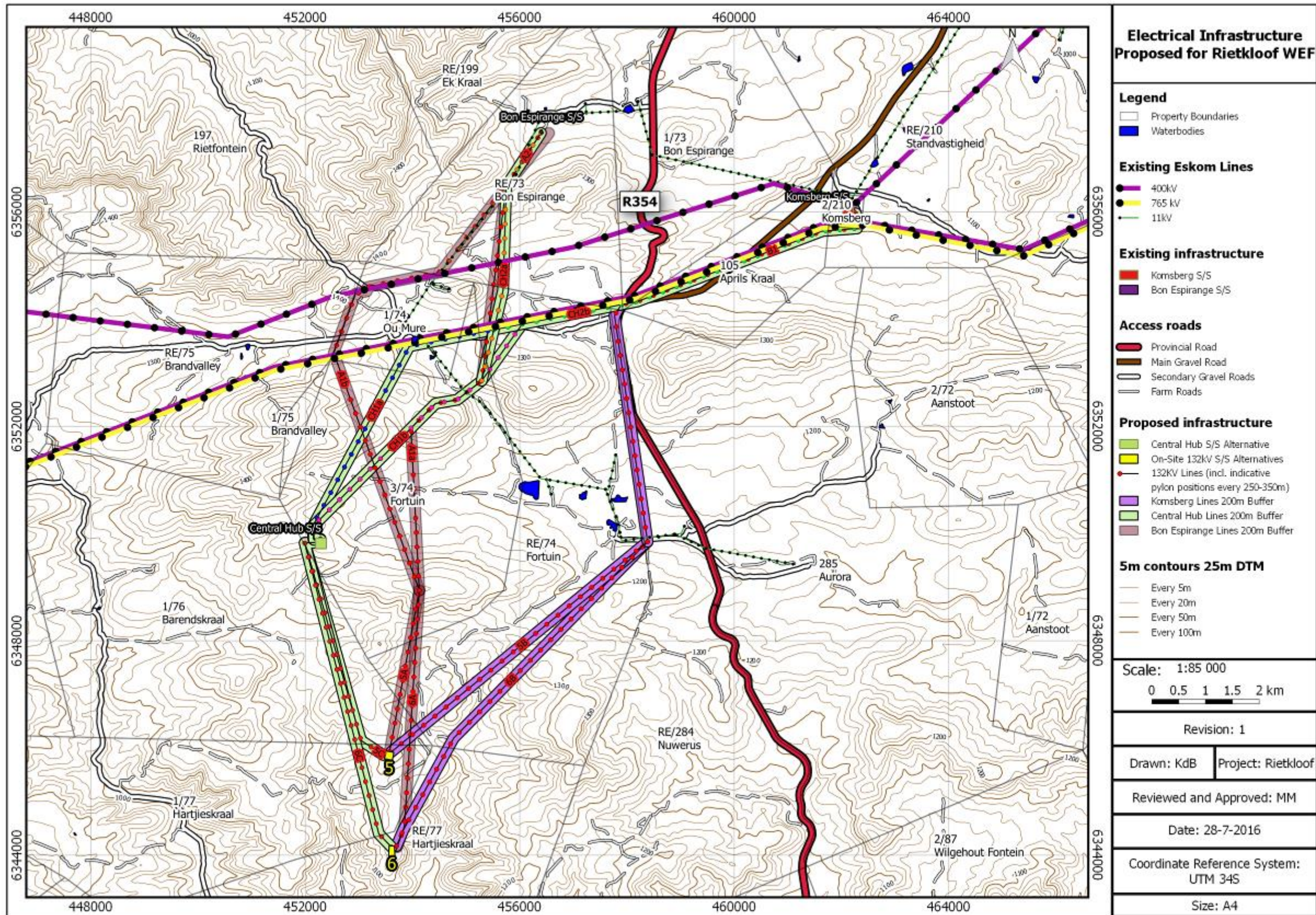


Figure 14: Proposed 132KV distribution line to connect to Komsberg Substation, Bon Espirange Substation or Central Hub Substation (Post-EIA layout)

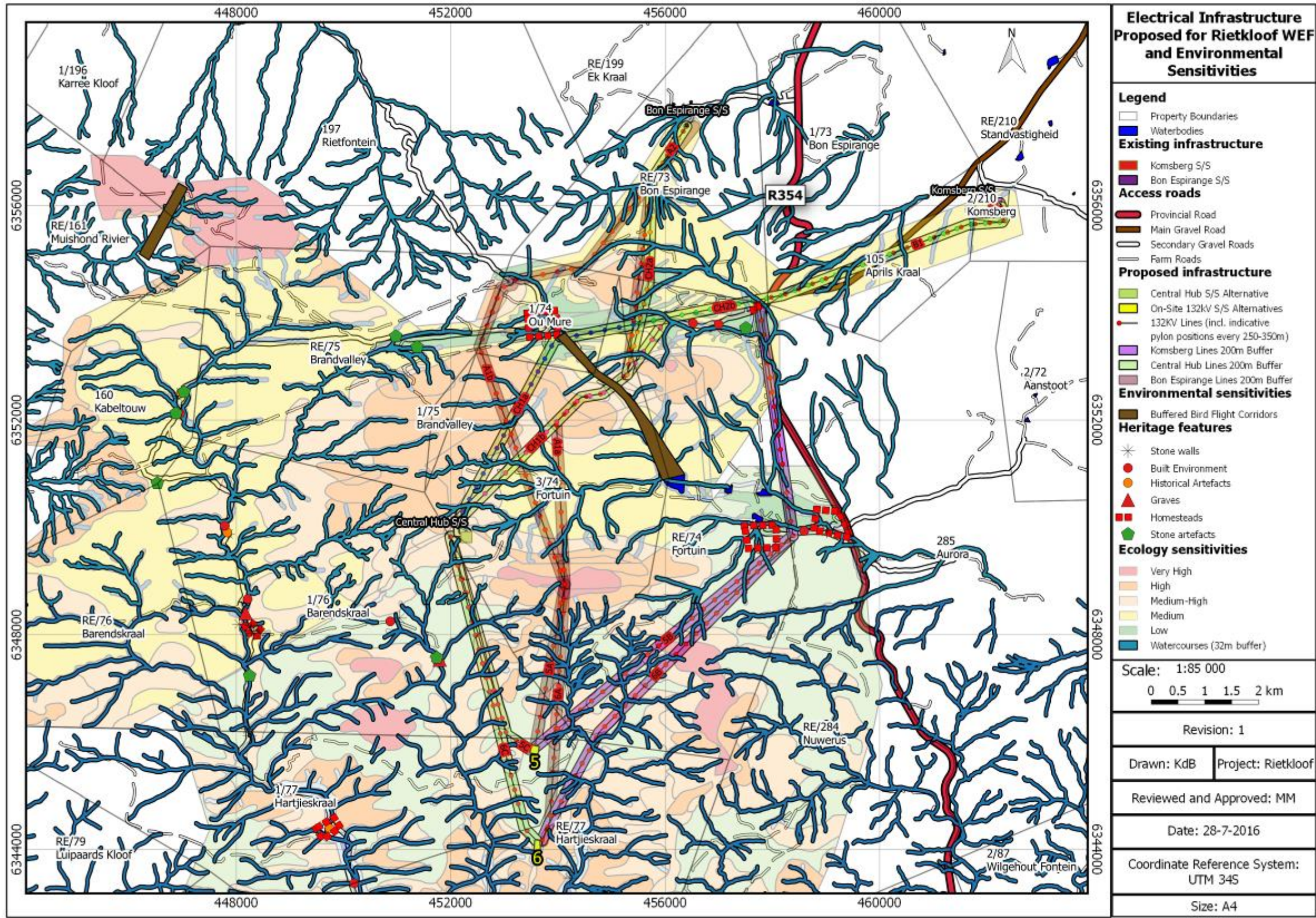


Figure 15: Proposed 132KV distribution line to connect to Komsberg Substation, Bon Espirange Substation or Central Hub Substation and environmental sensitivities (Post-EIA layout)

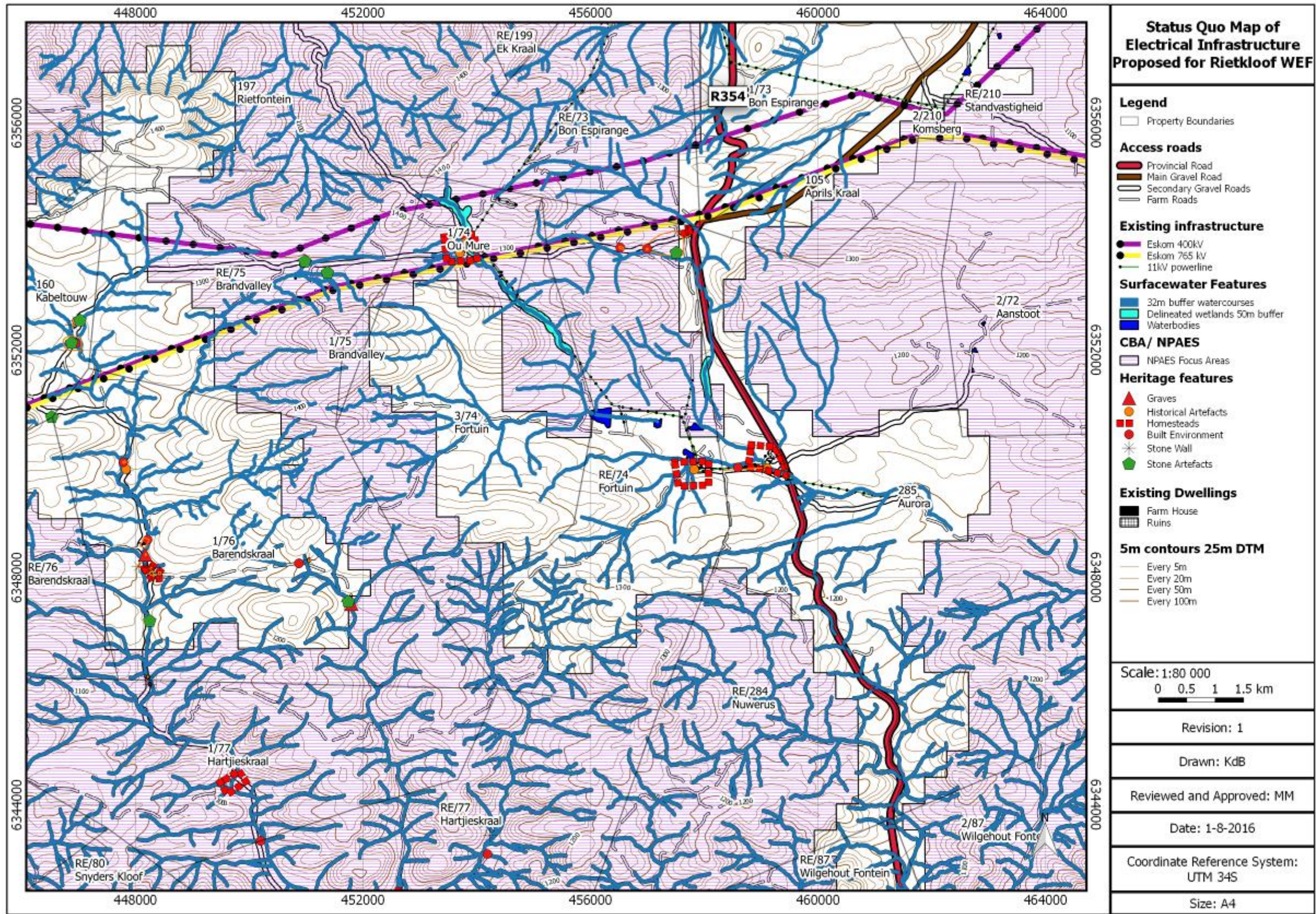


Figure 16: Status Quo Map / Regional Map

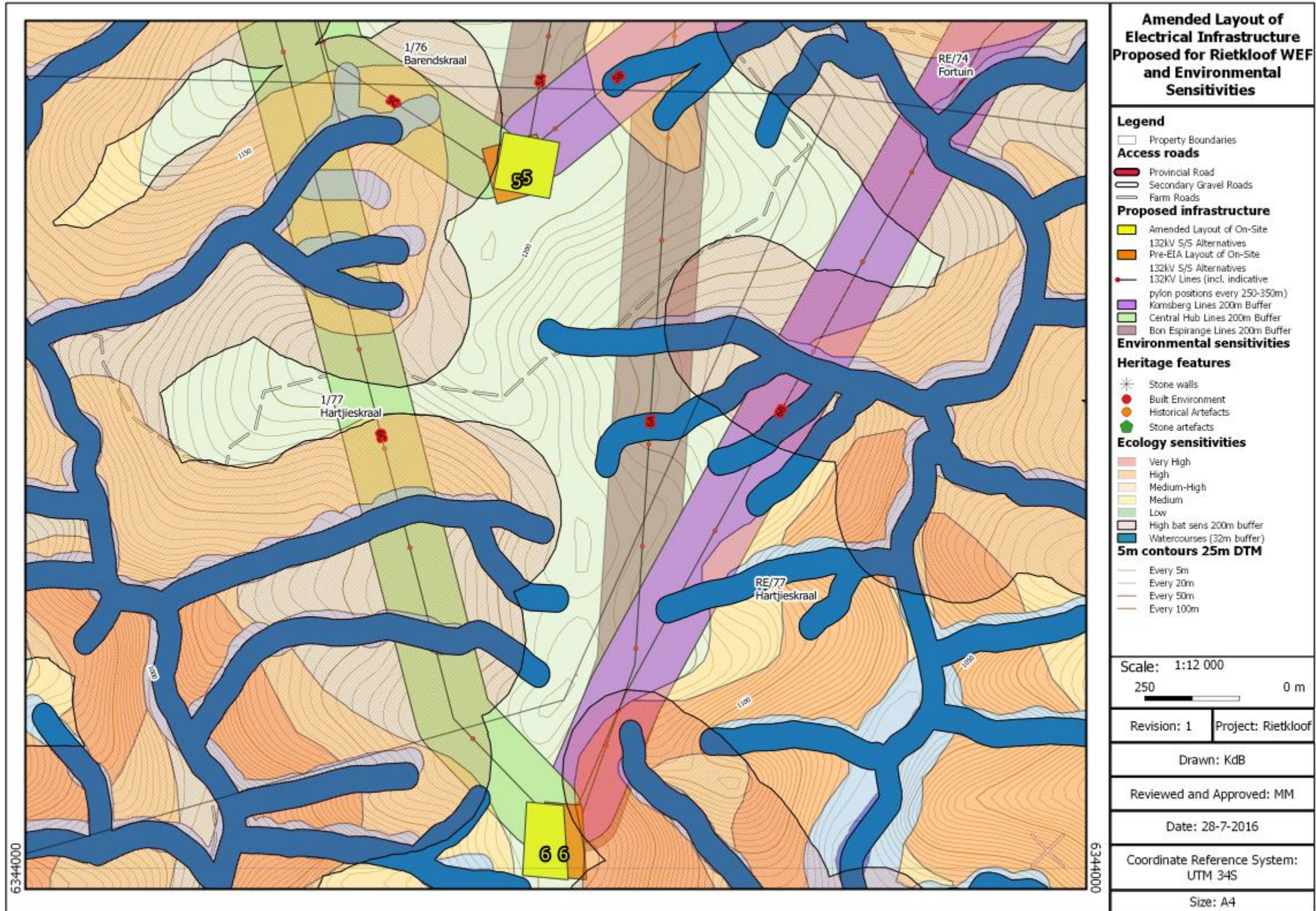


Figure 17: Post-EIA layout of the proposed 33/132kV onsite substations (orange location: pre-EIA; yellow location: post-EIA)

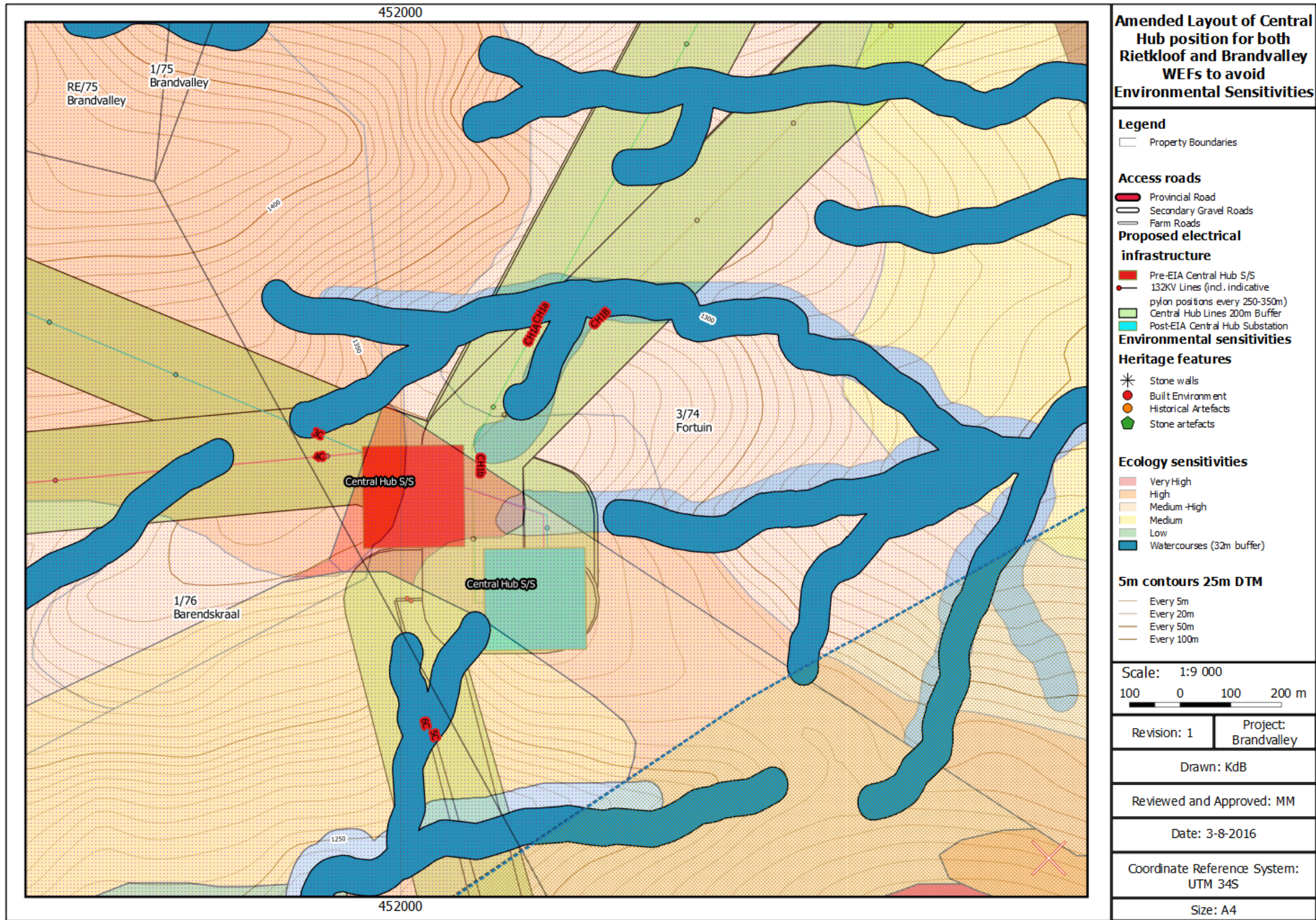


Figure 18: Post-EIA layout of the proposed onsite central hub substations (red location: pre-EIA; blue location: post-EIA)

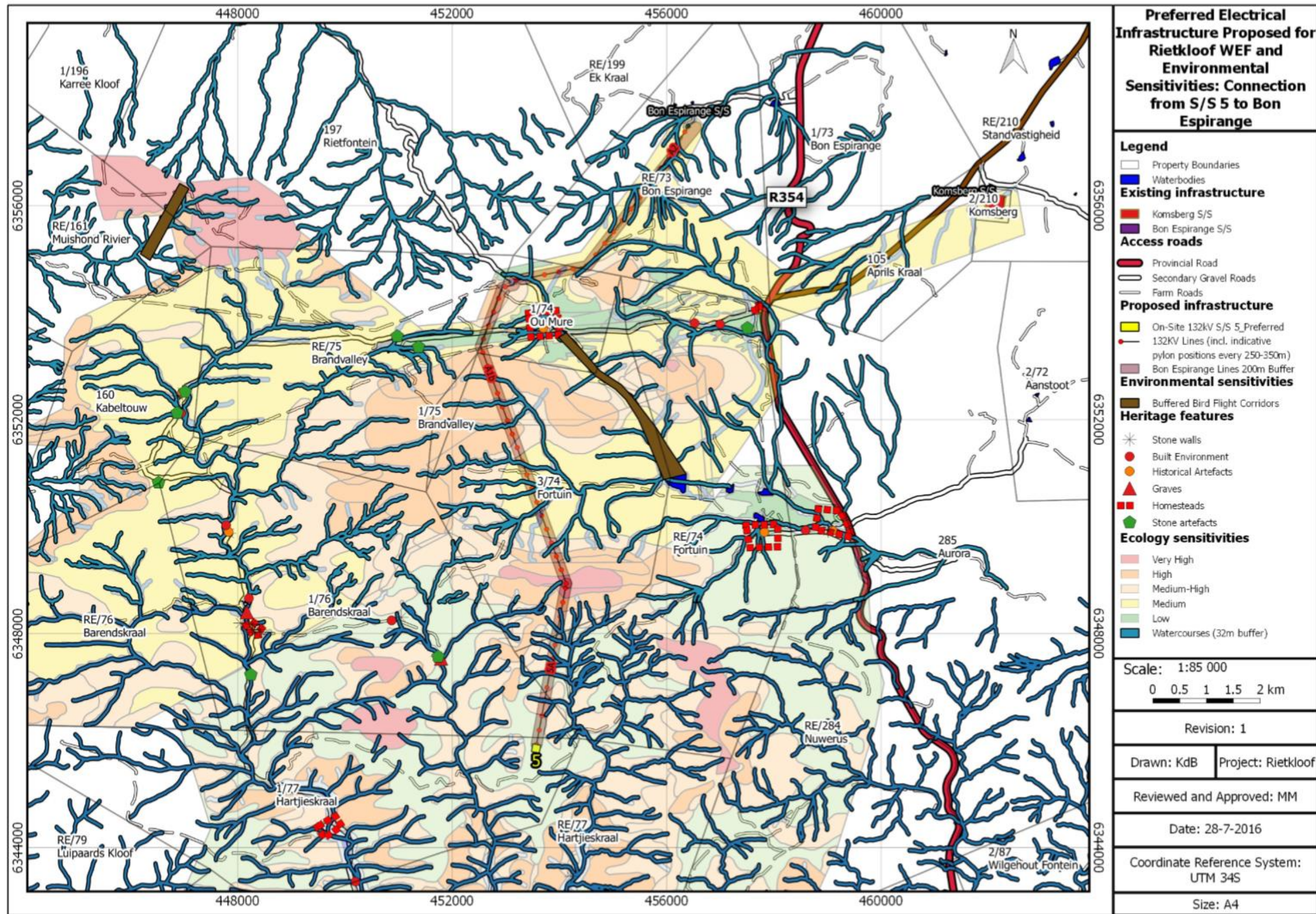


Figure 19: Preferred alternative substation 5 and 200m corridor to Bon Espirance and environmental sensitivities (Preferred layout for authorisation)

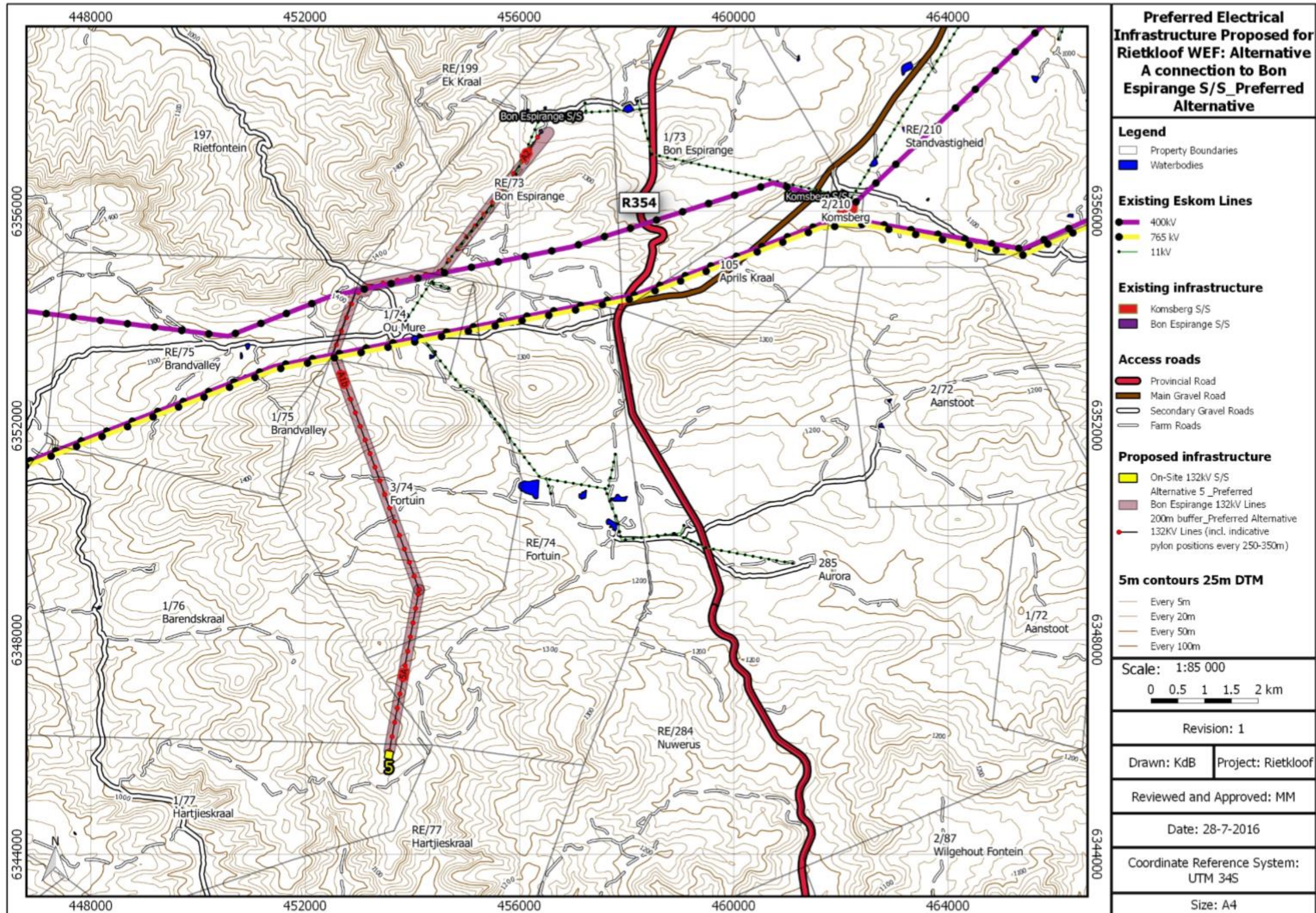


Figure 20: Preferred alternative substation 4 and 200m corridor to Bon Espirange (Preferred layout for authorisation)

6. OTHER SUPPLEMENTARY MAPS

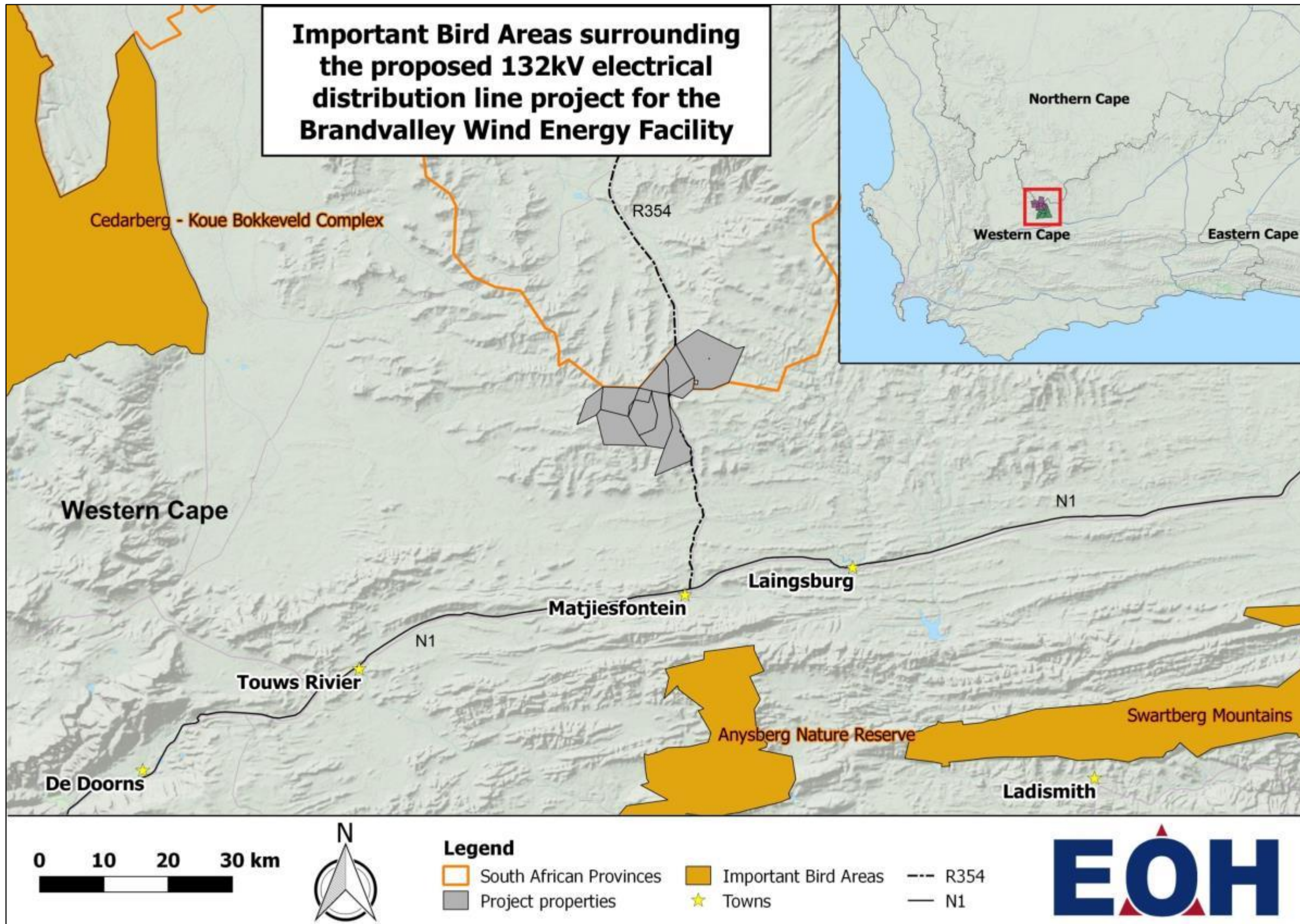


Figure 21: Important Bird Areas near the project region.

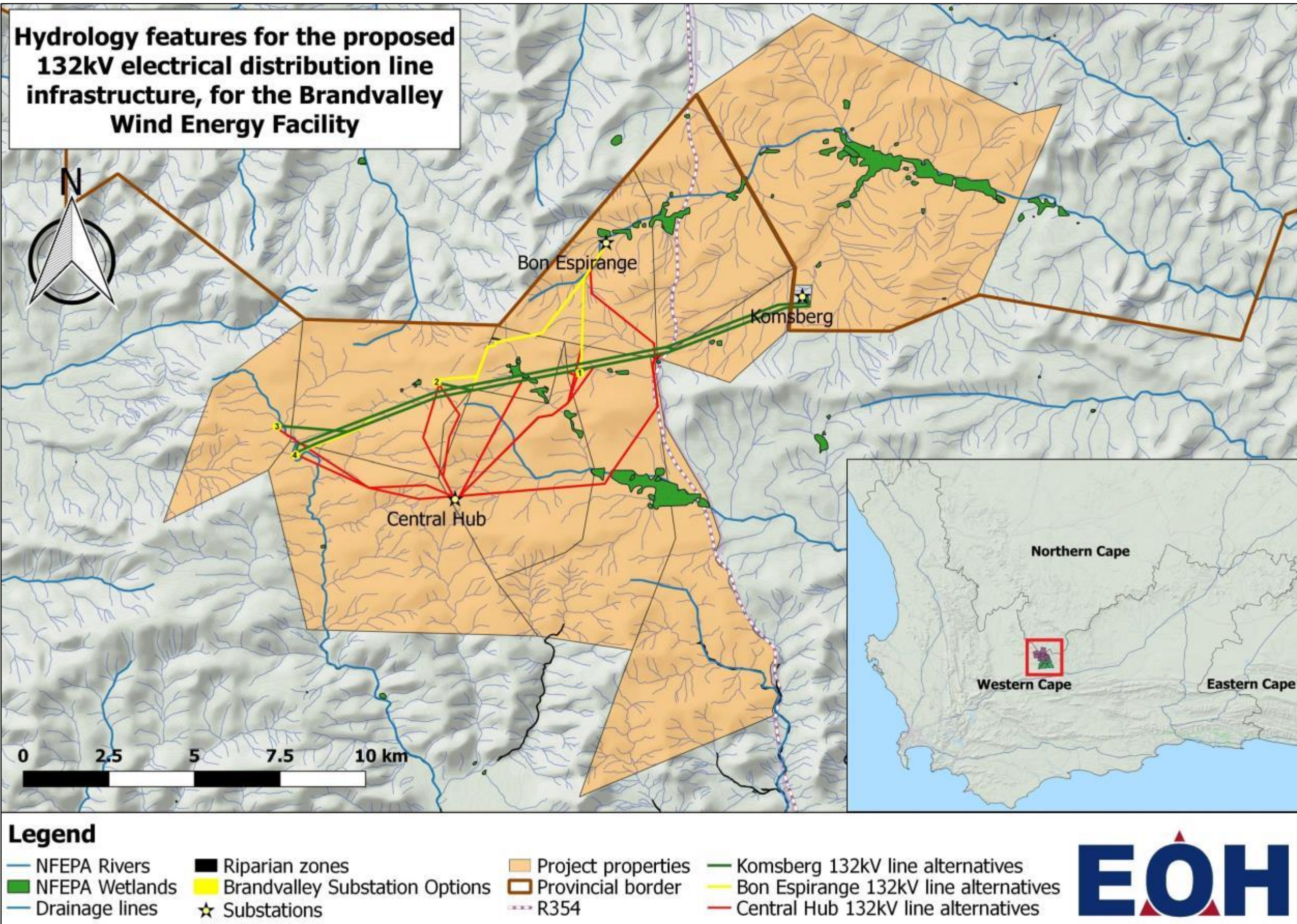


Figure 22: Hydrological features within the project region

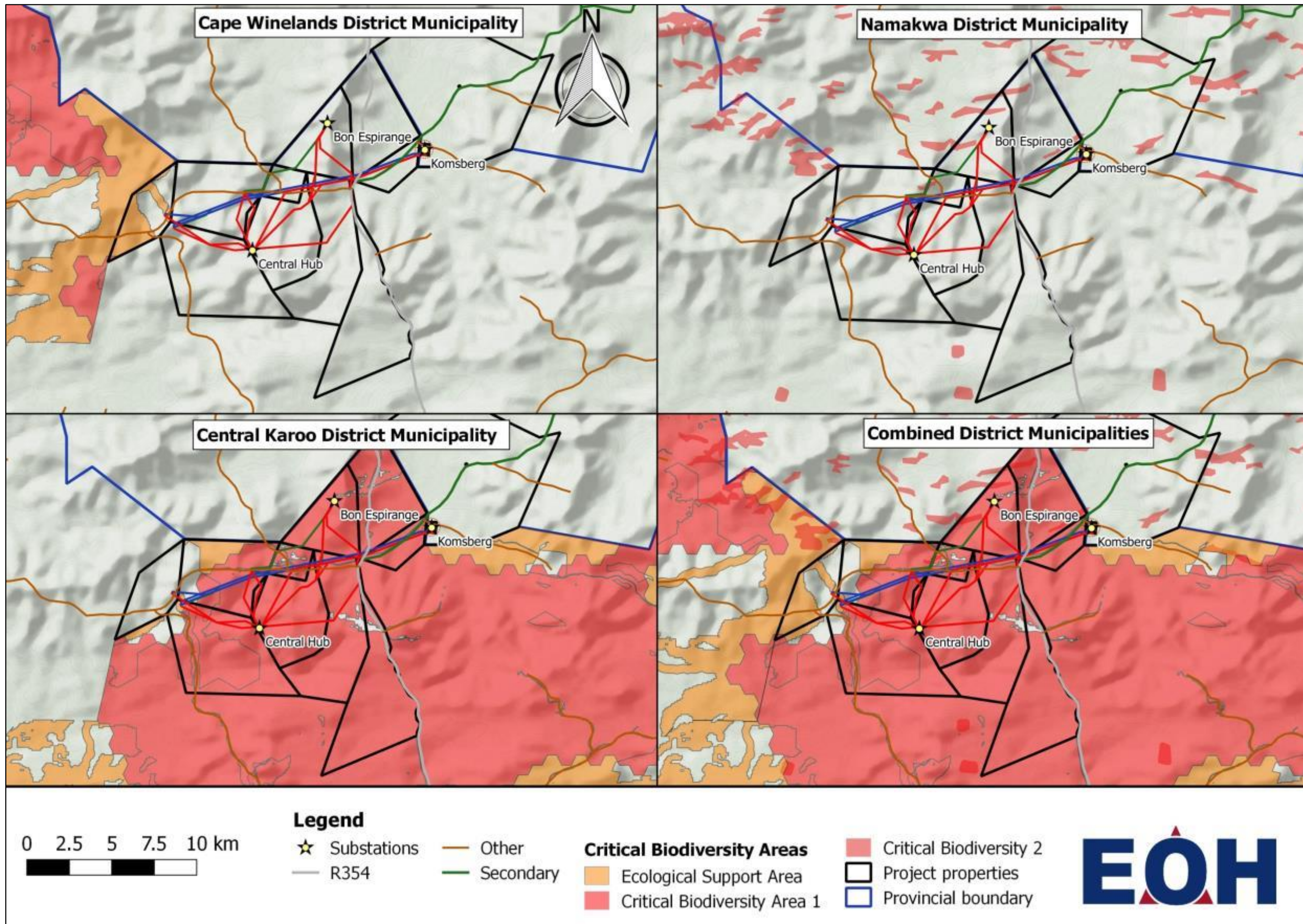


Figure 23: Critical biodiversity features within the project region

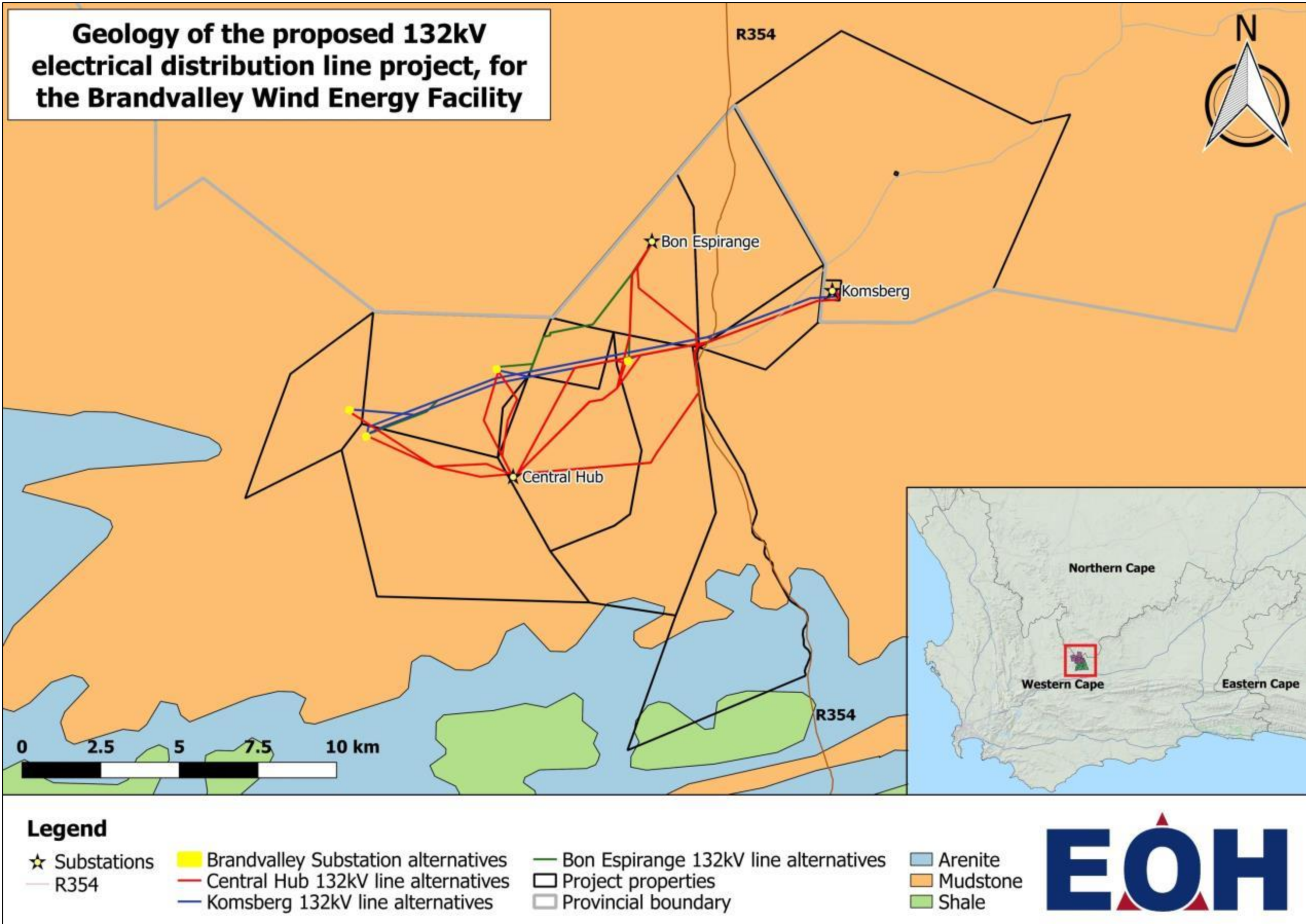


Figure 24: Geology of the project region

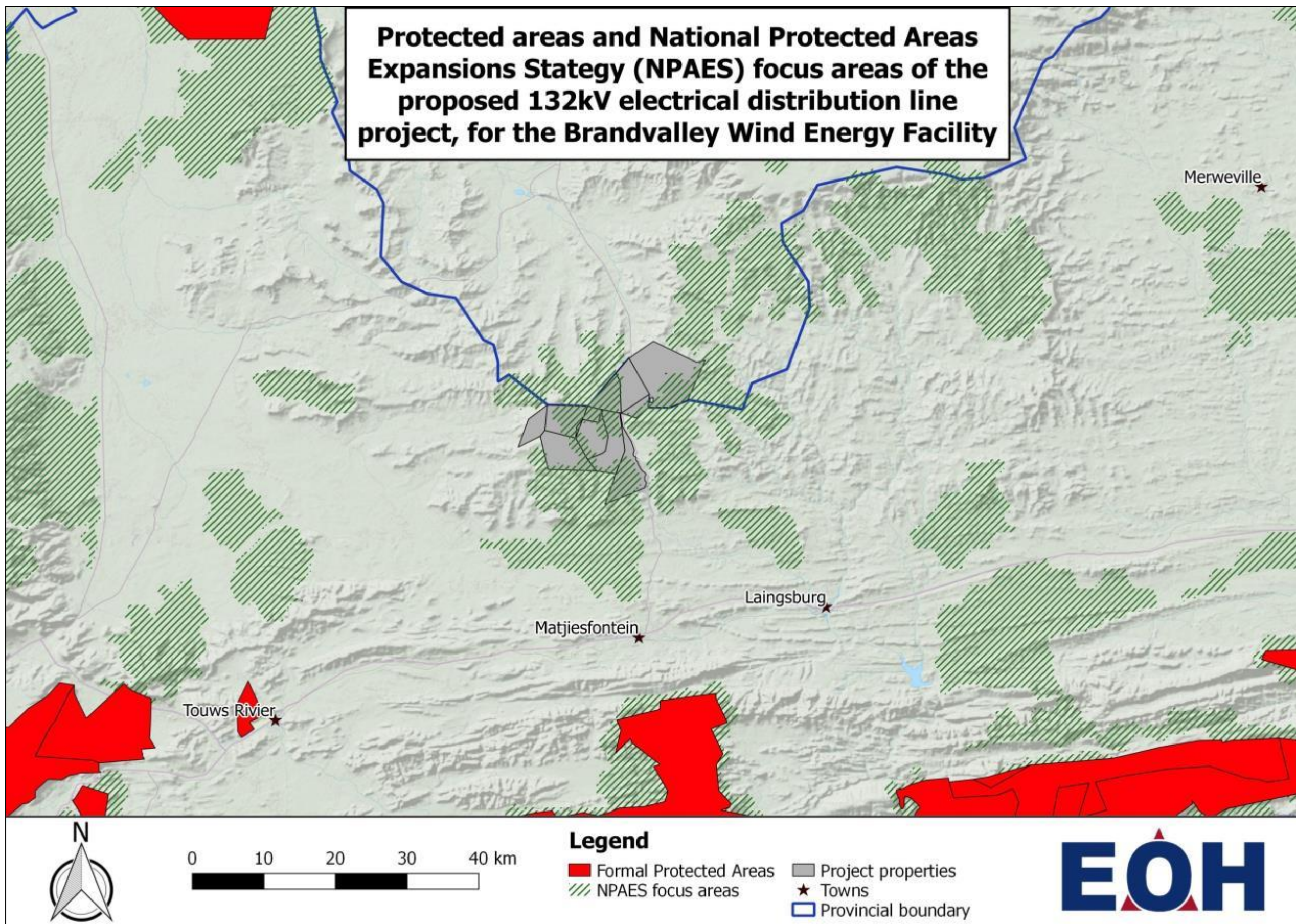


Figure 25: Protected Areas and National Protected Areas Expansion Project for the project

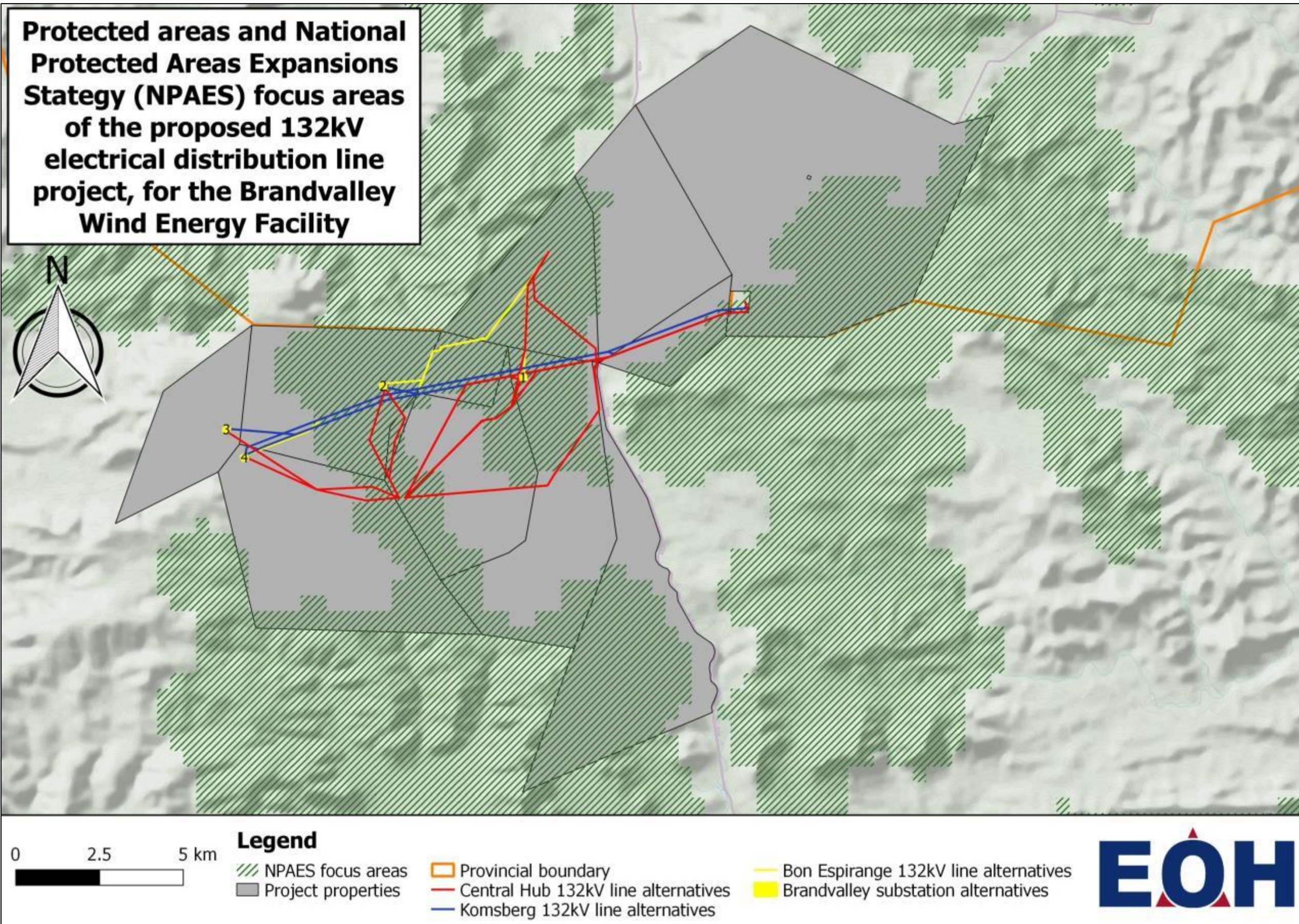


Figure 26: National Protected Areas Expansion Strategy regions near the project footprint

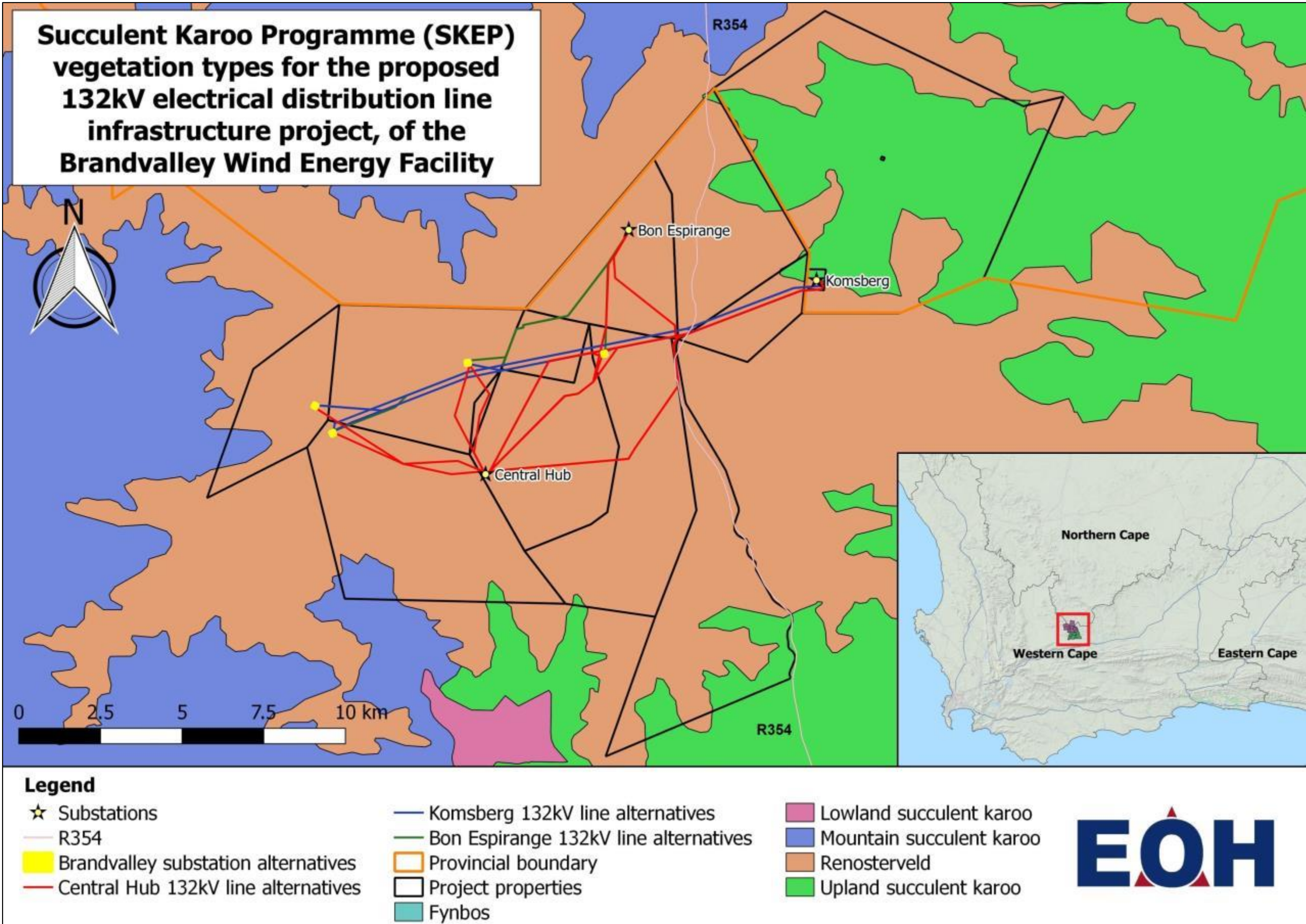


Figure 27: Succulent Karoo Expansion Programme regions within the project region.

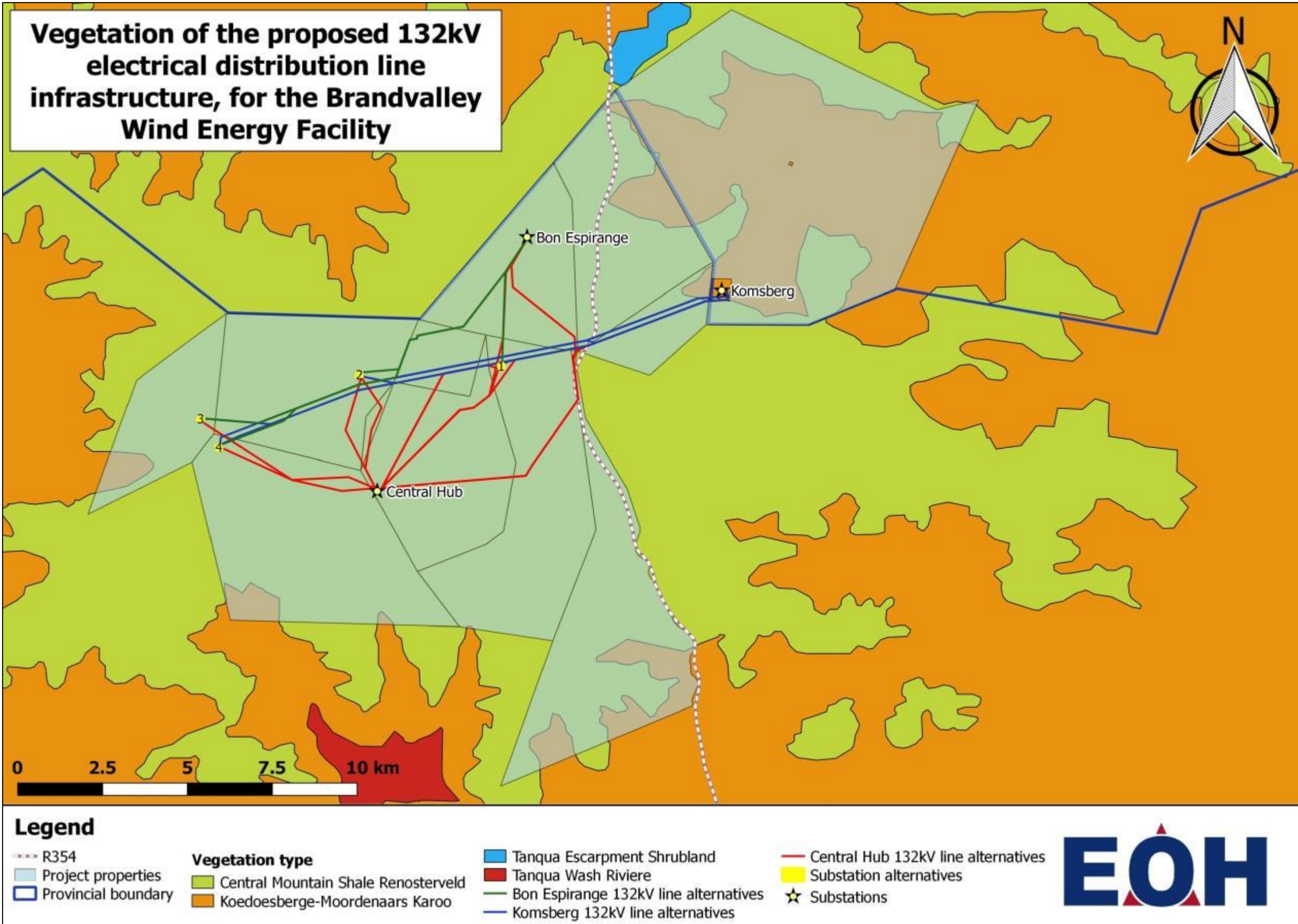


Figure 28: Vegetation types of the project region.

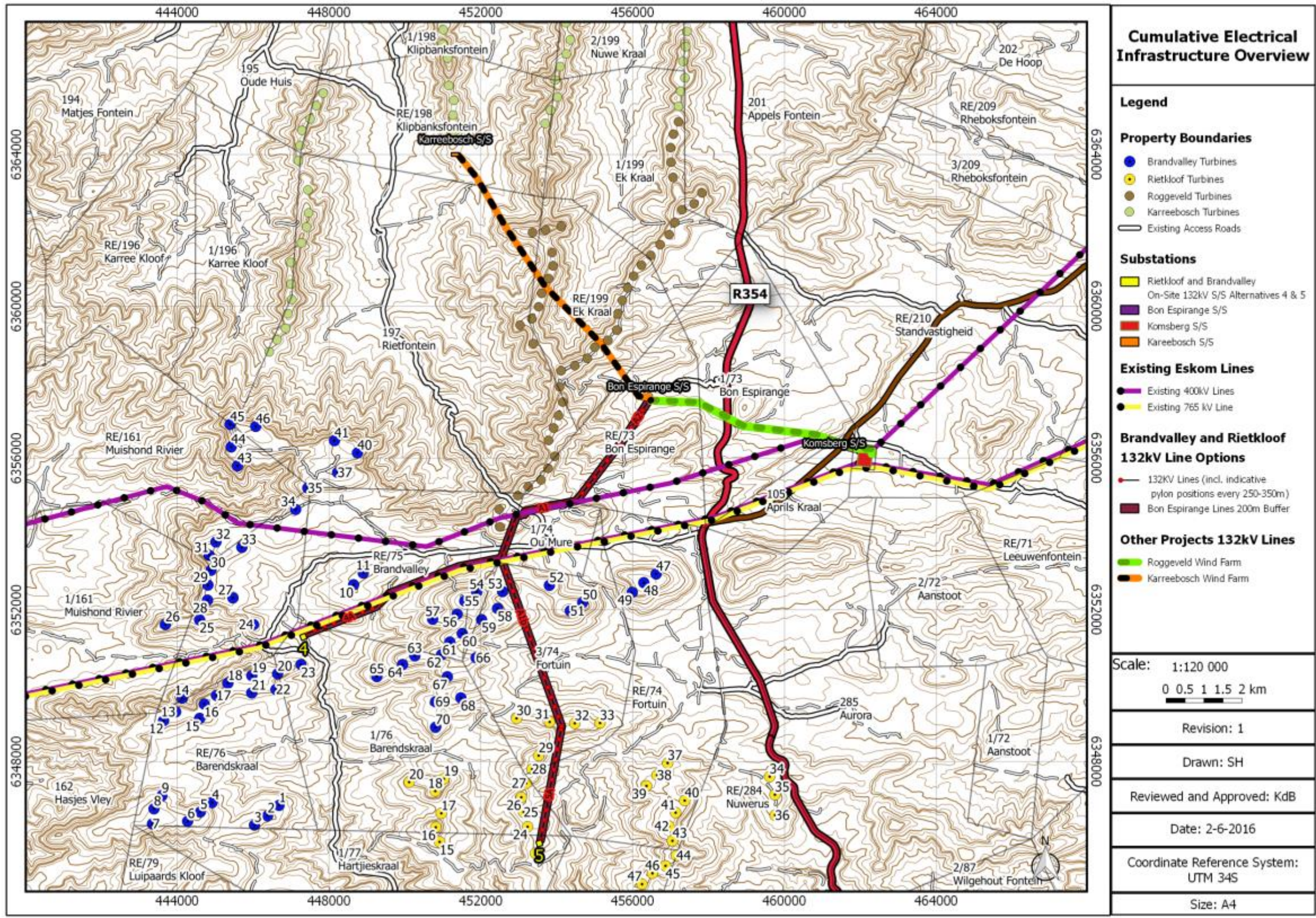


Figure 29: Cumulative Electrical Infrastructure Overview Map.

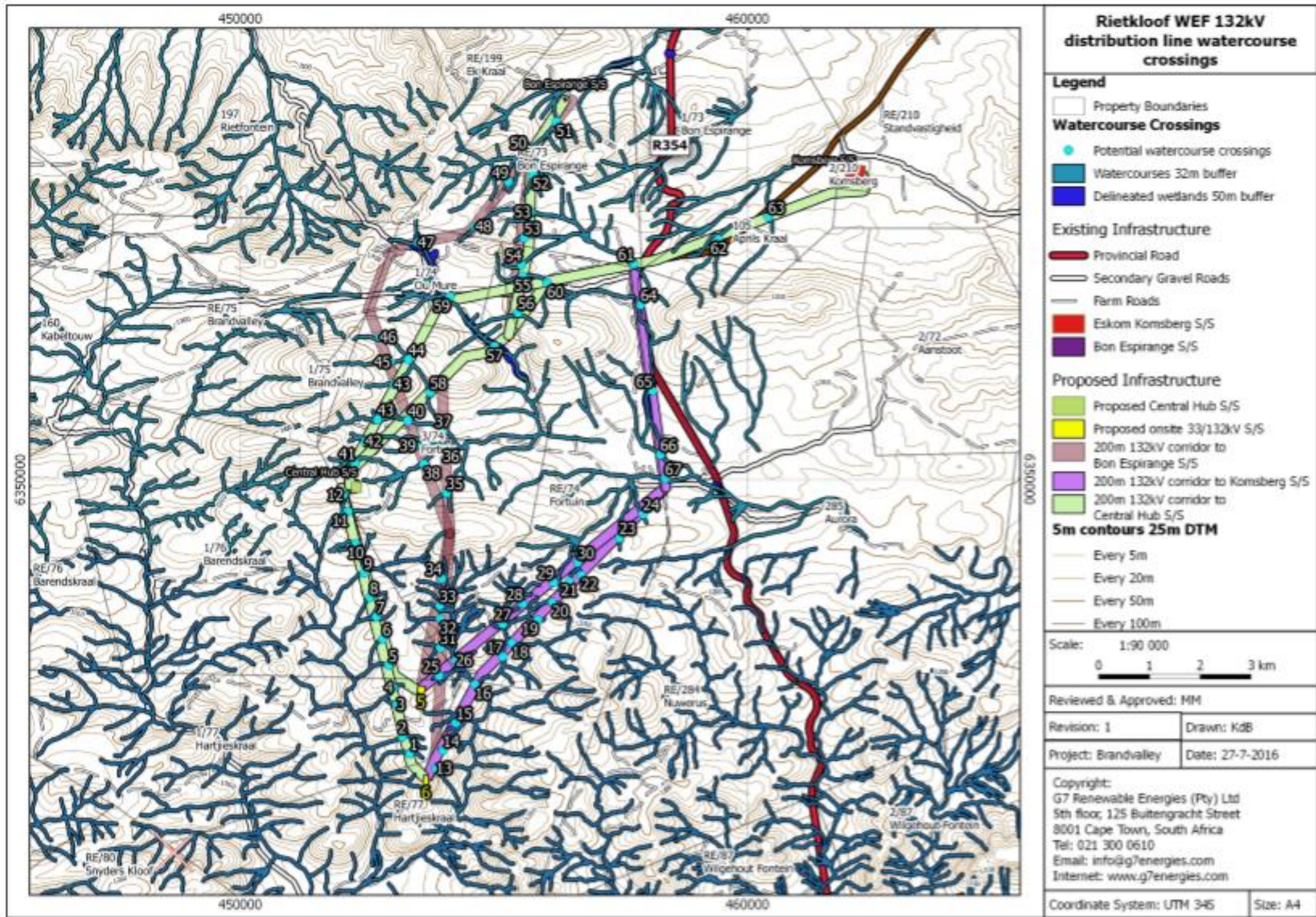


Figure 30: Overview of potential watercourse crossings. Watercourses can be avoided through micro-siting of the infrastructure within the buffer zones

Table E: Coordinates of potential watercourse crossings (numbers correspond with numbers indicated on Figure 30)

Potential watercourse crossings associated with the proposed 132kV distribution lines proposed for Rietkloof WEF					
id	Latitude	Longitude	id	Latitude	Longitude
1	-33.0361232	20.50031094	36	-32.9816707	20.50762594
2	-33.0331401	20.49875707	37	-32.9787411	20.5076422
3	-33.0273708	20.49761177	38	-32.9846788	20.50357248
4	-33.0243908	20.4968434	39	-32.9813645	20.5019091
5	-33.0203709	20.49596882	40	-32.9769162	20.50025224
6	-33.0157351	20.49470522	41	-32.9844314	20.48910883
7	-33.0117606	20.49338189	42	-32.9805655	20.49126151
8	-33.008353	20.49205543	43	-32.9767014	20.49386248
9	-33.0039537	20.49084692	43	-32.9704783	20.49737352
10	-32.9987487	20.48908241	44	-32.9660488	20.50042554
11	-32.9930249	20.4875454	45	-32.966506	20.49661125
12	-32.9900912	20.4865531	46	-32.9620554	20.49439442
13	-33.0387439	20.50579399	47	-32.9452663	20.50255994
14	-33.0355841	20.50732629	48	-32.9424788	20.51468009
15	-33.0306808	20.51010224	49	-32.9345673	20.52167159
16	-33.0238923	20.51412226	50	-32.9292896	20.52551012
17	-33.0189537	20.52003858	51	-32.9239266	20.53181388
18	-33.0165512	20.52195854	52	-32.9332639	20.52683372
19	-33.0124613	20.52747682	53	-32.9399719	20.52634969
20	-33.0093542	20.53052181	53	-32.944503	20.52498055
21	-33.0056348	20.5341306	54	-32.9493205	20.52439435
22	-33.0045574	20.53665982	55	-32.9513059	20.5246079
23	-32.9979246	20.54476924	56	-32.9578228	20.52356412
24	-32.9937374	20.54978115	57	-32.9637576	20.51859961
25	-33.0223033	20.50655883	58	-32.9719263	20.50498922
26	-33.0195769	20.51016366	59	-32.9549322	20.50923149
27	-33.0131418	20.52007007	60	-32.952554	20.52975745
28	-33.0095668	20.52429558	61	-32.9492197	20.5481575
29	-33.0058116	20.53087705	62	-32.9449357	20.56600041
30	-33.0022866	20.53594268	63	-32.9410023	20.57644285
31	-33.0172958	20.50686716	64	-32.9565013	20.54946561
32	-33.0121927	20.50689556	65	-32.9718197	20.55185442
33	-33.0098297	20.50679655	66	-32.9831661	20.55347906
34	-33.0050119	20.50727199	67	-32.9874224	20.55446686
35	-32.989801	20.50836577			