

CHAPTER 5 CONSIDERATION OF ALTERNATIVES

This chapter provides a summary of the various alternatives considered in the Scoping Study and gives a detailed description of the identified feasible alternatives assessed in the Impact Assessment phase of the EIA.

5.1 INTRODUCTION

The ECA and NEMA require that alternatives to a proposed activity be identified, described and assessed as part of an EIA process. According to the EIA Regulations Guideline Document (DEAT, 1998), “not all alternatives will be investigated in the same detail. An analysis of the range of alternatives should be undertaken to decide which ones should be carried forward for further investigation and which ones should be discarded.” The Scoping Study included consideration of the “do nothing” alternative, alternative route alignments and alternative positions for certain proposed mainline toll plazas.

The FSR provided a comparative analysis of the environmental, technical, financial and economic implications of the alternative route alignments, as appropriate, and indicated which ones would be carried forward for assessment in the Impact Assessment phase of this EIA. Specialist botanical, social and economic input was obtained in order to provide key information for a comparative analysis of the alternative route alignments. The following alternative alignments were considered in the Scoping Study (see Figures 5.1 to 5.3):

- Upgrading the existing N2 between Mthatha and Port Shepstone in relation to the “do nothing” alternative;
- Upgrading the existing R61 between Mthatha and Port Shepstone in relation to the “do nothing” alternative;
- Gallagher route between Mthatha and Port Shepstone in relation to the “do nothing” alternative; and
- Alternative greenfields routes between Lusikisiki and the Mthamvuna River, as follows:
 - SANRAL’s preferred alignment;
 - The Inland Mzamba route;
 - The coastal route;
 - The SDI route;
 - The WESSA route; and
 - The Coastal Mzamba route.

In addition, a number of localised alternative route alignments were considered in the FSR, as follows:

- Upgrading the existing R61 between Ndwalane and Ntafufu River via the Pondoland Bridge; and
- Site-specific alternative route alignments in the greenfields sections of the proposed route, i.e. between Ndwalane and the Ntafufu River and between Lusikisiki and the Mthamvuna River.

5.2 SCOPING STUDY CONCLUSIONS ON ALTERNATIVE ALIGNMENTS

This section summarises the conclusions reached on the comparative analysis of alternative alignments undertaken during the Scoping Study.

5.2.1 UPGRADING THE EXISTING N2 OR R61 BETWEEN MTHATHA AND PORT SHEPSTONE (IN RELATION TO THE “DO NOTHING” OPTION)

- Upgrading the existing R61 would result in similar environmental risks compared to upgrading the existing N2. However, it would result in higher risks to social functions/processes, more capital and operational costs and lower road user cost savings and total financial and economic benefits. These are primarily due to it being approximately 19 km longer and of poorer vertical and horizontal alignment than the existing N2. Road users would thus prefer to use the existing N2 between Mthatha and Port Shepstone, rather than an upgraded R61. The costs associated with upgrading the existing R61 would thus not be justifiable. In light of these considerations, it was proposed that upgrading the existing R61 not be carried forward for further investigation in the Impact Assessment phase of the EIA; and
- Upgrading the existing N2 would result in lower risks to sensitive ecosystems and in lower capital and operational costs compared to the proposed toll highway. However, upgrading the existing N2 would result in higher risks to social functions/processes and substantially (i.e. orders of magnitude) lower road user cost savings and total financial (and economic) benefits (linked to it being approximately 75 km longer and of poorer alignment than the proposed toll highway). Its vertical alignment would be less energy/fuel efficient compared to the proposed toll highway as substantially more ascents and descents would be encountered. Moreover, upgrading the existing N2 between Mthatha and Port Shepstone would result in no change to the current poor access to the Wild Coast area. This results from the fact that a relatively small portion of the required travelling would be undertaken on the upgraded road relative to the required travelling on district and local roads. In light of these considerations, it was proposed that upgrading the existing N2 between Mthatha and Port Shepstone not be carried forward for further investigation in the Impact Assessment phase of the EIA.

5.2.2 GALLAGHER ROUTE BETWEEN MTHATHA AND PORT SHEPSTONE (IN RELATION TO THE “DO NOTHING” OPTION)

The Gallagher route would result in lower risks to the receiving ecological environment than the proposed N2 Wild Coast Toll Highway between Mthatha and Port Shepstone. However, this route would result in no change to the current poor access to/from the Wild Coast area and would result in higher risks to social functions/processes since a larger number of settlements would be affected. The total construction and operational costs would be considerably higher than the SANRAL proposed route while it would offer no distance advantage. In addition, large sections of the route would follow the existing R61 (118 km) and the existing N2 (43 km) and, thus, inherently poorer alignments. Moreover, the route would result in a negative financial NPV of approximately -R 5.475 billion and thus a Benefit:Cost ratio of less than 1. It would therefore not be financially (or economically) beneficial to society to construct the proposed Gallagher route. In light of these considerations, it was proposed that the Gallagher route between Mthatha and Port Shepstone not be carried forward for further investigation in the Impact Assessment phase of the EIA.

5.2.3 ALTERNATIVE GREENFIELDS ALIGNMENTS BETWEEN LUSIKISIKI AND THE MTHAMVUNA RIVER

SDI, Coastal and Inland Mzamba routes in relation to SANRAL's preferred route

- The SDI and Coastal routes would result in similar environmental, technical, financial and economic costs and would be substantially less expensive than the other greenfields alignments. However, the SDI and Coastal routes would have major disadvantages, as follows:
 - Both would traverse the Mkambati Nature Reserve and would result in high risks to the ecological integrity of the statutorily proclaimed reserve;
 - The SDI route would impact directly on the habitat of a known vulture colony at the Msikaba River; and
 - The Coastal route would have poor linkages with the existing local road network and existing communities, i.e. it would be remote from the geographical centres of communities situated between the river gorges. The SDI route would be more favourable than the Coastal route in this regard, but is considered less favourable than SANRAL's preferred route and the Inland Mzamba route.
- SANRAL's preferred route and the Inland Mzamba route would pose similar, but lower, risks to sensitive ecosystems compared to the SDI and Coastal routes since the former would affect lower proportions of habitats with high sensitivity. However, the Inland Mzamba route would result in higher risks to social functions/processes and higher bridge construction costs and road user costs. It was thus considered that the Inland Mzamba route would provide no advantage over SANRAL's preferred route and would thus not be carried forward for further investigation in the Impact Assessment phase of the EIA.

WESSA and Coastal Mzamba routes in relation to SANRAL's preferred route

- The WESSA route would result in lowest risk to the receiving ecological environment compared to the Coastal Mzamba and SANRAL preferred routes between Lusikisiki and the Mthamvuna River. However, it would affect the highest number of structures in its 80 m road reserve and would be the longest in distance and thus travel time. Also, it would be least favourable in terms of integration with the existing road network and provision of access to communities in the Wild Coast area. Moreover, its total costs would be approximately twice as much as the other two routes.
- The Coastal Mzamba and SANRAL preferred routes would result in similar technical and financial implications. The Coastal Mzamba route would, however, be less socially intrusive than the SANRAL preferred route since it would affect a lower number of social structures and would result in lower intensity impacts in terms of loss of community access onto/across existing roads and community fragmentation. Moreover, the Coastal Mzamba route would avoid much of the area between the Mthentu and Mthamvuna rivers which would form part of the Wild Coast/Pondoland National Park planning domain.

In light of these considerations, it was proposed that the Coastal Mzamba route be carried forward for further investigation in the Impact Assessment phase of the EIA and that the WESSA route be discarded.

5.3 “FEASIBLE” ALTERNATIVES IDENTIFIED IN THE FSR

As mentioned in Section 5.4 of the FSR, the following alternatives were considered “feasible” and were taken forward for further investigation and assessment in the Impact Assessment phase of the EIA:

- The “do nothing” alternative;
- SANRAL’s preferred alignment between Lusikisiki and the Mthamvuna River;
- The Coastal Mzamba route between Lusikisiki and the Mthamvuna River;
- Alternative mainline toll plaza positions to SANRAL’s preferred Ndwalane and Mthentu mainline toll plazas; and
- The site-specific alternative route alignments in the greenfields sections of the proposed project, i.e. in the sections between Ndwalane and Ntafufu and between Lusikisiki and the Mthamvuna River, as follows:
 - for the proposed alignment between Ndwalane and the Mzimvubu River;
 - for the proposed alignment in the vicinity of Ntafufu village and the Ntafufu River;
 - for the proposed alignment across the Msikaba River;
 - for the proposed alignment across the Mthentu River; and
 - for the proposed alignment across the Mnyameni River.

A brief evaluation of the “do nothing” alternative and a detailed description of the identified feasible alternatives are provided below. The various alternatives considered in the Impact Assessment phase of the EIA are addressed, as appropriate, in the specialist studies in Volumes 2 to 4, and Parts C to E of this report.

5.3.1 THE “DO NOTHING” ALTERNATIVE

The “do nothing” scenario involves maintaining the status quo of the existing N2 and R61 routes between East London and Durban with no construction of new roads in the greenfields sections between Ndwalane and Ntafufu, and between Lusikisiki and the Mthamvuna River. The maintenance and upgrade of the relevant sections of the existing N2 and R61 would continue to be the responsibility of SANRAL and the relevant provincial road authorities, respectively. With SANRAL receiving insufficient funds, work to the routes is likely to be limited to the bare essentials and upgrade work may not be undertaken at the time required for such work. This would likely result in the roads becoming further damaged and increasingly hazardous and congested.

This is especially the case at the northern end of the proposed toll concession, where it is proposed to add additional lanes on the N2 between the Adams Road and Isipingo Interchanges before traffic congestion deteriorates beyond acceptable levels. Traffic volumes have reached theoretical capacity levels and the interim solution has been to re-mark the existing carriageway to three narrower lanes in each direction and sacrificing the hard shoulder. Traffic conditions on both the N2 and the only other viable alternative route (Kingsway) are likely to become unstable and deteriorate severely, resulting in stop-start travel, forming of long queues and significant increases in travel times.

The “do nothing” alternative would also result in the non-realisation of the anticipated benefits resulting from the proposed project. The expected benefits include the following:

- Improved access and linkage to the region, in particular the Wild Coast area;
- Optimisation of road user benefits (through reduced travel time cost and vehicle operating cost); and
- Potential socio-economic benefits relating to employment opportunities and growth in tourism and economic development of the region (see Parts C to E of this report).

On the contrary, anticipated negative biophysical, socio-economic and cultural heritage impacts associated with the proposed project would also not materialise. Key potential negative impacts include the following:

- Biophysical impacts, primarily associated with establishment of the proposed highway through the Pondoland Centre of Endemism (see Parts C and E); and
- Socio-economic impacts, primarily associated with relocation of households and businesses, severance of communities, tolling commuters and businesses, impact on bypassed towns, etc. (see Parts C to E).

The potential implications of the “do nothing” alternative were used mainly as a “base case” against which the potential impacts of the proposed project and the other identified feasible alternatives were measured (see specialist studies in Volumes 2 to 4, and Parts C to E of this report).

5.3.2 SITE-SPECIFIC ALTERNATIVE ROUTE ALIGNMENTS BETWEEN NDWALANE AND THE MZIMVUBU RIVER

The Impact Assessment phase includes a comparative assessment of two alternatives for the proposed alignment between Ndwalane (R61) and the Mzimvubu River (referred to as Alternatives 1b and 1e) – see Figure 5.4.

Alternative 1b

This alignment would be diverted from the R61 in the vicinity of the Mzimvubu River floodplain and tributary. The route would follow Fort Harrison road and the Mzimvubu River floodplain to a proposed bridge crossing site over the Mzimvubu River. Sections of this alignment would have to be designed to raise the gradeline above the 1:100 year floodline of the Mzimvubu River. The existing road reserve of approximately 8 m would have to be significantly widened to 80 m. This alignment is approximately 4.2 km longer than the SANRAL preferred route. The proposed bridge over the Mzimvubu River would be 340 m long.

Alternative 1e – SANRAL preferred route

This alignment would exit from the R61 closer to Ndwalane, in the vicinity of the Mampube Village (refer to Section 4.2.4). The alignment would follow the higher-lying ground and would traverse inhabited land, natural areas and land being used for commercial purposes. The proposed bridge over the Mzimvubu River would be 360 m long, with better foundation conditions than Alternative 1b.

5.3.3 SITE-SPECIFIC ALTERNATIVE ROUTE ALIGNMENTS IN THE VICINITY OF NTAUFUFU VILLAGE AND NTAUFUFU RIVER

Two alternatives for the proposed alignment in the vicinity of Ntafufu village and Ntafufu River (referred to as Alternatives 2a and 2f) are assessed – see Figure 5.5.

Alternative 2a

This alignment would cross the Ntafufu River at the existing crossing site and would largely follow an existing gravel road to join the existing R61 between Port St Johns and Lusikisiki. The alignment would require the relocation of the Ntafufu Junior and Senior Secondary Schools.

Alternative 2f - SANRAL preferred route

This alignment would cross the Ntafufu River at a point slightly downstream of the existing crossing site. This alignment would follow the Ntafufu River floodplain and join the existing R61 between Port St Johns and Lusikisiki. This alignment would require the relocation of the Ntafufu Junior Secondary School but would avoid the Ntafufu Senior Secondary School. The latter school's playing fields would require reconfiguration to compensate for the portion that would be impacted by the road reserve.

5.3.4 ALTERNATIVE ROUTE ALIGNMENTS BETWEEN LUSIKISIKI AND THE MTHAMVUNA RIVER

As mentioned above, two alternative route alignments between Lusikisiki and the Mthamvuna River were taken forward for further investigation and assessment in the Impact Assessment phase of the EIA, namely SANRAL's preferred route and the Coastal Mzamba route (see Figures 5.1 to 5.3, specialist studies in Volumes 2 to 4, and Parts C to E).

These routes are described in further detail below.

Coastal Mzamba route

The Coastal Mzamba route, a variation of SANRAL's preferred route between the Mthentu and Mthamvuna rivers, was proposed by SANRAL in order to address the concerns raised in recent conservation planning documentation and numerous concerns raised by I&APs about SANRAL's preferred greenfields route in general and, in particular, the proposed alignment between the Mthentu and Mthamvuna rivers. The Coastal Mzamba route would follow SANRAL's preferred alignment from Lusikisiki up to the northern side of the Mthentu River crossing. From there it would be aligned at a distance of between 11 – 16 km inland to a position east of Makwanteni, from where it would turn to the east and be aligned between the Mpahlane and Mzamba rivers. It would join SANRAL's preferred route south of the proposed crossing of the Mzamba River and essentially follow SANRAL's preferred alignment up to the Mthamvuna River crossing.

SANRAL's preferred route

SANRAL's preferred route would follow the existing concrete road (DR 08024) eastward over a distance of approximately 19 km through the outskirts of Lusikisiki (refer to Section 4.2.5). Thereafter the proposed road would divert north-eastward from the DR 08024 alignment and would cross the Msikaba River approximately 14-15 km inland (refer to Section 4.2.6). Continuing north-east the alignment would cross the Mthentu River also at a distance of about 14-15 km inland. From here it would follow an alignment towards the east up to a distance of about 5 km from the coast. The route would cross the Mnyameni River upstream of the Mnyameni Waterfall (approximately 6 km inland) after which it would loop in a north-easterly direction to cross the Mpahlane and Mzamba rivers at a distance of about 2-3 km inland. From there it would intersect and cross the existing R61 in the vicinity of the existing police station adjacent to the Wild Coast Sun complex and join the alignment of the existing R61 at the Mthamvuna River crossing, i.e. the existing Mitchell Bridge.

5.3.5 SITE-SPECIFIC ALTERNATIVE ROUTE ALIGNMENTS ACROSS THE MSIKABA RIVER

The Impact Assessment phase includes a comparative assessment of three alternatives for the proposed alignment across the Msikaba River (referred to as Alternatives 5g, 5e and 5g4) – see Figure 5.6.

Alternative 5g

This 9.7 km alignment would be diverted from the existing DR 08024 gravel road in the vicinity of the Lambasi Village some 21.5 km outside Lusikisiki. It would traverse rocky outcrops, small seasonal streams, wetland systems and grassland south of the proposed Msikaba River bridge crossing site (approximately 16 km upstream of the Msikaba River mouth). The required bridge would be 530 m long.

Alternative 5e

This alignment is 10.2 km long and would be diverted from the existing DR 08024 gravel road some 2 km ahead of Alternative 5g and would cross the Mateku River just downstream of the Mateku Waterfall. It would follow an elevated alignment to cross the Msikaba River immediately upstream of the confluence of the Mateku and Msikaba rivers. Thereafter the alignment would be located close to the edge of the Msikaba River gorge over a distance of some 2.4 km before it would join the alignment of Alternative 5g north of the Msikaba River. The total length of required bridges associated with Alternative 5e would be 420 m. The design speed of this alternative would be 80-100 km/h, based on its geometric alignment and steep grades, compared to 120 km/h for the other alignments.

Alternative 5g4 – SANRAL preferred route

This 9.1 km alignment would be diverted from the existing DR 08024 gravel road some 2.5 km ahead of Alternative 5g and would follow the edge of the southern Mateku River valley. It would join the alignment of Alternative 5g south of the proposed Msikaba river crossing site approximately 1.7 km below the confluence of the Mateku and Msikaba rivers. The required bridge would be about 530 m long.

5.3.6 SITE-SPECIFIC ALTERNATIVE ROUTE ALIGNMENTS ACROSS THE MTHENTU RIVER

The Impact Assessment phase includes a comparative assessment of two alternatives for the proposed alignment across the Mthentu River (referred to as Alternatives 9e and 9d5) – see Figure 5.7.

Alternative 9d5

This alignment would cross the Mthentu River some 12 km upstream of the Mthentu River mouth downstream of the proposed Msikaba River bridge crossing site. The required bridge would be aligned in an approximately east-west direction and would be 1 600 m long.

Alternative 9e – SANRAL preferred route

This alignment would cross the Mthentu River some 2 km upstream of Alternative 9d5. The required bridge would be aligned in an approximately north-south direction and would be about 1 200 m long.

5.3.7 SITE-SPECIFIC ALTERNATIVE ROUTE ALIGNMENTS ACROSS THE MNYAMENI RIVER

The Impact Assessment phase includes a comparative assessment of three alternatives for the proposed alignment across the Mnyameni River (referred to as Alternatives 10a, 10e and 10c) – see Figure 5.8.

Alternative 10a

This alignment would cross the Mnyameni River immediately above the Mnyameni Waterfall some 6 km inland of the Mnyameni River mouth. The required bridge would be about 140 m long.

Alternative 10e

This alignment would cross the Mnyameni River approximately 500 m upstream of the Alternative 10a crossing point. A second bridge would be required, some 530 m north of the Mnyameni River crossing, over the Kulumbe River (a tributary of the Mnyameni River). The total length of required bridges would be 350 m.

Alternative 10c – SANRAL preferred route

This alignment would cross the Mnyameni River approximately 1.2 km upstream of the Alternative 10a crossing point. The required bridge would be 240 m long. A second bridge crossing would be required some 1.7 km north of the Mnyameni River crossing over the Kulumbe River – this bridge would be 220 m wide.

5.3.8 ALTERNATIVE TOLL PLAZA LOCATIONS

A number of factors determine whether a particular area would be suitable as a mainline toll plaza location. These are as follows:

- Locations must be such that adequate sight distance in both directions exists at the mainline plaza. Plazas should preferably be located on straight sections of roads, with a minimum sight distance of 300 m in both directions;
- Positioning of a mainline plaza on a steep gradient is to be avoided as this creates problems for heavy vehicles in particular (e.g. downhill stopping and pulling off uphill from the plaza), and exacerbates impacts associated with noise and safety;
- As far as possible, locations should not be directly adjacent to settlements or homesteads, in order to avoid impacts in terms of noise, lighting, etc.;
- As far as possible, access to power, water and telephone services, as well as suitable proximity to towns providing other important services (employee accommodation, bank, post office, etc.) should be sought;
- Sufficient area must be available adjacent to the road for widening of the road at the mainline plaza, and for accommodation of a control building, which monitors the activities at the toll plaza, and maintenance and parking areas;
- Favourable ground conditions pertaining to foundation-bearing capacity and subsoil drainage are required; and
- Ease of construction of a temporary road deviation at plaza sites on existing roads, while plaza construction takes place.

SANRAL's preferred mainline and ramp toll plaza locations are identified in Chapter 4. Alternative mainline toll plaza locations were identified for some preferred mainline toll plaza locations, as follows:

- In the vicinity of the Ntlaza Mission, near the Tutor Ndamase Pass (in the section between Mthatha and Ndwalane) – refer to Figure 4.12 and see Plate 5.1 - alternative to SANRAL's preferred Ndwalane Plaza; and
- In the vicinity of the proposed intersection with the Holy Cross/Mkambati district road (in the section between Lusikisiki and the Mthamvuna River) – refer to Figure 4.22 and see Plate 5.2 - alternative to SANRAL's preferred Mthentu Plaza.



Plate 5.1: Location of Alternative Ndwalane mainline toll plaza along the existing R61 in the vicinity of Ntlaza Mission



Plate 5.2: Area in vicinity of the proposed intersection with the existing Holy Cross/Mkambati road where the Alternative Mthentu mainline toll plaza would be located

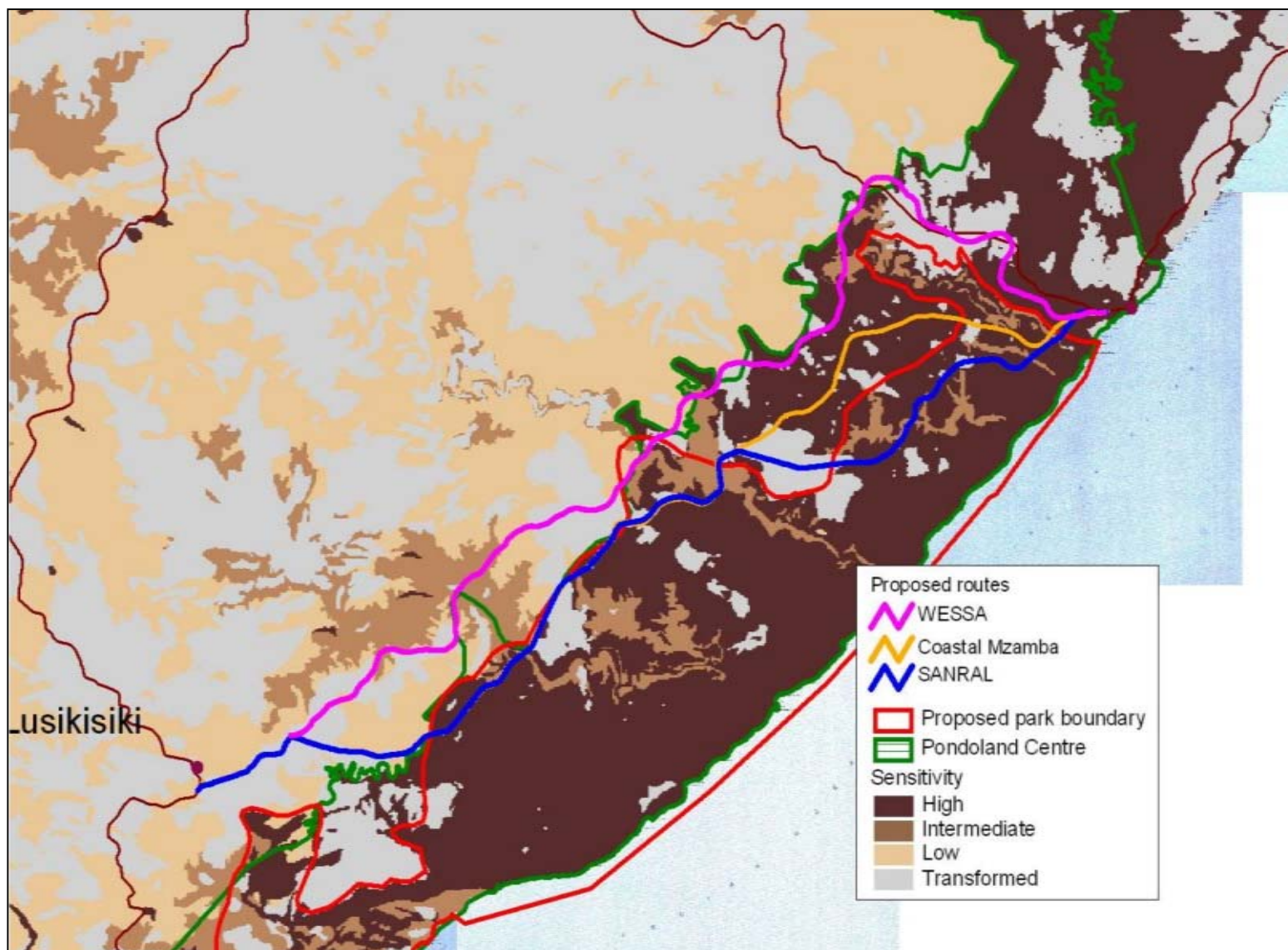


Figure 5.3 Proposed routes between Lusikisiki and the Mthamvuna River showing ecological sensitivity, boundaries of the Pondoland Centre of Endemism and the proposed Wild Coast National Park planning domain

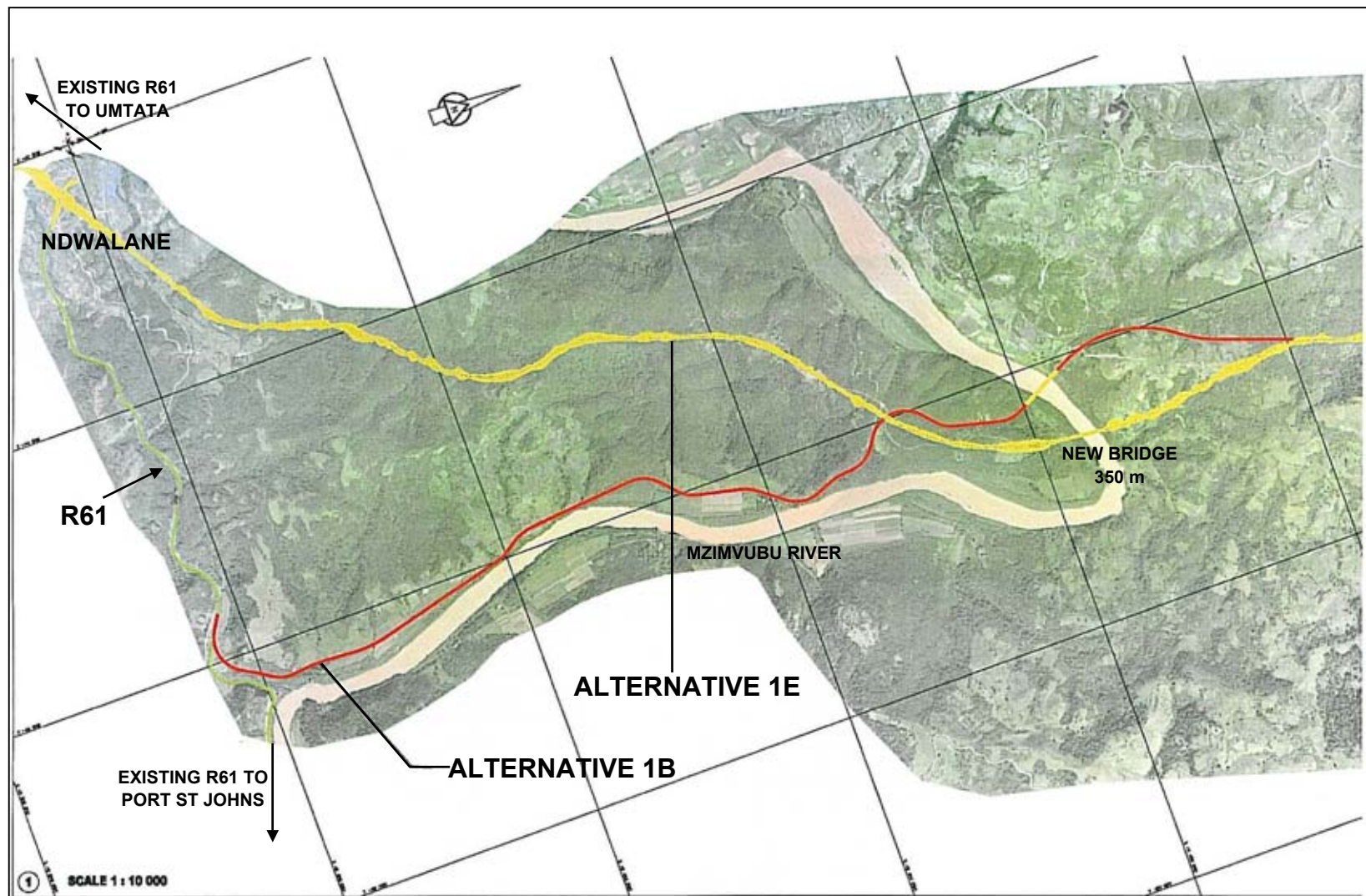


Figure 5.4: SANRAL preferred route (Alternative 1e) and the alternative alignment (Alternative 1b) between Ndwalane and the Mzimvubu River

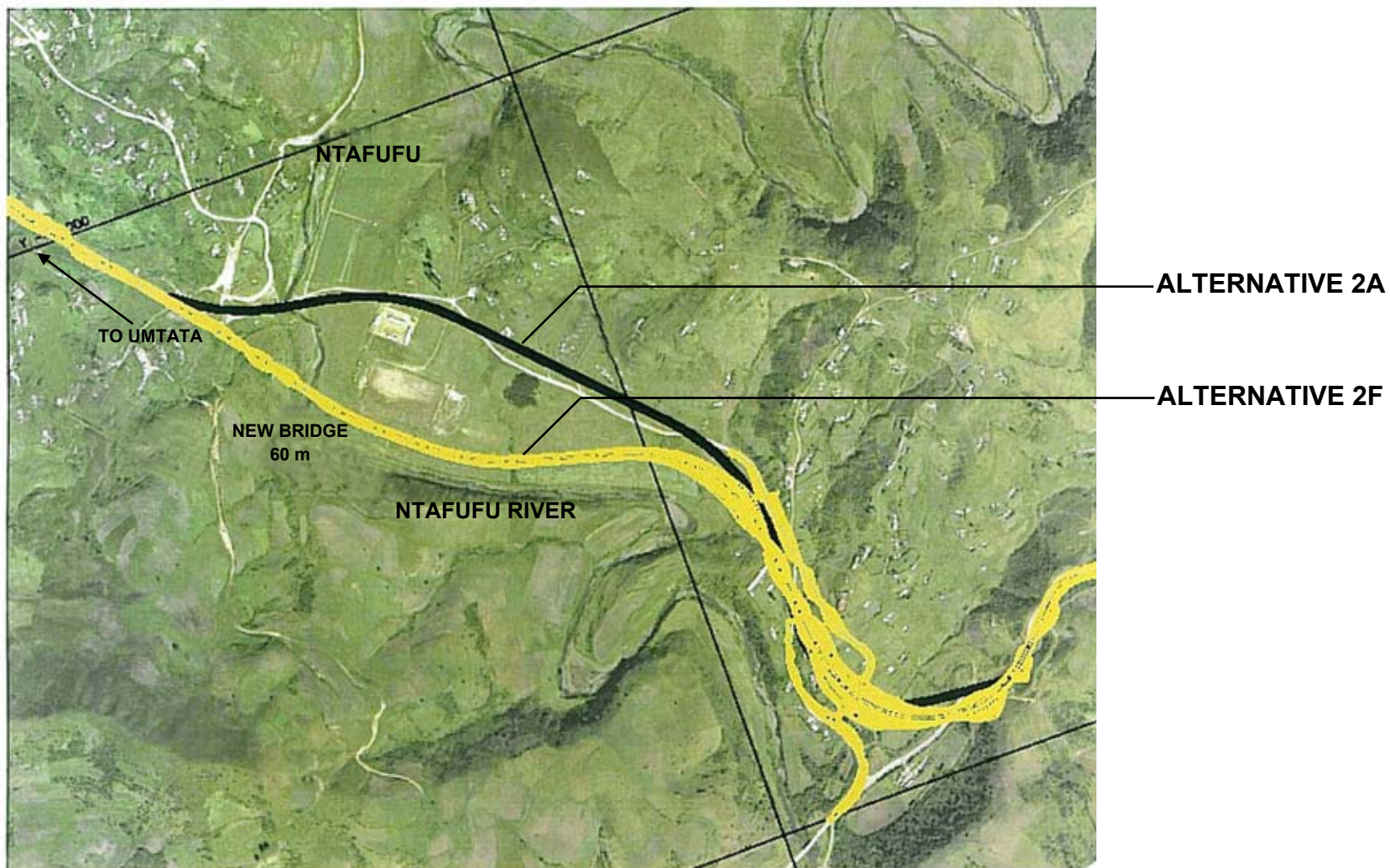


Figure 5.5: SANRAL preferred route (Alternative 2f) and the alternative alignment (Alternative 2a) in the vicinity of the Ntafufu Village and Ntafufu River

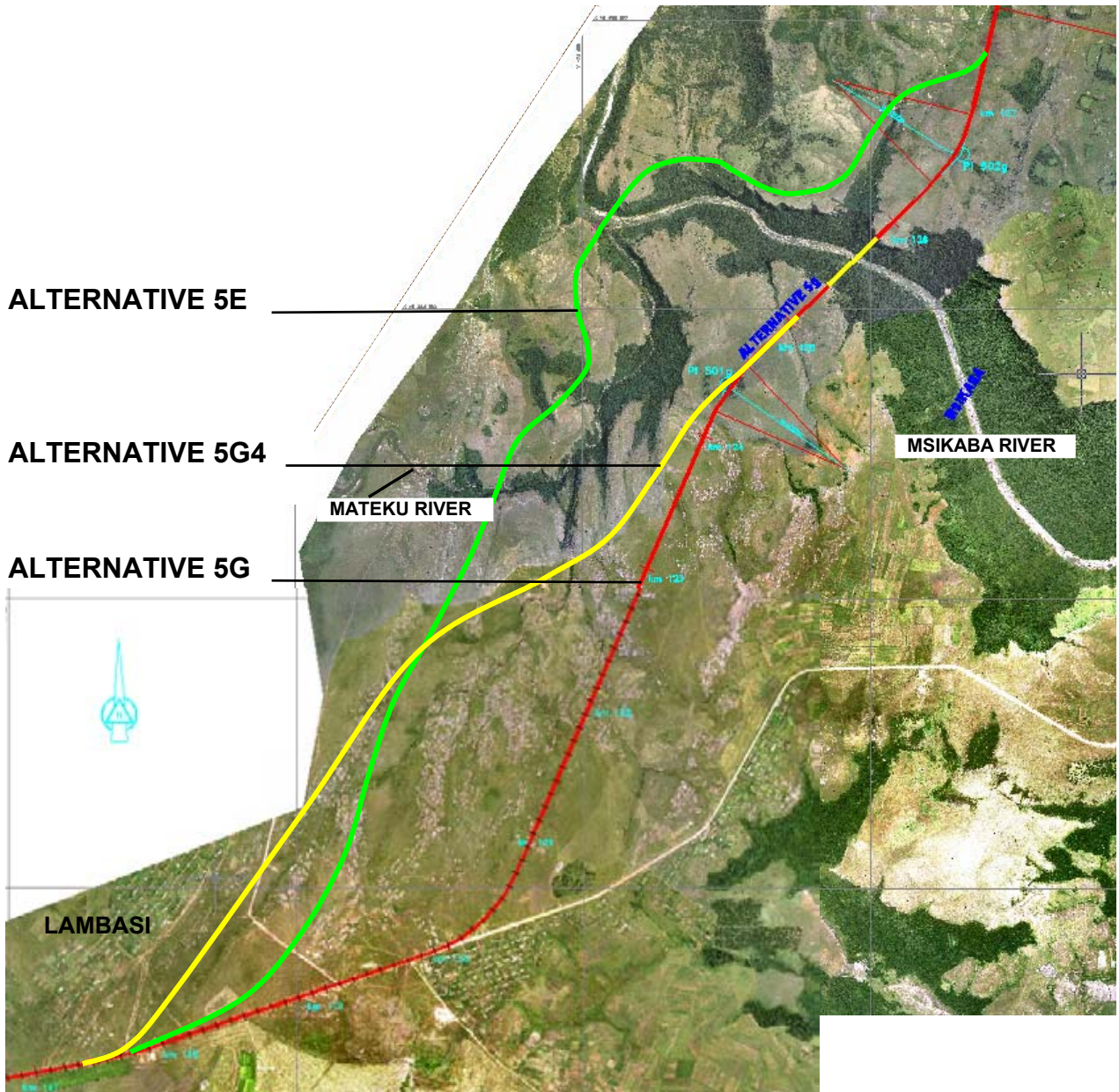


Figure 5.6: SANRAL preferred route (Alternative 5g4) and alternative alignments 5g and 5e across the Msikaba River

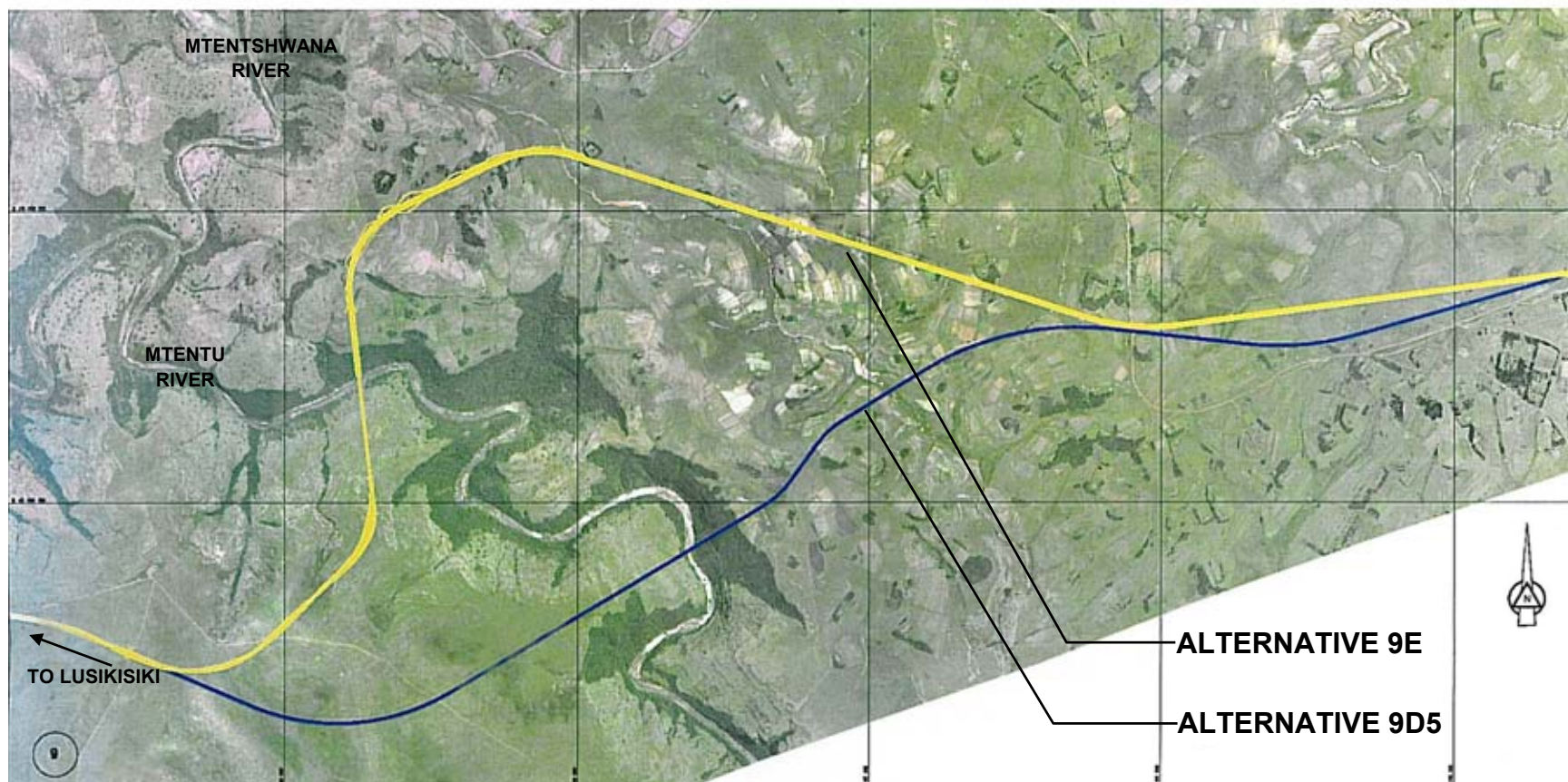


Figure 5.7: SANRAL preferred route (Alternative 9e) and the alternative alignment (Alternative 9d5) across the Mthentu River

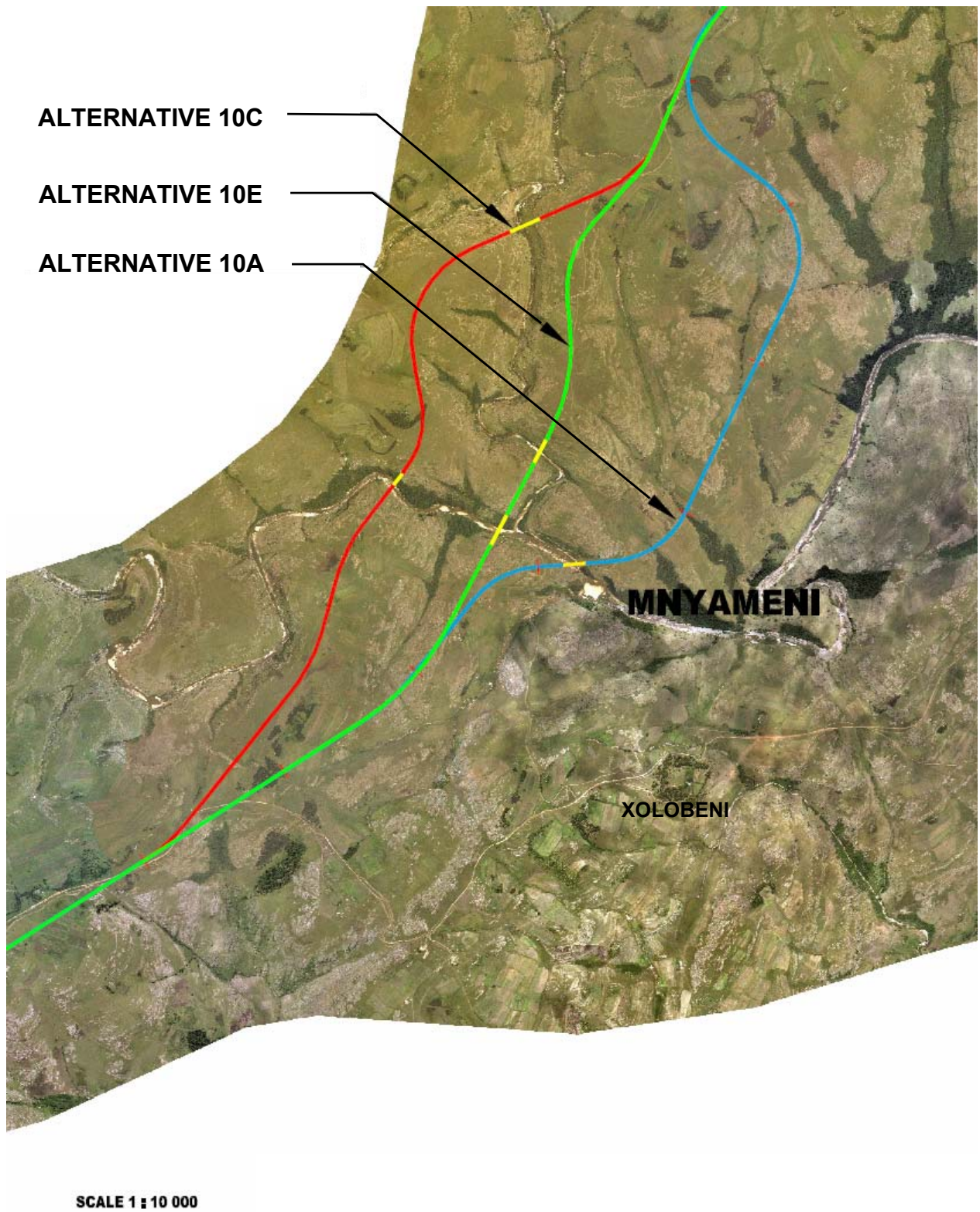


Figure 5.8: SANRAL preferred route (Alternative 10c) and alternative alignments 10a and 10e across the Mnyameni River