



Basic Assessment Report



Basic Assessment Report

Basic Assessment (BA) for the flood damage repairs to structures on MR309 in Seweweekspoort Pass, Western Cape

Hatch project no.: H351019

August 2017

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HATCH

Acronyms and Abbreviations

BAR	Basic Assessment Report
BID	Background Information Document
CBA	Critical Biodiversity Areas
DEA	Department of Environmental Affairs
DEA&DP	Department of Environmental Affairs & Development Planning
DWS	Department of Water & Sanitation
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EMPr	Environmental Management Programme
ESA	Ecological Support Areas
GN	Government Notices
Hatch	Hatch Africa (Pty) Ltd.
I&APs	Interested & Affected Parties
IDP	Integrated Development Plan
IEM	Integrated Environmental Management
KPAs	Key Performance Areas
NEMA	National Environmental Management Act, 1998 (Act 107 of 1998)
PPP	Public Participation Process
SDF	Spatial Development Framework
WULA	A Water Use License Application

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1. Introduction

This Basic Assessment Report (BAR) was prepared by Hatch Africa (Pty) Ltd. (Hatch) in terms of Regulation 19 and Appendix 1 of Government Notice No. 982 of the Environmental Impact Assessment (EIA) Regulations, 2014, as amended.

The BAR has been prepared for flood damage repairs to structures on the MR309 in the Seweweekspoort Pass in the Western Cape Province of South Africa.

A summary of the details of the Applicant, Environmental Assessment Practitioner (EAP) and Independent Reviewer are as follows:

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1.1 Details of the EAP

In addition to the information mentioned in the tables above, the sections describes in more detail the expertise of the EAP (Mr Evert Jacobs). Evert's CV and SACNASP certificate have been appended to this report in Appendix F.

Evert is an Ecologist who has been involved in management of environmental development projects for the last 12 years. He has experience in very large infrastructure, mining and energy projects specifically in guiding development from concept phase through to execution and construction. His experience includes Permitting Strategies for Mega Projects in various countries, ESIA's, monitoring protocols for water quality and air quality, environmental management plans and construction management, environmental auditing, GIS, Water Use License Applications, Ecological Research and Ecological Processes which have been combined in his work related experience. Evert's experience

in linear projects also makes him an ideal candidate to lead the Environmental team for this project.

Evert has extensive experience in South African environmental legislation and how these are integrated into projects. This includes knowledge of the following acts and regulations: The Constitution of the Republic of South Africa, (Act No.108 of 1996); National Development Plan; The National Environmental Management Act 1998 (Act No. 107 of 1998); The National Environmental Management: Biodiversity Act 2004 (Act No. 10 of 2004); The National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003); Marine and Living Resources Act 1998 (Act No. 18 of 1998); World Heritage Convention Act, 1999 (Act No. 49 of 1999).

1.2 Details of the Independent Reviewer

Hatch conducted both the Engineering and Environmental scope of the project and therefore an independent environmental review of the BAR (this report) and the public participation material was required, Mr Pieter de Villiers from Cornerstone Environmental Consultants conducted the independent review and his details are indicated in the table above. Hatch's response to the reviewer's comments have been included in Appendix J of this report.

1.3 Project Description

The Seweweekspoort Pass is located on the Main Road 309 (MR309) connecting Zoar in the South to Laingsburg in the north (refer to Appendix A for site maps and Figure 1-27). The proposed repairs are located between kilometer 40.9 to 58.1 of the MR309 (measured from Laingsburg) which is a gravel road that meanders through the narrow gorge of the Seweweekspoort ultimately linking the towns of Laingsburg and Ladismith in the Western Cape. The road was originally constructed to serve as a link between inhabitants of the towns on either side of the Swartberg. The pass is now incorporated in the Swartberg Nature Reserve that is joined to the Gamkapoort Nature Reserve and Towerkop Nature Reserve. The figures below have been extracted from the Freshwater Specialist Report (Appendix C) and provide a description of the proposed activities (structures) as well as the sites located between kilometre 40.9 to 58.1:

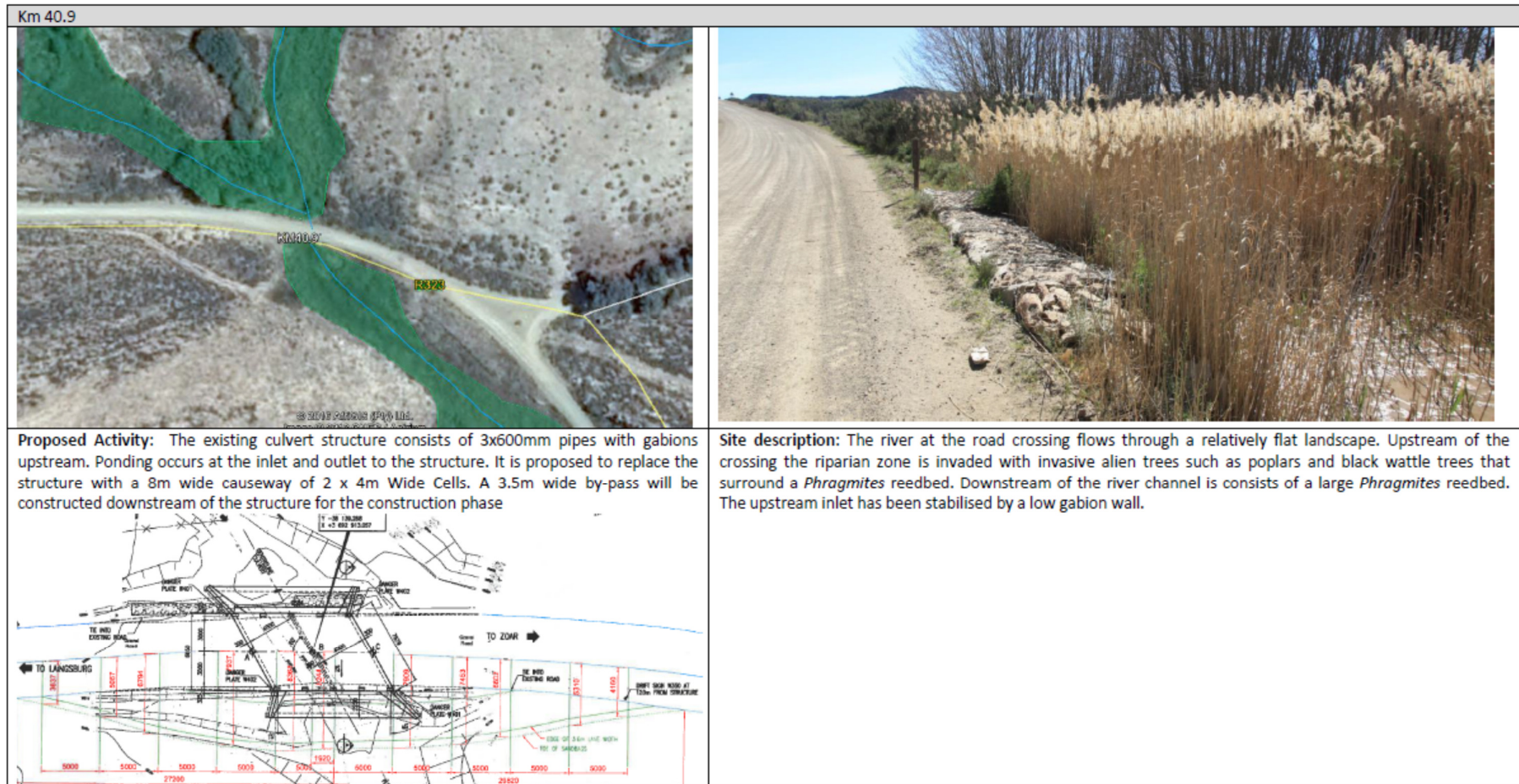


Figure 1-1: Site and proposed activity description at Km 40.9

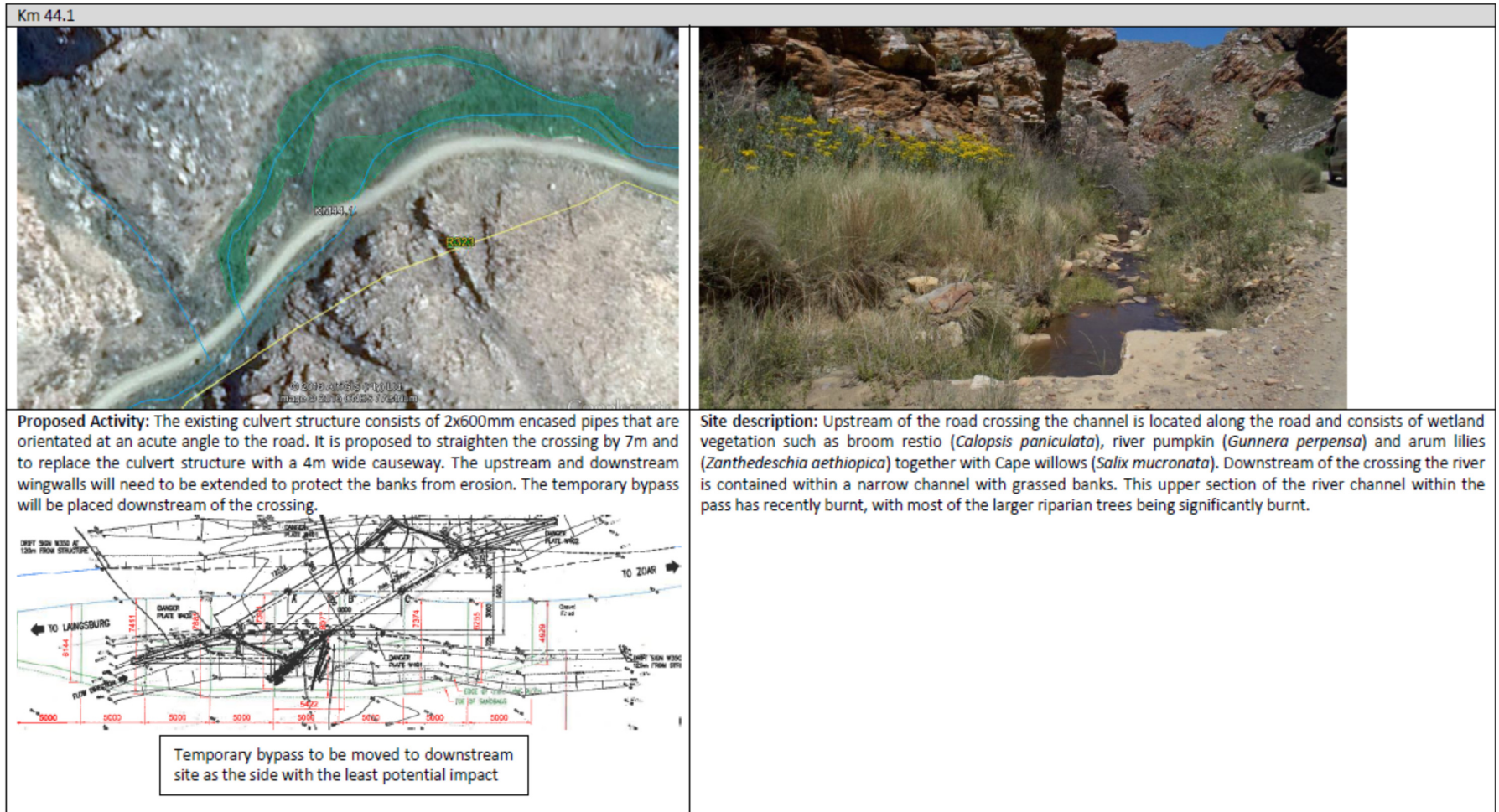


Figure 1-2: Site and proposed activity description at Km 44.1

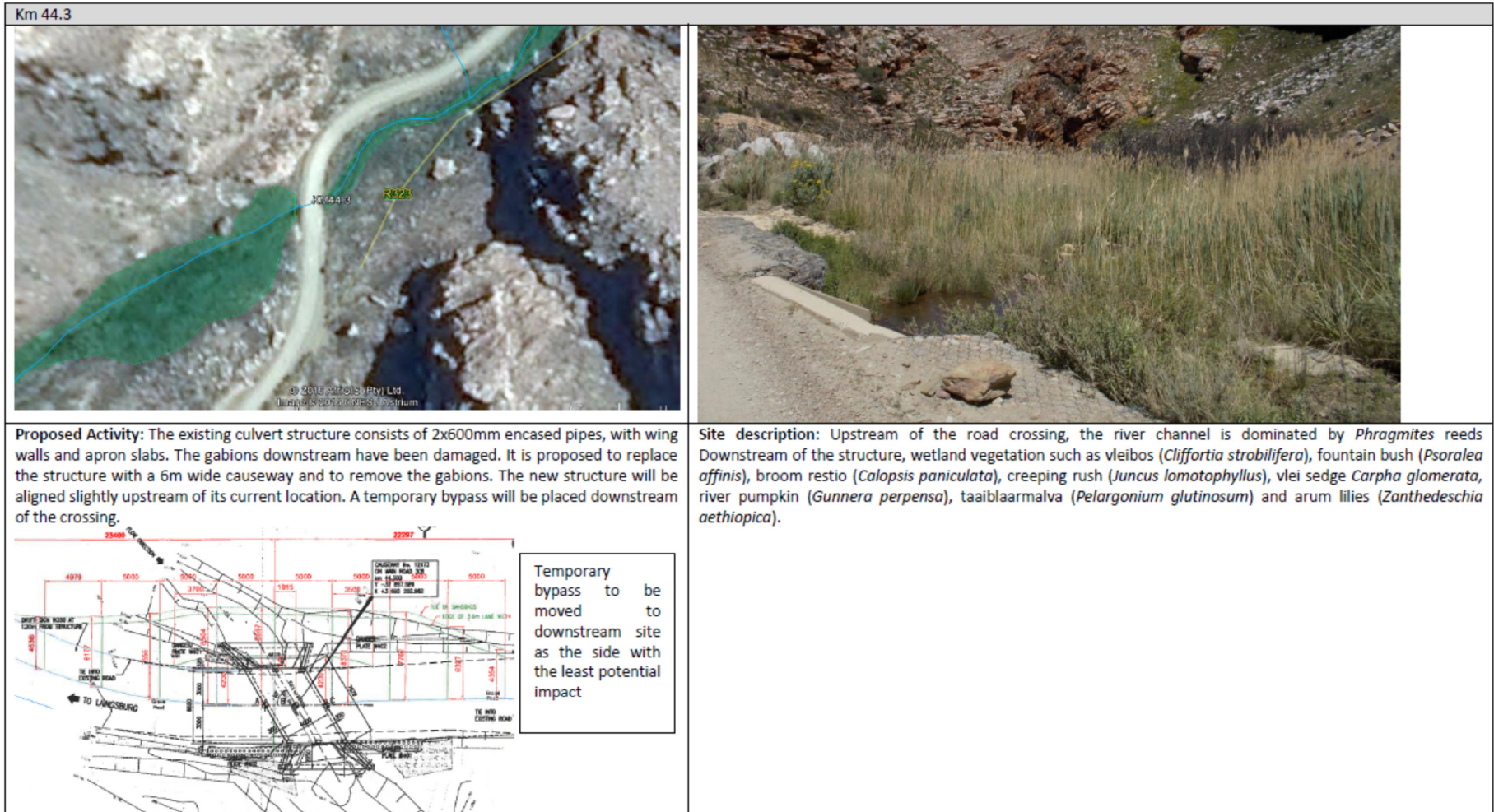


Figure 1-3: Site and proposed activity description at Km 44.3

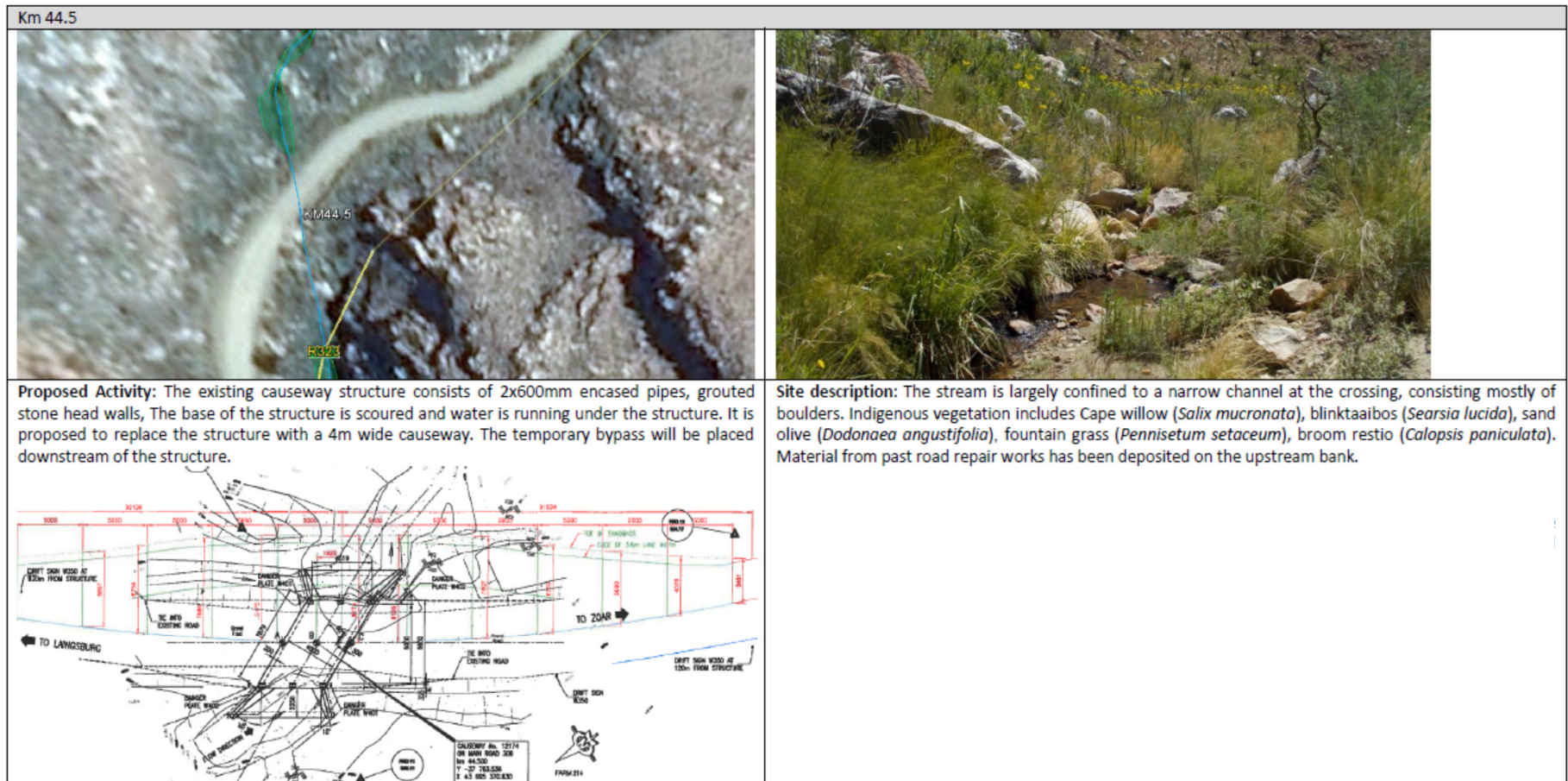


Figure 1-4: Site and proposed activity description at Km 44.5

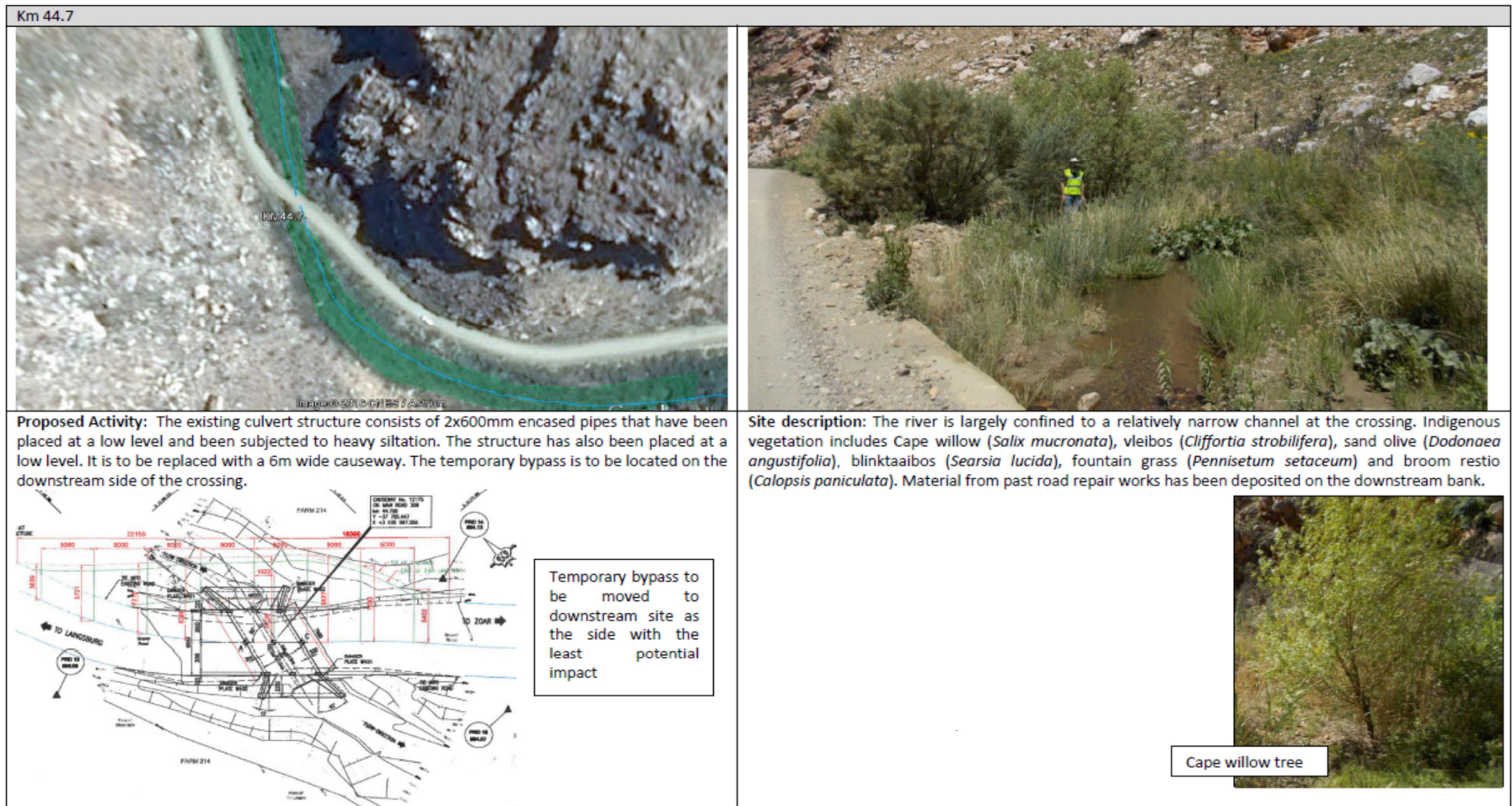


Figure 1-5: Site and proposed activity description at Km 44.7

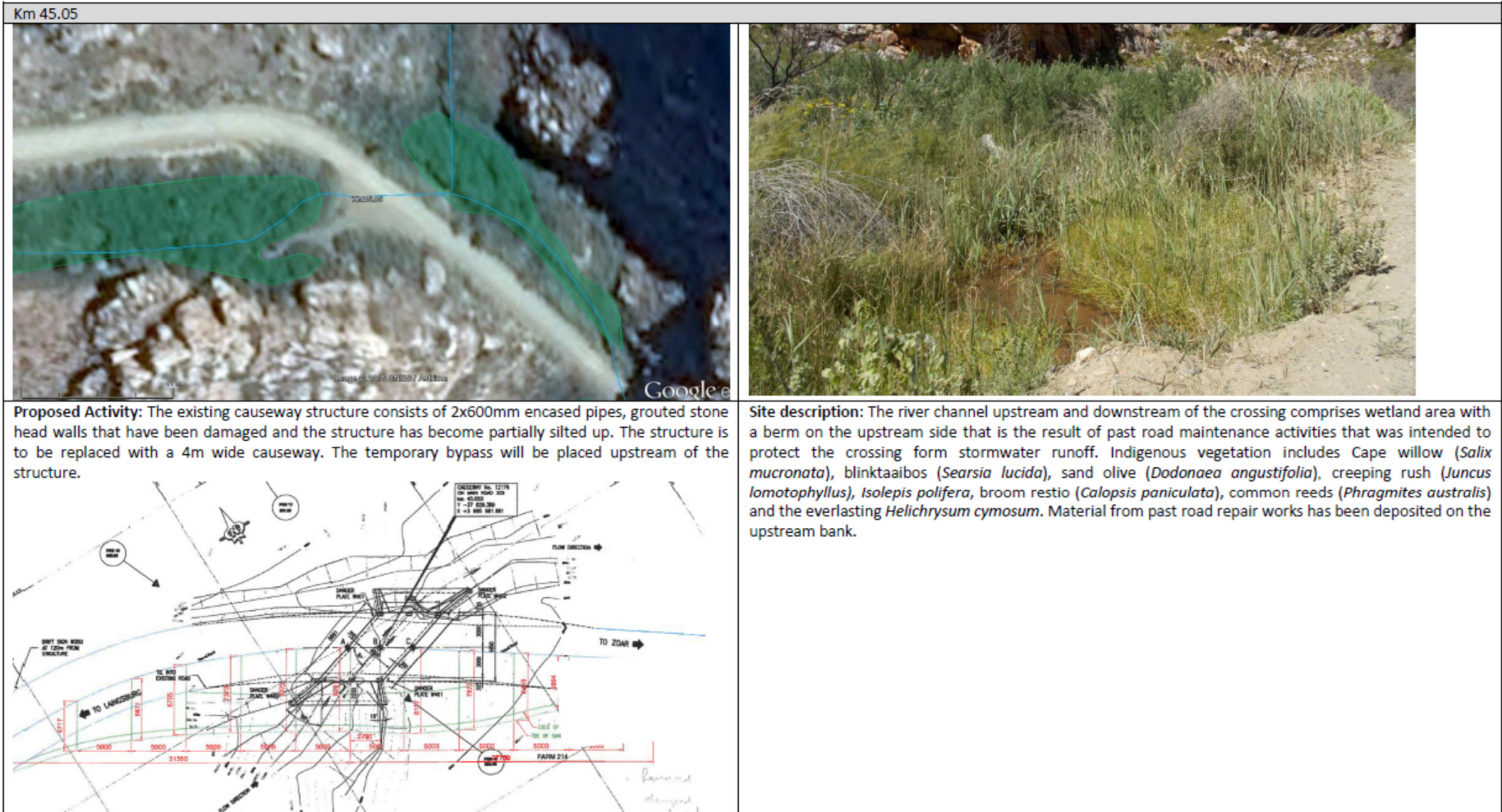


Figure 1-6: Site and proposed activity description at Km 45.05

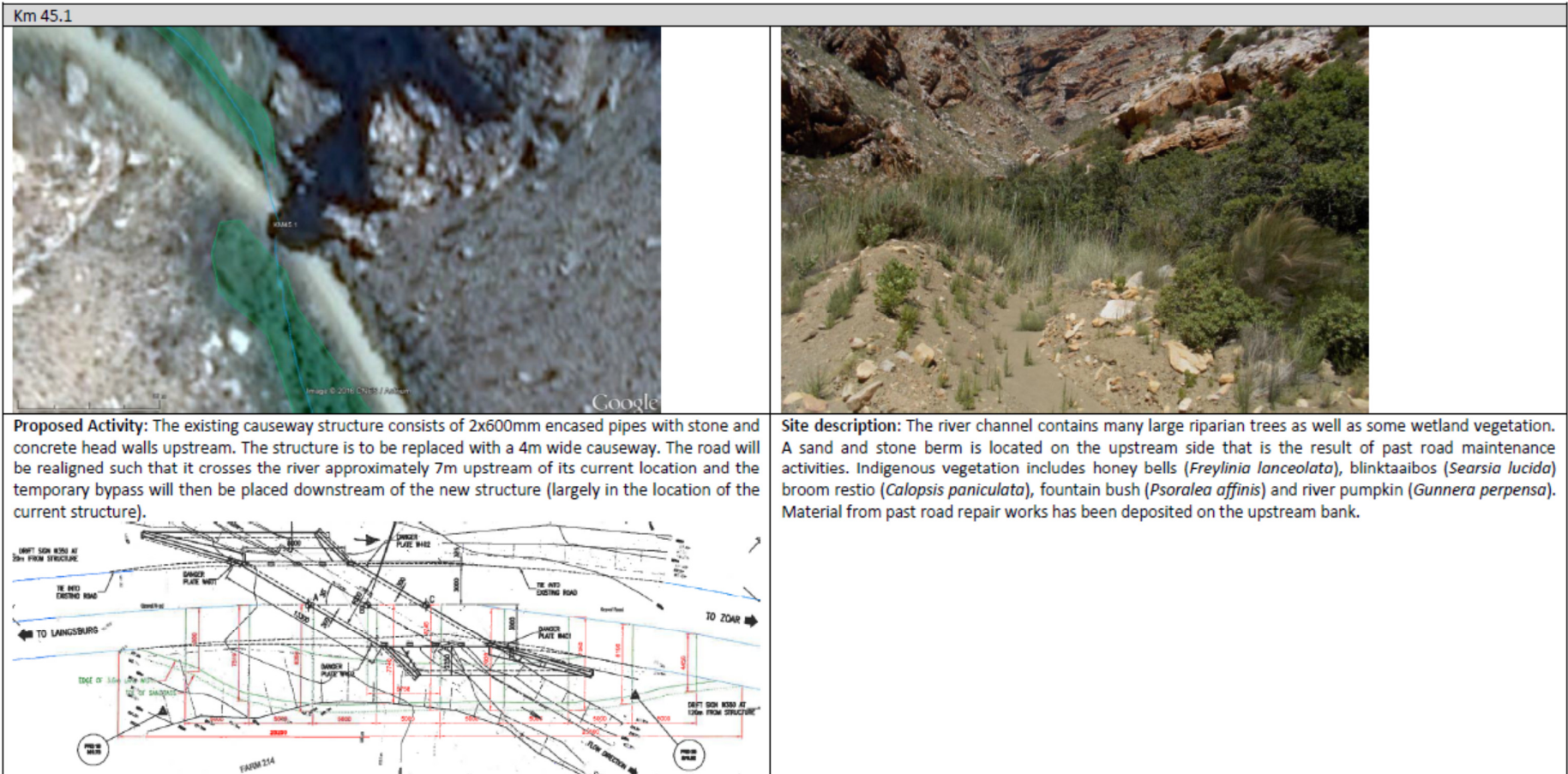


Figure 1-7: Site and proposed activity description at Km 45.1

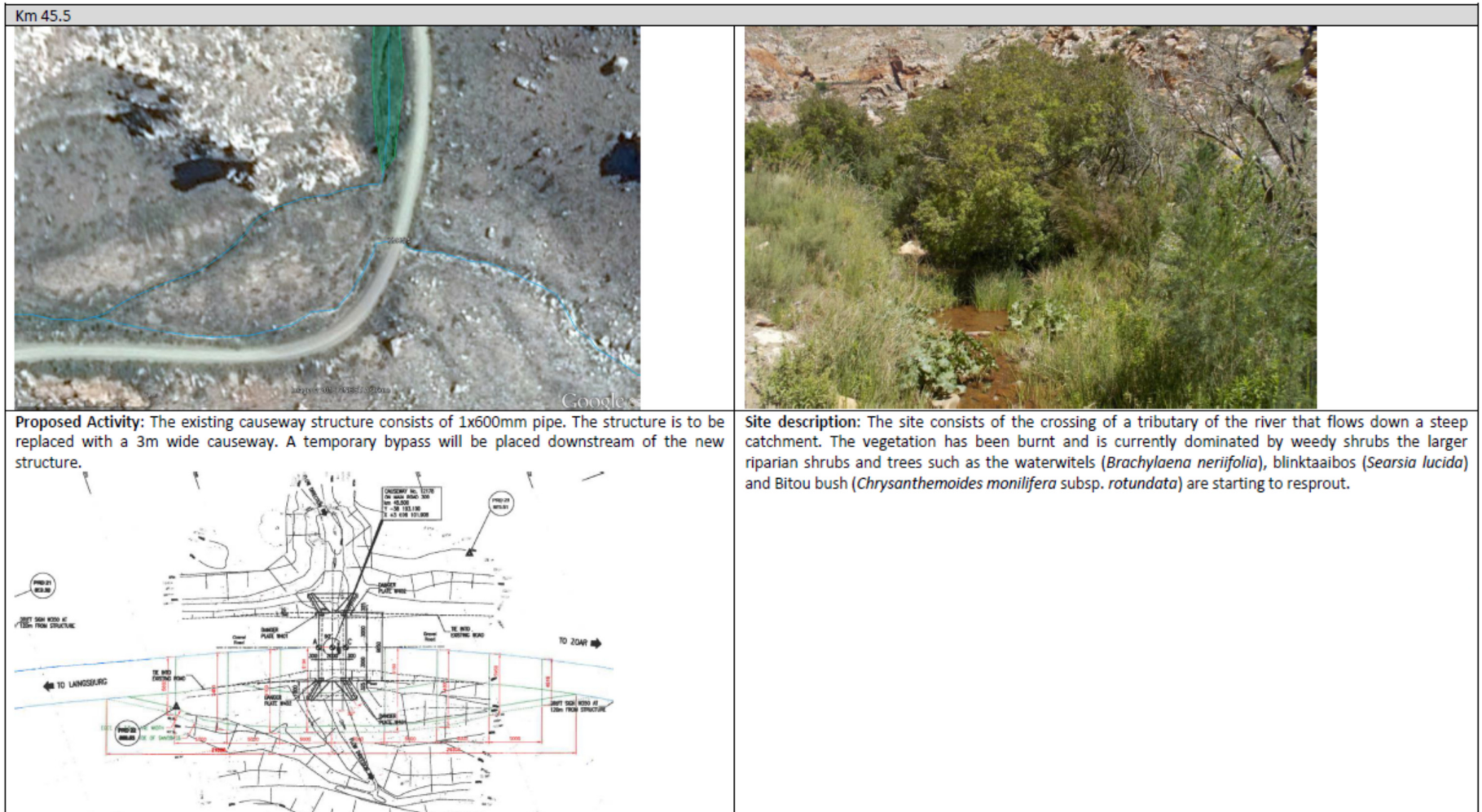


Figure 1-8: Site and proposed activity description at Km 45.5

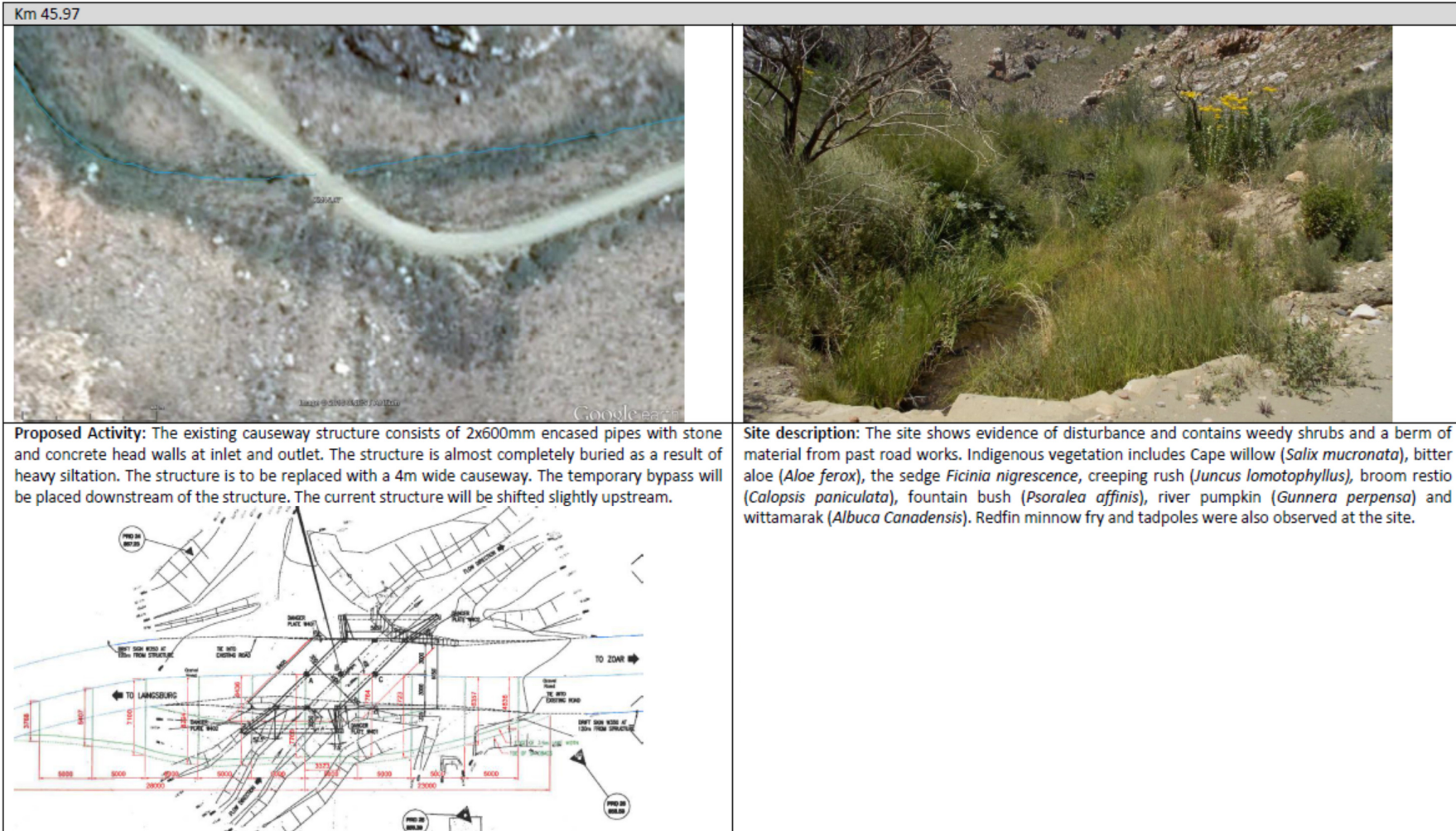


Figure 1-9: Site and proposed activity description at Km 45.97

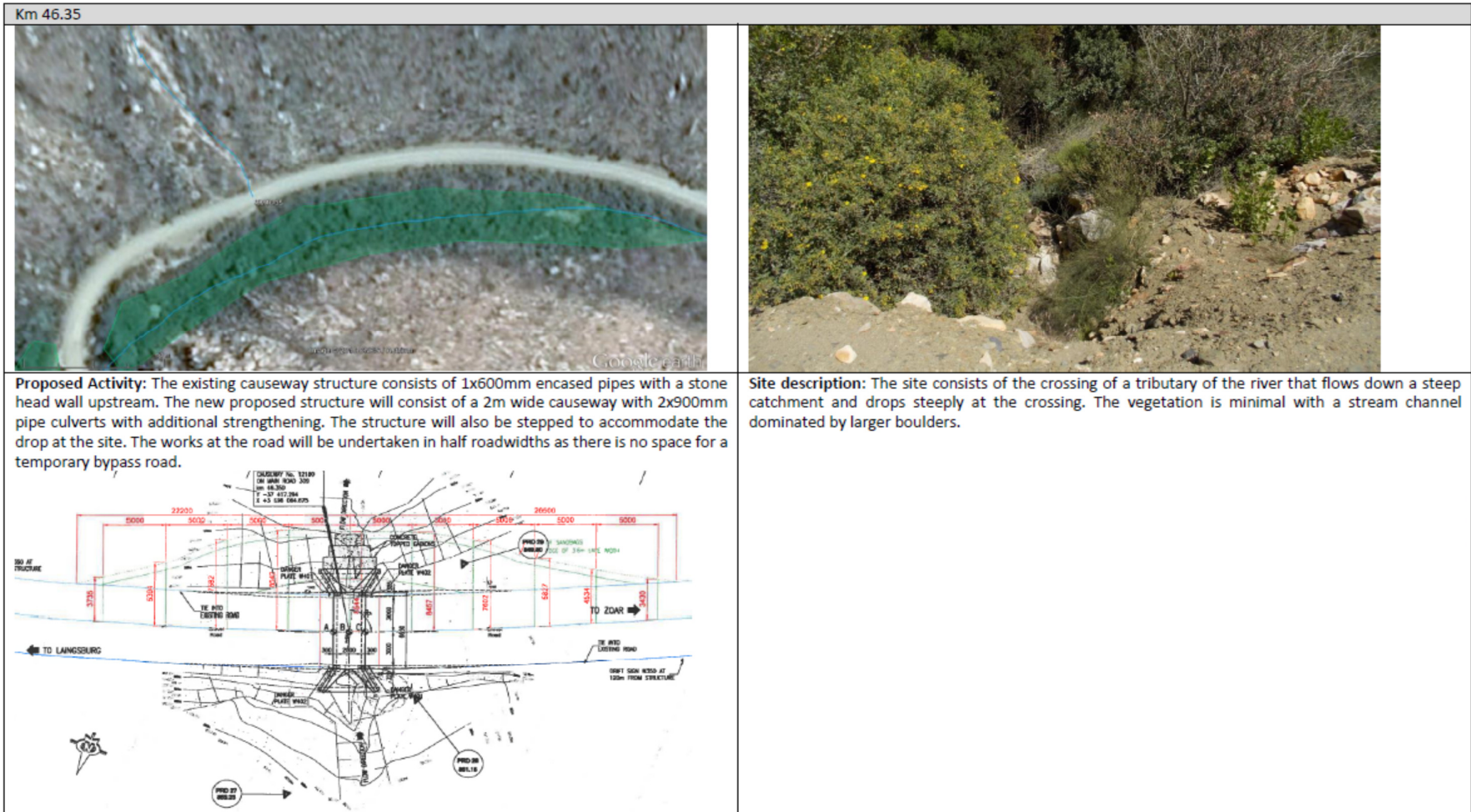


Figure 1-10: Site and proposed activity description at Km 46.35

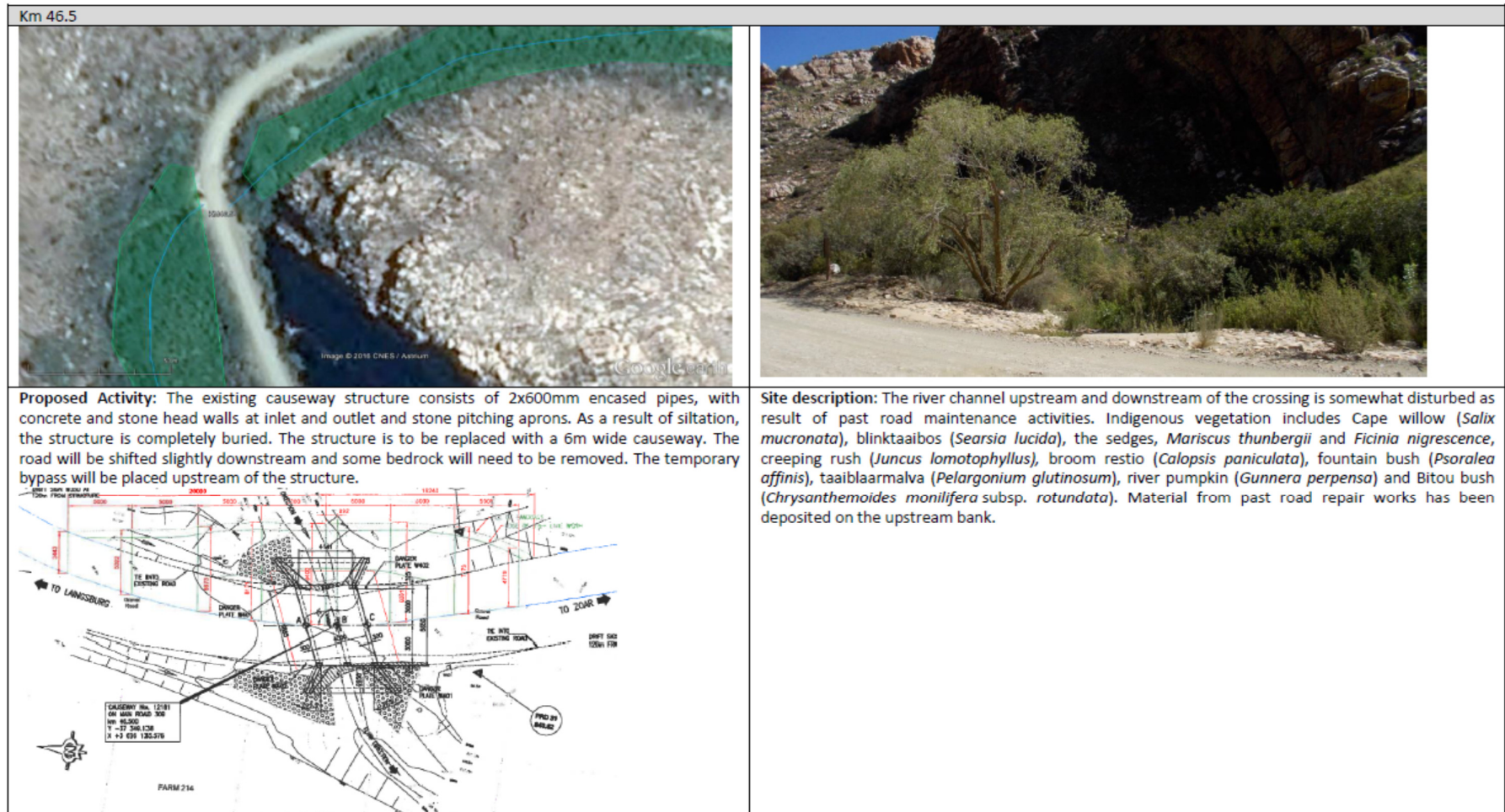


Figure 1-11: Site and proposed activity description at Km 46.5

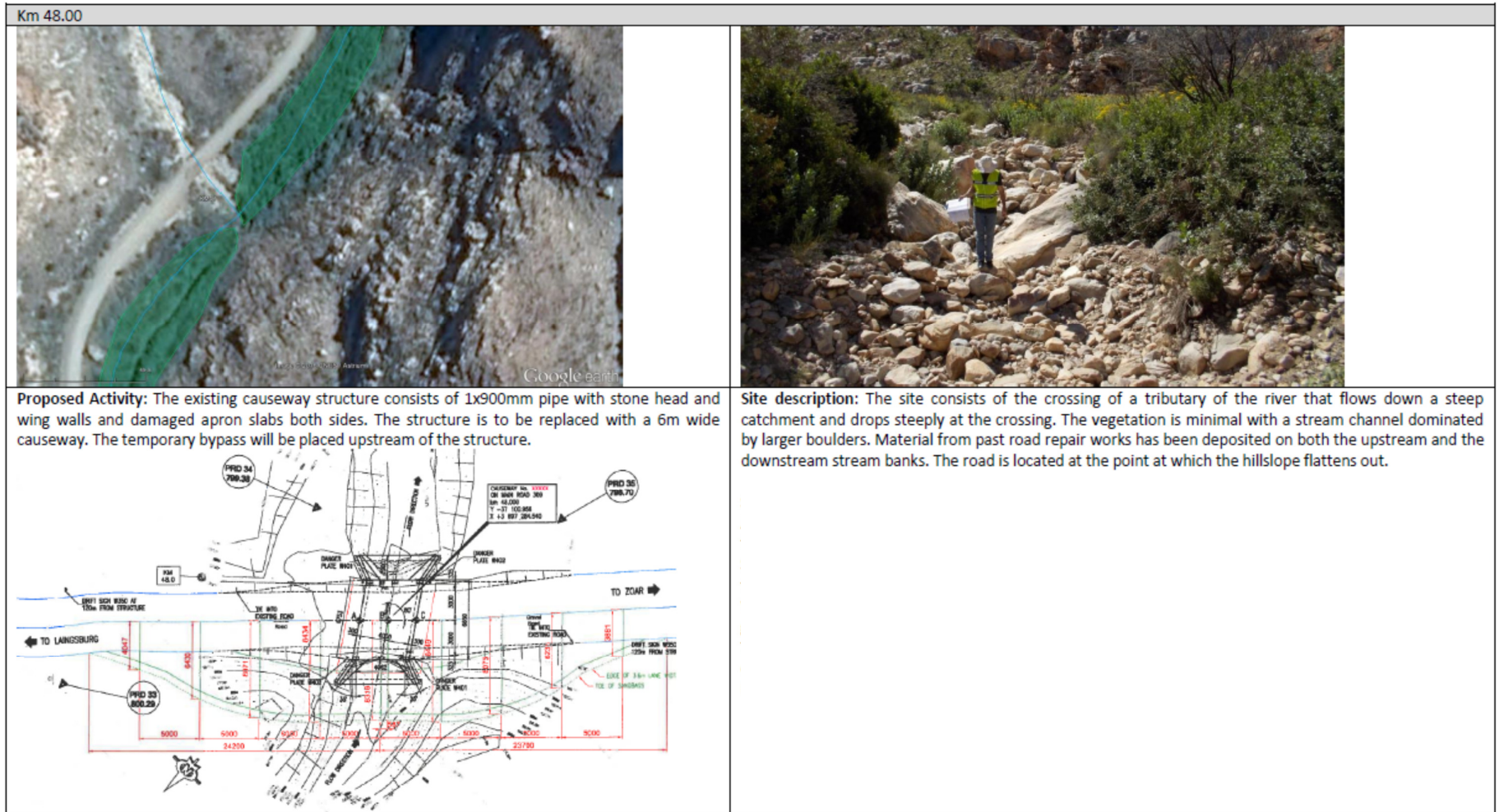


Figure 1-12: Site and proposed activity description at Km 48.00

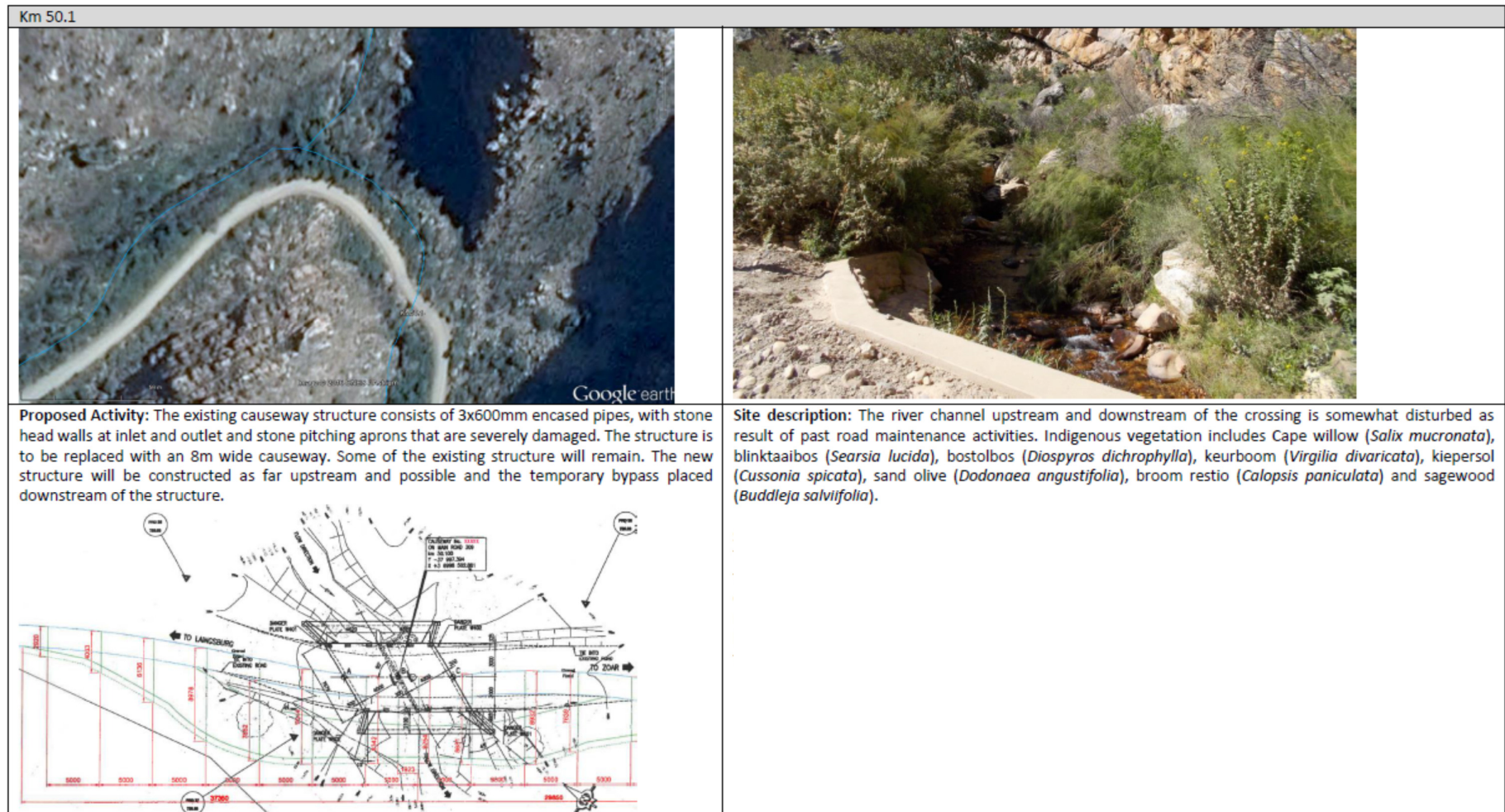


Figure 1-13: Site and proposed activity description at Km 50.1

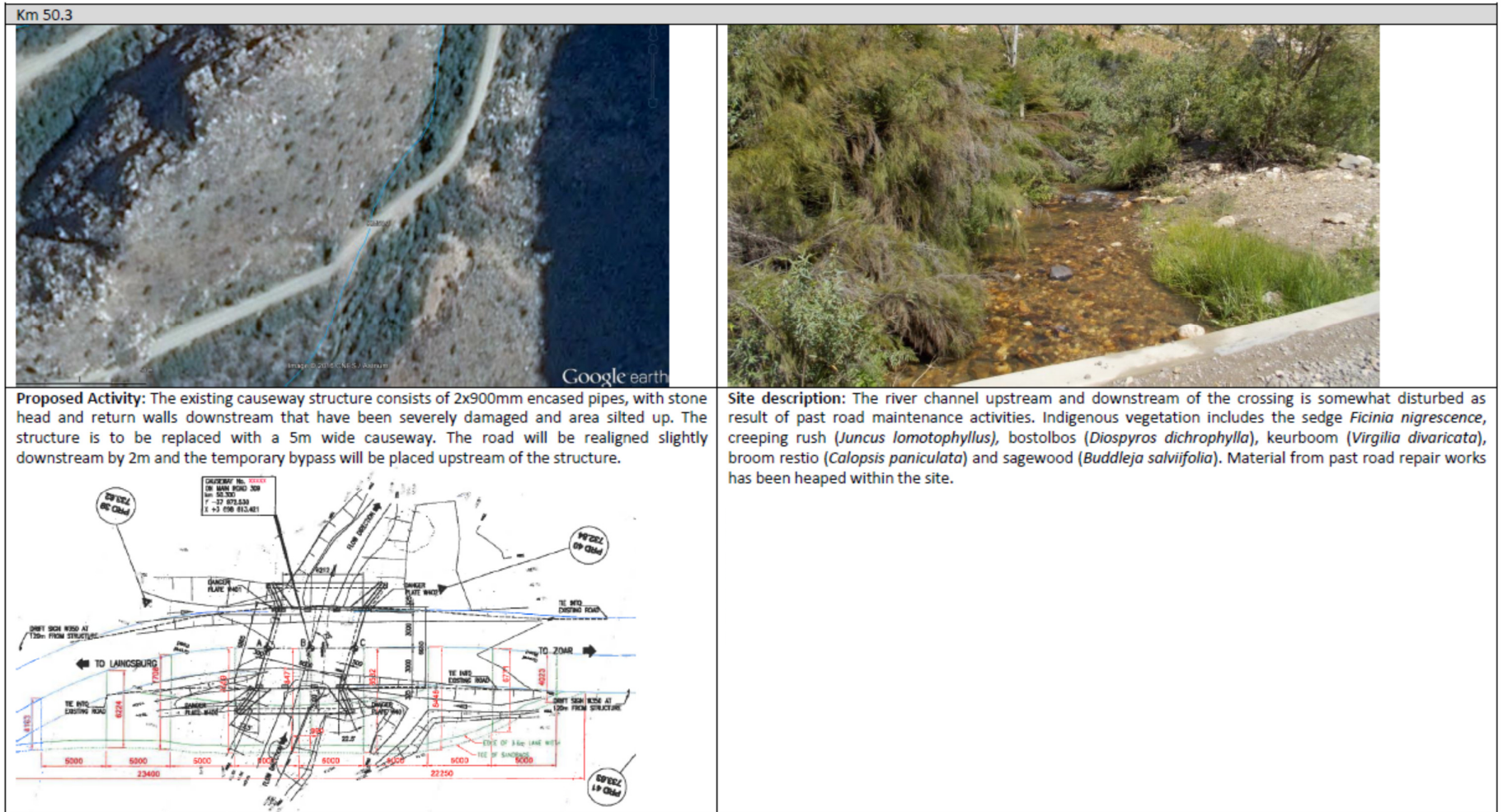


Figure 1-14: Site and proposed activity description at Km 50.3

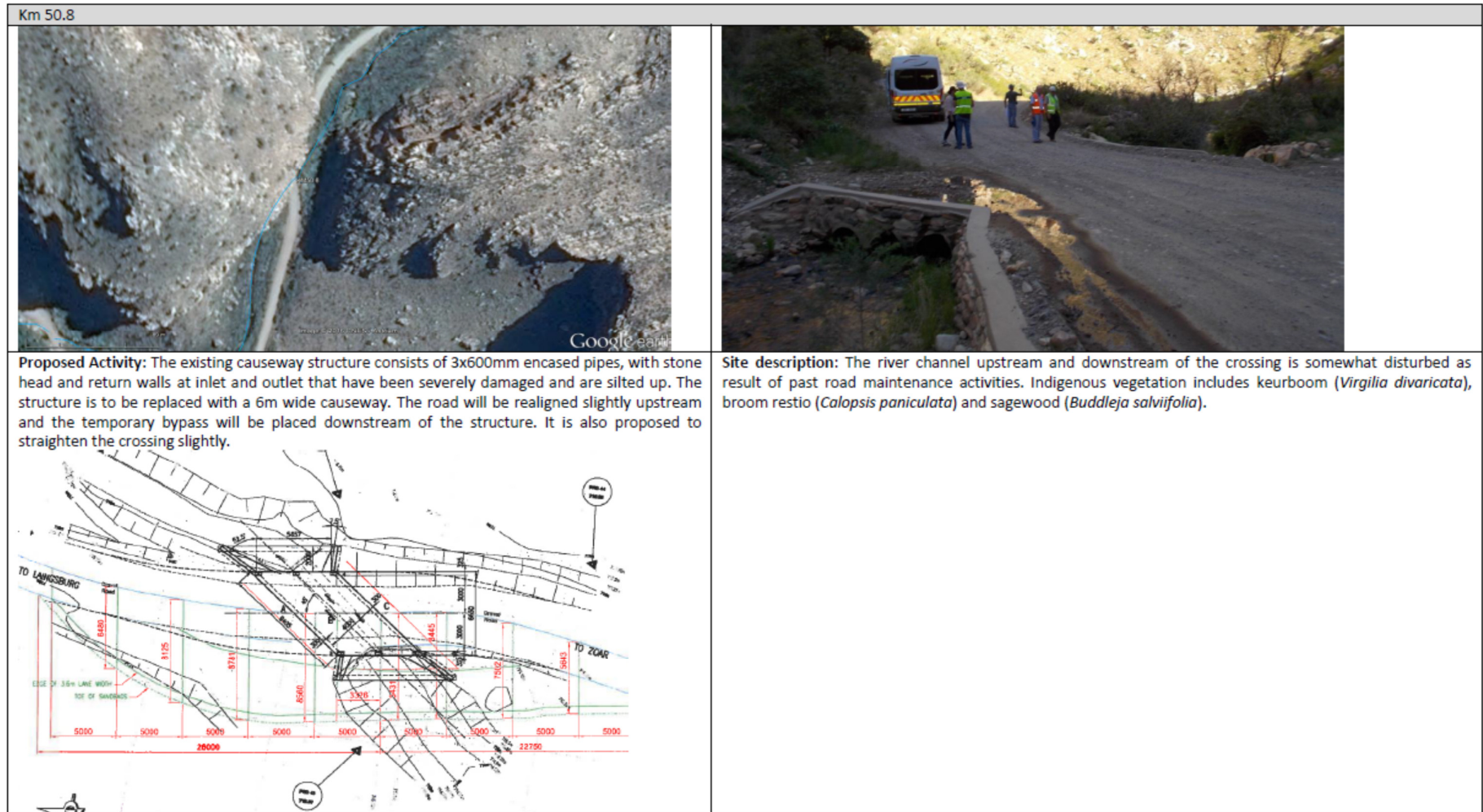


Figure 1-15: Site and proposed activity description at Km 50.8

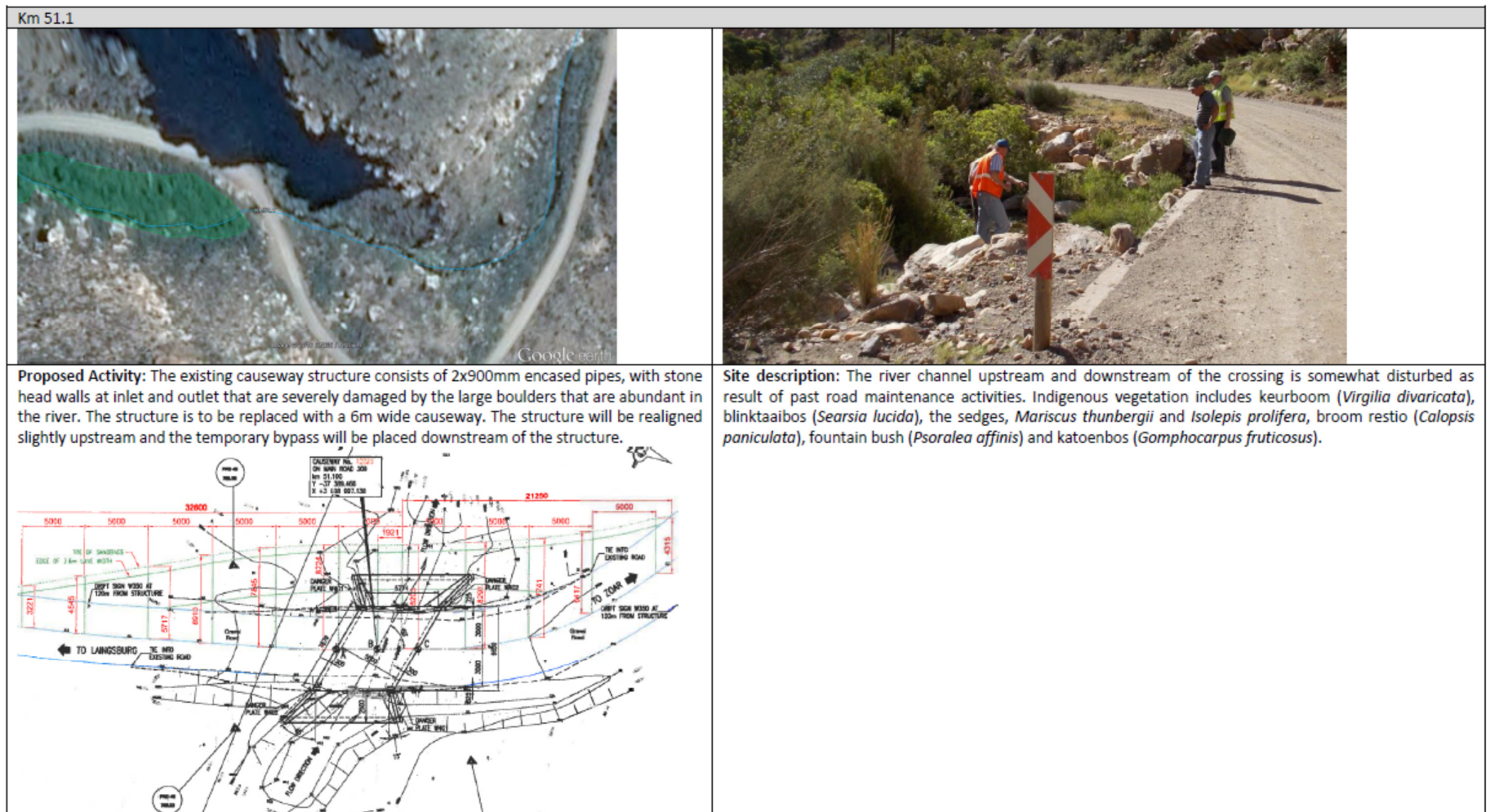


Figure 1-16: Site and proposed activity description at Km 51.1

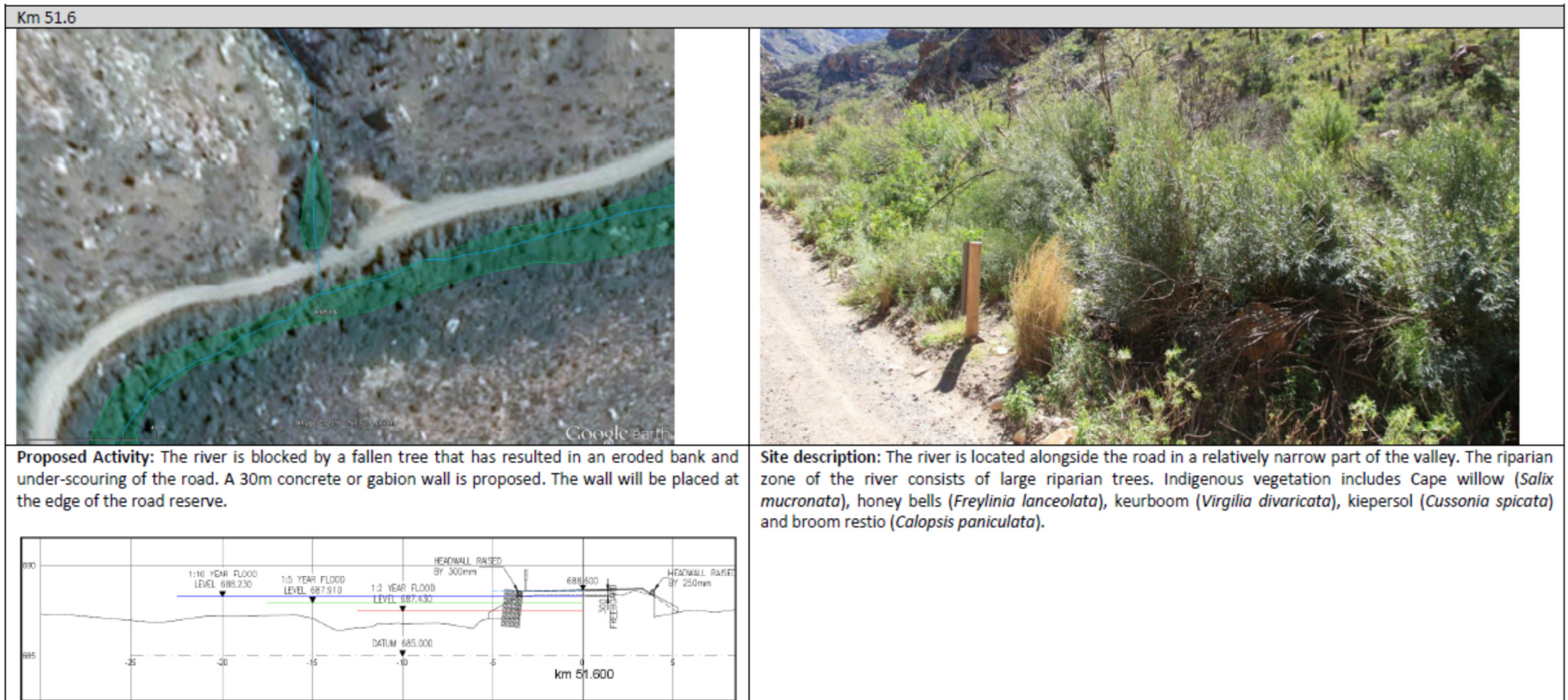


Figure 1-17: Site and proposed activity description at Km 51.6

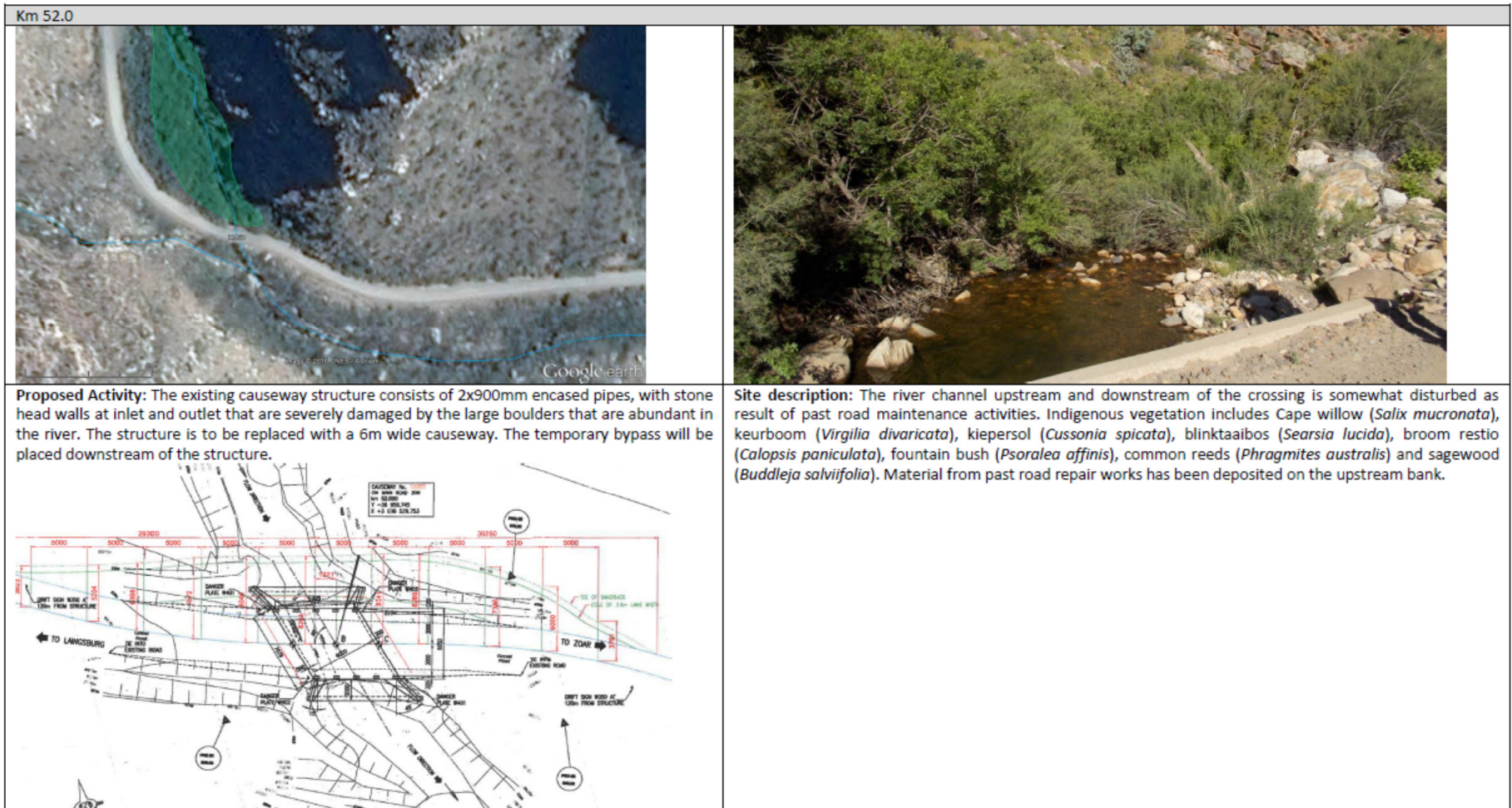


Figure 1-18: Site and proposed activity description at Km 52.0

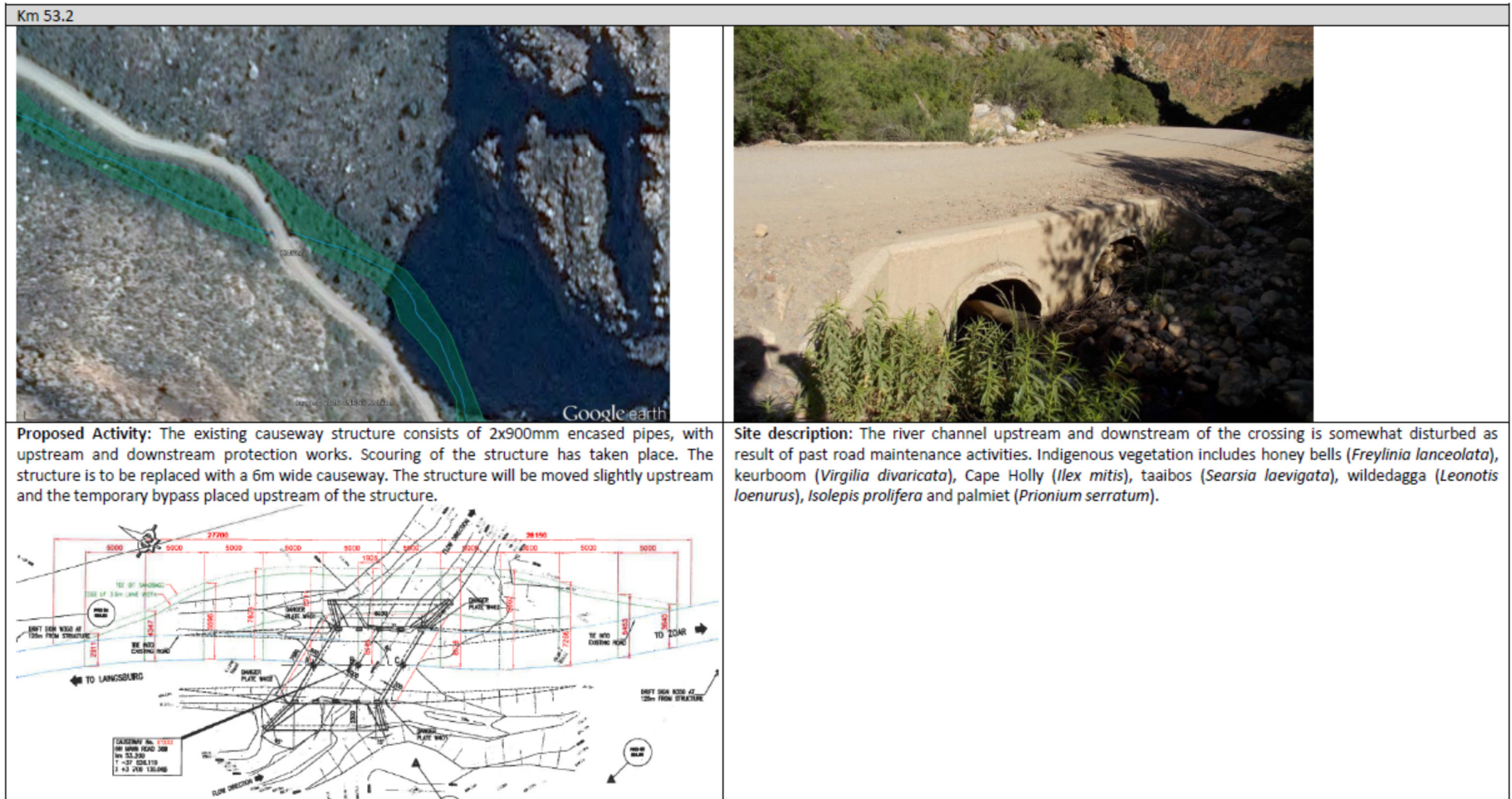


Figure 1-19: Site and proposed activity description at Km 53.2

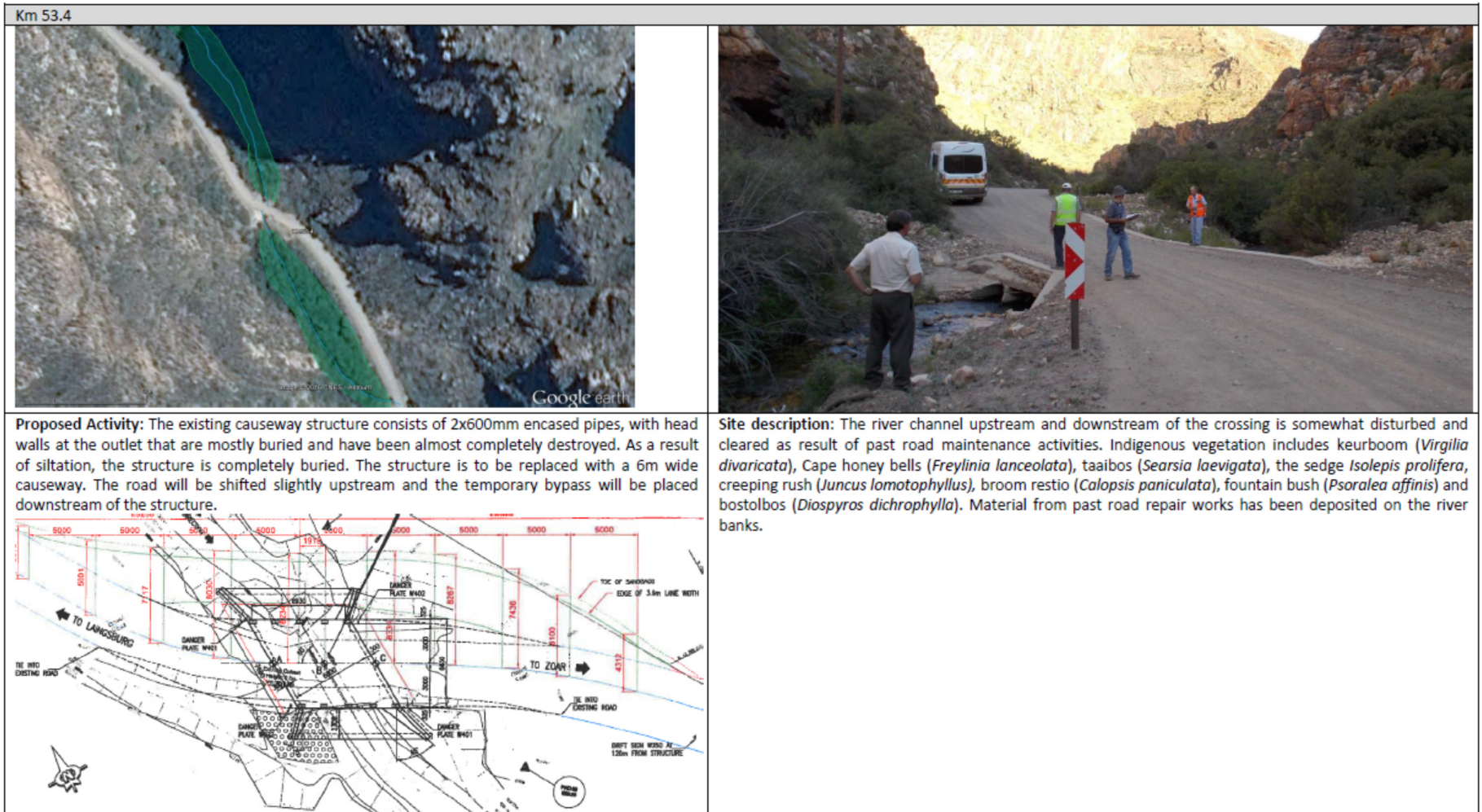


Figure 1-20: Site and proposed activity description at Km 53.4

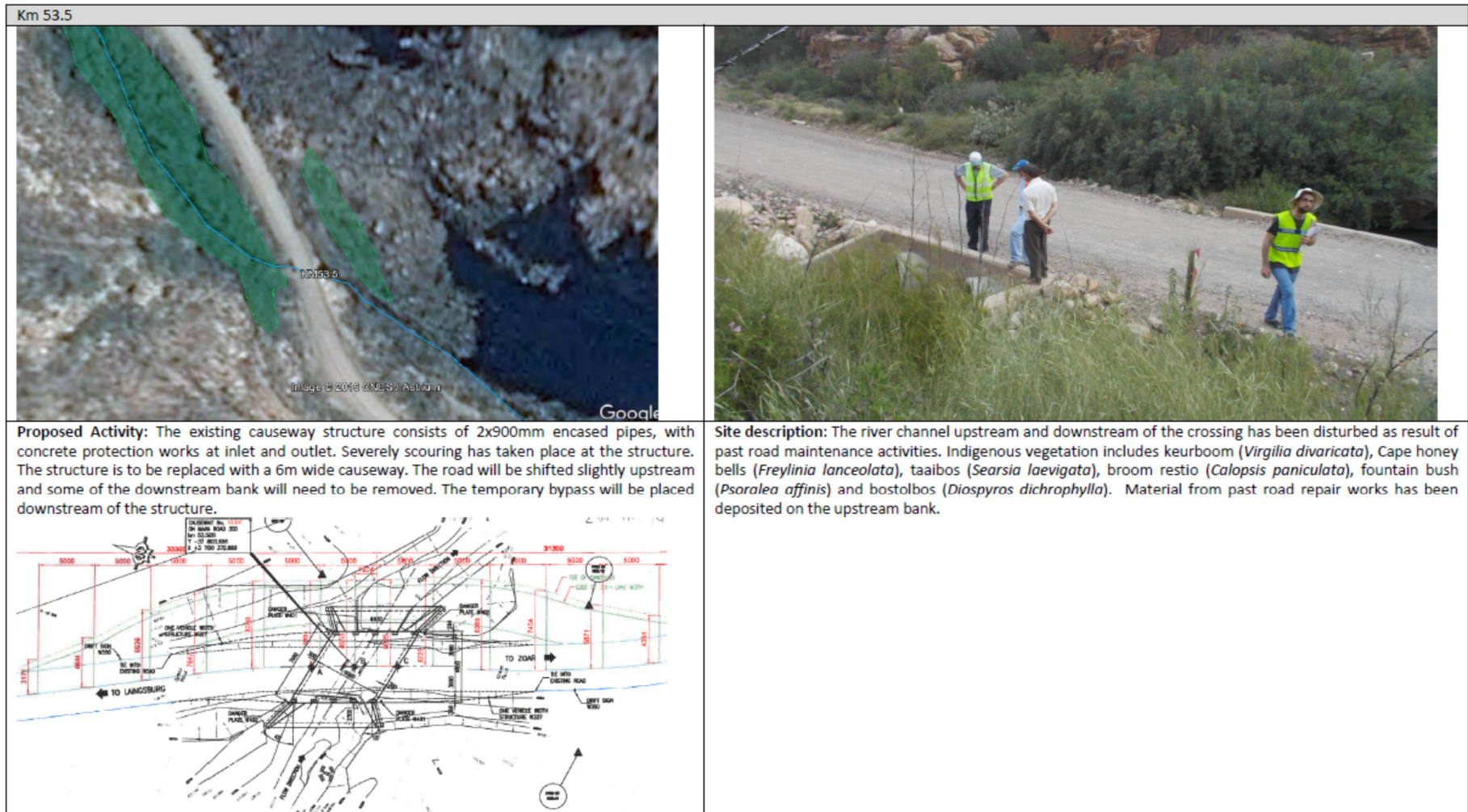


Figure 1-21: Site and proposed activity description at Km 53.5

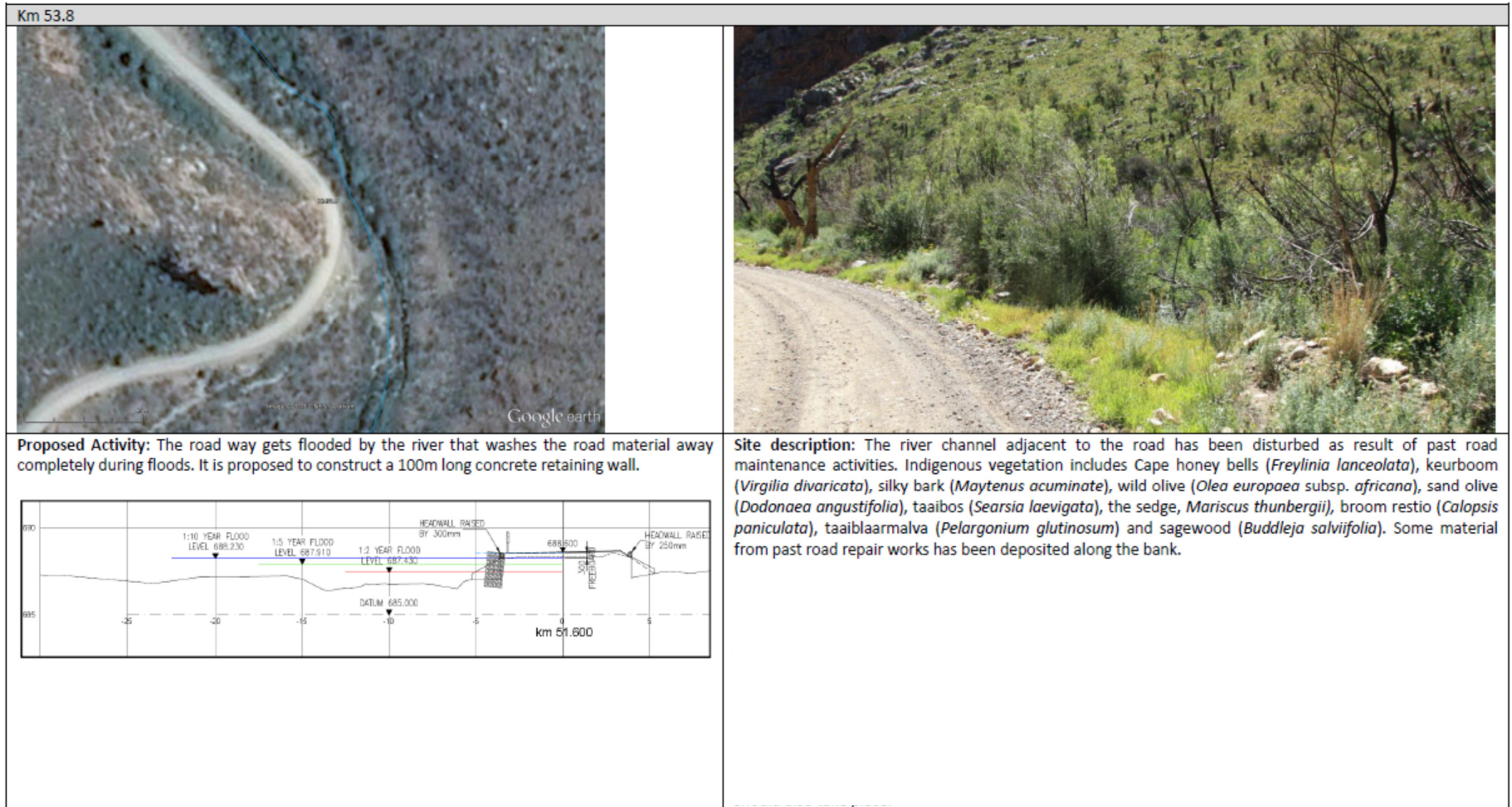


Figure 1-22: Site and proposed activity description at Km 53.8

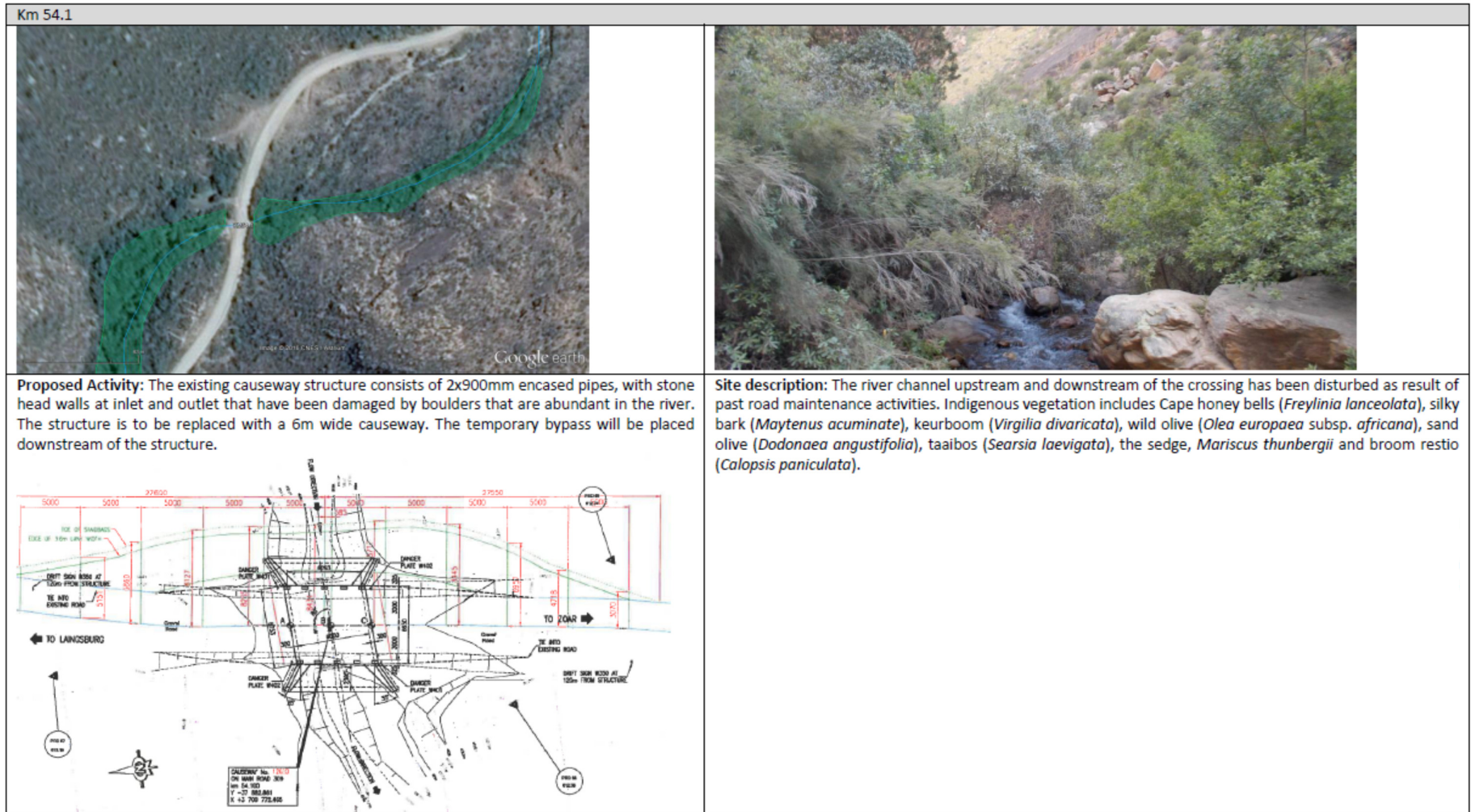


Figure 1-23: Site and proposed activity description at Km 54.1

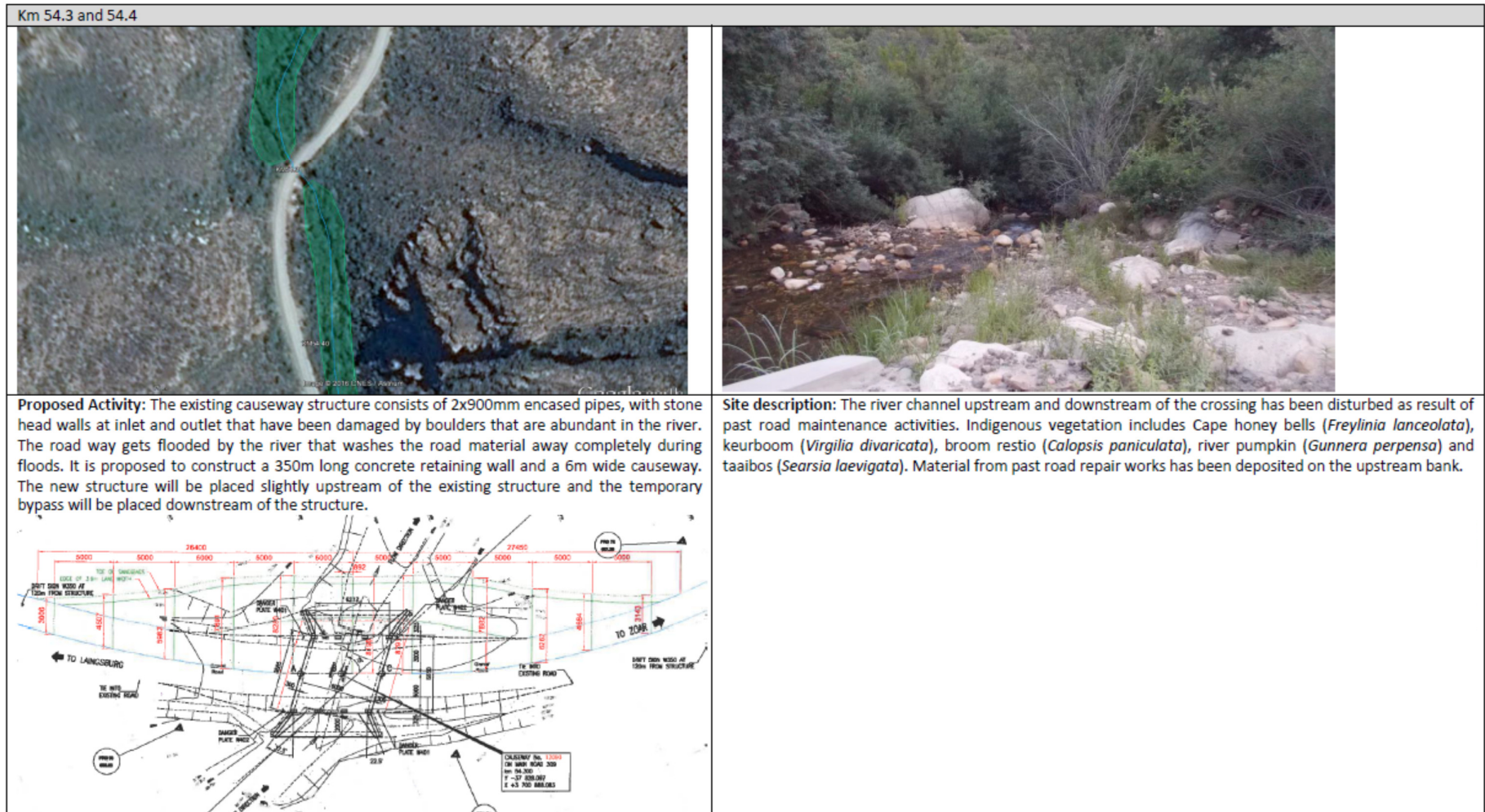


Figure 1-24: Site and proposed activity description at Km 54.3 and Km 54.4

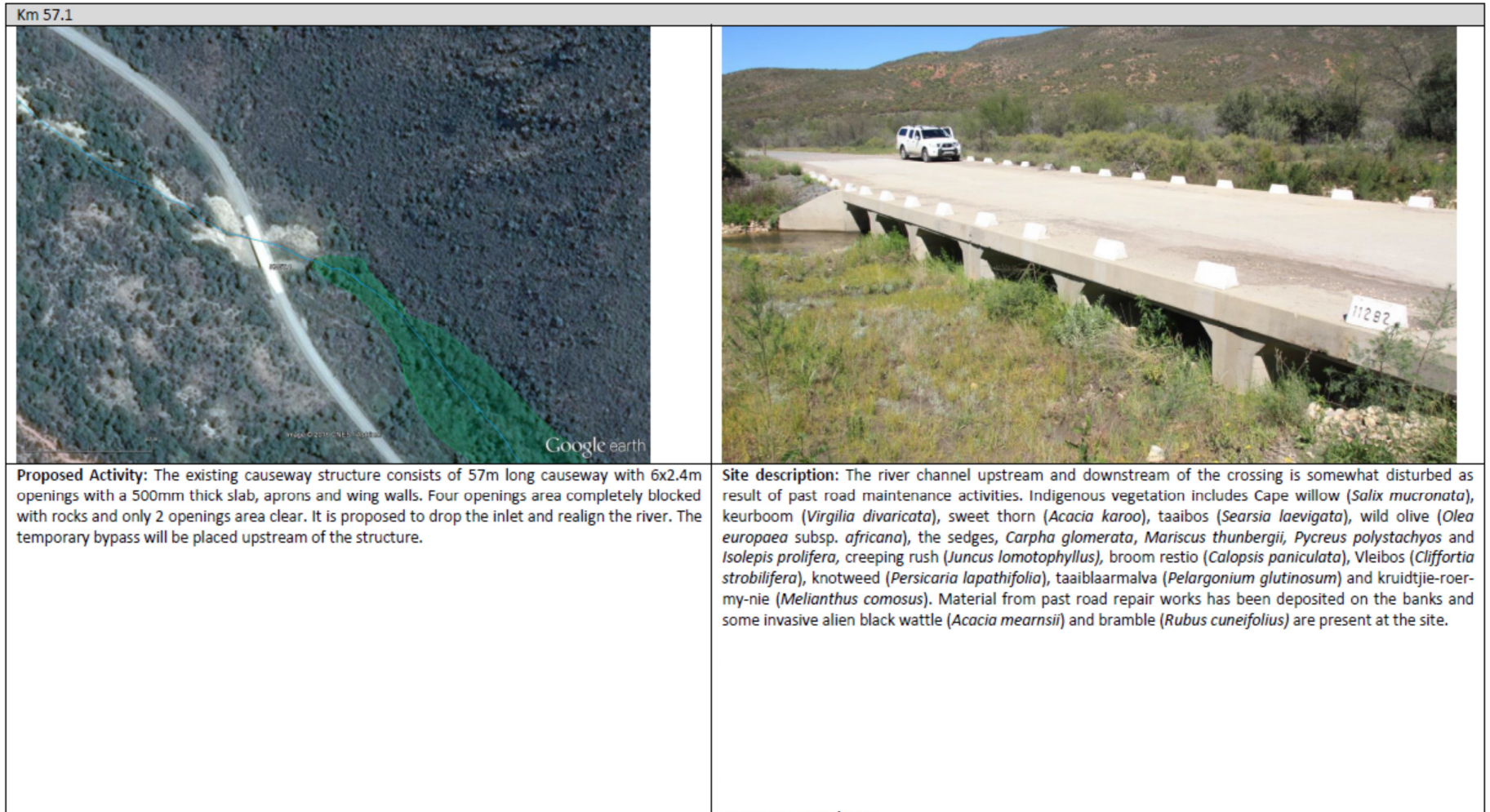


Figure 1-25: Site and proposed activity description at Km 57.1

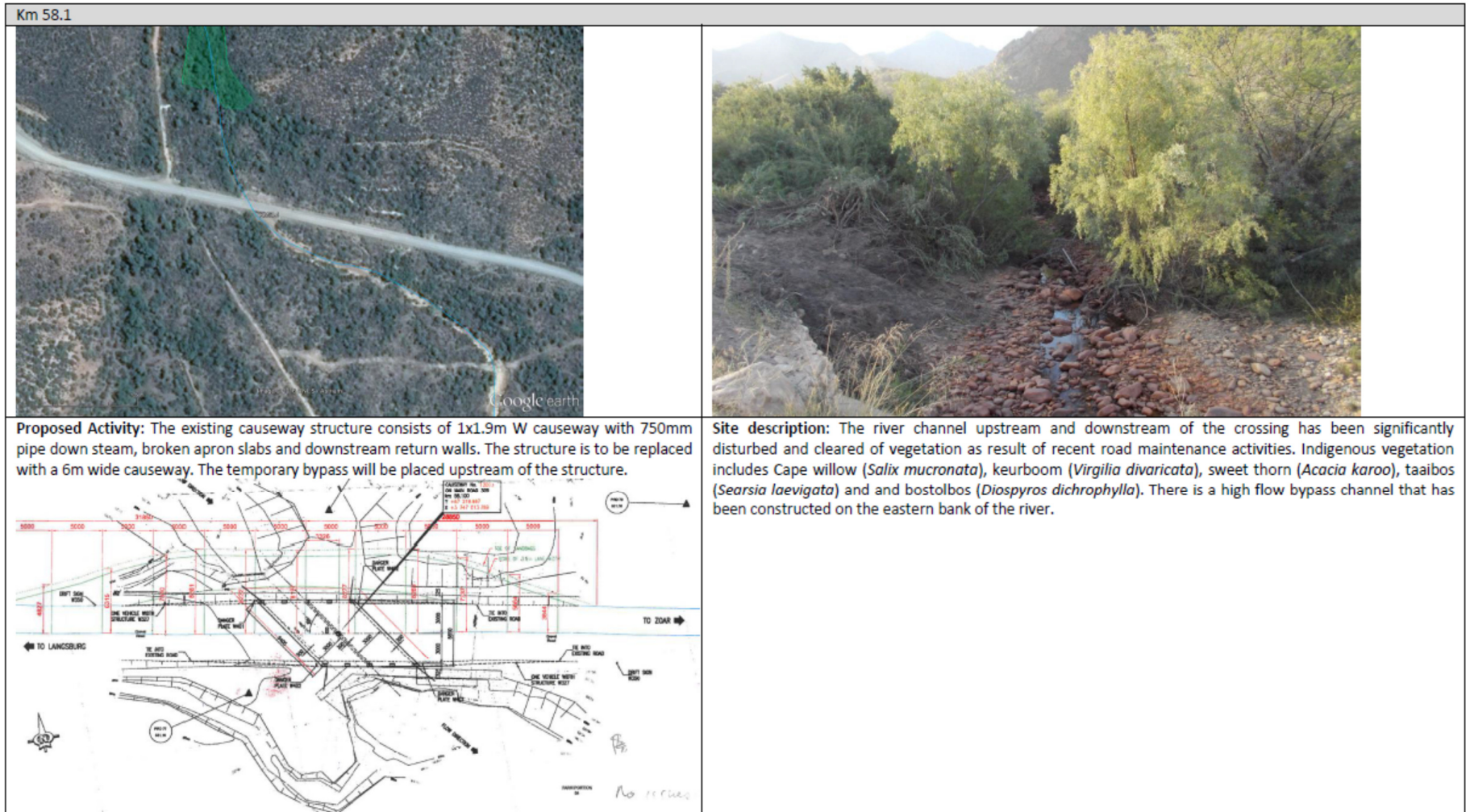


Figure 1-26: Site and proposed activity description at Km 58.1

The gravel road crosses the Seweweekspoort River numerous times in a short distance of 18 km, making the road susceptible to flood damage. Structures consisting mostly of one or two pipes have been constructed over many years to mitigate the flooding of the road. Even with small rainfall events, the road becomes flooded and covered with debris causing damage to causeways and sections of the road at the river crossings. At certain sections, where the river runs parallel to the road, flooding causes the road surface material to be completely washed away. Since the road traverses the border between the Eden District Municipality and the Central Karoo District Municipality, both of these authorities are responsible for its repair.

The Eden District Municipality and Central Karoo District Municipality have identified the structures which require repair work or upgrading. The work consists of 24 causeways and three short sections of road.

Infrastructure to be constructed

The design width of the structures is proposed to be a 6 m clear width between guide blocks and not materially wider than the gravel road which is narrower in many parts of the pass. Typical sizes for the proposed causeways will range from 2m wide to a maximum width of 8m (depending on the site) and will be perpendicular to the flow of the river and structures will be aligned with the direction of the river. Rectangular causeways with larger clear spans (few piers) are preferred to pipe causeways as the risk of blockage will be greatly reduced. The sizing of openings will allow floods with a 2 year return period to pass through drainage openings under the deck slab. Concrete approach slabs are to be omitted as far as possible due to under scour risks and expensive repairs.

The pass cannot be closed for traffic during construction activities as farmers, tourists and residents of the area make use of the road. The only alternative routes are the Swartberg Pass to the north or an alternative route to the south but this results in large detours. The proposed strategy to prevent disruption of traffic flow would entail temporary deviations at 23 river-crossing sites. This would require removal of natural vegetation next to each crossing and the construction of temporary gravel deviation roads to divert the traffic; however deviations will be kept to a minimum footprint and will be rehabilitated and revegetated post construction. Temporary river crossings will be created where required using similar techniques as currently in practise on the pass (e.g. pipe culverts).

A site visit was undertaken by the Environmental Impact Assessment (EIA) team (including the Freshwater Ecologist, Botanist and Heritage Specialist), the project engineers and the applicant to determine the deviation routing that would have the least environmental impact on the sensitive environmental surroundings.

Botanical, freshwater and heritage assessments have been undertaken in order to determine the impacts of the proposed traffic deviations, upgrades and repair work and these have been included in Appendix C.

1.4 Study Area

The starting point for the area of study is located at the northern end of the pass at km 40.9. The study area ends 17.2 km away at the southern end point at km 58.1.

Most of the study area is located within the formally protected Towerkop Nature Reserve, with the southern portion also forming part of a Mountain Catchment Area. The Western Cape Biodiversity Framework assigns a portion of the southern end and a small portion at the northern end of the study area as Critical Biodiversity Areas (CBA) and Ecological Support Areas (ESA). A significant proportion of the study area falls within a formally protected area and within a World Heritage Site. The main freshwater feature in the study area is the Seweweekspoort River, a tributary of the Kobus Tributary (J25B) in the Gouritz River System. There are some tributaries and valley bottom wetland areas associated with the river within the area where the road will be upgraded.

The roadway and associated structures are existing structures located within the Seweweekspoort River System. The existing road, together with some other physical modifications to the freshwater features in the upper catchment area, has resulted in the current deteriorated ecological condition of the river and its associated wetland areas.

A locality map, route plan and sensitivity map were developed for the Seweweekspoort road refurbishment and is presented in Appendix A with Figure 1-27 showing the general location of the structures along the road.

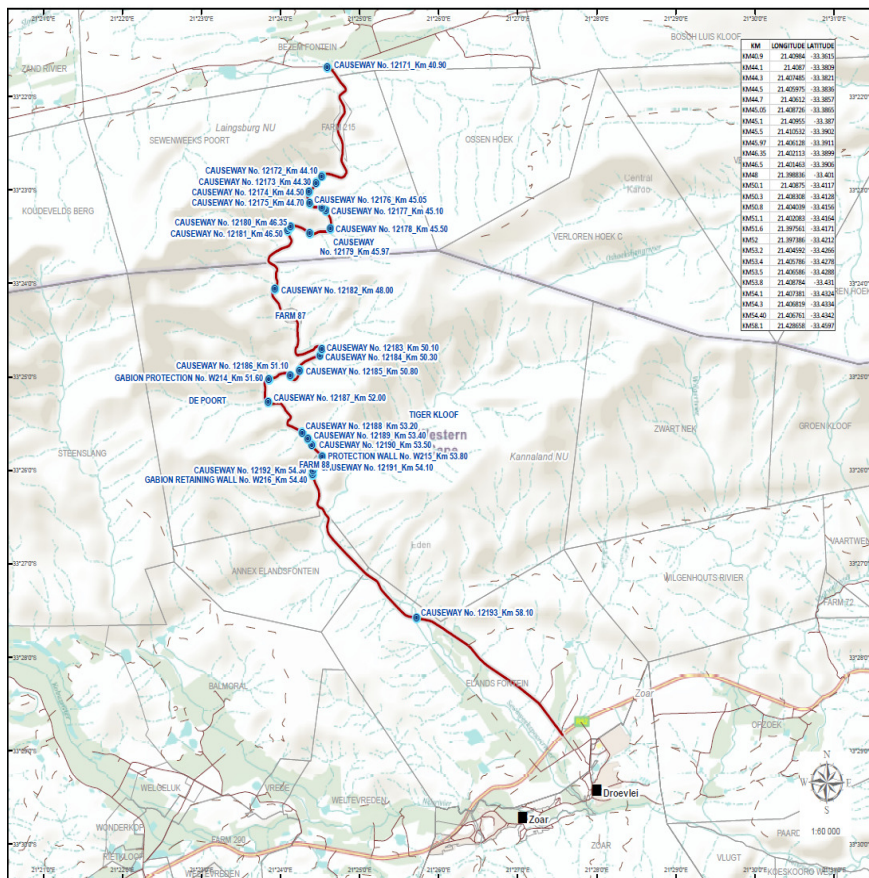


Figure 1-27: Site locality map showing the location of the affected areas

1.5 Site Access

Access to the site can be gained from two routes – the R62 from Zoar on the southern portion of the site and the R323 from Laingsburg on the northern portion (refer to Layout / Route Plan attached in Appendix A).

The proposed strategy to prevent disruption of traffic flow would entail the construction of temporary deviations at 23 of the 27 construction sites (of which 24 are river crossings) during the construction phase. This would require removal of natural vegetation next to each crossing and the construction of temporary gravel deviation roads to divert the traffic and accommodate construction vehicles.

The temporary deviation roads will be the shortest possible length, a trafficable width of 3.6 m and located along the disturbed route alignment as far as practical. The position of the temporary deviation roads was developed in consultation with specialists (freshwater, heritage and botanical) during the site assessment.

Temporary deviation road rehabilitation commitments have been included in the Environmental Management Plan (EMP) in Appendix E.

1.6 Need and Desirability for the Project

The activities proposed entail the repair of existing structures on a public road (MR309), within the mandate of the Western Cape Provincial Department of Transport and Public Works: Roads and Infrastructure. The proposed site is located outside the urban edge as well as on an existing road within an existing road reserve.

The pass has become an important link between the Central Karoo and the Little Karoo in the Eden District Municipality. Neglecting the road will result in poor road conditions and ultimately results in the need to avoid the road all together. This will reduce access between Laingsburg, Ladismith and Zoar and requires road users to make use of alternate routes with longer travelling times. Maintenance and repair of the route will therefore ensure that the current service it delivers in terms of access to the towns, economic activities between the towns and tourism along the pass is maintained and potentially further developed.

The proposed refurbishment of the road infrastructure will require a limited amount of water and electricity; however, if required, these services will be supplied through potable water and mobile generators.

The only municipal service required will be waste disposal for construction waste which will be generated during the construction phase. The appointed contractor will have to identify spoil sites for construction waste and material which is not suitable for re-use in consultation with the Environmental Control Officer which will be appointed by the applicant during the construction phase. No hazardous material will be generated. Proof of capacity for waste disposal if applicable will be obtained from the Municipality and included in the submission of the Final BAR.

1.6.1 Western Cape Province Spatial Development Framework (SDF) March 2014

Chapter 3 sets out the Spatial Framework for the Western Cape province. Section 3.2: Opening-up Opportunities in the Space-Economy acknowledges that infrastructure enables socio-economic development and that the provision and maintenance of regional

infrastructure is central to economic growth. Section 3.2.2 Regional Economic Infrastructure states: “The 2013 Western Cape Infrastructure Framework advocates a new approach to infrastructure – “one that satisfies current needs and backlogs, maintains existing infrastructure, and plans proactively for a desired future outcome leading to resilient and inclusive growth...”

The sustained growth of the economy is the primary goal of the Western Cape Government. The provision and maintenance of regional infrastructure is essential to achieving this goal. The repair and maintenance of the damaged structures will improve transport and travel between Ladismith and Laingsburg by ensuring that the road is accessible during all weather conditions. An adequate and reliable road not only forms part of service delivery to road users, but will support service delivery and economic growth within the Kannaland and Laingsburg Municipalities. The proposed project is therefore well aligned with the provincial objectives set out in 2014 provincial SDF.

1.6.2 **Integrated Development Plan (IDP)**

The proposed road repair falls within two local municipalities, the Kannaland Local Municipality within the Eden District and the Laingsburg Local Municipality within the Central Karoo District.

Reference is made to the Kannaland Municipality Integrated Development Plan 2014/2015 Review (IDP 2014/2015 Review). Section 1.7.6 of the IDP 2014/2015 Review identifies the following Key Performance Areas (KPA):

- KPA 1: To provide access to reliable infrastructure that will contribute to a higher quality of life for Kannaland citizens
- KPA 2: To provide adequate services and improve our public relations.

1.6.3 **Integrated Environmental Management**

The following provides an analysis of how the objectives of Integrated Environmental Management (IEM) have been considered for the repairs to structures along the MR309. The general objective of the IEM is to:

a) Promote the integration of the principles of environmental management set out in section 2 into the making of all decisions which may have a significant effect on the environment	The project is aligned with the NEMA principles described below (see section below).
b) Identify, predict and evaluate the actual and potential impact on the environment, socio-economic conditions and cultural heritage, the risks and consequences and alternatives and options for mitigation of activities, with a view to minimizing negative impacts, maximizing benefits and promoting compliance with the principles of environmental management set out in section 2	This has been identified in the current BAR process and included in Chapter 6 & Appendix E.
c) Ensure that the effects of activities on the environment receive adequate consideration before actions are taken in connection with them	This has been identified in the current BAR process and included in Chapter 6 & Appendix E.

d) Ensure adequate and appropriate opportunity for public participation in decisions that may affect the environment	The current BAR process has included a comprehensive PP process. See Chapter 5 and Appendix D.
e) ensure the consideration of environmental attributes in management and decision-making which may have a significant effect on the environment	A comprehensive assessment of the significance of impacts has been conducted as part of the BAR (see Chapter 6).
f) identify and employ the modes of environmental management best suited to ensuring that a particular activity is pursued in accordance with the principles of environmental management set out in section 23.	A comprehensive Feasibility Study, including consideration of environmental issues, was conducted prior to selecting alternative routes and technologies for inclusion in this BAR (see Appendix H for the Inception Report for the project).

The activities proposed entail the repair of existing structures on a public road (MR309). These activities were assessed bearing in mind, *inter alia*, the following principles of environmental management:

- Placing people and their needs at the forefront of its concern. The pass has become an important link between the Central Karoo and Little Karoo in the Eden District Municipality. Short-term employment opportunities and income associated with the construction phase of the structure upgrade will benefit local communities. Over the long term, the repair of the road will produce an adequate and reliable road will support service delivery and economic growth within the Kannaland and Laingsburg Municipalities
- Promoting a socially, environmentally and economically sustainable solution for the current situation on the MR309 through consultation with specialists to ensure the most environmentally acceptable design solution for the proposed outcome.
- The avoidance and mitigation of pollution and degradation of the environment , through the compilation of a construction environmental management plan to ensure that construction activities are managed in accordance with best practise standards
- Avoidance of disturbance of any elements of cultural heritage by appointing a Heritage Specialist to identify if any of these resources occur in the project area and proposing mitigation measures which have been carried across into the Environmental Management Programme (EMPr) (Appendix E)
- Disposal of waste in a responsible manner during the construction phase (recommendations included in the EMPr, Appendix E)
- Avoidance and minimisation of negative impacts through design by incorporating environmental principles into the design process as part of the early project development phases.

These considerations lead to a proposal which is considered the best practical road and culvert design options for the culvert repairs/improvements, does not discriminate against any person or group, recognises the participation of all Interested and Affected Parties (I&APs) and is socially, environmentally and economically sustainable.

1.7 Alternatives

The purpose of the proposed repairs and upgrades is to repair damage to existing structures along the Seweweekspoort Pass caused by flooding events and to replace undersized structures with new structures capable of diverting the flow during normal rainfall events. The need for the repairs is only required on the existing structures of which the location is fixed by the Seweweekspoort Pass road and the water crossing areas where the flood damage has occurred. No reasonable or feasible site / location alternative exists that would meet the need and objective of this application and therefore the alternatives have simply been assessed in terms of the following:

No-go alternative: The 'No-Go' scenario, where the status quo remains. The current road contains undersized culverts that are prone to flooding and result in flood damage occasionally. This results in the interruption of road activities as well as a need to enter the river system as part of repairs on these occasions. The resulting scouring and erosion affects the road infrastructure negatively and result in additional siltation of the river due to fill material being washed down river. The continuous repairs also result in increased costs to maintain the road due to the regular repairs required.

Alternative 1: The preferred alternative is to undertake the structure upgrades including the temporary deviation roads to ensure continuous traffic flow during construction. As part of Alternative 1, the Botanical Specialist assessed two alternatives for the deviation roads referred to as Deviation Route Alternative A (preferred deviation route) and Deviation Route Alternative B (the least preferred deviation). The two deviation alternatives were assessed in terms of the impact they would both have on loss of vegetation type and loss of ecological processes.

The Flood Damage Repairs Inception Report undertaken by Hatch (2016) (see Appendix H) identified 27 out of 30 structures for repairs. 27 sites were identified for repairs, based on inspections of the damaged structures, after discussions with officials from the District Municipalities regarding their priorities.

The 27 sites proposed for repair, restoration or maintenance work are located along the Seweweekspoort Pass, starting at the northern end of the pass at km 40.9 and ends 17.2 km away at the southern end at km 58.1 The construction approach and impacts will be similar to a linear development (refer to Appendix A for the coordinates of all structures along the pass).

Coordinates below should be read in conjunction with the Figure attached in Appendix A:

Alternative	Latitude (S)	Longitude (E)
Alternative 1 (preferred)		
Starting point of the activity	33°21'42.30 "S	21°24'35.42 E
Middle / additional point of the activity	33°21'51.11" S	21°24'45.77 E
End point of the activity	33°26'03.00" S	21°24'24.34" E

1.8 Location of Activity as per Section 3 (b)(i)-(iii)

The location of the Major Road MR309 is as follows:

Table 1-1: Site Locality Details

Province:	Western Cape Province	
District Municipality:	Eden District Municipality Central Karoo District Municipality	
Local Municipality:	Kannaland Municipality (Eden) Laingsburg Municipality (Central Karoo)	
Ward Number(s):	Kannaland Municipality Ward 4 Eden Municipality Ward 4	
Area / Town / Village:	Laingsburg Ladismith Zoar	
Property Description:	MR 309 (Road) (see Appendix A)	
21 Digit Surveyor General's Number:	Bezemfontein 213 PTN 3	C04300000000021300003
	De Poort 61	C04200000000006100000
	Elandsfontein 64	C04200000000006400000
	Farm 215	C04300000000021400000
	Annex Elandsfontein 62	C04200000000006200000
	Tiger Kloof 63	C04200000000006300000

The localities of the proposed structures requiring repair along the MR309 road are as follows:

Table 1-2: Localities of the structures requiring repair along the MR306

Km Dist.	GPS Coordinates	Existing Structure	Proposed Structure
40.90	33°21'41.30"S	3x600mm pipes with gabions upstream, ponding occurs at inlet and outlet	6m wide causeway
	21°24'35.42"E		
44.10	33°22'51.38"S	2x600mm encased pipes, large skew angle	4m wide causeway
	21°24'31.32"E		
44.30	33°22'55.45"S	2x600mm encased pipes, with wing walls, apron slabs, gabions downstream damaged	6m wide causeway
	21°24'26.95"E		
44.50	33°23'1.12"S	2x600mm encased pipes, grouted stone head walls, base scoured and water running under structure	4m wide causeway
	21°24'21.51"E		
44.70	33°23'8.56"S	2x600mm encased pipes, heavy siltation, low level	6m wide causeway
	21°24'22.03"E		

45.05	33°23'11.26"S	2x600mm encased pipes, grouted stone head walls, mostly damaged, slight siltation	4m wide causeway
	21°24'31.42"E		
45.10	33°23'13.16"S	2x600mm encased pipes, with stone and concrete head walls upstream	4m wide causeway
	21°24'34.38"E		
45.50	33°23'24.84"S	1x600mm pipe only for side stream	3m wide causeway
	21°24'37.91"E		
45.97	33°23'27.84"S	2x600mm encased pipes with concrete and stone head walls at inlet and outlet, heavy siltation, structure completely buried	4m wide causeway
	21°24'22.06"E		
46.35	33°23'23.57"S	1x600mm pipe with stone head wall	2m wide causeway
	21°24'7.61"E		
46.50	33°23'26.04"S	2x600mm pipes with concrete and stone head walls at inlet and outlet, stone pitching aprons, siltation, structure completely buried	6m wide causeway
	21°24'5.27"E		
48.00	33°24'3.53"S	1x900mm pipe, stone head and wing walls, damaged apron slabs both sides, river channel is deep	6m wide causeway
	21°23'55.81"E		
50.10	33°24'42.25"S	3x600mm pipes with stone head walls up and down stream, stone pitching aprons severely damaged	8m wide causeway
	21°24'31.50"E		
50.30	33°24'46.14"S	2x900mm pipes with stone head and return wall downstream, severely damaged and siltation issue	5m wide causeway
	21°24'29.91"E		
50.80	33°24'56.08"S	3x600mm pipes with stone head and return walls up and down stream, severely damaged and siltation prevalent	6m wide causeway
	21°24'14.54"E		
51.10	33°24'59.11"S	2x900mm pipes with stone head wall up and down stream, severely damaged, large boulders abundant in river bed	6m wide causeway
	21°24'7.50"E		
51.60	33°25'1.52"S	River blocked by fallen tree and erodes bank and under scours road when flood comes through	30m concrete or gabion wall
	21°23'51.22"E		
52.00	33°25'16.31"S		6m wide causeway

	21°23'50.59"E	2x900mm pipes with stone head wall up and down stream, severely damaged, boulders abundant in river bed	
53.20	33°25'35.88"S	2x900mm pipes with concrete protection works up and down stream, scouring severe	6m wide causeway
	21°24'16.53"E		
53.40	33°25'39.94"S	2x600mm pipes with stone head walls at and outlet, mostly buried, nearly completely destroyed	6m wide causeway
	21°24'20.83"E		
53.50	33°25'43.76"S	2x900mm pipes with concrete protection works up and down stream, scouring severe	6m wide causeway
	21°24'23.71"E		
53.80	33°25'52.34"S	Road way gets flooded by river and washes material away completely during floods	100m long concrete retaining wall
	21°24'31.94"E		
54.10	33°25'56.48"S	2x900mm pipes with stone head wall up and down stream, mostly damaged, large boulders abundant in river	6m wide causeway
	21°24'26.57"E		
54.30	33°26'0.20"S	2x900mm pipes with stone head wall up and down stream, mostly damaged, large boulders abundant in river bed, siltation high	6m wide causeway
	21°24'24.55"E		
54.40	33°26'3.00"S	Road way gets flooded by river and washes material away completely during floods	350m long concrete retaining wall
	21°24'24.34"E		
57.10	33°27'14.40"S	57m long causeway with 6x2.4m openings, 500mm thick slab, aprons and wing walls, 4 openings completely blocked with rocks only 2 openings clear	Drop inlet and river realignment
	21°25'15.08"E		
58.10	33°27'34.98"S	1x1.9m W causeway with 750mm pipe down stream, broken apron slabs and downstream return walls	6m wide causeway
	21°25'43.17"E		

Photographs of the location of each proposed activity are included in Appendix B and a list of coordinates as provided in Appendix A, locality map.

1.9 Specialist Studies

The following three specialist studies were undertaken in support of this Basic Assessment Report and are included in Appendix C:

- ASHA Consulting (Pty) Ltd – Heritage Impact Assessment
- Bergwind Botanical Surveys & Tours CC – Botanical Assessment
- BlueScience (Pty) Ltd – Freshwater assessment and Water Use Licence Application.

2. Listed Activities

This chapter has been compiled in accordance with Section 3(d)(i) & (ii) of the EIA Regulations, 2014, as amended.

All listed and specified activities triggered and being applied for, and the associated description of the projection activities, are listed in Table 2-1.

Table 2-1: Triggered Listed Activities in accordance with the EIA Regulations, 2014, as amended

Listed Activities as Described in GN 983 & 985	Description of Project Activity
Activities in terms of GN R.983 (No. 327 of 7 April 2017 as amended)	
<p>19. <i>The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse;</i></p> <p><i>but excluding where such infilling, depositing, dredging, excavation, removal or moving—</i></p> <p><i>(b) is for maintenance purposes undertaken in accordance with a maintenance management plan</i></p>	<p>The infilling and depositing of material of more than 10 cubic metres along the route is anticipated during the repair and development of river crossing structures within the watercourse as well as during temporary route diversions.</p>
<p>27. <i>The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for—</i></p> <p><i>(ii) maintenance purposes undertaken in accordance with a maintenance management plan.</i></p>	<p>The clearance of an area of 1 hectares or more of indigenous vegetation is anticipated during the repair and development of structures to accommodate the proposed route deviations for the traffic.</p> <p>It is recommended that a MMP should be submitted to the DEA for approval and implementation during proposed construction and for future maintenance work which may entail the clearance of vegetation.</p>
<p>30. <i>Any process or activity identified in terms of section 53(1) of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004).</i></p>	<p>Most of the proposed areas requiring repairs are located within the formally protected Towerkop Nature Reserve, with the southern portion also forming part of a Mountain Catchment Area. The portions of the study area immediately north and south of the protected areas are mapped as Critical Biodiversity Areas that should be protected. The site is within a World Heritage Site.</p>
Activities in terms of GN R.985 (No. 324 of 7 April 2017 as amended)	
<p>12. <i>The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.</i></p> <p>Western Cape</p> <p><i>i. Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004;</i></p>	<p>Most of the proposed areas requiring repairs are located within the formally protected Towerkop Nature Reserve, with the southern portion also forming part of a Mountain Catchment Area. The portions of the study area immediately north and south of the protected areas are mapped as Critical Biodiversity Areas that should be protected. The site is within a World Heritage Site.</p> <p>The clearance of an area of 300 square meters or more of indigenous vegetation is anticipated during the repair and development of structures to accommodate the proposed route deviations for the traffic.</p>

<p><i>ii. Within critical biodiversity areas identified in bioregional plans;</i> <i>iv. On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning; or</i> <i>v. On land designated for protection or conservation purposes in an Environmental Management Framework adopted in the prescribed manner, or a Spatial Development Framework adopted by the MEC or Minister.</i></p>	<p>It is recommended that a MMP should be submitted to the DEA for approval and implementation during proposed construction and for future maintenance work which may entail the clearance of vegetation.</p>
<p>14. The development of— <i>(ii) infrastructure or structures with a physical footprint of 10 square metres or more;</i> <i>where such development occurs—</i> <i>(a) within a watercourse;</i></p> <p>Western Cape</p> <p><i>i. Outside urban areas:</i> <i>(aa) A protected area identified in terms of NEMPAA, excluding conservancies;</i> <i>(bb) National Protected Area Expansion Strategy Focus areas;</i> <i>(cc) World Heritage Sites;</i> <i>(dd) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;</i> <i>(ee) Sites or areas listed in terms of an international convention;</i> <i>(ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;</i> <i>(gg) Core areas in biosphere reserves;</i></p>	<p>The proposed flood damage repairs occur on Main Road 309 in the Seweweekspoort Area, Western Cape, at 27 of the proposed construction sites along the route. The site is outside urban areas.</p> <p>The design width of the structures will be 6 m clear width between guide blocks and not materially wider than the gravel road which is narrower in many parts of the pass. Typical sizes for the structures will be 5 to 7 m long, perpendicular to the flow of the river, and structures will be aligned with the direction of the river.</p> <p>Most of the proposed areas requiring repairs are located within the formally protected Towerkop Nature Reserve, with the southern portion also forming part of a Mountain Catchment Area. The portions of the study area immediately north and south of the protected areas are mapped as Critical Biodiversity Areas that should be protected. The site is within a World Heritage Site.</p>

3. Site Description and Surrounding Land Use

This chapter has been compiled in accordance with Section 3(h)(iv) & (k) of the EIA Regulations, 2014, as amended.

3.1 Topography and Physical Characteristics

The Seweweekspoort Pass is located within a narrow valley within the Klein Swartberg Mountains between the Klein Karoo and Great Karoo. The Seweweekspoort road runs across the boundary of the Laingsburg Local Municipality and the Kanneland Local Municipality. The Laingsburg Local Municipality is located within the Central Karoo District municipality and the Kanneland Local municipality is located within the Eden District Municipality.

Over a distance of approximately 18 km the road elevation decreases from 1,005 m to 467 m. The elevation decrease results in the slope being 3.5% on average over the area in question. Due to the Seweweekspoort road being situated within the valley there are drainage lines which intersect with the road. The road and stream meanders through the valley and regularly intersects one another. During periods of high rainfall there is a significant amount of runoff which occurs due to the very steep landscape around the road. Runoff from the surrounding landscape flows through tributaries into the Seweweekspoort River in the valley. On average, the area receives the highest amount of rainfall during March and lowest in January.

The Seweweekspoort Pass is located within the CapeNature Towerkop Nature Reserve which is a formally Protected Area. There are some areas to the north and south which are cultivated areas with surface water bodies and wetlands in the surroundings. These water bodies mainly consist of farm dams which have been created for irrigation of the cultivated areas.

For more information, refer to the figures in Appendix A and specialist reports in Appendix C.

3.2 Vegetation and Fauna

The Seweweekspoort road passes through four different types of vegetation types:

- North Swartberg Sandstone Fynbos
- Central inland Shale Band Vegetation
- South Swartberg Sandstone Fynbos
- Montagu Shale Renosterveld.

Additional to these four vegetation types, a zonal vegetation type, which was not mapped in various vegetation datasets, was found as Fynbos Riparian Vegetation. This vegetation type is associated with wetland systems and is situated along river channels.

All of the vegetation types, except for Montagu Shale Renosterveld, are extremely well protected in the nature reserve. The entire study area is considered of very high importance. According to the Western Cape Biodiversity Framework, portions in the northern section of the road as well as the southern parts of the road are classified as

CBA and ESA. A significant portion of the study area occurs in protected areas while the remaining portions are classified as a Mountain Catchment Area (MCA).

For more information, refer to Appendix C1 for the Biodiversity Assessment compiled by Bergwind Botanical Surveys and Tours.

3.3 Aquatic Ecosystems

The main freshwater features in the study area are the Seweweekspoort River, a tributary of the Kobus Tributary (J25B) in the Gouritz River System. There are some tributaries and valley bottom wetland areas associated with the river in the area where the road will be upgraded. The present ecological state of the river system within the pass is largely natural. The ecoregion of this area has been classified as Southern Folded Mountains. The ecological importance and sensitivity of the river is high and for the wetland areas is moderate to high. The Seweweekspoort River and tributaries is mapped as a Fish Support Area.

The wetland areas at the site can largely be classified as a mosaic of valley bottom wetland and riparian zones that are associated with the river. The valley bottom wetland areas are closely associated with the riparian zones of the streams and as such have also been assessed as part of the river / stream assessment. The wetland features receive their flow from both groundwater and surface water.

For more information, refer Appendix C2 for the Freshwater Assessment compiled by BlueScience.

3.4 Heritage and Cultural Aspects

The predominant land use in the area is commercial farming although the immediate area is classified as a conservancy/nature reserve.. There are a large amount of historical buildings in the area as well in the town Amalienstein and Zoar. However, while there are historical building within the area, many are not of a high heritage importance.

The archaeological artifacts identified were mainly related to the road construction and maintenance activities. As a result of the current and past farming activities in the area, evidence of farming activities were observed including grave sites and buildings. These were situated away from the affected development area but in the general vicinity adjacent to the road.

There are a number of places along the road which has historical significance for the local community. There are a few areas where travellers used to rest through the pass as well as tributary stream that flows throughout the year which was used as drinking water. This is the only living heritage site but fortunately does not require remedial work.

Heritage Western Cape specifically requested registered heritage conservation bodies and municipalities are consulted with regards to the development. The following bodies were consulted with by the Heritage Specialist:

- Laingsburg Municipality
- Kannaland Municipality
- The Attaqua Tribal Council

- The Zoar Community Property Association
- Simon van der Stel Foundation
- CapeNature.

For more information, refer to Appendix C3 for the Heritage Impact Assessment compiled by Asha Consulting.

3.5 Socio-Economic Environment

3.5.1 *Level of Employment*

The Kannaland Municipality's unemployment rate is 17.3%, while in the Laingsburg Municipality the unemployment rate is 17.9%. Twenty-two percent of the economically active youth within the municipality is unemployed. These percentages do not include the discouraged work-seekers who are no longer looking for work.

3.5.2 *Economic Profile*

The growth rate for the Kannaland Municipality, according to the Census Statistics in 2011, was 0.33%. Thirty-five percent of the population has an income of less than R 19,600 while 64.6% earn more than R 2,457,600. Only 0.2% have an income of more than R 2,457,600. The Laingsburg Municipality's growth rate was 2.16% in 2011*. Thirty-one percent of the population has an income of below R 19,600 while 68.9% of the population earn more than R 19,600 but less than R 2,457,601.

3.5.3 *Education Level*

According to 2011 Census data, within the population of the Kannaland Municipality, 9.9% of people 20 years or older have completed primary school. Thirty-seven percent of the people 20 years or older have secondary educations while only 18.5% have completed matric. Only 4.3% of the population in the Kannaland Municipality have some form of higher education. Six percent of people 20 years and older have no form of education.

With regards to the Laingsburg Municipality, the 2011 census found that of those aged 20 years and older only 7.7% have completed primary school. Within the population of Laingsburg, 34.3% have some secondary education with 21.5% having completed matric. Out of the 21.5% who matriculated, only 7.1% have gone on to do some form of higher education. Ten percent of the Laingsburg Municipality have no form of schooling.

4. Policy And Legislative Context

This chapter has been compiled in accordance with Section 3(e)(i) & (ii) of the EIA Regulations, 2014, as amended.

Table 4-1 lists the applicable legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments identified as relevant to the proposed project. In addition, a description of how the proposed activity complies with and responds to the legislation and policy context, is given.

Table 4-1: Policy and Legislative Context of Proposed Project

Legislation, Policy or Guideline	Applicability to Project	Authorities	Date
National Environmental Management Act, 1998 (Act 107 of 1998) (NEMA) and the EIA Regulations 2014 (Government Notices (GN) 982, 983, 984, 985), as amended	For the project's potential to cause degradation to the environment. A number of listed activities are triggered by the proposed project under GN R983 & R985.	<ul style="list-style-type: none"> National Department of Environmental Affairs (Competent Authority) Regional Department of Environmental Affairs & Development Planning (Commenting authority) 	1998
Department of Environmental Affairs (DEA) Integrated Environmental Management Guideline Series, Guideline 5: Assessment of the EIA Regulations, 2012 (Government Gazette 805)	Environmental impacts will be generated primarily in the construction phase of this project with associated operational phase impacts. These will be assessed as part of the proposed project.		2012
Integrated Environmental Assessment Guideline Series 11, published by the DEA in 2004	An Environmental Assessment is required for the proposed project as activities are triggered under GN R983 & R985.		2004
Review in Environmental Impact Assessment, Integrated Environmental Management, Information Series 13, Department of Environmental Affairs and Tourism (DEAT), Pretoria.			
DEA Integrated Environmental Management Guideline Series, Guideline 7: Public Participation in the Environmental Impact Assessment Process, 2012 (Government Gazette 807)	Public participation is a requirement of the Basic Assessment Process and will be conducted for the proposed project.		2012
National Water Act, 1998 (Act 36 of 1998)	For potential impact of project construction activities on watercourses defined as such under the Act. A Water Use License Application (WULA) for section 21(c)&(i) activities has been submitted to the Department of Water	Department of Water & Sanitation	1998

Legislation, Policy or Guideline	Applicability to Project	Authorities	Date
	& Sanitation (DWS) (refer to Appendix I).		
National Heritage Resources Act, 1999 (Act 25 of 1999)	For the identification and preservation of items of heritage importance in Seweweekspoort which were identified by the Heritage Specialist.	Heritage Western Cape	1999
National Environmental Management: Biodiversity, 2004 (Act 10 of 2004)	For the protection of biodiversity. The construction of temporary deviation roads as various points along the road will require clearance of vegetation.	<ul style="list-style-type: none"> Department of Agriculture Department of Environmental Affairs CapeNature 	2004
Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983)	For protection of agricultural resources and for control and removal of alien invasive plants, particularly during the operational phase of the project.	National Department of Agriculture	1983
Department of Environmental Affairs and Development Planning (DEA&DP) Guideline on Public Participation (March 2013)	Public participation is a requirement of the Basic Assessment Process and will be conducted for the proposed project.	<ul style="list-style-type: none"> National Department of Environmental Affairs Regional Department of Environmental Affairs & Development Planning 	2013
DEA&DP Guideline on Alternatives (March 2013)	An alternatives assessment is required as part of the Basic Assessment Process and will be conducted for the proposed project.		
DEA&DP Guideline on Need & Desirability (March 2013)	There is a need for the proposed project in that the road requires repair work in order to make it functional and safe.		
Eden Municipal By-Laws	The project spans over the Eden and Central Karoo Municipalities, thus all proposed construction and operational activities must comply with	Eden Municipality	Updated accordingly

Legislation, Policy or Guideline	Applicability to Project	Authorities	Date
	these municipal By-Laws.		
Central Karoo By-Laws	The project spans over the Eden and Central Karoo Municipalities, thus all proposed construction and operational activities must comply with these municipal By-Laws.	Central Karoo Municipality	

5. Public Participation Process

5.1 Legislative Framework

In terms of Section 24(4) of NEMA & Regulation 41(b) of the NEMA Regulations (2014 as amended), the Western Cape Provincial Department of Transport and Public Works is required to consult with, and notify in writing, all landowners or lawful occupiers and any other I&AP regarding the proposed development and potential impacts arising therefrom. In order to ensure compliance, the following activities have been undertaken to date:

- Identifying key stakeholders and I&APs
- Developing and updating the I&AP database
- Advertising the notification of application for environmental authorisation and the BA process in a regional and local newspaper
- Placing site notices
- Distributing the Background Information Document (BID) via email and registered mail to identified I&APs
- Placing the Draft BAR in community libraries for public review and comment.

These aspects that form part of the Public Participation Process (PPP) are discussed in detail below.

5.2 Objectives of Public Participation

Following the requirements for public participation in terms of NEMA, objectives of the PPP include providing sufficient and accessible information to enable stakeholders to:

- Identify issues of concern
- Contribute to local knowledge and experience
- Provide sufficient time to comment on the proposed activity
- Ensure that their comments, issues of concern and suggestions are correctly captured, addressed and considered in the BA process and BAR.

Hatch commenced with the PPP for the BA process on 31 August 2017. This was concluded on 1 October 2017, allowing I&APs a 30-day comment period to respond to the proposed application.

5.3 IAP Notifications

Hatch prepared a newspaper advert, site notice and BID as well as written notification to identified I&APs of the proposed project. The documents provide the following information:

- A brief description of the proposed project, including the nature and location of the proposed activities
- Notification that an application for environmental authorisation has been submitted to the DEA (in terms of the 2014 EIA regulations)
- Description of where further information regarding the proposed project can be obtained

- Indication of how and to whom comments can be submitted to in this regard.

5.3.1 **Written Notification**

A letter, with the BID document attached, was e-mailed to IAPs identified as part of the initial IAP database drafted.

5.3.2 **Advertisement**

An advertisement was placed in a regional newspaper (i.e. Die Hoorn newspaper) on 31 August 2017 to advertise the Department of Transport and Public Work's intention to apply for environmental authorisation. The advertisement served to notify the public about the application, provided the description and location of the proposed activities, the availability of the Draft BAR for review and comment and the 30-day public review period, and details on the environmental consultants to contact for the BID and further information on the proposed project (refer to Appendix D1 for a copy of advertisement).

5.3.3 **Site Notice**

A2-sized site notices containing the same information as the advertisement were put up along the development path on 31 August 2017. A total of six site notices were erected (refer Table 5-1 for locations and Appendix D2 for a copy of the notice).

Table 5-1: Site Notice Placement

Site Notice Locations		Coordinates	
		Latitude	Longitude
1.	Start of the construction works	33°21'42.30" S	21°24'35.42" E
2.	End point of the construction works	33°26'03.00" S	21°24'24.34" E
3.	Zoar turn-off	33°28'50.38" S	21°27'33.96" E
4.	Laingsburg turn-off	33°12'05.39" S	20°51'15.76" E
5.	Laingsburg Community Library	33°11'39.45" S	20°51'32.94" E
4.	Ladismith Community Library	33°29'41.96" S	21°16'01.07" E

5.3.4 **Background Information Document**

A BID to provide further information on the proposed project and BA process was prepared for I&APs. The BID provided the following information:

- Purpose of the BID
- Appointed EAP
- Project description including proposed project activities
- Basic Assessment and PPP
- Contact details of the EAP for I&APs to register and send through written issues, concerns or queries
- Map of the proposed project area.

Refer to Appendix D3 for a copy of the BID.

5.4 Identification and Notification of I&APs

A database of I&APs for the proposed application was developed and updated during the PPP. I&APs were identified at national, provincial, district and local levels. Other I&APs surrounding the project site were also identified and added to the database and the general public was invited through advertisements and the distributed BID documents to register as I&APs on the database. To date, 20 stakeholders have been identified (Table 5-2).

On 1 September 2017, identified organs of state and other key stakeholders were sent an email notifying them of the proposed project. The email included details of the Project Applicant and the proposed site, as well as the Listed Activities applied for in terms of the 2014 EIA Regulations, and it was accompanied by a copy of the BID. The notification emails are included in Appendix D4.

5.5 Availability of Draft BAR for Review

The Draft BAR & EMPr were emailed to identified stakeholders where they were informed of the commenting period. Additionally, copies of the Draft BAR & EMPr were placed at the Ladismith and Laingsburg Community Libraries on 31 August 2017 for the public to review. The commenting period was for a period of just over 30 days between 31 August 2017 and 1 October 2017.

5.6 Issues Raised by I&Aps

Summary of Main Issues Raised by I&APs	Summary of Response from EAP
No comments have been received on the Draft BAR yet. Once the PPP is complete, the EAP will ensure that all comments are captured and included in the Final BAR.	

5.7 Comments and Response Report

To date, no comments have been received on the project. The public will be offered 30 days in which they can review the Draft BAR and submit comments as per the EIA regulatory requirements. The comments and responses will be included as Appendix D5 in the Final BAR.

Table 5-2: Key Authorities and Organs of State

Authority / Organ of State	Contact Person	Tel No.	Fax No.	e-mail	Postal Address
Municipalities					
Central Karoo District Municipality	Municipal Manger	(023) 449 1000	-	manager@skdm.co.za & Barbara@skdm.co.za	Private Bag X560 Beaufort West, 6970
Eden District Municipality (George)	Nina Viljoen	083 344 4883	086 555 6303	nina@edendm.co.za	PO Box 12 George, 6530
Laingsburg Local Municipality	Johan Mouton	(023) 551 1019	(023) 551 1019	jmouton@lainsburg.gov.za	Private Bag X4 Laingsburg, 6900
Kannaland Local Municipality	Aletta Theron	(028) 551 1023	(028) 551 1766	speaker@kannaland.gov.za	PO Box 30 Ladismith, 6655
Environmental					
Department of Environmental Affairs	Azrah Essop – Integrated Environmental Authorisations: Coordination, Strategic Planning & Support	(012) 399 8529	-	AEssop@environment.gov.za	Private Bag X447 Pretoria, 0001
	Department of Environmental Affairs Directorate: Biodiversity and Conservation Attention: Mr Seoka Lekota	(012) 399 9657	-	SLekota@environment.gov.za	Environment House, 473 Steve Biko, Arcadia, Pretoria, 0083
Western Cape Department of Environmental Affairs & Development Planning	Ms. Reyand	-	(044) 874 2423	-	Private Bag X 6509 George, 6530
Western Cape Department of Department of Economic Development & Tourism	Susan Davis – Deputy Director: Communications	(021) 483 5065	-	susan.Davis@westerncape.gov.za	PO Box 979 Cape Town, 8000
Water & Sanitation					
Department of Water & Sanitation	D. Daniels / N. Ndobeni	(021) 941 6189	086 585 6935	danielsd@dwa.gov.za & ndobenin2@dwa.gov.za	Private Bag X16 Sanlamhof, 7532
	Mr R Khan	(021) 941 6000 082 809 2218	-	KhanR@dws.gov.za	-
Breede-Gouritz Catchment Management Agency (George)	Carlo Amrahams	(024) 346 8031	-	camrahams@bgcma.co.za	101 York Street George, 6530
Agriculture					

Western Cape Department of Agriculture Forestry & Fisheries	Nafaroine Deahgo Briekwa	(028) 551 1017	-	NafaroineB@elsenburg.com	Private Bag X1 Elsenburg, 7607
CapeNature	Colin Fordham – Scientific Services: Land Use Advisor	(044) 802 5329	086 554 4165	cfordham@capenature.co.za	Private Bag X6546 George, 6530
Agri Western Cape	Johan Bothma	082 944 0790	-	johan@awk.co.za	
Farmers Association (Laingsburg)	Andries le Roux	(023) 004 0138 084 513 1893	(021) 941 6100	fortuin@roggeveld.co.za	
Farmers Association (Klein Swartberg)	Andre Malan	(023) 581 5146 083 302 7495	-	malan@kleinwartberg.co.za	
Farmers Association (Ladismith)	Ben (BZ) Kotze	(028) 551 2091 083 560 5679	-	bzkotze@mweb.co.za	
Local Agricultural Organisation	Ms Helena	-	-	Helena@awk.co.za	
Local Agricultural Organisation	Mr Johan	-	-	Johan@awk.co.za	
Heritage					
Heritage Western Cape	Waseefa Dhansay	(021) 483 5959	(021) 483 9842	Waseefa.dhansay@westerncape.gov.za	-
	Zwelibanzi Shiceka	021 462 4502	-	zwelibanzi.shiceka@westerncape.gov.za	-
SAHRA	Dumisani Sibayi Executive – Heritage Resource Management	(021) 462 4502	(021) 462 4509	dsibayi@sahra.org.za	PO Box 4637 Cape Town, 8000
Tourism					
Ladismith Tourism Bureau	Tourism board	(028) 551 1378	028 551 1378	visit@ladismith.org.za	
Laingsburg Tourism Bureau	Gwynne Harding	(023) 551 1019	-	gharding@laingsburg.gov.za	
CapeNature	Colin Fordham	(044) 802 5329	086 554 4165	cfordham@capenature.co.za	
BirdLife SA	Dale Wright	(011) 789 1122 072 562 3946	011 789 5188	dale.wright@birdlife.org.za	
Op-die-Plaas Camp Site	Jonel Hunlun	(023) 581 5009 076 276 2864	086 636 1053	info@seweweekspoort.co.za	
Sandriver Cottage	Jonel Hunlun	(023) 581 5009 076 276 2864	086 636 1053	info@seweweekspoort.co.za	
Stone Cottage	Jonel Hunlun	(023) 581 5009 076 276 2864	086 636 1053	info@seweweekspoort.co.za	
Bergzicht Cottage	Jonel Hunlun	(023) 581 5009 076 276 2864	086 636 1053	info@seweweekspoort.co.za	
Ben's Cottage	Jonel Hunlun	(023) 581 5009 076 276 2864	086 636 1053	info@seweweekspoort.co.za	
Art Deco Cottage	Jonel Hunlun	(023) 581 5009 076 276 2864	086 636 1053	info@seweweekspoort.co.za	

Olive Cottage	Jonel Hunlun	(023) 581 5009 076 276 2864	086 636 1053	info@seweweekspoort.co.za	
Sundown Cottage	Jonel Hunlun	(023) 581 5009 076 276 2864	086 636 1053	info@seweweekspoort.co.za	

6. Impact Assessment

The assessment of impacts adheres to the minimum requirements in the EIA Regulations, 2014 and takes into account applicable official guidelines. The issues raised by I&APs will also be addressed in the assessment of impacts.

6.1 Impact Assessment Methodology

6.1.1 *General*

The following has been considered as part of the Impact Assessment:

- Cumulative impacts that may occur as a result of the undertaking of the activity during the project life cycle
- The nature, significance, consequence, extent, duration and probability of the impact occurring
- The degree to which these impacts can be reversed, cause irreplaceable loss of resources; and can be avoided, managed or mitigated.

In addition, the impact types have been determined and included in the main BAR as according to the following categories:

1. Direct Impacts
2. Indirect Impacts
3. Cumulative impacts.

6.1.2 *Convention for Assigning Significance Ratings to Impacts*

Specialists considered seven rating scales when assessing potential impacts:

- Extent
- Duration
- Intensity
- Status of impact
- Probability
- Degree of confidence
- Significance.

In assigning significance ratings to potential impacts before and after mitigation, specialists were instructed to follow the approach presented below:

1. The core criteria for determining significance ratings are “extent”, “duration” and “intensity”.
2. The status of an impact is used to describe whether the impact will have a negative, positive or neutral effect on the surrounding environment. An impact may therefore be negative, positive (or referred to as a benefit) or neutral.

3. Describe the impact in terms of the probability of the impact occurring and the degree of confidence in the impact predictions, based on the availability of information and specialist knowledge.
4. Additional criteria to be considered, which could “increase” the significance rating if deemed justified by the specialist, with motivation, are the following:
 - Permanent / irreversible impacts (as distinct from long term, reversible impacts)
 - Potentially substantial cumulative effects (see item 7 below)
 - High level of risk or uncertainty, with potentially substantial negative consequences.
5. Additional criteria to be considered, which could “decrease” the significance rating if deemed justified by the specialist, with motivation, is the following:
 - Improbable impact, where confidence level in prediction is high.
6. When assigning significance ratings to impacts after mitigation, the specialist needs to:
 - First, consider probable changes in intensity, extent and duration of the impact after mitigation, assuming effective implementation of mitigation measures, leading to a revised significance rating
 - Then moderate the significance rating after taking into account the likelihood of proposed mitigation measures being effectively implemented. Consider the following: any potentially significant risks or uncertainties associated with the effectiveness of mitigation measures; the technical and financial ability of the proponent to implement the measure; and the commitment of the proponent to implementing the measure, or guarantee over time that the measures would be implemented.
7. The cumulative impacts of a project should also be considered. “Cumulative impacts” refer to the impact of an activity that may become significant when added to the existing activities currently taking place within the surrounding environment.
8. Where applicable, assess the degree to which an impact may cause irreplaceable loss of a resource. A resource assists in the functioning of human or natural systems, i.e. specific vegetation, minerals, water, agricultural land, etc.

The significance ratings are based on largely objective criteria and inform decision-making at a project level as opposed to a local community level. In some instances, therefore, whilst the significance rating of potential impacts might be “low” or “very low”, the importance of these impacts to local communities or individuals might be extremely high. The importance which I&APs attach to impacts must be taken into consideration, and recommendations should be made as to ways of avoiding or minimising these negative impacts through project design, selection of appropriate alternatives and / or management.

Significance Rating	Effect on Decision-Making
Very Low to Low	Will not have an influence on the decision to proceed with the proposed project, provided that recommended measures to mitigate negative impacts are implemented.
Medium	Should influence the decision to proceed with the proposed project, provided that recommended measures to mitigate negative impacts are implemented.
High to Very High	Would strongly influence the decision to proceed with the proposed project.

Nature

The environmental impacts of a project are those resultant changes in environmental parameters, in space and time, compared with what would have happened had the project not been undertaken. It is an appraisal of the type of effect the activity would have on the affected environmental parameter. Its description includes what is being affected, and how.

Extent

“Extent” defines the physical extent or spatial scale of the impact.

Rating	Description
Local	Extending only as far as the activity, limited to the site and its immediate surroundings. Specialist studies to specify extent.
Regional	Beyond the local influence and into Western Cape regions. Specialist studies to specify extent.
National	Beyond provincial boundaries within South Africa.
International	Beyond the borders of South Africa.

Severity / Intensity

“Intensity” establishes whether the impact would be destructive or benign.

Rating	Description
Negligible to Very Low	Where the impact affects the environment in such a way that natural, cultural and social functions and processes are not affected.
Low	Where the impact affects the environment in such a way that natural, cultural and social functions and processes continue, albeit in a slightly modified way or where the impact will return to the pre-impact state within one year.
Medium	Where the affected environment is altered, but natural, cultural and social functions and processes continue, <i>albeit</i> in a modified way.
High	Where natural, cultural and social functions or processes are altered to the extent that it will temporarily or permanently cease.

Duration

“Duration” gives an indication of how long the impact would occur.

Rating	Description
Short Term	0 - 5 years
Medium Term	5 - 15 years
Long Term	Where the impact will cease after the operational life of the activity, either because of natural processes or by human intervention.
Permanent	Where mitigation either by natural processes or by human intervention will not occur in such a way or in such time span that the impact can be considered transient.

Loss of Resources

“Loss of resource” refers to the degree to which a resource is permanently affected by the activity, i.e. the degree to which a resource is irreplaceable.

Rating	Description
Low	Where the activity results in a loss of a resource but where the natural, cultural and social functions and processes are not affected.
Medium	Where the loss of a resource occurs, but natural, cultural and social functions and processes continue, albeit in a modified way.
High	Where the activity results in an irreplaceable loss of a resource.

Reversibility / Potential for Rehabilitation

This refers to the degree to which an impact can be reversed.

Rating	Description
Irreversible	Where the impact is permanent.
Partially Reversible	Where the impact can be partially reversed.
Fully Reversible	Where the impact can be completely reversed.

Degree to which Impact can be Mitigated

This indicates the degree to which an impact can be reduced / enhanced.

Rating	Description
None	No change in impact after mitigation.
Very Low	Where the significance rating stays the same, but where mitigation will reduce the intensity of the impact.
Low	Where the significance rating drops by one level, after mitigation.
Medium	Where the significance rating drops by two to three levels, after mitigation.
High	Where the significance rating drops by more than three levels, after mitigation.

Status of Impact

The status of an impact is used to describe whether the impact would have a negative, positive or zero effect on the affected environment. An impact may therefore be negative, positive (or referred to as a benefit) or neutral.

Probability

“Probability” describes the likelihood of the impact occurring.

Rating	Description
Improbable	Where the possibility of the impact to materialise is very low either because of design or historic experience.
Probable	Where there is a distinct possibility that the impact will occur under the described scenario.
Highly Probable	Where it is most likely that the impact will occur.
Definite	Where the impact will occur regardless of any prevention measures.

Degree of Confidence

This indicates the degree of confidence in the impact predictions, based on the availability of information and specialist knowledge.

Rating	Description
High	Greater than 70% sure of impact prediction.
Medium	Between 35% and 70% sure of impact prediction.
Low	Less than 35% sure of impact prediction.

Significance

“Significance” attempts to evaluate the importance of a particular impact, and in doing so incorporates the above three scales (i.e. extent, duration and intensity).

Rating	Description
Very High	Impacts could be EITHER: <ul style="list-style-type: none"> • Of high intensity at a regional level and endure in the long term • OR of high intensity at a national level in the medium term • OR of medium intensity at a national level in the long term
High	Impacts could be EITHER: <ul style="list-style-type: none"> • Of high intensity at a regional level and endure in the medium term • OR of high intensity at a national level in the short term • OR of medium intensity at a national level in the medium term • OR of low intensity at a national level in the long term • OR of high intensity at a local level in the long term • OR of medium intensity at a regional level in the long term
Medium	Impacts could be EITHER: <ul style="list-style-type: none"> • Of high intensity at a local level and endure in the medium term • OR of medium intensity at a regional level in the medium term • OR of high intensity at a regional level in the short term • OR of medium intensity at a national level in the short term • OR of medium intensity at a local level in the long term • OR of low intensity at a national level in the medium term • OR of low intensity at a regional level in the long term

Rating	Description
Low	Impacts could be EITHER: <ul style="list-style-type: none"> • Of low intensity at a regional level and endure in the medium term • OR of low intensity at a national level in the short term • OR of high intensity at a local level and endure in the short term • OR of medium intensity at a regional level in the short term • OR of low intensity at a local level in the long term • OR of medium intensity at a local level and endure in the medium term
Very Low	Impacts could be EITHER: <ul style="list-style-type: none"> • Of low intensity at a local level and endure in the medium term • OR of low intensity at a regional level and endure in the short term • OR of low to medium intensity at a local level and endure in the short term
Insignificant	Impacts with zero to very low intensity with any combination of extent and duration
Unknown	In certain cases it may not be possible to determine the significance of an impact

6.2 Assumptions, uncertainties and gaps in the knowledge of the proposed project

The following assumptions, limitations and gaps in knowledge as highlighted by the various environmental specialists have reference:

6.2.1 **Botanical assessment limitations and assumptions**

The timing of botanical surveys is often an important factor in determining the sensitivity of a site since most geophytic flora are only visible during the spring flowering period, which varies according to region. The spring period in the Fynbos Biome extends into to the later months of the year with increasing proximity toward the east (Port Elizabeth). At Seweweekspoort, specifically the affected areas, the determination of vegetation sensitivity is not dependent on geophytic flora since perennial species are dominant. The timing of the survey was thus not a limiting factor.

All sites except two (KM54.10 and KM54.40) are located at the existing crossings. Since it was part of the scope of the study to determine where deviations could potentially be aligned (i.e. either left-or right-hand-side) the area of study was defined by surveying the vegetation on both sides of the road on either side of the crossing. The distance from the crossings was defined according to an assumption of the potential alignment route required for each deviation during the initial site visit. This was determined with a high level of accuracy during the site meeting with the assistance of the engineering team.

6.2.2 **Freshwater assessment limitations and assumptions**

Limitations and uncertainties often exist within the various techniques adopted to assess the condition of ecosystems. The following techniques and methodologies were utilized to undertake this study:

- Analysis of the Aquatic ecosystems was undertaken at a rapid level and did not involve detailed habitat and biota assessments

- The river health assessment was carried out using South African Department of Water and Sanitation developed methodologies. Aquatic Health assessments were carried out to provide information on the ecological condition and ecological importance and sensitivity of the river systems impacted.
- The guideline document, “A Practical Field Procedure for the Identification and Delineation of Wetlands and Riparian Areas” document, as published by DWAF (2005) was followed for the delineation of the wetland areas. According to the delineation procedure, the wetlands were delineated by considering the following wetland indicators: terrain unit indicator; Soil form indicator; Soil wetness indicator; and vegetation indicator.
- The wetlands were subsequently classified according to their hydro-geomorphic determinants based on a classification system devised by Kotze et al (2004) and SANBI (2009). Notes were made on the levels of degradation in the wetlands based on field experience and a general understanding of the types of systems present.
- A Present Ecological State (PES) assessment was conducted for each hydro-geomorphic wetland unit identified and delineated within the study area. For the purpose of this study, the tool WET-Health as defined in the WET Health Series developed for the Water Research Commission was used to assess the present ecological state of each wetland unit.
- The functional wetland assessment technique, WET-EcoServices, developed by Kotze et al (2009) was used to provide an indication of the ecological benefits and services provided by delineated wetland habitat. This technique consists of assessing a combination of desktop and infield criteria in order to identify the importance and level of functioning of the wetland units within the landscape.
- The ecological importance and sensitivity assessment was conducted according to the guidelines as developed by DWAF (1999).
- Recommendations are made with respect to the adoption of buffer zones within the development site, based on the wetlands/river's functioning and site characteristics.

6.2.3 *Heritage assessment assumptions and limitations*

The field study was carried out at the surface only and hence any completely buried archaeological sites would not be readily located. Similarly, it is not always possible to determine the depth of archaeological material visible at the surface. Visibility was often difficult because of the thick bush present along the river margins and in the base of the valley. It is possible that sites could have been obscured from view and were not recorded during the ground survey. The accuracy of the GPS co-ordinates is also highly variable because the steep sides of the valley resulted in poor reception in many parts of the study area. The desktop study for this project was limited by the very small number of cases lodged on SAHRIS for the broader area.

6.3 Environmental Impact Assessment

The following section provides a summary of the potential impacts identified in each of the specialist studies. Complete specialist studies are included in Appendix C.

6.3.1 Botanical Impacts

The main potential impacts to the botanical aspects in the area due to the proposed project include:

- Loss of vegetation and ecological processes due to clearance of vegetation required for construction of deviation roads
- Encroachment of alien invasive species due to the disturbance of areas required for the deviation roads
- Potential pollution as a result of accidental spillages of petrochemicals from construction machinery.

6.3.2 Freshwater Ecology Impacts

The main potential impacts to the freshwater systems in the area due to the proposed project include:

- Aquatic habitat modification or loss
- Impairment of the surface water quality
- Potential for erosion
- Flow modification.

6.3.3 Heritage Impacts

The main potential impacts to the cultural heritage in the immediate area due to the proposed project include:

- Damage to archaeological features located in close proximity to the river crossings or planned construction works
- Impacts to the built environment.

6.4 Potential Impacts and Mitigation Measures

The preferred alternative is the upgrading of the structures (which facilitate in diverting water away from the road surface) along the existing MR309 Road. During even light rainfall events, damage to the road is caused by flowing of water and in some cases, where the watercourse runs parallel to the road, parts of the road are washed away. The road traverses the border between the Eden District Municipality and the Central Karoo Municipality in the Western Cape Province of South Africa.

The road is utilized by farmers, travellers, tourists and residents of the area. It is an existing road and is currently in use. The development proposal is limited to upgrades of undersized structures and repairs of damaged structures to ensure that their function is reinstated. The affected area of impact will therefore be limited to currently disturbed areas with limited intrusion into new areas. During construction, several deviations would need to be created such that the flow of traffic would not be disrupted – the main impacts

to the environment would occur due to the establishment of these deviation roads which are temporary. Two alternatives for the deviation roads have been assessed by the specialists. No other reasonable and / or practical site alternative exists that would meet the need and desirability of this Application.

No other reasonable and / or practical technology alternative exists that would meet the need and desirability of this Application other than continuing with the current practice of *ad hoc* repairs to the road which has been ineffective as these repairs are not a sustainable solution.

The no-go Alternative is to not repair the identified structures . This alternative will entail no upgrading of existing structures and as such, the road will continue to function in the current state, resulting in continued degradation, soil erosion and periodic disruptions to traffic through the pass.

The main environmental disturbance / impact will occur during the construction phase of the project as a result of clearing of new areas. In terms of the operational impacts, current flow through the culverts as a result of the water diversion will remain, albeit improved by the upgraded structures. Impacts occurring during operation (mainly ongoing maintenance of the road) will continue, however the frequency will be reduced resulting in an improved scenario.

The rating of impacts, as per the methodology described in section 6.1 is provided in Table 6-2 . In addition, mitigation measures that may alleviate or result in avoidance of the potential impacts are listed in Table 6-2. The specialist assessment of impacts are provided in Appendix C.

NOTE: Since the proposed project involves the upgrade and repair of structures on an existing road, most of the impacts are related to the construction phase, with very few being carried over into the operational phase. Overall, the resultant operational impact is expected to be positive as a result of the improved flow within the culverts.

Table 6-1: Summary of Identified Impacts

No-go alternative										
Construction Phase	Impact	Nature of Project Impact	Extent and Duration of Impact	Probability of Occurrence	Reversibility	Resource Loss	Degree to which the Impact can be Mitigated	Significance without Mitigation	Significance with Mitigation	
	Soil	Erosion and potential soil loss due to clearance of vegetation	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		Increased sedimentation in surface water features due to increased erosion	Local	Probable	Reversible	Medium	Low	Medium	Low	
	Botanical	Loss of vegetation and ecological processes	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	Air Quality	Dust generation from construction activities	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	Waste	Waste generated during construction	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	Socio-Economic	Job creation and contribution to local economy	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	Noise	Disruption to residents through increased activity and noise in the area	N/A	N/A	N/A	N/A	N/A	N/A	N/A	

	Water Resources	Disturbance of freshwater related habitats at the road crossing sites	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		Impact on water quality due to runoff from construction activities	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		Temporary impedance of flow during construction activities	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Heritage	Direct destruction of archaeological resources	Local	Improbable	Low	High	High	Low	Very Low
		Impact to built environment	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Operational Phase	Soil	Erosion and potential soil loss due to clearance of vegetation	N/A	N/A	N/A	N/A	N/A	N/A
Increased sedimentation in surface water features due to increased erosion			Local	Probable	Reversible	Medium	Low	Medium	Low
Botanical		Loss of vegetation and ecological processes	Local	Probable	Very Low	Low	Very Low	Very Low	Very Low

	Air Quality	Dust generation from construction activities	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Waste	Waste generated during construction	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Socio-Economic	Job creation and contribution to local economy	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Noise	Disruption to residents through increased activity and noise in the area	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Water Resources	Ongoing disturbance of freshwater related habitats at the road crossings where construction activities have taken place, with reduced the potential for flow modification and erosion	Local	Probable	Reversible	Medium	Very low	Low negative	Low negative
	Heritage	Direct destruction of archaeological resources	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		Impact to built environment	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Alternative 1 – The preferred alternative of undertaking the structure upgrades. The assessment includes Deviation Route alternatives									
	Impact	Nature of Project Impact	Extent and Duration of Impact	Probability of Occurrence	Reversibility	Resource Loss	Degree to which the Impact can be Mitigated	Significance without Mitigation	Significance with Mitigation
Construction Phase	Soil	Erosion and potential soil loss due to clearance vegetation	Local	Probable	Partially reversible	Low	Low	Low	Very Low
		Increased sedimentation in surface water features due to increased erosion	Local	Probable	Reversible	Low	Low	Low positive	Low positive
	Botanical	Loss of vegetation & ecological processes	Local	Definite	Very Low	Medium	Low	High	Medium
		Deviation Route Alternative A- Loss of vegetation & ecological processes	Local	Definite	Very Low	Medium	Very Low	High	Medium
		Deviation Route Alternative B- Loss of vegetation & ecological processes	Local	Definite	Very Low	Very Low	Low	High	Medium

	Air Quality	Dust generation from construction activities	Local	Probable	Fully reversible	Low	Low	Low	Very Low
	Waste	Waste generated during construction	Local	Probable	Fully reversible	Low	Low	Low	Very Low
	Socio-Economic	Job creation and contribution to local economy	Local	Probable	Fully reversible	Low positive	Medium Positive	Low positive	Medium Positive
	Noise	Disruption to residents through increased activity and noise in the area	Local	Probable	Fully reversible	Low	Low	Low	Very Low
	Water Resources	Disturbance of freshwater related habitats at the road crossing sites	Local	Probable	Partially reversible	Medium to low	Low to very low	Low	Very low/negligible
		Impact on water quality due to runoff from construction activities	Local	Probable	Reversible	Low	Low	Very low	Very low
		Temporary impedance of flow during construction activities	Local	Probable	Reversible	Medium	Very low	Very low	Very low

		Disturbance of freshwater related habitats at the road crossing sites	Local	Probable	Partially reversible	Medium to low	Low to very low	Low	Very low/negligible
	Heritage	Direct destruction of archaeological resources	Local	Improbable	Partially reversible	High	High	Low	Very Low
		Impact to built environment	Local	Highly probable	Partially reversible	High	Low	Medium	Low
Operational Phase	Soil	Erosion and potential soil loss due to clearing of vegetation	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		Increased sedimentation in surface water features due to increased erosion	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Botanical	Loss of vegetation & ecological processes	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		Deviation Route Alternative A- Loss of vegetation & ecological processes	Local	Definite	Very Low	Low	Very Low	Low positive	Low positive
		Deviation Route Alternative B-	Local	Definite	Very Low	Low	N/A	Low	Low positive

		Loss of vegetation & ecological processes							
	Air Quality	Dust generation from construction activities	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Waste	Waste generated during operation	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Socio-Economic	Job creation and contribution to local economy	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Noise	Disruption to residents through increased activity and noise in the area	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Water Resources	Limited disturbance of freshwater related habitats at the road crossings where construction activities have taken place, with reduced	Local	Probable	Reversible	Low	Very low	Low positive	Low positive

		the potential for flow modification and erosion							
	Heritage	Direct destruction of archaeological resources	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		Impact to built environment	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table 6-2: Impact Assessment, after mitigation, for the Proposed Seweweekspoort Project

Activity	Impact Summary	Significance	Proposed Mitigation
Alternative 1			
Construction and repairs to structures along Main Road R309 impacting on soils	Direct Impacts: Erosion and potential soil loss due to vegetation clearing and insufficient storm water control measures.	Low	<ul style="list-style-type: none"> All fill material must be removed to expose the original soil surface and to preserve the soil integrity. Soil erosion prevention measures should be implemented such as gabions, sand bags etc. All exposed/cleared areas should be rehabilitated promptly with suitable vegetation to stabilize the soil. Stockpiles during construction should be placed away from high flow areas and removed as soon as construction at the particular location ceases.
	Increased erosion could result in increased sedimentation which could impact on ecological processes.	Low	<ul style="list-style-type: none"> The sites should be monitored weekly for any signs of off-site siltation. All areas impacted by earth-moving activities should be re-shaped post-construction to ensure natural flow of runoff and to prevent ponding. All exposed/cleared areas should be rehabilitated promptly with suitable vegetation to stabilize the soil. The area surrounding the drainage lines must be regularly checked for signs of erosion. If erosion is evident, corrective action must be taken. Stockpiles should be placed away from high flow areas to prevent washing away during rainfall events.
	Indirect Impacts: No indirect impacts have been identified.	N/A	N/A
	Cumulative Impacts: Cumulative impacts will largely take place during construction when activities are simultaneously being undertaken on a number of the crossings. While impacts to soils in the pass are each of low significance, it is essential that they be adequately mitigated to minimise the potential cumulative impacts.	Very Low	<ul style="list-style-type: none"> All fill material must be removed to expose the original soil surface and to preserve the soil integrity. Soil erosion prevention measures should be implemented such as gabions, sand bags etc. All exposed earth should be rehabilitated promptly with suitable vegetation to stabilize the soil The sites should be monitored weekly for any signs of off-site siltation. All areas impacted by earth-moving activities should be re-shaped post-construction to ensure natural flow of runoff and to prevent ponding.

	Impacts relating to increased sedimentation of the river will result at a number of sites due to soil erosion. It is important that each site, once completed, is rehabilitated.		<ul style="list-style-type: none"> All exposed earth should be rehabilitated promptly with suitable vegetation to stabilize the soil The area surrounding the drainage lines must be regularly checked for signs of erosion. If erosion is evident, corrective action must be taken.
Construction of temporary deviation roads impacting on botanical resources	Direct Impacts: Loss of vegetation and encroachment of alien invasive plants.	High	<ul style="list-style-type: none"> An Environmental Control Officer (ECO) must visit the site once a month and agree with the Contractor what will be allowed at each construction location. This will include the pruning of trees, marking or plants which must be protected, plants which may be relocated permanently, the replanting of plants at the end of construction where they have been removed.. Sensitive patches of vegetation, including trees identified as sensitive and requiring protection, must be marked with danger tape to prevent them from being removed or damaged. Plant relocation of permitted species must be done through search and rescue activities prior to commencement of clearing Pruning of trees must be carried out with care to prevent unnecessary damage to the overall health of each tree. Topsoil must be kept aside at all locations to aid in rehabilitation of the disturbed areas,
	Indirect Impacts: No indirect impacts have been identified.	N/A	N/A
	Cumulative Impacts: Overall loss of habitat due to clearing of vegetation.	Very Low	<ul style="list-style-type: none"> The EMPr should be updated to include recommendations on rehabilitation of the work areas. All fill material must be removed to expose the original soil surface and to preserve the soil integrity. Topsoil must be replaced and watered using stream water for a period of two weeks following topsoil reinstatement. In the event that topsoil replacement does not yield sufficient re-growth of species: <ul style="list-style-type: none"> seed must be collected from vegetation at each construction site prior to the construction phase by a qualified practitioner.

			<ul style="list-style-type: none"> ○ Collected seed should be cleaned and stored until the rehabilitation phase. The areas must then be rehabilitated by careful sowing of seed under supervision of a qualified horticulturalist. ○ Areas must be irrigated regularly using a vehicle-based irrigation hose. Areas should be watered twice weekly for 2-months and weekly thereafter for 3 months. • Monitoring of each site must be carried out to ensure that disturbed areas are successfully rehabilitated to an acceptable level.
Construction and repairs to structures along Main Road309 impacting on air quality	Direct Impacts: Potential dust generation	Low	<ul style="list-style-type: none"> • All construction machinery and equipment must be regularly serviced and maintained to keep noise, dust and possible leaks to a minimum, as per the requirements of the EMPr (Appendix E). • Road dampening should be undertaken to prevent excess dust during construction produced by construction vehicles.
	Indirect Impacts: No indirect impacts have been identified.	N/A	N/A
	Cumulative Impacts: Fumes and dust from construction machinery will contribute to the baseline levels of vehicle emissions and dust generated by cars which make use of the road.	Very Low	<ul style="list-style-type: none"> • All construction machinery and equipment must be regularly serviced and maintained to keep noise, dust and possible leaks to a minimum, as per the requirements of the EMPr (Appendix E). • Road dampening should be undertaken to prevent excess dust during construction.
Construction and repairs to structures along Main Road309 resulting in generation of waste	Direct Impacts: Pollution of the site with different types of waste generated during construction.	Low	<ul style="list-style-type: none"> • All waste generated on-site during construction must be adequately managed. Separation and recycling of different waste materials is supported. Construction fill must be re-used as far as practicable. • All solid wastes should be disposed of at a registered landfill site and records maintained to confirm safe disposal. In the absence of registered waste disposal sites, municipal tips must be used if the operator can accept the identified waste. • Adequate scavenger-proof refuse disposal containers should be supplied to control solid waste on-site.

			<ul style="list-style-type: none"> It should be ensured that existing waste disposal facilities in the Ladismith area are able to accommodate the increased waste generated from the proposed construction. Chemical waste should be stored in appropriate containers and disposed of at a licensed disposal facility. Portable sanitation facilities should be erected and tied down for construction personnel. Use of these facilities should be enforced (these facilities should be kept clean so that they are a desired alternative to the surrounding vegetation. These facilities should also be monitored and serviced regularly so as to prevent contamination of the water resources. The construction site should be inspected for litter on a daily basis. Extra care should be taken on windy days. Precautions should be taken to avoid litter from entering drainage lines.
	<p>Indirect Impacts: No indirect impacts have been identified.</p>	N/A	N/A
	<p>Cumulative Impacts: Waste generated at each of the 27 sites where upgrade / repair activities are planned.</p>	Very Low	<ul style="list-style-type: none"> Manage waste at each site in accordance with the mitigation measures indicated above for direct impacts or indicated in the EMP (Appendix E).
Construction and repairs to structures along Main Road309 resulting in generation of positive socio-economic impacts (benefits)	<p>Direct Impacts: Potential for job creation and contribution to the local economy.</p>	Low Positive	<ul style="list-style-type: none"> Local people should be employed where possible and a Community Liaison Officer could assist in raising any concerns / complaints noted by the affected community to the Construction Team.
	<p>Indirect Impacts: No indirect impacts have been identified,</p>	N/A	N/A
	<p>Cumulative Impacts: The cumulative impacts will largely take place during the construction phase when construction activities are simultaneously being undertaken on a number of the crossings. If the mitigation recommendations</p>	Very Low Positive	<ul style="list-style-type: none"> No mitigation possible. The repair and construction activities are limited to a small section of road within the Eden and Central Karoo Municipalities.

	are taken into account, the resulting outcome could be increased job creation for people in the immediate areas of the Eden and Central Karoo municipalities and well as increase in the local economy which would have an overall effect, albeit very small, on the economy of the Western Cape.		
Construction and repairs to structures along Main Road309 resulting in generation of noise	Direct Impacts: Disruption to residents / tourists through increased activity and noise in the area.	Low	<ul style="list-style-type: none"> All construction machinery and equipment must be regularly serviced and maintained to keep noise, dust and possible leaks to a minimum, as per the requirements of the EMPr (Appendix E). No works shall be executed between sunset and sunrise and on the non-working and special non-working days as stated in the Contract Data unless otherwise agreed between the Engineer and Contractor. Construction personnel should be made aware of the need to prevent unnecessary noise such as hooting and shouting.
	Indirect Impacts: No indirect impacts have been identified.	N/A	N/A
	Cumulative Impacts: The cumulative impacts will largely take place during the construction phase when construction activities are simultaneously being undertaken on a number of the crossings. While these impacts in the pass are of a very low significance, it is essential that they be adequately mitigated to minimise the potential cumulative impacts.	Very Low	<ul style="list-style-type: none"> All construction machinery and equipment must be regularly serviced and maintained to keep noise, dust and possible leaks to a minimum, as per the requirements of the EMPr (Appendix E). No works shall be executed between sunset and sunrise and on the non-working and special non-working days as stated in the Contract Data unless otherwise agreed between the Engineer and Contractor. Construction personnel should be made aware of the need to prevent unnecessary noise such as hooting and shouting.
Construction and repairs to	Direct Impacts:	Low	<ul style="list-style-type: none"> Work within the river channel should be limited as far as possible and the river bed and banks rehabilitated immediately afterwards. Construction within the

structures along Main Road309 resulting in impacts to water resources	Impacts resulting in aquatic habitat modification or loss. Potential for erosion. Flow modification.		<p>river channel should preferably take place during the drier months of the year. The temporary deviation roads should be according to the recommended methods was provided in the previous section.</p> <ul style="list-style-type: none"> Disturbed areas should be revegetated post-construction phase to reduce the risk of erosion – these areas should be monitored and kept free of invasive alien plant growth. The channel upstream of the river crossings should be kept free of debris and sediment build-up, particularly at the culvert structures where it might impede flows. The roads should be maintained such that the concentration / intensity of runoff along the road is reduced to dissipate the energy and erosion potential of the flow from the road.
	Indirect Impacts: Impacts to downstream water quality.	Low	<ul style="list-style-type: none"> Contaminated runoff from the construction site(s) should be prevented from entering the rivers / streams. All materials on the construction sites should be properly stored and contained. Disposal of waste from the sites should also be properly managed. Construction workers should be given ablution facilities at the construction sites that are located away from the river (at least 30 m) and regularly serviced. Sediment loads to river from construction activities should be prevented or minimized.
	Cumulative Impacts: The Seweweekspoort River, its tributaries and associated wetland areas within the proposed road upgrade area that would be impacted by the proposed activities have already been modified as a result of previous road construction activities as well as the ongoing road maintenance activities. These activities have all contributed to a modification of both the instream and riparian	Low	<ul style="list-style-type: none"> Work within the river channel should be limited as far as possible and the river bed and banks rehabilitated immediately afterwards.

	<p>aquatic habitats. Considering that the proposed activities are to the existing road, one can expect that the cumulative impact of this activity on the river systems will be of a low to very low significance.</p>		
<p>Construction and repairs to structures along Main Road309 resulting in impacts to heritage resources</p>	<p>Direct Impacts: Impacts to archaeological resources.</p>	Low	<ul style="list-style-type: none"> • Ensure that archaeological features close to crossings are marked as no-go areas during construction period. • Keep disturbance footprint to a minimum. • See specific measures in the EMP Appendix E).
	<p>Indirect Impacts: Impacts to sites relating to living heritage: Only one living heritage site is associated with a river crossing but that crossing will not receive any upgrade work.</p>	N/A	N/A
	<p>Cumulative Impacts: Impacts to the Cape Floral Region World Heritage Site: It should be borne in mind that the botanical specialists have examined the impacts at the site level (Emms & MacDonald, 2017), whereas from the heritage point of view the impacts to the World Heritage Site as a whole need to be considered. Thus, the expected impacts at any stage in the development are exceedingly small relative to the great size of the declared area and are not worth considering further.</p>	Very Low	N/A
No-go Option			

Ongoing repairs to existing flood abatement structures	Direct Impacts: Ongoing disturbance to soils and watercourses due to <i>ad hoc</i> repairs at the road crossings.	Low	<ul style="list-style-type: none"> If the no-go option was to be pursued, a Maintenance Management Plan (MMP) would need to be developed and distributed to the Applicant's maintenance contractor. The MMP would contain measures which would specify management and mitigation measures to ensure that the impacts to the soils and watercourses are minimised during <i>ad hoc</i> maintenance events.
	Indirect Impacts: No indirect impacts have been identified.	N/A	N/A
	Cumulative Impacts: No indirect impacts have been identified.	N/A	N/A

6.5 Environmental Impact Statement

Taking the assessment of potential impacts into account, the following environmental impact statement summarises the impact that the proposed activity and its alternatives may have on the environment after the management and mitigation of impacts have been taken into account, with specific reference to types of impact, duration of impacts, likelihood of potential impacts actually occurring and the significance of impacts.

Alternative 1
<p>Assuming all phases of the project adhere to the conditions stated in the EMPr (Appendix E) it is believed that the impacts associated with the proposed construction will have no significant, adverse, long term environmental impact on the surrounding environment.</p> <p>Positive impacts associated with construction repair works include:</p> <ul style="list-style-type: none"> • Safe transportation medium (vehicles) • Continuance of economic growth and development • Temporary employment opportunities during the construction phase. <p>Negative impacts associated with construction repair works include:</p> <ul style="list-style-type: none"> • Removal of natural vegetation to construct temporary deviation routes for commuters to make use of while certain sections of the road are being worked on • Encroachment of alien invasive species due to the disturbance of areas required for the deviation roads • Potential pollution as a result of accidental spillages of petrochemicals from construction machinery. • Aquatic habitat modification or loss • Impairment of the surface water quality • Potential for erosion <p>It is perceived that these impacts will be medium to long term and have sustainable benefits.</p> <p>If the proposed alternative is not taken forward and the 'no-go' or status quo approach is adopted the following negative impacts and risks will ensue:</p> <ul style="list-style-type: none"> • Contiguous repair work would need to be conducted at sections of the road due to flooding/pooling of water after rainfall events as is the case currently. This is not only costly but it is not effective as the repairs are not able to permanently withstand the impact of the flooding as a result of rain fall events. • Road surface material will continue to be washed into the surrounding rivers, thereby impacting on the integrity of these watercourses.

- A damaged road is a safety risk to commuters who rely on this route as the main link between the towns of Laingsburg and Ladismith

It must be ensured that the construction phase has very minimal impact such on the health of any of the ecological systems identified on site, and that post-construction rehabilitation leaves the surrounding environments in an as good, if not better, state. Further, should any privately owned infrastructure (e.g. fencing) be damaged during construction, it is to be replaced in the same condition, if not better, by the contractor.

After the construction phase of the project, the contractors must ensure that all materials are removed from the site and that site is rehabilitated as per the requirements of the EMPr (Appendix E).

Any alien plant management programmes that are implemented during the construction phase must be maintained during the operational phase by the Applicant as part of routine maintenance in line with the MMP which needs to be developed by the Applicant.

7. Recommendations

7.1 Botanical Specialist Recommendations

- An ECO must be present during the construction phase for a minimum of one day per month, in particular when vegetation clearing is required for the temporary deviations.
- Sensitive patches of vegetation, including trees identified as sensitive and requiring protection, must be marked by the ECO with danger tape to prevent them from being removed or damaged.
 - All deviations must be rehabilitated with the following in place: A detailed vegetation rehabilitation plan must be compiled, together with an easy to follow method statement, and implemented so that the temporary deviation roads are rehabilitated to their original or near-original condition.
 - All fill material must be removed to expose the original soil surface and to preserve the soil integrity.
 - Temporary deviation roads must be blocked to avoid motorists and pedestrians from accessing and disturbing these areas.
 - Seed must be collected from vegetation at each construction site prior to the construction phase by a qualified practitioner. Collected seed should be cleaned and stored until the rehabilitation phase. The areas must then be rehabilitated by careful sowing of seed under supervision of a qualified horticulturalist.
 - Areas must be irrigated regularly using a vehicle-based irrigation hose. Areas should be watered twice weekly for 2-months and weekly thereafter for 3 months.
 - Monitoring of each site must be carried out to ensure that disturbed areas are successfully rehabilitated to an acceptable level.

7.2 Freshwater Specialist Recommendations

- Work within the river channel or wetland areas should be limited as far as possible and the disturbed areas rehabilitated immediately afterwards.
- Construction within the river channel should as far as possible take place during the drier months of the year.
- To minimise the impact of the temporary temporary deviation road, the deviation route should be selected to avoid larger riparian trees as far as possible. Larger plants should be trimmed back to leave their stems and roots intact rather than removing the entire trees unless absolutely necessary. A geotextile should be placed over the existing topsoil and vegetation before placing the fill material in the channel, that the fill material can all be removed after completion of the road crossing structure. Pipe culverts should be temporarily placed within the channel to ensure the low flow in the river is not impeded. Sandbags should be placed on the outer edge of the temporary deviation road to prevent sediment entering the river channel.
- Rubble and debris from existing structures and construction activities, as well as the temporary deviation road, should be removed after construction so as not to impede flow in the stream.
- Once construction is complete, the area should be rehabilitated to resemble that of the surrounding bed and banks and, where necessary, vegetated with suitable local indigenous plants that occur at the site.
- The channel upstream of the crossing should be kept free of debris and sediment build-up, particularly at the culvert where it might impede flows.
- Any invasive alien plants from the road reserve should be monitored and removed on an ongoing basis according to methods as provided by the Working for Water Programme.

7.3 Heritage Specialist Recommendations

- In general, all disturbance footprints should be kept to an absolute minimum.
- Archaeological features close to crossings should be marked as no-go areas during the construction period.
- At km 45.97 construction of the temporary deviation is preferred on the downstream side of the road. However, if the upstream side is used then the deviation should be constructed within 8 m of the edge of the existing road in order to reduce the chances of impacts to archaeological artefacts and features related to the historic farm werf.
- At km 46.35 construction of the temporary deviation road, if required, must occur on the downstream side of the road to protect the historic retaining wall. During construction of the new structure impacts to the historic retaining wall must be minimised and, as far as possible, the new structure should be integrated with the old wall. Where required, the drystone retaining wall should be reconstructed in a manner that matches the existing walling.

- At km 51.6 all work and related activities must be restricted to the downstream side of the road. No activity to be allowed on the upslope (northwest) side of the road at this point so as to protect the ruin that lies very close to the edge of the road.
- At km 54.1 construction of the temporary deviation road is preferred on the upstream side of the road. However, if the downstream side is to be used then the deviation should be constructed within 8 m of the edge of the existing road and no further than 25 m south of the stream bed in order to avoid impacts to possible unknown archaeological features in the dense bush around the convict station.
- At km 54.3 construction of the temporary deviation is preferred on the downstream side of the road. However, if the upstream side is to be used then the deviation should be constructed within 8 m of the edge of the existing road and no further than 25 m north of the stream bed in order to avoid impacts to possible unknown archaeological features in the dense bush around the convict station.
- If any archaeological material or human burials are uncovered during the course of the development, then work in the immediate area should be halted. The find would need to be reported to the heritage authorities and may require inspection by an archaeologist. Such heritage is the property of the state and may require excavation and curation in an approved institution.

7.4 Concluding remarks

Based on the specialist findings and associated impact assessment, Hatch recommends that the proposed activities relating to the flood damage repairs to structures on the MP309 in the Seweweekspoort Pass, are authorised, as long as the mitigation measures and requirements of the EMPr are adhered to.

Evert Jacobs
Principal Environmental Advisor

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Senior Environmental Advisor

Evert Jacobs
EJ:ej
Attachment(s)/Enclosure

Appendix A: Layout / Route Plan

Appendix B: Photographs

Appendix C: Specialist Reports

C1. Biodiversity Assessment

C2. Freshwater Assessment

C3. Heritage Impact Assessment

Appendix D: Public Participation Process

D1. Newspaper Advert

D2. Site Notice

D3. Background Information Document

D4. Email Notification

To be included in the Final BAR

D5. Comments and Responses Report

To be included in the Final BAR

Appendix E: Environmental Management Plan

Appendix F: Details of EAP and Expertise

Appendix G: Specialist's Declaration of Interest

Appendix H: Inception Report

Appendix I: Water Use License Application

Appendix J: Hatch Response to Independent Reviewer's Comments on Draft BAR