

Cry, the beloved railway revisiting the Barkly East branch line

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INTRODUCTION

Along the mountainous border of Lesotho, between Aliwal North and Barkly East, ran what was arguably the most scenic branch railway line in South Africa. Railway enthusiasts also know the line for the famous set of eight reverses (or switchbacks) that negotiate the dif-

ficult terrain of the Witteberge in the southern foothills of the Drakensberg. Although relatively short in length, its overall construction period was unduly long (28 years), spanning from March 1903 to December 1930, and included the puzzling abandonment of an essentially completed and particularly striking section. What circumstances interfered? Because of conflicting explanations, and other questions, a group of five civil engineers visited the disused line during October 2012, seeking answers to their questions. Comprising what came to be known as the 2012 Barkly East Railway Reverses Tour (BERRT), the participants offer these findings, hoping other engineers will visit this remarkable branch line in a magnificent part of South Africa.

LENGTHY CONSTRUCTION TIME

Although only 157 km in length, the line was constructed in four separate sections:
1. Aliwal North to Lady Grey, 64 km, constructed from March 1903 to November 1905. This was a relatively easy section, the only significant obstacle being the first crossing of the Kraai River near Aliwal North.

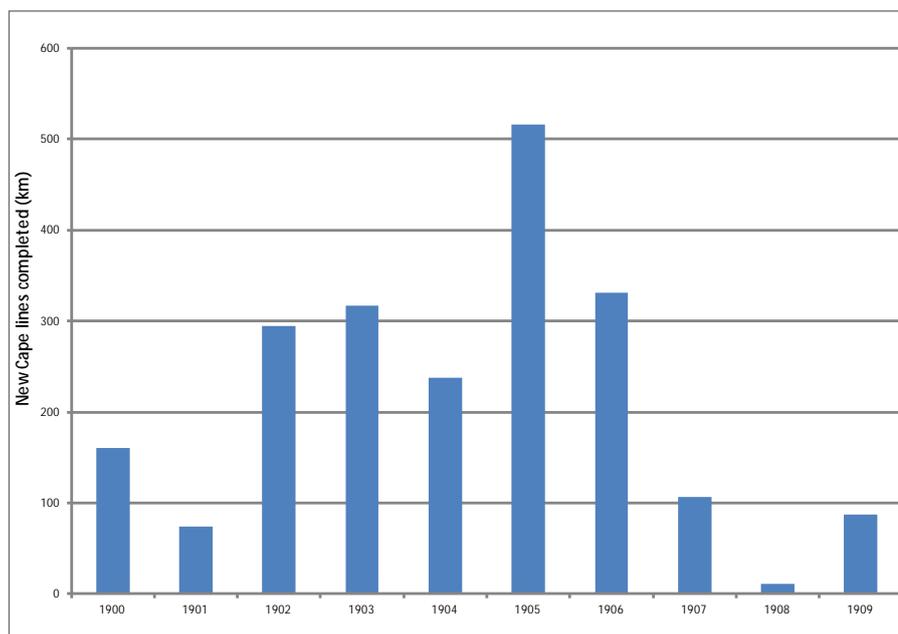


Figure 1: New railway lines completed in the Cape 1900 to 1909

2. Lady Grey to Motkop, 33 km, April 1910 to December 1913. This section was the most difficult, as the line had to cross the Karringmelkspruit, a deeply incised valley. It is here where six of the eight reverses were eventually built. Motkop comprised an insignificant temporary siding, a terminus necessitated by budget constraints.
3. Motkop to New England, 32 km, August 1914 to December 1915. New England was a more substantial terminus, better accessible by road from Barkly East and the surrounding farming country. This section was easy going without difficult obstacles.
4. New England to Barkly East, 28 km, after a 13 year delay, constructed from November 1928 to December 1930. This section crossed the Kraai River for a second time, and required two more reverses.

To the question why construction took so long, a short answer is that each section had to follow a similar, protracted procedure of lobbying, parliamentary authorisation of a desirable “new line”, and then awaiting parliamentary appropriation of the necessary funds (against fierce competition from many rival construction demands and requests). On each occasion insufficient funds were voted to complete the entire branch line – so, to complete the line, a new cycle had to be started. Economic and political conditions in the country also played a role:

- Section 1 was built at a time of national reconstruction following the end of the South African War, when almost every district was clamouring for rail access. Funds were stretched widely.
- Cape rail construction tapered off dramatically after 1905, as shown in Figure 1, and the line was implicated.
- From about 1906, large capital investment by government, which included new rail construction, was inhibited by the pending unification of South Africa in 1910, holding to the well-established principle that projects could only be approved if “those that have to pay have a voice in the expenditure incurred”. Section 2 of the branch line was the exception to the rule, as it was started only one month before unification after aggressive lobbying by the Barkly East community, based on the fear that their line would never be approved under a new government covering a much larger area of jurisdiction. Of course, the line

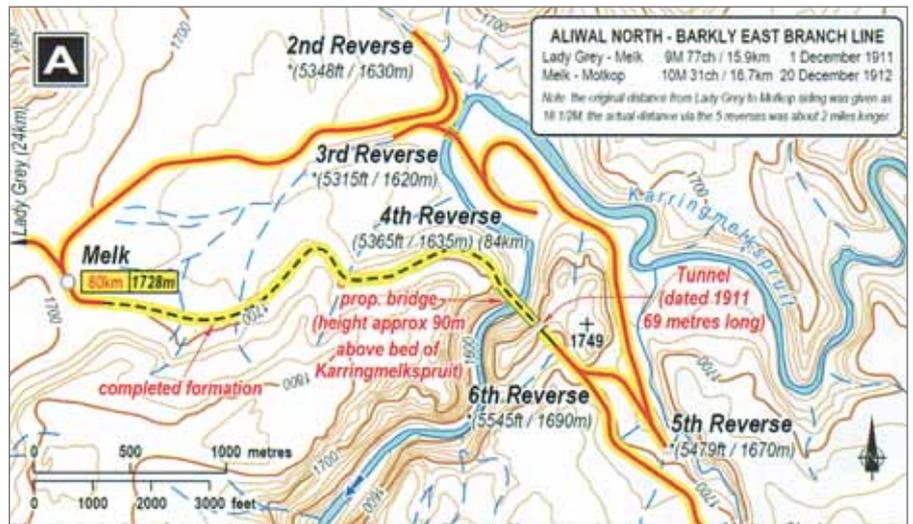
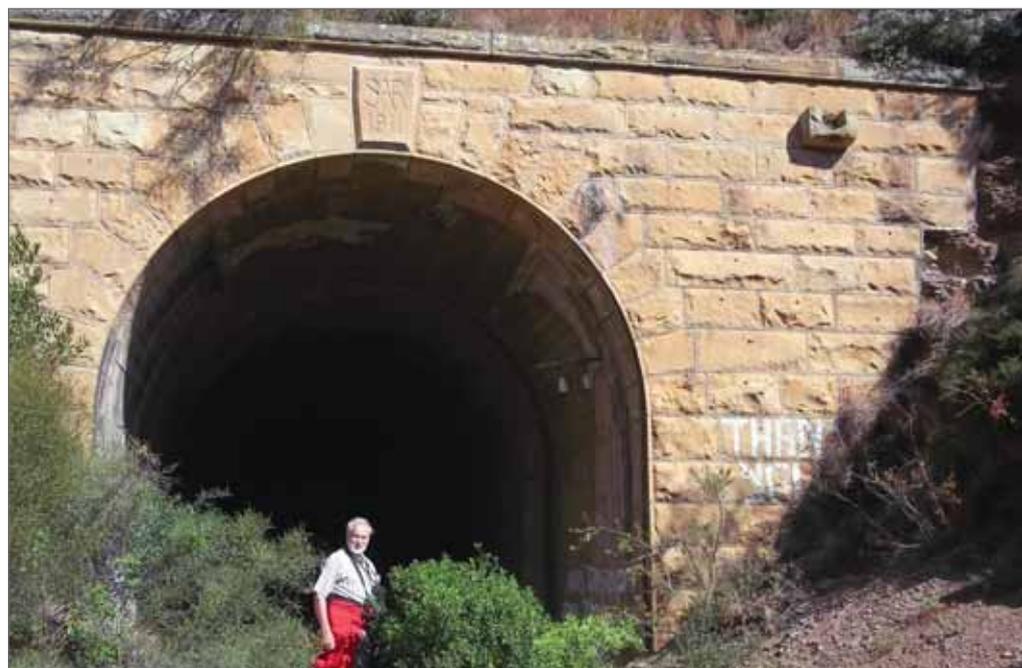


Figure 2: Map of the reverses area near Barkly East; the dashed line indicates the originally planned crossing of the Karringmelkspruit by a high bridge, eventually replaced by a series of six rail reverses (map originally drawn by Bruno Martin, published in *Tracks Across the Veld* by Boonzaaier in 2008, used with permission)



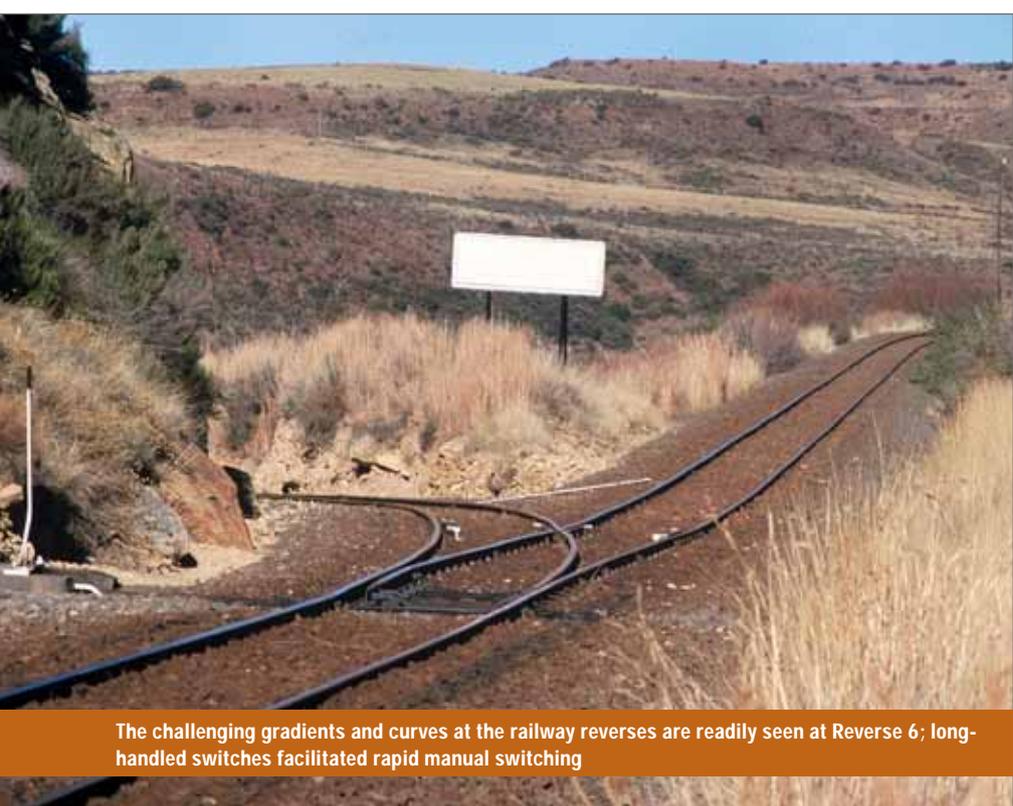
Manufactured by Westwood Baillie & Co in London in 1884, the three 40 feet (12.2 m) deck sections of the Karringmelkspruit rail bridge first served near Prieska before being moved to their present location in 1912/13



Concrete-lined over its entire 70 m, both portals of the abandoned rail tunnel incorporate one “SAR 1911” keystone; fine sandstone masonry is typical of the area



View from the west end of the tunnel (and east abutment of the aborted bridge) to the abandoned cutting at the other abutment (circled), showing the Karringmelspruit gorge; the existing bridges and Reverses 2 and 4 are located in the right middle distance (not clear on the photograph)



The challenging gradients and curves at the railway reverses are readily seen at Reverse 6; long-handled switches facilitated rapid manual switching

was absorbed into the South African Railways (SAR) upon unification.

- World War 1 (1914 – 1918) put an automatic stop to rail construction; the SAR had to divert its resources to, amongst other activities, connecting the South African and South West African railways in record time, and transporting troops and war supplies.
- Section 4 was authorised in 1925, when serious doubts were raised about the economic viability of branch lines in general. Critical examination of branch line proposals, coupled with difficult economic conditions, obliged a wait of three more years before construction started.

CROSSING THE KARRINGMELKSPRUIT

Between Aliwal North and Barkly East the most severe obstacle is presented by the Karringmelspruit, east of Lady Grey. Tributary to the Kraai River,

Karringmelkspruit cuts a deep gorge with steep, boulder-strewn slopes – designing and constructing a railway bridge here would be challenging. Upriver the gorge is less daunting, but the rugged *Little Berg* of the Drakensberg limits viable crossings to one short reach, a spot used in the 19th century for the old wagon trail, and today by the R58 main road between Lady Grey and Barkly East.

Rail alignment incurs severe geometrical constraints, forcing engineers to consider all possible options. Following a “flying survey” in 1899, probably performed on horseback with primitive surveying instruments (if any), George Schele, reporting his findings to none other than John Brown (soon thereafter the first president of SAICE in 1903), first suggested a route. His proposal was based on a rail gauge of 2 feet (mensuration at the time, 610 mm today) and would have crossed the Karringmelkspruit on a low bridge at exactly the same point where the rail crosses today. His proposal did not include any reverses, but he admitted that the route “could hardly be selected if the gauge was of standard width” (the standard Cape gauge of 3 feet 6 inches, or 1 067 mm). Soon thereafter, following a more detailed survey in 1903, resident engineer Allan McDonald Campbell boldly proposed a route that would cross the Karringmelkspruit about 1 000 m further downriver in the gorge, requiring a high bridge 93 m above the river bed. Moreover, at the eastern end of the bridge, the line would immediately enter a tunnel only 70 m long, exiting on a small plateau and continuing in regular fashion. When crews moved onto site in 1910, this proposal, which accommodated the wider gauge, was approved and tunnel construction started forthwith, in parallel with the bridge design. Understandably, the bridge design team (who had to be paid for many hours of overtime) finally came up with a cost estimate significantly higher than that budgeted for. Stringent budget controls imposed by parliament could not be exceeded, so Campbell’s grand design was scrapped and an alternative system of six reverses was hastily constructed. Three reverses allow the line to descend steeply to cross the Karringmelkspruit at the same low level that Schele had suggested, and via three more reverses to rise again to the plateau immediately east of the tunnel.

Substitution of the six reverses to replace the bridge was approved only in November 1911, three months after the



Railway reverses limit the length of trains; here a Class 19 has tightly backed up its coaches at Reverse 8, only a few metres beyond the switch, while another approaches Reverse 7 (Photograph by HG Graser, http://de.wikipedia.org/wiki/Bahnstrecke_Aliwal_North%E2%80%9393Barkly_East)

tunnel and the approach earthworks for the high-level bridge had been completed in August 1911. Naturally this led to an embarrassing situation: an expensive, complete, lined railway tunnel, worthless and unusable to this day. Additionally, the rail formation constructed on side-long ground on the western approach to the proposed high-level bridge has left a hillside scar visible to the present. For the first decades following the tunnel construction, it was commonly reported and generally accepted that abandonment of the tunnel and its approach formation ending in a short but deep curved cutting, was caused by an unavoidable shortage of money. Latterly, however, a number of myths have arisen to explain why the tunnel and formation were abandoned and the bridge design aborted; some are listed below, all easy to disprove by simply considering the timeline:

- “During World War 1 a ship loaded with bridge material *en route* to South Africa was sunk by a German U-boat.” (1978, *The Great Steam Trek*)
- “The ship with the bridge parts sank in a storm on its way from the United Kingdom to South Africa. The reverses were planned all along as a provisional arrangement for the transport of material for track and tunnel construction. As no second bridge could be ordered due to the impending war, the provisional arrangement became permanent.” (From a 1979 report on www.drehscheibe.com)

- “The reverses were designed in 1923 by a German woman living in the area.” (1980, *Volksblad*)
- “The steelwork for the bridge was lost at sea *en route* from the UK.” (1980, *South African Steam Today*)
- “The steel girders for the bridge were manufactured in England but the ship *Mexico*, carrying the girders, was sunk during World War 1.” (2011, *Heritage Management Strategy and Implementation Plan for Barkly East*)
- “Two bridges were sent from England and both failed to reach their destination – one was sent back for ammunition during World War 1 and the second sank with the ship that was transporting it.” (From www.zuluportal.com)

CROSSING THE KRAAI RIVER

Twice crossed by the railway line, the West Kraai River crossing is 27 km from Aliwal North. At the time of its construction, it required a fairly substantial bridge, which could only be completed about six months after the completion of the rest of the section. (Pre-dating the production of structural steel in South Africa, bridges had to be imported from overseas, mostly Britain, which incurred delays.) In March 1925 the original bridge was washed away, cutting New England off, and there ensued a series of three hastily erected temporary bridges, but they in turn were also washed away. On June 25, after a rail interruption

of more than three months, a fourth temporary bridge restored regular service. During the first part of the interruption, there were no locomotives on the Barkly East side of the break, and some goods (mostly coal and mealie-meal) had to be transported by trolley. May brought more rain, and the mountains were white with snow. Supplies of food, coal and paraffin ran very low in Barkly East. Before its foundations were damaged, the third temporary bridge remained in service just long enough to allow two engines to cross to the Barkly East side of the break. Passengers had to cross the river in a boat at their own risk and goods were hauled across the river using two aerial wire cables. Partial service was thus restored. One year later, in March 1926, the fourth temporary bridge was washed away and finally a permanent bridge was constructed by 30 July 1926. In exasperation the local newspaper (*Barkly East Reporter*) cried: "The whole affair has been a glaring example of how not to do things!"

At the other end of the line, 11 km from Barkly East, the Kraai River East crossing posed a similar problem as did the Karringmelkspruit. Approaching from the northeast the line descended steeply to cross the Kraai River at a reasonably low level. As the engineers tried to find a solution to the "difficult nature" of the Kraai River East crossing, construction was delayed three months beyond the promised date. Eventually the crossing was achieved by the use of two further reverses. Reverses have inherent disadvantages of slower average speed and limited train length, but they were adopted due to significant capital cost savings when compared to an alternative longer length of line. Six existing reverses on the branch line might have eased the decision to limit the capital outlay.

SERVICE FROM 1905 TO 1991

Finally completed all the way to Barkly East, the official opening of the line took place on 12 December 1930 – "Barkly's Day of Days". Starting at 10:00, the train

with officials entered the station and the customary bottle of champagne was broken on the decorated locomotive. One of the three national Railway Commissioners, D Hugo, opened the line. Then there followed a public luncheon at 13:00, a fancy-dress carnival at 15:00, free films ("bioscope") for children at 18:45, dancing in the town hall from 20:00, and free bioscope entertainment for adults from 21:00. Market Square was decoratively illuminated. "It is only once in the lifetime of a town that such an occasion as that which occurred on Wednesday last can be celebrated", exclaimed the *Barkly East Reporter*.

By transporting agricultural products to urban areas, and providing rural access to industrial commodities, provision of rail access has always been seen as an instrument of national development. Following this philosophy, many earlier railway lines were approved despite doubts that they would ever pay their way. Branch lines, in general, performed poorly. In 1906, for

The 2012 BERRT group from left: Johannes Haarhoff, Francis Legge, Bill James, Johan de Koker and Mike Johns at the monument alongside the railway track at the site of the fatal derailment of 1992



example, only two of the then 22 branch lines in the Cape system were profitable if capital redemption was included. Almost at the bottom of the list in terms of profitability was the Barkly East branch line. At the start of construction in 1903, the line had to compete with ox wagon traffic, which was still very much alive and well at the time, until legislation in 1909 removed ox wagons as an economic threat (and a local livelihood). But by the line's completion in 1930, a new competitor had arrived in the form of motor transport, against which it would steadily lose ground throughout the ensuing 60 years. For economic reasons regular service was finally discontinued in 1991.

THE ACCIDENT OF 1992

On Saturday 10 October, during the 1992 Lady Grey Spring Festival, an entertaining race between train and runners was organised between Melk siding and Lady Grey. Upon the return of the train to Lady Grey, an evidently inebriated passenger illegally entered the cab of the locomotive, pushed the driver aside and pulled the regulator to full speed on a section posted with a 30 km/h restriction. By the time the train entered a sharp curve, speed had increased to 76 km/h and the locomotive and five coaches derailed in a curved cutting. Between the locomotive and the coaches behind, the first coach was crushed, killing five people instantaneously – the Lady Grey station master, his wife, and three children from the area. Four days after the accident the engine driver succumbed. A further 38 people were injured. Subsequently, a monument was erected at the scene of the derailment.

Following this accident, for similar future trips it was impossible to purchase insurance at reasonable rates. However, exactly nine years after the accident, on 10 October 2001, Bushveld Train Safaris ran the ultimately last trip over the line, a commemorative passenger train, after which the line was closed and no further trains were run. Coincidentally, the present BERRT group visited the site almost exactly 20 years after the accident.

A PLACE TO VISIT

Unsurprisingly, the writers highly recommend a visit to this unique part of South Africa's railway heritage, incorporating, as it does, the only remaining railway reverses (the other two, between Volksrust and Newcastle, and near Van Reenen, were eliminated by subsequent realign-

ment and upgrading). Testament to the local custodians of the line, the Barkly East branch, though long disused, remains intact and complete. Being "*lovely beyond any singing of it*", the area will attract further railway enthusiasts and other tourists. Friendly farmers allow, by appointment, hiking along the line which mostly lies close to the main road. Furthermore, two heritage sandstone bridges built in the 1890s, both national monuments, are located close to the railway line. [In addition, celebrated high road passes, rock art, birding opportunities, fly fishing and modern rugged outdoor activities are supported by a range of accommodation opportunities.] Certainly the BERRT group is interested in all possibilities for resur-

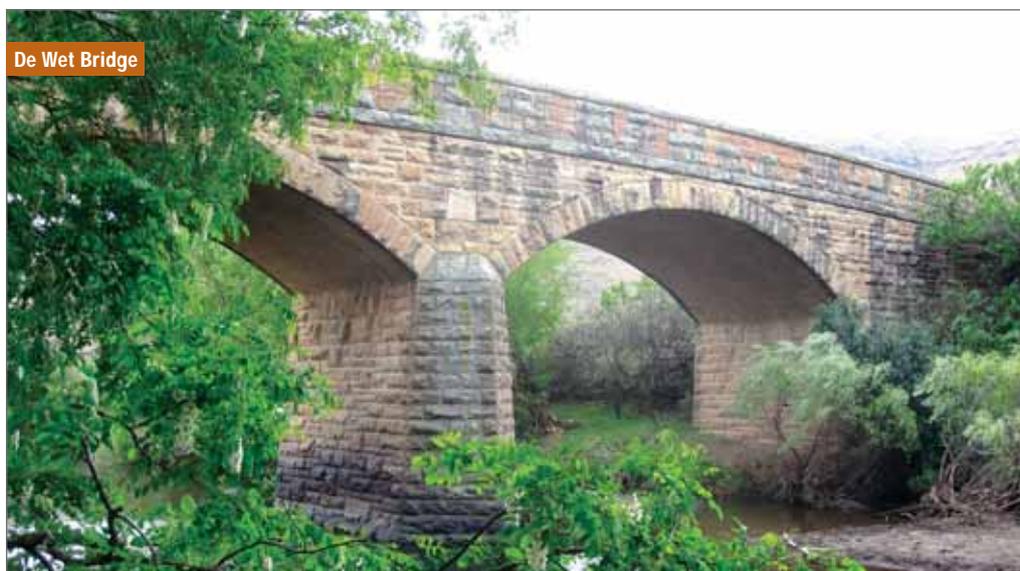
recting use of this branch line, perhaps by draisines and rail-bikes.

NOTE

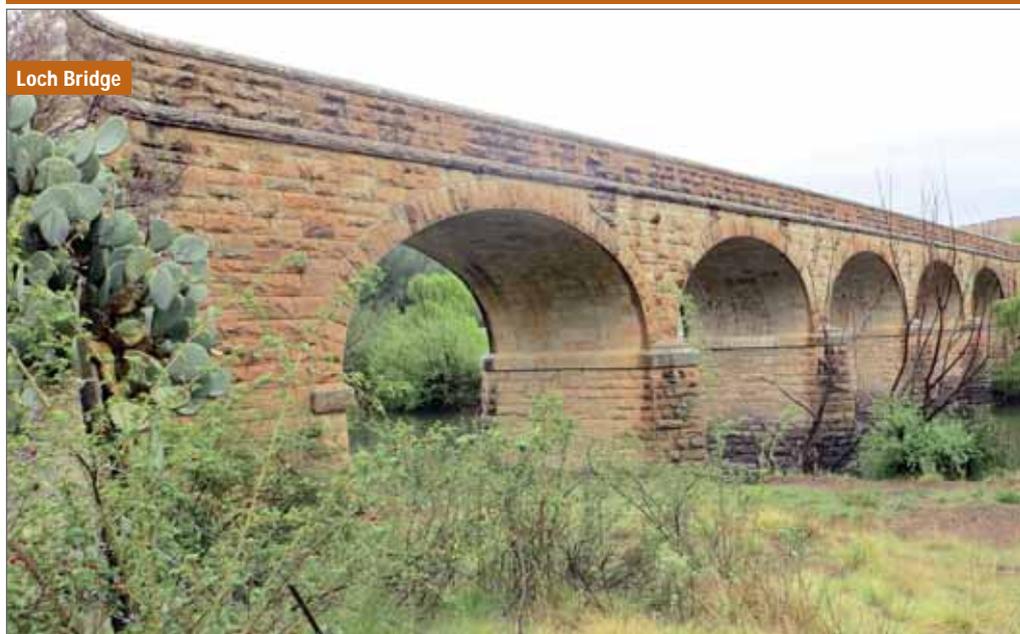
Our visit resulted from a suggestion by Mike Johns; Francis Legge provided transport; Johan De Koker proposed preparation of this article; Johannes Haarhoff conducted the research and wrote the draft; with Bill James as picky technical and language editor. A list of documentary sources is available from the BERRT members. Photographs not specifically credited were taken by the 2012 BERRT group.

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These two beautiful sandstone bridges, both designated national monuments, are in close proximity of the railway line – completed in 1899, the De Wet Bridge crosses the Karringmelkspruit near Reverse 4 about 11 km southeast of Lady Grey, while the Loch Bridge (officially named the John Laing Bridge, for the Commissioner of the Cape Department of Public Works), completed in 1893, crosses the Kraai River near Reverse 8 about 8 km northwest of Barkly East



Source:

http://www.saice.org.za/downloads/monthly_publications/2013/2013-Civil-Engineering-May/#/0