

Appendix 6: Heritage Impact Assessment Data

The 1st step in general assessment across all project components using common assessment criteria and through all the project phases are included in the matrix evaluation below.

Score	Description
3+	High significance of positive change
2+	Good positive change
1+	Minor positive change
0	Neutral, being no change
1-	Minor negative change
2-	Significant negative change
3-	High significance of negative change

The two-tier assessment makes use of the above valuation scale, to provide some texture to the impact landscape, and assess what intervention would be recommended, how and where, to best manage the resulting changes in the socio-cultural landscape.

Evaluation of Heritage Impacts

The evaluation of heritage impacts is conducted on two levels. Firstly the Conceptual Site Development Plan and Site Zoning Plan are evaluated. The evaluation of this master planning reveals considerations that need to be considered in terms of improving and reviewing overall planning for the site, as dealt with the Section 15.1. Secondly more specific evaluation is conducted on the 17 current project components, making use of comparative impact assessment methodology.

1. Evaluation of Conceptual Development Plan and Site Zoning Plan

The Conceptual Site Development Plan and Site Zoning Plan have undergone many years of planning and participation, and as such represent the collective thinking of a variety of stakeholders. These plans were last reviewed in 2003. In general the plans guide project implementation, which has been slower than expected. Two specific components within the conceptual planning do however require consideration, being the establishment of a camping site and use of the lime kiln area for tourism activities.

a) Camping Area

The establishment of the camping area within the Core Area of the TSWHS would most likely lead to detrimental impacts to the various heritage sites within close proximity. It needs to be recognized that the removal of fossils and other heritage objects from the site remains a threat. Providing access to campers allows for vehicle access, as well as unguided access within the Core

Area. Unguided access into the Core Area also poses a significant safety threat, within an area previously used for mining that has not been stabilised and rehabilitated.

Recommendation: It is recommended that the option to establish a camping area within the Core Area be declined and alternative locations for such a facility be explored within or around the Buffer Area. A possible alternative site for the establishment of a camping area is at Thomeng Falls, yet taking into full cognizance that this area has very sensitive wetlands that need to be better managed.

b) Lime Kiln Area

The lime kiln area poses various safety issues including unstable mine dumps, near vertical rock walls and derelict buildings and infrastructure. This area is a high safety risk and may also hold risk of underground cavities.

Recommendation: It is recommended that no visitor access or development proposals be entertained for this area, until the geotechnical stability has been properly assessed and adequate engineering input has been designed and costed, to render the area safe and usable.

2. Evaluation of Current Project Components

The *Improvement on Visitor Facilities, Site Infrastructure and Heritage Conservation Measures at the Taung Skull World Heritage Site* currently has 17 project components under assessment. These project components are assessed across project phases and according to the following assessment criteria:

- Archaeological impacts;
- Palaeontological impacts;
- Visual impacts;
- Ecological impacts;
- Socio-economic impacts;
- Safety; and
- Cultural impacts.

Impact assessment can be done in various ways. For the purpose of this assessment on the 17 project components the heritage impacts are comparatively quantified across a common set of assessment criteria mentioned above. It must be well noted that the quantification of impacts is not an exact science, yet does allow comparative advantage and needs to be based on the same set of assessment assumptions.

Comparative Impact Matrix Evaluation

The results of the assessment are presented as an impact assessment matrix, as detailed in Table 1 and 2. Table 1 includes an assessment where no mitigation measures are adopted and implemented. Table 2 details an assessment of impacts once mitigation measures are adopted and implemented.

One advantage of using the impact matrix method is that one can more easily compare impacts across various components on a single page. In this case the one page assessment compares project components across project phases. Medium to high negative impacts are indicated in red, thus indicating 'red flag' issues that require attention and intervention. The disadvantage of the impact matrix method is that specific impacts are not fleshed out in more detail, as it is not possible to do so with a matrix and on a single page. This requires further detailed scrutiny and has been done for the specific 'red flag' issues that have been highlighted.

Specific mitigation measures are highlighted in the further detailed impact assessment conducted and documented from Tables 5 to 11. The mitigation measures identified are also summarised and categorised according to the 17 project components, as presented in Section 22 of this report.

Table 1: Comparative Impact Assessment Matrix: Project Components across Project Phases and Assessment Criteria – No Mitigation

		No Go	Fence	AbPNic	AbTho	RdTho	MCRest	MMRest	PHRest	P&EAlt1	P&EAlt2	Sites	Trails	Msite	BoomTho	HistB	Museum	Restaur	Auditor	KinArea			
	Phase	0	PNo. 1	PNo. 2	PNo. 3	PNo. 4	PNo. 5	PNo. 6	PNo. 7	PNo. 8	PNo. 8	PNo. 9	PNo. 10	PNo. 11	PNo. 12	PNo. 13	PNo. 14	PNo. 15	PNo. 16	PNo. 17			
1	Construction in Progress	Archeological Impact	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
2		Paleontological Impact	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3		Impact on Heritage Site	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4		Visual Impact	-	1	2	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5		Ecological Impact	-	1	1	2	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6		Socio-economic Impact	-	1	1	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7		Safety	0	0	0	0	-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8		Cultural Impact	-	0	1	1	-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	Planning Design and Construction	Archeological Impact	-3	-	-	-	0	0	0	0	-1	0	1	-1	-1	-1	1	-1	0	-	-	-	
10		Paleontological Impact	-3	-	-	-	0	0	0	0	-1	0	1	-1	-1	-1	1	-1	0	-	-	-	
11		Impact on Heritage Site	-3	-	-	-	-1	0	0	0	1	2	2	-1	-1	0	1	0	0	-	-	-	
12		Visual Impact	-3	-	-	-	-1	-1	-1	-1	-2	-1	2	-1	-2	-1	2	-2	0	-	-	-	
13		Ecological Impact	-2	-	-	-	-1	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	
14		Socio-economic Impact	-2	-	-	-	1	1	1	1	2	2	1	1	1	1	1	1	1	1	-	-	
15		Safety	-3	-	-	-	-1	1	1	1	1	-2	1	2	-2	1	1	1	1	1	-	-	
16		Cultural Impact	-2	-	-	-	0	1	1	1	1	1	2	-1	2	1	2	2	1	-	-	-	
17	Operation and Maintenance	Archeological Impact	-3	0	0	0	0	0	0	0	0	0	-2	-1	-1	0	0	0	0	-	-	-	
18		Paleontological Impact	-3	0	0	0	0	0	0	0	0	0	-2	-1	-1	0	0	0	0	-	-	-	
19		Impact on Heritage Site	-3	0	0	0	0	0	0	0	1	1	-1	-1	-1	0	-1	0	0	-	-	-	
20		Visual Impact	-3	1	1	1	0	-1	-1	-1	-2	1	-1	-1	1	-1	0	-1	0	-	-	-	
21		Ecological Impact	-2	1	1	2	-1	0	0	0	0	0	0	0	0	0	0	0	0	-	-	-	
22		Socio-economic Impact	-2	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	-	
23		Safety	-3	1	1	1	1	1	1	1	1	-2	1	-2	-2	1	1	-3	1	-	-	-	
24		Cultural Impact	-2	-1	1	1	1	1	1	1	2	2	1	2	2	1	1	1	1	-	-	-	
25	Decommissioning	Archeological Impact	0	0	0	0	0	0	0	0	0	0	-1	0	-1	0	NA	NA	0	-	-	-	
26		Paleontological Impact	0	0	0	0	0	0	0	0	0	0	-1	0	-1	0	NA	NA	0	-	-	-	
27		Impact on Heritage Site	0	-1	-1	-1	0	-1	-1	-1	-1	-1	-1	0	-1	0	NA	NA	0	-	-	-	
28		Visual Impact	-1	-1	-1	0	-1	-1	-1	-1	-1	1	0	0	-1	-1	NA	NA	0	-	-	-	
29		Ecological Impact	0	-1	-1	1	0	0	0	0	0	0	0	0	0	0	NA	NA	0	-	-	-	
30		Socio-economic Impact	0	0	0	2	-1	-1	-1	-1	-1	-1	-1	0	0	0	NA	NA	-2	-	-	-	
31		Safety	-1	-1	-1	-1	-1	-1	-1	-1	-1	1	-1	-1	1	0	NA	NA	0	-	-	-	
32		Cultural Impact	0	0	0	-1	-1	0	0	0	1	1	-1	0	-1	0	NA	NA	0	-	-	-	
	Impact Summary Management Indicators Pre-Mitigation	Archeological Impact	-6	0	0	0	0	0	0	0	-1	0	-2	-2	-3	-1	1	-1	0	-	-	Tot -9	
		Paleontological Impact	-6	0	0	0	0	0	0	0	-1	0	-2	-2	-3	-1	1	-1	0	-	-	Avr -0.5	
		Impact on Heritage Site	-6	0	-1	-1	0	-1	-1	-1	-1	-1	0	-2	-3	0	0	0	0	-	-	-7	
		Visual Impact	-6	1	1	1	0	-3	-3	-3	-5	1	-1	-2	-2	-3	0	-3	0	-	-	-16	
		Ecological Impact	-4	2	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	14	
		Socio-economic Impact	-4	2	3	4	1	1	1	1	2	2	1	2	2	2	2	2	2	0	-	-	32
		Safety	-6	0	0	0	-1	1	1	1	1	-3	1	-3	0	2	2	-2	1	-	-	4	
		Cultural Impact	-4	-1	1	1	-1	1	1	1	2	2	1	2	2	1	1	1	1	0	-	-	23

Assessment Points:

- It is clear that the No Go option will continue to have several significant detrimental impacts across all assessment criteria and that improvement is required.
- The parking and new entrance Alternative 1 (P&E Alt1 PNo. 8) has four 'red flags' identified down the column, highlighting visual and safety issues.
- The parking and new entrance Alternative 2 (P&E Alt1 PNo. 8) has only no 'red flags' identified.
- Clearly there can be archaeological, palaeontological and safety 'red flags' for the sensitive heritage sites (Site PNo. 9).
- Safety issues are also highlighted in trails (Trails PNo. 10) and the monument site (Msite PNo. 11). The monument site also has visual impacts.

From the impact summary at the bottom of Table 1 it shows a significant improvement from more negative indicators on the left to less significant and positive indicators across to the right, even without effective mitigation. Effective mitigation is however required and one would thus expect better impact indicators, as shown in Table 2.

Table 2: Comparative Impact Assessment Matrix: Project Components across Project Phases and Assessment Criteria – With Mitigation

		No Go	Fence	AbPNic	AbTho	RdTho	MCRest	MMRest	PHRest	P&EAlt1	P&EAlt2	Sites	Trails	Msite	BoomTho	HistB	Museum	Restaur	Auditor	KilnArea			
	Phase	0	PNo. 1	PNo. 1	PNo. 2	PNo. 3	PNo. 4	PNo. 5	PNo. 6	PNo. 7	PNo. 8	PNo. 8	PNo. 9	PNo. 10	PNo. 11	PNo. 12	PNo. 13	PNo. 14	PNo. 15	PNo. 16			
1	Construction in Progress	Archeological Impact	-	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
2		Paleontological Impact	-	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3		Impact on Heritage Site	-	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4		Visual Impact	-	1	2	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5		Ecological Impact	-	1	1	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6		Socio-economic Impact	-	1	1	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7		Safety	-	0	0	0	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8		Cultural Impact	-	0	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	Planning Design and Construction	Archeological Impact	-	-	-	-	0	0	0	0	-1	0	1	1	-1	-1	1	-1	0	-	-	-	
10		Paleontological Impact	-	-	-	-	0	0	0	0	-1	0	1	1	-1	-1	1	-1	0	-	-	-	
11		Impact on Heritage Site	-	-	-	-	1	0	0	0	1	2	2	1	-1	0	1	0	0	-	-	-	
12		Visual Impact	-	-	-	-	1	1	2	2	-2	1	2	1	1	-1	-1	2	2	0	-	-	
13		Ecological Impact	-	-	-	-	2	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	
14		Socio-economic Impact	-	-	-	-	1	1	1	1	2	2	1	0	1	1	1	1	1	1	-	-	
15		Safety	-	-	-	-	1	1	1	1	1	1	2	1	1	1	1	1	1	1	-	-	
16		Cultural Impact	-	-	-	-	0	1	1	1	2	1	2	-1	2	1	2	2	1	-	-	-	
17	Operation and Maintenance	Archeological Impact	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	
18		Paleontological Impact	-	0	0	0	0	0	0	0	0	0	-1	1	-1	0	0	0	0	0	-	-	
19		Impact on Heritage Site	-	0	0	0	0	0	0	0	1	1	-1	1	-1	0	-1	0	0	0	-	-	
20		Visual Impact	-	1	1	1	0	2	2	2	-1	1	-1	2	1	-1	0	1	0	-	-	-	
21		Ecological Impact	-	1	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	
22		Socio-economic Impact	-	1	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	-	-	
23		Safety	-	1	1	1	1	1	1	1	-1	1	1	1	-1	1	1	1	1	1	-	-	
24		Cultural Impact	-	-1	1	1	1	1	1	1	2	2	2	2	2	1	1	1	1	1	-	-	
25	Decommissioning	Archeological Impact	-	0	0	0	0	0	0	0	0	0	-1	0	-1	0	NA	0	0	-	-	-	
26		Paleontological Impact	-	0	0	0	0	0	0	0	0	0	-1	0	-1	0	NA	0	0	-	-	-	
27		Impact on Heritage Site	-	0	0	0	0	0	0	0	-1	-1	-1	0	-1	0	NA	-1	0	-	-	-	
28		Visual Impact	-	1	-1	0	0	0	0	0	-1	1	0	0	-1	-1	NA	-1	-1	-	-	-	
29		Ecological Impact	-	0	2	2	1	0	0	0	0	0	0	0	0	0	NA	0	0	0	-	-	
30		Socio-economic Impact	-	0	0	0	2	0	0	0	-1	-1	-1	0	0	0	NA	-1	-1	-	-	-	
31		Safety	-	1	1	1	1	0	0	0	1	1	-1	1	1	0	NA	-1	0	-	-	-	
32		Cultural Impact	-	0	0	0	-1	0	0	0	-1	-1	-1	0	-1	0	NA	0	0	-	-	-	
	Impact Summary																						
	Archeological Impact	-	0	0	0	0	0	0	0	-1	0	-1	-	-3	-1	1	-1	0	-	-	-4	-0.2	
	Paleontological Impact	-	0	0	0	0	0	0	0	-1	0	-1	-	-3	-1	1	-1	0	-	-	-4	-0.2	
	Impact on Heritage Site	-	0	0	0	0	0	0	0	-1	-1	0	-	-3	0	0	-1	0	-	-	-1	0.1	
	Visual Impact	-	1	2	2	0	2	2	2	-4	1	-1	3	1	-3	2	2	-1	-	-	22	1.3	
	Ecological Impact	-	2	4	6	3	0	0	0	0	0	0	0	0	0	0	0	0	-	-	15	0.9	
	Socio-economic Impact	-	2	3	4	3	2	2	2	2	2	1	1	2	2	2	2	2	1	-	35	2.1	
	Safety	-	1	1	2	1	2	1	2	1	1	2	1	1	2	2	2	2	1	-	32	1.9	
	Cultural Impact	-	-1	1	2	1	2	1	2	1	2	2	2	2	2	2	2	2	1	-	32	1.9	

Assessment Points:

- a) It is clear that the No Go option will continue to have several significant detrimental impacts across all assessment criteria and that improvement is required.
- b) The parking and new entrance Alternative 1 (P&E Alt1 PNo. 8) has one ‘red flag’ identified highlighting visual impact issues.

From the impact summary at the bottom of Table 2 it shows a significant improvement from more negative indicators on the left (No Go option) to far less significant and more positive indicators across to the right, as a result of effective mitigation.

Project Component Impact Evaluation

Further detailed impact assessment has been done for the specific project components with ‘red flag’ issues highlighted in the impact matrix assessment in the previous section of this report. A more elaborative set of assessment criteria is used to evaluate each of the project components requiring more detailed assessment, and entail the consideration of extent, duration, magnitude, probability, status, reversibility, irreplaceability and mitigation.

Further evaluation conducted on project components selected with ‘red flag’ issues, as detailed in Table 1, are listed in Table 3 below.

Table 3: Project Components and further Impact Evaluation

No.	Project Component Name	Further Evaluation	Further Impacts Assessed
1	Protection of the core area/fence	No	-
2	The ablution block- picnic site	No	-
3	The ablution block-Thomeng Waterfalls	No	-
4	The road to Thomeng (Roads infrastructure)	No	-
5	The miners compound (restoration)	No	-
6	The mine manager’s office (restoration)	No	-
7	The Power House Complex (restoration)	No	-
8	Parking and entrance area	Yes	Visual impact Safety
9	Protection of sensitive and dangerous sites: Safety on the site, as well as conservation of Hrdlička’s Fossil Site, Equus Cave, Black Earth Cave, and Oxland Large Mammal Site.	Yes	Archaeological impact Palaeontological impact Safety
10	Trails and signage	Yes	Safety
11	Memorial site	Yes	Visual impact Safety
12	Boom Gate and Security Shelter at Thomeng	No	-
13	Historical Buildings in the Buffer zone	No	-
14	Museum and Amphitheatre	Yes	Visual impact Safety
15	Restaurant	No	-

16	Auditorium	-	-
17	Revamping of the Kiln area	-	-

Table 3 shows that components 1 to 4 are not assessed in more detail, as these are already in the construction phase. All the remaining components are not assessed in more detail since the impacts are less significant or no further planning information is available to assess. In particular, components 5 to 7 are not assessed more deeply, as heritage architects are actively involved in designing the restoration of these components to retain the heritage architectural fabric, as far as is possible. Components 12 and 13 require no further assessment as no plans are available. Component 15 requires no further assessment as it is established within the shed alongside the Mine Manager’s House and will result in no significant impacts. Components 16 and 17 are not assessed further as no plans are available.

The result in the impact matrix then triggers the need for the 2nd step, being a more detailed assessment, making use of the Detailed Impact Analysis Table 4 below.

Table 4: Considerations in Detailed Impact Assessment

Detailed Impact Assessment Table	
Project:	
Project Phase:	
Potential impact on ...	Description
Values of the heritage resource and/or place:	<i>This is a statement of the nature and degree of significance of the heritage resource being affected by the activity. From a heritage management perspective it is useful to distinguish between whether the significance is embedded in the physical fabric or in associations with events or persons or in the experience of a place; i.e. its visual and non-visual qualities. This statement is a primary informant to determine the nature and degree of significance of an impact and thus needs to be thoroughly considered.</i>
Nature of impact:	<i>This can be summarised in four criteria that determine the nature of impacts on heritage resources, being a) heritage loss and deterioration, b) social impacts resulting from change, c) non-conformity with heritage standards, and d) probability and acceptability of risk.</i>
Extent and duration of impact:	<p><i>Extent will be experienced:</i></p> <ul style="list-style-type: none"> • On a site (volume) scale, i.e. extend only as far as the activity; • Within the immediate context of a heritage resource; • On a local scale, e.g. town or suburb • On a metropolitan or regional scale; or • On a national/international scale. <p><i>Duration is whether the lifespan of the impact will be:</i></p> <ul style="list-style-type: none"> • Short term, (needs to be defined in context) • Medium term, (needs to be defined in context) • Intermittent • Long term where the impact will persist indefinitely, possibly beyond the operational life of the activity, either because of natural processes or by human intervention; or • Permanent where mitigation either by natural process or by human

	<p><i>intervention will not occur in such a way or in such a time span that the impact can be considered transient.</i></p> <p><i>Of relevance to the duration of an impact are the following considerations:</i></p> <ul style="list-style-type: none"> • <i>Reversibility of the impact; and</i> • <i>Renewability of the heritage resource.</i> <p><i>Consideration needs to be given to the significance of a heritage resource at different scales, i.e. site-specific, local, regional, national or international, the relationship between the heritage resources and the relationship between the heritage resource and its setting and its associations.</i></p>
Intensity	<p><i>Here it should be established whether the impact should be indicated as:</i></p> <ul style="list-style-type: none"> • <i>Low, where the impact affects the resource in such a way that its heritage value is not affected;</i> • <i>Medium, where the affected resource is altered but its heritage value continues to exist albeit in a modified way; and</i> • <i>High, where heritage value is altered to the extent that it will temporarily or permanently be damaged or destroyed.</i>
Probability (likelihood)	<p><i>This should describe the likelihood of the impact actually occurring indicated as:</i></p> <ul style="list-style-type: none"> • <i>Improbable, where the possibility of the impact to materialize is very low either because of design or historic experience;</i> • <i>Probable, where there is a distinct possibility that the impact will occur;</i> • <i>Highly probable, where it is most likely that the impact will occur; or</i> • <i>Definite, where the impact will definitely occur regardless of any mitigation measures.</i>
Confidence	<p><i>This should relate to the level of confidence that the assessor has in establishing the nature and degree of impacts. It relates to the level and reliability of information, the nature and degree of consultation with I&AP's and the dynamic of the broader socio-political context.</i></p> <ul style="list-style-type: none"> • <i>High, where the information is comprehensive and accurate, where there has been a high degree of consultation and the socio-political context is relatively stable.</i> • <i>Medium, where the information is sufficient but is based mainly on secondary sources, where there has been a limited targeted consultation and socio-political context is fluid.</i> • <i>Low, where the information is poor, a high degree of contestation is evident and there is a state of socio-political flux.</i> <p><i>The above levels of confidence are influenced by various factors, such as:</i></p> <ul style="list-style-type: none"> • <i>Scientific uncertainty – limited understanding of the heritage resource or community affected;</i> • <i>Data uncertainty – incomplete information or insufficient methodology; or</i> • <i>Policy uncertainty – unclear or disputed objectives or standards</i>
Severity (magnitude) of impact	<p><i>The significance of impacts in terms of their severity can be determined through a synthesis of the aspects produced in terms of the nature and degree of heritage significance and the nature, duration, intensity, extent, probability and confidence of impacts. Magnitude or severity of impacts or changes can be beneficial or adverse, taking into account their direct and indirect effects and whether they are temporary or permanent, reversible or irreversible. The magnitude or severity of impact can be ranked with due regard to the value of the heritage asset as:</i></p> <ul style="list-style-type: none"> • <i>No change</i>

	<ul style="list-style-type: none"> • <i>Negligible</i> • <i>Low; where it would have a minor effect on heritage; and on the decision</i> • <i>Medium, where it would have a moderate effect (positive or negative) on heritage, and should influence the decision.</i> • <i>Major (high), where it would have, or there would be a high risk of, a big effect on heritage. Impacts of high significance should have a major influence on the decision.</i> <p><i>A simple test to determine significance (magnitude) of impact is:</i></p> <ul style="list-style-type: none"> • <i>Are there residual environmental impacts?</i> • <i>If yes, are these likely to be significant or not?</i> • <i>If yes, are these significant effects likely to occur?</i>
Significance of effect of impact	<p><i>The significance of the effect of change – i.e. the overall impact - is a function of the value of the heritage asset’s attributes and the scale of change. This can be summarized for each place’s attribute described using the following descriptors. As change or impacts may be adverse or beneficial, there is a nine-point scale with “neutral” as its centre point:</i></p> <ul style="list-style-type: none"> • <i>Major beneficial;</i> • <i>Moderate beneficial;</i> • <i>Minor beneficial;</i> • <i>Negligible beneficial;</i> • <i>Neutral;</i> • <i>Negligible adverse;</i> • <i>Minor adverse;</i> • <i>Moderate adverse; or</i> • <i>Major adverse.</i>
Timing	<i>Here it should be determined if the impact will happen during construction or/and operation or/and decommissioning, and if the impact will be immediate or delayed.</i>
Degree to which the impact can be reversed:	<i>Rate as Low to High, + or -</i>
Degree to which the impact may cause irreplaceable loss of resources:	<i>Rate as Low to High, + or -</i>
Cumulative impact prior to mitigation:	<i>Describe the nature of the cumulative impact, as well as the related cumulative impacts that may be expected.</i>
Significance rating of impact prior to mitigation	<i>Rate as Low to High, + or -</i>
Degree to which the impact can be mitigated:	<i>Rate as Low to High, + or -</i>
Proposed mitigation:	<i>List the specific mitigation measures, frequency, resource allowances, implementation plan and monitoring.</i>
Cumulative impact post mitigation:	<i>Rate as Low to High, + or -</i>
Significance rating of impact after mitigation	<i>Rate as Low to High, + or -</i>

Table 5: Potential visual impacts of the proposed entrance area, including parking and other related infrastructure.

Nature of Impact				
Potential visual impacts in the proposed entrance area, including parking and other related infrastructure.				
	No Mitigation		With Mitigation	
	Proposed: Parking S of road	Alternative: Parking N of road	Proposed: Parking S of road	Alternative: Parking N of road
Extent (E)	-2 (local)	-1 (local)	-2 (local)	1 (local)
Duration (D)	-3 (long-term)	-3 (long-term)	-3 (long-term)	3 (long-term)
Magnitude (M)	-2 (medium scale)	-2 (medium scale)	-2 (medium scale)	2 (medium scale)
Probability (P)	3 (high)	3 (high)	3 (high)	3 (high)
Significance Rating (E+D+M)*P	-21	-18	-21	18
Status (+, -, 0)	Positive			
Reversibility	Yes			
Irreplaceable loss of resources	No			
Can impacts be mitigated?	Yes			
Mitigation	<ol style="list-style-type: none"> 1. Make use of existing infrastructure and landscape so as to blend all proposed infrastructure into the visual and physical landscape to the north of the road behind existing buildings. 2. Design all infrastructure in a similar manner and theme to that used on the access road through the Core Area, and the Blue Pools picnic site. 3. All signage for the TSWHS should be designed, and be placed in a low impact manner, so as to avoid any negative impacts on the visual landscape. 4. Architectural design for the restoration of the built landscape should incorporate detailed checks from a heritage architect. 			

The site is a sensitive built-environment heritage asset, as it holds testimony the operation of the lime works at Buxton. Visual intrusions will best be noticed upon entering through the New Town area, which opens up a high visual sensitivity area through the Thabasikwe River valley, towards Buxton and the amphitheatre created by the absence of the old lime works.

Table 6: Potential safety impacts of the proposed entrance area, including parking and other related infrastructure.

Nature of Impact				
Potential safety impacts in the proposed entrance area, including parking and other related infrastructure.				
	No Mitigation		With Mitigation	
	Proposed: Parking S of road	Alternative: Parking N of road	Proposed: Parking S of road	Alternative: Parking N of road
Extent (E)	-1 (local)	1 (local)	-1 (local)	1 (local)
Duration (D)	-3 (long-term)	-3 (long-term)	-3 (long-term)	3 (long-term)
Magnitude (M)	-2 (medium scale)	-2 (medium scale)	-2 (medium scale)	2 (medium scale)
Probability (P)	3 (high)	3 (medium)	3 (high)	3 (high)
Significance Rating (E+D+M)*P	-18	-12	-18	18
Status (+, -, 0)	Positive			
Reversibility	Yes			
Irreplaceable loss of resources	No			
Can impacts be mitigated?	Yes			
Mitigation	<ol style="list-style-type: none"> 1. Make use of existing infrastructure and landscape so as to blend all proposed infrastructure into the visual landscape to north of road. No flyover bridge is thus necessary in this case. 2. Design all infrastructure in a similar manner and theme to that used on the access road through the Core Area, and the Blue Pools picnic site. 3. All signage for the TSWHS should be designed, and be placed in a low key manner, so as to avoid any negative impacts on the visual landscape. 4. Start slowing traffic down when entering entrance area and narrow bridge. 			

Road, traffic and pedestrian safety around the new entrance and required parking area is of particular importance.

Table 7: Potential archaeological and paleontological impacts in the protection of sensitive heritage sites.

Nature of Impact				
Potential archaeological and paleontological impacts in the protection of sensitive heritage sites.				
	No Mitigation		With Mitigation	
	No Go	Proposed	No Go	Proposed
Extent (E)	-3 (global)	3 (global)	NA	3 (global)
Duration (D)	-3 (long-term)	3 (long-term)	NA	3 (long-term)
Magnitude (M)	-2 (medium scale)	2 (medium scale)	NA	2 (medium scale)
Probability (P)	3 (high)	3 (high)	NA	3 (high)
Significance Rating (E+D+M)*P	-24	15	-	15
Status (+, -, 0)	Positive			
Reversibility	Yes			
Irreplaceable loss of resources	Yes			
Can impacts be mitigated?	Yes			
Mitigation	<ol style="list-style-type: none"> Carefully designed heritage conservation measures with limited and only guided access to sites. Interpretation signage to sensitize visitors to the sensitivity of the heritage sites. Design all infrastructure in a similar manner and theme to that used on the access road through the Core Area, and the Blue Pools picnic site. All signage for the TSWHS should be designed, and be placed in a low key manner, so as to avoid any negative impacts on the visual landscape. 			

The heritage conservation measures at the sensitive sites are needed rather urgently to reduce the negative impacts being caused to these sites, with particular emphasis on Equus Cave currently being the most vulnerable.

Table 8: Potential safety impacts related to the use and development of existing trails.

Nature of Impact				
Potential safety impacts related to the use and development of existing trails.				
	No Mitigation		With Mitigation	
	Proposed	Alternative	Proposed	Alternative
Extent (E)	-1 (local)	1 (local)	-1 (local)	1 (local)
Duration (D)	-3 (long-term)	3 (long-term)	-3 (long-term)	3 (long-term)
Magnitude (M)	-2 (medium scale)	1 (small scale)	-1 (medium scale)	1 (small scale)
Probability (P)	2 (medium)	2 (medium)	2 (medium)	2 (medium)
Significance Rating (E+D+M)*P	-12	8	-8	10
Status (+, -, 0)	Positive			
Reversibility	Yes			
Irreplaceable loss of resources	Yes			
Can impacts be mitigated?	Yes			
Mitigation	<ol style="list-style-type: none"> All signage for the TSWHS should be designed, and be placed in a low key manner, so as to avoid any negative impacts on the visual landscape and improve safety. Guided tours will significantly improve visitor safety and reduce the risk of heritage impacts being negatively affected. Informing visitors of the inherent dangers in entering and walking around an old quarry and the danger of snakes needs to be done prior to entrance. 			

Sharing of information, guided tours and remaining on designated hiking trails will reduce the existing safety risks associated with entering the site.

Table 9: Potential visual impacts in the Memorial area, including parking and other related infrastructure.

Nature of Impact				
Potential visual impacts in the proposed Memorial area, including parking and other related infrastructure.				
	No Mitigation		With Mitigation	
	Proposed	Alternative	Proposed	Alternative
Extent (E)	-1 (local)	-1 (local)	-1 (local)	1 (local)
Duration (D)	-3 (long-term)	-3 (long-term)	-3 (long-term)	3 (long-term)
Magnitude (M)	-2 (medium scale)	-1 (small scale)	-2 (medium scale)	1 (small scale)
Probability (P)	3 (high)	3 (high)	2 (medium)	3 (high)
Significance Rating (E+D+M)*P	-18	-15	-12	12
Status (+, -, 0)	Positive			
Reversibility	Yes			
Irreplaceable loss of resources	Yes			
Can impacts be mitigated?	Yes			
Mitigation	<ol style="list-style-type: none"> 4. Carefully placed and designed facilities to reduce intrusion into landscape. 5. Interpretation signage to sensitize visitors to the sensitivity of the heritage sites. 6. Design all infrastructure is a similar manner and theme to that used on the access road through the Core Area, and the Blue Pools picnic site. 7. All signage for the TSWHS should be designed, and be placed in a low key manner, so as to avoid any negative impacts on the visual landscape. 			

The Memorial area is the most highly sensitive heritage area in TSWHS. Visual intrusions will best be noticed from the 1st moment that sight of the pinnacles is gained along the road or walking trails. Visual intrusions in the Memorial site and surrounding visual landscape must be very carefully managed, and is probably the most sensitive visual landscape area on the site. Negative impacts on the Memorial site must be avoided.

Table 10: Potential visual impacts of the proposed new museum in the lime kiln area.

Nature of Impact				
Potential visual impacts in the proposed new museum in the lime kiln area.				
	No Mitigation		With Mitigation	
	Proposed: Museum in lime kiln area	Alternative: Alternative location	Proposed: Museum in lime kiln area	Alternative: Alternative location
Extent (E)	-2 (local)	-1 (local)	-1 (local)	1 (local)
Duration (D)	-3 (long-term)	-2 (long-term)	-3 (long-term)	2 (long-term)
Magnitude (M)	-3 (large scale)	-2 (medium scale)	-3 (medium scale)	2 (medium scale)
Probability (P)	3 (high)	3 (high)	3 (high)	3 (high)
Significance Rating (E+D+M)*P	-24	-15	-21	15
Status (+, -, 0)	Positive			
Reversibility	Yes			
Irreplaceable loss of resources	No			
Can impacts be mitigated?	Yes			
Mitigation	<ol style="list-style-type: none"> 1. Make use of existing buildings and infrastructure, and landscape so as to blend all proposed infrastructure into the visual and physical landscape to the north of the road behind existing buildings. 2. All signage for the TSWHS should be designed, and be placed in a low impact manner, so as to avoid any negative impacts on the visual landscape. 3. Architectural design for the restoration of the built landscape should incorporate detailed checks from a heritage architect. 			

The proposed new museum falls in to a high visual sensitivity area situated just above the new entrance area, in the lime kiln area. Visual impacts and likely geotechnical instability count against this location. An alternative location for the new museum is to make use of existing buildings, like the old Locomotive Maintenance Workshop and adjoining structures.

Table 11: Potential safety impacts of the proposed new museum in the lime kiln area.

Nature of Impact				
Potential safety impacts in the proposed new museum in the lime kiln area.				
	No Mitigation		With Mitigation	
	Proposed: Museum in lime kiln area	Alternative: Alternative location	Proposed: Museum in lime kiln area	Alternative: Alternative location
Extent (E)	-2 (local)	1 (local)	-1 (local)	2 (local)
Duration (D)	-3 (long-term)	2 (long-term)	-3 (long-term)	2 (long-term)
Magnitude (M)	-3 (large scale)	2 (medium scale)	-3 (medium scale)	2 (medium scale)
Probability (P)	3 (high)	3 (high)	3 (high)	3 (high)
Significance Rating (E+D+M)*P	-24	15	-21	18
Status (+, -, 0)	Positive			
Reversibility	Yes			
Irreplaceable loss of resources	No			
Can impacts be mitigated?	Yes			
Mitigation	<ol style="list-style-type: none"> 1. Strict control on access into the lime kiln area and the use of this area is required to reduce safety risks. 2. All signage for the TSWHS should be designed, and be placed in a low impact manner, so as to avoid any negative impacts on the visual landscape. 3. Architectural design for the restoration of the built landscape should incorporate detailed checks from a heritage architect. 			