

APPENDIX L: ASSESSMENT METHODOLOGY USED TO RANK LAYOUT ALTERNATIVES

Environmental significance was used to evaluate the importance of each environmental impact predicted for the various layout alternatives. This evaluation relies heavily on the values of the person making the judgement, and for this reason a workshop approach was used. A four-point impact significance scale was applied to the impacts (Table 2.1).

Table 1: Environmental significance rating scale

Significance rating	Description	Examples
Very High	These impacts would be considered by society as constituting a major and usually permanent change to the (natural and/or social) environment, and usually result in severe (extensive) or very severe (extensive) effects.	The loss of a species would be viewed by informed society as being of very high significance.
High	These impacts will usually result in long term effects on the social and/or natural environment. Impacts rated as high will need to be considered by society as constituting an important and usually long term change to the (natural and/or social) environment. Society would probably view these impacts in a serious light.	The loss of a diverse vegetation type, which is fairly common elsewhere, would have a significance rating of high over the long term, as the area could not be rehabilitated. The change to landform and access will impact the natural system, and on the affected parties living on or using that land.
Moderate	These impacts will usually result in medium- to long-term effects on the social and/or natural environment. Impacts rated as moderate will need to be considered by society as constituting a fairly important and usually medium-term change to the (natural and/or social) environment. These impacts are real but not substantial	The loss of a sparse, open vegetation type of low diversity or a small change to the visual quality of a landscape may be regarded as moderately significant.
Low	These impacts will usually result in short- to medium-term effects on the social and/or natural environment. Impacts rated as low will need to be considered by the public and/or the specialist as constituting a fairly unimportant and usually short-term change to the (natural and/or social) environment. These impacts are not substantial and are likely to have little real effect.	The temporary change in the landform during construction, provided such landform is rehabilitated.

Degree of Mitigation Difficulty

The degree of difficulty of mitigating the various identified impacts ranged from very difficult to easily achievable. The four categories used are listed and explained in Table 2.2 below. The technical and financial feasibility and the practicality of the measures and their potential effectiveness were taken into consideration in deciding on the appropriate degree of difficulty. It may be determined that mitigation is not possible, as the option itself could cause certain effects that could only be mitigated by not proceeding with the option. In these cases the mitigation was categorised as very difficult.

Table 2: Degree of mitigation difficulty rating scale

Degree of Difficulty	Description
Very difficult	The impact could be mitigated through an alternative technology or alignment, but it would be very difficult, very costly or technically challenging to ensure effective mitigation.
Difficult	The impact could be mitigated but it would be both technically difficult and costly to ensure effective mitigation.
Achievable	The impact can be effectively mitigated (technically feasible at acceptable cost).
Easily achievable	The impact can be easily and effectively mitigated.

Options Analysis Assessment Methodology

Option not viable – All options that have impacts of Very High significance after mitigation are fatally flawed. Options that have impacts of high significance after Very Difficult or Difficult mitigation are also considered to be “Not Viable” options for the project. This means that the option is probably technically not feasible and too costly. Only one impact needs to fall into these categories to result in the option being “not viable”.

Option possibly viable – Options with impacts of moderate or low significance are “possibly viable”, even if the mitigation is very difficult or difficult to achieve. In these cases the costs and technical challenges to mitigate could possibly be justified and the option could be taken forward to the EIA phase, depending on the number of impacts that fall into these categories. Options that result in moderately significant impacts after difficult mitigation are “possibly viable”, again depending on the number of impacts for the option that fall into this category. Options with residual impacts of high significance, but for which mitigation is “Easily Achievable” to “Achievable” are rated as “possibly viable”. This means that these options still represent a major risk to the project (in terms of cost or technical difficulty), and whether or not these options are taken forward depends on the number of impacts falling into these categories.

Option preferred - Impacts of Low to Moderate significance for which mitigation is Achievable to Easily Achievable are preferred. Impacts of low significance are also preferred, even if the mitigation is “Difficult” to achieve.

Table 3: Options analysis matrix derived from the pairing of the significance of the impact and the technical difficulty or cost of mitigation

Mitigation Potential	Post Mitigation Impact Significance			
	Low	Moderate	High	Very High
Very difficult	Option possibly viable	Option possibly viable	Option not viable	Option not viable
Difficult	Option preferred	Option possibly viable	Option not viable	Option not viable
Achievable	Option preferred	Option preferred	Option possibly viable	Option not viable
Easily achievable	Option preferred	Option preferred	Option possibly viable	Option not viable

The implications of the three categories within which options can potentially fall are explained below.

Table: Options categories defined

Risk	Description
Option not viable	Even after significant mitigation some impacts are likely to remain of very high or high significance. For some impacts it may be possible to reduce the significance, but there will still be some impacts of very high or high significance, meaning they prevent the option from being used (raised as red flags in this assessment).
Option possibly viable	These options might be viable for residual impacts of high significance and for which the mitigation is achievable or easily achievable, with a maximum of two impacts falling into the “high and achievable or easily achievable” category are permissible. Options that result in impacts of low or moderate significance are also possibly viable, even though the impacts could be difficult or very difficult to achieve. There must not be more than three impacts that are difficult or very difficult to mitigate for the option to be explored further.
Option preferred	These options are all viable as impacts are acceptable (low or moderate significance) and in most cases mitigation is “achievable or easily achievable”.