

To: Minister for Canterbury Earthquake Recovery



IN CONFIDENCE

Mitigation Measures for Horotane Valley and Bridle Path Road

Date	24 August 2012	Priority	MEDIUM
Report No	M/12-13/076	File Reference	

Action Sought

Hon Gerry Brownlee <i>Minister for Canterbury Earthquake Recovery</i>	Deadline	24 August 2012
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Contact for Telephone Discussion (if required)

Name	Position	Telephone	1st Contact
Diane Turner	General Manager – Strategy, Planning and Policy	Withheld under section 9(2)(a)	<input checked="" type="checkbox"/>
John WA Scott	Senior Advisor		

Minister's office comments

- Noted
- Seen
- Approved
- Needs change
- Withdrawn
- Not seen by Minister
- Overtaken by events
- Referred to

Comments

Discussed directly with officials.
Kelly 9/10/12

Appendix 1: Port Hills – Horotane – Factors to Consider and Information

Appendix 2: Horotane Timeline

Appendix 3: Port Hills – Bridle Path – Factors to Consider and Information

Appendix 4: Bridle Path Timeline

Mitigation Measures for Horotane Valley and Bridle Path Road

Purpose

- 1 This report presents information about possible mitigation measures for residential properties in Horotane Valley (6) and Bridle Path Road (31), which are currently zoned white. The decisions arising from this report will have implications for mitigation measures across Christchurch, including the ability of property owners to construct their own protective structures.

Discussion

- 2 There are a number of factors to consider when making decisions about the feasibility of mitigation works to contain rock falls in the Port Hills:
 - The overall effectiveness of mitigation measures
 - Alignment with the Christchurch City Council (the Council) processes so that any section 124 notices, issued due to the risk of rock fall, are lifted once any protective structures are in place
 - Support of the property owners in the affected areas
- 3 This paper discusses each of these factors, prior to addressing issues which are distinct to the areas in question and the wider implications of any policy decisions.

Factors to consider

Effectiveness of mitigation measures

- 4 Technical advice provided to the Canterbury Earthquake Recovery Authority (CERA) indicates that mitigation measures would be effective in reducing the risk to life of rock fall in both the Horotane Valley and Bridle Path Road. This would involve the construction of bunds on slopes with low gradients (<20 degrees) as well as mitigation in localised small rock outcrop areas and a limited number of rock fall fences (see Appendices 1 and 3). However, particular design standards will need to be developed and tested prior to consent being given for construction so as to ensure that these structures can sustain multiple and significant impact energies, potentially in a very localised areas.

Alignment with Council policy

- 5 The desirability of undertaking mitigation work is contingent on the Council lifting section 124 notices on all properties in the protection shadow of the mitigation structures. Discussions have been undertaken with the Council on this particular matter and they have indicated that they would look favourably at the removal of section 124 notices as part of the approval process to grant building consents for any mitigation works. The Council would take advice from its geotech advisers during the consent process. Based on information currently available to CERA, our view is that the Council is likely to grant building consents and remove section 124 notices issued due to rock fall risk in these areas, assuming that the works are carried out to specification.¹
- 6 The Council has also indicated that it would give preference to a solution which avoids issuing building consents for the works under section 72 of the Building Act 2004. This would mean that the properties would have coverage under the Earthquake Commission Act 1993 and there would be no impact associated with section 72 of the Building Act on the insurance position of these properties.
- 7 However, the Council has indicated that it is possible that restrictions might be placed on the construction of new buildings on these properties in the future, even though the Council has

¹ CERA, CCC and PHGG engineers are in agreement that the structures in question are likely to be effective.

indicated that it will likely lift the section 124 notices for those properties protected by the mitigation structures. Such a change, if it were to occur, might impact on the value of the properties in question and potential land use.

Agreement of property owners

- 8 The ease with which mitigation could be developed is heavily influenced by the level of support for these measures from the property owners upon whose land these structures might be built. A number of refusals from properties owners where the protection structures are situated would reduce the effectiveness of mitigation. Moreover, with respect to the Bridle Path Road properties, where a long single bund is proposed, lack of agreement by property owners could undermine the protective benefits of this structure or require the construction of a series of smaller structures.
- 9 At a recent CERA public meeting with property owners from these areas, informal indications of the views was provided by landowners. Several property owners from Horotane Valley approached officials to indicate their strong desire for mitigation. The position of property owners on Bridle Path Road appears evenly split. Some property owners indicated a strong desire to stay in their houses while another group would gladly accept being red zoned. A third group was ambivalent - their position would be largely determined by the time it would take to complete the works. We propose that CERA enters into more focused discussions with relevant property owners.
- 10 Agreement of a limited number of property owners might also be required to allow ongoing access to the mitigation structures for maintenance. In this regard, it has been indicated that the placement of easements for the mitigation structures on the property titles may not be supported by the Registrar-General of Land. Therefore, other solutions may need to be found, including the possible acquisition of parcels of land on which to situate the mitigation measures. We do not consider this an insurmountable issue.

White zone properties

Horotane Valley

- 11 Mitigation appears to be a technically viable option for Horotane Valley. There are a limited number of properties affected (six properties are currently zoned white), which would mean that any negotiations over access, in order to undertake survey and construction work, could be concluded relatively quickly. The situation is simplified further in that five of the six protective structures each only cover one property. It has been signalled that the majority of property owners will agree to the works. Regardless of this, the scheme would not be drastically affected if one or two owners refuse to participate.
- 12 It should be noted that the proposed bunds will provide protection to the residential buildings located on these properties, but not necessarily the whole land area (which is primarily used for horticulture). This could leave any persons operating outside of the protective shadow at some risk.
- 13 The Council's policy position to date, with respect to horticultural use, has been to not issue section 124 notices on glasshouses and there is no indication that this will change. This means that the land could continue to be used for horticultural purposes, regardless of where the bunds are placed.
- 14 The placement of the bund also has implications for the cost benefit analysis. The full capital value for the property was used in the cost-benefit analyses, even though the full value of the property is not protected. Accordingly, the benefit cost ratio of 2.5:1 may be overestimated. (There appears to be some damage to properties associated with the earthquake – officials are seeking to gather more information on this point. This would also suggest that the benefit cost ratio could be overstated).

- 15 Appendix 1 presents an overview of the key factors influencing the mitigation works. If a sufficient number of property owners agree quickly to these measures, construction could begin in summer of 2012/13. Appendix 2 indicates the key steps required to allow construction to commence.

Bridle Path Road

- 16 Mitigation also appears to be technically feasible for the properties on Bridle Path Road. However, the most significant risk to undertaking this work would be refusal from a number of property owners on which the mitigation measures would be situated. The acquisition of, or parts thereof, several properties might be required to allow access for maintenance. That would only be in the event that a legal solution could not be found.
- 17 Appendix 3 presents an overview of the key factors influencing the mitigation works and Appendix 4 indicates the key steps required, with a timeframe of construction beginning in the summer of 2013/14.

Wider implications

- 18 There are several issues outlined in this report which have implications more broadly. In this regard, it is important to note that the Council position relating to the removal of section 124 notices on properties protected by mitigation structures could have a precedent setting effect. Arguably, the same approach should apply to private mitigation measures. This would mean that property owners could apply for a building consent to construct their own rock fences and/or bunds, which if approved (and constructed in conformity to the design standard), would raise the expectation that the section 124 notice on the property would be lifted. Any inequitable treatment by the Council of requests for building consent, and the subsequent removal of section 124 notices, would inevitably be questioned.
- 19 The discussions around Horotane Valley raised the issue of public private benefit arising from mitigation works. In this case, the idea of sharing costs between commercial operators, the Crown and Council was not explored in great detail due to the fact that the mitigation measures proposed would only cover the residential properties. Accordingly, it was felt that there was no precedent setting effect. However, in situations involving a benefit to commercial operators, the issue of cost sharing would need to be looked at.
- 20 Prior to reaching any conclusions about mitigation, it is useful to establish a set of guiding principles to frame the decision-making process. One way forward would be for a threshold to be set covering the overall costs of these works. In this regard, any mitigation costs should not exceed the costs of red-zoning these properties, and there is an argument to suggest that the overall costs of mitigation to the Crown / Council should not exceed a figure significantly less (66%?) than the rating value of the properties that would be protected. This position is argued on the basis that there is an element of risk associated with mitigation – and assumes some of the risk associated with construction would be borne by the Crown / Council.

Next Steps

- 21 As you are aware, the criteria agreed by Cabinet for properties affected by rock roll, means that red zones have been declared where:
- Annual individual fatality risk associated with residential dwellings in the area is higher than 1 in 10,000 at 2016 risk levels as per the GNS modelling, subject to expert advice in very particular circumstances;² and
 - an engineering solution to mitigate the life risk is judged not to be desirable, as it would (amongst other factors):
 - be uncertain in terms of detailed design, its success and its possible commencement; and/or

² This is an exceptional circumstances clause and needs the agreement of both CERA and the Christchurch City Council.

- be disruptive for landowners as the commencement date is uncertain and the length of time they would need to be out of their homes to allow mitigation to occur; and/or
- not be timely: for example the work required would probably lead to social dislocation for those communities in the short-to-medium term; and/or
- not be cost effective, especially where the cost of mitigation is greater than the value of the properties; and
- the health and wellbeing of residents is at risk from remaining in the area for prolonged periods.

22 In order to be able to provide certainty, detailed investigations and design work is need. Prior to commencing this work, it is proposed that CERA:

- Enters into focused discussions with individual property owners as to their preferences with regards to mitigation³;
- Seeks specific information on the level of property damage in these areas (this is particularly important in Bridle Path where residents have argued that there is significant damage to several properties); and
- Prepares advice on a possible overall framework for mitigation that covers issues such as funding for capital and maintenance costs.

This could be completed in the next couple weeks in accordance with the timetable for the announcement of the decisions regarding the remaining white zone properties.

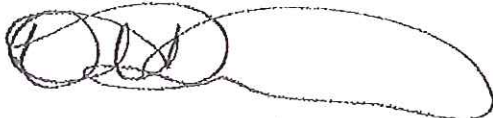
Consultation

23 CERA prepared this report. The Council was consulted on a draft of the paper.

Recommendations

24 It is recommended that you:

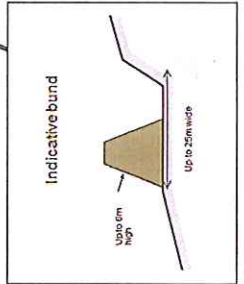
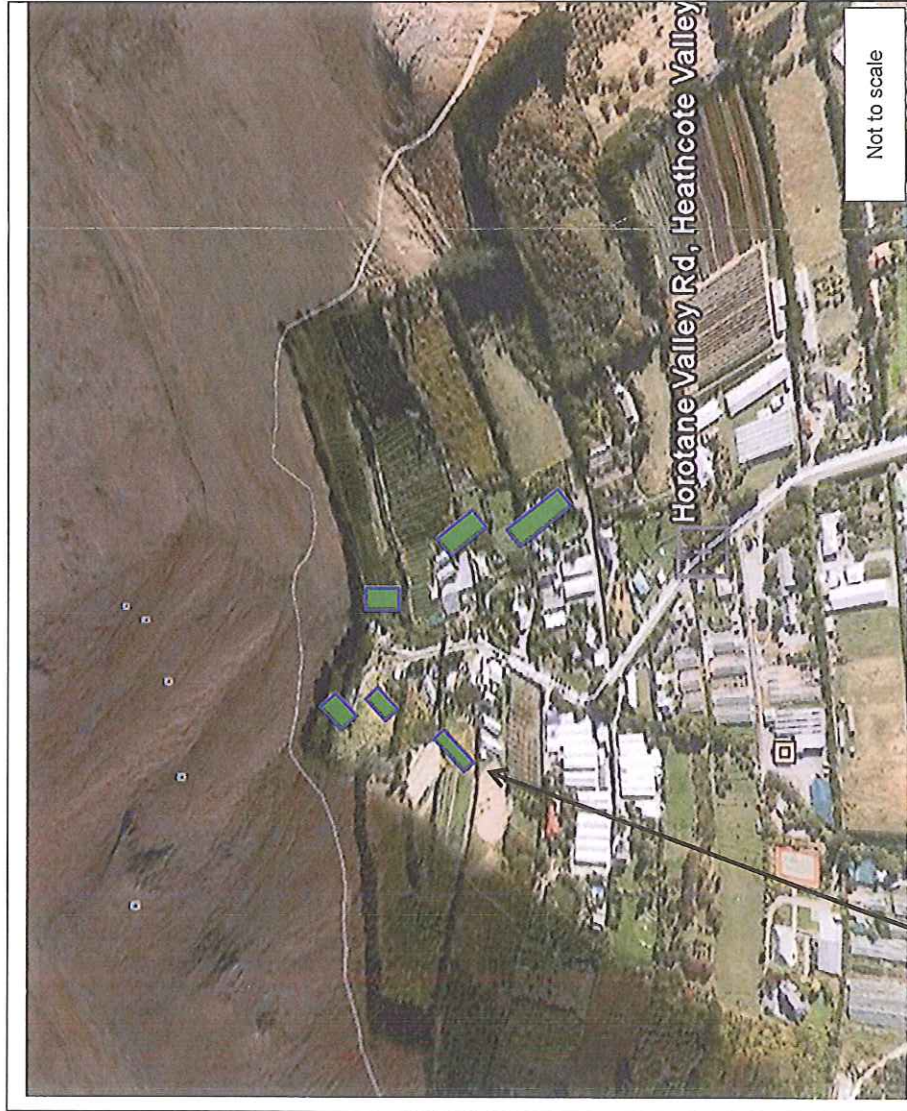
- 1 **Direct** officials to enter into more focused discussions with the property owners in Horotane Valley and on Bridle Path Road to ascertain the level of support for mitigation measures; **YES / NO**
- 2 **Direct** officials to seek specific information on the level of property damage in these areas; **YES / NO**
- 3 **Direct** officials to provide advice on a possible overall framework for mitigation; and **YES / NO**
- 4 **Discuss** options for further work prior to the announcement of any decision **YES / NO**



Diane Turner
General Manager, Strategy, Planning and Policy

NOTED / APPROVED / NOT APPROVED
<p>Hon Gerry Brownlee Minister for Canterbury Earthquake Recovery</p> <p>Date: / / 2012</p>

Port Hills – Horotane – Factors to Consider and Information



Indicative bund

Factors

- Negotiations with land owners for access and construction is likely to be significantly faster/easier than other areas, as the protection structures benefit the affected landowner
- Detailed design of the works - Estimated 4 months, assuming temporary access is provided for geotechnical investigations
- Obtain consents – Estimated 3 months
- Procurement process - Estimated 3 months
- Construction - Estimated 3-4 months (depending on available resources and plant)
- Earliest commencement for works would be most likely to be summer 2012/2013 (assuming no delays with access negotiations – much of the activities above could occur concurrently)
- Approximately half of the properties have section 124 notices meaning these residents are unable to occupy their homes
- These owners will have to be kept out of their homes until the works are complete unless temporary protection can be provided in the interim
- The land use of this area is predominantly horticultural. The economic effect of using this land without a residential house has not been investigated to date
- The viability of temporary protection has not been explored in detail at this point
- Some uncertainties around the effectiveness of the completed works can only be resolved through detailed design
- Repairs or rebuilding damaged properties could not begin until works were complete due to life safety risk

Cost and Programme Information

- Capital cost of protective works = \$1.9m, Present value = \$2.1m
 - 6 white zone properties in protection shadow
 - The costing assessments assumes a 6m high bund but it may be smaller
 - CBA = 2.5 : 1
- Other considerations*
- While this CBA is positive, there are indirect costs such as temporary accommodation or disruption costs taken into consideration which may reduce the overall benefits
 - The CBA is based on the full capital value of the property yet the protection only protects the buildings. To the extent property damage exists, this would also suggest the cost-benefit analysis is somewhat overstated.
 - Costings are indicative as they are based on outline design concepts, more investigation is required which may result in changes to these costs
 - Land use may be impacted with bund protection, however individual homes are protected and smaller bunds may allow access around the bund



1:2,500
20 10 0 20 40 m

PHGG: Mitigation Options - Horotane Valley

Prepared by:
Dale 224 04
7123, 622 2134
Site Level Emission Inventory
Project:
Site: 20120629
Control:
20120629

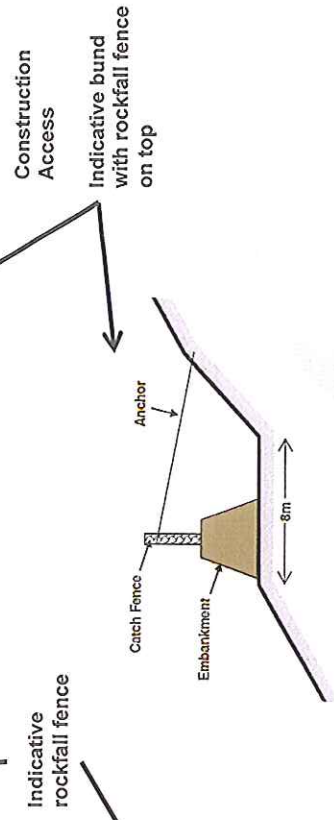


Appendix 2

Horotane Timeline	small number of properties, agree to access/easement, earthworks only											
	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May			
	Winter	Summer 12/13						Winter				
	1	2	3	4	5	6	7	8	9			
Legal/Policy												
Negotiate Access	6 properties											
CCC Finalise Design Standard												
Design												
Concept Design/Investigations												
Detailed Design												
Consents												
Resource Consent												
Building Consent												
Construction												
Tender/Select Single Contractor												
Construction												
Occupy Houses												



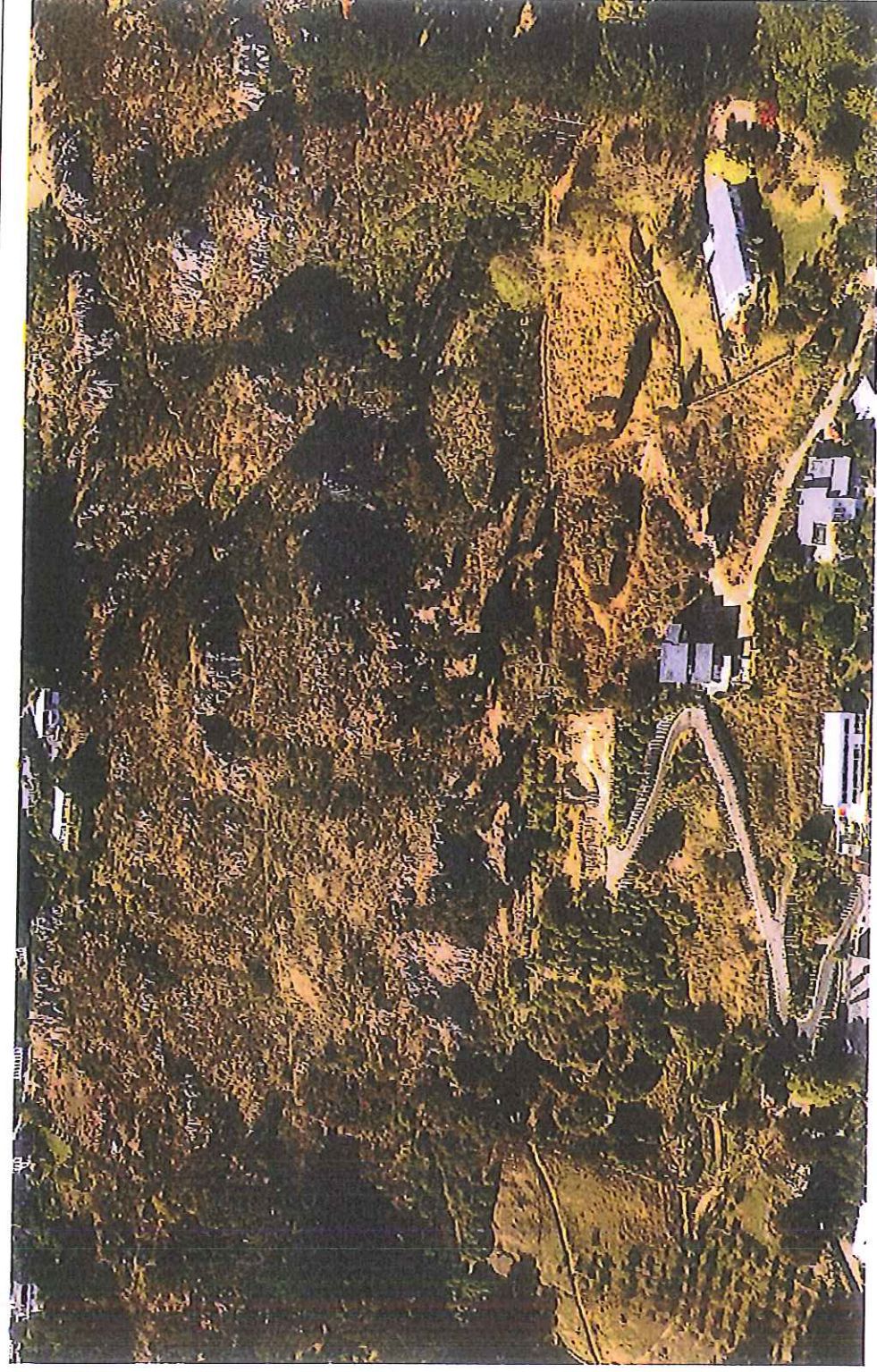
Port Hills – Bridle Path Road - Factors to Consider and Information



- Factors**
- Negotiations with land owners for access and construction - Estimated up to 6-9 months
 - Detailed design of the works - Estimated 4 months, assuming temporary access is provided for geotechnical investigations
 - Obtain consents - Estimated 3 months
 - Procurement process - Estimated 3 months
 - Construction - Estimated 6 months (depending on availability of resources and plant)
 - This type of structure needs to be constructed in the summer months
 - Earliest commencement for works would most likely be summer 2013/2014 (assuming some overlap of above timeframes)
 - Most houses currently have section 124 notices meaning these residents are unable to occupy their homes
 - These owners will have to be kept out of their homes until the works are complete unless temporary protection can be provided in the interim
 - Subject to detailed design, as there are uncertainties around the effectiveness of the completed works that need to be resolved
 - Repairs or rebuilding damaged properties could not begin until works were complete due to life safety risk.
 - Rockfall fence proposed further to the north where the land is steeper
 - Localised scaling, blasing and mesh protection likely to be beneficial in some areas including the old quarry
 - Sterilisation of land above the protection not considered significant

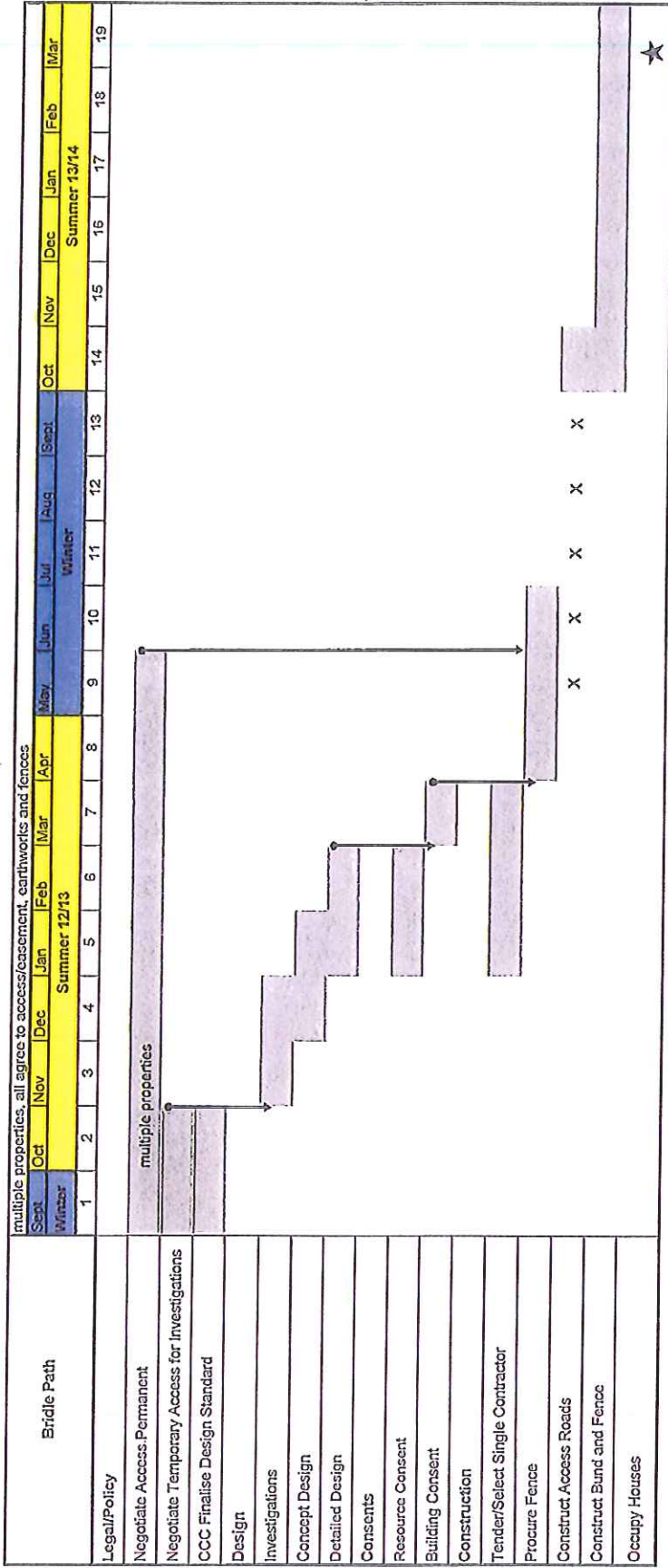
- Cost and Programme Information**
- Capital cost of protection work = \$5.3m, Present Value = \$6.2m
 - 31 white zone properties in protection shadow
 - 5 red zone properties also get benefit from the protection shadow.
 - CBA = 2.2 :1 (assuming bund, rockfall fence and source protection); not counting any benefit associated with properties that are already zoned red
 - It appears some properties have suffered significant damage; this needs investigation
 - Protection includes 180m of fencing and 350m of bund plus localised but significant source protection
 - There are indirect costs such as temporary accommodation or disruption costs taken into consideration which may reduce the overall benefits
 - Costings and timings are indicative as they are based on outline design concepts, more investigation is required, which may result in changes to these costs

PTO - Refer oblique aerial photo over page of Bridle Path and Old Quarry



Appendix 3, page 2

Appendix 4



All costs are at risk until final access is negotiated with all owners