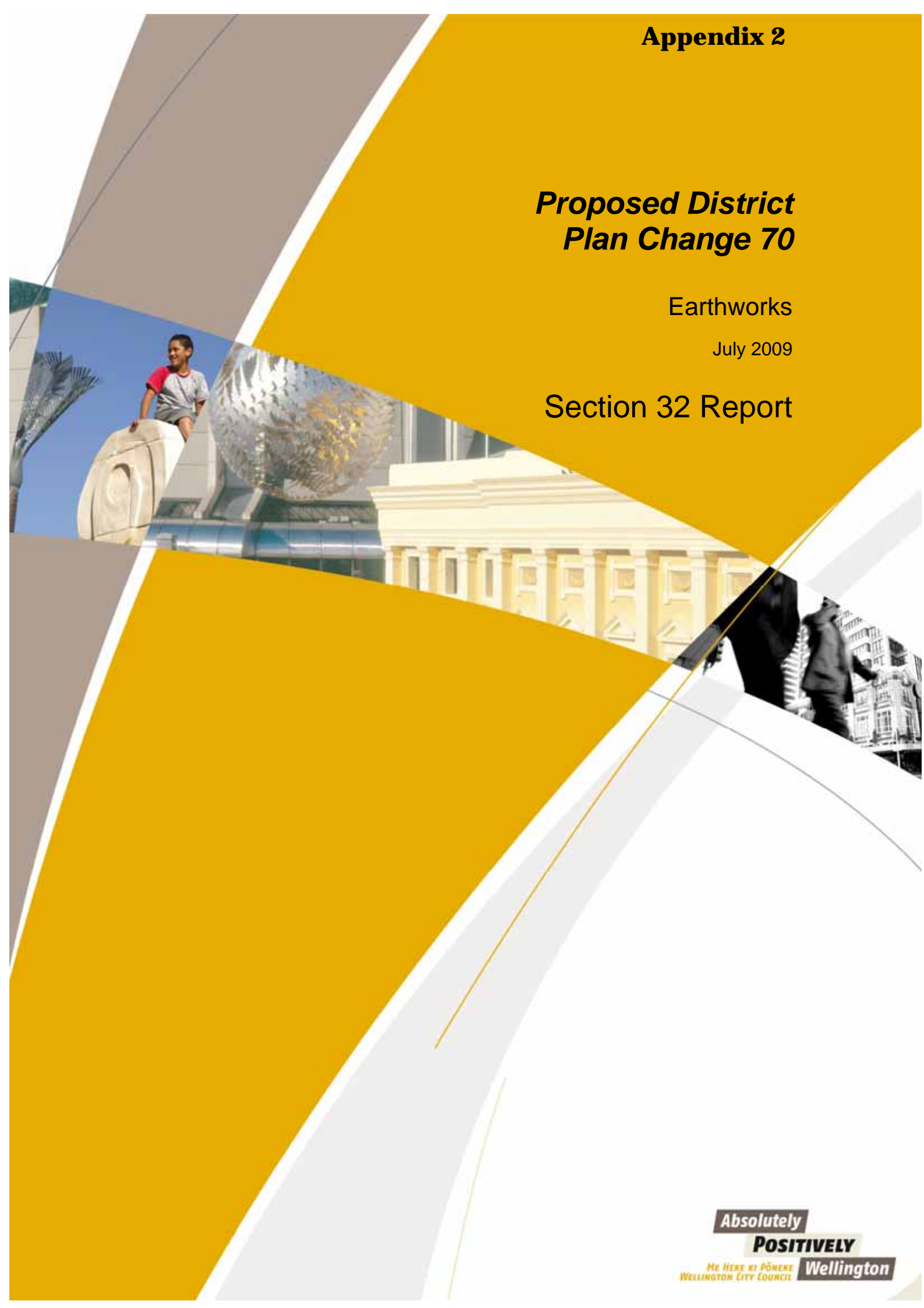


***Proposed District
Plan Change 70***

Earthworks

July 2009

Section 32 Report



SECTION 32 REPORT

PROPOSED DISTRICT PLAN CHANGE 70 EARTHWORKS

1 Introduction

Before a proposed District Plan change is publicly notified the Council is required under section 32 of the Resource Management Act 1991 (the Act) to carry out an evaluation of the proposed change and prepare a report. As prescribed in section 32 of the Act:

An evaluation must examine:

- (a) the extent to which each objective is the most appropriate way to achieve the purpose of the Act; and*
- (b) whether, having regard to their efficiency and effectiveness, the policies, rules, or other methods are the most appropriate for achieving the objectives.*

An evaluation must also take into account:

- (a) the benefits and costs of policies, rules, or other methods; and*
- (b) the risk of acting or not acting if there is uncertain or insufficient information about the subject matter of the policies, rules or other methods.*

Benefits and costs are defined as including benefits and costs of any kind, whether monetary or non-monetary.

A report must be prepared summarising the evaluation and giving reasons for the evaluation. The report must be available for public inspection at the time the proposed change is publicly notified.

2 Background

It is widely recognised that modification of the landscape by cut and fill earthworks can have a profound affect on slope stability.

In technical terms, adding material to the toe of a slope and or removing material from the head of a slope, will usually increase stability by reducing shear stresses and thereby diminishing the likelihood of slips. The addition of material near the head of a slope may lead to instability of the slope as a

whole, as well as of the fill itself. This action of surcharging, has an effect similar to removing material from the toe of a slope – in both cases, the shear stresses within the slope are increased. Engineering assessment is always required to determine safe slope modifications. (Guidelines for assessing planning policy and consent requirements for landslide-prone land, GNS Science 2007)

2.1 Geology of Wellington

The way in which earthworks affect an area is influenced by a number of factors, such as the way in which they are retained or left to weather and the existing ground conditions and the slope of the ground both before and after the earthworks. A major influence on the way in which earthworks affect the environment and will perform over time is the underlying geology of an area. Within the Wellington Region the presence of surface colluvium is not uncommon. Colluvium is particularly susceptible to failure when it is cut or when fill material is placed onto it, particularly on steeper land (greater than 28 degrees). Such failures can result in large uphill sections of colluvium slipping, particularly where a cut removes part of, or all of the toe of a section of colluvium.

The locations where colluvium occurs are not defined and may not be known without undertaking substantial subsurface investigations. Investigations to determine if colluvium is present on a site would be costly and beyond what would be reasonably expected to determine whether or not an activity was permitted. Hence, it would not be practicable to identify riskier areas from others and it is not possible to have rules structured to respond to known anticipated risks. A generic approach is, therefore, required.

2.2 Existing or past Council processes

There have been several instruments and Council processes that have controlled or have an influence over the control of earthworks. The operative District Plan contains provisions relating to earthworks, but their main function has been to address the visual effects of earthworks, with some controls on sediment control and flood hazard areas. Aside from Plan Change 65, Council's ability to consider stability is primarily contained in the Building Act and associated codes and, up until 2008, an Earthworks Bylaw. Each is described below.

Building Act and Building Codes

The New Zealand Building Act (and associated Building Regulations) requires that all buildings (the definition of buildings is broad and covers the majority of structures including dams) satisfy the requirements of the Building Code. Building work covers siteworks which are defined as work on a building site, including earthworks, preparatory to, or associated with, the construction, alteration, demolition, or removal of a building. Any earthworks (cut or fill) carried out in conjunction with the construction or alteration of a building are, therefore, covered by the requirements of the Building Act and the Building Code.

Some structures and site works are exempt from requiring a building consent, but, as noted above, must still satisfy the Building Code. Such structures include retaining walls of less than 1.5 m in height and which carry no surcharge loading. Surcharge loading on a wall is any loading on the wall that is in addition to the loading resulting from the soil immediately behind but not extending above the top of the wall. Surcharge loading is a concept well understood by engineers engaged in retaining wall design but may have little meaning to the lay person.

Fills for residential subdivisions (developments) are covered by the Building Code. The specified verification method for residential fills is New Zealand Standard, NZS 4431:1981. Other than this standard, the Building Code, currently contains no specific requirements covering stability of siteworks. Compliance is, therefore, typically verified from first principles and good engineering practice.

If a building consent is applied for then the Council Consents and Licensing engineers will evaluate whether or not geotechnical engineering input is required to validate the submission. Geotechnical data of appropriate detail (from simple tests to a full geotechnical report) will generally be required for all but minor buildings or where the founding provisions of NZS 3604:1999 are not met. A consent will be issued if the Council believes on reasonable grounds that the works will comply with the Building Code.

Unless mitigation or restoration measures are in place, under the Building Act WCC must refuse to grant a building consent for construction or major alteration of any building if the land on which the building is to be or is located is subject to or likely to be subject to natural hazards including erosion, falling debris (rock), inundation, subsidence and slippage, or the building work is likely to accelerate, worsen or result in a natural hazard on that land or any other property. This is very similar to the requirements under Section 106 of the RMA.

Once building works (including siteworks) have been completed, the Council will issue a Code Compliance Certificate if it is satisfied on reasonable grounds that the building work complies with the terms of the building consent.

In summary, any instability of land and earthworks cuts or fills that are associated with buildings, at any time during the construction of or life of the building or known prior to construction is intended to be covered by the provisions of the Building Act.

Earthworks Bylaw

An Earthworks Bylaw was enacted in 1991 prior to the current Building Act and the Resource Management Act. It was brought about in order to address a perceived shortcoming in the then District Scheme.

The Earthworks Bylaw essentially required consent to be obtained for any earthworks entailing more than:

- 600 mm cut or fill; or

- 10 m³ of excavation.

Under this Bylaw consent was required irrespective of whether relevant RMA or Building Act consent had been obtained, although typically resource consent would be obtained prior to obtaining Bylaw consent. Normally where a Bylaw consent was needed a building consent was also needed. In contrast, resource consent was not normally required for many of those works. Bylaw consents were administered by the Council's engineering staff in the Consents and Licensing area and it is understood that many applicants for building consents were unaware that an earthworks bylaw consent from a separate regulation process was also required.

The Local Government Act 2002 requires that Bylaws brought about before it came into being be reviewed by 2007. That review is to determine whether the Council wishes to lapse or continue with the Bylaw. In 2005 the Strategy and Policy Committee decided to lapse the Bylaw in favour of its relevant provisions being incorporated in the Wellington City District Plan by means of a district plan change (Plan Change 65). This was because the Bylaw did not offer effective enforcement and there was substantial duplication between it and the resource and building consents applications.

Plan Change 65 was notified in July 2008 at the same time the Earthworks Bylaw expired. The Plan Change reviewed all existing earthworks rules in the District Plan. In addition to engineering stability, the main issues addressed were erosion, dust and sediment control; earthworks affecting streams and wetlands; the transport of material between properties; the visual appearance of earthworks generally, and their appearance in suburban coastal areas and earthworks in flood hazard areas.

Once publicly notified, the submissions on Plan Change 65 and the administration of the Plan Change raised a number of concerns. These included; the complexity of the rules; the low thresholds for activities (which appeared to catch many activities that had not been intended to be regulated). While the threshold values in Plan Change 65 were not necessarily any more onerous than those contained within the Earthworks Bylaw, there was now the need to apply for a resource consent which was costly, often required detailed engineering advice and design and / or a geotechnical report and could invoke other issues beyond the consideration of earthworks which initiated it.

2.3 Consultation

The earthworks review has the potential to affect large sectors of the community. This was recognised in the planner's report to the Strategy and Policy Committee in February 2007. Draft objectives, policies and rules were presented to the Committee, which voted to use them as the basis for consultation.

Letters were sent to a wide range of professional, industry, environmental and interest groups. Letters were also sent to residential owners of suburban coastal properties.

Appendix Four of the main report (to Strategy and Policy Committee - 13 March 2008) details all the groups and individuals who were consulted.

Plan Change 65 was publicly notified in July 2008 and 26 submissions on this Plan Change (along with a number of submissions on the associated variations) were received. All these submissions were given due consideration in the development of the rules proposed in Plan Change 70.

2.4 Key Documents

The primary documents relevant to the review of the Earthworks Provisions were:

Review of the Wellington Consolidated Bylaw 1991 Part 8 – Earthworks, Report to the Strategy and Policy Committee, 16 February 2005.

Draft District Plan Change – Earthworks Provisions, Report to the Strategy and Policy Committee, 15 February 2007.

A guide for assessing effects of urbanisation on flow-related stream habitat, NIWA Science & Technology Series No. 52, Sandy Elliot, Ian Jowett, Alistair Suren, Jody Richardson, 2004.

Erosion and sediment control for small sites, Greater Wellington Regional Council, 2006.

Erosion and sediment control guidelines for the Wellington Region, Greater Wellington Regional Council, 2003.

Guidelines for assessing planning, policy and consent requirements for landslide-prone land, GNS Science Miscellaneous Series 7, W. Saunders and P. Glassey (Compilers), 2007.

Managing Earthworks under the Resource Management Act, Quality Planning website.

Earthworks and Stability Provisions (Final Report), Prepared for Wellington City Council, Beca Carter Hollings & Ferner, April 2009.

Technical notes and sketches for the plan change from Tonkin and Taylor, Environmental and Engineering Consultants.

3 Evaluations

3.1 Resource Management Issues

Earthworks are an important activity that facilitates the community’s use of natural and physical resources. The following issues were identified in the course of preparing the proposed plan change:

Earthworks and the economy
<ul style="list-style-type: none"> ▪ Earthworks are an essential part of building and development ▪ Earthworks enable development of roads and accessways at driveable gradients ▪ Mass earthworks for greenfield subdivisions makes land more usable ▪ Domestic scale earthworks make properties more usable providing amongst other things useable outdoor amenity space ▪ Levelling ground is cost effective in comparison to building on slopes ▪ Earthworks provide for recreation e.g. sports fields, tracks, gardens ▪ Earthworks are essential to lay and maintain underground services ▪ Earthworks are necessary to the construction and operation of landfills, reservoirs and cemeteries
Earthworks stability
<ul style="list-style-type: none"> ▪ Economic pressure / property value has made development of steeper and more difficult infill sites feasible ▪ Earthworks need to be engineered to be stable or retained by structures ▪ Landslips more likely due increasing frequency of extreme weather events associated with climate change ▪ Public concern following some high profile landslips albeit these occurred some time ago. ▪ Engineering design may not be to a standard that provides sufficient safety during large earthquakes and extreme weather events ▪ Lack of detailed mapping of riskier sites, particularly those affected by colluvium – time and cost required to map
Erosion, dust and sediment control
<ul style="list-style-type: none"> ▪ Dust can be a major nuisance to neighbours ▪ Settled dust can become sediment ▪ Sediment runoff onto footpaths and the road ▪ Sediment runoff into channels, sumps and the stormwater system ▪ Sediment runoff into streams and the sea, affecting water quality and aquatic life ▪ Many small earthworks sites can cumulatively result in large amounts of sedimentation. ▪ Erosion, water quality and aquatic ecology are regional council functions. However, this Council has considerable ability to control because it directly regulates development sites. ▪ ‘Soft engineering’ alternatives are not well developed for Wellington’s steep terrain
Protecting streams and wetlands
<ul style="list-style-type: none"> ▪ Loss of streams detracts from the landscape and peoples’ enjoyment of the environment ▪ Piping or modification of streams affects aquatic ecology ▪ Work in streams is a regional council function, but current regional rules don’t protect urban streams (in this manner) ▪ Subdivisions and other developments along streams often determine whether stream are piped or modified

<ul style="list-style-type: none"> ▪ Hard surfaces associated with development increase the volume and speed of water (flow), causing bank erosion (sediment) and changes to the stream channel and the need for flood control structures, affecting aquatic ecology ▪ Changes to the shape and flow of streams affect peoples' enjoyment
<p>Flooding hazard</p>
<ul style="list-style-type: none"> ▪ Earthworks in floodplains can add to flooding hazards ▪ Hard surfaces associated with development increase the volume and speed of water, causing flooding
<p>Visual amenity</p>
<ul style="list-style-type: none"> ▪ Earthworks change the contours of the natural ground – on a large scale they can change landforms and peoples' experience of the landscape ▪ Earthworks can leave long terms 'scars' on the land ▪ Earthwork on single properties can be unattractive for neighbours or from the street ▪ Earthworks are often associated with achieving drive-on access to older properties ▪ Earthworks often have associated structures to stabilise or retain them ▪ The visual impact of these associated structures is often as bad as untreated earthworks ▪ New buildings and structures often hide the worst of the earthworks and structures ▪ Slopes susceptible to slip are often stabilised with sprayed concrete, which is ugly ▪ City Council earthworks and retaining structures on roads are highly visible ▪ Landscape planting can be ineffective in mitigating the adverse effects of earthworks
<p>Coastal environment</p>
<ul style="list-style-type: none"> ▪ Wellington has a very attractive coastal environment within the suburban part of the City ▪ Steep coastal escarpments contribute significantly to its character ▪ A number of houses have been constructed on escarpments in the last few years changing peoples' experience of the coastal roads ▪ Earthworks for access roads has also occurred on the escarpments ▪ Cutting back the escarpment for building can detract from visual amenity ▪ Earthworks for encroachment garages can detract from visual amenity ▪ Mitigation through landscape planting is difficult due to wind and salt spray ▪ Weathered rock and weathered concrete are significant parts of the existing character
<p>Transport of material</p>
<ul style="list-style-type: none"> ▪ Transport of material can affect pedestrian, cycle and vehicle safety, and cause congestion ▪ Transport of material can affect neighbours amenity through noise, dust and dropped material
<p>Archaeological sites</p>
<ul style="list-style-type: none"> ▪ Earthworks destroy archaeological material and information ▪ Earthworks can destroy historic patterns of land use ▪ Archaeological sites protected by Historic Places Act 1993 is not always effective as land owner may not know or understand significance of the archaeological site ▪ Iwi Authority concerns about destruction of human remains and cultural material – want to be consulted on projects and advised of discoveries ▪ Archaeological site policy is contained in the District Plan but no sites are identified as such ▪ All of Central Area and much of the inner suburbs are archaeological sites ▪ Significant financial implications if projects stopped to excavate archaeology

Efficiency and effectiveness of regulation, enforcement
<ul style="list-style-type: none"> ▪ Decision to reduce the number of consents required for earthworks ▪ Greater ability to enforce complex issues under RMA ▪ Greater complexity and cost for applicants ▪ Potential time delays for applicants ▪ Coordination with building consent approvals ▪ Greater resources needed to approve and monitor new resource consents ▪ Minimising overlap with rules in the Regional Council's plans

The identification of issues is an important part of the process of developing plan provisions because objectives, policies and means of implementation all flow from the issues chosen. Not all the issues identified can be addressed by the District Plan process and some issues may be the primary responsibility of different legislation or other agencies.

3.2 The appropriateness of objectives

Section 32 of the Act requires the appropriateness of each objective in achieving the purpose of the Act to be examined. This section of the report outlines a summary of the evaluation for a proposed, single new objective, for earthworks, against both the purpose of the Act, and matters that are relevant to this purpose.

An evaluation of objectives under section 32 must examine:

- (3) (a) *the extent to which each objective is the most appropriate way to achieve the purpose of this Act,*

The purpose of the act:

- 5 (1) *The purpose of the Act is to promote the sustainable management of natural and physical resources.*

- (2) *In this Act, "sustainable management" means managing the use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic, and cultural wellbeing and for their health and safety while –*

- (a) *Sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and*

- (b) *Safeguarding the life-supporting capacity of air, water, soil, and ecosystems; and*

- (c) *Avoiding, remedying, or mitigating any adverse effects of activities on the environment.*

The evaluation considers the objective in terms of different elements that make up the purpose of the Act.

In assessing the extent to which the objective is the most appropriate way to achieve the purpose of the Act, it is necessary to look at the proposed policies and methods that will implement the objective. The analysis of those provisions should ideally reveal that the cost of pursuing the objective do not significantly outweigh the benefits.

3.3 The new objective

New policies and rules have been developed to address the environmental issues caused by earthworks. The new earthworks provisions have been organised into a single stand-alone chapter, which has created the need for an objective to focus and organise the policies, rules and methods.

Under the existing district plan (the Operative District Plan) the earthworks policies, rules and other methods are located under the Area based chapters. The policies sit under objectives concerned with a range of issues e.g. amenity values, the natural environment, flooding hazard and ridgelines and hilltops. There are no specific objectives that directly address the issue of earthworks itself.

The proposed objective is:

19A.2.1 To provide for the use development and protection of land and physical resources while avoiding, remedying or mitigating any adverse effects of earthworks and associated structures on the environment.

The new objective responds in part to all of the ‘qualities and values’ and most of the ‘specific issues’ identified in Chapter One of the District Plan (1.6.1 and 1.6.2):

- | | |
|----|--|
| Q1 | Efficient City |
| Q2 | Amenity |
| Q3 | Healthy/Safe City |
| Q4 | Accessible City |
| Q5 | Natural Environment |
| S2 | Managing Rural Areas, the Coastal Environment, and Waterbodies |
| S3 | Protecting Open Space |
| S4 | Maintaining the Quality of Living Environments |
| S6 | Maintaining and Enhancing the Quality of the Built Environment |
| S7 | Maintaining and Enhancing the Quality of the Natural Environment |
| S8 | Reducing Risk |

This indicates the objective is achieving the purpose of the Act.

In terms of section 5, the following table considers the objective in terms of the different elements that make up the Act.

Elements that make up the purpose of the Act	Examination of objective in meeting the Act's purpose
Enabling – social wellbeing	New earthworks contribute to people's social, economic and cultural wellbeing as part of the processes of building and development. These provide places to work, shop, live, recreate and worship. Earthworks are integral to constructing and maintaining roads, railways, airports and ports, which allow people to move around in their environment.
Enabling – economic wellbeing	
Enabling – cultural wellbeing	
Enabling – health and safety	<p>Ensuring that earthworks are properly engineered for stability provides for people's safety. Flood control work and considering the adverse effect of earthworks in floodplains also provide for people's safety.</p> <p>Earthworks are also relevant to the issues of hazardous substances and contaminated sites and they help to protect people's health and safety by containing spills and sealing off contaminated ground.</p> <p>Dust from earthworks can affect people's health and the transporting earth / material can affect people's safety</p>
Sustaining the potential of natural and physical resources	Earthworks can affect the stability of land, removing its potential for building, development and use; and its potential for protection e.g. for its amenity, recreational and ecological values.

Safeguarding life-supporting capacity	<p>Earthworks can affect the life supporting capacity of soil through compaction, mixing and erosion.</p> <p>Earthworks can affect the life supporting capacity of water through sediment runoff to streams, wetlands and the sea; and by adverse effects on aquatic ecosystems.</p> <p>Earthworks play a part in the complex physical and biological cycles that contribute CO₂ and other gases to the atmosphere, which are responsible for global warming.</p>
Avoiding, remedying, or mitigating any adverse effects on the environment	<p>In addition to the adverse effects in other categories above:</p> <p>Earthwork can have an adverse effect on:</p> <ul style="list-style-type: none"> - the character and visual amenity of landscapes, suburbs and the coastal environment - the character and visual amenity of streams and wetlands.

This objective is consistent with the purpose of the Act. It enables people to provide for their, *social wellbeing, economic wellbeing, cultural wellbeing, and for their health and safety* (5(1)). The objective is also satisfies sections 5(2)a, 5(2)b, and 5(2)c) as it provides a mandate for the policies and methods that; sustain the potential of resources, safeguard life-supporting capacity and avoid, remedy and mitigate adverse effects.

The objective is also considered to be the most **appropriate** for achieving the purpose of the Act. This conclusion is made on the basis of the second part of the evaluation of section 32 (3) (b):

whether, having regard to their efficiency and effectiveness, the policies, rules, or methods are the most appropriate for achieving the objectives.

This analysis is provided in the next section of the report.

4. Efficiency/effectiveness of polices, rules or other methods

4.1 The case for regulation - Efficiency and effectiveness

People do not need policy guidance or rules to *provide for earthworks for the use, development or protection of land*. It is the part of the objective, concerned with controlling the adverse effects of earthworks, that creates the needs for policies, rules and other methods. The rules can be said to be efficient and effective if the rules allow people to undertake minor earthworks,

where the risk of instability is low and the negative (adverse) effects of earthworks on the wider environment are minor. Rules should only be used to the extent that it is necessary to control any adverse effects.

The negative effects of earthworks can be from natural causes for example, geological processes, earthquakes and extreme weather. Little can be done about these except to factor them into the engineering design of earthworks as appropriate. However, there are potential adverse effects from earthwork activity, which are directly attributable to human behaviours.

Regulation is generally accepted to be an appropriate means of discouraging negative behaviour in the community (unless a strong incentive to positive behaviour can be provided). Adverse effects of earthworks can result from behaviour that seeks to:

- simplify and minimise the cost of earthworks (by not providing and implementing appropriate stability measures);
- modify natural landscapes in inappropriate ways; or
- seek to develop very steep sites in ways that are out of character with the surrounding area.

Therefore, it is appropriate to use regulation to ensure that earthworks are well designed and engineered to appropriately minimise instability risk and to ensure the other policies of the plan change e.g. erosion, dust and sediment control, visually amenity are implemented.

The proposed plan change seeks to *manage* risk to an acceptable level; it is not one of completely avoiding or even minimising risk. Minimising risk will necessarily entail introduction of limits to earthworks so as to require regulation of most forms of earthwork or development involving earthworks. This is the approach that was put forward in Plan Change 65 which has proven to be inefficient. This plan change proposes new rules and limits that allow some smaller scale earthworks activity to occur and permits larger cuts / fill (of a scale currently allowed by the Operative Plan) but only if they are retained by a structure authorised by a building consent. This approach means that the implied risk is greater than achieved with the provisions of Plan Change 65, and the Earthworks Bylaw. However, the risk is less than is achieved by the provisions of the operative plan.

It is important to recognise that a technical assessment of the acceptability of that risk or quantification of the risk resulting from the application of the provisions of Plan Change 70 has not occurred. The thresholds proposed in the plan change are based on judgement of the level of risk that the community is prepared to accept. This recognises the submissions made in respect of Plan Change 65, and is based on an understanding of the Building Act (and code), an assessment of the use of the earthworks bylaw, discussions with officers and by reference to technical work undertaken in respect of Plan Change 65. It is noted that a retaining structure over 1.5 metre in height needs a building consent under the Building Act. Also, in general, the community was unaware of the Earthworks Bylaw and its consenting requirements and finally, the number of slope failures that are reported to

Council is low. This approach means that other methods are needed to complement regulation. The Council can use advocacy, information and education to inform and explain Councils policies (for earthworks) to the public and applicants. It is considered that information programmes to outline “best practice” in earthworks and retaining wall construction is an important part of this approach.

Overall, the proposed approach provides a pragmatic approach to managing risk associated with earthworks. Generally earthworks that require a building consent are permitted, but cuts and fills that do not, but which could cause higher than acceptable risk of instability, would require a resource consent.

5. Options for managing Earthworks throughout the City

In considering whether having regard to their efficiency and effectiveness, the revised earthworks policies and rules are the most appropriate for achieving the earthworks objective the following options were evaluated:

Option 1: Do Nothing /Fragmented control

Option 2: Complete District Plan Control (Plan Change 65)

Option 3: Integrated District Plan and Building Act Control

5.2 Option 1 – Do Nothing: Fragmented Control (Operative District Plan and Building Consent)

5.2.1 Explanation

This option would entail using the operative plan and not incorporating or proceeding with Plan Change 65.

The Operative District Plan provides for cuts up to 2.5m (subject to conditions) and 1.5m in some sensitive areas. Consideration of matters when this limit is exceeded is limited to visual effects and does not include consideration of earthworks stability. The Operative District Plan does not address all the matters that have been identified as being issues related to earthworks (section 3 of this report), notably stability.

Three new issues that have been identified (which would have policies and rules under the Proposed Plan Change) have no counterpart in the existing earthworks rules and could not be addressed in the existing provisions for earthworks. They are the issues of earthworks and structures associated with streams and wetlands, the new rules for earthworks in the suburban coastal environment and the transport of material.

Common Law

Common law obliges people to not cause nuisance, this includes stopping their land from falling on to other property and not undermining adjacent

properties i.e. supporting adjacent properties. However, this approach is a reactive one, which can only be applied once the earthworks are known about or undertaken, or after the earthworks have collapsed.

The City owns large amounts of property and infrastructure, including the road network, that it doesn't want threatened by poor earthworks. In addition there is a community expectation that the Council will regulate earthworks. The Council is the first port of call if a neighbour's property threatens their own and there would be considerable pressure on officers and councillors to 'do something'.

Section 17 RMA

Section 17 of the RMA provides a duty for every person to avoid, remedy or mitigate any adverse effect on the environment arising from an activity, whether or not the activity is in accordance with a rule in the plan, a resource consent or a designation. Enforcement can occur requiring the activity and/or remedial action but only if the activity is likely to, or has caused adverse effects.

This option is also reactive, and the legal and engineering solutions are likely to be very expensive. The only real difference between this option and using common law is that it would allow the Council to meet some of the community's expectations about the role it should be playing. The costs of enforcement could prove to be greater than those of regulation.

Building Consent Process

The Building Act 1991 and the Building Code do not directly control earthworks. However the Building Code is able to consider "siteworks", which includes "work on a building site including earthworks, preparatory to or associated with the construction, alteration, demolition or removal of a building".

The first schedule of Building Regulations 1992 states, the following:

Objective B1.1 of the Building Code states:

The objective of this provision is to:

- (a) Safeguard people from injury caused by structural failure;
- (b) Safeguard people from loss of amenity caused by structural behaviour;
- and
- (c) Protect other property from physical damage caused by structural failure.

Functional Requirement

B1.2 *Buildings shall withstand the combination of loads that they are likely to experience during construction or alteration and throughout their lives.*

Performance

B1.3.1 *Buildings, building elements and sitework shall have a low probability of rupturing, becoming unstable, losing equilibrium or collapsing during construction or alteration and throughout their lives.*

B1.3.2 *Buildings, building elements and sitework shall have a low probability of causing loss of amenity through undue deformation, vibratory response,*

- degradation, or other physical characteristics throughout their lives or during construction or alteration when the building is in use.*
- B1.3.3 Account shall be taken of all physical condition likely to affect the stability of buildings, building elements and sitework including:*
- (a) self weight;*
 - (b) imposed gravity loads arising from use;*
 - (c) ...*
 - (d) Earth pressure*
 - (e) ...*
 - (f) Earthquake*
 - (g)....*
 - (r) removal of support.*
-
- B1.3.6 Sitework, where necessary shall be carried out to:*
- (a) provide stability for construction on the site; and*
 - (b) (b) avoid the likelihood of damage to other property.*
- B1.3.7 Any sitework and associated supports shall take account of the effects of:*
- (a) ...*
 - (c) ground loss and slumping.*

Therefore, as outlined above (and explained in full in section 2.2) while the building code does not directly control the stability of earthworks *per se*, there are provisions for ensuring that earthworks that form part of siteworks are undertaken in a way that appropriately protects buildings, the site and the adjoining property. However, these provisions can only be used where a building consent has been issued or applied for in relation to building work.

Under these provisions the Building Control team regularly ask for geotechnical assessments of sites if there are concerns over the stability of the site, concerns about the stability of siteworks to be undertaken or the stability of proposed retaining structures to retain proposed siteworks.

5.2.2 The key benefits and costs of Option 2

Benefits:

- No District Plan administration/compliance costs
- Issue of stability (where it relates to a building consent process) addressed under one piece of legislation and therefore only requiring one consent.

Costs:

- District Plan assessment of earthworks that do not comply with the permitted activity standards is limited to visual amenity and does not include any assessment of stability.
- Issue of stability not addressed where earthworks are done and no structure is proposed.
- High costs to individual property owners (and occupiers) from landslips
- High cost to Council from landslips affecting its roads, properties and infrastructure
- Anticipate increased complaints and political pressure for Council to do something
- Consequent high cost of enforcement for Council
- Adverse effects of earthworks in sensitive environments
- Adverse effects from the transport of material

- Higher long term community costs from poor engineering and design of earthworks

5.2.3 Evaluation

If the policies, rules and methods in the Operative District Plan were retained many of the issues identified under 'resource management issues' would not be addressed.

The reactive nature of the "common law" principal, and the section 17 provisions of the RMA, combined with the expectation of the public for the Council to be able to have the power to be involved when issues arise means that a process based entirely on common law and section 17 of the RMA is not practical.

The Building Code does not give consent to earthworks *per se* and it can be difficult to separate situations where earthworks are controlled by a building consent for a retaining structure, from situations on the same site where the Building Act has no influence.

Option 1 – No Change / Fragmented Approach is not recommended .
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5.3 Option 2 – Complete District Plan Control

5.3.1 Explanation

Plan Change 65 identified all the relevant resource management issues for earthworks and brought them into consideration in the resource consent process. Many of these identified issues are unable to be considered under the Operative District Plan as the policies do not address them and the permitted activity standards do not have specific or appropriate limits for them.

Plan Change 65 brought the earthworks provisions together in their own chapter allowing for the comprehensive consideration of all the issues associated with earthworks. There were two main reasons for the new earthworks chapter. Firstly, the permitted activity conditions were designed to address earthworks at different scales, for a wide range of landforms and geology / soils and as the principles are the same for all areas of the city, it is appropriate to locate them in a single chapter. This avoided the need to repeat the provisions in each chapter of the District Plan. Secondly, the rest of the issues (erosion, dust and sediment control, flooding hazard etc) are either common to all areas; apply to several areas; or are similar enough to warrant them being located in the same place in the document.

Plan Change 65 took a conservative engineering based approach to earthworks imposing a limit of 600mm of cut or fill on some slopes. As a result all earthworks (other than extremely minor earthworks) required a resource consent and assessment from a suitably qualified professional. The result was an extremely high cost to the public in terms of resource consent fees (approximately \$800) and engineering costs. In addition there was a duplication of processes as many of the earthworks applications involved

retaining structures, where a building consent would also be required entailing duplication of consideration of stability issues.

The technical nature of the rules in Plan Change 65 made them complicated and difficult for the average user (of the District Plan) to determine whether the earthworks activity they wished to undertake was permitted or the matters that might be subject to consideration.

It is important to note that even these low thresholds for earthworks did not absolve all risk and/or liability. Engineering or geotechnical producer statements are normally subject to a disclaimer stating that there is a level of risk and that engineered earthworks or retaining walls can fail.

5.3.2 The key benefits and costs of Option 3

Benefits

- Assessment of the stability of all but extremely minor earthworks
- Reduced risk of earthworks instability
- Ability to address and assess all issues related to earthworks (e.g. erosion, dust sediment control, visual amenity, etc.) through comprehensive rules and policies
- Possibly less legal liability for Council (although it should be noted that the majority of engineers/geotechnical specialists put disclaimers on their engineering statements)
- Good regulatory and enforcement powers under the RMA (higher penalties and use of Environment Court)
- Reduced short-term and long-term costs to neighbours, the Council and the community from well engineered earthworks
- Higher quality visual mitigation of earthworks and structures
- Protection of the character of sensitive environments, streams and wetlands
- Less sediment entering streams, wetlands and the sea
- Fewer adverse effects from the transport of material.

Costs

- Higher compliance costs arising from the need to have resource consent (approximately \$800) for all but very minor earthworks
- Engineering and/or geotechnical assessment required of all but very minor earthworks
- Risk that due to the cost of the resource consent and the complexity of the rules that people will not apply for a resource consent or want to pay for a resource consent and undertake the work regardless
- Risk that due to the volume of consents that may be generated by this approach (and the desire to put the general public to minimal cost) that resource consents do not get assessed appropriately
- Duplication of processes (Building Consent and resource consent) for all applications where retaining structures are to be built.

5.3.3 Evaluation

Plan Change 65 provided a comprehensive set of objectives, policies, rules and methods for the assessment of all aspects of earthworks. Plan Change 65 brought the assessment of stability into the framework of the District Plan as well as placing all earthworks matters within a single chapter of the District Plan.

However, the approach was overly technical and complex, taking a risk averse approach. The high cost to the public in terms of the resource consent needed and which may also require detailed engineering and / or geotechnical inputs combined with duplication issues (where some applications would also need a building consent) means that this approach is not acceptable to the public.

Option 2 – Complete District Plan Control is not recommended.

5.4 Option 3 - Integrated Building Act and District Plan Control

5.4.1 Explanation

Option 3 addresses all the resource management issues for earthworks within a comprehensive Earthworks focused chapter similar to the approach adopted in Option 2. The major differences are that this option:

- i. increases the thresholds so that only larger cuts and fills require consent; and,
- ii. cuts and fills which are to be retained by a structure authorised by a Building Consent are permitted.

Each resource management issue is addressed below:

Stability of earthworks

Earthworks are an essential part of development and building in a hilly city. Mass earthworks provide roads at reasonable gradients and areas of flat or gently sloping land that can be built on, or used for other activities. Earthworks are essential to the construction of buildings whether they are built on the level ground or steep slopes. Mass earthworks and construction of buildings is dependant on the finished land being stable and, therefore, some regulation of earthworks is required. Earthworks are also part of the day to day maintenance and development of people's properties and allowing minor earthworks where the risk of instability is relatively minor allows people to use and enhance their properties.

As has been explained under Option 1 the Building Consent process does not give consent to earthworks. However, in instances where a retaining structure is to be constructed, the issue of stability will be taken into account.

Therefore, it is possible to provide for some permitted activities within the District Plan in circumstances where the cut or fill will be retained by a structure authorised by a building consent. Therefore, where minor cuts or fills (up to 2.5 metres) are retained by structures authorised by a building consent, then the need for a resource consent is avoided, as the issue of stability can be addressed through the building consent process.

Erosion, dust and sediment

A consideration in the management of erosion, dust and sediment is the overlap between district plan and regional plan rules. A major feature of the rule is the use of two Greater Wellington Regional Council's guidance documents. The permitted activity standards have been developed and refined in close cooperation with officers at Greater Wellington to be consistent with their approach to managing these effects.

The dust rules have been included with those for erosion and sediment because dust is created in the same way as sediment through excavation and erosion. Dust can be a nuisance effect as well as become sediment once it settles. The control of dust is strongly linked to the control of erosion and sediment.

Earthworks and structures associated with streams and wetlands

Streams and wetlands are valued for their character and amenity values, as the habitat of fish, insects and macro invertebrates and to ensure the functioning of the ecosystems that support these species. The protection of the fresh water resource is the function of the Regional Council. Earthworks activities can have an adverse effect on the amenity and functioning of the fresh water resource. To be consistent with the Regional Freshwater Plan and the Regional Policy Statement the plan change proposes District Plan rules that complement the Regional Council's role.

Flooding hazard

The Operative District Plan has specific provisions relating to identified flood hazard areas. These have been developed and used over a number of years and are considered to be appropriate in managing the effects of earthworks in these areas (Takapu Hazard (Flooding) Area and Tawa Hazard (Flooding) Area). A change to activity status from controlled to restricted discretionary is proposed to bring these rules into line with other earthworks rules.

Visual amenity

The Operative District Plan contains a cut / fill threshold of 2.5m for the majority of areas and a lower threshold for some other areas. The 2.5m cut / fill threshold is still considered appropriate for considering visual amenity in the majority of the City. In other visually sensitive areas, the rules propose a lower threshold of 1.5m cuts/fills. Visually sensitive areas include the suburban coastal environment, the ridgelines and hilltops overlay area, Open Space B Areas, Conservation sites and identified heritage items. The policy framework has been rewritten to provide better guidance to the appropriateness and effectiveness of proposed mitigation measure. Therefore it is considered that better visual protection is potentially afforded, reducing the visual impact of earthworks on these parts of the City.

Transport of materials

In order to manage the impacts of transporting large quantities of earth or construction fill material to or from a site, limits have been determined which if exceeded (as part of a restricted discretionary activity consent) require the consideration of effects on the roading network. The limits have been

determined as a result of assessing the effects of larger earthworks consents. Methods such as traffic management plans have proved an effective means of mitigating many of the adverse effects of the transport of material.

Cultural and archaeological values

A new policy addresses the possible loss of Maori and non-Maori cultural material or archaeological sites as a result of earthworks. This will enable consideration of the potential archaeological value of sites through the resource consent process. No permitted activity condition is proposed as a blanket condition would be too onerous requiring people undertaking earthworks of any size to investigate the archaeological potential of their site.

The discovery of archaeological material during earthworks is controlled through the Historic Place Act. A note is included in the District Plan to provide information to people undertaking earthworks and reminding them of their obligations under this legislation.

It is proposed to notify cultural and archaeological sites as individual listings in the District Plan. This has been anticipated and allowed for by changes to the Heritage Chapter under Plan Change 43. Work will proceed to collate and assess archaeological sites, in consultation with iwi, culminating in a district plan change, similar to that of other Heritage Items.

5.4.2 The key benefits and costs of Option 4

Benefits

- Ability to address and assess all issues relating to earthworks (e.g. erosion, dust sediment control, visual amenity etc) through comprehensive rules and policies
- Two complimentary and integrated processes used to consider stability issues, namely; Building Consent and District Plan Consent
- Good regulatory and enforcement powers under the RMA (higher penalties and use of Environment Court)
- Reduced risk of earthworks instability for significant earthworks
- Reduced short-term and long-term costs to neighbours, the Council and the community from well engineered earthworks
- Protection of the character of sensitive environments, streams and wetlands
- Less sediment entering streams, wetlands and the sea
- Management of adverse effects from the transport of material
- Ability for the public to undertake minor earthworks without the need for a resource consent.
- Ability for the public to undertake slightly larger earthworks if building consent obtained for a retaining structure (with no consequential need to apply for a resource consent).

Costs

- Possible legal liability for Council if damage to life/property occurs as a result of failure of earthworks that are permitted by the District Plan

- Duplication of process (Building Consent and resource consent) for applications for retaining structures over 2.5m)
- Engineering and/or geotechnical assessment required of all but very minor earthworks.

5.4.3 Evaluation

Minor earthworks become a permitted activity if retaining structures are built and building consent is obtained. This approach allows the issue of stability to be addressed while avoiding the need for a resource consent along with its associated costs for all earthworks activities.

In circumstances where retaining structures are not proposed the threshold is lower to enable the assessment of the stability of the proposed earthworks.

Increasing the thresholds from those proposed in Plan Chang 65 (and in the now lapsed By Law) adopts a greater inherent risk than was expressed by Plan Change 65. It is considered that this approach reaches a more acceptable balance between risk and resource consent processing complexity and costs.

Option 3 provides a balance between allowing people to undertake earthworks activities and regulation and seeks to manage risk according to the degree and severity of that risk. In addition Option 3 reduces (but does not completely avoid) the duplication of processes with the Building Act / consents process.

Option 3 – Integrated District Plan Control is recommended .

6. The Risk of Acting or Not Acting

An evaluation under section 32 of the RMA must consider the risk of acting or not acting if there is uncertain or insufficient information about the subject matter of the proposed approach. In this case, it is considered that there is sufficient information available for:

- Earthworks stability
- Erosion and sediment control
- Dust control
- The character and amenity values of streams and wetlands
- Flood hazard areas
- Construction of tracks
- The visual effects of earthworks generally
- The landscape / townscape values of the coastal environment
- Experience of problems with the trucking of material

Areas where the Council has insufficient information are:

- No technical work has been undertaken to assess the risks associated with the thresholds provided in the plan change rule conditions to do with permitted activities. Instead a judgement has been of the level of risk that the community is prepared to accept

(based on submissions made in respect of plan change 65 and subsequent administration of the plan change). The thresholds chosen reflect an understanding of the Building Act, the use of the Earthworks Bylaw (now lapsed) and on technical advice on minimum risk levels.

Obtaining detailed technical advice on the risk of the chosen thresholds would entail obtaining detailed mapping of slope stability hazards areas (which specifically identifies areas of colluvium relative to slope gradient) within Wellington City. Such mapping would indicate areas of potential risk and thus, where more stringent earthworks rules (lower thresholds) may need to apply for stability reasons and (concomitantly) where more relaxed thresholds might be applied. However such an exercise would be very costly and represent inefficient use of resource.

- Further, it is not known how much sediment streams, wetlands and coastal waters can absorb cumulatively, without water quality and ecosystems being affected. At this time, the proposed plan change aims to raise the standard of erosion and sediment management. Water bodies including streams, wetlands and coastal waters will continue to be monitored by both the Council and the Regional Council.

There is sufficient information to deal with all the key issues. The development of the earthworks stability conditions are backed by appropriate technical advice from a geotechnical and engineering expert. The policy is flexible and allows for the geotechnical analysis of the site if officers consider it necessary. It allows for the Council's level of assessment to grow over time as resources, such as hazard mapping, become available.

Other earthworks issues are dealt with in accordance with existing practice or a blend of appropriate analysis and the experience of council officers. It is therefore considered that there is a very low risk of any untoward outcomes resulting from the implementation and application of the proposed earthworks provisions.

7. Conclusion

The review of the earthworks objective, policies, rules and methods, adds to, and updates, provisions for earthworks in the Operative District Plan. It is considered that the proposed improvements to the earthworks provisions will ensure that they will work more effectively and efficiently to address the 'qualities and values', and 'specific issues identified in the District Plan and the relevant provisions of Part 2 of the Resource Management Act 1991.

The Proposed Plan Change will address the matters identified as being significant resource management issues for earthworks and achieves a balance between allowing minor earthworks to enable people to use and manage their properties while ensuring the adverse effects of earthworks are avoided or

mitigated. Bringing the issue of stability into the District Plan allows for a more comprehensive assessment of the effects of earthworks on the environment. In addition, the Proposed Plan Change works in conjunction with other Council processes, such as the Building Consent process to ensure that the duplication of processes can be avoided where necessary.