

Canterbury Regional River Gravel Management Strategy

October 2012



Everything is connected

FOREWORD

The Canterbury Regional River Gravel Management Strategy has been prepared under the Local Government Act (2002). A draft version of this document was publically notified May 2012. A total of 19 written submissions were received. An independent hearing was held from the 3rd to the 5th of September 2012 at which 9 submitters presented an oral submission. The hearing panel recommended the changes included in this document and Environment Canterbury Commissioners adopted the amended Strategy on 1st November 2012.

This Strategy should be used to inform decision makers about the management of gravel sourced from Canterbury's rivers.

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INTRODUCTION

The Canterbury Regional River Gravel Management Strategy (the Strategy) provides the framework for managing the extraction of gravel from rivers across Canterbury. The Strategy sets out the role of Environment Canterbury in managing gravel extraction from rivers, the outcomes we wish to achieve, and the methods by which gravel extraction will occur.

The purpose of this Strategy is to sustainably manage gravel extraction from rivers for natural hazard purposes that ensures community safety and well-being and to allow for sustainable economic development without compromising cultural, social and environmental outcomes and values.

This Strategy has been developed after a series of initial discussions with the industry and key interest groups and a formal Local Government Act 2002 (LGA). The Gravel Extraction Industry, represented by the Gravel Liaison Committee, is a key partner to Environment Canterbury in managing the region's river gravel resource

Land Information New Zealand (LINZ) and Department of Conservation (DOC) are significant riverbed, land and species managers in the region. There is also a commitment to work with Te Rūnanga o Ngāi Tahu to achieve sustainable environmental outcomes, to support customary practices and to provide for effective iwi participation. Environment Canterbury recognises that the relationship of Ngāi Tahu with their ancestral land within Canterbury is inextricably linked with its own functions and powers.

This strategy aims to provide best practice objectives by joining up the range of outcomes in a collaborative process with all stakeholders and the community.

PRINCIPLES

These principles provide the context for the Strategy. They shape and guide the direction and decision-making around the planning and management of gravel extraction from rivers.

- Recognition of the kaitiaki responsibilities of Te Rūnanga o Ngāi Tahu
- Achieving multiple outcomes – flood management first
- Sustainable resource management of gravel extraction
- Economic growth while continuing to maintain and restore the environment
- Good science supporting decision-making
- Partnership between sectors to ensure best practice and incentives to maximise environmental, cultural, social and economic benefits (refer to Appendix 1 for more details about the Council's partnerships); and
- Partnership with the gravel extraction industry to achieve a mutually beneficial management framework

OBJECTIVES

The objective of this strategy is to sustainably manage the extraction of river gravel for flood management and erosion control purposes, while;

- Providing for Ngāi Tahu cultural and spiritual values of rivers, wetlands and hapua;
- Protecting and where appropriate enhancing environmental values;
- Ensuring consistency with the Regional Policy Statement, proposed or operative Land and Water Regional Plan and other planning documents;
- Allowing access to gravel to meet community needs; and,
- Implementing opportunities for scientific investigations to better understand related environmental processes.

BACKGROUND

Canterbury has excellent sources of river gravel that can be used for residential and commercial construction and roads. The landscape within the region has been shaped by tectonic uplift, creating the Southern Alps and foothills and resulting in a landscape of highly folded and shattered greywacke rock. This rock varies in size from fine sediments through to gravel and large boulders. Flood events transport this gravel downstream from the mountains to the Canterbury Plains creating a complex network of gravel bars, berms and braids typical of Canterbury's braided rivers. Gravel that reaches a river mouth is stored in gravel barriers adjacent to, and across, river mouths creating lagoons and hapua, or is discharged to the sea.

These braided rivers have unique and productive ecosystems. Rivers with gravel beds are composed of accumulations of different sediment sizes, from sand to boulders, and this variation produces a variety of habitats. The riffle, run, and pool sequence of braided rivers creates a patchwork of habitats supporting species and their different lifecycle stages. Riffles can be highly productive and important feeding habitats for fish and birds as well as helping to maintain good water quality by aerating the water and controlling temperature. Outside of the channel, the braided river environment is suited to many species of birds and provides habitat for invertebrates.

Gravel beds allow water to flow both horizontally and vertically: that is, water can be gained or lost in the channel from, or to, groundwater or through the localised movement of water within channels. These subsurface flows generate a unique subsurface zone (hyporheic zone), providing important habitat for fish and invertebrates. They are particularly important for spawning, and are places of refuge from predation and floods.

Man-made disturbance of riverbeds includes confining the river channels within stopbanks, altering river flows, and extracting gravel. Gravel extraction can potentially alter river channel characteristics and river ecology by direct disturbance of habitat, of riparian features and of nesting birds, non-migratory native freshwater fish, and migrating or spawning fish. On the other hand, well-managed gravel extraction can create habitat for birds while removing weeds.

Ngāi Tahu Papatipu Rūnanga are tangata whenua for the rivers of Canterbury. These rūnanga have kaitiaki: this stewardship is expressed through actions to protect natural resources to ensure the mauri or life-force of rivers, streams and wetlands are

restored and protected. Ngāi Tahu believes that managing water resources for sustainable economic development is dependent on sustaining healthy water ways.

Wai, or water, is central to all Māori life. It is the taonga left by ancestors to provide and sustain life. It is for the present generation, as tangata tiaki (guardian or caretaker), to ensure that the taonga is available for future generations in as good as, if not better quality (Te Rūnanga o Ngāi Tahu 2000). This is the philosophy of ki uta ki tai – from the mountains to the sea.

Ngāi Tahu do not see themselves as separate from Te Ao Tūroa (the natural world) but as an integral part of it. Through whakapapa (genealogy), all people and life forms descend from a common source. Whakapapa binds Ngāi Tahu to the mountains, forests and waters and the life supported by them, and this is reflected in the traditional attitudes towards the natural world and resource management. It is therefore important to recognise for Ngāi Tahu, that there is no separation between the bed of a river and the water and all life which flows through and is sustained by it. Therefore for Ngāi Tahu the management of water resources for sustainable economic development is linked to sustaining and promoting the connected nature of healthy water ways.

For Ngāi Tahu, the management of gravel in riverbeds is inherently linked to resource consent processes and development of planning policies and industry or codes of best practice. To address the issues recognised in the gravel strategy, engagement with Ngāi Tahu will be required to ensure the above mentioned processes reflect Ngāi Tahu interests and values and their kaitiaki role.

In its liaison and engagement with Ngāi Tahu, the Canterbury Regional Council under the Treaty of Waitangi and the legislative responsibilities under the Resource Management Act 1991 (RMA), LGA, Te Rūnanga o Ngāi Tahu Act 1996 and the Ngāi Tahu Claims Act 1998 are obliged to consult with the ten Canterbury Papatipu Rūnanga and the iwi authority Te Rūnanga o Ngāi Tahu. The level of extent of engagement and how this occurs is determined through early engagement in these processes. Often in many instances because of the shared interest in resource use, the areas and the scale and type of activity or issue there will be a requirement to engage with a number of Papatipu Rūnanga and Te Rūnanga o Ngāi Tahu for particular purposes or processes.

Legislative framework

This Strategy was prepared under the LGA. Gravel is managed under a range of Acts. Regional councils' roles in gravel management stem from the following Acts:

- Soil Conservation and Rivers Control Act (1941) for the management of flood and erosion hazards; and
- RMA for the extraction of gravel and an accompanying role managing the environmental effects of extraction.

Gravel is a mineral under the Crown Minerals Act (1990), but in the case of riverbeds no permit is necessary from, and no royalty is charged by the Ministry of Economic Development.

Nine central government departments and agencies have different degrees of involvement in gravel extraction depending upon their role as legislator, regulatory authority, land manager, affected party or end-user. These roles are not exclusive as some agencies act in multiple roles, each using a different method in managing their particular relationship with gravel. Some management methods do not align well or lack a specific policy direction that can make it difficult for Environment Canterbury to manage gravel extraction from Canterbury's rivers.

DOC has a role in the management of riverbeds as follows:

- Section 6(ab) of the Conservation Act to preserve as far as practicable all indigenous freshwater fisheries and freshwater fish habitats,
- Freshwater Fish Regulation functions for fish passage,
- Wildlife Act role for some invertebrates and native birds,
- Coastal management role under the RMA and the New Zealand Coastal Policy Statement (NZCPS).

All ten Canterbury territorial authorities have an important role in planning for land use activities, land use on the coast, land stability and mitigation of natural hazards. They have interests relating to ensuring a supply of gravel for district/city development, the maintenance and construction of their own infrastructure, and to protect their infrastructure from the adverse effects of gravel extraction.

Emergency works provisions

Sections 330 – 331 of the RMA allow for emergency works to be carried out without obtaining a resource consent in advance, although one may be required retrospectively.

Environment Canterbury's preference is not to be placed in the situation where such emergency works are needed. This Strategy provides the framework by which Environment Canterbury will operate and target gravel extraction. Well-managed gravel extraction can reduce the need for emergency works in the riverbed. Having permissions in place prior to an emergency can also assist recovery if material is suddenly needed to repair or protect an out of river asset. This approach would require infrastructure owners to share information relating to their infrastructure to enable targeted and timely extraction.

Hazard mitigation

Gravel extraction is a key method for managing flood hazard by maintaining and increasing the flood carrying performance of riverbeds. Management of gravel and vegetation within riverbeds can enhance channel stability and reduce the risk of flooding. The expected probable flood flows have been calculated for many of Canterbury's rivers for a range of potential recurring flood events. Flood protection schemes are designed and built to carry these flows. Gravel extraction can either increase or reduce risk to flood protection schemes.

If a section of riverbed has risen due to the continued deposition of gravel over time (aggradation) – this rise in mean bed level reduces the flood carrying capacity of the river, increasing the risk of flood. Conversely, if a section of river has too much gravel extracted, the reduced bed level may increase the risk of erosion of the river's banks, berm areas, flood protection vegetation and eventually any stop banks. Increased erosion rates can scour out a stop-bank, causing it to fail during a flood far sooner than it would if the bank was overtopped.

Environment Canterbury is developing target bed levels for many key rivers where gravel extraction is favoured and/or necessary. Aside from flood protection, it is also necessary to maintain the bed level of rivers at an approximately constant level around other infrastructure such as bridges, power pylons, water intake structures and fords. The position of the main channel in the fairway is important for infrastructure such as irrigation and water supply intakes.

The management of gravel

Residential and commercial development and construction of infrastructure within urban and rural Canterbury depends on the ability to access, extract, process and transport gravel economically both from land and river sources. Regionally there are some quite clear differences in how the extraction process is managed. These differences are driven by the nature of the existing consents in place, the scale of demand and the type of end-use required, aligned with the proximity to the resource, the amount of information held on the river itself (mean bed-levels) and the type of processing plant that is in place.

Territorial authorities and Environment Canterbury both play a role in planning for the availability of gravel as well as managing the effects of extraction on the environment. From the early 1990s, Environment Canterbury has required the extraction industry to apply for resource consents to extract gravel from riverbeds (as did the North and South Canterbury Catchment Boards before this). The consent, if granted, included conditions to ensure good environmental and cultural practices are being carried out.

Environment Canterbury commissioned the Regional Management Report (R06/1) in 2006. This aimed to quantify the scale of the regional gravel resource and relate sustainable supply to regional demand. The report led to a change in the way the gravel would be managed. The report showed increasing demand while the sustainable supply volume was relatively small, putting the role of land based extraction in a new context and highlighting the need to plan for land based extraction.

Using the information provided in this report, Environment Canterbury and the gravel extraction industry for the first time had information that supported planning for future extraction. Environment Canterbury was able to move towards fulfilling its function of minimising and preventing damage by floods and erosion within the region using more sustainable gravel extraction practices. Then through their Annual Planning process at the time, Environment Canterbury introduced an ongoing project to provide a gravel management charge based on consented volumes to co-fund surveying analysis and modelling to determine gravel availability in rivers. In parallel with this approach, minimum bed levels are being introduced to protect river-related infrastructure whilst also providing for consistent flood capacity.

In South Canterbury, as demand increased, extraction increased in relatively small rivers. It became apparent there was a need to ensure that the rate of extraction was sustainable and did not adversely affect river-related infrastructure or create erosion issues. Environment Canterbury has a role under section 5 of the RMA to sustain the life supporting capacity of aquatic ecosystems. In the Waimakariri River, the sustainable supply and flood capacity are well understood by the major extractors, although this is not the case for many other rivers.

By default the allocation of gravel is currently managed through the resource consent process under the RMA. Potential extractors are required to submit an application detailing the volume required from the proposed area of extraction, proposed duration and proposed mitigation methods to avoid adverse effects on the environment and people. Environment Canterbury staff provide

advice on the application before a decision is made. Environment Canterbury holds gravel availability information on a number of rivers. On other rivers applicants may be required to carry out an independent gravel assessment to demonstrate whether volumes sought are available; Environment Canterbury staff strongly encourage dialogue with consent applicants prior to consent applications being lodged.

In South Canterbury, Environment Canterbury and the industry have signed the South Canterbury Gravel Agreement (commonly referred to as the Memorandum of Understanding - MoU). The agreement limits all consents issued to a maximum volume and duration enabling better flood management in rivers and creates a level playing field for signatories. Contractors are able to apply for consents as they need them, rather than holding a long duration consent as a “just in case” for future contracts that would tie up the gravel resource from other parties.

North of the Rangitata River, there is no formal maximum duration of consent. On rivers under significant pressure for the gravel resource, such as the Waimakariri River and Ashley River/Rakahuri, public notification of resource consents has been common in recent years. A recent High Court decision in 2011¹ determined that only available gravel in rivers should be allocated to consent holders. This provided Environment Canterbury with the opportunity to review the current levels of service in managing gravel extraction and change the way gravel is managed across Canterbury for the purpose of natural hazard management, and in particular flood management. Analyses of available gravel volumes indicate that some rivers have been given consents that effectively over allocate the amount of gravel available for extraction without increasing hazard risk. Minimum bed level conditions imposed on consents will, however, limit the extraction to available gravel (above target bed levels).

Environment Canterbury relies on the gravel extraction industry to keep costs to the community down for flood management. The difficulty lies in the ability to marry flood protection improvements directly with where extraction is sought by the industry (through the consent process) taking into account gravel quality and the haul distance for the extractor from the river to the customer. The Waimakariri River and Ashley River/Rakahuri have good quality gravel and are near to the end user, and have therefore been heavily targeted by extractors. In North Canterbury, where demand is lighter, there is not as much opportunity to target extraction. In South Canterbury sustainability limits have been reached in parts of some rivers, so in some instances haul distances are increasing for extractors.

Figure 1



Undermining of bridge piles due to gravel extraction can put the structural integrity of bridges at risk. Better management of gravel extraction can reduce this risk to infrastructure.

The business of gravel

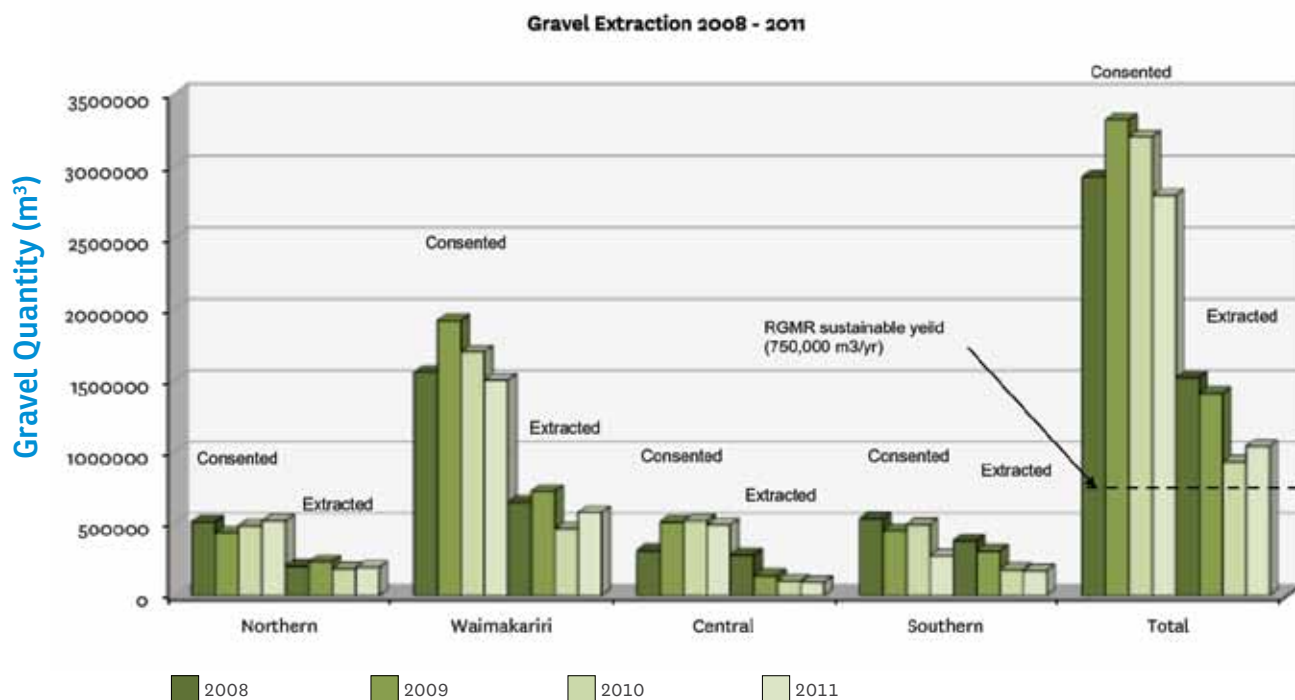
A number of key challenges face the extraction industry: these relate to how the industry can maintain future access to gravel resources to ensure their business is successfully maintained. Expediting the consenting/permitting process would help limit tendering costs. Ensuring sufficient supply of gravel to sites located near to fixed infrastructure in some locations continues to be a key concern for some extractors. This will become more of an issue in the future as fuel prices increase and stored gravel volumes within riverbeds decrease.

Environment Canterbury faces the challenge of balancing the gravel to be extracted from both rivers and land-based operations without jeopardising the viability of either. In order to continue to have gravel removed from rivers, Environment Canterbury must ensure that it is financially viable for contractors to do so. Otherwise, the cost to remove this gravel or the increased flood risk will be borne by the community. Also the commercial and competitive nature of the extraction industry is a challenge to the current management process. This centres on the relationship between operating a tendering process and ensuring a guaranteed supply is available for the future.

The tender process often involves a number of competing suppliers vying to provide gravel, each having to demonstrate not only the final price of the resource, but also its quality and availability. Added to this is the extractors' limited ability to forecast demand, knowing the tenders coming up, as well as providing for an adequate additional source of supply to address unforeseen market demand and their day-to-day business. This creates a disparity between the quantity of gravel extracted and the consented volumes, because an unsuccessful bid on a tender frequently results in a reduction in the amount of gravel extracted. This also ensures that the market and competitive forces deliver gravel to consumers at the most efficient price with the flow-on benefit of an affordable supply for infrastructure construction. This potentially drives Figure 2 below. A geographical representation of the different areas is presented in Figure 3.

These factors are compounded for rivers where there is lesser demand for gravel resources. In this instance the gravel extractors fill a key role for improving flood carrying capacity (otherwise the ratepayer would pick up the cost). While an extractor may not take their full volume every year, having certainty of supply from the river may prove the difference between consenting and establishing an operation, or not taking the risk.

Figure 2 – Consented and extracted amounts



Environment Canterbury would prefer that in the future all gravel allocated for flood management purposes is actually extracted.

A key issue for industry concerns the infrastructure in place. For some operators, primarily around greater Christchurch, fixed plants have been the most economically viable option for processing the volume of and quality of gravel for the types of end-use associated with the urban demand. As the availability of river gravels change and land-based resources are worked out, the existing locations of fixed plants might not remain commercially viable. New plants, whether they are mobile or fixed, may be required as the market changes.

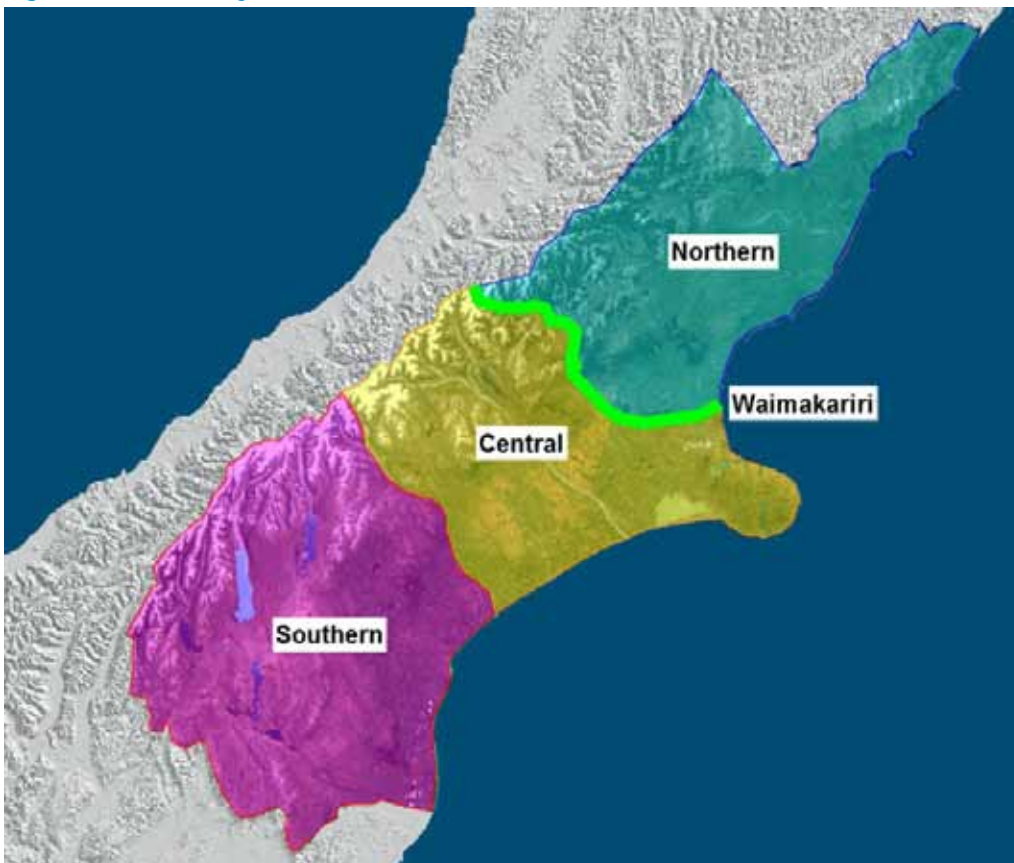
Fixed plants require a considerable lead-in time to obtain consents and be built. For an extractor to be able to justify such costs, certainty of resource is absolutely critical. Indeed, from an industry perspective, short-term consents may compromise investment in fixed plant/processing operations; forecasting may be required to give some idea as to availability of gravel in the next 5–10 years. In addition data gathering needs to be improved to better understand river balances and sustainable yields.

Limited data availability has meant that much work has been based on estimates.

The cost of transport as a total percentage cost of extraction is also a key issue for the wider extraction industry – and particularly for those using the aggregates for construction. This is why areas close to high demand have been heavily extracted. It is expected that gravel available in flood risk locations will generally remain cheaper to extract than land-based quarries, due to the increasing cost of purchasing land and reverse sensitivity issues for quarries near to urban areas.

The key issue from an industry perspective is ensuring river gravel resources are available and that a consenting process is in place to provide long term certainty of supply from river gravel extraction that is economically competitive with land-based operations. It is important not to create disincentives for river gravel extraction that would result in a wide scale shift towards land-based operations compromising flood management.

Figure 3 - Canterbury Gravel Extraction Areas



CURRENT CHALLENGES

In 2006 the Regional Gravel Management Report (R06/1) predicted increasing gravel demand in Canterbury Region. Since then, demand has eased in line with the global financial climate, but the 2010/2011 Canterbury earthquakes have meant that a significant quantity of gravel will be required as the rebuild progresses. While the estimate of the likely quantity required is uncertain it is likely to increase on the pre-earthquake figures of 2009. Rural areas have also experienced an increase in demand for roading associated with dairying and growth in farming activities across Canterbury. Demands from central government and territorial authorities for the development and maintenance of infrastructural assets and local sector projects have also increased.

A portion of this requirement will be met through land-based quarries and potentially some recycled demolition material, as well as through river gravel extraction. The ratio of this mix is unknown at this stage but is expected to be largely determined by price, with transport costs being a significant factor in any decisions made.

Differences within the region

There are sub-regional differences in how the industry views gravel management. In greater Christchurch the demand for gravel is high from the Waimakariri River. In this river industry would prefer a more streamlined approach as it needs to plan for the long term. Many believe they can get this through long-term resource consents. The certainty of future access is important to the large operators so they can fulfil their ongoing demand for urban customers including large infrastructure projects.

Outside greater Christchurch, demand is more localised and can be sporadic in both time and location. Extractors believe the resource consent and land ownership permission processes take too long and so are unable to rely on getting consents to extract gravel when placing competitive tender bids for work.

Effects on river ecology and habitat

Internationally a number of studies and reports indicate that gravel extraction can harm the ecology and habitat of rivers. In many cases the effects are short-lived and limited to the area of extraction, in others the effects are more long-term and restoration may take many years². There are few New Zealand-specific studies available to confirm if the same applies in Canterbury. One study of two rivers found significant effects on one and minor effect on the other. Neither of the rivers in this study are particularly representative of rivers in Canterbury. Useful inferences may be taken from the international studies to provide a list of possible effects but it is desirable to confirm the impacts, negative and positive, in a Canterbury context. DOC has also undertaken some work under the Project River Recovery initiative in the Upper Waitaki area.

Particular areas of enquiry could be changes to sediment size distribution and mixing, channel habitat structure (riffle, run, pool sequences), habitat for sensitive species or life stages for certain species (torrent fish, eel, lamprey, Canterbury Galaxias, salmon and trout, birds), and riparian habitat.

Aside from effects on hazard management, gravel extraction may have other effects on the riverbed environment. These include:

- The potential for large amounts of sediment to be discharged into the surface water. Such discharges can adversely affect water quality and smother instream biota
- Causing variations in channel morphology which can impact on instream habitat heterogeneity (or diversity)
- The disturbance of various riverbed bird species during nesting
- Bed disturbance including extraction in water and vehicles crossing braids which can impact on spawning habitat
- Adversely affecting the amenity values of the river by generating machinery noise, fumes and dust, and by disturbing the natural character of the riverbed; and,
- Recreational use can be adversely affected by a loss of public access, be it a real or perceived; by increased hazards in the riverbed, such as large pits with steep edges being left which can pose a hazard to vehicles and by sediment discharge into waterways, which may impact on recreational fisheries.

Currently these effects are required to be avoided, remedied or mitigated by resource consent conditions.

Influence on coastal processes

There is a lack of data on the influence of gravel extraction on coastal processes³. Gravel extraction from the beds of rivers may decrease the supply of gravel delivered to the coastal system, altering the sediment budget and potentially increasing coastal erosion. The effect of a reduced bed load is relatively unknown and the issues vary for different parts of the Canterbury coast. Pegasus Bay, in general, is considered a closed system so it is presumed that this is not an issue there except at specific points. For the Canterbury Bight (Rakaia, Rangitata, Ashburton/ Hakatere, Orari and Ophi Rivers) things are not so clear: these rivers often directly input gravel to an already eroding coast. A 2001 study of the effects of a decrease in river load, in particular for the Rangitata Rivers, found that decreased loads could increase erosion of the adjacent coastal cliffs by up to 10 centimetres per annum.

Planning matters

Rules authorising the extraction of gravel are inconsistent across the Canterbury region. The most significant difference is the approach taken by the various territorial authorities. Five district councils have either made river based extraction a permitted activity so long as a regional council consent is obtained, or have simply stated that their rules do not apply to the beds of lakes and rivers. In these instances sole responsibility for authorising the extraction of aggregate from riverbeds through resource consents

falls to Environment Canterbury. The remaining territorial authorities have either not differentiated between river and land extraction in their plans or while acknowledging the overlap in responsibilities, require potential extractors to obtain consent from both the local authority and the regional council.

Land ownership

It is often assumed that the Crown owns all riverbeds in New Zealand but in fact much of the Crown's riverbed has never been formally recorded and ownership of riverbeds is much more complex. Ownership can range from land administered by LINZ or DOC on behalf of the Crown, to land owned by Environment Canterbury, to the common law right of AMF – *ad medium filum aquae* – where land ownership is presumed to be the adjacent land owner out to the mid-line of the river.

Where occupation of a riverbed is sought for gravel extraction but ownership is not confirmed, a status investigation is normally required by LINZ and a license (from LINZ) or a concession (DOC) negotiated before occupation rights can be granted by the riverbed owner. Where works are to occur on DOC land, consent holders are legally required to also obtain concessions under the Conservation Act 1987. DOC typically charge for this concession based on the volumes of gravel extracted. This can be costly and time-consuming to the applicant because of difficulties in confirming whether an area of riverbed is LINZ-administered Crown land, or whether it belongs to a third party. That has in part contributed to widespread unauthorised occupations of Crown riverbed land across the region. This has occurred despite resource consents advising that separate landowner permission is required.

The need for operators to consult with all or some of these parties, with each organisation having its own requirements and charges, is perceived by the industry as a time-consuming, expensive obstacle and is seen as acting as a deterrent to gravel extraction which may eventually force the industry to turn more to land-based quarrying over river extraction.

Because it cannot be easily confirmed which riverbeds are LINZ administered Crown land or have AMF private ownership rights, Environment Canterbury does not usually treat the Crown as an "Affected Person" under section 95E of the RMA. However, in May 2010, LINZ and Environment Canterbury staff developed a trial process whereby LINZ is notified of all applications to extract gravel, thus giving LINZ the opportunity to assess whether the riverbed is indicatively Crown land requiring a status report and license to occupy. If the land is found to be part of the Crown estate, LINZ can charge a ground rent for access to the works area and royalties under the Land Act 1948 and Crown Minerals Act 1991. DOC similarly requires gravel extractors to apply for a concession under the Conservation Act 1987 to occupy the land with an accompanying charge.

Aesthetics and Recreation

Recreational and aesthetic values of riverbeds are a key aspect of their value to the community and can be impacted by gravel extraction. Challenges include:

- The perception that gravel extraction affects riverbed access;
- The visual impact of works and machinery; and
- Site rehabilitation post works.

MANAGEMENT FRAMEWORK

This management framework aims to manage a range of broad regional issues in a consistent way, while ensuring other stakeholders' values are protected during gravel extraction.

The Regional Approach

This Strategy, prepared under the LGA, will inform RMA processes and decision making, and in particular the Proposed Land and Water Regional Plan. It will also enable Environment Canterbury to meet the responsibilities for hazard mitigation defined in the Soil and Conservation and Rivers Control Act (1941).

Consistent Approach

The desired management regime is intended to provide a clear direction for industry, territorial authorities, regional and central government to manage a range of broad regional issues in a consistent way. These issues are:

- That hazard management is recognised in decision making for extraction;
- That tangata whenua values held in common by all Canterbury rūnanga through consultation with Te Rūnanga o Ngāi Tahu are respected;
- To continue to work with landowners and land managers to provide clarity on the ownership of riverbeds;
- To protect local, regional and national infrastructure such as roads, bridges, railways and dams;
- To develop a consistent approach to the issuing of consents between Environment Canterbury and territorial authorities;
- To recognise and be consistent with the purpose for which riverbed land is held by an authority e.g. recreation reserve, soil conservation etc.;
- To develop an industry Gravel Extraction Code of Practice to simplify and streamline the resource consent process for the extraction industry; and
- To sustain the natural values of the riverbeds.

Planning

Canterbury Water Management Strategy (CWMS)

The CWMS is a developing partnership to address water management issues between Environment Canterbury, the district and city councils and Ngāi Tahu along with environmental and industry stakeholders. This provides the opportunity to align gravel extraction with the wider aspirations for environmental protection and enhancement on a river by river basis.

Each CWMS Zone Implementation Programme (ZIP) contains a set of recommendations. For some rivers, recommendations for gravel extraction are held within the context of maintaining natural character, for recreation access, opening river mouths to allow fish passage, protecting wetlands and braided river springs, and maintaining the braided character.

Sub-regional chapters under the proposed Land and Water Regional Plan (LWRP) will be the focus of the zone committees who will work with Environment Canterbury and stakeholders to prepare catchment rules. These are not yet developed so their shape is unknown.

Regional Policy Statement

The Canterbury Regional Policy Statement (RPS) provides an overview of resource management issues for the region, and the policies and methods to achieve integrated management. In relation to river and gravel management, this includes the management of natural character of water bodies, biodiversity, and management of beds of rivers for gravel extraction and hazard management. The RPS does not contain rules but it does contain broad directions for provisions in regional and district plans which must give effect to the provisions of the RPS.

Proposed Land and Water Regional Plan

Gravel management is addressed through the proposed LWRP providing environmental management across the Canterbury region. The proposed LWRP will, when adopted, replace specific chapters of the current Natural Resources Regional Plan and will operate at two levels. The first is at the region-wide level and will contain the objectives, policies and rules for managing water and land across all of Canterbury. The second is at a sub-regional level and sections will be developed over time to contain policies and rules that are specific to the catchments – these may relate to flood hazard management, environmental flows or specific water quality standards.

Canterbury Conservation Management Strategy

The Canterbury Conservation Management Strategy is DOC's overall strategy for integrating the management of natural and historic resources in Canterbury.

Management

Overarching Rules for Gravel Extraction

The following are the overarching rules that will apply to the extraction of river gravel throughout the Canterbury region:

- Section 124A to section 124C of the RMA do not apply to gravel extraction in Canterbury;
- Written authorisations (under a Permitted Activity rule) and resource consents will be issued to parties on a first in, first served basis;
- All extraction will be governed by a Gravel Extraction Code of Practice.
- Applications for written authorisations and resource consents will be required to include a statement of reasonable need for the volume sought;
- Resource consents and written authorisations to extract river gravel will not be granted in areas where a deficit of gravel has been identified or where proposed extraction may cause a deficit in gravel volumes i.e. gravel cannot be over allocated;
- Written authorisations will be issued for a maximum duration of 12 months and a maximum volume of 60,000 cubic metres (m³) across the entire Canterbury region;
- Resource consents will be issued for a maximum duration of 12 months and a maximum volume of 60,000m³ across the entire region, except on the Waimakariri River where durations of up to 5 years and volumes of up to the maximum available quantity will be considered.

Figure 4 below presents schematically how permission to extract gravel can be obtained by way of example. Permission from Environment Canterbury can be sought either in the form of a written authorisation from the Regional Engineer or a resource consent under the RMA.

Section 124A to 124C of the Resource Management Act

Section 124A-C of the RMA govern the way Environment Canterbury must treat new applications for resource consents to take gravel with regard to existing consent holders (priority is given to existing consent holders) and the reallocation of gravel that was not extracted under a previous consent (an automatic opportunity to apply to renew a consent is given to existing consent holders).

The overarching rules proposed above state that section 124A to section 124C do not apply to gravel extraction in Canterbury. The implications of this are that existing resource consent holders will no longer have a priority of renewal of consent and that quantities of gravel not extracted under the previous consent can be made available to other parties, provided that all of the other overarching rules are met.

Development of a Gravel Extraction Code of Practice

The purpose of a code of practice is to provide a guiding document for gravel extraction from rivers. It demonstrates the consistent practices that avoid and minimise environmental impacts for gravel extraction.

The code of practice is a living document, developed with partners and key stakeholders to ensure a balance of environmental, cultural, social and economic outcomes. The code will be updated as needed. The code of practice may contain specific requirements for particular rivers although site specific matters are better addressed through written authorisation or resource consent conditions.

Allocatable Volumes

Gravel available for allocation in a particular reach is determined by taking the sum of stored gravel volumes and the expected

gravel supply to that reach, and then subtracting the existing allocated volumes for that particular reach. Stored volume is defined by the difference between the current mean bed level and the defined target or minimum mean bed level for that reach of river. In cases where there is no defined target or minimum mean bed level, site specific investigation will be required to determine an acceptable quantity of stored gravel available for extraction.

Fees and charges

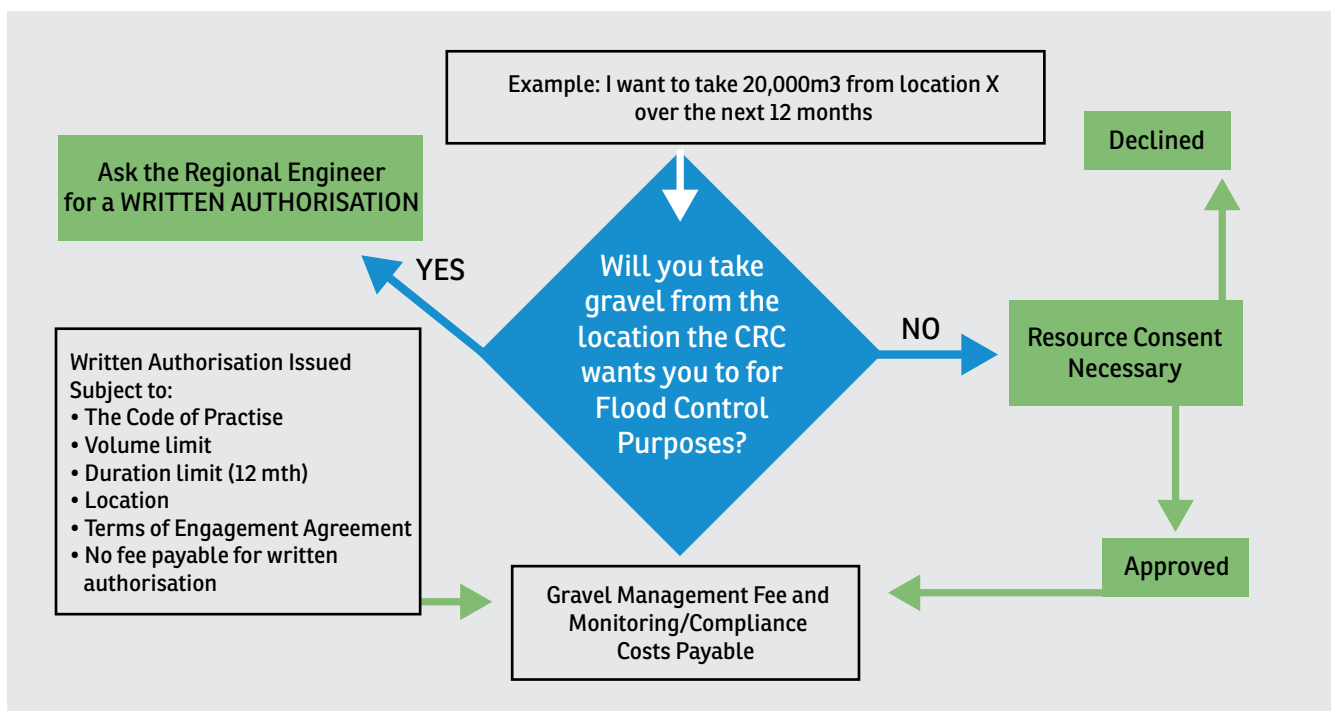
Environment Canterbury is proposing to review funding arrangements including the funding policies.

There are several fees/charges that extractors are subject to, depending on where their operations are located. Environment Canterbury charges for resource consent application processing costs (\$1,472 deposit in 2012), a gravel management fee (see below) is set at \$0.13 per m3 of the consented volume, and consent compliance and monitoring costs are billed on a time/cost basis to the consent holder.

Additional costs can sometimes occur with associated territorial authorities' consents and DOC concessions, land access rights and commissions. For example, fees could be payable to DOC, LINZ, and Environment Canterbury depending on the location. LINZ proposes to charge a ground rent of between \$200-400 for access while DOC currently charges a concession of \$2 per m3 in addition to the concession cost.

These are in addition to Environment Canterbury charges which are to cover the cost of processing consents, monitoring those consents, and collecting data for management (see below). More education is needed to improve the understanding of the costs and benefits associated with extraction. There is a need to ensure standardised processes can be facilitated with charges at reduced cost, and to ensure consistent messages and discussion with all parties to ensure consistency and maintain attractiveness of river extraction versus land-based quarries. All this has implications for flood management as riverbed material can aggrade in these areas, with the Regional Council having insufficient funds (and it generally being uneconomical) to remove it directly.

Figure 4 - Gravel Permissions Process



The Gravel Management Fee

The gravel management programme funds all the survey and analysis work required to determine how much gravel is available for extraction from rivers and from where it should be taken to provide the most benefit. Looking ahead, as demand for gravel is expected to increase, more data will be required. Allowances are needed to continue the current total gravel management budget, but recognising the need to increase funds in coming years. The fluvial (gravel and hazard) management programme is funded by general rates (currently a fixed contribution of \$230,000 per year) and the gravel management fee (currently around \$330,000 per year). The quantum of the gravel management fee collected currently depends on the total quantity of gravel consented. Ideally, from a management perspective, overtime the consented quantity of gravel for extraction will more closely align with the actual quantity of gravel extracted. This will inevitably mean that the total consented quantity and the gravel management fee received will reduce overtime. Around 50 rivers are identified as potentially needing to be included in the survey programme. Many of these are small coastal rivers and will not require the level of service currently provided for the region's large alpine rivers.

Approximately 60% of the gravel management fee is currently used to fund the surveying of sections of 32 rivers in Canterbury. The frequency of these surveys varies from six monthly (around key infrastructure such as bridges) to 20 years on rivers where little extraction occurs. The survey network will need to expand to cover new areas of extraction because over the next few years many traditional extraction locations will reach Environment Canterbury's target bed level elevations. The frequency of monitoring within the existing survey network may need to increase in areas where extraction is expected to increase. The remaining 40% of the gravel management fees are used to fund the analyses of survey data, monitoring, to provide comment on gravel availability and to fund research directly related to understanding the effects of river gravel extraction. This current 60:40 ratio of survey: analyses costs is expected to remain relatively constant regardless of how much survey work is done.

Future investigation and monitoring Programme

An important component of work that will come out of this Strategy will be the development of a detailed framework for targeting science and investigation to help inform management decisions in the longer term. These are likely to comprise the following:

- Develop a research programme to address gaps in current data and build an understanding of key areas in coastal processes, ecological disturbance and change
- Present potential funding mechanisms to carry out research. Land ownership clarified with GIS datasets
- Evaluate Strategy outcomes through an ongoing monitoring programme
- Hazard management – how best to react to legislative and policy changes
- Consider the influence of climate change
- Better understand the end use management of gravel; and,
- Regional management programme including environmental effects at the regional level

Differences throughout the region

While a regional approach to gravel management is desirable for many issues, we also recognise that the region is not homogenous and there are local issues that will need to be addressed. This will be done through specific conditions on the written authorisation or resource consent issued. These issues include, but are not necessarily limited to:

- The management of rivers near, at, or beyond the limit of safe sustainable extraction and or that require more individualised management for some other reason
- Where there are specific values and concerns of local Rūnanga
- Where there are specific values and concerns of local communities, as expressed through the CWMS zone committees, territorial authorities, and/or local advocacy groups such as the Ashley/Rakahuri River Care group
- Identifying DOC area and/or conservancy level values such as particularly sensitive reserve areas and rivers of particular environmental importance; and,
- Additional assessment/consultation/written approval required for particularly sensitive areas

PROPOSED ACTION PLAN

The aim of the action plan is to move beyond the strategic direction outlined to a programme of work that will implement the strategy. This action plan will be further refined following the consultation phase.

Action	Lead	Who else
1 Advocate for streamlining consent requirements between the territorial authorities and Environment Canterbury	Environment Canterbury Resource Planning Section	All territorial authorities
2 Develop a code of practice to guide the extraction of gravel from rivers – demonstrates best practice Review the role of the Gravel Liaison Committee in the development and review of the code of practice	Environment Canterbury River Engineering and Strategy and Programmes	Consents/policy team TRoNT and all Rūnnga as partners, territorial authorities, industry and interest groups
3 Review of the Fees and Charges associated with gravel extraction including the role of the river rating district schemes	Environment Canterbury Finance with River Engineering and Strategy and Programmes	All river rating districts, and relevant Zone Committees
5 Investigate how to best issue permits to enable hazard management	Environment Canterbury Consents, River Engineering and Science and Investigation	Relevant zone committee partners, industry and key interest groups
6 Liaise with central government regarding concession costs, processes and relationship to hazard management	Environment Canterbury Strategy and Programmes Land Information New Zealand	DOC, NZTA and KiwiRail
7 Develop an investigation programme that encompasses both research and monitoring	Environment Canterbury Strategy and Programmes, Science and Investigation and River Engineering	NIWA, University of Canterbury, Lincoln University and DOC

GLOSSARY

Aggregate	Aggregate is the collective term for gravel, sand and stone
Allocation	The volume of gravel that may be taken by resource consent holders / written authorisation holders as defined by the conditions of their consent
Aquifer	An underground deposit of water-bearing sand, gravel or rock capable of yielding water supplies
Bed load	Particles of aggregate carried by the natural flow of a waterway on or immediately above its bed
Berm	A level space, shelf, or raised barrier separating the river bed from stop-bank or surrounding land
Catchment	The total area draining into a river, reservoir or other body of water
Ecosystem	A system formed by all plants, animals and micro-organisms in a particular area interacting with the non-living physical environment as a functional unit
Good management practice	An umbrella term to describe industry led programmes promoting practice changes to improve industry performance against particular or agreed objectives
Gravel	Includes all coarse and fine materials sourced primarily from river deposits
Groundwater	Water located underground in rock crevices and pores of geological material supplying springs and wells etc
Hapua	Coastal wetlands or lagoons, predominantly freshwater, held by gravel or sand barriers at river mouths
In-stream flow	Relates to the intrinsic environment of the river, lake or aquifer (ecology, cultural, recreation, aesthetic, natural character) and the flow required to maintain these values
Iwi	Tribe
Kaitiakitanga	The exercise of guardianship
Over-allocation	A situation where either: values associated with current resource use cannot be sustained to a minimum standard if all resource consents are fully exercised; and/or the total allocation exceeds the total available volume if all consents are fully exercised
Riffle	A small rapid within a river or stream where water is flowing over shallow rocks.
Riparian	Relating to the bank of streams, rivers and lakes - riparian vegetation is vegetation found on the banks of a river, stream or lake
Taonga	Treasured possessions, both tangible and intangible

APPENDIX 1

The Ministry for the Environment (MfE), the Ministry of Economic Development (MED), and the Canterbury Earthquake Recovery Authority (CERA) all have potentially significant, legislative roles in the management of gravel.

CERA, under the Canterbury Earthquake Recovery Act 2011, has special powers to facilitate the rebuild of Christchurch and includes the ability to require local authorities to amend RMA documents, and even suspend or cancel resource consents. While MfE has limited their involvement to providing advice to local government planners (via a guidance note on the Quality Planning website⁴) they are able to prepare a National Environmental Standard (NES).

New Zealand Petroleum and Minerals⁵ is a subsidiary organisation of MED and acts on behalf of the Crown to control the extraction of minerals. While the Crown Minerals Act 1991 takes a default position of excluding the extraction of gravel from requiring a permit, it does give MED the ability to produce a formal Minerals Programme that includes gravel extraction. There is currently no Minerals Programme to deal with extraction and MED have no direct involvement in the management of gravel at present.

LINZ is responsible for managing the Crown estate, including Crown owned riverbeds, except where it is managed by another Crown entity. DOC, in particular, manages the use of land on the Conservation Estate that includes riverbeds. Given their roles as landowners, both LINZ and DOC have an interest in gravel extraction on their land.

DOC also has a role in the sustainable use of resources - including gravel and sand - in the coastal marine area though their legislative role in reviewing Regional Coastal Plans under the RMA. While they have input into the planning process, their primary involvement with fluvial and land-based gravel extraction is generally as a landowner or affected party.

DOC also has responsibilities in protecting indigenous ecosystems and significant environments outside of the Conservation Estate. Where works are outside of this area, and where there have been issues of potential concern to DOC, they have typically either provided written approvals or submitted on notified consent applications.

Rivers within Canterbury also have cultural, spiritual, historic, and traditional associations with Te Rūnanga o Ngāi Tahu. The Ngāi Tahu Claims Settlement Act 1998 specifically acknowledges these associations with particular regard to a number of rivers such as the Hurunui River and Ashburton River/Hakatere. The Regional Council must have regard to these Statutory Acknowledgement Areas when considering applications for resource consents within these areas and typically Te Rūnanga o Ngāi Tahu are considered an affected party under the RMA. Where applicants have consulted Ngāi Tahu and addressed their concerns, Ngāi Tahu have typically provided written approval for resource consent applications. In other instances, when their concerns have not been addressed, Ngāi Tahu have submitted on notified resource consent applications.

The New Zealand Transport Agency (NZTA), KiwiRail and Transpower all maintain essential infrastructure that may be adversely affected by gravel extraction. These parties typically provide either written approval, when they are considered adversely affected but there they do have no concerns, do not submit on notified resource consents.

NZTA, KiwiRail and Transpower have legislation (Government Rooding Powers Act 1989, the Railways Act 2005 and the Electricity Act 1992 respectively) that protects their interests outside of the resource consent process. In particular, works in close proximity to NZTA bridges⁶ or KiwiRail⁷ infrastructure requires an authorisation from the related body, while the Electrical Code of Safe Practice for Electrical Safe Distances (NZCEP 34:2001) provides controls on how close excavation can occur to Transpower Infrastructure⁸. Transpower have also published guidelines to assist the public with maintaining safe distances. In general the management approach taken by NZTA, KiwiRail and Transpower is largely hands-off and is reliant on the Regional Council controlling adverse effects through the resource consent process.

The New Zealand Historic Places Trust (NZHPT) is the regulatory authority established under the Historic Places Act 1993 to protect heritage sites, including archaeological sites. Any works that may damage or destroy a historic site requires an NZHPT Authority⁹ prior to the works proceeding. While this might, in some instances, require multiple authorities to undertake works, in general this requirement is infrequent and has little impact on gravel management.

In addition to described roles above several government agencies, in particular DOC, NZTA and KiwiRail also use aggregate for maintaining and/or building infrastructure. While in some instances KiwiRail and DOC obtain their own consents, these organisations typically employ third party contractor's who obtain the relevant authorisations.

Fish and Game Councils are the statutory managers of the sports fish and game bird resource in this country, and any impacts resulting from unsustainable and inappropriate gravel extraction management directly impacts their ability to fulfil their statutory functions under the Conservation Act 1987. Where gravel extraction in certain areas raises issues of potential concern to Fish and Game, they have typically either provided written approvals or submitted on notified resource consent applications.

Footnotes

1 *Christchurch Ready Mix Concrete Ltd v Canterbury Regional Council*, CIV - 2011-049-001501 Fogarty, J.

2 Kelly D., A McKerchar, M Hicks. 2005. *Making concrete: ecological implications of gravel extraction in New Zealand rivers*. *Water and Atmosphere* 13 (1)

3 See *Regional Gravel Management Report / Report No R06/1 / Environment Canterbury 2006 - pages 16 to 18*

4 <http://www.qp.org.nz/plan-topics/aggregate-quarry-industry.php>

5 <http://www.nzpam.govt.nz/cms>

6 Section 51, *Government Rooding Powers Act 1989*

7 Section 86, *Railways Act 2005*

8 <http://transpower.co.nz/landowner-guides>

9 Section 11, *Historic Places Act 1993*

Everything is connected

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