Kapiti Coast District Council

Notice of Requirement for a Designation in the Kapiti Coast District Plan for Water Supply Purposes (Lower Maungakotukutuku Dam) under section 168A of the Resource Management Act 1991

Notice of Requirement for a Designation by the Kapiti Coast District Council

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Acknowledgements

This NOR contains information provided to KCDC by CH2M Beca in their report titled 'Kapiti Water Supply – Ranked Options - Technical Report' dated 6 August 2010.

Contents

Form 18

PART A: NOTICE OF REQUIREMENT FOR A DESIGNATION UNDER SECTION 168A OF THE RESOURCE MANAGEMENT ACT 1991

To: Kapiti Coast District Council
Private Bag 60601
PARAPARAUMU 5254

From: Kapiti Coast District Council
Private Bag 60601
PARAPARAUMU 5254

Kapiti Coast District Council (KCDC or 'the Requiring Authority') gives notice of a requirement for a designation for a work, being the construction, operation and maintenance of the Lower Maungakotukutuku Dam.

This designation is necessary to provide for the construction, operation and maintenance of the Lower Maungakotukutuku Dam, which is anticipated to be constructed in approximately 50 to 100 years' time.

The purpose of the dam is to provide a reliable water supply for the Waikanae, Paraparaumu and Raumati (WPR) communities that is sustainable and will meet the expectations of consumers is a fundamental issue for KCDC. The existing water supply is under stress in terms of its capacity to meet the peak water demand in summer. The proposed NOR is part of the Kapiti Water Supply Project, and the purpose of the project is to identify the most suitable solution for providing water to meet the communities' needs for the next 50 to 100 years.

The Project identify 41 supply options. Of these, the chosen solution was the Waikanae River Recharge with Groundwater Option. This is the option that is currently been implemented.

The proposed dam is designed to provide the water supply needs of the District's communities beyond the demand that can be supplied by the recharge option. This need is considered to lie within fifty to hundred years time.

The site to which the requirement applies is as follows:

The site to which the requirement applies (or the land subject to this notice) is identified and legally described in the plan GIS-6515959-13 (attached to this notice). The site is physically located at 78 Mahaki Road, Paraparaumu, and Maungakotukutuku Road, Paraparaumu and is comprised of seven land parcels, being:

- Lot 2 DP 360865;
- Ngarara West C 1 Block;
- Ngarara West C 2 Block;
- Ngarara West C 3 Block;
- Section 11 Block I Akatarawa SD;

- Lot 15 DP 669; and,
- Maungakotukutuku Road Legal Road Document 496456.1 DP 670.

A full description of the site is provided in Section 2 of the AEE (Part B).

The nature of the proposed work:

The purpose of the designation, to be noted in the Kapiti Coast District Plan, is for 'Water Supply Purposes (Lower Maungakotukutuku Dam)' and is required to enable the construction, operation and maintenance of a proposed dam in order to future-proof the freshwater supply for the Waikanae, Paraparaumu and Raumati communities.

The land to be designated provides for:

- the physical extent of the dam;
- all ancillary structures associated with the dam;
- earthworks and vegetation clearance associated with the construction of the dam and ancillary structures;
- aggregate extraction associated with the dam construction;
- on-site concrete milling;
- the area to be flooded upstream of the dam; and
- tracks for construction access and long-term access for maintenance.

A full description of the proposed work is provided in Section 3 of the AEE (Part B).

The nature of the proposed restrictions (conditions) that would apply are:

It is proposed that the designation for the Lower Maungakotukutuku Dam will be subject to the designation conditions (as may be confirmed or modified in the determination of this requirement) contained in Section 8 of the AEE (Part B).

The effects that the work will have on the environment, and ways in which any adverse effects will be mitigated, are:

Section 5 of the AEE contains a description of the existing environment, an assessment of the environmental effects of the Project and an outline of appropriate methods to avoid, remedy or mitigate any adverse effects of the works associated with the works.

Alternative sites, routes and methods have been considered to the following extent:

Section 5.10 of the AEE provides details of alternative sites and methods considered prior to the selection of the proposed dam site and then the specific land parcels to be designated.

A full description of the selection process is on Council's Website and can be found on the following link –

http://www.kapiticoast.govt.nz/Projects/Water-Supply-Project/Project-Reports/

The work and designation are reasonably necessary for achieving the objectives of the requiring authority because:

The Works

As a local authority, KCDC must operate under the principles set out in Part 2 of the Local Government Act (LGA) 2002, including the purpose of local government (section 10), being:

> *"(a) to enable democratic local decision-making and action by, and on behalf of, communities; and*
>
> *(b) to promote the social, economic, environmental, and cultural well-being of communities, in the present and for the future."*

More specifically, section 11A of the LGA sets out the core services for a local authority to consider in performing its role. This includes the provision of network infrastructure, which itself includes (as defined in section 197 of the LGA) the provision of water.

KCDC's objectives for the Kapiti Water Supply Project are:

- The dam must be able to meet the design demand in a drought with a 1 in 50 year return period.
- The design peak day demand for 50 years on the basis of the following:
  - 400 L/person/day peak day consumption (incorporating commercial/industrial demands); and
  - Unaccounted for water (losses) of 90 L/person/day; and
  - Population growth (and matching increase in demand) at the medium-growth scenario.
- The design peak day yield from the particular water source is 32,000 m³/day, which allows for headroom of 6,000 m³/day on the design demand.

KCDC's objectives under the LGA 2002 and KCDC's objectives for the Kapiti Water Supply Project will be achieved by constructing the Lower Maungakotukutuku Dam. The dam will assist with providing the most suitable solution for meeting the community's water needs into the future.

The Designation

Part 8 of the RMA provides for requiring authorities to include provision for designations in district plans, for projects and works for which the requiring authority has financial responsibility. The effect of including a designation in a district plan is to allow the requiring authority to carry out activities, projects or works in accordance with the designated purpose, notwithstanding anything to the contrary in the district plan.

KCDC is a requiring authority under section 166 of the RMA and may therefore designate land, water, subsoil, or airspace to provide for a public work within its district and for which it has financial responsibility. KCDC has financial responsibility for the Lower Maungakotukutuku Dam.

This designation is necessary as it will secure land required for the Lower Maungakotukutuku Dam and will enable KCDC to carry out the works necessary for this part of the Kapiti Water Supply Project. The principal reasons for requiring a designation to facilitate the works this requirement relates to are:

- The designation will enable KCDC to achieve its principal objective under the LGA 2002;
- The designation will enable KCDC to construct a new dam in accordance with one of its core functions under the LGA 2002;
- The designation is necessary to assist KCDC to achieve the specific Kapiti Water Supply Project objectives;
- The designation will allow KCDC and/or its authorised agents to undertake the works in accordance with the designation, notwithstanding anything contrary in the Kapiti Coast District Plan (KCDP);
- The designation will allow the land required to be identified in the KCDP, giving a clear indication of the intended use of the land;
- The designation enables the Lower Maungakotukutuku Dam project to be undertaken in a comprehensive and integrated manner; and
- The designation protects the proposed site from future development which may otherwise preclude the construction of the works.

Resource consents will be required in relation to the activity to which the requirement relates.

No resource consents have been applied for at this stage as construction of the dam is not anticipated to occur for at least **50** years. Resource consents are likely to be required under regional plans in terms of activities restricted under sections 9(1), 9(2), 13, 14 and 15 of the RMA.

All necessary resource consents will be sought before construction of the dam commences.

The consultation undertaken with parties likely to be affected by the designation, public work, project or work is:

Section 6 of the AEE provides details of consultation undertaken with parties likely to be affected.

Lapse period for the designation:

This requirement seeks to designate the aforementioned land for water supply purposes, with the intention of constructing a dam in the Lower Maungakotukutuku Stream in approximately 50 to 100 years' time. The proposed dam is part of the package of works

to help future-proof the water supply for the Waikanae, Paraparaumu and Raumati communities.

Therefore, pursuant to section 184(1)(c), KCDC seeks a 100 year lapse period to give effect to the designation.

KCDC attaches the following information required to be included in this notice by the district plan, regional plan, or any regulations made under the Resource Management Act 1991:

- Assessment of Environmental Effects (Part B)

Plans identifying the land subject to this notice of requirement and a schedule of properties affected by this requirement are contained in the plan **GIS-6515959-13**.

Signature of person giving notice (or person authorised to sign on behalf of person giving notice):

_____

Pat Dougherty
Chief Executive, Kapiti Coast District Council
Signed for and on behalf of KCDC (pursuant to delegated authority from the KCDC)

_____

Date

Land Requirement Plan (reference tba):

PART B: ASSESSMENT OF ENVIRONMENTAL EFFECTS

1 Introduction

This assessment of environmental effects (AEE) has been prepared to meet the requirements of section 168A(3) of the Resource Management Act 1991 (RMA). It has been prepared in support of the Kapiti Coast District Council's (KCDC or 'the Requiring Authority) Notice of Requirement (NOR) to designate land for water supply purposes to provide for the construction, operation and maintenance of the proposed Lower Maungakotukutuku Dam.

1.1 Notice of Requirement

KCDC has lodged this NOR under section 168A of the RMA. Section 168A(3) sets out that:

> *"When considering a requirement and any submissions received, a territorial authority must, subject to Part 2, consider the effects on the environment of allowing the requirement, having particular regard to -*
>
> *(a) any relevant provisions of -*
>
> *(i) a national policy statement:*
>
> *(ii) a New Zealand coastal policy statement:*
>
> *(iii) a regional policy statement or proposed regional policy statement:*
>
> *(iv) a plan or proposed plan; and*
>
> *(b) whether adequate consideration has been given to alternative sites, routes, or methods of undertaking the work if -*
>
> *(i) the requiring authority does not have an interest in the land sufficient for undertaking the work; or*
>
> *(ii) it is likely that the work will have a significant adverse effect on the environment; and*
>
> *(c) whether the work and designation are reasonably necessary for achieving the objectives of the requiring authority for which the designation is sought; and*
>
> *(d) any other matter the territorial authority considers reasonably necessary in order to make a decision on the requirement."*

These matters are addressed as follows:

- **Section X** of this report provides a statutory assessment of the relevant provisions (ss.168A(3)(a));
- **Section X** of this report provides an assessment of the alternatives considered (ss.168A(3)(b));
- **Part A (Form 18)** sets out the reasons why the designation is reasonably necessary to achieve the Requiring Authority's objectives(ss.168A(3)(c));
- **Section X** of this report provides an assessment of the environmental effects of the proposed work; and,
- **Section X** of this report provides an assessment of the NOR in terms of Part 2 of the RMA.

1.2 Inclusion of NOR with Proposed District Plan

KCDC is currently reviewing the Kapiti Coast District Plan. Clause 4 of Schedule 1 of the RMA provides for the insertion of requirements as part of the district plan review process prior to notification. Specifically, sub-clause (6) provides that:

> *"A territorial authority may include in its proposed district plan -*
>
> *(a) any requirement for a designation or heritage order which the territorial authority has responsibility for within its district; and…"*

It is intended that this requirement (i.e. as described in this NOR) for the Lower Maungakotukutuku Dam will be included as part of the proposed Kapiti Coast District Plan when it is publically notified.

1.3 Background

The purpose of this NOR is to provide for[1] the construction, operation and maintenance of the Lower Maungakotukutuku Dam. It is anticipated that the dam will be required in approximately 50 to 100 years' time. The requirement for the dam will trigger the next stage in its construction. This will include gaining the required consents and the final design of the project.

The purpose of the dam is to provide a reliable water supply for the Waikanae, Paraparaumu and Raumati (WPR) communities that is sustainable and will meet the expectations of consumers is a fundamental issue for KCDC. The existing water supply is under stress in terms of its capacity to meet the peak water demand in summer.

The proposed NOR is part of the Kapiti Water Supply Project, and the purpose of the project is to identify the most suitable solution for providing water to meet the communities' needs for the next 50 years. The aim was to find a solution that provides the required amount of water by 2060 – that is, 32,000 m³/day – up from the currently consented limit of 23,000 m³/day.

[1] i.e. to authorise in terms of those activities restricted under section 9(3) of the RMA.

Significant research has been undertaken and a number of options have been identified to future-proof water supply for the WPR. After a Council meeting on 19 August 2010, the Council has recommended the following –

> *"That Council accepts the conclusions and recommendations in CH2M/Beca – Ranked Options – Summary Report dated 6 August 2010 but confirms River Recharge with Groundwater as the top ranked water supply option for the Waikanae/Paraparaumu/Raumati catchment.*
>
> *That Council confirms the Maungakotukutuku Dam as the second ranked water supply option for the Waikanae/Paraparaumu/Raumati catchment.*
>
> *That Council authorises the Chief Executive to negotiate the conditional purchase of the Maungakotukutuku Dam site subject to final approval by Council."*

A summary of the CH2M/Beca report recommendation is as follows –

- that Council proceed with River Recharge with Groundwater as the preferred solution; and

- that Council future-proof the WPR water supply for the long term (e.g. 50-100 years) by securing ownership for the Lower Maungakotukutuku dam site and resolving any constraints to development of a dam on that site in the long term.

2 Description of Environment

2.1 Legal Description

The proposed designation will cover the following land:

Legal description	Owner(s)	Total area (ha)	Area to be designated (ha)
Lot 2 DP 360865	Ikaham Holdings Ltd		
Ngarara West C 1 Block	Greater Wellington Regional Council		
Ngarara West C 2 Block	Kaitawa Forests Ltd		
Ngarara West C 3 Block	Kaitawa Forests Ltd		
Section 11 Block I Akatarawa SD	Kaitawa Forests Ltd		
Lot 15 DP 669	Greater Wellington Regional Council		
Maungakotukutuku Road Legal Road Document 496456.1 DP 670.	Kapiti Coast District Council	0.122	
TOTAL			79.74

The land proposed to be designated is identified in the 'Maungakotukutuku Dam Land Requirement Plan' (GIS–6515959–13). The proposed designation area identified on this plan will be referred to as 'the site' in this report.

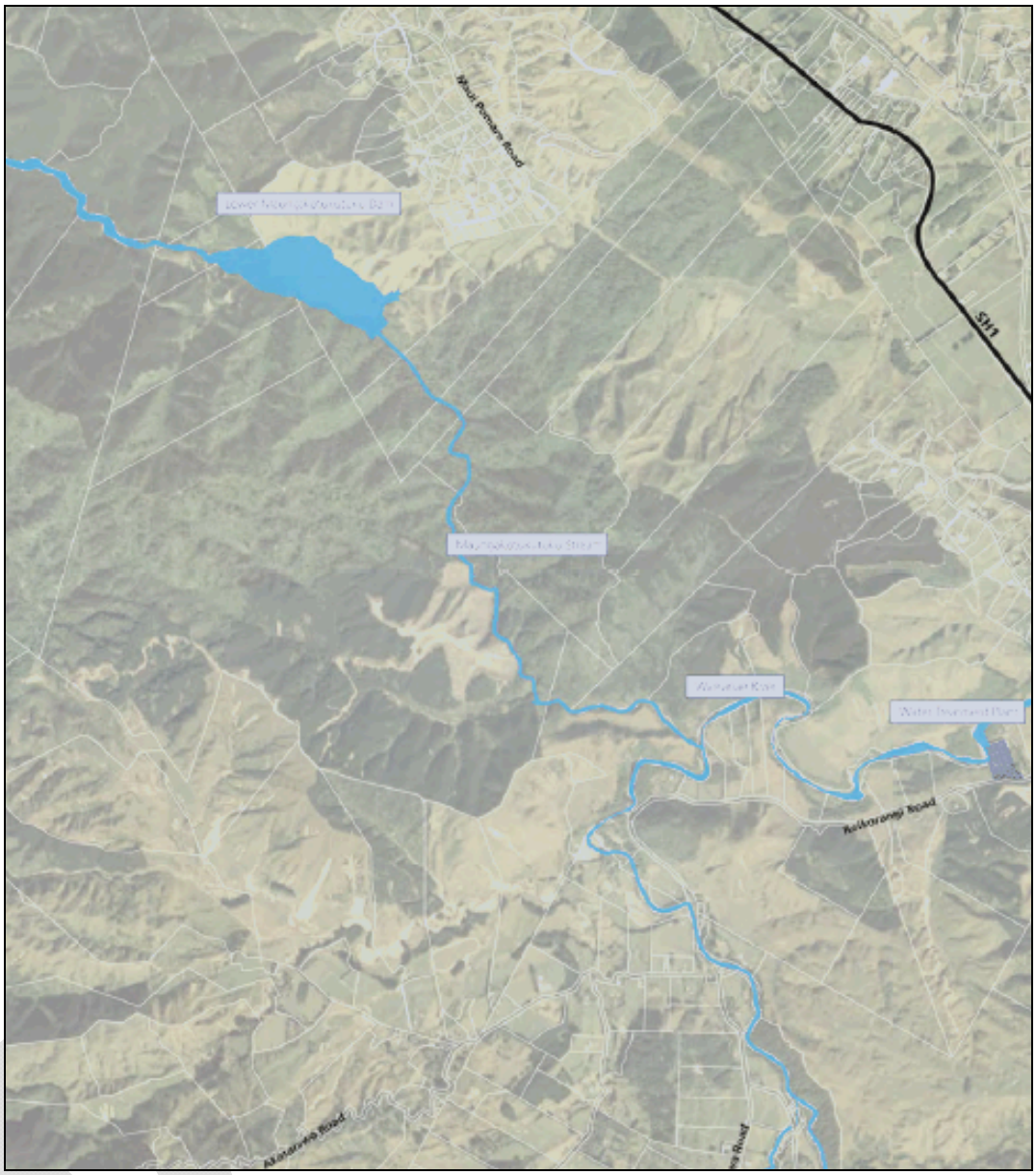

Figure 5-1: Maungakotukutuku Dam Site Location (source: 'Kapiti Water Supply – Ranked Options Reports' by CH2M BECA, dated 6 August 2010).

2.2 Locality

The site lies to the east of the Paraparaumu town centre and can be accessed from the Nikau Valley subdivision, from 78 Mahaki Road. The site lies in a rural setting and is isolated from residential areas. The site is accessed via a farm track and is currently used for stock grazing, forestry harvesting, and contains native bush. The overall area required for the designation is 79.74 hectares. The shape of the site is irregular.

The proposed Lower Maungakotukutuku Dam will be located on the Maungakotukutuku Stream, a tributary of the Waikanae River in the western part of the river catchment. The dam site is located where the valley narrows to a gorge downstream of a wider valley section, approximately 3 km upstream of the confluence of the Maungakotukutuku Stream with the Waikanae River.

The terrain of the site is undulating. A large portion of the site is a flat area, with the surrounding land rising steeply forming a basin-like landscape.

2.3 Land Use

The subject site consists of a variety of land uses. The flat area in the valley is currently utilised for stock grazing and has an farm shed. The surrounding hillsides are predominantly used for forestry.

The land to the north and north-west of the site are occupied by rural lifestyle blocks while the land to the west, south, and east are predominantly used for forestry harvesting.

2.4 Terrestrial Ecology

Wildland Consultants Ltd have been engaged to assess the ecological features of the site. The following are compiled from extracts of their full report titled 'Preliminary Ecological Assessments of Six bulk Water Supply Options for Kapiti Coast' dated July 2010 which is attached in Appendix 1 of the subject report. They have described the ecological features of the site as follows –

> *Most of the area proposed to be flooded in association to the dam is primarily pasture or exotic plantation forest, with a range of indigenous species in the understorey of the pine plantation. The riparian margin of the stream, including that within plantation forest, comprises primarily indigenous species.*
>
> *The quality of the indigenous riparian vegetation improves along a downstream gradient. Vegetation at the southern end of the property has been more modified by introduced conifers and stock. Vegetation along the stream progressively improves towards the northern half of the property, to become (rimu-pukatea)/tawa-mahoe forest at the northern end, especially on the true right of the stream. Downstream, on the true left, vegetation appeared to be predominantly kohekohe and mahoe, with mamaku and occasional rewarewa, rimu and matai (Prumnopitys taxifolia). A small toetoe-bracken (Pteridium esculentum) wetland is present where the degraded pastoral wetland drains down through the riparian forest to the Maungakotukutuku Stream.*
>
> *The entire true right face adjacent to the stream, above the strip of riparian vegetation, comprises kohekohe forest or (rewarewa)/kokekohe forest. Part of this area would also be flooded. The good condition of the kohekohe forest indicates that possums are being controlled to relatively*

low levels. The canopy is generally completely closed, with the exception of some clearings c.100 m upstream of the potential dam site.

Fencing along a section of the southern part of the covenant is in poor repair, with stock gaining access and grazing the understorey. At the northern end, the fence was in better condition, but stock may still move along the stream and gain access to this area.

At the northern end of the inundation area, the vegetation includes a range of species in the canopy, including tawa, rewarewa, pukatea, and kohekohe with stem diameters greater than 30 cm, and impressive, old multi-stemmed mahoe with a combined stem diameter greater than one metre. A matai with a diameter at breast height (dbh) of c.1.7 m and c.30 m tall is present near proposed drilling site LM5. Other canopy species include heketara, pigeonwood, pate, nikau (Rhopalostylis sapida), and mamaku.

Understorey vegetation, including that present at the proposed drilling sites, was reasonably dense, reflecting stock exclusion and possum control. Understorey vegetation comprised seedlings and small trees of kohekohe, heketara, rewarewa, kawakwawa (Macropiper excelsum), mahoe, tawa, and pate. A range of shrub and small tree species was present, including kanono, karamu, Coprosma rotundifolia, hangehange (Geniostoma ligustrifolium), pigeonwood, ramarama (Lophomyrtus bullata), nikau, supplejack vines (Ripogonum scandens), silver fern (Cyathea dealbata), mamaku, wheki, and kiekie (Freycinetia banksii). In most places, a carpet of ferns clothes the ground, including hen and chicken fern (Asplenium bulbiferum), kiokio (Blechnum novae-zelandiae), and a variety of filmy ferns.

No threatened plant species were seen during the brief field surveys. The podocarp-hardwood forest and the kohekohe forest, are not classified as regionally-threatened plant communities in the Wellington Region (Sawyer 2004). Kohekohe forest is under threat from possum browse, but possums are controlled to low levels at this site by the Department of Conservation (three-monthly refilling of bait stations with Feratox).

Tui were abundant, and a black shag (Phalacrocorax carbo novaehollandiae, Naturally Uncommon) was seen to fly into the northern riparian margin, indicating a possible roost or fishing site. Warblers, silvereyes, fantails, and pukeko were common. Kereru, Australasian harrier and paradise shelduck were regularly seen. A range of introduced species use the site, such as eastern rosella, greenfinch, goldfinch, blackbird, and starling. Sheep and cattle (Bos taurus) graze the paddocks and a goat carcass was seen within the pine forest.

2.5 Existing Protective Covenant

In the same aforementioned report, Wildland Consultants Ltd has also described an existing protective native vegetation covenant on site as follows –

It is noted that approximately 18 hectares of the subject site, in Lot 2 DP 360865, has been covenanted by previous landowners under the Reserves Act 1977, to protect ecological values. This area is part of the 41,353 ha Heritage Site E17 in the District Plan, which is the largest example of indigenous bush/wilderness area on the Kapiti Coast, and is considered to be of 'Regional Significance'. Approximately 4.41 ha of this covenant would be inundated or affected by construction works. However adverse effects on the forest could extend beyond this area as waterlogged soils may kill some species or rot roots, and vegetation clearance increases edge effects, such as drying out of the interior of the forest margin due to increased exposure to wind and sunlight.

The covenant includes the following provisions:

(a) To protect and enhance the natural character of the Land with particular regard to the indigenous flora and fauna;

(b) To protect the landscape amenity of the Land;

(c) To protect the landscape amenity of the indigenous vegetation, and to preserve the land as a representative sample of the class of natural ecosystem which in the aggregate originally gave the Tararua Ecological District its own recognizable character;

(d) To allow and encourage the natural regeneration of indigenous species;

(e) To preserve freshwater life and habitat of the land;

(f) To preserve the historical, archaeological and educational values of the land. Ecological values of this covenant include the primarily indigenous riparian vegetation along the Maungakotukutuku Stream, an extensive area of kohekohe (Dysoxylum spectabile) forest on the slopes above the stream, and mature (for lowland parts of Tararua Ecological District) podocarp hardwood forest along the lower reaches of the stream within the land parcel.

2.6 Aquatic Ecology

National Institute of Water & Atmospheric Research Ltd (NIWA) has provided an investigation report on the aquatic ecology of the Maungakotukutuku Stream. The following extracts from NIWA's full report titled 'Technical memo summarizing the effects to aquatic ecology of proposed water supply options for the Kapiti Coast' dated May 2010 (attached in full under Appendix 2 of the subject report) give a general description of the existing aquatic environment –

The biological communities of the Maungakotukutuku stream were investigated. Six fish species were found, the most common of which were longfin eels and redfin bullies. The fish fauna appears typical to that

of other rivers in the area. The invertebrate community was dominated by invertebrates indicative of streams in good – excellent condition, with low-nutrient water. Community composition changed little along the river. Hydrological analysis of data from the Waikanae River shows that there would be very little difference in flow statistics of the residual flows downstream of the take when low flows are augmented with release from the proposed dam.

2.7 Geotechnical Description

The basement rock in the area of the dam site and reservoir is greywacke. Although bedrock exposures are limited at the site, those seen show the greywacke to be hard and strong, consistent with the steep terrain. Greywacke exposure in the vicinity of the site is suitable for a dam foundation.

Terraces on both banks at the dam site are the result of previous valley aggradation. Exposures on the right bank show approximately 3 m of relatively fine alluvium. A wedge of alluvium is probably present at the same level on the left bank.

Colluvium mantles steeper slopes in abutment areas. There is a possible small mass movement debris tongue which extends out onto the terrace approximately 600 m upstream from the right abutment. While interpreted as a mass movement deposit the source may be “erosional” rather than a failure in bedrock. This feature would be further investigated as part of further design work.

Groundwater profiles are unknown but are expected to be near the bedrock surface.

A traverse of the inner (slot) gorge showed that the stream channel is sinuous and is not controlled by a particular discontinuity i.e. there is no obvious fault present and master joints in the greywacke are random. Most of the gorge walls are very steep to precipitous.

Aerial photographs of the reservoir and dam site area show no sign of major slope failures or mass movement in the steep bedrock slopes of the valley walls.

3 Description of the Proposed Works

3.1 Time Factor

As the dam will not be built for at least 50 years, the following information forms the basis on which it has been determined that a dam can be constructed on the site using today's materials and construction techniques.

It is acknowledged that many of the following references will alter over the next fifty years. The information provides the evidence that a dam can be constructed and commissioned on the site within today's parameters.

The details include a summary of current best practices of dam design and construction/maintenance that will stay the same or improve over time.

3.2 Activity Outline

The Kapiti Coast District Council, as the Requiring Authority, is seeking to designate an area of 79.74 hectares of land currently accessed from Mahaki Road, Paraparaumu.

The purpose of the designation, to be noted in the Kapiti Coast District Plan, is for 'Water Supply Purposes (Lower Maungakotukutuku Dam)' and is required to enable the construction, operation and maintenance of a proposed dam in order to future-proof the freshwater supply for the Waikanae, Paraparaumu and Raumati communities.

The land to be designated provides for:

- the physical extent of the dam;
- all ancillary structures associated with the dam;
- earthworks and vegetation clearance associated with the construction of the dam and ancillary structures;
- aggregate extraction associated with the dam construction;
- on-site concrete milling;
- the area to be flooded upstream of the dam; and
- tracks for construction access and long-term access for maintenance.

3.3 Concept Design of Dam

The proposed Lower Maungakotukutuku Dam will be located on the Maungakotukutuku Stream, a tributary of the Waikanae River in the western part of the catchment (Figure 5-1). The proposed dam and reservoir is a means of providing in-catchment storage to augment the existing water supply during periods of low flow in the Waikanae River. Water from the reservoir would be released into the stream to be conveyed by the Waikanae River to the water treatment plant and extracted at the existing intake.

The dam site was identified in the mid-1990s and is located where the valley narrows to a gorge downstream of a wider valley section. This site takes advantage of the inherent reduced length of the dam in the narrow section and the increased volume of reservoir in the wider section of the valley. The dam site is approximately 3 km upstream of the confluence of the Maungakotukutuku Stream with the Waikanae River.

The dam site can be accessed from State Highway 1, Nikau Palm Rd, Maui Pomari Rd. The easiest way to access the site is from the end of Mahaki Rd, from where a farm track leads to the Maungakotukutuku Valley upstream of the dam site.

A roller-compacted concrete (RCC) dam construction process has been selected based on the reduced construction cost and duration when compared to conventional mass concrete dam construction.

Concrete gravity dams can withstand overtopping and are commonly designed with the spillway accommodated over the dam body, characteristics not inherent in other types (rockfill and embankment) of dam. The ability of a concrete gravity dam to accommodate an overflow spillway over the dam was influential in the choice of a concrete gravity dam.

The chosen dam design will have a capacity of 1.9 million cubic metres. The proposed layouts showing a plan and sections for the design are shown on drawings WS909/20/21, 22, 23 and 24, included in Appendix 5. The significant characteristics of the dam are –

Live Storage	1,931,000 m^3
Dead Storage	350,000 m^3
Dam Height	31.5 m
Dam Crest	RL 123.5
Spillway Crest (full supply level)	RL 120.5
Spillway Capacity	120 m^3/s
Inundation Area	280,200 m^2

Table 5-2: Significant Characteristics of Lower Maungakotukutuku Dam (source: 'Kapiti Water Supply – Ranked Options Reports' by CH2M BECA, dated 6 August 2010).

A free overflow spillway has been chosen for reasons of safety, simplicity of operation and economics. It is designed to pass a 1 in 10,000 annual exceedance probability flood in accordance with the Medium Potential Impact Classification assessed for this dam. The spillway utilises the stepped downstream face of the dam for the base of the spillway chute that is formed by side walls supported from the downstream face of the dam. A roller bucket energy dissipater is included at the base of the spillway to dissipate energy and reduce erosion downstream when the spillway operates.

The RCC dam body is founded on greywacke bedrock. Foundation preparation would involve excavation of alluvium from the flat terrace on the right bank and areas of colluvium on both banks.

The bedrock is generally finely fractured and to reduce seepage through the rock fissures a grout curtain has been included.

Drainage of the downstream area of the dam footprint would be with underdrains placed at the time of preparation of the foundation rock surface. These underdrains would discharge downstream of the dam. Flows from these drains would be monitored as part of the dam surveillance program.

Outlet works which enable drawing reservoir water from three levels of the reservoir are accommodated in an intake tower which is integral with the upstream face of the dam. The outlet works deliver from the tower through a gallery through the dam body to a control valve discharging into the spillway energy dissipater. It is anticipated that outlet flows would be controlled remotely from the water treatment plant. This outlet will provide minimum flows immediately downstream during reservoir filling.

3.4 Construction of the Dam

The main construction activities are civil works activities including:

- Progressively clear the construction area of vegetation, strip and stockpile top soil.
- Construct access roads and site facilities.
- Commence quarry activities and preparation of aggregates for RCC production.
- Construct the river diversion.
- Excavate and prepare dam foundation.
- Construct dam.
- Commence reservoir impoundment using closure gate planned with favourable weather forecast.
- Commission dam – monitoring reservoir filling and initial dam performance.
- Clear construction site and complete site rehabilitation works.

The construction period is estimated to be 18-20 months.

More technical details will be provided during the construction phase of the dam (i.e. at the Outline Plan stage).

3.5 Operation and Maintenance of the Dam

Once operational Lower Maungakotukutuku dam would require routine maintenance of the facilities including:

- Access roads, including running surface, drainage facilities, berms and verges vegetation control.
- Site maintenance including, site drainage facilities, and clearance of debris from the spillway works.
- Servicing of the outlet valves and associated automatic controls and actuators.
- Routine surveillance which would include bi-monthly inspection and reading of the drainage weir and piezometers; annual inspection and a Comprehensive Safety Review every 5 years.

3.6.1 Dam Safety (Industry Guidelines/Legislation)

It is recognised that as the dam will not be constructed for at least 50 years, the following outlines the current situation with regards to the construction and operation of dams. This commentary has been included in the assessment of effects to provide the reader with an understanding as to the framework/regime that the proposed dam may be subject to. It is reasonable to assume that the construction, operation and maintenance of the dam will be subject to equlivant industry guidelines and legislation.

The construction of dams is currently subject to the New Zealand Society of Large Dams (NZSOLD) Dam Safety Guidelines. NZSOLD is a technical group of the Institute of Professional Engineers New Zealand. The organization leads the profession in ensuring that dams are built safely, efficiently, economically and with minimal detrimental effects on the environment.

The guidelines are seen as the minimum standard that the owners and operators must comply with. Anything less that compliance with the published guidelines would expose dam owners to allegations of negligent practice and actions for damages in the event of dam failure.

New dams that are designed, constructed, operated , maintained, monitored and inspected in accordance with the NZSOLD Design Safety Guidelines are expected to be Broadly Acceptable Risk structures.

In addition to the above, the construction and operation of dams are subject to the provisions of the Building Act 2004 and the Building (Dam Safety) Regulations 2008. The Act and Regulations are administered by the Department of Housing and Regional Council.

The proposed dam has been assessed under the Dam Safety Scheme (Regulations) to have a Medium Potential Impact Classification (PIC). This classification is based on the potential for damage to the dam and the impacts that would occur if the dam were to release its reservoir contents. Owners of medium potential impact dams are required to prepare a Dam Safety Assurance Programme, which are approved by the Regional Council.

The Dam Safety Assurance Programme is required to be reviewed with 10 years of it begin approved by the regional authority and after the first review, at

intervals of no more than five years.

In addition to the Programme, the Council will be required to provide the regional council with a Dam Compliance Certificate every year. The certificate provides ongoing evidence of the Council carrying out the appropriate surveillance and maintenance in line with the approved Programme.

The design philosophy for the dam considers safety of the dam structure as a vital component of not only the design, but also of the construction and long term operation of the water storage scheme.

The design, construction and operation practices will address the hazards that have the potential to impact on the safety of the dam and the potential consequences downstream that the dam might influence.

Based on the PIC rating (refer above), the appropriate level of security in the design and operation of the dam has been assigned based on he NZSOLD Dam Safety Guidelines.

Having a medium PIC means that the dam must safely pass a 1:10,000 annual exceedance probability flooding. A similar situation applies in regard to earthquakes generated by all the active fault sources in the region would be considered in the design of the dam. Similarly, higher standards of design, construction and operation are demanded where the consequence of dam failures are significant.

This means that if the dam were to be built today, it would need to be designed to the standards for a Medium PIC dam and be able to safely withstand any of the known natural hazards that might affect it. The design and geotechnical risks together with the construction management and systems and procedures would be taken into consideration in managing the operational risks associated with the dam.

3.7 Risk Mitigation

The risks that have identified in the construction and operation of the dam and the reservoir include:

- Algal blooms
- Poor water quality
- Dam foundations
- Reservoir takes longer to fill
- Public (1 dwelling in floodplain downstream)
- Natural hazards (flooding, earthquakes, slope instability).

These potential risks will be minimised by the adoption of appropriate practices in the deign of the dam, its construction, operation and management. These include:

- Engaging suitable designers and peer reviewers.

- Assessing the flood hazard and providing adequate spillways and diversion facilities to manage this hazard.

- Assessing the seismic hazard and providing adequate defence against earthquake effects

- Provision of an emergency action plan

- Regular safety reviews of the dam and associated gates and structures.

- Appropriate techniques adopted during the commissioning of the dam to ensure the stability of the dam and the reservoir.

3.8 Consideration of Alternatives

The Requiring Authority has undertaken significant research in selecting the subject proposal as part a broader research project to ensure the sufficient supply of water to the Waikanae, Paraparaumu and Raumati areas. A full description of the selection process along with a series of option selection reports is on Council's Website and can be found on the following link –

http://www.kapiticoast.govt.nz/Projects/Water-Supply-Project/Project-Reports/

Stage 1: A review of 41 options (Preliminary Status Report). This report narrowed the list down to 31 options, with 9 being eliminated due to insufficient yield, excessive cost or major technical or consenting difficulties. This report was tabled with Council on 17th December 2009.

Stage 2: An evaluation of all 31 options was based on the values the wider community identified as being important in making a decision on water supply. Further investigations into each of the 31 options eliminated a further 11 based on yield, cost or other technical difficulties. A multi-criteria assessment was carried out on the remaining 20 options.

The criteria were strongly informed by the results of community consultation and technical knowledge of each option. At this time, there was a strong view from the Otaki community that water from the Otaki River should not be considered. When this view was considered alongside Council policy which was to favour in-catchment solutions in the first instance, Otaki options were placed on hold while Council undertook further consultation with that community. The Option Selection Report therefore recommended a short-list of six in-catchment options that was adopted unanimously by Council on 11th March 2010.

At the conclusion of Stage 2, Otaki River source options were not pursued further due to Council's policy preference for in-catchment sources, and also local community concerns.

In addition, as investigations occurred into each of the six in-catchment solutions,

some options were eliminated. The Ngtiawa Dam and Kapakapanui Dam, as well as two variations of the Borefield and Storage/Treatment option were eliminated as a result of an interim report adopted by Council on 24th June 2010.

These options were going to be significantly over the capital budget Council identified. Therefore, four in-catchment options remain. They are – River Recharge with Groundwater, Lower Maungakotukutuku Dam, Aquifer Storage and Recovery, Borefield and Treatment.

After further research and consultation, the following two options were eliminated:

- The Aquifer Storage and Recovery (ASR) option was eliminated due to it being unproven in New Zealand and the uncertainty that it brings. It is also more expensive than the River Recharge option. The principles of ASR can be refined and applied in the River Recharge option.

- Bore field and Treatment is simply too expensive. Furthermore, it is the one option that involves continuing to drink bore water, albeit that there would be enhanced treatment. Based on extensive community consultation carried out in the past, this option may have difficulty gaining the support of the public.

This then leaves two options for implementation. They are; the River Recharge with Groundwater as the preferred solution for the next 0 to 50 year period, and to purchase land for the Lower Maungakotukutuku Dam to future proof water supply for the next 50 to 100 year period.

This was confirmed by Council in August 2010 following the Ranked Options Report dated 6 August 2010 prepared by CH2M Beca.

4 Consultation

4.1 Iwi

Council has undertaken extensive consultation with Te Ati Awa Water Working Group, Ngati Raukawa and Nga Hapu o Otaki.

Council is working in partnership with tāngata whenua in relation to water management, including both the water supply and conservation initiatives. Te Āti Awa, as the Tāngata whenua of Maungakotukutuku dam site and wider water catchment area, has been actively involved in this project. Te Āti Awa has a long history of water management on the Kapiti Coast and a strong connection to the Waikanae River and its tributaries and surrounding environment.

At a broader level, Council's strategic policy documents, such as the District Plan and the Water Matters document, stress the importance of a partnership approach between Council and tāngata whenua to decision-making and resource management. This is consistent with the purpose and principles of the Resource Management Act and the Treaty of Waitangi. The core values of Te Āti Awa,

such as kaitiakitanga, taonga, mauri and whakapapa are well documented in Council policy and provide an overarching framework for project-specific engagement.

These core values are important to all tāngata whenua of the District, including Ngāti Raukawa and Ngāti Toa Rangatira. All iwi have an active role in water management within the District and have been involved to some degree in this project, particularly early on during the consideration of many District-wide options.

Ngāti Raukawa in particular has confirmed their support for an in-catchment water supply solution.

Iwi will continue to have an important partnership role with Council for this project, including through the more formal Te Whakaminenga o Kāpiti Partnership Committee.

Specific to the dam site, Te Āti Awa has worked in partnership with Council during all stages of this project, from the initial optioneering of some 40 water supply options, through to the short-listing of options and the selection of the combined water supply solution (being the more immediate river recharge solution and the future Maungakotukutuku dam).

Significantly, in May 2010 the Kaumatua Committee proposed a Water Working Group to represent iwi on water matters and to work closely with Council on the water supply project. The Water Working Group (a group of 3 iwi representatives) was actively involved in the water supply project from its inception in 2011 and regularly contributed to the option selection process on behalf of iwi.

This process of partnership on water management was further endorsed during October 2010 with a Memorandum of Understanding in Relation to Water between KCDC and Te Āti Awa signed at the Whakarongotai Marae.

The Water Working Group has visited the Maungakotukutuku dam site and surrounding area as part of the assessment of short-listed options and later visited the Maitai Dam site in Nelson to gain a better understanding of the longer-term effects of a water supply dam.

A number of meetings and stakeholder hui have been held at the Whakarongotai Marae over the course of the project, involving iwi representatives and stakeholders such as KCDC; Greater Wellington Regional Council; Department of Conservation; Fish and Game; Forest and Bird and a range of environmental groups. The Maungakotukutuku dam option and its anticipated effects have been presented at the Marae and through a number of iwi newsletters.

Te Āti Awa has recently completed their Cultural Impact Assessment (CIA) for both the river recharge and Maungakotukutuku dam projects, completed by Hāpai Whenua Consultants. Te Āti Awa prefer the construction of the Maungakotukutuku dam over the river recharge with groundwater option. Te Āti Awa believe that the risks associated with the construction of a dam are well known and can therefore be managed. The dam was viewed as a secure long-

term water supply solution for the district. The Maungakotukutuku valley was cited as a “natural gorge”, which lends itself to being dammed.

The CIA states that Te Āti Awa has an authentic willingness to work with KCDC in order to explore and apply mitigation and remediation measures if the dam is to be constructed, potentially including riparian restoration downstream of the dam site and the inclusion of a fish passage on any structure which alters the flow of the stream.

Overall, Te Āti Awa support the Maungakotukutuku dam as a community water supply project.

4.2 General Public

The Council has held public meetings and undertaken a survey with regards to the water supply options.

The Council has also undertaken consultation with a wide range of stake holder groups and continues to do so. These include Forest & Bird, Fish & Game, and Friends of Waikanae River.

In addition to the public meetings, the wider community has had the opportunity to comment on the proposal through the Annual Plan and Community Plan processes.

The Council has published a series of Water Supply Project Newsletters, Water Update. These have been posted to residents on a regular basis.

The public consultation that has been undertaken is outlined in the water supply documents listed at: http://www.kapiticoast.govt.nz/Projects/Water-Supply-Project/Project-Reports/#council

4.3 Affected Land Owners

The Council has finalised negotiations with all the owners of the land required for the NOR. At the time of drafting this submission, the Council has reached purchase agreements with; Ikaham holdings Ltd, Kaitawa Forests Ltd and Greater Wellington Regional Council and Reikorangi Forests Ltd.

The Council is still in negotiations with the Department of Conservation regarding the 4.4 hectares of covenant protected land that will be affected by the proposal. The Mahaki Covenant requires alteration to allow work to occur on the site while still maintaining effective protection.

5 Assessment of Effects on the Environment

5.1 Introduction

It is widely accepted among the Kapiti Coast community that the current water supply for the district is under stress, especially for the Waikanae, Paraparaumu and Raumati areas.

All relevant regional and district policy statements point towards the need to secure water supply for the future generations of the Kapiti Coast. The proposed NOR is a directive of the Kapiti Coast District Council in order to safeguard the future of the community in terms of providing sufficient water supply. The intent of the proposed NOR is consistent with the intent of the Kapiti Coast District and all the district's relevant community outcome documents.

Although the use of the site is not strictly for 'rural purposes' as permitted by the underlying rural zoning, it is not out of character for the rural zone. Dams are generally constructed in rural areas due to their requirement for large amounts of land area. They often form part of the landscape once established, and are often utilised as reserve land (e.g. the Matai Dam in Nelson).

It is recognized that there will be adverse environmental effects associated with the proposed NOR and consequently the construction of a dam, the following assessment will study these effects in-depth and look at mitigation measures in order to ensure that the effects on the environment will be able to be managed to an acceptable level.

5.2 Effects on Landscape, Amenity and Natural Character

The construction of the dam and the flooding of the valley behind the dam will have significant effects on the valley's landscape values and qualities and natural character, as it is today.

The actual and potential effects however need to be put in context. The subject site is located approximately 1200 metres from the nearest public road, being the end of Mahaki Road. The closest residential activity lies within the Mahaki Road subdivision.

The proposed activity will have no impact on the views gained from these properties or roadway due to the steep hill that lies between these locations and the proposed features.

The properties that lie to the east and south of the proposed dam/lake are steep and currently covered in pine trees. The properties are zoned rural under the provisions of the district plan. The steep contours and zoning would ensure that today, only a single dwelling could be erected on each of the separate titles. It is reasonable to assume that the steepness of the land is such that the potential to erect dwellings on the sites is severely constrained.

The land to the north-west is in pasture and steep. Like the land to the east and south, it is considered that it will be built on.

The land to the north is covered in native vegetation and currently is subject to full protection under the provisions of the Plan.

The dam structure itself, will not be visually intrusive as there will be limited vantage points downstream of the structure. When viewed from this direction, any view of the dam face will be from the sides of the steep heavily vegetated slopes of the narrow valley down which the stream flows.

The lake behind the dam will intrude into the landscape when first filled, but the extent of the intrusion will be quickly mitigated as the water body reaches its final level and in doing so, it's "natural" state and corresponding presence/appearance.

When viewed from the western and southern shore lines, the lake will have a steep heavily vegetated backdrop. Any view the other way will be limited and seen through mature vegetation.

Currently there is no public access to the subject site. This may change prior to or after the dam is constructed. Any effects the dam and/or the lake may have on the values and qualities enjoyed by the public should be mitigated by factors that are yet to be determined, such as the use of the lake and surrounding areas for recreational use.

If not access is permitted, no member of the general public will be aware of the dam's presence, from a visual perspective.

Filling the dam will require the removal of significant areas of vegetation. The removal of the bush will have detrimental impacts on the current landscape, when viewed from the western side of the proposed lake. The actual effect will however be mitigated by the inundation of the valley. The lake level will rise above most of the areas affected by the required clearance. The areas that are left exposed will be colonised over time and will appear as integral components of the natural landscape following the commissioning of the dam.

The level of water in the reservoir/lake will fluctuate depending on the flow of the Waikanae River and community water supply needs. The receding shoreline will expose bare earth during periods of draught. However, it is considered that that the exposed banks will appear as a natural element, within the context of the dam.

5.3 Effects on Vegetation (Removal)

Wildland Consultants Ltd has been engaged by Council to undertake significant study on the ecological effects of the proposal in terms of vegetation removal. They have compiled a report titled '*Preliminary Ecological Assessments of Six bulk Water Supply Options for Kapiti Coast*' dated July 2010 which is attached in Appendix 1 of the subject report.

The ecology of the site has already been described under Part 2.4 of the subject report.

The following table was extracted from the Wildland report and it identifies the different types of species that will be removed or inundated in association with the proposed dam.

Ecological Value	Vegetation Type	Area inundated (ha)	% of Total Inundation Area
High	Riparian forest	2.67	9.5%
	Mixed hardwood podocarp forest	1.68	6.0%
	Kohekohe forest	0.85	3.0%
	Wetland	0.03	0.1%
High Total		**5.23**	**18.6%**
Moderate	Introduced conifer/riparian forest	0.71	2.5%
Moderate Total		**0.71**	**2.5%**
Low-moderate	Plantation forest	5.94	21.1%
	Degraded wetland	2.88	10.3%
	Clearing	0.47	1.7%
	Indigenous-exotic shrubland	0.16	0.6%
Low-moderate Total		**9.00**	**33.6%**
Low	Pasture	12.69	45.2%
Low total		**12.69**	**45.2%**
Total inundation area		**27.63**	**100.0%**
Total Area High and Moderate Value		**5.94**	**21.2%**

Table 4 – Vegetation types within the Lower Maungakotukutuku inundation area (source: Wildland Consultants Report – attached in Appendix 1 of the subject report)

Wildland Consultants Ltd has identified the following possible ecological effects –

- *Clearance of vegetation. Indigenous vegetation clearance may be greater than indicated above* (table 4)*, as this figure was based solely on potential inundation area and did not include work platform of access or maintenance routes.*

- *A forest edge in excess of 700 m long would be created. Vegetation clearance may cause surrounding vegetation to dry out by removal of buffering vegetation. Such edge effects are likely to be more pronounced in taller vegetation.*

- *Construction and clearance works may cause damage to roots of large trees adjacent to clearance areas, with subsequent deterioration in health.*

- *Potential introduction of unwanted species (e.g. weeds).*

- *Soil compaction.*

- *Changes to the water table, which could cause previously unaffected vegetation to die or deteriorate through root rot.*

- *Loss of habitat for indigenous terrestrial fauna.*

- *Loss of riparian vegetation and potential deterioration of in-stream ecological values.*

- *Soil slumping causing additional loss of vegetation.*

The report has recommended the following mitigation measures –

- *Replanting forest edges with suitable eco-sourced indigenous plant species to assist with rapid edge reestablishment.*

- *Check for weeds on construction and works sites every three months for the first two years, and yearly thereafter for up to five years, or until an indigenous canopy is re-established, and undertake weed control as required.*

- *Establish temporary fences or high visibility tape around trees and parts of the site that need to be avoided during construction.*

- *Employ silt retention devices around the perimeter of the cleared site and construction areas.*

- *Undertake or fund pest control within remaining area of forest.*

- *Establish indigenous riparian margin (at least 20 m wide) using suitably eco-sourced plant species, along non-forested portions of the final lake.*

The report forms the basis on which the effects of the proposal may have on the area's ecology. It must be recognised that the report's recommendations are preliminary at this stage as it may be 50 to 100 years before the structure and associated work are carried out. It is reasonable to assume that the significant time delay will require that a new report be commissioned closer to the time that the dam is to be constructed.

The report does however provide the reader with an understanding of the area's ecology.

Most importantly, the report demonstrates that the effects can be avoided or mitigated through adopting appropriate measures.

In addition to the above, Council is currently working with DOC to mitigate the effects on the covenanted area of bush to an acceptable level. Measures include offset modeling, regeneration of areas of pasture, and covenanting new suitable areas in a 'like for like' manner.

5.4 Effects on Ecology (Fish Passage, Water Quality)

The National Institute of Water & Atmospheric Research Ltd (NIWA) has provided a report on the Maungakotukutuku Stream's aquatic ecology.

The aquatic ecology has been described in Part 2.6 of the subject report. NIWA's report titled *'Technical memo summarizing the effects to aquatic ecology of proposed water supply options for the Kapiti Coast'* dated May 2010 is attached in full under Appendix 2 of the subject report.

This report has identified the following effects on the aquatic ecology in relation to the proposed NOR –

- *Dam construction would potentially disrupt movement of native fish to and from the sea. In particular, there is a high risk that eels will encounter the dam when migrating downstream. Survival of or damage to eels moving past the dam will be an issue.*

- *Water quality in the reservoir may be affected as flooded vegetation at the proposed site decomposes. A decision needs to be made as to whether large trees would be removed prior to reservoir filling, or whether they would be left to decompose. If vegetation is removed, sedimentation may become an issue.*

- *There will be a total loss of river habitat, displacing fish such redfin bullies and torrent fish and koaro, and invertebrates from the flooded river. Other fish species such as trout, giant kokopu and eels, however, can tolerate lentic conditions.*

NIWA has recommended the following mitigation measures to reduce the effects of the proposal –

- *Fish passage can be assisted by constructing a bypass pipe/channel such that when water gets close to crest/spill levels, an open pipe through the dam provides safe passage down to the riverbed.*

- *A multi-level outlet structure could be included in the dam design to allow the release of both surface oxygenated water, and deeper water to minimise against release of poor quality water.*

This report, like the report prepared by Wildland Consultants Ltd, provides an understanding of the current situation and demonstrates that any adverse effects on the streams ecology can be mitigated by the adoption of appropriate mitigation measures.

Again, any methods and techniques that are adopted will be based on good practice at the time the dam is erected.

Overall, it is considered that subject to the adoption of appropriate measures, the

effects on the stream's ecology will be acceptable and manageable.

5.5 Effects of Stability (Geotechnical Investigations)

The Gibbs Fault (which is an uncertain – poorly constrained fault) runs across the site in a north-east to south-west direction, and a thin strip of land across the northern corner of the site running in a west-east direction is identified as a well-defined fault.

Damwatch Services Ltd has been engaged to carryout the relevant geotechnical investigations for the dam site. They have carried out a series of field surveys including drilling and sampling. The following is an extract from their full report titled *'Lower Maungakotukutuku Dam Interpretave Geotechnical Report'* dated August 2010 is attached in Appendix 3 of the subject report. They have summarized the following –

> *The dam site is underlain by greywacke bedrock.*
> *The greywacke bedrock is moderately to highly jointed and sheared. The rock mass however is relatively competent, as demonstrated by the near vertical sides of the inner gorge, which has withstood multiple seismic events over tens of thousands of years.*
>
> *The left abutment greywacke has been hydrothermally altered.*
> *The greywacke beneath the left abutment intercepted by drillhole LM1 has been hydrothermally altered millions of years ago. This accords with observations in the inner river gorge just upstream from the dam site. The extent of this altered greywacke is yet to be defined.*
>
> *The permeability of the greywacke rock mass is low.*
> *Tests within the drill holes indicate the greywacke rock mass has a very low permeability. It is anticipated that foundation treatment, such as grouting, required to control seepage under the dam, would therefore be limited.*
>
> *No large scale discontinuities have been identified.*
> *No faults, or low angle discontinuities of significance have been encountered within the drill holes. This concurs with the lack of surface displacement displayed at the dam site, inferring an absence of potentially active faults. No sub-horizontal discontinuities or through going faults of recent origin have been encountered, although drilling has yet to fully investigate the dam foundation.*
>
> *Overburden on the terraces would need to be stripped.*
> *Approximately 6m of alluvial and colluvial overburden was intercepted on the right bank terraces with inferred thickening of overburden at the right abutment. Minor alluvium and a wedge of colluvium is present on the left bank. This overburden would be stripped to prepare the dam foundation.*
>
> *The site is considered suitable for siting a gravity dam and diversion tunnel.*

The current level of investigation has located no fatal flaws. Further investigation necessary to fill in gaps in the geological information would be required as part of subsequent detailed design.

In light of the above, it can be drawn that the proposed siting is suitable for the construction of a dam. Further geological survey will be undertaken prior to the construction of the dam and will be lodged with at the outline plan stage.

5.6 Effects of Slope Stability

The NZSOLD Dam Safety Guidelines refer to the risk of landslides in the reservoir potentially affecting downstream safety. The initial assessment of the reservoir and dam site area that the slopes are free of areas of major instability.

5.7 Effects of Construction and Operation

The proposed method of construction of the dam and its operation and maintenance requirements are described in Parts 3.3 & 3.4 of the subject report respectively.

5.6.1 Effects of Construction

The proposed dam is a large scale construction project and is expected to take between 18 to 20 months to complete.

Significant construction effects are anticipated for a project of such a scale. These include those associated with access roads, site clearing, diversion of water course, drilling, concrete supply, quarrying and temporary site buildings.

It is envisaged that a Construction Management Plan (CMP) or similar document will be submitted at the outline plan stage. CMP's are used to mitigate environmental effects associated with construction activities to acceptable levels. The Plans generally include such matters as: traffic management, dust, odour, noise, sediment control and site remediation measures.

These plans are generally drafted in consultation with the local council and are subject to the Council's approval.

The majority of the construction traffic should be limited to light vehicles, as the bulk of the raw materials to be used in the construction of the dam, are to be quarried on-site. A temporary crushing plant and concrete batching plant will be established on the site.

All construction traffic will be subject to the CMP and appropriate traffic techniques will be implemented to minimise any impact on the local traffic network and vehicle movements.

Significant construction noise and vibration will be unavoidable during the construction of the dam. However, these can be managed to an appropriate level through the use of appropriate mitigation measures in the CMP. The measures will be supplemented by the steep hill and the significant separation distance

between the nearest houses and the construction site.

Construction air quality will be monitored carefully and appropriate mitigation measures will be part of the CMP. These will include dust repression, and regular cleaning of equipment to avoid mud being trekked onto the legal road.

The proposed dam will most probably require consents from the Greater Wellington Regional Council. The Council will apply for these consents closer to the time of construction. If approved it is reasonable to assume that the consents will be subject to conditions.

5.7.2 Effects of the Reservoir

The filling of the reservoir is anticipated to take approximately 7 weeks. This will be achieved by closing the diversion culvert bulkhead gates when the dam, spillway and penstock intake structure are complete and functional. This will preferably take place in autumn to take advantage of higher winter flows to speed filling the reservoir.

During the lake filling period downstream flows will be maintained by discharging through the lowest intake.

Also during this period, the dam will be monitored with flow measuring weirs on the outlet to the under drains. Piezometers would be located under the dam foundation to measure any uplift pressure under the structure. Survey marks will be located along the crest of the dam to monitor any deformation of the dam structure.

These instruments will be monitored from the completion of the dam structure through to the filling of the reservoir, and over the life of the dam.

The monitoring, reading and recording of the instruments will take place in order to ensure the safety and stability of the dam. During the filling of the reservoir, the lake's banks will be monitored to ensure that they are stable.

After the reservoir has filled, the diversion culvert will be permanently plugged with water tight mass concrete infill.

5.7.3 Effects of Changing Reservoir Levels

The level of the reservoir will fluctuate due to its function. The environmental effects that may result from the fluctuation in the lake's levels will be determined by the area's topography, nature of soils, rock, climate and hydrology.

In this case, there is the potential for wind erosion of the exposed ground at low lake levels. The options available to manage the dust effects that may arise are managing the level to reduce extremes in fluctuation and plantings to minimise wind erosion.

5.7.4 Effects of Operation and Maintenance

A dam maintenance plan will be submitted at the outline plan stage once the design of the dam and its associated facilities are finalized. This plan will include provisions for access road, drainage, and vegetation control, clearance of debris from the spillway, servicing of the outlet valves, and routine surveillance.

5.8 Effects of Potential Land Contamination

Greater Wellington Regional Council has confirmed that the subject site is not listed under the Selected Land Use Database (SLUR) database as a site that has used, stored or disposed of hazardous substances.

5.9 Effects on Maori Cultural Values

The Council has been working closely with the tangata whenua in selecting the options that led to the selection of the Lower Maungakotukutuku dam site. The relationship has taken into account the tangata whenua's relation to water management, based around the core values of kaitiakitanga, tino rangatiratanga, taonga, mauri, and whakapapa. The focus has been on investigating in-catchment options as a first priority. This approach demonstrates that the Council considers that these core values are important and must be into account.

Ngāti Raukawa in particular has confirmed their support for an in-catchment water supply solution.

Te Āti Awa has recently completed their Cultural Impact Assessment (CIA) for both the river recharge and Maungakotukutuku dam projects, completed by Hāpai Whenua Consultants. Te Āti Awa prefer the construction of the Maungakotukutuku dam over the river recharge with groundwater option. Te Āti Awa believe that the risks associated with the construction of a dam are well known and can therefore be managed. The dam was viewed as a secure long-term water supply solution for the district. The Maungakotukutuku valley was cited as a "natural gorge", which lends itself to being dammed.

The CIA states that Te Āti Awa has an authentic willingness to work with KCDC in order to explore and apply mitigation and remediation measures if the dam is to be constructed, potentially including riparian restoration downstream of the dam site and the inclusion of a fish passage on any structure which alters the flow of the stream.

Overall, Te Āti Awa support the Maungakotukutuku dam as a community water supply project.

5.10 Effects of Dam Failure

The potential effects of the dam failing include those on public safety, property and livelihood, the environment, people and other tangible factors.

Dam safety risks can be managed, reduced and treated through adopting the principles of risk management as recommended in AS/NZS 4360:1999.

In addition to the tools set out in the standard, the NZSOLD Dam Safety Guidelines provides guidance on the design, construction and commissioning of dams. The guidelines also identify operation,. maintenance and surveillance of completed dams as being important components of the overall Quality Assurance objective for dam safety.

The sound operation, maintenance and surveillance systems and training in their use will reduce the likelihood off dam failure by providing early warning of unsatisfactory conditions developing. Where these can be identified with sufficient time for intervention actions to be taken, it should be possible to maintain dam safety before it deteriorates to a critical state.

Emergency action planning and training are an important method to reduce the consequences of dam failure.

AS/NZS 4360:1999 endorses ongoing monitoring and review of risks because livelihoods and consequences may change. Reviews should be a part of the safety management programme. These include Intermediate and Comprehensive safety reviews as described in the NZSOLD Dam Safety Guidelines as part of the ongoing process.

It is considered that subject to the provisions of the standards and the guidelines being fully implemented and maintained, the effects of the dam failing would be miminised.

To ensure that the above are adopted and the risk of dam failure is minimised, appropriate conditions will be imposed on the consent that require the dam to be built to the appropriate design standards.

5.11 Other Relevant Matters

There is an existing protective covenant on site in order to protect indigenous plant species. This was described in Part 2.5 of the subject report.

The applicant is currently negotiating with DOC and has engaged Wildland Consultants Ltd. The proposal is to adjust the covenant by incorporating other areas of similar ecological value to off-set the area of the existing covenant which will be affected by the NOR. This involves offsetting modeling, replant on pasture, and covenanting new suitable areas in a ‘like for like’ manner.

The site does not contain any archaeological sites that are identified by the District Plan.

5.12 Positive Effects

The construction of the dam will have significant positive benefits which include:

- The primary positive effect of the proposal is that it will future proof the

water supply to the Waikanae, Paraparaumu and Raumati areas. This is consistent with the community's and Council's aspirations and The provision will have both economic and social benefits for the local communities.

- In addition to ensuring the supply of water to these areas, the dam and its surroundings have the potential to be used for recreational activities. If developed as a recreational facility, the dam will add to the district's list of attractions as well as being beneficial to its open space strategy. The water body will enhance the landscape character by adding diversity, interest and sense of open space to the valley.

- There is the potential for the dam to be used for micro-hydro generation.

- The dam may suppress flood flows and lessen flood effects downstream.

- The dam will create new habitats for particular wildlife, including water fowl and freshwater fisheries (lake based) fishery.

- Controlling the peak flows will reduce the scouring/erosion of the riverbanks and allow riparian vegetation to establish and be enhanced.

- The aquatic environment may be enhanced by the more extensive riverbank vegetation.

5.13 Conclusion on Assessment of Effects on the Environment

The actual and potential effects of the construction and operation of the dam have been identified and outlined above. The key factor that must be taken into consideration is the time line. The dam is to be constructed in 50 to 100 years time, whereas the above assessment is based on the current environment.

Many of the issues and required mitigation measures may therefore vary significant than those identified and proposed above.

What this assessment does do, is provide guidance that the identified effects can be mitigated to the extent that any of the effects will be no more than minor. It is reasonable to assume that the mitigation measures will only be improved as technology allows the development of more suitable and effective measures, including construction techniques.

In addition to the advances in technology, the long lead in period will allow the Council to be proactive in mitigating many of the potential effects, such as undertaking appropriate planting.

6.0 Proposed Conditions

In relation to the mitigation identified as being necessary, the following conditions are proposed. Note that many of the conditions will require modification at the time of the design and construction of the dam due to the lapse between when this designation is approved and when the dam is built. The ability to require the applicant to comply with the intent of the conditions will need to be incorporated into the consent.

Definitions

Council	-	Kapiti Coast District Council
District	-	Kapiti Coast District
District Plan (the Plan)	-	Kapiti Coast District Plan
The Manager	-	[insert relevant position title] of the Council
Outline Plan (OP)	-	an outline plan prepared in accordance with section 176A of the RMA
Project	-	The construction, maintenance and operation of the Lower Maungakotukutuku Dam
Requiring Authority	-	Kapiti Coast District Council
RMA or 'the Act'	-	Resource Management Act 1991
Road Asset Manager	-	Kapiti District Council's road asset manager
Work	-	Any activity or activities undertaken in relation to the Project

General Conditions and Administration

1. Except as modified by the conditions below, and subject to final design, the Project shall be undertaken in general accordance with the information provided by the Requiring Authority in the Notice of Requirement dated October 2012 and supporting documents being:

   (a) Assessment of Environmental Effects report, dated XXX
   (b) Plans:
   (c) List relevant plans

   For the avoidance of doubt, none of these conditions prevent or apply to works required for the ongoing operation or maintenance of the Project following construction. Depending upon the nature of such works, Ps or OP waivers may be required for any such works. Where there is conflict between

the documents listed above and these conditions, these conditions shall prevail.

2. The designation shall lapse if not given effect to within 100 years from the date on which it is included in the District Plan under section 175 of the RMA.

Construction Traffic

3. A construction traffic management plan (CTMP) shall be prepared by the Requiring Authority and provided to the Road Asset Manager for certification at least 20 working days prior to commencement of construction of any part of the Project.

4. The CTMP shall contain a section setting out methods to manage the construction traffic effects of construction of the Project. These methods shall include, but not be limited to:

    (a) Traffic and access considerations;
    (b) Methods to manage effects on the amenity of surrounding residents' including hours of operation, and number of heavy vehicle movements per day;
    (c) Methods to maintain the quality of local roads used as access routes.

Archaeology and Accidental Discovery

5. The Requiring Authority, in consultation with, Te Ati Awa ki Whankarongotai and the New Zealand Historic Places Trust, shall prepare an accidental discovery protocol, and provide a copy to the Council at the same time as submission of the Outline Plan. The protocol shall be implemented in the event of accidental discovery of cultural or archaeological artefacts or features during the construction of the Project. The protocol shall include, but not be limited to:

    (a) Training procedures for all contractors regarding the possible presence of cultural or archaeological sites or material, what these sites or material may look like, and the relevant provisions of the Historic Places Act 1993 if any sites or material are discovered;
    (b) Parties to be notified in the event of an accidental discovery shall include, but need not be limited to Te Ati Awa ki Whankarongotai, the New Zealand Historic Places Trust, the GWRC, the relevant District or City Council and the New Zealand Police (if kiwi are discovered);
    (c) Procedures to be undertaken in the event of an accidental discovery (these shall include immediate ceasing of all physical works in the vicinity of the discovery); and
    (d) Procedures to be undertaken before Work under this designation may recommence in the vicinity of the discovery. These shall include allowance for appropriate tikanga (protocols), recording of sites and material, recovery of any artefacts, and consulting with Te Ati Awa ki Whankarongotai and the New Zealand Historic Places Trust prior to recommencing works in the vicinity of the discovery.

Construction Noise and Vibration

6. At least 20 work days prior to the commencement of Works, a construction noise and vibration management plan (CNVMP) shall be prepared, by a suitably qualified and experienced person, and the works shall be undertaken in accordance with that CNVMP.

7. Subject to condition 6, all construction work shall be designed, managed and conducted to ensure that construction noise from the site does not exceed the limits in NZS6803:1999 Acoustics–Construction Noise at locations set out in section 6.2 of that standard.

8. Subject to condition 6, vibration from all construction activities shall not exceed the limits of, and shall be measured and assessed in accordance with, German Standard DIN 4150-3 (1999-02) *Structural Vibration – Effects of Vibration on Structures*.

Landscaping and Visual Mitigation Planting

9. The Requiring Authority shall prepare a visual mitigation planting plan for the site as part of the Outline Plan.

10. The Requiring Authority shall implement the visual mitigation plan within the first planting season following completion of the first bulk earthworks on the site and shall thereafter maintain the planting to the satisfaction of the Manager.

Protective Covenant

11. Work shall not commence until the affected area of protective covenant xxx on Lot 2 DP 360865 is uplifted.

Terrestrial Ecology

12. Following the clearing of the site, forest edges for the reservoir/inundation area shall be replanted with suitable eco-sourced indigenous plant species to assist with rapid edge re-establishment. The species are to be selected in consultation with Council's Biodiversity Advisor.

13. The growth of weeds shall be inspected on construction and works sites every three months for the first two years, and annually thereafter for up to five years, or until an indigenous canopy is re-established. Weed control shall be conducted when required.

14. Prior to the commencement of construction, high visibility fencing or tape shall be established around trees and any parts of the site that need to be avoided during construction.

15. During and following the construction phase, pest control shall be undertaken (or funded to be undertaken) for the remainder area of forest on the site for a period of 5 years.

16. Following the clearing of the site, an indigenous riparian margin (of at least 20 metres wide) shall be established using suitably eco-sourced plant species, along non-forested portions of the reservoir/inundation area. The species are to be selected in consultation with Council's Biodiversity Advisor.

Construction Environmental Management Plan

17. A construction environmental management plan (CEMP) shall be submitted to Council at the outline plan stage. This management plan shall incorporate the CTMP, CNVMP, and other measures including but not limited to: dust, odour, and sediment control, and site remediation measures.

Dam Construction, Maintenance and Monitoring Plan

18. A dam and associated structures shall be designed, constructed, operated and maintained for the life of the dam in accordance with the NZSOLD Dam Safety Guidelines, November 2000 or equlivant documents.

19. The consent holder must comply with the "Quality Assurance " requirements applying to medium hazard dams set out in section C.3 of the NZSOLD Dam Safety Guidelines, November 2000 or equlivant documents, during the construction of the dam.

20. A dam safety and surveillance management plan shall be completed in accordance with the criteria specified in the NZSOLD Dam Safety Guidelines, November 2000 or equlivant documents. The consent holder shall submit to the consent authority a copy of the Plan at least three months prior to the construction of the proposed work.

21. Dam safety inspections shall be carried out accordance with the criteria specified in the NZSOLD Dam Safety Guidelines, November 2000 . or equlivant documents. A report of the evaluation shall be submitted to the consent authority.

22. An emergency action plan shall be developed in accordance with the criteria specified in the NZSOLD Dam Safety Guidelines, November 2000 or equlivant documents.

7.0 Statutory Assessment

7.1 Introduction

As discussed in Section 1 of this report, section 168A(3)(a) of the RMA provides that a territorial authority must consider the effects on the environment of allowing the NOR, having particular regard to:

Of relevance to this NOR are:

- National policy statements:
    - National Policy Statement for Freshwater Management 2011
    - National Policy Statement for Renewable Electricity Generation 2011

- Regional policy statements:
    - Wellington Regional Policy Statement 1995
    - Proposed Wellington Regional Policy Statement.

- Plans:
    - Wellington Freshwater Regional Plan 1999.
    - Kāpiti Coast District Plan 1999.

In addition to these statutory matters, there are some other relevant matters:

- Water Matters – Sustainable Water Management Strategy.
- The Long Term Council Community Plan (including the sustainable development principles).
- Development Management Strategy.
- Conservation covenant under the Reserves Act 1977.

The relevant provisions of all these matters are set out and assessed.

7.2 National Policy Statement

The National Policy Statement for Freshwater Management 2011 took effect in July 2011, and is considered relevant to the application as the NOR is for water supply purposes.

The National Policy Statement for Renewable Electricity Generation 2011 is also considered relevant as there is the potential for the proposed dam to generate electricity.

The dam would remain full most of the time when there is sufficient flow in the Waikanae River to supply the water demand. Stream flow would discharge over the spillway if the outlet works are closed.

There is potential to tap into the water supply outlet works pipe which passes through the dam body with a micro-hydro penstock. This penstock could feed into

a micro-hydro power station immediately downstream of the dam. The amount of flow that could be utilised to generate electricity would be dependant on the generation capacity installed and ability of the plant to utilise low flows.

If the plant can utilise 70% of the flow available, which is a normal utilisation for such an installation, the potential energy generation, based on mean flow of 598 L/s and overall efficiency of 80%, would be 900,000 kW.hr per year.

7.3 Regional and District Policy

The Regional Policy Statement, Regional Plans and District Plan contain objectives and policies to guide the sustainable management of natural and physical resources on the Kapiti Coast. This includes the management of water and development of water supply to provide for well-being of the community.

7.3.1 Regional Policy Statement

The following provisions of the Proposed Regional Policy Statement (PRPS) are considered relevant to the proposed NOR. The provisions of the PRPS were used for assessment as they provide a more detailed vision than those of the operative Regional Policy Statement. It is understood that the decision on submissions has been notified for the PRPS and it is currently undergoing an appeal process.

Regionally significant infrastructure
Objective 10: The social, economic, cultural and environmental, benefits of regionally significant infrastructure are recognised and protected.

Policy 6: Recognising the benefits from regionally significant infrastructure and renewable energy – regional and district plans.

The quantity and quality of fresh water
Objective 12: The quantity and quality of fresh water to
(a) meet the range of uses and values for which water is required;
(b) safeguard the life supporting capacity of water bodies; and
(c) meet the reasonably foreseeable needs of future generations.

Policy 11 and 39: Maintaining and enhancing aquatic ecosystem health in water bodies – regional plans and consideration.

Policy 12: Allocating water – regional plans

Policy 14 and Policy 40: Minimising the effects of earthworks and vegetation disturbance – district and regional plans and consideration.

The health of the region's rivers, lakes and wetlands
Objective 13: The region's rivers, lakes and wetlands support healthy functioning ecosystems.

Policy 16 and 42: Protecting aquatic ecological function of water bodies – regional plans and consideration.

Policy 17: Protecting significant values of rivers and lakes – regional plans.

Efficient use of water
Objective 14: Water is used efficiently and is not wasted.

Policy 18: Using water efficiently – regional plans and consideration.

Policy 19: Prioritising water abstraction for the health needs of people – regional plans.

Policy 43: Managing water takes to ensure efficient use – consideration.

Policy 65: Promoting efficient use and conservation of resources – non-regulatory.

Protection and enhancement of ecological values
Objective 16: Indigenous ecosystems and habitats with significant biodiversity values are maintained and restored to a healthy functioning state.

Policy 23: Protecting indigenous ecosystems and habitats with significant indigenous biodiversity values – district and regional plans.

Policy 46: Managing effects on indigenous ecosystems and habitats with significant indigenous biodiversity values – consideration.

The purpose of the NOR is largely consistent with the principles of the RPS and PRPS. The purpose of the NOR is to secure the future supply of water to the local community which is consistent with the purpose of the PRPS.

7.3.2 Kapiti Coast District Plan

The subject site lies in the rural zone and adjoins the conservation zone to the north. A small corner of the site on the northern side will be within the outstanding landscape overlay, while the eastern corner of the site is under the ecological site overlay (E17). The site is also wholly within the Waikanae water collection area in accordance with the rural subdivision overlay. The Gibbs Fault (which is an uncertain – poorly constrained fault) runs across the site in a north-east to south-west direction. A thin strip of land across the northern corner of the site running in a west-east direction is identified as a well-defined fault.

Objectives and Policies of the Kapiti Coast District Plan

The Relevant provisions of the Kapiti Coast District Plan are listed and assessed below –

C.2 Rural Zone

C.2.1 Objectives & Policies

Objective 1.0 – General

Ensure that any adverse effects of activities on the natural and physical environment of rural areas and of rural based activities beyond this environment are avoided, remedied or mitigated with particular regard to sustaining the life supporting capacity of the resources of the land to meet the needs of future generations.

Comment – The purpose of the NOR is to provide water supply to future generations by utilizing existing resources. The effects of the proposal is considered to be no more than minor following Parts 5.1 to 5.7 of the subject report.

Policy 1(A) – Natural Environment – Identification and Protection

Identify and protect areas of significant indigenous vegetation and significant habitats of indigenous fauna.

Comment – The applicant is currently working with Wildland Consultants Ltd and DOC in order to identify a suitable area within the subject site to offset the area under protective vegetation covenant that will be affected by the proposal.

Policy 1(B) – Natural Environment – Use and Development

Ensure the adverse effects of rural use and development on the natural environment are avoided, remedied or mitigated.

Comment – With the mitigation measures proposed by experts, and in consultation with Council's Biodiversity Advisor, the effects of the proposal on the natural environment will be no more than minor.

Policy 2 – Outstanding Landscapes

Maintain, enhance and protect the district's outstanding landscapes in the Rural Zone from inappropriate subdivision, use and development.

Comment – Although the proposal will include the creation of an access track around the buffer zone, the proposal will not alter the topography of the site in terms of its natural landscape. The surrounding hilltops will be untouched while the filling of the reservoir will not be visible to the general public unless they are granted access onto the site or are flying overhead. The appearance of the proposal will result in a lake surrounded by hilltops that is not considered to be out of character for a rural zone.

Policy 3 – Production Forestry

Control production forestry to avoid, remedy or mitigate any adverse effects on the environment.

Comment – Almost the entire area surrounding the subject site is currently utilized for production forestry. The proposal will not increase the intensity of production forestry operation. In fact, pine will be removed from the southern part of the site and this area will be utilised for re-vegetation of native bush.

Policy 4 – Extractive Activities, Intensive Farming, Rural Industry, Shelter Belts and Plantations, Tourism Activities and Settlements Based on Community Facilities

Control the adverse effects of intensive farming, shelter belts and plantations, home occupations and non rural activities on the physical and natural environment of rural areas and adjacent residential areas and amenity values of these areas.

Comment – The proposed dam and reservoir could be used for passive recreational activities, such as walkways and unpowered boating. This remains an option at this stage and its realization will be dependent on public consultation. If public access is to be permitted onto the site, operation hours will need to be carefully considered in order to mitigate any effects on the surrounding activities.

Policy 11 – Extractive Industry

Ensure the consequences of existing or proposed aggregate extraction sites on nearby land are considered when planning for and making decisions on new use, development and subdivision of land.

Comment – There will be no importation of extraction material into the site. The materials to be used for the dam will be extracted from the area to be inundated.

Kapiti Coast District Plan Review

The Kāpiti Coast District Plan review has commenced. Based on the current programme, the draft district plan is expected to be notified by the end of 2012. The Review will cover a range of topics. Topics of potential relevance to the subject proposal are likely to include: ecological sites (hill country), sites of importance to tangata whenua, archaeological sites, and earthworks.

7.3.3 Kapiti Coast District Policy

There are a number of District policy documents that are relevant to the subject NOR. They include:

- Water Matters – Sustainable Water Management Strategy.
- The Long Term Council Community Plan (including the sustainable development principles).
- Development Management Strategy.

These documents summarise Council policy position in relation to both growth of the District, water supply and water conservation. Many of the strategies established by these documents are given effect through detailed objectives, policies and rules in the District Plan. These documents are assessed in more detail under Part 5 Assessment of Effects on the Environment.

7.4 Other Statutory Matters

7.4.1 Reserves Act 1977 and Conservation Act 1987

An 18 hectare area of land within Lot 2 DP 360865 has been covenanted under the Reserves Act and is administered by the Department of Conservation (DOC).

The Council and DOC are currently in consultation with regards to the use of the covenanted area as part of the NOR.

At the time of writing, it is understood that DOC is largely in agreement with the proposal given that significant mitigation measures are put in place.

7.4.2 Part 2 of the RMA

Section 168A(3) of the RMA is subject to consider Part 2 (the purposes and principles of the RMA) of the RMA.

Section 5

Section 5 states –

> *(1) The purpose of this 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 proposed NOR will future-proof water supply for parts of the Kapiti Coast

District, which will provide for the community's social, economic and cultural wellbeing and for their health and safety. As outlined in the above assessment of effects on the environment, any adverse effects are able to be adequately avoided, remedied or mitigated, and are also balanced by the benefits that the NOR will bring. Given these matters, the proposal is considered to be consistent with the purpose of the Act.

Section 6 Matters of national importance

Section 6 states –

In achieving the purpose of this Act, all persons exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources, shall recognise and provide for the following matters of national importance:

> *(a) the preservation of the natural character of the coastal environment (including the coastal marine area), wetlands, and lakes and rivers and their margins, and the protection of them from inappropriate subdivision, use, and development:*
>
> *(b) the protection of outstanding natural features and landscapes from inappropriate subdivision, use, and development:*
>
> *(c) the protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna:*
>
> *(d) the maintenance and enhancement of public access to and along the coastal marine area, lakes, and rivers:*
>
> *(e) the relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga:*
>
> *(f) the protection of historic heritage from inappropriate subdivision, use, and development:*
>
> *(g) the protection of protected customary rights.*

The construction of the dam and the flooding of the valley behind the dam will have significant effects on the natural character of the valley, as it is today, and on access through the section that will be affected by the structure and inundation.

However it is considered that these effects will be offset by the creation of the lake and the potential of the water body and its surroundings begin used for recreational purposes.

The lake will take on the appearance of a natural water body, thereby altering the natural character of the valley from an area dominated by the extensive pasture covered flat and steep bush covered slopes.

Access around the lake will be made possible thereby re establishing access along the waterway.

Section 7 Other matters

Section 7 states –

> *In achieving the purpose of this Act, all persons exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources, shall have particular regard to—*
>
> *(a) kaitiakitanga:*
>
> *(aa) the ethic of stewardship:*
>
> *(b) the efficient use and development of natural and physical resources:*
>
> *(ba) the efficiency of the end use of energy:*
>
> *(c) the maintenance and enhancement of amenity values:*
>
> *(d) intrinsic values of ecosystems:*
>
> *(f) maintenance and enhancement of the quality of the environment:*
>
> *(g) any finite characteristics of natural and physical resources:*
>
> *(h) the protection of the habitat of trout and salmon:*
>
> *(i) the effects of climate change:*
>
> *(j) the benefits to be derived from the use and development of renewable energy.*

Of these matters, b, c and f are the most relevant.

The construction of the dam and subsequent shortage of water to service the long term needs of the Kapiti community will ensure that the facility results in and represents an efficient use of the natural resource.

The valley currently has a rural bush environment and offers an amenity that reflects its physical characteristics and relative isolation. The proposed reservoir will alter the valley's physical features with corresponding changes to the level and nature of the amenity that it provides.

It is considered that the amenity provided by the lake will adequately compensate for the change and will provide those that experience the area with an equlivant

experience.

The dam will result in the clearing of an area of mature bush and the inundation of a narrow bush lined gorge, in addition to the flat pasture land. The clearing and flooding will have impacts on these physical features and associated ecologies/habitats.

These impacts will be offset by the environment that the body of water will provide with regards to visual values and qualities, amenity levels and new habitats.

Overall it is considered that the lake and its recreational opportunities will provide a natural environment with high environmental values.

Section 8 Treaty of Waitangi

> *In achieving the purpose of this Act, all persons exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources, shall take into account the principles of the Treaty of Waitangi (Te Tiriti o Waitangi)."*

As described in part 4 of the subject report, Te Āti Awa, as the Tāngata whenua of the Maungakotukutuku dam site and wider water catchment area, has been actively involved in this project. Council has been working closely with the tangata whenua in selecting the options that led to the selection of the Lower Maungakotukutuku dam site, taking into account the tangata whenua's relation to water management, based around the core values of kaitiakitanga, tino rangatiratanga, taonga, mauri, and whakapapa.

The focus on in-catchment options as a first priority in the selection of the subject NOR site is a strong indication that Council is taking these core values into account.

Te Āti Awa has drafted a Cultural Impact Assessment (CIA) for both the river recharge and Maungakotukutuku dam projects. The CIA was carried out by Hāpai Whenua Consultants. Te Āti Awa believe that the risks associated with the construction of a dam are well known and can therefore be managed.

The CIA states that Te Āti Awa has an authentic willingness to work with KCDC in order to explore and apply mitigation and remediation measures if the dam is to be constructed. The measures include riparian restoration downstream of the dam site and the inclusion of a fish passage on any structure which alters the flow of the stream.

Overall, Te Āti Awa support the Maungakotukutuku dam as a future community water supply project.

8.0 Conclusion

The Kapiti Coast District Council, as the Requiring Authority, is seeking to designate an area of 79.74 hectares of land located at the end of Lower Maungakotukutuku Valley, Mahaki Road.

The purpose of the designation is to provide for the construction and operation of the Maungakotukutuku Dam as part of the Kapiti Water Supply Project.

The purpose of the water supply project was to identify the most suitable solution for providing water to meet the communities' needs for the next 50 to 100 years. Providing a reliable water supply for the Waikanae, Paraparaumu and Raumati (WPR) communities that is sustainable and will meet the expectations of consumers is a fundamental issue for Council. The existing water supply is under stress in terms of its capacity to meet the peak water demand in summer.

Following significant research undertaken between August 2009 and August 2010, and a series of public consultation sessions, 41 options were identified. Options were evaluated through a staged process of short-listing options based on their ability to meet the community's water supply needs. The community identified three main areas of concern:

- water quality,
- security of supply, and
- affordability.

The recommendations for a water supply solution were based on these concerns, together with environmental impact assessments, and consideration of the cultural and social well-being of the community. It was concluded that a River Recharge with Groundwater option is the preferred solution and the Maungakotukutuku Dam, the second preferred solution.

In August 2011, Council resolved to pursue both options in order to future-proof the water supply for the long term (i.e. 50-100 years).

This includes securing the ability to utilize the land as the proposal dam. This can be achieved using the designation provisions available under the RMA 1991.

The designation is necessary as it will secure the land required for the Lower Maungakotukutuku Dam and will enable KCDC to carry out the works necessary for this part of the Kapiti Water Supply Project. The principal reasons for requiring a designation to facilitate the works this requirement relates to are:

- The designation will enable KCDC to achieve its principal objective under the LGA 2002;
- The designation will enable KCDC to construct a new dam in accordance with one of its core functions under the LGA 2002;
- The designation is necessary to assist KCDC to achieve the specific Kapiti Water Supply Project objectives;

- The designation will allow KCDC and/or its authorised agents to undertake the works in accordance with the designation, notwithstanding anything contrary in the Kapiti Coast District Plan (KCDP);
- The designation will allow the land required to be identified in the KCDP, giving a clear indication of the intended use of the land;
- The designation enables the Lower Maungakotukutuku Dam project to be undertaken in a comprehensive and integrated manner; and
- The designation protects the proposed site from future development which may otherwise preclude the construction of the works.

The proposed dam lies on the Maungakotukutuku Stream, a tributary of the Waikanae River. The dam site is located where the valley narrows to a gorge downstream of a wider valley section, approximately 3 km upstream of the confluence of the Maungakotukutuku Stream with the Waikanae River.

The majority of the reservoir's floor is flat, with the surrounding land rising steeply forming a basin-like landscape.

Extensive consultation has taken place, including with key stakeholders such as Te Ati Awa Water Working Group, Ngati Raukawa, Nga Hapu o Otaki, Greater Wellington Regional Council, Department of Conservation, Forest & Bird, Fish & Game, and Friends of Waikanae River.

It is recognised that as the dam is unlikely to be constructed for at least 50 years, the framework/regime that the proposed dam will be subject to will be different. This request demonstrates that the dam can be constructed in a safe manner and be subject to appropriate monitoring. It is reasonable to assume that when the dam is required, its construction, operation and maintenance will be subject to industry guidelines and legislation that are equlivant to today's provisions.

The effects that the proposal may have on the natural environment will be significant in that the valley floor will be flooded and areas of native vegetation cleared. However it is considered that these adverse effects will be mitigated by the proposed measures and the "natural" environment that will be created as a result of the lake being formed behind the dam.

Overall, it is considered that the dam represents the most appropriate solution to providing Kapiti's residential areas with a water supply that meets their future demands, in a manner that makes effective and efficient use of the natural resource, both in terms of land and water in a sustainable manner.

Appendix 1 – Wildland Consultants' Report

Appendix 2 – NIWA Report

Appendix 3 – Damwatch Report

Appendix 4 – Site Photographs

Appendix 5 – Concept Drawings of Dam

Appendix 6 – SLUR Correspondence

Appendix 7 – Summary of Consultation