



5 Legal Position, Planning Instruments and Guidelines

5.1 Statutory Context

The resource consent applications are to be prepared, processed and considered in accordance with the relevant provisions of the Resource Management Act 1991 (RMA) and any relevant planning instruments. This Section provides an overview of the relevant provisions of the RMA identifies the resource consents required and outlines the provisions of the various planning instruments and guidelines that are of relevance to the applications.

5.2 Resource Management Act

5.2.1 Purpose and Principles of the RMA

The purpose of the RMA as set out in Section 5 'is to promote the sustainable management of natural and physical resources'. The term 'sustainable management' is defined to mean:

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 well-being and for their health and safety while:

- (i) *Sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and*
- (ii) *Safeguarding the life-supporting capacity of air, water, soil and ecosystems; and*
- (iii) *Avoiding, remedying or mitigating any adverse effects of activities on the environment.*

Section 5 is followed by Sections 6, 7 and 8 which set out the principles of RMA. Section 6 sets out a number of matters of national importance (such as 'the preservation of the natural character of the coastal environment and Section 7 a range of other matters (such as 'the maintenance and enhancement of the quality of the environment'). Section 8 requires that the principles of the Treaty of Waitangi be taken into account, which includes consultation and active participation of iwi. Any matters which are considered relevant in terms of these Sections are then assessed in making an overall judgement as to whether a proposal promotes or is contrary to Section 5.

5.2.2 Part 3 – Duties and Restrictions

Part 3 of the RMA contains the provisions which determine whether resource consents are required. The following activities will generally require authorisation by way of resource consent unless an operative plan contains a rule that resource consents are not necessary:

- Discharges of contaminants to water, air and land, including from any 'industrial and trade premises' (which are defined in the RMA to include all premises undertaking waste management activities) require resource consents (Section 15).
- Occupation, erection and use of structures in or on the foreshore or seabed (Section 12).
- Disturbance of the foreshore or seabed (Section 12).

5.2.3 Matters for Consideration

Section 104 of the RMA sets out the matters that the consent authority must have regard to when considering applications for resource consent. These include any actual or potential effects and any relevant planning instruments. All applications are subject to Part 2 of the RMA.



Section 105 applies to applications for discharge permits and requires consent authorities in addition to the matters contained in Section 104(1) to have regard to:

- a) *The nature of the discharge and the sensitivity of the receiving environment to adverse effects; and*
- b) *The applicant's reason for the proposed choice; and*
- c) *Any possible alternative methods of discharge, including discharge into any other receiving environment.*

Section 107 sets out the restrictions that apply to discharge permits and these have been identified and addressed in Sections 8, 0, and 11 of this AEE.

5.2.4 Meaning of Effect

Section 3 of the RMA sets out the meaning of effects in the context of this Act and this includes not only adverse effects but also positive effects. Cumulative effects are also included, which arise over time and in combination with other effects.

5.3 Planning Instruments

The Operative Regional Coastal Plan for Northland, and the Operative Regional Water and Soil Plan for Northland are the main planning instruments to be taken into account when assessing this Project. These Regional Plans set out the status of the various activities (i.e. whether the activities are permitted, controlled discretionary or non-complying), any environmental standards that must be met, and the relevant objectives and policies to assist in the evaluation of the application. An assessment of the Regional Plans and the consent status of the activities have been undertaken within this Section.

Other components of the Ruakaka long-term Wastewater Consents Project such as the discharge of contaminants to air are subject to the provisions of the Northland Regional Air Plan (NRAP). An assessment of the NRAP is included in this Section.

Other key national planning instruments that have been assessed in this Section are the New Zealand Coastal Policy Statement (NZCPS), the Operative Regional Policy Statement for Northland (RPS).

The Ruakaka WWTP site is currently designated in the Whangarei District Plan for 'wastewater pumping and treatment facility'. Land to the north of the WWTP site is designated for the 'proposed extension to existing wastewater treatment plant and disposal facility'. Activities associated with the future development of the Ruakaka WWTP are consistent with the designated purpose and all works will be contained within the existing designations area therefore there is no requirement to alter the existing designation.

5.3.1 Consents

The following table sets out the activities for which consents are being sought and the status of each activity under the relevant planning instrument. Overall the activities of the Project for which consent is being sought are considered to be discretionary activities under the relevant Regional Plans.

**Table 5.1 Summary of Consents and Activity Status**

Northland Regional Council	Application Number
The discharge of treated wastewater directly to water (including groundwater) which results in run-off to water via discrete flow paths is a discretionary activity , as determined by Rule 15.3.2 of the Northland Regional Water and Soil Plan and requires resource consents (discharge permits).	1, 2, 4, 5
The discharge of treated wastewater directly to land is a discretionary activity , as determined by Rule 15.3.1 of the Northland Regional Water and Soil Plan and requires resource consents (discharge permits).	1, 2, 4, 5
The discharge of contaminants to air is a discretionary activity as determined by Rule 9.3(2) of the Northland Regional Air Plan and requires resource consents (discharge permits).	3, 6
The construction, disturbance of the Coastal Management area, deposition of materials, erection or placement and the occupation of space for and use of an ocean outfall structure is a discretionary activity as determined by Rule 31.4.4(w) of the Northland Regional Coastal Plan and requires resource consents (coastal permits).	8,9
The discharge of treated wastewater to the coastal water from a land based wastewater treatment plant is a discretionary activity as determined by Rule 31.4.6(f) of the Northland Regional Coastal Plan and requires a resource consent (coastal permit).	7

5.4 Statutory Criteria and Restrictions

Depending on their status, applications for resource consents are evaluated in terms of a range of criteria set out in the RMA. Plans may also contain assessment criteria, and their objectives and policies are an important basis for decision making.

Section 104B of the RMA contains the matters to be considered when determining applications for Discretionary Activities.

The considerations are, in summary:

- Matters set out in Part II of the RMA, including the Act's purpose and principles of sustainable development; matters of national importance (such as the preservation of the natural character of Rivers and their margins and the protection of them from inappropriate use and development, the relationship of Maori and their culture and traditions with their ancestral lands, waters and other taonga); other matters to which decision makers must have particular regard (such as kaitiakitanga, the efficient use and development of natural and physical resources, amenity values, intrinsic values of ecosystems, environmental quality, the effects of climate change); and the principles of the Treaty of Waitangi.
- Provisions of the Regional Policy Statement.
- Objectives, policies, rules or other provisions of relevant plans and proposed plans.
- Any actual and potential effects on the environment of allowing the activity.
- Any other matters the Consent Authority considers relevant and reasonably necessary to determine the application (such as for example national standards and guidelines).

In addition to the matters set out in Section 104 of the RMA, Section 105 sets out matters to be considered when determining applications for discharge permits. These include the nature of the discharge and the sensitivity of the receiving environment, the applicant's reasons for making the proposed choice and any possible alternative methods of discharge, including discharge into any other receiving environment.



Section 107 of the RMA is also important in the consideration of applications for discharge permits. This Section contains important restrictions on the grant of discharge permits and effectively precludes a grant of consent, if after reasonable mixing; the discharge would result in any of the following effects:

- The production of any conspicuous oil or grease films, scums or foam, or floatable or suspended solids.
- Any conspicuous change in colour or visual clarity.
- Any emission of objectionable odour.
- The rendering of fresh water unsuitable for consumption by farm animals.
- Any significant adverse effect on aquatic life.

5.5 Resource Consents and Designation

5.5.1 Existing Designations

There are currently two designations relating to the Project.

The designation numbers under the Operative Whangarei District Plan 2007 (District Plan) are:

- DW4 - Ruakaka/One Tree Point Wastewater Treatment Plant, Sime Road, Ruakaka. The purpose of the designation is for a wastewater pumping and treatment facility. The site is 12.4 ha s in size and is owned by WDC.
- DW3 - Proposed extension to Ruakaka One Tree Point Wastewater Treatment Plant, Sime Road, Ruakaka. The purpose of this designation is for the proposed extension to the existing wastewater treatment plant and disposal facility. The site is 12.5 ha s in size and is owned by the Crown. It is partially made up of wastewater disposal Zones 6B and 7. The use of this land for such purposes is subject to, amongst other things, the granting of a concession under the Conservation Act. As discussed in Section 4 this is a contingency area for treated wastewater disposal should other land areas and reuse options not be adequate to manage all the treated wastewater before the ocean outfall is operational.

5.5.2 Existing Resource Consents

The following table details the current resource consents which WDC and a private adjacent landowner, J & R Keith (adjacent land known as the Keith Block) hold in respect to the discharge of contaminants to land and air in respect to the Ruakaka Wastewater Treatment and Disposal Scheme.

Whangarei District Council				
Ruakaka Wastewater Treatment Plant				
Schedule of Resource Consents held as Issued by Northland Regional Council				
Consent Number	Activity to be Authorised	Date Issued	Date Expired	New Consent Required
CON20040415501 (Zones 3, 6 & 7)	Discharge of contaminants to land from the Ruakaka treatment system	01.12.2006	31.05.2018	For Zones 3 and 6A only
CON20040415501 (Zone 3, 6 & 7)	Discharge of contaminants to air from the Ruakaka treatment system	01.12.2006	31.05.2018	For Zones 3 and 6A only



Whangarei District Council				
Ruakaka Wastewater Treatment Plant				
Schedule of Resource Consents held as Issued by Northland Regional Council				
Consent Number	Activity to be Authorised	Date Issued	Date Expired	New Consent Required
CON20061752701 (Keith Block/Zone 5)	Discharge of treated wastewater to land on Lot 10 DP 55607 Blk VII Ruakaka SD	02.12.2008	31.05.2018	
CON20061752701 (Keith Block/Zone 5)	Discharge of contaminants to air (primarily odour) to air from a wastewater disposal system on Lot 10 DP 55607 Blk VII Ruakaka SD	02.12.2008	31.05.2018	

5.5.3 Other Consents (land use) and Approvals (concessions) Being Applied For

WDC will apply for three concessions from the Department of Conservation for pipelines and associated structures on crown land. These are.

- For the discharge of treated wastewater from the Ruakaka Wastewater Treatment Site onto Zones 6B and 7.
- For the construction, occupation and access for pipelines and associated structures to convey wastewater from the WDC Ruakaka Wastewater Treatment Site to the WDC Rama Road Block,
- For the construction, occupation and access for the ocean outfall structure and associated structures to convey wastewater from the Ruakaka Wastewater Treatment Site to the Coastal Marine Area.

Under the Whangarei District Plan, resource consents may be required for the discharge of treated wastewater onto Business zoned land (Rama Road Block) and the Open Space zoned land (Roger Hall Memorial Park). These additional resource consents shall be applied for when required.

The movement of treated wastewater across the DoC land is considered to be a permitted activity if conducted by means of an underground pipeline under the Whangarei District Plan under the Open Space zone, Rule 46.3.2.

For earthworks and works within the coastal hazard zone and appropriate land use consent, if required, shall be applied for from the WDC and/or NRC when more precise details are known.

For building works, the necessary building consents, if required, shall be applied for from WDC when more precise details are known.

If necessary, authorities under the Historic Places Trust shall be obtained when more precise details are known.

5.5.4 Activities Not Requiring Resource Consent

The WWTP site is currently designated for 'wastewater pumping and treatment facility' while the land to the north of the WWTP site is designated for the 'proposed extension to existing wastewater treatment plant and disposal facility' within the WDC District Plan. The continued use and development of the Ruakaka WWTP is consistent with the designated purpose and all works will be contained within the



existing designations area therefore there is no requirement to alter the designation or obtain any land use consents for the proposed activities.

For any earthworks or building works within the existing designated sites, an appropriate Outline Plan of Works and building consent, if required, shall be applied for from the WDC when more precise details are known.

5.6 Relevant Planning Instruments

5.6.1 New Zealand Coastal Policy Statement

The New Zealand Coastal Policy Statement 2010 (NZCPS) is the only mandatory National Policy Statement under the RMA. The purpose of the NZCPS is to state policies to promote the sustainable management of natural and physical resources in relation to the coastal environment of New Zealand.

The NZCPS sets out policies regarding the management of natural and physical resources in the coastal environment. Local authorities are required by the RMA to give effect to the NZCPS through their plans and policy statements. Resource consent decision-makers must also have regard to relevant NZCPS policies.

The policy which is of key relevance is as follows:

Policy 23 (2) Discharge of contaminants states

In managing discharge of human sewage do not allow:

- (a) discharge of human sewage directly to water in the coastal environment without treatment; and*
- (b) the discharge of treated human sewage to water in the coastal environment, unless:*
 - (i) there has been adequate consideration of alternative methods, sites and routes for undertaking the discharge; and*
 - (ii) informed by an understanding of tangata whenua values and the effects on them.*

Section 6 of this AEE Report relates to this policy.

5.6.2 Regional Policy Statement for Northland

The Regional Policy Statement for Northland (RPS) became operative on the 31 March 1999. The RPS sets the direction for the future management of the Northland Region's significant resource management issues. All regional and district plans must give effect to the regional policy statement, and regard must be had to all the relevant objectives and policies when considering these applications.

Objectives and policies which are of key relevance are as follows:

14 Involvement of Tangata Whenua

14.3 Objective: *Involvement of tangata whenua in the management of the natural and physical resources of the region in a manner that recognises and respects tangata whenua and ahi kaa as kaitiaki o nga taonga tuku iho (guardians of the treasures of their ancestors, as handed down).*

16 Air Quality

16.3.1 Objective: *The sustainable management of the air resource by avoiding, remedying, or mitigating adverse effects on the environment from the discharge of contaminants to air.*

Section 12 of this AEE Report relates to these policies.



17 Water Quality

17.3.1 Objective: *The maintenance or enhancement of the water quality of natural water bodies and coastal waters in Northland to be suitable, in the long-term, and after reasonable mixing of any contaminant with the receiving environment and disregarding the effect of any natural events, for such of the purposes listed below as may be appropriate.*

Type of water body	Purpose
Other groundwater	Protection of uses of receiving water body, cultural purposes
Other harbour areas and open coastal beaches and bays	Aquatic ecosystems, contact recreation and aesthetic purposes, cultural purposes
Open coastal waters	Its natural state, cultural purposes

Policy b (1) Effluent Treatment and Disposal Systems

To require that all new discharges of organic contaminants, particularly sewage and animal wastes, either be onto or into land, or be the best practicable option when compared to land disposal. Discharges shall be considered to have been disposed onto land or into land where they have been passed through soil, or a constructed wetland where there is no discharge to surface water.

Sections 11 and 14 of the AEE Report relates to these policies.

18 Water Quantity and Flows

Objective 18.3.3: *The maintenance of groundwater levels to the extent that the use of groundwater resources is sustainable.*

Policy c (1) Sustainable Use of Groundwater and Lake Water Resources

To avoid any reduction in groundwater levels or pressure or any saltwater intrusion into aquifers that would result in loss of the resource or limit its use.

Section 11 of this AEE Report relates to these policies.

20 Soil Conservation and Land Management

Objective 20.3.2: *The protection of the soil resources, including soil quality and soil quantity, from degradation or loss as a result of unsustainable land use and land use practices.*

Policy b (1) Contamination Discharges:

To ensure that discharges onto or into land do not result in any toxic or potentially toxic accumulation of contaminants, significant loss of soil fertility, or any significant adverse effects on riparian vegetation and habitat, water quality, aquatic ecosystems, or cultural or spiritual values associated with the soil or water resource.

Section 11 of this AEE Report relates to these policies.



22 Coastal Management

Objective 22.3.1: *The preservation of the natural character of the coastal environment, including protection from inappropriate subdivision, use and development.*

Policy a (1) Preservation of Natural Character

In both the plan preparation and resource consent processes, to preserve the natural character of the coastal environment by, as far as practicable, avoiding adverse effects on:

- (i) Significant landscape values, including seascapes and significant landforms which impart a distinctly coastal character; and*
 - (ii) Significant indigenous vegetation, significant habitats of indigenous fauna, predominantly indigenous ecosystems and indigenous biodiversity; and*
 - (iii) Natural coastal processes, including the movement of sediments, water and biota; and*
 - (iv) Water quality; and*
 - (v) Cultural heritage values, including historic places and sites of significance to Maori; and*
 - (vi) Intrinsic and amenity values, including the values of wild and scenic areas*
- Where avoidance is not practicable adverse effects should be mitigated and provision made for remedying those effects to the extent practicable.*

Section 9 of this AEE Report relates to these policies.

25 Waste Management

Objective 25.3.2: *Efficient and environmentally sound collection, treatment and disposal of waste.*

Policy b (3) Waste Collection Treatment and Disposal

To promote the establishment of sewage treatment systems utilising land disposal.

Sections 11 and 14 of this AEE Report relates to these policies.

5.6.3 Regional Coastal Plan for Northland

The Regional Coastal Plan for Northland (RCP) became operative on the 30 June 2004. The RCP provides the regulatory framework for the sustainable management of the natural and physical resources in relation to the Northland Region's coastal marine area.

The provisions of the RCP that are considered to be of key relevance to these applications are as follows:

7 Preservation of Natural Character

7.3 Objective:

The preservation of the natural character of Northland's coastal marine area, and the protection of it from inappropriate subdivision, use and development.

Policy 2:

As far as reasonably practicable to avoid the adverse environmental effects including cumulative effects of subdivision, use and development on those qualities which collectively make up the natural character of the coastal marine area including:

- (a) natural water and sediment movement patterns;*
- (b) landscapes and associated natural features;*
- (c) indigenous vegetation and the habitats of indigenous fauna;*
- (d) water quality;*
- (e) cultural heritage values, including historic places and sites of special significance to Maori;*
- (f) air quality; and where avoidance is not practicable, to mitigate adverse effects and provide for remedying those effects to the extent practicable.*

Section 9 of this AEE Report relates to these policies.



11 Recognition of and Provision for Maori and their Culture and Traditions

11.3 Objective:

The management of the natural and physical resources within Northland's coastal marine area in a manner that recognises and respects the traditional and cultural relationships of tangata whenua with the coast.

11.4.2 Policy:

To recognise and, as far as practicable, provide for the concerns and cultural perspectives of tangata whenua in regard to the disposal of waste into water.

Section 16 of this AEE Report relates to these policies.

17 Structures

17.3 Objective

The provision for appropriate structures within the coastal marine area while avoiding, remedying or mitigating the adverse effects of such structures.

Policy 3: *Within all Marine Management areas, to consider structures generally appropriate where:*

- (a) there is an operational need to locate the structure within the coastal marine area; and*
- (b) there is no practical alternative location outside the coastal marine area; and*
- (c) multiple use is being made of structures to the extent practicable; and*
- (d) any landward development necessary to the proposed purpose of the structure can be accommodated; and*
- (e) any adverse effects are avoided as far as practicable, and where avoidance is not practicable, to mitigate adverse effects to the extent practicable.*

A structure that does not meet all of the considerations listed above may also be an appropriate development, depending on the merits of the particular proposal.

Section 9 of this AEE Report relates to these policies.

19 Discharges to Water

19.3 Objective

The avoidance of the effects of discharges of contaminants to Northland's coastal water and the remediation or mitigation of any adverse effects of those discharges of contaminants to coastal waters, which are unavoidable.

Policy 1: *In the consideration of coastal permit applications to use the best practicable option approach to avoid, remedy, or mitigate the adverse effects of:*

- (a) discharges from wastewater treatment plants*
- (b) urban and industrial stormwater discharges*
- (c) discharges from boat maintenance facilities*
- (d) discharges from ports on the coastal marine area.*

Policy 2: *Subject to Policy 1, in the consideration of coastal permit applications, to progressively eliminate direct discharges of human sewage to the coastal marine area from land-based wastewater treatment facilities, including existing authorised discharges, except where:*

- (a) the allowance of the discharge better meets the purpose of the Act than disposal on to land; and*
- (b) there has been consultation with the tangata whenua in accordance with tikanga Maori and due weight has been given to Sections 6, 7 and 8 of the Act; and*
- (c) there has been consultation with the community generally.*



Policy 4: *To ensure that the individual and cumulative effects of authorised discharges to the coastal marine area do not compromise the maintenance and enhancement of coastal water quality.*

Section 8 of this AEE Report relates to these policies.

The discharge of treated wastewater into the coastal water from a land based treatment plant and the erection, placement, occupation and use of the ocean outfall structures are all considered to be discretionary activities pursuant to Rule 3.1.4.6(f) and 3.1.4.4(w) as determined by the Regional Coastal Plan. The activities required resource consent (coastal permits) as summarised in Table 5.1 above.

5.6.4 Regional Water and Soil Plan for Northland

The Regional Water and Soil Plan for Northland (RWSP) became operative on the 28 August 2004. The NRWSP provides the regulatory framework for the sustainable management of the Northland Region's water and soil resources.

The provisions of the RWSP that are considered to be of key relevance to these applications are as follows:

6. Recognition of and Provision for Maori and their Culture and Traditions

6.3 Objective:

The management of the natural and physical resources within the Northland region in a manner that recognises and provides for the traditional and cultural relationships of tangata whenua with the land and water.

Section 16 of this AEE Report relates to these policies.

7. Water Quality Management

7.4 Objective:

The maintenance or enhancement of the water quality of natural water bodies in the Northland region to be suitable, in the long-term, and after reasonable mixing of any contaminant with the receiving water and disregarding the effect of any natural events, for such of the purposes listed below as may be appropriate:

Type of water body	Purpose
Other groundwater	Protection of uses of receiving water body, cultural purposes
Other harbour areas and open coastal beaches and bays	Aquatic ecosystems, contact recreation and aesthetic purposes, cultural purposes
Open coastal waters	Its natural state, cultural purposes

Section 8 of this AEE Report relates to these policies.

8. Discharges

8.6 Objective:

The effective treatment and/or disposal of contaminants from new and existing discharges in ways which avoid, remedy or minimise adverse effects on the environment and on cultural values.

Policy 1: *To require all new discharges of sewage or discharges with a high organic content to be:*

(a) By land disposal; or

(b) To water, if after reasonable mixing:

(i) it does not cause a discernible adverse change in the physiochemical and/or microbiological water quality of the receiving water at the time of discharge; and

(ii) it is the best practicable option (as defined by Section 2 of the Act).



Policy 4: *To promote effective effluent treatment and disposal systems which are:*

- (a) Low maintenance and low risk;*
- (b) Land based, where the soil types, available disposal areas, back-up facilities and pumping systems are adequate;*
- (c) Operated in accordance with approved maintenance and contingency plans; and*
- (d) Designed and maintained so as to prevent the collection of catchment runoff.*

Sections 11 and 14 of this AEE Report relates to these policies.

10 Groundwater Management

10.4 Objective:

The sustainable use and development of Northland's groundwater resources while avoiding, remedying or mitigating actual and potential adverse effects on groundwater quantity and quality.

Policy 1: *To ensure the sustainable use of groundwater resources, by avoiding groundwater takes that exceed recharge which result in any of the following:*

- (a) Saltwater intrusion or reduced groundwater quality;*
- (b) A lowering of the groundwater table below existing efficient bore takes;*
- (c) A lowering of the temperature of geothermal waters in geothermal aquifers and springs;*
- (d) Adverse effects on surface water resources in terms of Policy 10.05.07.*

Section 11 of this AEE Report relates to these policies.

The activities of the discharge of treated wastewater to water and on to land, including the seepage to groundwater, are all considered to be discretionary activities pursuant to Rule 15.3.2 and 15.3.1 as determined by the Regional Water and Soil Plan. The activities required resource consent (discharge permits) as summarised in Table 5.1 above.

5.6.5 Regional Air Quality Plan for Northland

The Regional Air Quality Plan for Northland (RAQP) became operative on the 31 March 2003. The NRAQP purpose is to assist the NRC sustainable manage the Northland Region's air quality.

The provisions of the RAQP that are considered to be of key relevance to these applications are as follows:

Objective 1:

The sustainable management of Northland's air resource including its physical, amenity and aesthetic qualities by avoiding, remedying or mitigating adverse effects on the environment from the discharge of contaminants to air.

Policy 1: *To maintain the existing high standard of ambient air quality in the Northland region, and to enhance air quality in those instances where it is adversely affected, by avoiding, remedying or mitigating adverse effects of activities discharging contaminants to air.*

Sections 12 and 13 of this AEE Report relates to these policies.

The activities of the discharge the contaminants to air are considered to be discretionary activities pursuant to Rule 9.3(2) as determined by the Regional Air Quality Plan. The activities required resource consent (discharge permits) as summarised in Table 5.1 above.



5.6.6 New Zealand National Environmental Standard for Air Quality

In October 2004, the Government introduced the National Environmental Standards for Air Quality. The 14 standards include:

Seven standards banning activities that discharge significant quantities of dioxins and other toxics into the air.

- Five standards for ambient (outdoor) air quality.
- A design standard for new wood burners installed in urban areas.
- A requirement for landfills over 1 million tonnes of refuse to collect greenhouse gas emissions.

5.7 Other Relevant Legislation

5.7.1 Local Government Act 2002

The purpose of the Local Government Act 2002 (LGA 2002) is to:

“Promote the social, economic, environmental and cultural wellbeing of communities in the present and for the future”.

Local Authorities are required under Section 77 of the LGA 2002 to consider the benefits and costs of in the decision making process in terms of the present and future social, economic, environmental and cultural wellbeing of their district.

In addition, in the case of a significant decision that relates to land or a body of water, the local authority is also required to take into account the relationship of Maori and their culture and traditions with their ancestral land, water, sites, waahi tapu, valued flora and fauna and other taonga.

The local authority has to assess each option by considering the extent to which community outcomes would be promoted or achieved in an integrated and efficient manner by each option, and the impact of each option on the local authority’s capacity to meet present and future needs in relation to any statutory responsibility of the local authority.

The views and preferences of persons likely to be affected by, or to have an interest in any matter have to be considered at every stage of the decision making process.

Section 123 of the LGA 2002 requires local authorities to undertake assessments of sanitary services which includes assessment of alternatives, quality and quantity of wastewater discharge.

5.7.2 Health Act 1956

This legislation requires WDC to ensure safe sanitation through the improvement, promotion and protection of public health within its District. The Act also requires WDC to inspect its District to ascertain if conditions exist which are likely to be injurious to health. If such conditions do exist, Councils are required to take reasonable steps to ensure that they are abated or removed.

5.7.3 The Reserves Act 1977

The Reserves Act 1977 requires the Department of Conservation (DOC) to administer the preservation and management of crowned owned (public) areas in New Zealand. In regards to the coast DOC is to ensure that access for the public to and along the coast, bays, inlets and off shore islands are preserved and protected from unnecessary development.



The 'Proposed Scheme' seeks to utilise land owned by DOC to construct, occupy and provide access for pipelines and associated structures to convey wastewater from the Ruakaka Wastewater Treatment Site to the WDC Rama Road Block. The "Proposed Scheme' also proposes to construct, occupy and seek access over land owned by DOC for the ocean outfall structure and associated structures to convey wastewater from the Ruakaka Wastewater Treatment Site to the Coastal Marine Area. It is considered that this legislation is of relevance to ensure that the Project does not inhibit the provision of access to the Bream Bay coastline for the general public.

5.8 Information Requirements (4th Schedule Requirements)

Section 88 and the Fourth Schedule of the RMA sets out the information required to support applications for resource consent. These provisions are addressed throughout the AEE Report. The cross referencing table included at the start of this report and repeated as Table 5.2 below provides a summary of these.

Table 5.2 Cross-Reference to Provisions of the Fourth Schedule RMA 1991

1. Matters that should be included in an assessment of effects on the Environment	Relevant Section in this AEE
(a) A description of the proposal	1.5, 4.4, 4.5, 4.6
(b) Description of any possible alternative locations or methods for undertaking the activity	6
(c) Repealed	--
(d) An assessment of the actual or potential effect on the environment of the proposed activity	8,9,10,11,12,13,14,15
(e) Hazardous risk assessment	8,9,10,11,12,13,14,15
(f) Discharge of contaminants	8,10,11,12,13,14,15
(f)(i) The nature of the discharge and the sensitivity of the proposed receiving environment to adverse effects	8,9,10,11,12,13,14,15
(f) (ii) Any possible alternative methods of discharge, including discharge into any other receiving environment	6
(g) Mitigation measures (safeguards and contingency plans where relevant) to help prevent or reduce the actual or potential effect	8,9,10,11,12,13,14,15
(h) Consultation undertaken, and any response to the views of those consulted:	18
(i) Monitoring	3.4, 19

2. Matters that should be considered when preparing an assessment of effects on the Environment	Relevant Section in this AEE
(m) Any effect on those in the neighbourhood and, where relevant, the wider community including any socio-economic and cultural effects	7.6, 17, 16
(n) Any physical effect on the locality, including any landscape and visual effects	8,9,10,11,12,13,14,15,17
(o) Any effect on ecosystems, including effects on plants or animals and any physical disturbance of habitats in the vicinity	8,9,10,11,12,13,14,15,17
(p) Any effect on natural and physical resources on plants or animals and any physical disturbance of habitats in the vicinity	8,9,10,11,12,13,14,15,17



2. Matters that should be considered when preparing an assessment of effects on the Environment	Relevant Section in this AEE
(q) Any discharge of contaminants into the environment, including any unreasonable emission of noise and options for the treatment and disposal of contaminants	8,9,10,11,12,13,14,15
(r) Any risk to the neighbourhood, the wider community, or the environment through natural hazards or the use of hazardous substances or hazardous installations	8,9,10,11,12,13,14,15,17

5.9 Whangarei District Council's Relevant Plans, Policies and Bylaws

5.9.1 Waste Disposal 25 Year Strategic Plan (1995)

The WDC's Wastewater Disposal 25 Year Strategic Plan (1995) identified that the Ruakaka and One Tree Point wastewater systems would need to be upgraded to meet current and future growth demands.

5.9.2 Trade Wastes Bylaw 2008

WDC has a Trade Wastes Bylaw (2008) which places limits on the undesirable contaminants of an industrial discharge and specifies prohibited compounds as well as setting down the charging formulae.

This Trade Wastes Bylaw is established under the provisions of the LGA 2002 and sets the trade waste acceptance criteria and trade waste consenting procedures that WDC follows in the acceptance or declining of trade waste discharge applications and the management of these discharges.

The Trade Wastes Bylaw, as elsewhere in New Zealand, is enacted for the following reasons:

- To protect the health and safety of staff;
- To protect the environment (and ensure Resource Consent Compliance) by controlling the composition of wastewater conveyed to the WWTP and then discharged to land and the Coastal Marine Area environment; and
- To protect the integrity of the conveyance system and the WWTP itself.

5.9.3 Whangarei District Council Waste Management Plan 2002

The WDC adopted a Waste Management Plan in 2002 to establish the effective management of solid and hazardous waste in the District, and to meet the requirements of the New Zealand Waste Strategy.

5.9.4 Long-Term Council Community Plan

WDC is required to consult and implement a long-term Council Community Plan (LTCCP) under the LGA 2002 every three years, which provides an outline of Council lead projects over a ten year period.

WDC's Vision, Mission and Values as set out in the LTCCP Plan 2009-2019 is detailed below. These have been included in the framework for the development of the 'Proposed Scheme' and associated 'Ruakaka Wastewater Strategy'. The LTCCP has been taken into consideration as it outlines at a strategic level the long-term management of the District's environment, growth and community needs.



The Council's vision for the District is:

Vision

"To be a vibrant, attractive and thriving District by developing sustainable lifestyles based around our unique environment; the envy of New Zealand and recognised worldwide."

Mission

"Creating the ultimate living environment"

The Council has identified six community outcomes, which are:

Community Outcomes

1. A sustainable, environmentally responsible District which values its natural uniqueness
2. A District which is safe and crime free
3. A community which is healthy and educated
4. A vibrant and growing local economy
5. A District with a community programmes and facilities for all
6. A community which values its culture and heritage

5.10 Relevant Guidelines

5.10.1 Ministry for the Environment and Ministry of Health – Microbiological Water Quality Guidelines for Marine and Freshwater Recreational Areas (MfE 2003)

These Guidelines, updated in June 2003, are intended to help reduce the public health risk from microbiological contamination in both marine bathing water and recreational shellfish gathering waters. The guidelines use indicator organisms to reflect the potential risk to public health.

They include the following criteria:

- Contact recreation, over the contact recreation season nominated as 1 November to 31 March:
 - To achieve a microbiological assessment category of A, a 95thile of sample data less than 40 enterococci/100ml
 - To maintain the status of the beach at surveillance level, no single sample greater than 136 enterococci/100ml
- Shellfish Gathering, over the shellfish gathering season:
 - Median faecal coliforms should not exceed 14 MPN/100ml
 - Not more than 10% of samples exceed 43 MPN/100ml.

5.10.2 Australian and New Zealand Guidelines for Fresh Water and Marine Water Quality (ANZECC 2000)

These Guidelines have been developed 'to provide an authoritative guide for setting water quality objectives required to sustain current or likely future environmental values for natural and semi-natural water resources in Australia and New Zealand.' It is intended that the ANZECC guidelines will provide a set of tools to enable the assessment and management of ambient water quality in a wide range of water resource types, and according to designated environmental values.

A review of the ANZECC guidelines was initiated in May 2009 and is expected to be completed during 2012.



5.10.3 New Zealand Municipal Wastewater Monitoring Guidelines (NZWERF 2002)

The Wastewater Monitoring Guidelines provide guidance to developing programmes for municipal wastewater discharges. The suggested resource consent conditions as set out in Section 19 have taken these Guidelines into account.

5.10.4 New Zealand Biosolids Guidelines 2003 (MfE and NZWWA)

The New Zealand Biosolids Guidelines 2003 provides guidance for managing the application of biosolids to land, and seeks to promote a more consistent approach to the management of biosolids throughout New Zealand in a way that maximises the benefit and reduces the risk of adverse effects on human health, the environs and the economy. The suggested resource consent conditions as set out in Section 19 have taken these Guidelines into account.

5.10.5 New Zealand Waste Strategy 2002

This document sets out a general direction for waste management and waste minimisation. It takes an integrated and holistic view to wastes and resources within a sustainable development framework. It sets out targets including those for wastewater treatment discharges and trade waste management. It gives general direction and guidance for this Wastewater Consents Project.

5.10.6 Ministry of Health Guidelines for Safe Use of Sewage Effluent and Sewage Sludge on Land, Department of Health, 1992

These guidelines include information on pathogens of public health significance in treated wastewater and sewage sludge that are applied to land. They provide guidance for the irrigation to the treated wastewater and guidance on buffer zones and distances from residential dwellings.

5.10.7 New Zealand Food Safety Authority – Animal Products (Specifications for Bivalve Molluscan Shellfish) Notice 2006

This Specification is issued under Section 40 and 167(1)(g) of the Animal Products Act 1999. It sets out the specifications applying to all persons involved in, and activities involving Bivalve Molluscan Shellfish (BMS). Section 8.6.7 of this AEE further discusses this Specification and its (possible) application in respect of the treated wastewater discharge from the proposed off shore ocean outfall into Bream Bay.



6 Alternatives Considered

6.1 Background

Section 105 and the Fourth Schedule of the RMA require that alternatives (i.e. options) are considered. The term 'options' has also been used in this Project. Throughout this Project the terms 'options' and 'alternatives' are synonymous in terms of RMA language.

In response to this RMA requirement and as WDC also desired to ensure that all representative groups of alternatives have been appropriately considered, an extensive amount of work has been undertaken throughout the Project in assessing alternatives to cope with the extensive growth and associated wastewater generation projected for the medium- to long-term. Some of these alternatives were generated and all have been discussed as part of the extensive consultation programme undertaken.

This section of the AEE summarises this extensive alternatives assessment and in doing so, cross-references a number of the support documents. These support documents should be referred to for the detailed assessments of the various categories of alternatives that have been assessed.

Within this assessment, not all alternatives that are physically possible have been identified and evaluated. Instead as is common procedure with RMA alternative assessments, only 'representative alternatives' have been assessed within the various categories or groupings of alternatives available. In the selection of these options, those offering the most appropriate or most representative features are evaluated.

Figure 6.1 below diagrammatically represents the process by which alternatives for the current WWTP were considered over time prior to and for Stage 1 and Stage 2 of the Project. Table 6.1 lists the Support Documents that specifically address alternatives and summarises the range and types of alternatives considered in each of those reports.

Prior to Stage 1 of this Project, earlier considerations of alternatives had been undertaken as part of the 2004 Resource Consent application for the existing Ruakaka Wastewater Discharge and for the short-term (immediate) future. These earlier studies are also summarised below.

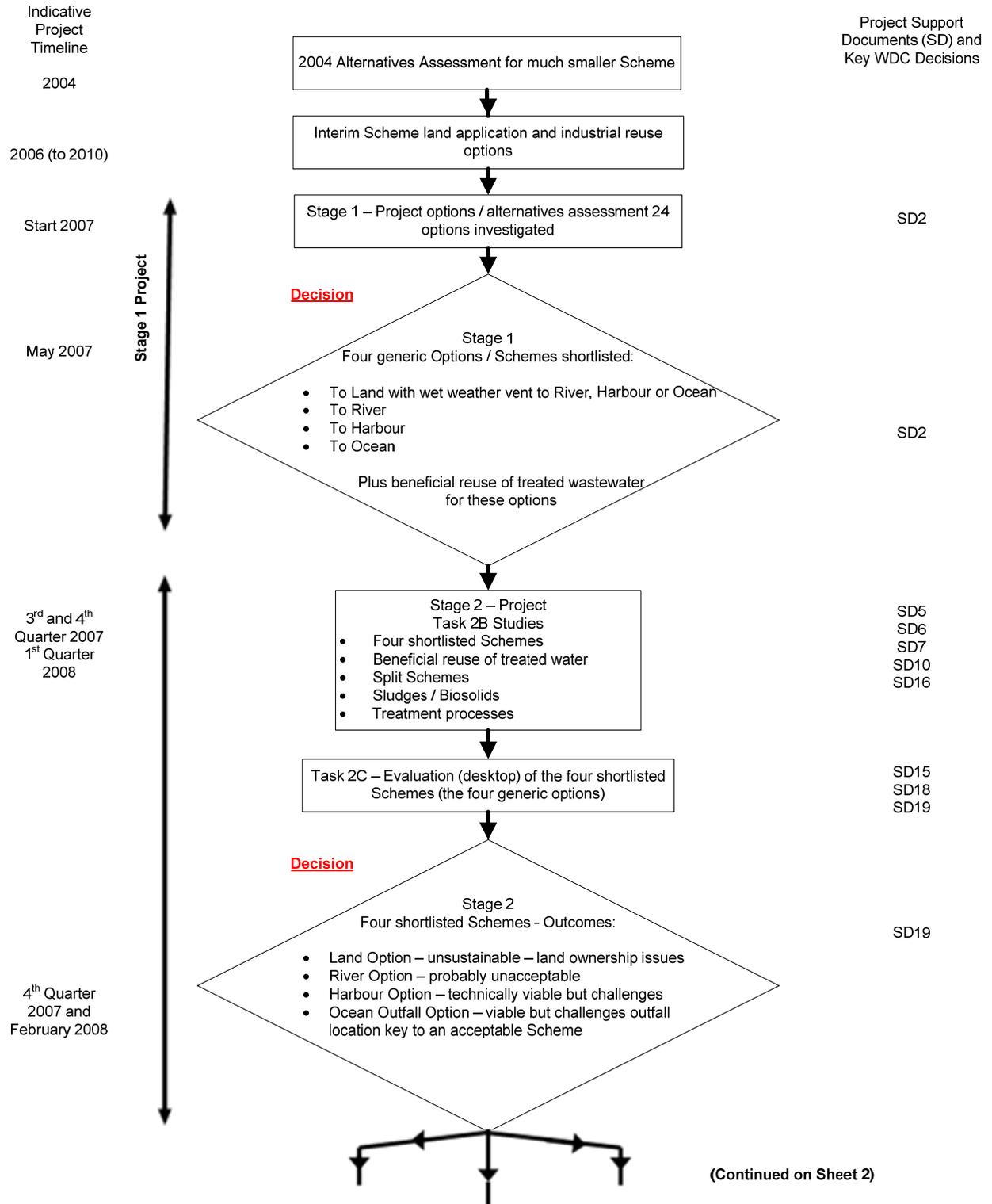
In assessing the alternatives, an important starting point is, as recorded in Section 5 of this AEE, a key policy in Section 17.3(b) 1 of the RPS relating to Water Quality is *"To require that all new discharges of organic contaminants, particularly sewage and animal wastes, either to be onto or into land, or be the best practicable option when compared to land disposal. Discharges shall be considered to have been disposed onto or into our Land where they have been passed through soil or a constructed wetland where there is no discharge to surface water"*.

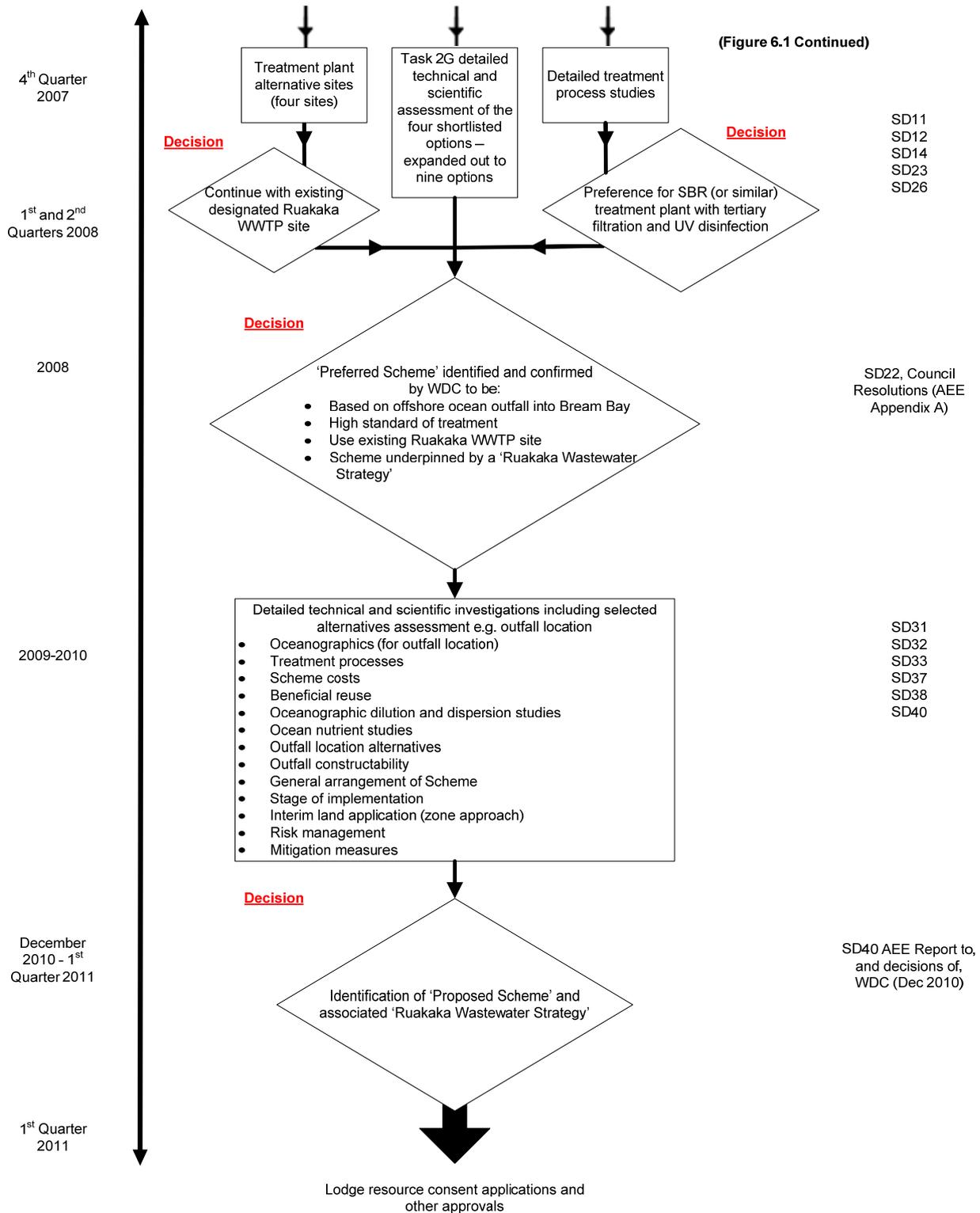
This policy and the Northland Regional Council's (NRC) explanation for it is discussed in the MWH Task 2F Report in Section 2.2.3, particularly on page 31 (Support Document 21).

This policy parallels that of the former New Zealand Coastal Policy Statement (NZCPS) Policy 5.1.2 which required consideration of 'onto land' (land disposal) or 'through land' alternatives. However, as set out in Section 5.6.1, the new NZCPS, operative from 3 December 2010, does not have the same context but requires alternatives to be assessed and the tangata whenua values to be addressed.



Figure 6.1 Schematic of Alternatives Identification and Evaluation Process





Footnote: 1st Quarter 2011 for consent lodgement is now 2nd quarter

**Table 6.1 Support Document Summary of Alternatives Assessed**

Ruakaka Wastewater Long-Term Wastewater Consents Project: Support Documents		
Support Document Number	Title	Date
1	The Final 'Ruakaka/One Tree Point Wastewater Options Study, Stage 1 Future Wastewater Quantity and Quality Projections' by GHD/URS	20 April 2007
2	The Final 'Issues and Options Investigations Ruakaka/One Tree Point Wastewater Options Stage 1 Study Report' and accompanying Planning and Consultation Reports by GHD / URS	15 May 2007
3	Public Health, Microbial/Viral Risk Assessment, Stage 1 by GHD / URS	15 May 2007
4	Stage 2 Study Task 2A - Future Wastewater Quantity and Quality Projections, By MWH	November 2007
5	Stage 2 Study Task 2B Part 1 Indicative Cost Estimates, Option Schematics and Key Issues, by MWH	November 2007
6	Stage 2 Study Task 2B Part 3 Alternative Wastewater Treatment Process, by MWH	November 2007
7	Stage 2 Study Task 2B Part 4 Investigate Feasibility of Split Industrial and Domestic Wastewater Schemes, by MWH	November 2007
8	Ruakaka Wastewater Treatment Plant Discharge Options – Initial Assessment of Dilutions, by NIWA	October 2007
9	Whangarei District Council Ruakaka Wastewater Project 'Discussion Paper on Draft Project Objectives', By Whangarei District Council	November 2007
10	Stage 2 Study Task 2B Part 2 Reuse of Treated Effluent, by MWH	December 2007
11	Whangarei District Council, Ruakaka/One Tree Point, Options for Wastewater Treatment, by MWH	7 November 2007
12	Whangarei District Council, Ruakaka/One Tree Point, Options for Wastewater Treatment – Supplementary Information, by MWH	28 November 2007
13	Ruakaka Coastal Environment Recreational Survey, by MWH/WDC	December 2007/ January 2008
14	Whangarei District Council, Ruakaka/One Tree Point, Options for Wastewater Treatment, – Supplementary Information, Part 2 by MWH	20 December 2007
15	Stage 2 Study Task 2C - Hydro-Geological Appraisal of Land Disposal Options and Consultation Information/Overheads, by Voss Infrastructure Consulting	December 2007



Ruakaka Wastewater Long-Term Wastewater Consents Project: Support Documents		
Support Document Number	Title	Date
16	Stage 2 Study Task 2B Part 5 Sludge and Biosolids Management, by MWH	February 2008
17	Stage 2 Study Task 2C – Preliminary Assessment of Terrestrial Ecology Associated with the Options, by MWH	February 2008
18	Stage 2 Study Task 2C – Preliminary Odour and Air Emissions Report, by MWH	February 2008
19	Stage 2 Study Task 2C – Short-listed Options: Initial Technical Studies Report, by MWH	February 2008
20	Stage 2 Study Task 2E – Qualitative Public Health Risk Assessment, by MWH	February 2008
21	Stage 2 Study Task 2F – Planning Risk and Consentability Assessment, by MWH	February 2008
22	Stage 2 Study Task 2G – Detailed Options Evaluation Report, by MWH	February 2008
23	Whangarei District Council, Ruakaka/One Tree Point, Options for Wastewater Treatment, Summary BTF and SBR Comparison Table, by MWH	April 2008
24	Consideration of Alternative Sites for the Ruakaka Wastewater Treatment Plant, by MWH	May 2008
25	Stage 2 Study: Development of the ‘Proposed Scheme’ and a ‘Ruakaka Wastewater Strategy’, by MWH	June 2008
26	Whangarei District Council, Ruakaka/One Tree Point, Options for Wastewater Treatment– Supplementary Information, Part 3, by MWH	June 2008
27	Assessment of Effects of Endocrine Disrupting Compounds and Microbiological Pathogens on the Fish and Marine Mammals of Bream Bay, by Cawthron Institute	January 2009
28	Review of potential effects of endocrine disrupting compounds on marine species at Bream Bay Aquaculture Park by NIWA	July 2009
29	Ecotoxicity information on species cultured at NIWA Bream Bay Aquaculture Park	July 2009
30	Bream Bay Water Quality 2008-2009 prepared for Whangarei District Council, by MWH	December 2009
31	Bream Bay Dilution and Dispersion Study, Phase One: Comparative Assessment, Final Report, by DHI	January 2010
32	Bream Bay Dilution and Dispersion Study, Phase One: Comparative Assessment – Addendum, by DHI	February 2010



Ruakaka Wastewater Long-Term Wastewater Consents Project: Support Documents		
Support Document Number	Title	Date
33	Bream Bay Dilution and Dispersion Study, Phase Two: Comparative Assessment, Final Report, by DHI	May 2010
34	Coastal Vegetation Assessment for the Whangarei District Council, Irrigation of Wastewater Suitability Study, Rama Road Block, Ruakaka, by Alastair Jamieson - Wild Earth Media & Harley Spence - Coastline Consultants	May 2010
35	Bream Bay Environmental Assessment, Bream Bay Outfall and Benthic Survey and Assessment by Golder Associates	July 2010
36	Ruakaka long-term Wastewater Consents Project, Quantitative Public Health Risk Assessment, by MWH	August 2010
37	Ruakaka Ocean Outfall Report, Constructability Assessment and Estimated Costs, by OCEL Consultants and Preliminary Assessment January 2008.	August 2010 Rev. 2
38	Odour Management for Ruakaka Wastewater Treatment: long-term Resource Consent Project, by MWH	August 2010
39	Bream Bay Dilution and Dispersion Study, Nutrient Modelling, Final Report, by DHI	November 2010
40	Study, Task 2I – The Proposed Scheme Outline Concept Design, by MWH	September 2010
41	Consultation Record by MWH	May 2011

6.2 Categories of Alternatives Considered

Throughout the Project the following categories of alternatives have been assessed as each makes up part of a total wastewater management approach and associated wastewater management scheme. Assessing alternatives that fall within these generic categories ensures a holistic and integrated approach is undertaken, and one that addresses sustainable wastewater management and the receiving environment for the contaminant discharges.

Category 1: Alternatives for Wastewater Management

This category includes a number of sewage and wastewater management options available or potentially available for urban communities. These range from the conventional waterborne reticulated wastewater collection system (as in place now for part of Ruakaka and One Tree Point) through to on property septic tank type systems, cluster systems and possible use of waterless toilet systems.

The Stage 1 Study considered a number of such options including a number of reticulation options. The fact that there is a reticulated water-borne wastewater system already in Ruakaka and there are no other types of schemes available that do not require a water-borne reticulation system in significantly sized urban areas, has led to the conclusion that the Ruakaka Wastewater (Sewerage) Scheme needs to be based on a modern-day, well operated, waterborne reticulated system. Notwithstanding this, there are



means to minimise the input of wastewater relative to the community the Scheme serves. These means are included in Category 2 and discussed as part of the Ruakaka Wastewater Strategy.

Category 2: Alternatives for Producing Less Wastewater

This category includes a wide range of wastewater reduction and minimisation techniques including trade waste management to reduce the inputs to a waterborne wastewater collection system.

As shown in Figure 4.1 in Section 4.2 which sets out the Ruakaka Wastewater Strategy, there are a number of wastewater input management techniques that can reduce the wastewater flows and loads relative to those in uncontrolled and not well managed sewerage systems. These include:

- Water supply conservation and demand management.
- Engineering and infrastructure standards used in the construction and management of the wastewater infrastructure.
- Infiltration and inflow management, including illegal connections.
- Trade waste management.

WDC already have in place procedures involving these techniques and will further develop these and others as part of the 'Ruakaka Wastewater Strategy'.

A brief discussion on these matters is set out in Sections 4.3 and 4.5 of this AEE.

Category 3: Alternatives for Wastewater Treatment Locations & Wastewater Treatment Processes

This category includes both wastewater treatment sites and wastewater treatment process options and their inter-action. The majority of the alternatives in this category will focus on wastewater treatment processes. The current Ruakaka Wastewater Treatment Plant site is well established, appropriately designated for wastewater treatment plant purposes, and is of a generous size of around 10 ha. Notwithstanding this, a wastewater treatment plant site assessment was also undertaken, even although WDC because of its site designation can develop on this existing wastewater treatment site by right (subject to outline development plan procedures etc).

Category 4: Alternatives for Treated Wastewater Discharge and Reuse

This category includes land disposal, land application and land contact options for treated wastewater disposal and beneficial reuse, as well as alternative discharge locations into natural water.

Category 5: Alternatives for Residuals Management

This category includes an overview of the range of sludge treatment and disposal options as well as biosolids (sludge treated to acceptable standards for safe application to land) beneficial use options. This category also includes the cogeneration plant and overall energy management system, odour and air emissions. The latter two are separately covered in Section 8 for the treated wastewater discharge into Bream Bay, Section 11 for the Rama Road Block irrigation and Section 12 for the Ruakaka Wastewater Treatment Plant.

Category 6: Alternatives for Wider Environmental Enhancement

This category includes possible activities and/or physical works that could be adopted as mitigation, offset and / or compensation measures in terms of the Wastewater Scheme. These measures are not physically part of the Scheme or the inputs to it or the outputs from it. This category encompasses the concept of environmental enhancement and compensation. As part of this Scheme, some suggested resource consent conditions include such offset mitigation measures, a number of which relate to tangata whenua's considerations. Some suggested conditions in Section 19 of this AEE are, in fact, offset mitigation measures.



6.3 Resource Consent Application 2004 – Alternatives Considered

The application for the continued and volumetrically expanded use of the Ruakaka WWTP land disposal system in 2004 included, as per RMA requirements, as an assessment of alternatives. Table 6 included in Section 5.1 of that AEE summarises these alternatives. Table 6, which is reproduced below, shows that:

Slow rate irrigation (land disposal) was investigated but not selected as a large increase in land area would be required and that made the option impractical. That application and alternative assessment was for an ADWF of 2,630 m³/day as projected for 2029 (compared to this Stage 2 study of 2056 ADWF of 24,000m³/day, since revised down to around 16,000m³/day).

Rapid infiltration by trenches and other means was also considered, but not selected because of costs. It indicates that rapid infiltration basins maybe a better alternative, but these were not considered at that stage.

What appears to be relevant to the Stage 2 Task 2C study is that, even for a very significantly lesser volume of treated wastewater, a slow rate land disposal system was even then considered impractical due to the large area of land required.

Excerpt from Report prepared by Harrison Grierson Consultants Limited 2004.

5.1 DESCRIPTION OF ALTERNATIVES CONSIDERED

A range of treatment and disposal alternatives have been investigated and a brief summary of the assessment of each options application to Ruakaka / One Tree Point is presented in Table 6 below

Table 6: Short Listing Assessment of Treatment Upgrade Options for Ruakaka / One Tree Point Wastewater Treatment Plant	
Description of the Option	Short-Listing Assessment
Treatment Options	
Status quo with not modifications	Not selected. Not suitable due to increasing loads in future exceeding treatment capacity of plant.
Expansion of pond capacity by installation of anaerobic ponds prior to Pond 1 and aerating Pond 1.	Not selected. Previously implemented and decommissioned
Upgrade of effluent quality by adding tertiary treatment (i.e. DAF, dynamic sand filtration, disc filters, UV disinfection, membrane filtration)	Not selected. High increase in capital and operational cost, and good disinfection treatment from current system.
Upgrade of existing ponds to provide advanced wastewater treatment (Advanced Wastewater Pond System (AWPS) or Aquamats)	Not selected. Cost of works unwarranted given satisfactory performance of system, now expected to continue in the future. (Subject to preferred upgrade being implemented).
Decommissioning the ponds and replacement with high rate treatment plant such as Sequencing Batch Reactor (SBR), Membrane Bioreactors (MBR) or other activated sludge or fixed media plant	Not selected. This option would achieve a high quality effluent, however significant increase in cost not warranted.
Decommissioning of the wetlands	Not selected. Only applicable if they were not required due to implementation of a treatment option that has effluent superior to wetland effluent
Disposal Options	
Slow rate irrigation disposal	Not selected. Large increase in land area required makes this option impractical.
Rapid infiltration by trenches, surface drippers, sub-surface drippers, or surface sprinklers	Not selected at concept design stage. Increased cost of these options gives preference to rapid infiltration basins which would have easier maintenance. Could be assessed at the detailed design stage.
Sea Discharge	Not selected. Would require a high level of treatment of effluent and is not preferred culturally.
Discharge to the Ruakaka River	Not selected. Would require a high level of effluent treatment and is not preferred culturally or by NRC Regional Water and Soil Plan for Northland.



6.4 Interim Scheme Investigations

WDC along with the Bream Bay Land Owners Association (BBLOA) have investigated what at the time were referred to as interim disposal/ discharge and industrial reuse options for the increased amounts of treated wastewater that were projected to be produced in the interim period.

This interim scheme included the following arrangements and options.

- Land application on the WDC owned land within the designated land denoted as DW4 in the District Plan (consents granted).
- Land application on a privately owned area of exotic (pine) forest (known as the Keith Block) immediately adjacent to the existing Ruakaka WWTP (consents granted).
- Crown land adjacent to the Ruakaka WWTP within the designated land denoted as DW3 in the District Plan, subject to conditions imposed by the Department of Conservation concession and NRC discharge consent.
- Land application on the 20 ha of land off Rama Road (referred to as the 'Rama Road Block' previously being known as the 'Rio Tinto Block'), now owned by WDC. It is proposed to be used for land application of treated wastewater until the ocean outfall is constructed (consents being applied for Applications 5 and 6).
- Industrial reuse of highly treated Ruakaka wastewater (UF/RO treatment) by the NZRC at the Marsden Point Oil Refinery.

As the Long Term Consenting Project progressed it became apparent these interim arrangements and options needed to be combined with the options being investigated as part of the Long Term Consenting Project (see Sections 6.5 to 6.9). Thus the Proposed Scheme as set out in Sections 4.5 and 4.8 of this AEE includes the staged use of these land disposal and beneficial reuse options together with other longer term options.

6.5 Stage 1 Ruakaka Wastewater Long-Term Wastewater Consent Project

The GHS/URS 'Issues and Options Investigations Ruakaka/One Tree Point Wastewater Options Stage 1 Study Report May 2007 (Support Document 2)', initially considered 24 options that were all-inclusive of collection, treatment and disposal. The following excerpt from the Executive Summary of that Report summarises the approach and outcome in short listing four generic options for the Stage 2 Study.

"These options were then assessed using the 'Parry' method, which has proven to be a successful and robust methodology under the Resource Management Act (RMA 1991) in the past for this purpose, with other community sewerage schemes. This evaluation technique incorporates a matrix of criteria (or issues) against which each option is scored. The scoring incorporated feedback from both the public and Maori about their perceptions or concerns, and also the Project Advisory Group (including key legislative stakeholders).

This option may also be supplemented with beneficial reuse to the oil refinery (as a substitute for potable water), or other beneficial reuse options such as residential use of treated effluent for toilet flushing and garden watering.

Depending upon the degree to which the future reticulation system may be sealed, and the rate at which land disposal to the coastal strip may be sustainable (with respect to foreshore stability, etc), a wet weather vent may also be required in addition to this highest scoring option. This wet weather vent may take a series of forms, with the ranking being:

- *Vent to the Ruakaka River (bores / seep or wetland);*



- Other coastal vent (i.e. old sand mine);
- Vent to the ocean; or
- Vent to the harbour.

If a fatal flaw were to be encountered in subsequent investigative phases of the project with the above strategy, then the assessment ranked the following standalone hydraulically unlimited (i.e. able to handle wet weather flow without I/I minimisation) alternatives:

- New Ocean Outfall – adjacent the existing wastewater treatment plant site into Bream Bay;
- Ruakaka River – indirect discharge via either bores / seep / wetland or public use lake; or a
- New Harbour Outfall – in the vicinity of Marsden Point.

A conventional reticulation system has been identified by WDC as its preferred reticulation system type. Land application and disposal to landfill have been identified as preferred Biosolids disposal options.

Accordingly, the four generic short-listed options identified from this Stage 1 Project Assessment are:

- **Option A – Discharge to Land with Wet Weather Vent**
- **Option B – Discharge to Ocean Outfall in Bream Bay**
- **Option C – Discharge to Ruakaka River**
- **Option D – Discharge to Whangarei Harbour**

This desktop study has been based upon information currently available and consultation with key stakeholders through the Project Advisory Group and initial discussions with some of the key stakeholders such as Patuharakeke Trust Board and DoC. No private landowners have been contacted nor any onsite investigations carried out. All the options presented would require detailed site investigations to confirm their technical suitability.

It is recommended that WDC:

- 1) *Proceed with a modified Stage 2 of the study, taking forward the four options shortlisted in this study; and*
- 2) *From the four shortlisted options, identify a long-term secure solution for the Ruakaka / One Tree Point community through Stage 2 investigations.”*

This Stage 1 study traversed a wide range of land application options as the strong initial preference from tangata whenua and some other stakeholders was for a land application solution. These options included:

- | | |
|--|-----------------------------------|
| • High Rate Land Application | • Discrete Bores |
| • Medium Low Rate Application | • Engineered Trenches or Pits |
| • Land Application (Coastal Strip) | • Existing Forest (exotic/native) |
| • Spray Irrigation (fixed/mobile) | • Other Land Use |
| • Drip Irrigation (surface/subsurface) | |



6.6 Stage 2 Ruakaka Wastewater Long-Term Wastewater Consent Project

An extensive investigation into a wide range of wastewater management options is embodied in this part of the Project. These investigations were undertaken as a consecutive series of tasks. The scope and output of these tasks are summarised below. Figure 6.1 and Table 6.1 summarises the process followed and list of Support Documents associated with this part of the Project. The following text highlights in summary form the extent of alternatives considered in the Stage 2 Project and the findings that were taken forward firstly to the identification of a 'Preferred Scheme', and following identification of the 'Preferred Scheme' to the development of the Ruakaka Wastewater Strategy and Proposed Scheme for which the resource consents and other approvals are being sought.

6.6.1 Task 2B Investigations and Hydro-geological Appraisal of Land Disposal

These tasks commenced with the development of the four shortlisted generic options determined in Stage 1 of the Project, along with the desire for beneficial reuse of treated wastewater as far as that could be practical.

- **Part 1: Review and Development of Part 1 Options (Support Document 5)**
This document undertook a concept development of each of the Stage 1 shortlisted options, along with indicative costs. The output presented on A3 sheets was used in the consultation phases of the Project.
- **Part 2: Investigate Options for Reuse of Treated Wastewater (Support Document 10)**
This document investigated a range of treated wastewater reuse options and further developed the output from the Stage 1 findings. Twenty potential wastewater reuse options were identified and compared, of which 13 were shortlisted and prioritised for possible inclusion in the development of the Ruakaka Wastewater Management Strategy. This strategy is presented in Section 4 of the Report. It includes a number of the shortlisted and prioritised options.
- **Part 3: Investigate Alternative Wastewater Treatment Processes (Support Document 6)**
This document identified two preferred treatment processes and developed those in terms of assessing the suitability for the four shortlisted Stage 1 generic options. The document also considered a phased (staged) modular approach to the implementation of the Wastewater Treatment Plant. Six different secondary treatment processes, along with tertiary processes and disinfection, were evaluated and compared against each other.
- **Part 4: Investigate Feasibility of Split Domestic and Industrial Wastewater Schemes (Support Document 7)**
This investigation considered split scheme options where the treatment and / or disposal of the domestic wastewater would be undertaken in a separate or split scheme from the industrial wastewater.
- **Part 5: Evaluate Sludge Management and Biosolids Options (Support Document 16)**
This report identified sludge and biosolids management strategies that would be appropriate for the Ruakaka Wastewater Scheme. These included beneficial reuse options for biosolids. In all, some 11 beneficial use and disposal options were considered, along with 14 sludge treatment options.
- **Hydro-geological Appraisal of Land Disposal Investigations**
Specialist hydro-geological consultant Voss Infrastructure Consulting Limited (Voss Report) was engaged to appraise the hydro-geological of land disposal options. Support Document 15 includes this Report and associated consultation information and overheads.

This investigation was a pivotal one in the assessment of the four generic options, as land disposal not only needed to be investigated, but was a favoured option coming out of the Stage 1 Project Study.



In this respect:

- land application was favoured by tangata whenua and a number of stakeholder parties;
- the then current NZCPS required land application or wetland contact of human wastewater unless discharge to the CMA was a better practicable option;
- NRC's NPS Policy b (i) in Section 17.3.1 required all new discharges to be onto or into land or be a best practicable option when compared to land disposal.

The Voss Report investigated the hydro-geological features associated with land disposal of the then projected 35 year ADWF of 24,000m³ /day onto six different soil types and locations in the wider Ruakaka, Waipu, One Tree Point and Takahiwai lowlands area.

The (overflow) wet weather flow above the ADWF was assumed to be provided for by a wet weather vent discharging direct to water, be it the river, harbour or ocean.

A desktop study was undertaken using a wide range of available local information. From this a spatial model of the geology was developed. From this model an assessment was undertaken to determine the indicative area requirements for each of the six soil types and locations.

Both surface and sub-surface irrigation methods were considered and also deep well injection.

The Summary and Conclusion of the Voss Report are included below:

“Disposal of treated wastewater from the future Ruakaka wastewater treatment system requires large land areas, due to the predominantly fine-grained soils of the area. Even in areas with reasonably high permeabilities, the low-lying aspect of the ground and/or impeded drainage paths require large land areas to mitigate impacts on drainage and to maintain minimum depths to the groundwater surface required for water quality polishing.

Very preliminary calculations show that mounding in response to irrigation will be unsustainable in some areas. This is particularly true for the Ruakaka-One Tree Point-Takahiwai lowlands area, where the saturated horizon is very thin (only 1 to 2 metres) and the groundwater table is already close to the ground surface. Estimates of groundwater mounding were made for a notional square of 1 ha area. Actual mounding may be considerably greater than the estimates in this report, depending on the actual layout of disposal fields and their proximity to streams, drains and other hydraulic features.

Disposal to the coastal sands strips could have adverse impacts on local drainage patterns and water table elevations inland of the sand strips. These effects will be further affected by sea level rise.”

The Voss Report included calculations of the minimum land area needed for disposal of 24,000m³ /day ADWF, being the earlier assessed ADWF figure to cover a 35 year resource consent period.

This showed areas of between 480 ha on coastal sand country up to 1,200 ha on inland forested land would be the minimum requirement to dispose of this amount of treated wastewater continuously (fulltime land disposal). Pro-rata scaling reduces these areas to 320 and 800 ha respectively for the more recently projected ADWF 16,000 m³ /day for the 35 year period.

With the coastal sand strip being the preferred land disposal area, further hydraulic modelling was undertaken. The findings of this work are summarised in the Voss Report as follows:

“Application (on the coastal sands) based on minimum irrigation area is predicted to have severe impacts on local drainage and water tables. Subject to detailed analysis and design, it is considered that these potential impacts might be mitigated by appropriate design such as use of



discrete, non-contiguous application zones but the gross area required for disposal will be correspondingly greater. Directly impacted by sea level rise.”

Further consideration and additional modelling of land disposal on the coastal strip highlighted that:

- With contiguous sites along the coastal strip, a longitudinal mounding of ground will form a barrier for the seaward flow of groundwater. This will have the effect of raising groundwater table levels inland of the coastal strip. With much of the Ruakaka and environs area behind the coastal strip low lying, such water table rises would be unsustainable.
- Inland of the dunes, subsurface conditions do not support land infiltration.
- Based on the existing wastewater soakage performance at Ruakaka and Waipu, the coastal strip using discrete disposal areas might handle 5,000m³ /day of treated wastewater, but definitely not 10,000 to 20,000m³ /day.

While the Voss Report did not consider sea level rise in the hydraulic modelling undertaken, it clearly points out the significance of this and the resulting less feasible / less sustainable effect this would have on land disposed on the coastal strip or Takahiwai lowlands and other low lying land behind the coastal sand dunes. When the Voss Report work was being undertaken, the NIWA prediction was to allow for a 0.5m sea level rise in the next 50 years. More recent projections being discussed are up to 0.8m rise.

The output of the Voss Report and the further considerations were then fed into the MWH Task 2C Report investigations.

6.7 Task 2C Stage 1 Shortlisted Option: Initial Technical Studies (Support Document 19)

The output from the Task 2B studies and the Voss Report was then taken into the Task 2C (Support Document 19) further development and short listing of the four Stage 1 generic options.

The task involved technical and scientific desktop investigation work, supplemented by field work when necessary. The objective of this work was:

- Determine whether any one of the four short-listed options, or some variation or modification of it, has a technical and/or scientific technical flaw that would eliminate that option from further consideration.
- Ensure that a logical and defensible alternatives (options) assessment is undertaken through this stage of the overall Project in order that RMA requirements (in respect to an alternatives assessment) are achieved.
- Provide key information including a high level risk assessment of technical and scientific information, in order that the short listed options can be further evaluated in Task 2G and a 'Preferred Scheme' identified for further assessment and development.
- Provide input into the future Task 2H requirements for the detailed technical and scientific investigations that will be required for the 'Preferred Scheme', once it is identified as the output of Task 2G.

Each of the four generic options were assessed in their own right and compared to each other. Coming out of this, the positive and negative attributes of each option were identified and summarised. The next steps in a decision process associated with each of the options, provided they continued to be viable, were identified for the Task 2G detailed technical and scientific studies. The overall conclusion of the Task 2C Report is:



“On the basis of information available at this time, the summary findings of this technical and scientific review are that:

- *the land disposal option would require very large areas of land and has a number of features that probably make it marginally viable. Accordingly, when considered in its wider context this option probably should not proceed to the next stage;*
- *the diffuse discharge to the Ruakaka River is unlikely to be acceptable on a number of grounds and in particular water quality and associated river ecology. It is considered to be marginally viable at best. There are strong grounds as to why this option should not proceed to the next stage;*
- *the offshore ocean outfall into Bream Bay appears to be viable although there are some significant issues that will need to be taken into account in deciding on the most appropriate outfall location and length and construction method. Subject to suitable resolution of these matters this option is likely to provide a sound solution from a technical and scientific viewpoint; and*
- *the Whangarei harbour outfall while technically viable, provides significant challenges and has some uncertainty around it. Nevertheless the option appears to be potentially viable.”*

As stated above, the Voss Report work and the Task 2C Study included an extensive amount of work associated with the land disposal and land contact options. MWH took the output of the Voss Consulting work and then undertook a systematic layering approach as part of an 11 step approach. GIS assisted in the identification of six possible land disposal areas, and further determined the suitability of those sites for land disposal. The Task 2C Report sets out that assessment in detail. An important consideration of land disposal options on the coastal strip as recorded above is the predicted sea level rise and the negative impact of this in terms of determining long-term sustainable land application schemes in this area.

6.8 Alternative Sites for the Ruakaka Wastewater Treatment Plant (Support Document 24)

6.8.1 Approach

WDC currently own a 12.4ha site located off Sime Road which is designated for wastewater purposes in the Whangarei District Plan (Planning Map 55) and is the current wastewater treatment plant site. This designated site is available for expansion and upgrading of the wastewater treatment facilities, in accordance with the designation purpose. This is referred to as Site 4 in the evaluation in Support Document 24. This site is available for a new and expanded treatment plant by right, subject to submitting an Outline Plan of Works and other statutory procedures.

However, when applying for resource consents the RMA requires the consideration of alternatives, even if the result of that consideration is that the site selected is the most suitable.

At one of the PAG meetings, a question was raised over the consideration of alternative treatment plant sites. Since that time, WDC has identified an additional three ‘general site areas’ within the Ruakaka / One Tree Point area that were considered likely to be suitable for further desktop study and consideration. For the other three sites, a generic 2.5 ha site area was assumed as suitable for the ultimate plant size. The three sites were:

- Site 1, a site located near the coast surrounded by industrial land and Port zone land. WDC has subsequently purchased the Rama Road site, which could include such a footprint.
- Site 2 was adjacent to State Highway 1, surrounded on three boundaries by Rural Countryside Living zone.
- Site 3 was adjacent to State Highway 1, and surrounded by rural land.



Since this investigation into alternative wastewater treatment plant sites the importance of the existing oxidation ponds being available for future contingency storage ponds, in terms of operational management and risk management, has become evident. Therefore, there is even a greater reason why the existing generously sized 12.4 ha site has advantages over the other three sites investigated.

6.8.2 Existing Site Findings (Site 4)

In summary, the existing site is considered the best for wastewater purposes for a number of important reasons. Firstly, it is owned by WDC and already designated for wastewater pumping and treatment facilities. It has ample room to enable a new wastewater treatment plant to be constructed (in a staged modular approach) and has available the existing oxidation ponds that can be converted to contingency storage ponds when a new WWTP is constructed. The site has a considerable distance between it and the nearest residential zone. The site is also well located in terms of odour nuisance potential, with no residential zoning in close proximity to it, and predominant winds directing any unexpected odour offshore. Furthermore, three existing rising mains are in place that brings wastewater to this site.

6.8.3 Conclusion

The consideration of alternative sites for a new wastewater treatment plant for Ruakaka has identified differences (negatives and positives) between the existing site and the other three potential alternative general site areas. No fatal flaws were identified with any of the alternative general site areas, although some sites had discrete issues that new development is anticipated to be able to work around, such as archaeological sites or more difficult geotechnical and foundation conditions.

On balance, the existing site is considered the most appropriate site for the future wastewater treatment plant, which also confirms the view taken in Section 2.6 of the Ruakaka Wastewater Stage 2 Study – Task 2B Part 3 Review and Development of Stage 1 Options – Investigate Alternative Wastewater Treatment Processes. Because the site is already owned by WDC and designated for wastewater pumping and treatment facilities, it is clearly identified within the District Plan and its existence is a known fact that can be taken account of by the community and developers. Retaining the already developed site for future expansion is consistent with the purpose of the RMA in promoting the sustainable management (including use) of natural and physical resources.

6.9 Task 2G Detailed Options Evaluation Report (Support Document 22)

6.9.1 Overview

This Report brings together the output of the Stage 2 technical, scientific and planning investigations to that date. The Voss Report and the Task 2C Report provided key input relating to the land disposal and land application. Using this information along with output from the consultation at that time, comparison is made of the refined Stage 2 short-listed options. This comparison includes undertaking of a high level risk assessment and using a Multi-Criteria Analysis (MCA) of the short-listed options. Both these two activities were considered key tools in assisting in the identification of a 'Preferred Scheme'.

This Report also includes updated indicative cost estimates and an indicative implementation and sequencing assessment comparing the options. For completeness the Report also includes summaries of the short-listed options and summaries of key considerations and comparisons on a topic by topic basis.

The Stage 1 short-listed four generic options were further refined and developed. This development included consideration of both a continuous and ebb tide discharge for Options C and D. In addition, possible split (joint) domestic and industrial wastewater treatment options have been considered and the two more practical of those options included in the Stage 2 short-list. This expanded (from the Stage 1 output) short-list, referred to as the refined Stage 2 short-listed options is summarised Table 6.2.

**Table 6.2 Refined Stage 2 Short-Listed Options**

Ref	Option Title
A	Discharge to Land with Wet Weather Vent
B	Discharge to Ocean Outfall in Bream Bay
C1	Discharge (indirect/diffuse) to Ruakaka River (Continuous release)
C2	Discharge (indirect/diffuse) to Ruakaka River (Ebb-tide release)
D1	Discharge to Whangarei Harbour (Continuous release)
D2	Discharge to Whangarei Harbour (Ebb-tide release)
E	Split Scheme Option 4 (Separate Treatment, Combined-ocean discharge)
F1	Split Scheme Option 3 (Domestic to land Industrial to harbour – continuous release)
F2	Split Scheme Option 3 (Domestic to land Industrial to harbour – ebb-tide release)

Sections 2 to 6 (inclusive) of that Report separately summarise each of the above options outlining the scheme concepts, indicative layout, investigations and findings, indicative costs and key determinants relating to each of the refined Stage 2 short-listed options.

6.9.2 Key Considerations and Comparisons of Options

The Task 2G Report assessed, under the following headings, the above nine short-listed options. Key summary information is included under each heading.

- **Wastewater Treatment and Flows and Loads**

This section of the Report considered appropriate wastewater treatment processes for each of the generic shortlisted options.

An environmental effects-driven approach was used to determine appropriate and cost effective treatment options for each of the four generic options being evaluated. In doing this, a relatively high level effects assessment was undertaken for each of the four receiving environments (land, Bream Bay ocean waters, Ruakaka River and Whangarei Harbour), into which a treated wastewater of an appropriate standard would be disposed / discharged.

It is important to note that for Option B Ocean Outfall, neither a Sequencing Batch Reactor (SBR) nor a Continuous Flow Activator Sludge Type Biological Nutrient Removal Plant was considered in these studies as necessary for this option. The fact that a SBR (or similar nutrient removal continuous flow activated sludge-type plant) is now proposed for as part of the 'Preferred Scheme', results from WDC's decision to have a high standard treated wastewater for discharge into Bream Bay (refer Section 6.11 below and Appendix A to this AEE).

- **Indicative Cost Estimates**

The cost estimates at the time of completion of the Task 2G Report (February 2008) are as follows based on a present day cost basis excluding GST. These estimates carry an accuracy range of +0% to -0%. These estimates were undertaken on the 24,000 m³ /day ADWF 2047 projected volume. Operating and maintenance costs were calculated on this daily volume. The revised and updated estimate for WDC's share of the 'Proposed Scheme' is included in Section 4.9 of this AEE.

Table 6.3 Indicative Cost Estimates of the Four Generic Schemes

Short List Option Description		A Land Disposal with River vent	B Ocean Outfall into Bream Bay	C Discharge to Ruakaka River	D Whangarei Harbour Outfall
Total Scheme Capital (rounded to nearest \$M)	\$M	145-159	89-90	89-108	99-112
Total Scheme Operating & Maintenance (rounded to nearest \$0.1M)	\$M pa	3.3-3.8	1.3-1.7	2.0-2.5	1.9-2.1

- **Implementation and Phasing**

The Task 2G Report assessed an indicative implementation and phasing programme for each of the refined Stage 2 short-listed options, these programmes being based on staged 6,000m³/day modular treatment plant additions after the initial two at 3,000m³/day Stage 1.

- **Public Health**

A qualitative public health risk assessment was undertaken of the four generic options (Support Document 36). This used a very precautionary (conservative) approach in assessing the exposure routes of contact recreation, consumption of shellfish and fish both recreationally and commercially, worker contact, drinking water protection and spray drift (aerosol effect).

This work preceded the quantitative public health risk assessment undertaken for the 'Proposed Scheme' (Support Document 36) as is summarised in Section 8.6.6 of this AEE.

- **High Level Risk Assessment**

A qualitative assessment identified some 44 separate hazards or threats and compared each of the refined Stage 2 short-listed options. This assessment showed Option B – offshore ocean outfall (providing it is correctly designed, installed and maintained) is likely to have to have significantly less risk than the other options. By contrast, Option A, land disposal with a wet weather vent was shown in the assessment to have the highest level of risk.

- **Planning Risk and Consentability Assessment**

This assessment showed that Option B offshore ocean outfall appears to have the least consentability difficulty. At that stage of the project however, as recorded in the Task 2G Report, some of the tangata whenua matters were not known.

The above Task 2G findings related to identification of a 'Preferred Scheme'. Once identified and agreed to by WDC (Council itself), the 'Preferred Scheme' was developed into the 'Ruakaka Wastewater Strategy' and 'Proposed Scheme', and in doing that key findings from the Task 2G assessment were more fully evaluated.

6.9.3 Multi-Criteria Analysis (MCA) Decision Workshops of Short-Listed Options

As MCA is a powerful tool to assist in making decisions in uncertain situations it was used in this Task 2G to assist in identifying the 'Preferred Scheme.' The approach used by MWH has followed a decision conferencing framework. This has involved determination of the following 12 assessment criteria (C1 to C12) and the weighting of those criteria. The assessment criteria (or issues) are as follows. For each of these criteria, a number of key matters that have been included in the assessment are identified for each of them.



C1	Public Health	C7	Long-Term Hydraulic Acceptance
C2	Natural Environment	C8	Technology and Build ability
C3	Built Environment	C9	Estimated Costs
C4	Social	C10	Risk and Risk Management (Excluding Health Risk)
C5	Tangata Whenua	C11	Long-Term Sustainability
C6	Land Matters	C12	Planning / Consentability

Firstly, MWH staff involved on the project tested the tool, then WDC staff used it, and finally the PAG similarly undertook an MCA Workshop to determine their Preferred Scheme. In all three cases Option B, Discharge to an Ocean Outfall, became the 'Preferred Option'. In each workshop, the participants were mindful of the Project Objectives in undertaking the assessment.

6.9.4 Summary of Positive and Negative Attributes of the Four Generic Schemes

The following summaries are presented in the Task 2G Report (Support Document 22) to highlight the Positive and Negative Attributes. They should be read together with estimated cost and other information presented in that Report and summarised above.

- **Option A – Land Disposal with Wet Weather Vent**

This summary assumes sufficient areas of suitable land would be available. Subsequent investigations show this is unlikely to be the case, particularly for the preferred area along the coastal strip.

Positive Attributes	Negative Attributes
<ul style="list-style-type: none"> • Likely to address Maori cultural issues and have some positive perceptions for the wider community • Eliminates the need for a continuous discharge of treated wastewater to surface or marine waters although a wet weather vent discharging direct into water is likely to be still needed • Low risk to public health identified providing the scheme is appropriately sited and operated • Depending on land type and land use in the disposal area then some benefits can be achieved from the irrigation and soil fertiliser properties of the treated wastewater 	<ul style="list-style-type: none"> • Soil types mean that only low disposal irrigation rates are possible • Mounding of groundwater and sea level rise projections severely limit sustainable solutions • Potential land and ground and surface water contamination • Large area of land required, which would necessitate use of multiple parcels of land in different areas. • High cost capital and ongoing operating cost • Impact on land use particularly dairy farming which may not be considered compatible with land disposal of treated human wastewater • Land would need to be purchased by WDC or leased on secure long term arrangements • A wet weather 'vent' discharge to surface or marine waters is likely to be still likely to be needed unless large wet weather storage volumes are provided.



• **Option B – Discharge to Ocean Outfall in Bream Bay**

In summary, the discharge of treated wastewater to Bream Bay through a new ocean outfall appears to be a viable option. The positive and negative attributes identified in this assessment are:

Positive Attributes	Negative Attributes
<ul style="list-style-type: none"> • The point of discharge (approximately 1,500m or so offshore) would be well removed from recreational bathing beaches and shellfish collection areas; • The discharge would be to open coastal waters in an area subject to significant tidal currents, where moderately efficient dilution and dispersion of the treated wastewater can be achieved; • The existing Ruakaka Wastewater Treatment Plant and site can be further developed and upgraded to achieve a suitable treated wastewater quality for an ocean discharge • Effects on water quality and marine ecology are likely to be no more than minor after reasonable mixing. 	<ul style="list-style-type: none"> • The discharge would be into a relatively pristine marine environment; • The near shore coastal waters of Bream Bay are highly valued for recreational bathing, shellfish gathering, boating and fishing activities; • The Bream Bay Aquaculture Park water intake is located in the near shore coastal waters of Bream Bay • The cultural and spiritual values to tangata whenua of waters in and around Bream Bay are considered to be significant. The discharge of treated human wastewater into this area would be considered to be contradictory to these values.

• **Option C – Discharge to Ruakaka River**

In summary, the option to discharge treated wastewater to the Ruakaka River, either continuously or on the ebb tide, presents rather more negative than positive attributes.

Positive Attributes	Negative Attributes
<ul style="list-style-type: none"> • The point of discharge would be distant from recreational shellfish collection areas; • This wastewater discharge would need to be highly treated and at most times would contain fewer indicator bacteria than the receiving waters of the Ruakaka River. • All infrastructure would in effect be on land 	<ul style="list-style-type: none"> • The original concept of a diffuse discharge to the River is unlikely to be viable because of the large volumes of wastewater that will be received in the future. A more direct “rock passage” type discharge, or direct discharge via a cross river diffuser would need to be employed to achieve more efficient initial mixing and dilution; • The low water velocities in the Ruakaka River estuary mean that the receiving water – treated wastewater mixing efficiency will be poor and the dilution achievable within a reasonably mixing zone will be low; • The low dilutions available mean that, even if a very high quality treated wastewater were produced, the discharge would significantly increase river concentrations of ammonia and oxygen demand and may alter the salinity balance; • The discharge is upstream of the highly valued Coastal Marine Area (CMA) reach of the lower river, which has significant ecological values and receives intensive recreational use in summer.



Positive Attributes	Negative Attributes
	<ul style="list-style-type: none"> A River discharge has potential for odour generation.

- Option D – Discharge to Whangarei Harbour**

The discharge of treated wastewater to the Whangarei Harbour entrance on the ebb tide has some favourable characteristics, but also presents a number of significant difficulties.

Positive Attributes	Negative Attributes
<ul style="list-style-type: none"> If approval was given to discharge into the deeper water shipping channel, then this deeper waters and strong tidal currents would provide efficient mixing characteristics and a moderately high initial dilution at most times. The option to discharge only on the outgoing tide is available and should mitigate concerns about enrichment effects and other contamination issues within the harbour 	<ul style="list-style-type: none"> The potential adverse impacts of shipping and/or the Refinery operations are likely to limit the location where an outfall and particularly its diffusers can be placed. Proximity of the discharge to the highly valued Mair Bank pipi beds, and cockle beds within the harbour, are likely to be significant public perception and cultural issues. Proximity of the discharge to the Motukaroro Marine Reserve may present a public perception issue (although tidal currents are expected to carry the discharge treated wastewater away from the reserve). Proximity of the point of discharge to the Marsden Point Refinery stormwater/ wastewater discharge and associated mixing zone introduces uncertainty about assimilative capacity of receiving waters. (The option to discharge only on the outgoing tide when tidal currents are strong would probably mitigate this concern).

6.10 Identification and Reasons for the ‘Preferred Scheme’

6.10.1 Comparison of the Four Generic Options with the Project Objectives

Using the output of all the Stage 1 and 2 investigations and consultation output up to that point in the project, the four generic options, including the refined Stage 2 short-listed options, were assessed against the project objectives. Table 6.4 sets out a summary of this assessment. The four generic options encompass the other five Refined Stage 2 short-listed options, as each of these is in effect a sub option of a generic ‘option’ as is indicated by the coding of options as A,B,C and D in Table 6.2. Option B, ocean outfall includes wastewater reuse opportunities.



Table 6.4 Comparison of the Four Generic Options with the Project Objectives

OBJECTIVES	OPTION A – LAND DISPOSAL WITH A WET WEATHER VENT	OPTION B – DISCHARGE TO OCEAN OUTFALL IN BREAM BAY WITH REUSE	OPTION C – DISCHARGE TO RUAKAKA RIVER	OPTION D – DISCHARGE TO WHANGAREI HARBOUR
<p>OVERALL OBJECTIVE</p> <ul style="list-style-type: none"> To work in partnership with the community and tangata whenua to obtain the necessary long-term resource consents for the 'Proposed Scheme'. The 'Proposed Scheme' shall encompass a high level of public health and environmental protection and be the Best Practicable Option (BPO) (BPO in terms of RMA interpretation of the term BPO) for Ruakaka's future wastewater management that is in keeping with sustainable management principles and practices. 	<ul style="list-style-type: none"> Investigations show that a long-term scheme is not likely to be neither practicable nor sustainable, although in the short- and medium-term land disposal will be used. Land available for the preferred coastal strips is of significant limitations. 	<ul style="list-style-type: none"> Provide for a long term solution but some issues with tangata whenua regarding discharge to water. On balance, it is considered this option best meets the overall objective as, taking all factors into account, it is considered to be a 'BPO' solution. 	<ul style="list-style-type: none"> This option is the most unlikely to meet this objective. It is not considered a 'BPO' solution. 	<ul style="list-style-type: none"> This option could generally meet this overall objective if acceptance of a harbour discharge was achieved, but in comparison to Option B, Option B is considered to be a better solution.
<p>ENVIRONMENTAL OBJECTIVES</p> <ul style="list-style-type: none"> To protect the natural environment and in particular the soil and water quality of the land, Ruakaka River, Whangarei Harbour and Bream Bay and ensure these are not compromised. 	<ul style="list-style-type: none"> Use of the coastal strip as the preferred location would raise ground water tables and is not considered sustainable over the long term. Other more inland areas, if available, may achieve this objective, but at higher costs. 	<ul style="list-style-type: none"> With an appropriate level of treatment and well sited offshore outfall investigations show that a high level of protection will be achieved. 	<ul style="list-style-type: none"> Substantial difficulties in achieving this objective. 	<ul style="list-style-type: none"> Some possible difficulties in achieving this objective especially in respect to protection of harbour and inner Bream Bay water quality, particularly from a nutrient viewpoint.
<ul style="list-style-type: none"> To ensure a high level of compliance with recreational, ecological and water quality standards and guidelines, and Regional and District Planning requirements. 	<ul style="list-style-type: none"> Able to comply if appropriately sited land available, but even then there are likely to be substantial risks. 	<ul style="list-style-type: none"> Should well meet this objective as a high level of compliance should be achieved, except possible issue with some aspects of the planning instruments associated with the protection of the mauri of the water and air. 	<ul style="list-style-type: none"> Likely to be substantial difficulties in achieving this objective due to existing water quality issues and problems with mixing volumes. 	<ul style="list-style-type: none"> Some limitations in achieving this objective particularly with proximity to Mair Bank and Marsden Bank shellfish areas and harbour water quality issues.
<ul style="list-style-type: none"> To promote the efficient use and development of natural and physical resources, and the sustainable reuse of wastewater products. 	<ul style="list-style-type: none"> Could meet this objective if suitable land available and land disposal had beneficial effects – but no cost affordable solution was identified that meets this objective. 	<ul style="list-style-type: none"> The 'Ruakaka Wastewater Strategy' and this option with a high standard of treated wastewater, appropriately sited offshore outfall and wastewater reuse, well meets this objective. 	<ul style="list-style-type: none"> The use of the River as a discharge does not meet this objective. 	<ul style="list-style-type: none"> The use of the Harbour for a discharge point would meet this objective if there was an appropriate outfall into the harbour, and the Ruakaka Wastewater Strategy was followed.



OBJECTIVES	OPTION A – LAND DISPOSAL WITH A WET WEATHER VENT	OPTION B – DISCHARGE TO OCEAN OUTFALL IN BREAM BAY WITH REUSE	OPTION C – DISCHARGE TO RUAKAKA RIVER	OPTION D – DISCHARGE TO WHANGAREI HARBOUR
<ul style="list-style-type: none"> To minimise energy use and the emission of greenhouse gases and any other adverse effects on climate change as far as is practicable. 	<ul style="list-style-type: none"> High energy use scheme with spray irrigation and long conveyance lines. 	<ul style="list-style-type: none"> Medium energy use scheme. 	<ul style="list-style-type: none"> Medium to high energy use scheme because of extra enhanced treatment needed for River discharge. 	<ul style="list-style-type: none"> Medium energy scheme – similar to Option B Ocean Outfall but (slightly) higher energy use than Option B.
<p>SOCIAL OBJECTIVES</p> <ul style="list-style-type: none"> To ensure that the Ruakaka Wastewater Scheme achieves the greatest practicable protection of public health. 	<ul style="list-style-type: none"> Potential for surface and groundwater (therefore bore supplies) to be contaminated. Spray drift and aerosol effect can pose public health risks and be a concern if dairy farming is nearby. 	<ul style="list-style-type: none"> The Quantitative Public Health Risk Assessment confirms that a high degree of public health protection for recreation and shellfish gathering – based on the high standard treated wastewater and location 22 for the ocean outfall both as now included for in the ‘Proposed Scheme’. Specific considerations are appropriate in respect to the NIWA Bream Bay seawater intake. Some potential issues regarding perception of public health risk of ocean outfall. 	<ul style="list-style-type: none"> Consultation highlighted strong opposition to this option from a public health viewpoint (as well as other viewpoints). 	<ul style="list-style-type: none"> Proximity to pipi and cockle beds would probably be a significant issue at least from a perception view point. Perception and cultural assessment may lead to more negative comment if this option was proposed.
<ul style="list-style-type: none"> To provide a suitable wastewater system which will ensure an appropriate level of service and encourage the uptake of the services of the existing and future communities. 	<ul style="list-style-type: none"> Even if found practicable, this option would be likely to have limitations on longer-term future development in the area. 	<ul style="list-style-type: none"> With appropriate sizing of the outfall and scheme operation, this option well meets this objective. 	<ul style="list-style-type: none"> The limited assimilation capacity of the River is likely to limit the longer-term scheme capacity even if a River discharge scheme was acceptable initially. 	<ul style="list-style-type: none"> With appropriate sizing of the outfall, this option should well meet this objective unless harbour discharge issues, e.g. nutrients limit future expansion of the discharge.
<ul style="list-style-type: none"> To work in partnership with the Project Advisory Group (PAG), the community and key stakeholders to achieve a good understanding of this Project, so as to enable genuine and effective consultation. 	<ul style="list-style-type: none"> Considered consultation on this option has achieved this objective and a good understanding of option limitations and the unsustainable nature has been realised. 	<ul style="list-style-type: none"> Considered consultation on this option has achieved this objective, especially through the output of the extensive investigations undertaken. Final consultation expected to confirm this. 	<ul style="list-style-type: none"> Objective reasonably achieved as stakeholders indicated understanding of this option and its significant limitations. 	<ul style="list-style-type: none"> Considered consultation on this option has generally achieved this objective, although limited support as Option B preferred.



OBJECTIVES	OPTION A – LAND DISPOSAL WITH A WET WEATHER VENT	OPTION B – DISCHARGE TO OCEAN OUTFALL IN BREM BAY WITH REUSE	OPTION C – DISCHARGE TO RUAKAKA RIVER	OPTION D – DISCHARGE TO WHANGAREI HARBOUR
<p>ECONOMIC OBJECTIVES</p> <ul style="list-style-type: none"> To provide an economically sustainable future 'Proposed Scheme' which will match the anticipated growth in the area, – i.e. affordable for both the existing and growth communities now and in the future. 	<ul style="list-style-type: none"> Highest capital and operating cost scheme by a significant margin, and likely to have capacity limitations in longer-term compared to some other options. Off the Four Options, Option A least meets this objective of the four options. 	<ul style="list-style-type: none"> Best meets this objective as it is the lowest capital and operating cost scheme, although the long (3,000m) Ocean Outfall and high standard of treatment have added significantly to what could have been a lower-cost scheme. 	<ul style="list-style-type: none"> Similar capital costs to Option B. Significantly higher operating costs due to an even higher standard of treatment being required. As operating costs increase with time (inflation), does not well meet this objective in comparison to Options B and D. 	<ul style="list-style-type: none"> Reasonably meets this objective, but not as well as Option B.
<ul style="list-style-type: none"> To ensure the optimum economic use of the existing infrastructure. 	<ul style="list-style-type: none"> With ongoing use of the existing designated treatment plant site for treatment and Zone 3 soakage for the initial period, and the wastewater collection system leading to this site, then all options are equal / similar in this respect. They all well meet this objective. 	<ul style="list-style-type: none"> With ongoing use of the existing designated treatment plant site for treatment and Zone 3 soakage for the initial period, and the wastewater collection system leading to this site, then all options are equal / similar in this respect. They all well meet this objective. 	<ul style="list-style-type: none"> With ongoing use of the existing designated treatment plant site for treatment and Zone 3 soakage for the initial period, and the wastewater collection system leading to this site, then all options are equal / similar in this respect. They all well meet this objective. 	<ul style="list-style-type: none"> With ongoing use of the existing designated treatment plant site for treatment and Zone 3 soakage for the initial period, and the wastewater collection system leading to this site, then all options are equal / similar in this respect. They all well meet this objective.
<ul style="list-style-type: none"> To promote outcomes that ensure sufficient flexibility to adopt appropriate technology and more sustainable solutions in the future, including treated wastewater reuse, where they provide more effective solutions. 	<ul style="list-style-type: none"> Investigations show a sustainable long-term scheme is not considered possible, although land disposal is to be used in the short- to medium-term before the Ocean Outfall of the 'Preferred Scheme' (Option B) is installed. 	<ul style="list-style-type: none"> Well meets this objective, including through the implementation of the Proposed 'Ruakaka Wastewater Strategy'. 	<ul style="list-style-type: none"> Not considered to meet this objective on a number of grounds – particularly river water quality / ecology, culturally, community, scheme capacity limitations and operating costs. 	<ul style="list-style-type: none"> Could meet this objective if environmental (harbour water quality and ecology) cultural and public concerns are met.
<ul style="list-style-type: none"> To apply appropriate technology that will protect public health and meet environmental standards and tangata whenua and community aspirations while achieving lowest whole of life costs. 	<ul style="list-style-type: none"> Least meets this objective. 	<ul style="list-style-type: none"> Best meets this objective. 	<ul style="list-style-type: none"> Unlikely to meet this objective. 	<ul style="list-style-type: none"> Could meet this objective.
<p>TANGATA WHENUA CULTURAL OBJECTIVES</p> <ul style="list-style-type: none"> To recognise and provide for the special role and relationships that Maori have as tangata whenua. 	<ul style="list-style-type: none"> Consultation with iwi signals that disposal to land is the preferred option as it is considered consistent with natural processes. 	<ul style="list-style-type: none"> Iwi have expressed a strong preference for no wastewater to be discharged to the ocean (water) In response this option 	<ul style="list-style-type: none"> Iwi have expressed a strong preference for no wastewater to be discharged to water. This option is considered likely 	<ul style="list-style-type: none"> Iwi have expressed a strong preference for no wastewater to be discharged to water.. Iwi has identified that this



OBJECTIVES	OPTION A – LAND DISPOSAL WITH A WET WEATHER VENT	OPTION B – DISCHARGE TO OCEAN OUTFALL IN BREM BAY WITH REUSE	OPTION C – DISCHARGE TO RUAKAKA RIVER	OPTION D – DISCHARGE TO WHANGAREI HARBOUR
		includes wastewater reuse and disposal to land	to increase the existing levels of pollution to the Ruakaka River.	proposal poses risks to feral pipi beds on the Whangarei foreshore.
<ul style="list-style-type: none"> <i>To work in partnership with tangata whenua to achieve a good understanding of this Project, so as to enable genuine and effective consultation and allow knowledge sharing.</i> 	<ul style="list-style-type: none"> Iwi and WDC have worked closely in partnership to ensure that knowledge is shared by both parties as part of the consultation process. This has played a key part in the development of the preferred scheme 	<ul style="list-style-type: none"> Iwi and WDC have worked closely in partnership to ensure that knowledge is shared by both parties as part of the consultation process. This has played a key part in the development of the preferred scheme and in the case of this option through to the 'Proposed Scheme'. 	<ul style="list-style-type: none"> Iwi and WDC have worked closely in partnership to ensure that knowledge is shared by both parties as part of the consultation process. This has played a key part in the development of the preferred scheme 	<ul style="list-style-type: none"> Iwi and WDC have worked closely in partnership to ensure that knowledge is shared by both parties as part of the consultation process. This has played a key part in the development of the preferred scheme
<ul style="list-style-type: none"> <i>To promote widespread community awareness and concern for the land and water-based resources and taonga including kaimoana, fisheries, native birds and wildlife, the foreshore, seabed and surrounding estuaries, and indigenous flora and fauna of Te rohe O Patuharakeke Hapu.</i> 	<ul style="list-style-type: none"> Consultation with PTB and the general community up until the preferred scheme was adopted helped promote awareness and concern for land and water based resources 	<ul style="list-style-type: none"> Consultation with PTB and the general community up until the preferred scheme was adopted helped promote awareness and concern for land and water based resources The high standard of treatment proposed reflected the concern for water based resources The CIA prepared by PTB has further helped promote awareness and concern land and water based resources The mitigation by way of suggested consent condition providing for monitoring and capacity building will also increase the awareness of these resources 	<ul style="list-style-type: none"> Consultation with PTB and the general community up until the preferred scheme was adopted helped promote awareness and concern for land and water based resources The high standard of treatment proposed reflected the concern for water based resources 	<ul style="list-style-type: none"> Consultation with PTB and the general community up until the preferred scheme was adopted helped promote awareness and concern for land and water based resources The high standard of treatment proposed reflected the concern for water based resources



6.10.2 Identification and Reasons

The findings of the wide ranging initial technical, scientific and planning investigations of the Stage 2 short-listed and refined scheme options, supported by both the multi-criteria analysis decision workshop and the evaluation against the Project Objectives, showed that the most appropriate scheme is Option B discharge to the ocean through an offshore outfall into Bream Bay.

Feedback from the Stage 2 consultation at that stage of the Project indicated some growing support for an ocean outfall option. In this respect it is acknowledged however that the position of tangata whenua is clear in that their preference is for all treated wastewater to be disposed of onto land if that is practical and sustainable over the long-term. Tangata whenua do not, however, favour use of those parts of the coastal strip land that are subject to a Treaty of Waitangi Land Claim.

The preference for Option B, the ocean outfall into Bream Bay, with reuse opportunities, has been further confirmed and strengthened by the following two Task 2G activities, namely:

- a) The results of the high level risk assessment of the refined Stage 2 short-listed options which shows significantly less (potential) risks are associated with Option B than the other options; and
- b) The results of the MWH Multi-Criteria Analysis (MCA) which also gives a very significant preference for Option B the ocean outfall.

In summary, key matters that lead to the selection of Option B, Discharge to Ocean Outfall in Bream Bay as the 'Preferred Scheme' by the PAG, the Project Team and WDC (Council itself) included:

- The overall outcome of the technical and scientific investigations, the Multi-Criteria Assessment Decision Workshops and the Risk Assessment.
- The fact that land disposal, even with a wet weather vent (overflow) was found not to be sustainable and furthermore, was likely to have difficulties with land ownership. This is further elaborated on below.
- The (estimated) lower capital and operating costs of Option B.
- Output from the consultation, particularly the Open Days in support of Option B, providing there was a high standard of treatment and an appropriately sited outfall.
- The realisation by tangata whenua that, from a practicable and pragmatic viewpoint, an ocean outfall was probably the appropriate long-term solution if implemented as part of the 'Proposed Scheme' as detailed in Section 4.8 Staged Development of the 'Proposed Scheme'.
- The decision by WDC to adopt the high standard (5.5.10.10) of treated wastewater.

The assessment also highlighted that Option E, which involves split (separate) treatment of the domestic and industrial waste streams with discharge out the same offshore ocean outfall into Bream Bay is a relatively close second to Option B. Option E could therefore be worthy of further consideration, but the difficulty at this stage is that WDC are not aware of what industries and trade wastes are likely to be, and when and how much of what quality of trade waste they would discharge. Option E may therefore be worthy of considering at a later stage.

The principal reasons why Option A, Land Disposal with a Wet Weather Vent, as was identified by some stakeholders in the Stage 1 consultation as a favoured long-term scheme, was **not** selected as the 'Preferred Scheme' included:

- The coastal sand country strip was identified as the desirable location, but in this area:
 - there is insufficient land available; and
 - it would raise the groundwater table in the adjacent inland, low lying land covering much of the Ruakaka / One Tree Point area, thereby causing foundation issues, flooding and drainage problems.



- WDC would need to purchase or have long-term security over leased land.
- Tangata whenua's position is not favouring land disposal in the coastal strip as part of this land is subject to their Treaty of Waitangi Claims.
- Most of the coastal land is included in the conservation estate and the Department of Conservation are unlikely to grant concessions for the long term use of significant areas of this land. A proposed concession covering a currently consented land disposal concession area for wastewater disposal would in 2018.
- High (estimated) capital and ongoing operating costs and high energy needs.
- Higher degree of risks than other options, including risks associated with the public health protection.
- Expected difficulty obtaining consents.
- The overall unsustainable nature of such an option, taking all the above and related factors, into account.

6.11 Council's Adoption of a 'Ruakaka Wastewater Strategy' and the 'Preferred Scheme'

On 13 August 2008 a report was presented to the then Works and Services Committee of WDC. This report is included as Appendix A to this AEE.

The Committee at that meeting resolved to:

- adopt the Ruakaka Wastewater Strategy approach (yet to be developed); and
- to adopt the 'Preferred Scheme' consisting of an ocean outfall together with wastewater reuse opportunities; and
- confirm the existing treatment plant as the long-term treatment site.

In terms of the wastewater treatment standard, that report stated that:

"In both the Stage 1 GHD / URS study and the Stage 2 study involving MWH, the level of treatment and possible treatment plant types have been progressively developed in conjunction with the treated wastewater receiving environment considerations. An environmental effects approach has, to date, been used in this work. Such an approach, which is consistent with the RMA, is based on assessing what quality / standard of treated wastewater is required for discharge to the receiving environment (land, river, harbour, and ocean). The treatment processes and plant types are then tailored to meet this standard.

However, it is proposed to adopt a higher standard than indicated from a purely environmental effects basis. Such a standard takes into account additional factors including feedback from consultation, including that with Iwi, preferences from the Bream Bay Landowners Association, the importance of and possible effects on the NIWA Aquaculture Park, the high recreation and commercial value of the waters of Bream Bay and the desire for a precautionary approach."

The proposed treated wastewater median standard is described as a 5:5:10:10 standard. With the values representing the respective concentrations of BOD, TSS, TN and FC. Section 8.2 of this AEE further elaborates on this high standard and compares it to ocean outfalls elsewhere in New Zealand, noting that it is a higher standard than any other existing or proposed ocean outfalls as far as WDC is aware.

The decision by WDC to adopt this high standard treated wastewater quality is a key decision in the treatment and discharge / beneficial reuse options assessment.

(Please note: There was a typographic error in the Report to Council – 'Proposed Scheme' should have read 'Preferred Scheme'. This has been corrected in the resolutions as recorded above.)



6.12 Development of the ‘Preferred Scheme’ Into the ‘Proposed Scheme’ and the Ruakaka Wastewater Strategy

Following the identification of the ‘Preferred Scheme’ and its adoption by Council as recorded in Section 6.11 above; this scheme was then investigated in further detail and consulted on. These activities resulted in the development of the ‘Proposed Scheme’ and the associated Wastewater Strategy.

The ‘Proposed Scheme’ and Wastewater Strategy on which the resource consents and other approvals are being lodged were approved by Committee on 8 December 2010. This consultation draft AEE and then the final application is based on the selected ‘proposed scheme’ and the associated Ruakaka Wastewater Strategy.

In Section 2 the process of developing the ‘Preferred Scheme’ into the ‘Proposed Scheme’ is shown schematically (Figure 2.1 and Figure 2.2) and discussed. That information highlights the feedback or revisit loops in the process of defining the ‘Proposed Scheme’ and strategy, and the measuring of those against the project objectives.

Section 4 sets out both the Ruakaka Wastewater Strategy and rationale for the strategy, and the ‘Proposed Scheme’ and its rationale, respectively.

A key part of the alternatives assessment, once the ‘Preferred Scheme’ was identified including the confirmation of the future WWTP being located on the existing Ruakaka Wastewater Treatment Plant designated site was the determination of the proposed offshore ocean outfall location. The process followed to determine this is summarised in Section 6.13 below.

6.13 Ocean Outfall Alternatives Investigations (Support Documents 30, 31, 32, 33, 39)

6.13.1 Overall Approach

This part of the technical and scientific studies has been extensive. Initially in the Stage 1 Project, GHD / URS proposed an offshore outfall location in Bream Bay out from the existing WWTP. In the Stage 2 Project, NIWA provided MWH with some initial dilution and dispersal information on which the Task 2C studies were based.

Once the ‘Preferred Scheme’ was identified, being based on an offshore ocean outfall, hydraulic modelling specialists DHI (DHI Water and Environment Ltd) were engaged to undertake a systematic oceanographic investigation. This investigation is reported in the DHI Phase 1 (Support Document 31), Phase 1 Addendum (Support Document 32), and Phase 2 Reports (Support Document 33). A further report was prepared on the nutrient modelling in Bream Bay (Support Document 39).

The investigations involved a progressive approach to oceanographic modelling through a Phase 1 and Phase 2 sequence.

Section 8.5 summarises the approach to this modelling and the results from it.

Three sensitive areas in the marine environment were identified for the modelling in order that minimum dilutions and dilution frequency assessment could be undertaken at these. These three locations were:

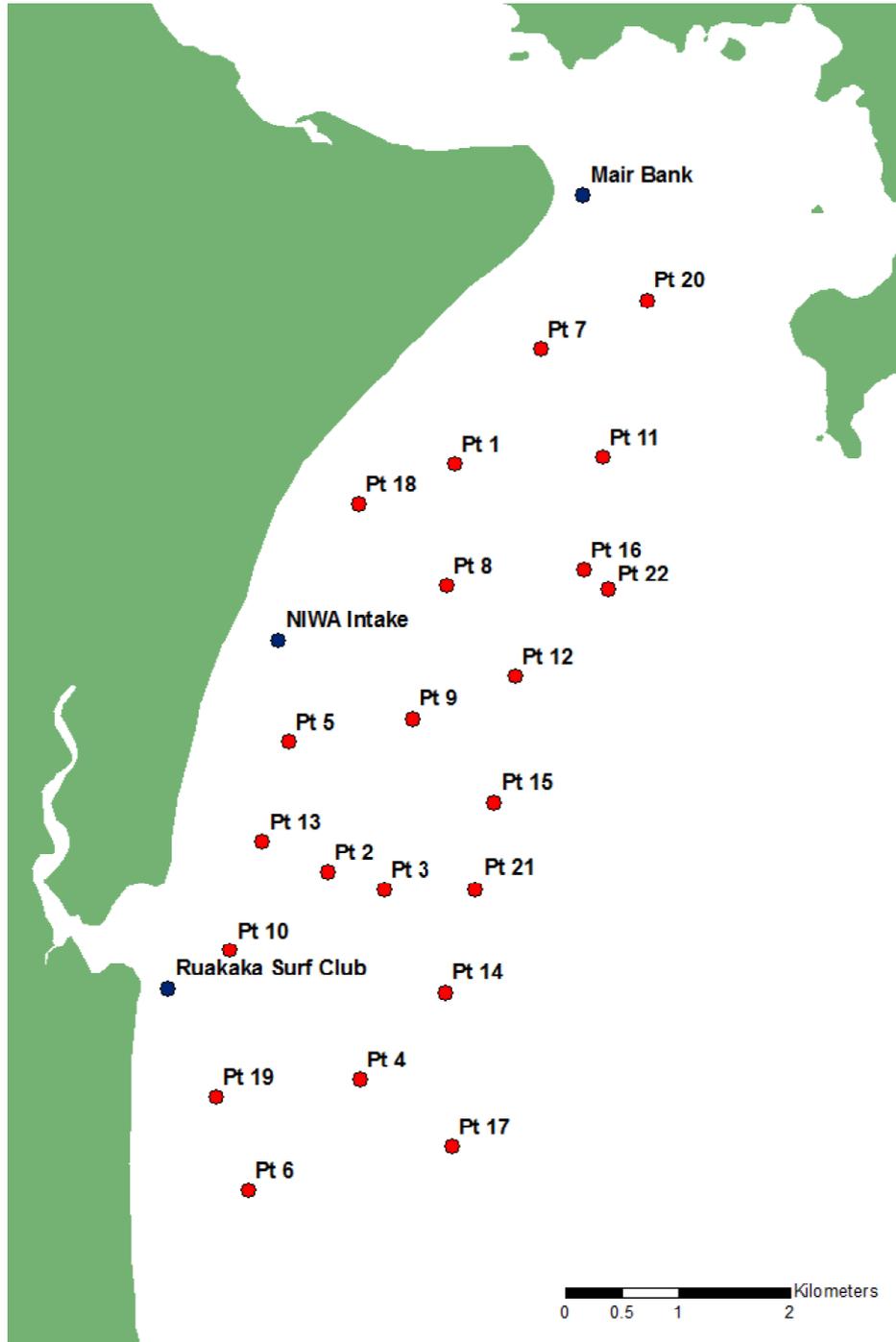
- The Ruakaka Surf Club beach.
- The NIWA Bream Bay Aquaculture Park water intake (approximately 600m offshore, being the former NIWA water pipe intake).
- The Mair Bank shellfish bed near the Whangarei Harbour entrance.



These locations are shown, along with the dilutions for a range of wastewater discharge rates, wind and sea conditions, throughout the DHI reports.

In all, some 22 outfall locations were considered and evaluated on a progressive and reiterative approach through the Phase 1, followed by Phase 2, modelling. A summary of the sequenced approach is given below.

Figure 6.2 Location of Possible Outfalls at Points 1 to 22





6.13.2 Phase 1 – DHI Investigations (Support Documents 31, 32)

This investigation was sequenced as follows. This Phase 1 assessment was based on the Table 4.1 volumes and flows, using specific ADWF figures as set out in Section 8.5.1.

The Phase 1 comparative assessment, based on 2047 ADWF, was initially intended to include Outfall Points 1, 2, 3 and 4 (selected by WDC / MWH).

Following initial discussions with NIWA, the Phase 1 comparative assessment was expanded to include Points 1 – 20.

On completion of the first part of the comparative assessment, WDC / MWH selected three locations for more detailed analysis. These are Points 3, 4 and 11.

Following further discussions with NIWA, WDC / MWH expanded the short list to include Points 17 and a new Point 21 for detailed assessment.

Point 11 was found to perform best, and Point 17 also performed well, particularly from NIWA's perspective. Phase 1 Report completed January 2010.

Due to concerns about proximity to Point 11 to Whangarei Harbour entrance, a new Point 22 was created, similar to Point 11 but further south. Point 22 was found to perform better than Point 11, reported in Phase 1 Addendum, completed February 2010.

6.13.3 Phase 2 (Support Document 33)

The Phase 2 Study compared Points 17 and 22, and undertook more rigorous modelling including assessment of the peak wet weather flow (PWWF), as well as the average dry weather flow (ADWF). This Phase 2 modelling was based on the revised flow predictions as derived from Table 4.2 as set out specifically in Section 8.5.1, as the more recent flow projections (WDC 2010).

Points 17 and 22 were included in the first part of the Phase 2 assessment using 2047 PWWF. Based on the dilution performance, Point 17 was found to perform no better than Point 22. WDC / MWH select Point 22 as the preferred outfall location.

The Phase 2 assessment was completed on Point 22. Phase 2 Report draft completed March 2010.

The conclusion of this Report (Support Document 33) was:

“The aim of the truncated PWWF assessment was to determine whether Point 17 performed better than Point 22 with regard to the predicted wastewater dilutions (including minimum dilutions) at the sensitive sites, with the possibility that Point 17 could replace Point 22 as the preferred outfall location.

WDC / MWH selected Point 22 as the final preferred outfall location, on the basis that Point 17 did not perform better than Point 22 for the 2047 ADWF and 2047 PWWF dilution and dispersion modelling assessments, including minimum dilutions analysis. Also considered were a range of factors beyond the scope of the dilution and dispersion modelling.”

6.13.4 Outfall Construction Alternatives

OCEL Consultants have assessed the alternative outfall construction and material types both for the offshore ocean outfall of approximately 3000 metres and the shoreline section of approximately 200m from the WWTP site. The OCEL Report titled 'Ruakaka Ocean Outfall Report – Constructability Assessment and Estimate Cost' – August 2010 (Support Document 37) discusses:

- **For the Offshore Ocean Outfall Construction Methods:**
 - Bottom Tow Method
 - Dig and Lay Moving Island
 - Float and Sink



- **For the Shore Crossing and Land Section connecting to the WWTP:**
 - Trenching and Sheet Piling
 - Horizontal Directional Drilling
 - Microtunnelling
- **For the Outfall Pipeline Materials**
 - Concrete Mortar Lined Steel Pipe
 - Polyethylene (PE) Pipe
 - In Sections 4.10 and 9 of this AEE WDC's preferred approach to procuring the ocean outfall system under a 'Design and Build' (DB) approach is discussed. Using this approach it is not appropriate to determine the construction methods or material types at this time, particularly as the outfall is not likely to be required until 2026.

A summary of the above is included in Section 9 of this AEE as it relates to the effects assessment.

6.13.5 Outfall Location Conclusion

Based on the above conclusion, WDC and MWH further evaluated the wide range of other matters that are important in determining the most appropriate outfall location. Part of this evaluation included assessing these two shortlisted locations against the Project Objectives (refer Section 2.2).

Table 6.5 below as it was prepared in early 2010. Since that date, further consultation with key stakeholders, including tangata whenua, has taken place.

Throughout the entire consultation, and particularly the ocean outfall location investigations, WDC maintained dialogue with NIWA representatives in respect to the Bream Bay Aquaculture Plant water intake and potential effects of an outfall discharge on that intake. Refer to Section 18 of this AEE consultation and the separate consultation record document (Support Document 41).

Table 6.5 Comparison of Outfall Locations 17 and 22 against the Project Objectives

OBJECTIVES	OUTFALL LOCATION 17	OUTFALL LOCATION 22	NOTES / DISCUSSION
<p>OVERALL OBJECTIVE</p> <ul style="list-style-type: none"> • <i>To work in partnership with the community and tangata whenua to obtain the necessary long-term resource consents for the 'Proposed Scheme'. The 'Proposed Scheme' shall encompass a high level of public health and environmental protection and be the Best Practicable Option (BPO) (BPO in terms of RMA interpretation of the term BPO) for Ruakaka's future wastewater management that is in keeping with sustainable management principles and practices.</i> 	<ul style="list-style-type: none"> • While this outfall location gives a similar, but not quite so good, performance as location 22 from a dilution etc performance, in respect to the NIWA intake (being the more sensitive location in terms of the MCA weighting) and when other factors, particularly costs (financial implications) are taken into account in the BPO assessment; location 22 is considered by the WDC / MWH project team to be a better overall choice of the preferred outfall. 	<ul style="list-style-type: none"> • While this ocean outfall location gives a similar, but somewhat better performance than location 17, in respect to protection of the NIWA intake (being the more sensitive location in terms of the MCA weighting) and the estimated costs (financial implication) and other considerations, the WDC / MWH project team considers location 22 to be preferred over location 17. Accordingly, in terms of the two shortlist outfall options, location 22 is the BPO outfall location. 	<ul style="list-style-type: none"> • BPO as per the interpretation in the RMA encompasses jointly considering adverse effects on the environment, financial considerations, and the current state of technical knowledge and practical application when considering discharge of contaminants to the environment where they may have adverse effects.



OBJECTIVES	OUTFALL LOCATION 17	OUTFALL LOCATION 22	NOTES / DISCUSSION
<p>ENVIRONMENTAL OBJECTIVES</p> <ul style="list-style-type: none"> <i>To protect the natural environment and in particular the soil and water quality of the land, Ruakaka River, Whangarei Harbour and Bream Bay and ensure these are not compromised.</i> 	<ul style="list-style-type: none"> Good degree of protection, similar to Location 22 for far field dilutions. Near field dilutions greater than for Location 22. 	<ul style="list-style-type: none"> Good degree of protection, similar to Location 17 for far field dilutions. Near field dilutions less than for Location 22. Slack water dilutions relatively low. 	<ul style="list-style-type: none"> Refer DHI modelling output and summary table of ADWF and PWWF under four wind scenarios, and also minimum dilution contaminant contraction tables for ADWF and PWWF. The very high standard of treatment proposed and the offshore outfall locations.
<ul style="list-style-type: none"> <i>To ensure a high level of compliance with recreational, ecological and water quality standards and guidelines, and Regional and District Planning requirements.</i> 	<ul style="list-style-type: none"> While a high level of compliance is expected to be achieved in respect to these matters, location 17 is closer to recreational (contact) areas and ecological areas, particularly the shoreline bird life reserve around the Ruakaka estuary. Meeting planning requirements is necessary for any location. Location 17 and 22 are likely to be similar in this respect, although location 22 may have some advantage. Construction activities for location 17, while not impinging on the bird reserve area near the Ruakaka estuary, could have some effect that needs assessment from a noise and equipment viewpoint. (Current proposal to lay the outfall diagonally from approximately the end of the racecourse). 	<ul style="list-style-type: none"> Location 22 gives, on balance, a greater separation from recreational and ecological (land ecology) activities, other than for the Mair bank shellfish area. Notwithstanding this, with the high quality and dilution / dispersion available at Mair bank, ANZECC shellfish standards will be complied with by a large safety factor. Meeting planning requirements is necessary for any location. Location 17 and 22 are likely to be similar in this respect, although location 22 may have some advantage. Construction activities are more distant from the bird reserve area near the Ruakaka estuary. Less potential effect on birdlife and other ecological considerations. 	<ul style="list-style-type: none"> The AEE and appropriate support documents will set out the assessment of effects that highlights compliance with these statutory and guideline documents.
<ul style="list-style-type: none"> <i>To promote the efficient use and development of natural and physical resources, and the sustainable reuse of wastewater products.</i> 	<ul style="list-style-type: none"> Similar to location 22, but uses more natural resources as long outfall length. Higher carbon footprint than location 22 in terms of pipeline materials because of the longer length of outfall pipeline (land and ocean). 	<ul style="list-style-type: none"> Similar to location 17, but shorter overall outfall length uses fewer natural resources. Lower carbon footprint than location 17. 	<ul style="list-style-type: none"> Sustainable reuse of wastewater products can be equally achieved regardless of the outfall location.



OBJECTIVES	OUTFALL LOCATION 17	OUTFALL LOCATION 22	NOTES / DISCUSSION
<ul style="list-style-type: none"> <i>To minimise energy use and the emission of greenhouse gases and any other adverse effects on climate change as far as is practicable.</i> 	<ul style="list-style-type: none"> Greater construction requirements and ongoing pumping energy required than location 22. Similar to location 22 in other respects. Higher carbon footprint than location 22 in terms of pipeline materials because of the longer length of outfall pipeline (land and ocean). 	<ul style="list-style-type: none"> Less construction and ongoing pumping energy than location 17. Similar to location 17 in other respects. Lower carbon footprint than location 17. 	<ul style="list-style-type: none"> Energy use for treatment is a key resource minimisation consideration. This is independent of the outfall location.
<p>SOCIAL OBJECTIVES</p> <ul style="list-style-type: none"> <i>To ensure that the Ruakaka Wastewater Scheme achieves the greatest practicable protection of public health.</i> 	<ul style="list-style-type: none"> Generally similar, but location 22 gives better protection to Mair Bank in SE winds and provides greater minimum dilution at Mair Bank at PWWF discharge. Apparent proximity to Surf Club area being offshore in that vicinity may result in negative perceptions as to contact recreation and seafood gathering in this well used area. 	<ul style="list-style-type: none"> Generally similar to location 17, with 17 better for ADWF and 22 better for PWWF for both Surf Club and Mair Bank. 	<ul style="list-style-type: none"> All aspects of the Proposed Wastewater Scheme provide an equally high degree of public health protection, although as recorded herewith there are some minor differences in the degree of protection in terms of the safety factors with respect to the two outfall locations. The high standard of treatment and offshore locations of the outfalls are key to providing this high level of public health protection.
<ul style="list-style-type: none"> <i>To provide a suitable wastewater system which will ensure an appropriate level of service and encourage the uptake of the services of the existing and future communities.</i> 	<ul style="list-style-type: none"> Similar but more expensive than location 22 for similar level of service. 	<ul style="list-style-type: none"> Similar, but overall more affordable than location 17 for similar level of service. 	<ul style="list-style-type: none"> Each location will achieve the same / similar level of service in the serviced wastewater district.
<ul style="list-style-type: none"> <i>To work in partnership with the Project Advisory Group (PAG), the community and key stakeholders to achieve a good understanding of this Project, so as to enable genuine and effective consultation.</i> 	<ul style="list-style-type: none"> WDC consider this will have been achieved to an adequate degree for outfall selection once the further consultation is completed. 	<ul style="list-style-type: none"> WDC consider this will have been achieved to an adequate degree for outfall selection once the further consultation is completed. 	<ul style="list-style-type: none"> Refer to consultation report documentation and summary WDC AEE.
<p>ECONOMIC OBJECTIVES</p> <ul style="list-style-type: none"> <i>To provide an economically sustainable future 'Proposed Scheme' which will match the anticipated growth in the area, – i.e. affordable for both the existing and growth communities now and in the future.</i> 	<ul style="list-style-type: none"> Around \$6 million in capital and slightly higher operating costs than location 22. Less feasibility than Location 22 to accommodate greater growth than anticipated. 	<ul style="list-style-type: none"> This location is the lower cost option in capital (by about \$6 million in comparison to Location 17, together with less pumping energy and lower operating costs also. The shorter land and ocean outfall line better accommodates growth than the longer outfall / conveyance length of Option 17. 	<ul style="list-style-type: none"> The proposed wastewater scheme has been developed to cater for anticipated growth.



OBJECTIVES	OUTFALL LOCATION 17	OUTFALL LOCATION 22	NOTES / DISCUSSION
<ul style="list-style-type: none"> To ensure the optimum economic use of the existing infrastructure. 	<ul style="list-style-type: none"> Same to similar as Location 22 for wastewater infrastructure. The longer landward conveyance line to the ocean outfall itself will, in part, be laid down WDC roads and in reserves. This will have a (potential) adverse effect on that roading and other services infrastructure. 	<ul style="list-style-type: none"> Same to similar as Location 17 for wastewater infrastructure. As the landward conveyance line is short (200m) to the ocean outfall, there will be no or little effect on other infrastructure. 	<ul style="list-style-type: none"> Each outfall location is based on use of the existing Ruakaka WWTP site.
<ul style="list-style-type: none"> To promote outcomes that ensure sufficient flexibility to adopt appropriate technology and more sustainable solutions in the future, including treated wastewater reuse, where they provide more effective solutions. 	<ul style="list-style-type: none"> Similar to Location 22, although significantly longer outfall pipeline therefore less flexibility for future to economically accommodate much higher flows should these unexpectedly occur in the future. 	<ul style="list-style-type: none"> Similar to Location 17, but with less outfall pipeline length has more flexibility to accommodate, at reasonable cost, significantly larger future flows than maybe designed for. 	<ul style="list-style-type: none"> Other parts of the overall Proposed Wastewater Strategy and Scheme provide equal flexibility, regardless of outfall location. There is a difference in the flexibility provided with respect to the two outfall locations as set for each location.
<ul style="list-style-type: none"> To apply appropriate technology that will protect public health and meet environmental standards and tangata whenua and community aspirations while achieving lowest whole of life costs. 	<ul style="list-style-type: none"> Higher cost outfall location being <ul style="list-style-type: none"> Approximately \$6m estimated capital cost greater than Location 22 (estimate TBC). Higher operating costs through pumping and longer pipeline to maintain. Higher risk, potential of pipeline damage on land section, as longer length through developed area, also more potential for scour damage as pipeline would cross on diagonal through seabed out from Ruakaka River / estuary discharge. 	<ul style="list-style-type: none"> Significantly better cost wise than location 17 as: <ul style="list-style-type: none"> Approximately \$6m less in capital cost estimate (estimate TBC). Lower in operating and maintenance costs (less power for pumping and shorter outfall length for maintenance). 	<ul style="list-style-type: none"> Appropriate treatment pipeline and operating technology will be used, regardless of the outfall location.
<p>TANGATA WHENUA CULTURAL OBJECTIVES</p> <ul style="list-style-type: none"> To recognise and provide for the special role and relationships that Maori have as tangata whenua. 	<ul style="list-style-type: none"> Will depend on tangata whenua's assessment of the difference between this location and location 22. Earlier indication, based on a pragmatic approach from tangata whenua was that this location is probably preferred should an ocean outfall proceed. 	<ul style="list-style-type: none"> Will depend on Tangata whenua's assessment of the difference between this location and location 17. At this stage, location 22 has not been discussed to the same extent as location 17, as location 22 has been identified later in the oceanographic investigations. Future hui with PTB will cover these matters. 	<ul style="list-style-type: none"> Tangata whenua have previously advised they will seek guidance from NIWA on the preferred outfall location. Earlier indications from PTB were preference for location 17 if an outfall was confirmed necessary. This preference was made prior to location 22 being identified as an offering a greater distance offshore than the earlier location 11. Further



OBJECTIVES	OUTFALL LOCATION 17	OUTFALL LOCATION 22	NOTES / DISCUSSION
			knowledge sharing relating to the comparison of location 22 is scheduled to take place with tangata whenua in early April 2010.
<ul style="list-style-type: none"> <i>To work in partnership with tangata whenua to achieve a good understanding of this Project, so as to enable genuine and effective consultation and allow knowledge sharing.</i> 	<ul style="list-style-type: none"> To date a sound and fruitful working partnership has been established between tangata whenua and the WDC. 	<ul style="list-style-type: none"> To date a sound and fruitful working partnership has been established between tangata whenua and the WDC. 	<ul style="list-style-type: none"> Knowledge sharing is an important component for tangata whenua and WDC in this project. WDC consider knowledge has been effectively shared through the series of hui and other partnership activities.
<ul style="list-style-type: none"> <i>To promote widespread community awareness and concern for the land and water-based resources and taonga including kaimoana, fisheries, native birds and wildlife, the foreshore, seabed and surrounding estuaries, and indigenous flora and fauna of Te rohe O Patuharakeke Hapu.</i> 	<ul style="list-style-type: none"> This location is closer to the Ruakaka Estuary and bird sanctuaries, and closer to the crab and fishing areas. It is also closer to the shoreline than Location 22. 	<ul style="list-style-type: none"> While both outfall locations will perform well in terms of protecting the marine environment – including taonga and kaimoana – Location 22 is considered overall to better protect both the marine and land environments, which include shoreline environments for native birds and other wildlife. Location 22 is, however, closer to the Mair Bank marine resources, but the high standard of wastewater treatment coupled with the still significant distance (3,750m) and the high degree of dilution and dispersion available. 	<ul style="list-style-type: none"> This objective was formulated from PTB's Environmental Plan. This objective overlaps with a number of the environmental objectives (refer above).

6.14 Other Alternatives Considered During the Stage 2 Study

In addition to the wide range of alternatives assessed under the six categories (refer Section 6.2 above) that are reported on in the Support Documents and summarised above, the following two further matters arose during the Stage 2 Study.

6.14.1 Conveying Untreated Wastewater Back to the Whangarei City Wastewater Treatment Plant

The possible alternative of conveying untreated wastewater from Ruakaka back to the Whangarei City Wastewater Treatment Plant and discharging that volume of treated wastewater into Limeburners Creek as an additional volume to the current City's discharge. The question about this possible alternative, and had it been investigated, was raised in the CH2M Beca High Level Review.

This possible alternative for treatment and discharge was considered not to be appropriate for a number of factors, the main ones being:

- The long (around 35 km) conveyance distance and the matter of pipe diameter sizing to take future large flows, yet small flows in the early years.



- The use of the limited presently unused site footprint at the existing Whangarei City Wastewater Treatment Plant.

The risks of overflows / emergency discharges from the long pipeline from Ruakaka to the Whangarei Plant, particularly with the reliance on one pipeline covering a range of geographies and soil types. The limited assimilation capacity of the receiving water to take what could, in the future, be significant additional flows, because of the small flow in Limeburners Creek and the tidal nature of this receiving environment.

The fact that the treated discharge, no matter how well treated, would be into the upper Whangarei Harbour environment rather than the much more appropriate ocean receiving environment that is available in Bream Bay.

6.14.2 Residential Grey Water Recycling

The second alternative that arose during the Stage 2 investigations was the use of household grey water recycling to reduce the wastewater volumes needing treatment and disposal in a reticulated scheme, and also as a means to reduce household potable water requirements. This was investigated in the Stage 1 Study. The further considerations in the Stage 2 Study highlighted that such a technique is possible (with Health Authorities approval) and can be incorporated in a local authorities District Plan and Codes of Practice (as has recently been done for Kapiti District Council with their District Plan Change No. 75).

There is no WDC direction or policy at this stage for direct residential grey water recycling.

The conclusion was that even if grey water reuse was permitted and enforced, there are limitations on its use on small lots for garden watering etc, and furthermore, in periods of wet weather with high water tables, there would be severe limitations on its application. The key conclusion was that while it would reduce the volume of domestic wastewater, at least at times, it would not reduce it to the extent that full land disposal was possible in the medium- to long-term as there was still the black water from domestic sources and the business and industrial wastewater.

6.15 Rationale for the Alternatives Selected in the Ruakaka Wastewater Strategy and the ‘Proposed Scheme’

Section 2 sets out the Project Objectives against which the alternatives considered for all parts of the ‘Ruakaka Wastewater Strategy’ and first the ‘Preferred Scheme’ and then the ‘Proposed Scheme’ been assessed against. Section 2 also sets out the Strategies and other WDC requirements and drivers, as well as wider community, District and Regional needs and desires.

Progressively throughout the Project, the reasons for decisions made have been identified and recorded as the Project has progressed through to identifying a ‘Preferred Scheme’ and then the ‘Proposed Scheme’ and the Wastewater Strategy. This provides an all-important audit trail for the project development and the decisions made.

Section 4.11 sets out a summary of the rationale for the ‘Proposed Scheme’ and associated ‘Ruakaka Wastewater Strategy’. This summary highlights how each of the main components of the Scheme and Strategy meet the Project Objectives and other WDC drivers and Strategies. The assessment of the ocean outfall location included above underpins the part of Section 4.11 that relates to the ocean outfall component.