

Evaluation of the Waikato Regional Policy Statement

September 2007



DISCLAIMER: While every effort has been made to ensure the accuracy of this report Enfocus Ltd accepts no liability whatsoever for any errors of fact or opinion expressed herein

Document reference: C:\Enfocus\Enfocus Project Files\Environment
Waikato\RPS Review\Draft Reports\EW RPS
Report Draft 2.doc

Date of this version: 16/09/2007 3:53 p.m.

This report was prepared by: Gerard Willis

Enfocus Limited
Unit G04, 23 Edwin Street
Mt Eden
Private Bag MBE M251
Auckland

(Ph) 09 630 2300
(Mb) 021 630 310

Contents

Executive Summary.....	i
1 Introduction.....	1
2 Methodology.....	1
3 Changing Context.....	4
3.1 Key social and economic changes since the mid 1990s.....	4
3.2 Changed legislative and policy context.....	7
4 Land and Soil.....	11
4.1 Accelerated erosion.....	11
4.2 Soil Contamination.....	14
4.3 Maintenance of soil health.....	19
4.4 Moisture management.....	20
4.5 River and lake beds management.....	21
4.6 Overview of current land and soil issue identification.....	22
4.7 Relevant contextual changes.....	23
4.8 Additional issues and possible changes.....	24
4.9 Structural implications for the RPS.....	25
5 Water.....	26
5.1 Water quality.....	26
5.2 Flow Regimes.....	29
5.3 Efficient use of water.....	29
5.4 Wetlands.....	31
5.5 Public access to water bodies.....	32
5.6 Mauri.....	32
5.7 Overview of current water issue identification.....	33
5.8 Relevant contextual changes.....	34
5.9 Additional issues and possible changes.....	36
5.10 Structural implications for RPS.....	39
6 Coast.....	40
6.1 Natural character and coastal processes.....	40
6.2 Coastal water quality.....	44
6.3 Integrated management.....	45
6.4 Public access.....	46
6.5 Noise emissions.....	46
6.6 Overview of current coastal issue identification.....	46
6.7 Contextual changes.....	49
6.8 Additional issues and possible changes.....	50
6.9 Structural implications for the RPS.....	52
7 Air.....	54
7.1 Regional and local air quality.....	54
7.2 Climate Change and Greenhouse Gases.....	57
7.3 Ozone Depletion.....	58

7.4	Overview of current air issue identification	59
7.5	Relevant contextual changes.....	61
7.6	Additional issues and possible changes	62
7.7	Structural implications for the RPS	63
8	Natural Hazards	64
8.1	Management of natural hazards	64
8.2	Adverse effects	64
8.3	Overview of natural hazards issues	65
8.4	Relevant contextual changes.....	66
8.5	Additional issues and possible changes	67
8.6	Structural implications for the RPS	68
9	Waste	69
9.1	Waste management.....	69
9.2	Overview of waste chapter	70
9.3	Relevant contextual changes.....	71
9.4	Additional issues and possible changes	72
9.5	Structural implications for the RPS	73
10	Hazardous Substances	74
10.1	Management of hazardous substances	74
10.2	Storage, transportation, use and disposal of hazardous substances	75
10.3	Existing contaminated sites	75
10.4	Overview of hazardous substances issues.....	76
10.5	Relevant contextual changes.....	77
10.6	Additional issues and possible changes	79
10.7	Structural implications for the RPS	80
11	Energy	81
11.1	Efficient energy use	81
11.2	Overview of energy issue	82
11.3	Relevant contextual changes.....	82
11.4	Additional issues and possible changes	83
11.5	Structural Implications for the RPS	84
12	Structures (Infrastructure)	85
12.1	Infrastructure.....	85
12.2	Overview of Infrastructure.....	86
12.3	Relevant contextual changes.....	86
12.4	Additional issues and possible changes	87
12.5	Structural implications for the RPS	90
13	Minerals	91
13.1	The ability to extract mineral resources	91
13.2	Adverse effects of mineral exploration and development	93
13.3	Overview of minerals issues	94
13.4	Relevant contextual changes.....	95
13.5	Additional issues and possible changes	95
13.6	Structural implications for the RPS	96
14	Heritage	97

14.1	The Region's heritage.....	97
14.2	Maori heritage.....	98
14.3	Overview of heritage issues.....	98
14.4	Relevant contextual changes.....	99
14.5	Additional issues and possible changes.....	99
15	Iwi and integrated management.....	101
15.1	Treaty of Waitangi and matters of significance to Maori.....	101
15.2	Iwi issues for further consideration.....	102
15.3	Integrated management.....	104
15.4	Issues for the future RPS.....	104
16	Structural options for the second generation Waikato RPS.....	105
16.1	Structural options.....	105
16.2	Style and scope.....	106
16.3	Achieving integrated management.....	107
16.4	The structure of the future RPS.....	109
17	Conclusion.....	111
17.1	Answers to core evaluation questions.....	111

Executive Summary

This report evaluates the performance and continued relevance of the Waikato Regional Policy Statement (RPS). It has been produced as the first stage of the review of the Waikato RPS scheduled for notification in 2010.

The following text attempts to summarise some of the main points raised by the evaluation. However, the evaluation makes many *detailed* points and recommendations that ought to be considered in the preparation of the next generation of the RPS. It is not possible to repeat those in the executive summary and readers are directed to the main body of the report for further explanation and elaboration.

Changing Context

Four of the main drivers of change in the Waikato over the past decade have been:

- significant population growth both within parts of the Waikato region itself and on the Region's northern and eastern borders which has heightened demand on the Waikato's resources;
- growth and intensification in the primary production sector (particularly the growth in the dairy industry) with consequent implications for land and water management;
- continued emergence of the Waikato as a major energy provider (not just in terms of traditional thermal and hydro but increasingly in geothermal and in wind generation); and
- continued emergence of the Waikato as a tourist and lifestyle destination with consequential demand for urban and leisure development opportunities (particularly in coastal areas).

The other major contextual change since the last RPS was produced is the evolving legislative environment within which the RPS is developed and implemented. In particular, the enhanced role of the RPS (in directing district and regional plans) and the broader range of regional council functions can be expected to strongly influence the shape of the second generation RPS.

Chapter evaluation

▪ *Land and Soil*

Relatively good information is available to evaluate most aspects of the *Land and Soil* chapter. That information indicates that some progress has been made in relation to the soil erosion and river and lake bed objectives. However, the ambitious soil contamination, soil health and moisture management objectives do not appear to have been met. Indeed many soil/land management trends appear to be heading in the wrong direction.

The land and soil chapter of the RPS has a relatively limited in scope focussing as it does on issues traditionally seen as the core and exclusive preserve of regional councils. In essence, this means it addresses the effects of land use on the land and soil resource itself. It does not address the effects land use on other resources. Given the challenges posed by significant regional growth pressures and the new

regional function of *strategic integration of land use with infrastructure* the relative narrow, single dimension focus of the current land and soil chapter may need to be revisited.

- *Water*

As would be expected, the issues identified in the current *Water* chapter remain valid. If anything, pressures on water quality have become more severe. Although it is difficult to draw robust conclusions about the achievement of objectives, there is good evidence to suggest that water quality has not experienced a “net improvement” over the past decade (as the current RPS seeks) when reviewed at the regional scale. Some improvements are detectable (particularly reduction in the effects of point source discharges) but in many areas water quality continues to deteriorate as a result of land use change and associated non point source discharges.

Water quantity issues and objectives are generally poorly articulated and there are no relevant benchmarks against which to assess progress. Some gains in the efficiency with which water is used do, however, appear to have been made. Little direction is provided on broader issues of water allocation and prioritisation.

The area of the region recognised as “wetland” seems to have continued to reduce both in size and (probably) in quality. Modest progress may have been achieved on enhancing public access to water bodies though information is sparse.

Recognition of tangata whenua concerns relating to mauri is almost impossible to assess although the improvement in levels of contamination from point source discharges is consistent with this objective.

Water issues for the future RPS to address include: (a) more attention of *groundwater* which is expected to experience increased demand as surface water nears full allocation in many catchments; (b) greater recognition of *lakes* as valued resources in their own right; and (c) freshwater ecosystem health (including freshwater fisheries and mahinga kai).

- *Coast*

Progress towards achieving objectives for the *coastal environment* is more difficult to evaluate than for many other parts of the RPS. Many coastal objectives deal inevitably with *values, characteristics and management approaches* rather than easily quantifiable, scientifically based benchmarks.

Aspects that lend themselves to more quantitative evaluation such as ecological systems are complex and not fully understood. It would not be robust to draw firm conclusions on the basis of existing data.

That said, there is reasonable evidence to suggest that the coastal water quality objective has been met. Progress has also clearly been made on promoting greater integration in the management of some aspects of the coastal environment. Due to lack of information no conclusions may be drawn about noise.

Only in respect of natural character is there a suggestion that the RPS’s coastal objectives are not being met. In some respects that is inevitable. Assessment of natural character is complicated by the multi-value nature of the term (including as

it does ecological, physical, spiritual and aesthetic dimensions) and by incomplete knowledge and underdeveloped indicators and subsequent monitoring data.

While the “preservation” objective has not been met it may be unrealistic to suggest that it could in any absolute way given the very high hurdle that the notion of “preservation” represents, the “locked in” change as a result of historical acts and the pressure for growth and development within the region’s coastal environment.

A better way of conceptualising and articulating how “preservation of the natural character of the coast” ought to apply will be a priority for the second generation RPS.

- *Air*

Local and regional *air quality* obviously continues to be a highly relevant issue for the RPS to address.

The major deficiency of the current wording of the air quality chapter is the failure to emphasise what is clearly the main air quality issue - namely high fine particle levels caused by home heating. This is the regionally significant air quality issue (along perhaps with odour) yet it currently receives no specific mention in the RPS.

The complex air quality objective is broadly met with air quality generally good – except in localised urban areas where fine particles degrade air quality. The issue statement’s observation that people perceive air quality to be high may continue to be true but that perception is at least partly wrong – certainly over the winter months when localised air quality comes under pressure from the cumulative effects of multiple small sources of contaminants.

The extent to which the RPS can take credit for improvements in air quality management is, however, highly questionable with much change being driven from national initiatives and by EW’s direct response to community concern. In respect of odour management, in particular, the RPS could do more. The future RPS will also need to grapple with how to set fine particle emissions on a path to meet the NES by 2013.

Both the ozone and climate change objectives have clearly been met although that is it no great achievement since those objectives merely direct management consistent with government policy (policy that did not require any specific action by regional councils).

The continuing relevance of the two global issues to the air chapter of the RPS is questionable. In particular, locating climate change within the *Air* chapter tends to misrepresent EW’s role in responding to the issue. Climate change responses pervade almost all regional council functions and the issue itself represents a major cross-cutting theme.

In addition to the separation of regional air quality issues from those relating to the global atmosphere, the future RPS will need to consider how air quality objectives can be better framed so as to acknowledge that some additional effects are to be expected (whilst maintaining consistency with the air quality NES).

- *Natural hazards*

Information is reasonably sparse on whether *natural hazard* objectives have been achieved. Indications are that roles have been clarified but not consistently implemented while public awareness of hazards seems to be improving.

Although there is a lack of hard data to substantiate claims, the general EW staff view is that hazard risk is not reducing (in some areas at least), that development is still occurring in hazard prone areas and that there is on-going loss of flood storage areas. Erosion/slip risk in some areas is threatening property and is not a risk that is currently well recognised.

The current RPS does seem deficient in one important respect: it provides little guidance on *how* natural hazard risk should be managed. There may not be any additional issues that the future RPS needs to address but it may need to address current issues in a more direct and detailed manner.

- *Waste*

Information on waste volumes is not good. However, based on available data it seems unlikely that quantities of waste requiring disposal in the Waikato have declined and may have increased substantially over the past decade.

Progress may have been better in relation to the management of adverse effects of waste disposal. Based on the consenting of closed landfills (and consenting of other processes generating liquid and gaseous waste) it seems fair to conclude that the adverse effects of waste disposal are likely to have reduced. No more specific information is, however, available.

The most significant waste-related question for the review of the RPS is whether the RPS needs to address waste at all and, if so, whether the waste policies and methods should be organised around (a) the need to protect land, air or water quality or (i.e. the effects of waste disposal), or (b) a separate objective (focussing perhaps, the specific issue of resource efficiency). Given that the regional council's involvement in waste issues need not be mandated via the RMA it would seem doubtful that waste issues focussed on the first 4 Rs of waste policy would warrant a separate chapter in a restructured RPS.

- *Hazardous Substances*

The evaluation of the *Hazardous Substances* chapter of the RPS is also limited by an absence of information and/or imprecise objectives.

While responsibilities for hazardous substance management are broadly identified the chapter appears to lack a coherent description of the role of the Hazardous Substances and New Organisms Act (HSNO) or the Environmental Risk Management Authority (ERMA), and by implication, the *residual* "value-adding" role of local authorities.

The focus on *consistent implementation* (by way of the adoption of the Hazardous Facilities Screening Procedure - HFSP) does not appear to have been successful but may well, in any event, be misplaced since the future of the HFSP appears to be in some doubt.

Seeking "no significant risk" from the storage, transport, use and disposal of hazardous substances is sensible but to be relevant and meaningful the section

needs to acknowledge the role of HSNO and ERMA in that objective and more clearly describe what additional risk reduction is to be achieved through the RPS/RMA.

Similarly, it is difficult to assess whether the objective of “no significant risk” from existing contaminated sites has been met particularly given the incomplete knowledge of those sites. Certainly many sites remain to be assessed.

Regional councils’ new function in respect of contaminated *land* (as opposed to sites) will have implications for the structure of the future RPS.

- *Energy*

Efficient energy use within the region remains a valid issue not least because of the link between energy use and carbon emissions.

With available information it is not, however, possible to confirm whether energy efficiency at the regional scale has improved or not, either across time or relative to other regions. Indications from national data, however, would suggest that efficiency gains are unlikely to have occurred (or if they have they are almost certainly less than those achieved at the national level).

The Energy Chapter of the current RPS is narrow focusing solely on energy efficiency. While energy efficiency will remain a valid concern (particularly in light of the amendment to the RMA to make explicit reference to energy efficient in Part 2), the future RPS will need to address broader energy issues. Such issues include increased demand for energy (particularly renewable energy) and associated infrastructure, the potential for the deployment of new and novel technologies (including marine energy, micro scale generation projects and the production of biofuel) and the new regional function of the strategic integration of infrastructure (defined to include electricity generation and conveyance facilities) and land use.

- *Structures (infrastructure)*

No information is collected by EW that would assist in determining whether, or to what extent, the infrastructure objective of the current RPS has been met. In the absence of such information, it is possible only to suggest that there is likely to have been some affect on the operation of regionally significant infrastructure but that there are no obvious instances of the operation of such infrastructure being fatally compromised.

The existing infrastructure chapter is clearly limited in scope. The future RPS will need to be more expansive on infrastructure issues and have regard to the new *strategic integration* function and to the relationship of the RPS with the regional land transport strategy (RLTS). The RLTS sets on future transport investment direction and provides direction on matters that are determined (or influenced) through RMA plans and processes. A close relationship between the RPS and RLTS will be needed to ensure that the new integration function can be delivered.

- *Minerals*

Although EW does not collect information on the extent of land use change overlaying or adjacent to mineral resources, it is clear that mineral extraction has increased significantly in the Waikato over the past decade, it is possible that the ability of some, known but not currently exploited, mineral resources have been

compromised by urban development, rural residential and other intensive land uses in rural areas. While the potential for compromised access to minerals remains relevant there is no information on which to base a conclusion on the extent of significance of this issue.

The second of the two minerals issues identified in the current RPS is similarly difficult to assess. Little information on effects or the integrated nature of the regional and district planning framework, as it affects minerals extraction, is available.

The main minerals issues for the future RPS to consider relate to the likely demand growth for minerals (and aggregates in particular) and the need to integrate minerals issues with regional growth management.

- *Heritage*

There simply is not the information to say whether the heritage objectives have been achieved. Anecdotal evidence, however, suggests that the RPS policies on heritage are too general and unspecific to have been useful for those seeking to promote heritage protection in the region.

Rather like the relationship between waste and discharges, the concept of *heritage* provides another lens through which many resource management issues can be considered.

The definition of heritage used in the RPS creates a degree of duplication with policies in the *Land, Coast and Biodiversity* chapters of the RPS. In so doing it undermines the heritage issues that are not addressed elsewhere in the RPS and detracts from a sense of clear purpose.

The future RPS may need to separate natural from cultural heritage and apply concepts and definitions consistent with the legislation.

- *Iwi*

The iwi section of the RPS seeks mutual understandings and recognition of relationships. Clearly these are difficult outcomes to monitor or measure. The extent to which these objectives have been met is clearly debateable, even with Environment Waikato. It is possible to point to some evidence of progress on iwi objectives but it is clear that further progress is required. Many issues confronting iwi participation in RMA processes remain and a future RPS provides an opportunity for guidance and direction to enhance iwi participation and better recognise tangata whenua interests.

The second generation RPS

Although it is too early to be definitive about the best structure for the second generation Waikato RPS, experience with the current RPS, the emergence of cross-cutting regional issues and new regional functions all point to the need to rethink the overall approach.

There are many structural options; however, one that recommends itself for further consideration would build on the current RPS's approach of separating cross-cutting issues from the single resource issues.

Part 1 of such an RPS would set out *issues and objectives*. The identification of issues would focus on cross cutting themes/challenges faced by the region. They would be “cross-cutting” in the sense that prudent management of multiple resources is necessary for the objectives to be met.

The likely list of such issues would include, sustainable agriculture, urban growth management (including potentially transport and infrastructure), community health and wellbeing climate change, tangata whenua relationships with natural resources, minimising natural hazard risk and maintaining biological diversity.

Ideally, each of these themes would include a full description of the issues and challenges, a long term goal and measureable, time bound targets identified in respect of each goal.

Part 2 of such a hybrid RPS would be a series of *policies* organised around the individual natural resources including air, water, soil (including policies on contaminated sites), land and landscapes, coastal marine area, geothermal and minerals.

Policies organised under those headings would be cross-referenced back to the strategic objectives and would refer to all matters that affect the achievement of the strategic objectives.

One of the benefits of this approach is that it encourages integrated policy development and implementation and allows for the specification of genuinely meaningful, integrating objectives.

Overview findings

This evaluation asked two primary questions: (a) does the RPS focus on current regionally significant issues; and (b) is the RPS achieving the objectives it set for itself?

It shows that of the 33 objectives evaluated only three could be said to have been met in full. A further six objectives could be said to be met in part or that some progress had been made. Seven other objectives have clearly not been met.

There was insufficient data to determine whether nine of the objectives have been met or not. In another four cases the objectives were too imprecise to allow robust evaluation and in four further cases the available data were inclusive (with some evidence of progress and some of regression).

It is important to note that these evaluation results are strongly influenced by the monitoring programmes in place and the data that is available. The results show a clear bias in data availability towards “core” regional functions (land, air and water quality) with very little, and in some cases no, information available to evaluate objectives that relate to non core functions (such as those relating to the waste, energy, structure, minerals and heritage objectives).

Accordingly, results are able to show a relatively high level of under-achievement in land and water areas largely because of the extensive monitoring that has been carried out.

▪ *Answers to core evaluation questions*

The answer to the first of the primary questions described above is difficult to summarise. Certainly, most of the issues included in the current RPS remain valid on the basis either that (i) objectives have not been met or have only been met in part; and (ii) in many cases the drivers (such as, for example, growth of the dairy industry) behind these issues have increased in strength over the past decade.

However, it is also true there are other significant issues that are not dealt with by the current RPS or which are only dealt with in an oblique fashion. Many of these issues are strategic and/or *cross-cutting* in nature and do not fit easily within the existing “silo” approach of Chapter 3 of the current RPS. These new issues emerge partly in response to new and additional functions given to regional councils under amendments to the RMA and partly from changing demands on the region’s resources and environmental values.

New issues to emerge relate to climate change, energy, sustainable agriculture, and urban growth.

The answer to the second question is that only around 10% of the RPS’s objectives have been met in full. However, care should be taken in drawing firm conclusions from that result. Another 20% of objectives have been met in part, or at least progress towards the objective is clearly being made. The failure to record a “met in full” result is, in most cases, attributable to the ambitiousness of the objective rather than classic policy failure. In short objectives are seldom articulated in such a way as to set realistic 10 year targets given pressures faced.

Furthermore, some of the 50% of objectives that could not be robustly evaluated might also have found to have been met if information had enabled proper evaluation.

Overall, while the Waikato RPS represents a good first effort and regional policy development, a series of changes will need to be considered (in terms of structure, content and monitoring commitments) if the second generation RPS is to remain relevant for the next ten years and to ensure that the 2020 RPS evaluation is able to record a greater degree of progress.

1 Introduction

The Waikato Regional Policy Statement (RPS) was publicly notified in August 1993. After following the statutory processes set out in the Resource Management Act (RMA) involving public submissions, hearings and the settling of unresolved matters at the Environment Court, the RPS became operative in October 2000¹.

The RMA provides that Environment Waikato (EW) must, at all times have an RPS and requires that that a *full review* of the RPS be commenced within 10 years of becoming operative. On that basis, a review of the Waikato RPS must commence before October 2010.

In addition, during the life of the RPS, EW is required (under section 35 (2) (b) of the RMA) to monitor the *efficiency and effectiveness* of its policies, rules, or other methods.

These legislative requirements ensure that a rational *policy cycle* is followed whereby policies are developed, monitored and reviewed on an ongoing basis. This process ensures that the RPS is kept up to date, taking account of changes in demands on resources, and refined on the basis of enhanced knowledge and experience and an improved understanding of issues and potential responses.

This report constitutes a key stage in that policy cycle. It records the outcome of an evaluation process that considers the effectiveness of the RPS as the initial step in determining how, and to what extent, any new RPS might need to differ from the current RPS.

In so doing this report begins the process of reviewing the RPS and fulfils the Council Long Term Council Community Plan (LTCCP) commitment to launch an in-depth information gathering process in 2006/2007 with a view to having a revised RPS ready to put forward to the public by 2010.

2 Methodology

2.1.1 Method of information gathering

This evaluation seeks to answer two key questions:

- Does the RPS continue to focus on the appropriate, *regionally significant issues*? (The subsidiary question is what has changed since 1993 that will influence the shape and content of a new RPS).
- Is the RPS successfully *achieving the objectives* it set for itself?

To answer these questions the evaluation has involved a desktop review of legislative and government policy changes and state of the environment monitoring information held by EW.

However, in recognition that elements of the questions will be subjective, and to ensure that all relevant information was identified and considered, workshops were held with council officers on each of the eight main issue chapters of the RPS.

¹ A variation to the RPS in relation to biodiversity became operative in October 2002.

This yielded direct information and pointed the project team to specific research and monitoring information already held by EW. Such information was gathered and subsequently reviewed. No additional primary research was commissioned as part of this evaluation².

2.1.2 Approach to issue evaluation

Although, as noted above, a primary question to be answered by this evaluation is whether the issues remain valid priorities, it is readily apparent that in most cases the current RPS expresses issues with enough generality as to remain valid over time (short of fundamental economic, social or technological changes). For that reason, this evaluation adopts an approach that the existing issues remain valid where the evaluation of the objective demonstrates that the issue has not been resolved.

Furthermore, issues in the RPS are generally expressed in terms of the *potential* for adverse effects to arise. Given the nature of environmental risk, that potential remains even where significant progress has been made towards managing those risks.

That does not, however, mean that the issues identified in the existing RPS are necessarily sufficient, comprehensive or specifically enough expressed given changes that have taken place in the intervening 10 years (including, in many cases, greatly improved information).

Therefore, this evaluation takes the approach of scoping the *additional* matters that may need to be considered taking account of new economic and social trends and/or a changed policy context (including changed legislative requirements as they apply to EW's functions and responsibilities).

2.1.3 An "outcome" approach to evaluation

The RPS, of course, includes issues, objectives, policies and methods.

In general, this evaluation considers only the *issues and objectives*. In other words, it reviews *outcomes* (and whether they are being achieved) rather than *outputs* (whether what EW said it would do has been done). This focus is partly determined by time constraints and partly because it seems logical to assume that if objectives are not being achieved, the policies and methods being employed will require re-examination.

Although it may not follow that the attainment of an objective is *necessarily* the result of the application of the policies and methods listed in the RPS, the effort required to demonstrate the efficiency and effectiveness of the particular policies and methods is beyond the scope of this project and will (to the extent that objectives are considered to be attained) require closer examination as part of the RPS review process. Readers should also note that some output review work has

² It is recognised that to fully answer the questions identified will require discussion with key stakeholders and the community at large and possible additional research. That is envisaged as a second stage of the project.

already been undertaken (in respect of biodiversity and coastal issues) independent of this evaluation project.³

2.1.4 Exclusions

It is also important to note that this evaluation is not comprehensive and deliberately excludes consideration of the *biodiversity* and *geothermal* sections of the RPS.

The biodiversity section is excluded because that topic has been recently subject of a detailed evaluation which is reported separately.⁴

The geothermal section is excluded because that matter has recently been the subject of a variation to the RPS and it is therefore too early to be contemplating an evaluation of those recently applied policies.

2.1.5 Structure of report

The report sets out in three main parts.

Section 3 deals with some of the big picture changes that have occurred over the past decade that might have an effect on the RPS as a whole (rather than just a single chapter).

Sections 4-14 address each of the resource-focused chapters of the RPS. These sections consider (a) progress towards stated objectives (b) contextual changes that require re-consideration of issues; and (c) possible implications for the future RPS.

Section 16 of the report deals with over-arching issues and questions relating to the structure of the RPS. One of the key matters to consider is whether the current RPS organises issues and responses to best effect – particularly given the RPS's statutory purpose being:

to achieve the purpose of the Act by providing an overview of the resource management issue of the region and policies and methods to achieved integrated management of the natural and physical resources of the whole region.

There are many different ways to structure the RPS and many different ways to approach the issue of integrating management. These broad issues are discussed further in section 16.

³ See Progress toward achievement of Environment Waikato's Regional Policy Statement Objectives: Biodiversity and Natural Heritage, Policy Effectiveness Paper No.1, 2006

⁴ Ibid.

3 Changing Context

3.1 Key social and economic changes since the mid 1990s

In the 14 years since the Waikato RPS was first notified the economic and social context within which environmental policies and priorities are developed have changed greatly. Some of the key trends are outlined briefly below.

3.1.1 Population growth

In the period 1996-2006 the population of the Waikato grew by a modest 7.7% to 387,600. However that regional scale growth rate masks very significant intra-regional disparities.

Some parts of the region recorded negative population growth while other areas were some of the fastest growing parts of the country. In particular it is noteworthy that Pukekohe on the northern boundary of the Waikato (though just on the Auckland side) is currently the fastest growing urban area in New Zealand with an growth rate of 2.5% per annum over the past five years. Hamilton City, currently growing at 1.7% per annum (19.7% in the 10 years to 2006), is now the fourth fastest growing urban area in the country (behind only Pukekohe, Tauranga and the Kapiti Coast). It is a little known fact that, in 2005-2006 year Hamilton City grew at a faster rate than Auckland (currently growing at 1.5% per annum).

Population growth is reflected in urban growth and demand for peri-urban development which in turn places pressure on the infrastructure and natural resources of the region. Between 1991 and 2001 almost 3200 hectares of rural land were subdivided for intensive (mostly residential or rural residential) use. Forty-two percent of that development was on Class I or II land (land of this classification only represents around 12% of the region)

Urban centres neighbouring the Waikato – notably Auckland and Tauranga are also growing rapidly and many of their associated resource needs (including energy, water, waste disposal and aggregate supplies) are met by resources and facilities located in the Waikato.

On the other hand, between 1996 and 2006 five of the rural dominated territorial authorities within the Waikato region recorded either stable or *declining* population⁵. This reflects the increasingly urbanised nature of the Waikato population. In 1996 48% of the regional population lived in one of the five largest towns⁶. By 2006 that had risen to over 51%. Hamilton alone grew from representing 31% of the population to 34.5%. Taupo and Cambridge also recorded significant population increases (13.2% and 16.5% respectively).

3.1.2 Primary production

Agriculture remains the second largest sector in the Waikato economy (after manufacturing). The dairy sector in particular has shown rapid growth in that last five years. In financial terms, dairy farming grew 55.5% between 2001 and 2005

⁵ South Waikato, Otorohonga, Hauraki, Matamata-Piako and Waitomo districts.

⁶ Hamilton, Taupo, Cambridge, Tokoroa and Te Awamutu.

while dairy processing grew 59.4% over the same period. This is the second fastest growing sector of the Waikato economy (after tourism)⁷.

This growth was on the back of an increase in the region's dairy herd of over 229,000 cows between 1999 and 2006. The region now has more than 1.27 million dairy cows⁸.

This increase has been accommodated partly by an increase in stocking rates (from 2.7 cows/ha in 1999 to 2.9 cows/ha in 2006) and partly an increase in the average size of farms (up from 90.9 ha in 1999 to 116 ha in 2006). The area of the region devoted to dairying has increased over 10% (40,500 ha) over the 7 year period and now stands at over 440,850 ha.

At the same time the number of farms *decreased* from 4939 in 1999 to 4269 in 2006. Herd sizes increased from 227 to 323 over the same period. Thus, there has been a clear trend towards fewer but larger and more intensively farmed units covering a physically larger regional footprint.

Growth in dairying has occurred at the expense of sheep and beef farming (with sheep and beef numbers in the region both dropping 25% between 1994-2006, most of that decrease occurred prior to 2002); and forestry (with the total area of forestry replanted dropping each year since 2000).

3.1.3 Energy sector

Waikato is both a major electricity load centre and major energy supplier. Population and economic growth has been reflected in sharply increased demand for electricity. Between the years ending June 2000 and June 2006 electricity usage in the region increased 10.25% or just over 2% per annum (from 2780.8 GWh to 3065.8 GWh). The region's *peak* demand forecast for the period 2007 to 2020 (the end of the next RPS period) is for a 30% increase (from 543 MW to 706 MW).

Electricity generation within the region is a large and growing industry⁹. Currently there is 3551 MW of consented generating capacity in the region up from 2667 MW in 1995 (representing a 33% increase since 1995).

Hydro is a largely mature industry in the region. Although Huntly switched to burning coal in large quantity in 2003 (and is now totally coal fired) this is more of an historical anomaly and, due to CO₂ emission issues, is unlikely to signal a trend in the region. Most recent growth has, by contrast, been in gas-fired thermal and geothermal generation. Growth in capacity results from 13 new projects (8 geothermal, 5 thermal). The growing commitment to respond meaningfully to climate change is giving impetus to greater renewable electricity development and already in the region there have been four windfarm proposals totalling 235 MW of

⁷ Waikato School of Management, 2007.

⁸ Data used here are from the 1998/99 and 2005/06 Livestock Improvements Surveys. The boundaries used for this regional survey do not align with the regional council boundaries and it has been necessary to exclude those parts of the Franklin and Rotorua districts that are within the Waikato region.. Note: Statistics NZ data suggest that there are now 1.735 million dairy cattle in the region however those data are considered less reliable than the Livestock Improvement survey data used here.

⁹ A Waikato University Management School study has estimated electricity generation as being now worth over \$1billion to the regional economy – an 83% between 2001-2006.

capacity. More are expected. Windfarms raise issues such as landscape protection and distribution/transmission requirements (and associated implications) not contemplated when the RPS was first notified.

Coal production from Waikato's two large scale mines increased 46% between 1998 and 2005. Meanwhile coal is being imported into the Port of Tauranga at a rate of around 1 million tonnes p.a. and transported by road to Huntly.

3.1.4 Tourism and lifestyle

Another significant trend has been the flow of people (both permanent residents and holiday-makers) to coastal locations. Both nationally and internationally, coastal areas have been under considerable development pressure fuelled by lifestyle changes associated with greater work flexibility and increased affluence. Waikato too has experienced its own "sea change"¹⁰ along the Coromandel coast. The trend is manifest in rapid and significant increases in land values and development pressure on rural coastal land often with significant landscape, ecological and/or amenity values, often for second/holiday homes.

While the *usually resident* population of Thames Coromandel district grew only 5.2% between 1996-2006, the rate of housing development was much more significant. The number of building permits issued for additions and alternations between 1991-2004 was on a par with those issued by Hamilton City. Permits issued for new dwellings over the same period averaged 101 per quarter. Hamilton – five times the size - only issued an average of 198 permits per quarter over the same period.

The discrepancy between population and housing growth can be explained by the low occupancy rates – the lowest in New Zealand. This reflects the high proportion of second homes and visitor accommodation in the district.

The building boom is reflected of massive property value increases. Between 1981 and 2004 real property values in the Thames Coromandel district rose 217%¹¹ - the third highest district level growth in the country (after Auckland and Queenstown Lakes).

This rate of development has taken its toll on the natural character of the peninsula. Over 70 percent of the Coromandel beaches and dunes now have houses on them and in almost all cases natural systems and features (such as dunes) are much reduced. With large increases in holiday-makers comes pressure for associated development such as marinas, canal housing, mooring areas and associated commercial development. There is significantly heightened demand for new infrastructure (or upgrading of existing infrastructure) including, in particular, water, waste water and coastal protection works.

Ongoing subdivision pressures are likely to threaten most of the remaining undeveloped Coromandel beaches and will intensify at existing settlements. Several previously underdeveloped beaches have been sold to developers since the current RPS was prepared.

¹⁰ The term "sea change" is applied to this trend – particularly in the Australian context.

¹¹ Or 103% between 1992-2004 (as opposed to 58% in Hamilton)

A related trend is the increase in tourism. As noted above, in recent years tourism has been the Waikato's fastest growing industry. The Waikato Management School study suggested that the industry had grown 91.4% between 2001 and 2006 and is now worth \$1.4 billion to the regional economy. Waikato now has more domestic visitors than any other region. But the real growth in the industry has been in international visitors. Between 1997 and 2007 overseas visitor numbers increased by 177,128 people or 56%, while nights stayed by overseas visitors increased by 137%. In short, many more overseas visitors are coming to the Waikato and they are staying longer. It is also noteworthy that the main activities of overseas tourists while in the Waikato are outdoor pursuits strongly resource/environment dependent. The most common activities being caving, fishing, use of parks and sky diving/parachuting.

3.2 Changed legislative and policy context

Not only has the Waikato's social and economic environment changed since the RPS was first notified, so too has the legislative environment within which the RPS must operate.

3.2.1 Resource Management Act

The RMA has been amended 11 times since the RPS was notified. Many of the changes have implications for the specific issues discussed in the following sections of this report. Some of the changes are, however, more generic in their affect and are outlined below.

- *Enhanced role of RPSs*

Perhaps the most significant amendment to the RMA as it relates to RPSs is the change to section 75 (3). Prior to 2005, that section had stated that a district plan must "*not be inconsistent with*" the RPS. The 2005 RMA Amendment Act changed this section to state that district plans must "*give effect*" to an RPS.

This amendment has two implications. First, it enhances the role of an RPS in directing territorial level plans and policies. RPSs have, in other words, become more powerful instruments that can achieve greater integration of regional and territorial policy.

Second, by implication, RPSs now need to be drafted such a way that territorial authorities (through their district plans) *can* "give effect" to them. The new wording suggests a role for RPSs in providing *direction* to district plan policy and therefore has implications for the way RPS policy is drafted.

- *Additional functions and responsibilities for regional councils*

Changes to section 7 of the RMA affect the matters EW must take into account in preparing the next generation RPS (and in the exercise of its other functions). Amendments mean that in carrying out its functions EW must now, in addition to the matters that were relevant in 1994, recognise and provide for:

- the protection of historic heritage from inappropriate subdivision, use and development [section 6 (f)];
- the protection of recognised customary activities [section 6 (g)];
- the efficiency of the end use of energy [section 7 (aa)];

- the effects of climate change [section 7 (i)]; and
- the benefits to be derived from the use and development of renewable energy [section 7 (j)].

In addition, there have been important amendments to the *functions* of EW as set out in section 30. These new (or clarified) functions are:

- the investigation of land for the purposes of identifying and monitoring *contaminated land*;
- the establishment of rules to *allocate* the taking of water (including heat) and the capacity of water to assimilate a discharge;
- the establishment of rules to allocate space in the coastal marine area (for aquaculture);
- the establishment of objectives, policies and methods for the maintenance of indigenous *biological diversity*; and
- the strategic integration of *infrastructure with land use*.

The required contents of regional policy statements have also been amended to include:

The resource management issues of significance to-

- (i) *inwi authorities* in the region; and
- (ii) the board of a foreshore and seabed reserve, to the extent that those issues relate to that reserve.

3.2.2 Hauraki Gulf Marine Park Act 2000

Another significant development since 1994 was the enactment of the *Hauraki Gulf Marine Park Act (HGMPA)*. The HGMPA is significant not least because it establishes a national policy statement (in the form of sections 7 and 8 of the Act) which EW must have regard to in preparing the next generation RPS (and in exercising other functions). While there are few wholly new matters identified in section 7 and 8 of the HGMPA, the fact that they are reiterated in a separate statute and given the force of a NPS adds weight to those matters which needs to be reflected in subordinate instruments such as the RPS. The NPS has effect in the CMA and in the Gulf's catchments. It is, therefore, relevant to management of the marine, freshwater and land resources of much of the region.

3.2.3 Local Government Act and Local Government (Rating) Act

In 2002 the Local Government Act (LGA) and Local Government (Rating) Acts were passed. Although the LGA does not directly affect the exercise of RMA functions it does place those functions in the broader *sustainable development* context. Furthermore, both the LGA and the LG (Rating) Act provide EW with tools that may be applied to help realise RPS objectives that were not available in 1994. (These include ability to establish regional parks and to set targeted rates to achieve resource management objectives).

3.2.4 Local Government (Auckland) Amendment Act 2004

The Local Government (Auckland) Amendment Act 2004 (LGAAA) requires that Auckland territorial authorities change their district plans to integrate land

transport and land use provisions and make those provisions consistent with the Auckland Regional Growth Strategy (ARGS).

More specifically, changes to plans are to give effect to the growth concept in the ARGS and contribute to (amongst other things) reinforcing the metropolitan urban and rural objectives of the ARGS.

This is significant for EW because the LGAAA defines Auckland territorial authorities as including those authorities that are wholly *or partly* with the Auckland region. Similarly the “Auckland region” is defined (for this purpose of that act) to include the southern half of the Franklin District Council that is within the Waikato Region. Accordingly, the LGAAA states that to give effect to the Act “the Franklin District Council may change its district plan in relation to that part of its district that is within the region of the Waikato Regional Council”.

Franklin District Council has subsequently notified a change to its district plan (Plan Change 20). In accordance with the LGAAA, Plan Change 20 applies to all land within Franklin, including those parts that are within the Waikato Region.

In effect this means that the management of growth (and associated resources) in the north of the Waikato region is now being determined by the Auckland Regional Growth process (including urban and rural policies of the Auckland Regional Council’s RPS).

- *Auckland Regional Growth Forum*

The Auckland Regional Growth Forum (“the Growth Forum”) was established under an amendment to the LGA 1974. The role of the Growth Forum is to advise on, and approve, the Auckland regional growth strategy.

Since 2005, EW has had observer status on the Growth Forum and has participated on that basis.

3.2.5 Regional growth planning

In recent years Waikato District and Hamilton City Councils entered into a strategic agreement to change the local authority boundaries to bring more land (to the north and east of the existing city) within the City boundaries. The timing of this change will be determined by roading projects (i.e. the designation of the Te Rapa bypass and Waikato expressway).

More recently Hamilton City, and Waikato and Waipa District Councils have commenced work on a Hamilton Sub Regional Growth Strategy. A scoping study has recently being prepared.

The region’s territorial authorities have also been considering the need for a longer term *regional* growth strategy but recognise the need to resolve governance issues before work can commence.

3.2.6 Central government policies

A number of policy and regulatory changes have been made at central government level that are also relevant to the future Waikato RPS. The most significant amongst these is the *Resource Management (National Environmental Standards Relating to Certain Air Pollutants, Dioxins and Other Toxins) Regulations 2004*.

Other national environmental standards and national policy statements are currently being considered but at the time of writing none have been completed. It is, however, likely that at least some will come into affect before Waikato's second generation RPS is notified. Policies in relation to water management and (separately) renewable energy are known to be being considered and will be of particular interest to the Waikato. A proposed NPS on electricity transmission is currently being considered by a board of inquiry.

A large amount of other relevant, non statutory policy and guidelines have been produced by government agencies since the mid 1990s but is not reviewed here.

4 Land and Soil

The *Land and Soil* chapter of the RPS identifies five issues with associated objectives. These are:

- accelerated erosion
- soil contamination
- maintenance of soil health
- moisture management
- river and lake beds management

Each of these issues and accompanying objectives is discussed below.

4.1 Accelerated erosion

Accelerated erosion of soil resources is leading to:

1. Loss of soil productivity, capability and/or versatility.
2. Downstream sedimentation resulting in degradation of water quality, aquatic ecosystems and water supply systems, and increased flooding potential.
3. Adverse effects on the aesthetic, scientific and cultural values associated with land.

The objective is:

Net reduction in the effects of accelerated erosion and those effects avoided where practical

4.1.1 Evaluation of soil erosion objective

The effects of accelerated soil erosion are taken to be those matters set out in 1 to 3 of the issue statement. A “net reduction” in those effects will occur where there is a decrease in the incidence of those effects at the regional scale (acknowledging that effects may not reduce, and may even increase, in some sub regional areas). Provided that any increase in effects is more than offset by decreases elsewhere, the “net” position is to be regarded as a reduction.

This objective can, therefore, be assessed by considering regional scale trends in (a) productivity, capability and/or versatility; and (b) sedimentation rates. Trends on aesthetic, scientific and cultural values are more difficult to quantify and assessment of such trends is not attempted here.

The general view of EW staff is that progress has been made in reducing the effects of soil erosion. However, there is little available information that can show change over time with most information providing a snapshot of the situation as at a certain date. There is a clear need to improve the way this objective is measured. The available information is reviewed below.

4.1.2 Loss in soil productivity, capability and versatility

Loss in productivity, capability and versatility is difficult to measure directly. The information below summarises available information on soil loss and soil disturbance within the region.

- *Soil intactness survey*

A 2003 assessment of soil intactness in the region¹² found that 70.9% of the Waikato's soil was intact – in other words soil is staying in place and is not subject to disturbance over 70.9% of the region.

Soil disturbance (such as changes in depth, exposed area, or movement on-site) may reduce land's productive capacity.

The same study found that 5.9% is revegetating after disturbance by *land use* and 6.8% is freshly disturbed by *land use*. Soil bared by fresh land use disturbance represented 1% of the region.

The study also found that 6.2% of the region was recently disturbed by *natural processes* and 0.4% of the region's soil bared by natural processes. The total bared soil – that is, land most susceptible to soil loss – was therefore 1.4%.

Unfortunately there is no baseline information with which these data can be compared although a second survey is planned for 2007/08.

- *Soil stability in priority catchments*

Soil stability is also monitored in priority catchments¹³. Again, little time series information is available that allows firm conclusions to be drawn about the direction of change in erosion. What information is available (for example for the Pokaiwhenua catchment in the Middle Management Zone) is inconclusive with, in the case of Pokaiwhenua, the rate of natural erosion down but the rate of land use erosion up (the former is probably attributable to soil conservation work while the later is likely to reflect increased forest harvesting activity).

In the same catchment, soil conservation was assessed as either absent or insufficient in 22% of the catchment. In the Lower Waikato Management Zone's Matahuru catchment, soil conservation was assessed as either absent or insufficient in 27% of the catchment. Overall, however, soil conservation works undertaken in priority catchments are assessed as being very effective at controlling natural erosion.

The general conclusion from catchment environmental monitoring is that progress is being made on soil conservation in these "at risk" catchments.

- *Soil loss from outdoor vegetable growing*

Studies of the Class 1 soils of the Franklin district¹⁴ estimate typical soil erosion associated with outdoor vegetable production to be 7-30 t/ha/yr at the paddock scale and 0.2 – 1.1 t/ha./yr at the catchment scale (meaning that much soil is lost

¹² Soil intactness assessment of the Waikato Region: 2003 Environment Waikato Technical Report 2003/14

¹³ Priority catchments are defined as part of Project Watershed. The Catchment Environmental Monitoring (CEM) programme provides a representative indication of changes in hillslope erosion, stream bank erosion, sedimentation in surface water, water temperature, riparian vegetation fencing and in-stream ecological habitat resulting from soil conservation and river management work in selected priority catchments in each management zone.

¹⁴ Basher L. R. and Ross C.W. 2002. Soil erosion rates under intensive vegetable production on clay loam, strongly structured soils at Pukekohe, Australian Journal of Soil Research.

from paddocks but stays within the catchment)¹⁵. Losses on this scale represent a significant reduction in topsoil nutrients.

4.1.3 Downstream sedimentation

Although there is no direct data on the extent of downstream sedimentation, sediment loads in waterways and the extent of riparian fencing do provide reasonable indicators. Available information is as follows.

- *Sediment loads (turbidity)*

A 2004 study¹⁶ of sediment loadings in Waikato's waterways showed catchment yields of between 21 and 285 t/km²/yr and mean sediment concentration of between 3.6 and 87.1 mg/l.

The Catchment Environment Monitoring programme ("the CEM") also provides some information of sediment loads in priority catchments. In the Waitomo stream, for example, sediment concentration declined about 40% over the period 1991-1999 as a result of soil conservation work.

- *Length of riparian planting*

Between 2000 and 2001 the extent of riparian fencing was surveyed in each of the Region's nine water management zones. The results are shown in Table 1.

Table 1 - Proportion of riparian fencing in the Waikato in 2001

Management Zone	Proportion of riparian margin fenced*
Coromandel	44%
Hauraki	41%
West Coast	12%
Lower Waikato	28%
Middle Waikato	35%
Upper Waikato	53%
Lower Waipa	30%
Upper Waipa	30%
Lake Taupo	70%

* Figures relate to the proportion of total stream bank that is fenced, not the proportion of stream that is fenced both sides.

Unfortunately there is no baseline data to compare these management zone scale results with and the survey has not been repeated since 2001 (although this is planned).

¹⁵ Although during a 1999 storm event loss were as high as 30-100t/ha. Basher L R and Thompson T, 1999. Erosion rates at Pukekohe During Storm of 21 January 1999, Landcare Research Report: LC9899/096, June 1999.

¹⁶ Balir 1, 2004 Suspended Sediment Monitoring Report

However, the CEM has provided data for some priority catchments. It shows, for example, that between 03/04 and 05/06 the length of waterway fenced on both sides increased from 26% to 34% in the Pokaiwhenua catchment, 31% to 50% in the Mangare catchment and 46% to 56% in the Matahuru catchment.

These increases are important when research in the Middle Waikato Management Zone indicates that fenced riparian strips reduced sediment input to streams by 40-84%.

4.1.4 Summary

Insufficient data are available to robustly assess whether the objective has been achieved. Certainly there is some evidence to suggest that progress in reducing erosion is being made in priority catchments where specific soil conservation works are being carried out. The general conclusion from the CEM is that progress is being made as a result of soil conservation activity in these “at risk” catchments.

However, it is not possible to draw regional wide conclusions from these data and it seems likely that soil productivity losses continue as a result of erosion in some areas including, in particular, the intensively cropped Franklin elite soils. Whether this represents a *net* gain or loss is difficult to assess on an objective basis.

4.2 Soil Contamination

The discharge of contaminants onto land may adversely affect the physical, chemical or biological condition of the soil.

The objective is:

The range of existing and foreseeable uses of the soil resource not reduced as a result of the contamination of soils

4.2.1 Evaluation of soil contamination objective

The above objective can only be measured by assessing the levels of various contaminants in Waikato soils (and the *trends* in their accumulation). Current and predicted future levels can be compared with known guideline concentration levels¹⁷. Exceeding guideline levels can mean:

- the ability to subdivide land for residential or rural-residential purposes is curtailed (with site assessment and remediation required);
- possible market access restrictions on produce; and
- non-compliance with food standards for crops grown on a property because of soil contamination.

In other words, the range of possible uses of soil is reduced when that soil becomes unsuitable for certain forms of production because levels of contamination exceed relevant standards and guidelines.

¹⁷ In the absence of a formal national environmental standard, the recommended level used by Environmental Waikato is based on the NZ Waste Water Association’s *Guidelines for the Safe Application of Biosolids to Land in New Zealand* and takes account of the need for rural food production to be able to meet the *Australia New Zealand Food Authority Standard*.

The main contaminants of interest are cadmium, fluorine, uranium, zinc, copper and DDT. Each of these is discussed in turn.

4.2.2 Trace element contaminants in phosphate fertilisers

Cadmium, fluorine and uranium are naturally present in soils but levels are increased through the application of phosphate fertilisers. These fertilisers are made from phosphate rock that contains cadmium, fluorine and uranium as trace elements.

As the use of phosphate fertilisers has increased since the 1940s (varying in rate according to economic conditions) cadmium, fluorine and uranium concentrations have been gradually increasing in the region's agricultural soils.

An estimated 346,000 tonnes of superphosphate fertiliser is currently applied annually in the Waikato region.

- *Cadmium*

Cadmium enters the food chain because it is taken up by crops (such as vegetables and grains) and by grazing animals. Cadmium can be harmful to human health. Concentrations of cadmium in Waikato soils are now, on average, about five times higher than their pre-European levels. An estimated 8.3 tonnes of cadmium is currently applied to Waikato soils each year mostly as a consequence of the application of superphosphate fertiliser.

In recent years, the NZ food standard for cadmium in key crops has dropped by a factor of ten to 0.1 mg/kg. Recommended guidelines for cadmium in NZ agricultural and residential soils have dropped by a factor of three to 1mg/kg.

Testing of 227 representative properties in the Waikato indicate that 10% of the region's soils may now exceed the 1mg/kg recommended level. This represents 175,000 hectares¹⁸.

There is no doubt that the *average* cadmium levels in the Waikato have increased (by an estimated 14%) over the past decade. This is despite a 1997 industry voluntary agreement to set a maximum (voluntary) cadmium limit for superphosphate of 280mg Cd/kg P₂O₅ (achieved by mixing phosphates from different sources). The NZ Fertiliser industry has reported that preventing further accumulation in NZ soils would require an 80% reduction in the cadmium content of superphosphate to approximately 24mg Cd/kg P₂O₅.

Any reduction achieved in the rate of cadmium accumulation in soils brought about by the industry agreement, will have been offset by the greater volume of fertiliser that has been applied to agricultural land over the past decade in response to improved prices for agricultural products. Between 1939 and 2006 mean net cadmium accumulation rates in Waikato soil are estimated to be 8.1 µg/kg/year (0.0081 mg/kg/year) for horticultural soils and 9.0 µg/kg/year (0.009 mg/kg/year) for pastoral soils.

¹⁸ Kim, N, 2005, Cadmium Accumulation in Waikato Soils, Environment Waikato Technical Report 2005/51.

- *Fluorine*

Fluorine is regarded as an essential element but high levels of fluorine in soils can make them unsuitable for sheep, beef and dairy production. Fluorine is absorbed by the soil and while it is not taken up by pasture, livestock ingest a certain amount of soil in normal grazing practices. During winter months when pastures are low ingestion rates increase. If fluorine concentrations in soil are too high stock can develop the bone disease *fluorosis*.

While there is no standard in relation to the fluorine concentrations in soils, a guideline value of 500 mg/kg has been suggested as the point where there needs to be to change grazing and fertiliser management practices¹⁹.

EW estimates that average concentrations of fluorine in Waikato soils is now about twice the natural level. Recent research suggests that fluorine levels on some properties are high enough to cause *fluorosis* in animals under some conditions. Recent monitoring showed that of the 160 Waikato properties tested, 40 (25%) had fluorine concentrations exceeding 500mg/kg.

- *Uranium*

Uranium is the other trace element in superphosphate fertiliser. Although not particularly radioactive compared to other natural sources, it does give off radon-22 gas which is potentially hazardous.

EW research has shown that uranium levels in agricultural soil are more than double natural levels. While natural uranium levels are estimated at 0.72 mg/kg of soil, levels on in pastoral land have been shown to average 1.7 mg/kg and 2.6 mg/kg on horticultural soils²⁰.

While these average concentrations remain well below relevant guidelines, samples from sites close to fertiliser storage bins do show significantly higher levels of uranium and land use controls to keep both agricultural and residential uses away from such sites have been suggested.²¹

- *Zinc*

Zinc is another contaminant that can build up in soils. The main source of zinc contamination is the veterinary medicines and animal remedies (particularly facial eczema remedies) but zinc is also contained in agricultural sprays (pesticides, fungicides and insecticides). Zinc can also be applied directly to pastures. It is estimated that up to 8510 tonnes of zinc is applied (indirectly) to Waikato agriculture land each year²².

¹⁹ P Lonanathan, C. W. Gray, M.J. Hedley & A.H.C Roberts, Total and soluble fluorine concentrations in relation to properties of soils in New Zealand, European Journal of Soil Science, June 2006

²⁰ Taylor, M and Kim K, The Fate of Uranium Contaminants of Phosphate Fertiliser (unpublished).

²¹ Ibid.

²² This is a *maximum* loading. Facial eczema remedies are not applied on all farms in all years. Ture region-wide loadings in any one year are likely to be only a portion of this upper limit.

Soil testing indicates that Waikato soils currently have an average zinc level of 57 mg/kg, although this is an average and some properties tested do have higher (and lower) levels.

The range of results varied from 12 to 191 on horticultural land, 4 to 258 on pastoral land and 18 to 142²³ on forestry land.

The guideline level for zinc concentrations in soil is 300 mg/kg²⁴. Current *average* zinc levels are therefore well below the guideline level. However, levels on some properties sampled are beginning to approach that guideline level (three of the 148 pastoral farms recorded levels over 200 mg/kg).

Based on levels in the soil of previously unfarmed land (reserves) *natural* zinc levels in Waikato soils is estimated to be around 35 mg/kg. Zinc started to be applied around 20-25 years ago. On that basis it is estimated that zinc is accumulating in Waikato's soils at an average rate of about 1 mg/kg/yr. However, on some properties it seems to be accumulating considerably faster. In the highest recording 20% of the sample zinc levels seem to be accumulating at a rate of between 3.5-4.5 mg/kg/yr. On the "worst" case property the rate is as high as 9 mg/kg/yr.

While it is unlikely that any land has been rendered incapable for use due to zinc concentration in soil over the life of the RPS, average concentrations have certainly increased (perhaps as much as 10%) over the past decade. Furthermore, it is possible (assuming current zinc accumulation rates continue) that some properties could reach levels that exceed 300mg/kg soil during the life of the next RPS.

Zinc applied in facial eczema remedies is reasonably water soluble, and there is evidence that zinc concentrations are probably building up in Waikato's rural lake sediments. In 11 lakes sampled, 7 seem to have elevated zinc in sediments and another 2 are "probably" elevated²⁵.

In some of these lakes the zinc levels are getting close to sediment quality guidelines. This may be the most significant consequence of zinc contamination as high levels of zinc in sediments can have a toxic effect of sediment dwelling biota leading to lake sterilization over the longer term.

Neither the RPS nor regional plan currently addresses the issue of zinc contamination.

■ *Copper*

Copper can also build up in soils. The issue is largely confined to horticultural soils as copper is commonly used in fungicides applied to horticultural and market gardening crops.

²³ This relatively high level reflects the at the site had relatively recently converted to forestry from pastoral farming.

²⁴ This is taken from the NZ Waste Water Association's *Guidelines for the Safe Application of Biosolids to Land in New Zealand*. The level is set to guard against plant yield reduction, plant toxicity (phototoxicity) and microbial poisoning. These effects occur well before there are human or animal health effects.

²⁵ These results are expressed as probable because of uncertainty about natural zinc in sediments.

Copper levels can build up to the point where guidelines for residential soils are exceeded. There are a number of guidelines in relation to copper but no formal national standard. The current *Biosolids Guideline* level for copper concentration is 100 mg/kg. The level set by the *Health and Environmental Guidelines for Selected Timber Treatment Chemicals*²⁶ is 80 mg/kg.

Given that copper fungicides continue to be used it is likely that copper levels in horticultural soils will have increased in recent years. However, the amount of land devoted to horticulture within the region is small (only around 0.4%) and so at the regional scale it is not a significant issue.

Nevertheless, a 2003 study²⁷ of historic pesticide residues in Waikato soils (residues on 31 Waikato properties developed for horticultural use prior to 1975) found copper values in horticultural soils that ranged from 8 to 523 mg/kg with a median value of 81 mg/kg. That is, 55% of the horticultural sites sampled exceeded the Timber Treatment guideline level.

- *DDT*

Although the use of DDT to control grass grub ceased in the 1970s, DDT persists in the region's soils. The presence of DDT has limited conversion of land to dairying because Fonterra has imposed a soil concentration standard to ensure DDT does not enter milk.

A 2002 survey of Waikato farms showed that 40% of samples submitted by landowners wishing to convert to dairying exceeded the Fonterra standard of 0.2 mg/kg soil. However, in May 2006 Fonterra raised the DDT residue standard to 0.7 mg/kg soil. It is unknown what proportion of farms exceeds the new standard.

Importantly, as DDT is now banned, and because it does slowly break down in the soil, the issue will improve over time (assuming the residue standard does not become more stringent in the future). There is nothing that the RPS need do to further manage this issue.

4.2.3 Summary

There is a significant amount of monitoring information on soil contamination. That information suggests that, with the exception of DDT, the levels of all main contaminants are *increasing* in the Region's soils.

There are no national standards for contaminant levels in soils that formally and categorically trigger foreclosing of certain land uses. However, the guidelines that are available suggest that contaminant levels could (should trends continue) reduce the "range of existing and foreseeable uses of the soil resource".

Because of its toxicity and the widespread nature of contamination, cadmium is of the greatest concern.

²⁶ Ministry for the Environment and Ministry of Health, 1997

²⁷ Gaw, SK April 2003, Historic Pesticide Residues in Horticultural and Grazing Soils in the Waikato Region

4.3 Maintenance of soil health

Some land use practices may adversely affect soil health and reduce soil versatility and productivity in the Region.

The objective is:

Maintain versatility and productive capacity of the Region's soil resources

4.3.1 Evaluation of soil health objective

Soil health is a product of soil's chemical, biological and physical characteristics. EW's long-term soil quality monitoring programme monitors seven indicators. These are pH, total C, Olsen P, total N, mineralised N, bulk density and macroporosity.

These indicators are measured across the five major land uses in the region and the proportion of sites not meeting predefined targets is calculated.

Results for the monitoring carried out between 1998 and 2005 show the following.

- 50% of dairy pasture sites do not meet targets for macroporosity (meaning soils are experiencing unsatisfactory compaction). 20% of dairy soils have mineralised N higher than the target and 19% have total nitrogen higher than the target (indicating excess nitrogen fertiliser use).
- 40% of drystock (sheep and beef) farms have Olsen P levels *higher* than the target range and 38% do not meet the macroporosity target.
- 46% of forestry sites had Olsen P levels *below* the target. 42% had low bulk density and 31% had high macroporosity.
- 26% of horticultural/cropping land has Olsen P levels *higher* than target. 18% have macroporosity *below* the target and 9% have low total carbon.

Overall 34% of dairy, 47% of drystock, 15% of forestry and 2% of horticultural/cropping land is of concern because of its failure to meet soil health targets.

At the regional scale, about *one third* of all sites meet all soil health targets meaning that two thirds do not meet at least one indicator targets. (38% failed to meet one health indicator target and 22% failed to meet two such targets). The most common concern is low macroporosity (corresponding to high soil compaction/pugging rates) and high Olsen P (corresponding to excessive phosphate fertility).

Comparative data is only available for dairy soils. Those data show that compaction of dairy pastures was worse on 2004 than in 1998/99.

▪ *Fertiliser Use*

Nitrogen levels in the soil are a reflection of the use of nitrogen fertiliser use. The use of nitrogen has increased from 6 to 9 kg N/ha/yr on drystock farms in the five years from 1997/98 to 2002/03. On dairy farms nitrogen application has increased from 68 to 125 N/ha/yr over the same period.

4.3.2 Summary

Considerable monitoring information is available in relation to soil health. Although comparative data is available only for dairy soils, indications (from that 1998-2005 comparison, from known increases in phosphate and nitrogen fertiliser use and from known increases in stocking rates) are that trends in soil health are going in the wrong direction if the RPS's objective of maintaining versatility and productive capacity of the Region's soil resources is to be achieved over the long term.

4.4 Moisture management

Poor moisture management may lead to a degradation of productive soils and peatlands.

The objective is:

No net loss of productive soils as a result of inappropriate moisture management.

4.4.1 Evaluation of moisture management objective

This section of the RPS is somewhat cryptic. The issue refers to degradation of productive soils and peatlands, but the objective refers only to productive lands. Furthermore the term moisture management seems unnecessarily vague when the real concern appears to relate to land drainage.

For the purpose of this evaluation, the objective is read as relating principally to the management of the Region's 94,000 hectares of peatlands and more particularly to the drainage of these peat soils.

While drainage has greatly improved the ability to farm these soils, excessive drainage can lead to increased shrinkage of peat soils as peat dries out and oxidises (where carbon turns into carbon dioxide).

The concept of "net" loss applies as discussed in section 4.1.1.

Subsidence rates of peat soils have been determined by various regional studies²⁸. These studies show that peat soils are subsiding at the annual rates indicated in Table 2.

Table 2 – Peat soil subsidence rates in main peat soils of the Waikato

Peat soil area	Rate cm/y
Hauraki Plains	1.85
Moanatuatua Swamp	3.3
Rukuhia Swamp	2.56

These figures indicate that the region's peat soils are shrinking, on average, more than 2cm per year. Although the studies measure long term (70-80 year) trend and

²⁸ McLeod M, Taylor A, Duncan L, 2003. Subsidence Rates of Peat Since 1923 in the Hauraki Plains Area; Fitzgerald N, McLeod M, 2004 Subsidence Rates of Peat Since 1924 in the Rukuhia Swamp; McKenzie S, McLeod M, 2002 Subsidence Rates of Peat Since 1924 in the Moanatuatua Swamp Area.

not simply the period over which the RPS has applied, the data is considered a robust representation of continuing trend.

On this basis it is difficult to conclude that the objective is being met because peat soils are clearly being lost and that loss is attributable to drainage practices. However, the lack of precision about the scope and intent of this objective should be noted.

4.5 River and lake beds management

Some activities and natural processes can destabilise the beds and banks of rivers and lakes.

Objective:

A net reduction in the adverse effects of the destabilisation of river and lake beds

4.5.1 Evaluation of river and lake beds objective

The adverse effects of the destabilisation of banks and beds include effects on water quality and the aquatic habitat as well as changes in the course of rivers and streams resulting in loss of land and damage to property.

This issue and objective is something of an anomaly in the *Land and Soil* chapter of the RPS. Clearly it is located there in acknowledgement that the RMA defines the beds and banks of rivers as “land”. However the effects of concern relate more to water quality and aquatic biodiversity.

In terms of monitoring progress towards this objective it is fair to say that it is difficult to identify specific or unique indicators.

The CEM has explicitly considered bank stability and generally found evidence of improvements in stream bank stability in priority catchments. In Matahuru catchment for example 66% of stream bank was considered stable in 2005/06 compared to 46% in the 2003/04 survey. In the Pokaiwhenua catchment stability increased over the same period from 88% to 95%. In the Mangatutu catchment 57% of the stream bank was considered stable in 2005/06. No data is available for earlier years.

Information from the CEM provides some indication the stream bank stability is improving in priority catchments but, again, these data are of little assistance in assessing the region wide position (in areas where there have not been dedicated soil conservation initiatives).

Information on water quality reported in the following section of this report provides some further indication of turbidity but, of course, the source of that turbidity cannot necessarily be attributed to stream bank erosion.

4.6 Overview of current land and soil issue identification

The current *land and soil* section of the RPS has a relatively narrow focus. It is currently limited to those issues that were, in the years immediately after the enactment of the RMA, seen as the core and exclusive domain of regional councils. Thus, the focus of the section is on impacts of land use *on the land/soil resource itself*.

4.6.1 Traditional land and soil issues

There can be little doubt that these “traditional” land and soil issues identified remain valid and highly relevant. While progress may have been made on some issues (such as erosion) here is little evidence that the suite of issues identified have been resolved (nor could they be) to a point where a future RPS need not concern itself with them. If anything, due to increasing intensification of rural land use (particularly the area of the region devoted to dairying and increased stocking rates on dairy farms), the issues identified in the current RPS look set to become more pressing in the years ahead.

The issue for the next RPS is how it approaches the setting of objectives in response to these issues. It could continue the current ambitious approach which focuses on either (a) maintaining a *net positive* outcome (acknowledging that under and over achievement will occur); and/or (b) limiting the extent of effects to protect core characteristics of the resource in general (e.g. productive potential or suitability to a range of uses).

If it does so, better means of measuring progress will need to be developed to provide confidence that progress can be effectively monitored. In addition, the current approach to measuring progress is hampered, even where significant monitoring information has been collected, by the absence of firm, broadly accepted quantifiable standards compliance with which, represents unequivocal evidence that a narrative objective has been attained or is being promoted. At present there is a necessary but problematic reliance on *guideline targets* that extracted from various non statutory documents not included or referenced in the RPS itself. The relevance of these guideline targets to the objective in question is therefore disputable.

Notwithstanding the above comment, given that some of the objectives do not appear to have been attained within the RPS period, there is an obvious need to do one of two things, either:

- develop more effective policies and measures to respond to the issue and/or
- re-set the objectives to be more “realistic”.

Objectives may not be achieved within the 10 year RPS period but may in fact be achievable of a longer time frame. The articulation of a long term objective (or “vision”) with specific *milestone targets* is one possible approach.

Alternatively, the objectives might need to be articulated in such a way that there is *spatial differentiation*. In other words, objectives could be set to apply different expectations in different places. They may be designed to protect existing high quality resource from any degradation while allowing a lower level of outcome in already degraded areas.

The appropriate approach to take requires more detailed evaluation. However, as a matter of principle, the objectives and the means of their assessment should be specific and transparent so that there can be no debate about the degree of progress that is (or is not) made over the life of the RPS.

4.6.2 Emerging land issues

While the RPS needs to address the effects of land use on the land and soil resource, land management does have various other dimensions. The use of land can have implications for *other* resources and values. That is, the use to which land is put can affect (by itself or when undertaken as part of a broader trend) the pressure placed on other resources and/or the value third parties extract from their own properties or from the environment generally. While managing some of these effects sits squarely with territorial councils others may require regional level attention.

In broad terms, the effects of land use that the RPS can legitimately consider - in addition to effects on soil - include:

1. Land use effects on other *regional council managed* resources (such as water and biodiversity).
2. Land use effects of *regional significance* (whether these relate to regional council controlled resources or not). Managing impacts on landscape might be an example if there were landscapes of regional significance.
3. Land use effects that have *strategic* level impacts. Examples of strategic level impacts would be where land use change:
 - forecloses other land use options which may be essential or desirable (either short or long term) from a regional perspective. Including consequential effects such as the displacement of land uses from one area to another where conditions are less able to accommodate effects.
 - creates demand for infrastructure, or affects the efficiency with which infrastructure (including water supply, roads, stormwater services, electricity transmission and distribution) can be used, provided and upgraded.
 - creates demand pressures that cross territorial boundaries (so that the decisions by one territorial authority have implications for other territorial authorities or the region).

4.7 Relevant contextual changes

The narrowness of the current approach taken to land and soil issue identification perhaps needs to be reconsidered, particularly in light of major changes that have occurred since the mid 1990s, including:

- the increased rate of urban, peri-urban and coastal development (agriculture – urban land use change) and the growth pressures that extend across territorial/regional boundaries (reflected in efforts both in the north and around Hamilton to co-ordinate growth management)

- The Resource Management Amendment Act 2005 which provides regional councils with the express function of the “*strategic integration of infrastructure with land use*”²⁹.
- The Resource Management (Climate Change and Energy) Amendment Act 2004 which requires EW to have regard to (amongst other things) *the benefits to be derived from the use and development of renewable energy* coupled with the central government policies that promote renewable energy development (and the likelihood that there will be continued demand for the Waikato to provide renewable energy opportunities).

As noted in section 1.1 above, the Waikato RPS is currently not well placed to respond to these changes.

4.8 Additional issues and possible changes

Given the changed context and experience to date with the land and soil section of the RPS a number of changes could be considered for the next generation RPS.

- *Strategic impacts of urban growth/ land use change*

These issues relate to how the region can best accommodate growth with the least impact on its resources. Issues include:

- Availability of high quality soils for intensive productive use may be reduced leading to displacement of such uses onto land less capable of supporting such uses (without greater environmental impact).
- The potential of urban or rural residential development to compromise groundwater potentially required for municipal supplies.
- Potential impact of urban and rural residential development on regionally significant landscape values.
- Potential impact of urban and rural residential development on regionally significant heritage values³⁰.

- *Issues arising from energy growth*

Potential impact on landscape values from renewable electricity generation (wind farms) and transmission services.

Potential need to manage the landscape so as to ensure opportunities for wind farm development are maintained.

- *Issues associated with the relationship between land use/growth management and infrastructure*

These relate to how the effects of urban growth can best be mitigated through appropriate and timely infrastructure (including, in particular, transport infrastructure). Note that these issues are discussed more fully in section 12 of this report.

²⁹ See section 12 for further discussion.

³⁰ See section 14 for further discussion

- *Issues relating to the integrated nature of land use effects across environmental media*

These relate to the potential for land use to affect other resources and the need to integrate management (including co-ordinating territorial authority planning responses).

A good example is the existing moisture management issue and objective which currently focus entirely on the soil impacts of land management practices. However, the consequences of too much drainage are broader than simply a reduction in peat soils depth. Other key effects are (a) the reduction of water levels in neighbouring wetlands and peat lakes (as they are left higher than surround land); and (c) release of carbon dioxide to the atmosphere contributing to greenhouse gas emissions³¹.

Those impacts of land use are currently not addressed. With the new regional function of “maintaining biodiversity” and increased emphasis on climate change³², however, there may be a need to consider these matters further in the new RPS.

Furthermore, the “moisture management” issue might be more accurately recast as *peat management*.

- *Other matters*

Other matters to arise from the staff workshop that ought to be considered in the new RPS include:

- Establishing a *sub regional framework* in the RPS to address land issues
- Promoting *integrated catchment management* to ensure issues within a catchment are considered together
- Promoting better matching of land use to *land capability*
- Providing stronger *direction* to territorial authorities to assist implementation of RPS policies.

4.9 Structural implications for the RPS

The overall structure of the RPS is discussed in Section 16 of this report. However, analysis of the *Land and Soil* section suggests that, as a minimum, the *Land and Soil* section of the RPS, may need to distinguish between the effects of *land use* (which tend to be strategic) and the effects of *land management* (which tend to be site specific). This may be done by dividing the section into three.

- The effects of primary production on soil
- The strategic effects of land use and land use change
- The effects of land use on landscape.

³¹ It is estimated that developed peatland releases about 1.3 million tonnes of carbon dioxide each year

³² It should be noted that loss of carbon associated with existing use of peatland does not come within New Zealand’s obligations under the Kyoto Protocol.

5 Water

The *Water* chapter of the RPS identifies six issues with associated objectives. These are:

- Water quality
- Flow regimes
- Efficient use of water
- Wetlands
- Public access to water bodies
- Mauri

Each of these is discussed in below.

5.1 Water quality

There is potential for the reduction of water quality from:

1. The cumulative effects of point source and non-point source discharges of contaminants
2. Land uses which affect the margins and beds of water bodies
3. The taking or impoundment of water

The objective is:

Net improvement of water quality across the region

5.1.1 Evaluation of water quality objective

Up to 19 different characteristics are measured in the Waikato to determine water quality at any one monitoring site (of which there are 110).

In other contexts, the concept of *net improvement* refers to the desire for the overall regional position to improve accepting that some sites or features may deteriorate while others improve – and provided there are more sites improving the net position is improved.

In water quality, however, net improvement can be applied to refer to the water quality at one site showing a net improvement (in other words accepting that some of the 19 measures of quality may decrease while others increase).

The RPS is not currently clear on how the concept of net improvement is to be applied. In reality, what has happened is that water quality at some sampling points has improved in absolute terms while in others the overall position is less clear with some characteristics improving and others deteriorating. The huge variation between sites (in terms of what characteristics are improving and which are not) and the difficulty in prioritising the characteristics *most* critical to “improvement” makes for a very complex picture.

General trends are discussed as follows³³.

³³ Data from Trends on river water in the Waikato Region 1987-2002, Bill Vant and Paul Smith, 2004.

- *Waikato River water quality*

There are 10 sampling sites on the Waikato River. Between 1987 and 2005 none of these sites showed deterioration in temperature, dissolved oxygen (BOD), total ammonia or *Enterococci* levels. Indeed, all sites recorded improvement in ammonia and all but one in BOD. *Arsenic* levels improved in all sites downstream of the Wairakei Power station, while *dissolved colour* has improved (or stayed the same) at all sites below the Kinleith mill. (These improvements are attributable to improvements in point source discharges from major industrial plants.)

On the negative side, there has been a general decrease in pH and a number of sites on the mid and lower reaches of the Waikato system have recorded higher levels of total phosphorous and nitrate reflecting land use practices.

- *Other Waikato rivers*

Between 1990 and 2002 significant trends are also identifiable in the quality of water in other Waikato rivers. The majority of the trends involve deterioration. While there are some positive trends in terms of increases in visual clarity, decreases in ammonia and decreases in turbidity, there were adverse trends in dissolved oxygen, conductivity, pH, total nitrogen total phosphorous and dissolved colour.

While there is a strong correlation between the magnitudes of these trends and proportion of the catchment in pasture the precise reason for many of these changes is not clear. (Although ammonia reduction seems to be related to improvements in point source discharges and, possibly the move towards land disposal of farm dairy wastewaters).

Microbial contamination in all rivers continues to be a problem with 70% of samples (51 of 73) having *E. coli* levels too high for safe swimming and nearly 75% of samples having levels too high to be suitable for stock watering. There is no particular trend in *E. coli* for the period 1990-2002, with some sampling sites recording deterioration and others improvement.

- *Lakes*

Monitoring of nutrient enrichment in nine of the Waikato's *shallow lakes* (Manahia, Ngaroto, Rotokauri, Rotomanuka North, Rotomanuka South, Rotoroa, Waahi, Waikare, Whangapae) between 1993 and 2001 indicated that nitrogen and phosphorus levels were improving in two lakes, worsening in four lakes with no change in the remaining three lakes.

All these lakes continue to suffer from high nutrient enrichment with two having "very high" levels and five having from "extremely high" nutrient levels.

The open water quality of Lake Taupo is good but long term trends do show deterioration in key water quality indicators. Monthly average Chlorophyll *a* levels have increased since 1994. Water clarity has decreased from 12 metres in the 1970s to 10 metres in 1998 and then to about 7 metres in 2002. Nitrogen levels are also increasing with the amount of nitrate in the water doubled between 1974 and 2004.

A long term monitoring programme detects change through assessment of the rate of consumption of oxygen from the bottom waters of the lake (volumetric hypolimnetic oxygen depletion – *VHOD*) as an integration of all biological

processes occurring in Lake Taupo. The 2004/05 net VHOD rate at $11.30 \pm 1.13 \text{ mg m}^{-3} \text{ d}^{-1}$ was more than $2 \text{ mg m}^{-3} \text{ d}^{-1}$ higher than in 1994/95 and 1995/96. (This indicates increasing oxygen demand in the lake associated with increasing micro organisms).

The water quality at 18 of Taupo's *bathing/recreational* beaches is also monitored by measured microbial contamination. Overall, data generally show that 68% of the time water quality is excellent for contact recreation and only 9.6% is it unsatisfactory. Obviously, this varies depending on the monitoring site. In the 2005 survey, *excellent* ratings ranged from 83% of samples at some sites to 45% of samples at another site (*unsatisfactory* ratings similarly ranged from 0% of samples to 18% of samples depending on the monitoring site).

▪ *Ground water*

Ground water is also susceptible to various forms of contamination. In 2004 *E. coli* were detected in 9 of 82 wells sampled.

There is no time series data nor is there much information on the extent of microbial contamination in individual rural groundwater supplies. However, earlier site specific studies indicate that the microbial contamination of ground water has been an issue for many years and is attributed to bore holes being too close septic tanks. Various studies over the past decade reveal between 50% and 9% of samples contaminated. It is currently unknown whether this trend is getting better or worse.

Monitoring shows that *nitrate* concentrations in groundwater exceed drinking water guidelines on about 16% of monitored sites. About a third of monitored sites have nitrate levels above half of the guideline. Nitrate levels on separately monitored community (i.e. school) supplies are lower with only 2% of samples exceeding the drinking water guideline. Nitrate concentrations are increasing in many areas due to land use intensification.

Pesticides have been detected in groundwater at 20 percent of regional monitoring sites and 10 percent of community sites (one community water supply had a pesticide concentration above the drinking water guideline). The concentrations of most pesticides detected are still well below drinking water guideline levels. There is no historical pesticide contamination data from which a trend can be determined.

5.1.2 Water quality summary

The water quality picture is mixed. There are signs that improvement to point source discharges has had a material affect on the region's river water quality (particularly the upper reaches of the Waikato). However, trends in nutrients particularly in the lower reaches of rivers, in lakes and in groundwater are not positive. Microbial contamination is also a large and continuing issue for intensively used parts of the region. In other words, while the impacts of many point source issues are abating, the impacts of non point source (diffuse) discharges are continuing and, while information is not comprehensive, it seems likely that many of these issues have grown over the past decade.

Although the concept of *net improvement* is under-developed (in terms of its precise definition) it is not possible to conclude that it has been met during the life of the RPS.

5.2 Flow Regimes

Use of water bodies, including recreational, consumptive and in stream uses depend on a variety of inter-dependent characteristics of natural and modified flow regimes. Any alteration of these characteristics has the potential to adversely affect the variety of uses.

The objective is:

The range of uses of water reliant on the characteristics of flows regimes maintained or enhanced.

5.2.1 Evaluation of flow regime objective

There is general agreement within EW that the flow regime objective is both unclear and unhelpful. It is not apparent, for example, what the characteristics of flow regimes are or what uses are, and are not, reliant on those characteristics.

Furthermore, what the objective seeks to maintain is “the range of uses” (i.e. those uses reliant on undefined characteristics). Yet, what the preferred “range” includes is left unsaid and no indication about the extent of each use within the range is provided. The objective is largely void for uncertainty.

The objective perhaps reflects understanding at the time it was drafted - when regional councils’ role in allocation (and the purpose of that role) was poorly defined. It certainly was drafted at a time when there was much less demand for water and when competition for available water seldom posed significant management challenges.

There is no information available on what the current range of uses reliant on the characteristics of flow regimes, and whether that range has been maintained or enhanced. This would, of course, vary greatly depending on the catchment. The objective is considered largely unfeasible to evaluate objectively.

EW staff do note, however, that there have been few large scale new allocations (and opposed to “renewals”) since the RPS was notified that could be said to have reduced the suitability of water bodies for the range of uses historically associated with that water body. In that sense it may well be that the objective has been achieved.

In any event, the field of water allocation has been advanced significantly since the RPS was notified. The implications of emerging issues and opportunities in water allocation are discussed further in section 5.8.

5.3 Efficient use of water

The water which can be taken from water bodies without producing significant adverse effects is finite. Inefficient use of that water may limit the ability of people and communities to provide for their needs.

The objective is:

The efficient use of water that is available to be taken from water bodies.

5.3.1 Evaluation of efficient use of water objective

Efficient use of water generally has two dimensions (a) *allocative* efficiency (such that the benefit to society from the use of water is maximised); (b) *technical* efficiency (such that as much benefit is derived from each allocation as that allocation allows for).

It is not entirely clear whether the objective refers to both forms of efficiency or to technical efficiency only. Although the issue statement hints at the later, the objective can certainly be read both ways. For that reason each type of efficiency is dealt with below.

5.3.2 Technical efficiency

There has been some reported efficiency gains in water use. This is considered partly a result of technology changes and partly a result of the move to water metering and management guidelines.

For example, the move to centre pivot irrigation systems has increased the efficiency of irrigation (as measured by the proportion of water that gets to the target root zone) from 65% to 85-90%.

A 2004 study of the irrigation system efficiencies on dairy farms in the Waihou catchment, for example, concluded that efficiencies were relatively high.

While there appear to have been gains in the efficiency of water use within the rural sector there are clearly further efficiencies to be had in other sectors. For example, with most the territorial authorities not yet metering water, there are opportunities to reduce municipally supplied water use.

New measures have been introduced through Variation 6 to the Regional Plan that make domestic and municipal supply subject to the need for, and efficient use of, the water being established through a *water management plan*. Of course, it is too early expect this provision to have affected efficiency but the influence of the RPS can perhaps be seen in this provision.

5.3.3 Allocative efficiency

Without detailed economic analysis it is very difficult to demonstrate that allocation of water is optimal such that no re-allocation could make the region better off.

However, various sector-specific studies have been undertaken as background to Variation 6 to the Regional Plan. Studies into the Waihou³⁴ and Reporoa³⁵ catchments and into municipal supply³⁶ all suggest that there were significant volumes of water allocated but not used (or that return flows were disregarded) and therefore allocative efficiency was compromised (since water is physically available but due to management arrangements was not able to be allocated to alternative uses).

³⁴ Rout, R S, 2004, Irrigation Efficiency and Water Allocation in the Waihou Catchment

³⁵ Rout, R S, 2005, Water Resources of the Reporoa Basin

³⁶ Rout, R S, 2005, Water Management Study of Municipal Water Supplies

Those studies and associated reviews of Environmental Waikato's water allocation processes and procedures³⁷ (and additional theoretical work) supported the introduction of Variation 6 and the various measures it promotes to free up unused water for allocation and to enhance opportunities for transfer of water permits. These measures should enhance allocative efficiency in the long term.

5.3.4 Summary of efficiency

Overall, it seems that there have been technical efficiency improvements at least in the agricultural sector over the past decade. While there is room for improvement in the efficiency of municipally supplied water (most of which is not metered) recent policy changes respond to this issue.

There is no evidence to suggest that allocative efficiency has improved over the past decade but clear evidence that there is opportunity to make improvements in that respect. Again, recent policy initiatives (Variation 6) respond to that opportunity.

5.4 Wetlands

Wetlands are an important resource within the region. Human activities in and around wetlands have the potential to further adversely affect their natural character.

The objective is:

An increase in the quantity and quality of the Region's wetlands

5.4.1 Evaluation of wetlands objective

EW is committed to monitoring change in extent of wetlands on a five yearly basis. At the present time information is available for 1995 and 2002 only. Detail is reported separately³⁸, however, the overall key finding of this monitoring is that the extent of wetland continues to decline. The area of wetland was 30,000 ha in 1995 (down from 100,000 in 1840). By 2002 it had reduced by a further 600 ha. Unfortunately there is no more recent data.

Monitoring of the quality of wetlands is also occurring. Marra et al found that:

Most wetland areas are declining in health through weed incursion, particularly willow and reed sweetgrass. Almost one third of wetlands are infested with willows.

The main threats to wetlands are stock incursions, peat mining, drainage, weeds, nutrients and sedimentation.

A 2005 study³⁹ of the 950 ha Opuatia Wetland, for example, found that although the wetland is generally in good health, grey willows had infested the wetland from almost 0% in 1942 to 30% by 2005 and that without management this would

³⁷ Rout, R S, 2004, Assessment of Improvements to Environment Waikato's Water Allocation Processes and Procedures

³⁸ Marra M, Trebilco, U and Denyer K, 2006, Progress Toward Achievement of Environment Waikato's Regional Policy Statement Objectives: Biodiversity and Natural Heritage

³⁹ Brown K and Campbell D, 2005, Ecohydrological Characterisation of Opuatia wetland and Recommendations for Future Management.

increase to 43% by 2024. The wetland is also subject to grazing and high nutrient inputs. Maintaining quality will require active management⁴⁰.

5.5 Public access to water bodies

Public access to water bodies is valued for many purposes. In some instances access is unnecessarily restricted while in limited circumstances access needs to be restricted for safety, defence, security or conservation purposes

The objective is:

Enhancement of public access to and along lakes, rivers, wetlands and their margins, except in certain defined circumstances.

5.5.1 Evaluation of public access objective

While some GIS mapping of existing public access has been undertaken to establish a baseline (at least at a coarse scale) there has not yet been data collected that can be used to demonstrate either change in extent or change in quality of access to water bodies. Further work on this is planned over the next two years.

Although it cannot be quantified at this point, it is likely that modest progress has been made – largely through territorial authorities’ actions including (in at least some cases) the taking of esplanade reserves as a consequence of land subdivision, acquiring lake margins, and the development of walkways. EW has ensured that grazing leases over its flood protection schemes provide that occupiers should enable reasonable public access.

Overall, while some progress is likely to have been made, more can be achieved and the RPS could have a role in co-coordinating and prioritising investment in securing public access.

5.6 Mauri

Maori consider that the disposal of contaminants to water has the potential to diminish the mauri of that water.

The objective is:

Tangata whenua concerns relating to the mauri of the water recognised and provided for.

5.6.1 Evaluation of mauri objective

The objective can be interpreted to in two ways.

First, the phrase recognise and provide for [concerns] may be *outcome* focused. In that sense the objective is only met if the mauri of water is protected from contamination. According to that definition, little progress has been made at a regional scale since, as discussed in section 5.1.1, water contamination continues to be a major issue and, depending on the contaminant measured, is getting worse.

⁴⁰ The wetland is subject to management as mitigation for the construction of the Mercer West flood control scheme (which resulted in the loss of approximately 50-60 ha of minerotrophic wetland). Subsequent monitoring (2007) did not find improvement in quality in the degraded (mineralised) area of the wetland although improvement is expected as a result of significant restoration (including willow spraying and fencing).

On the other hand the objective may also be interpreted as focusing on *management* or process matters rather than the outcome (the objective does refer to *recognising and providing for concerns*). By that measure progress is mixed. Little explicit recognition of mauri is made in the Regional Plan nor have there been, for example, arrangements to provide for co-management/kaitiaki interests.

However, recognition is taken (albeit it cannot be quantified) of concerns about mauri when raised in decision-making fora. Furthermore, EW is involved in a project with Raukawa Maori Trust Board (*Wai Ora Project*) established to specifically to consider mauri of water. The project has evolved to examine monitoring methods in relation to water (including considering the *cultural health index*) and how to measure characteristics of water that help to describe mauri. The project is still in its early stages but does represent one attempt to recognise and provide for tangata whenua concerns in relation to the mauri of water.

5.7 Overview of current water issue identification

Many of the same comments made in respect of land apply also to the water chapter.

As would be expected, the issues identified in the current RPS remain valid. If anything, pressures on water quality have become more severe. Although it is difficult to draw robust conclusions about the achievement of objectives, there is good evidence to suggest that water quality has not experienced a “net improvement” over the past decade when reviewed at the regional scale. Some improvements are detectable (particularly reduction in the effects of point source discharges) but in many areas water quality continues to deteriorate as a result of land use change and associated non point source discharges.

Water quantity issues and objectives are generally poorly articulated and there are no relevant benchmarks against which to assess progress. Some gains in the efficiency with which water is used do, however, appear to have been made. Little direction is provided on broader issues of water allocation and prioritisation.

The area of the region recognised as “wetland” seems to have continued to reduce both in size and (probably) in quality. Modest progress may have been achieved on enhancing public access to water bodies though information is sparse and it is doubtful that any progress can be directly attributed to the RPS with territorial authorities exercising their own statutory responsibilities in that regard.

Recognition of tangata whenua concerns relating to mauri is almost impossible to assess although the improvement in levels of contamination from point source discharges is consistent with this objective.

As discussed in the *Land and Soil* section of this report, the evaluation suggests that to the extent that progress has not been made, either policies and methods of the RPS need to be revisited and/or objectives need to be set more “realistically” (or as circumstances dictate, more ambitiously). The challenge is to determine which strategy is most appropriate.

The options for rethinking the setting of objectives are broadly the same as discussed in section 4.6.1 of this report. In summary, objectives could be set at a finer resolution, for example, for particular water bodies (e.g. the Upper Waikato river, Lake Waikere, Kaawa aquifer etc) or types of water bodies (rivers, lakes,

groundwater). It is well accepted that the ability to cope with contaminants (for example) varies depending on the water body. A “one size fits all” regional-scale objective does not necessarily promote management sensitive to the characteristics and condition of particular catchments.

Alternatively, (or additionally) long term goals could be set with intermediary targets representing interim steps that might coincide with the life of the RPS. The appropriate response will be determined in part by the need to expressly address a wider range of water issues (as discussed in section 5.9).

At present, when delivering water improvement programmes, an “informal” policy has developed whereby greatest priority is given to the upper reaches of river systems. This delivers the most cost effective outcomes (that is, more can be achieved with available resource). For transparency, should this practice be continued, it may need to be validated through the RPS.

5.8 Relevant contextual changes

In contemplating a revised water section of the RPS a number of changes to the operating environment are relevant to consider. These are discussed below.

- *Allocation amendment to the RMA*

The Resource Management Amendment Act 2005 clarified regional councils’ role in allocating public resources, including water. Prior to 2005, regional councils’ role in water allocation was implied but not expressly provided for as a function. As a result EW placed little emphasis in a policy sense on its allocation role focusing instead on the effects of allocation decisions.

An express role in allocation clarifies and legitimises regional council’s role in allocating water and requires the EW consider what objectives it seeks from allocation decisions (and, as a consequence, what allocation methods it chooses to use).

- *Sustainable Water Programme of Action*

The Sustainable Water Programme of Action (SWPoA) is a government agenda for improving water management. Considerable work on providing new tools and methods for water allocation has been undertaken, including work on (a) alternatives to the current “first in first served” approach to allocation decisions and (b) the “unbundling” of the existing take and use components of water permits so as to facilitate permit transfers (and potentially market based primary allocation). It is possible that before the second generation Waikato RPS is notified there will be legislative amendment and/or national policy statement (and/or NESs) that establishes a clearer direction on how allocation decision ought to be made.

- *Variation No. 6 (Water Allocation) to the Regional Plan*

To some extent EW has pre-empted national level changes to allocation decision-making through the preparation of Variation 6 to the Proposed Regional Plan. That variation introduces a comprehensive regime for setting allocable and environmental flows and for allocating available resource through permitted activity and consenting framework, as well as enhancing opportunities for secondary allocation (transfers between consent holders).

This variation currently has no foundation in the RPS.

- *The Tainui (Waikato River) Treaty settlement*

Recently the Crown has announced a draft agreement to settle Tainui's outstanding claim against the Waikato River.

The draft agreement proposes the establishment of the "Guardians of the Waikato River" made up of representatives of Waikato-Tainui, other iwi along the river, the Crown, and EW.

The Guardians would be responsible for developing a high level vision for the Waikato River, which EW would have to give effect to in its policies and plans under the Resource Management Act (RMA).

The draft agreement also proposes a separate statutory board made up of equal numbers of Tainui and EW councillors. It is anticipated the board would assist with the implementation of the strategy required to realise the vision.

Assuming the draft settlement is confirmed, EW will continue to have the same responsibilities under the RMA for water quality, water allocation, and other functions, however, the exercise of those functions will need to accommodate the co-management arrangements outlined above.

Although there will be implications for the RPS, it is too early to say precisely how the RPS will need to recognise new arrangements and priorities.

- *Enhanced biodiversity function*

As discussed in section 3.2.1 of this report, regional council's function in relation to biodiversity have been enhanced since the current RPS was prepared.

Section 30 (1) (c) of the RMA now states that a regional council may control the use of land for the purpose of –

(iia) the maintenance and enhancement of ecosystems in water bodies and coastal water

Furthermore section 30 (1) (ga) now states that a regional council has the function of –

The establishment, implementation, and review of objectives, policies, and methods for maintaining indigenous biological diversity.

Biological diversity is broadly defined and include aquatic plants and animals and different assemblages of these species.

These additions were contained in the 2003 Resource Management Amendment Act. Prior to 2003, regional councils' role in these matters was much less explicit.

- *Increasing demand for the region's water*

There is growing demand for water for irrigation, municipal supply and industrial uses.

The Ministry for Agriculture and Forestry and Ministry for the Environment projected an over 200% increase in demand for *irrigation* water between 2000 and 2010 in the Waikato Region (an increase of 9100ha over the present 4,500 hectares

of irrigated land)⁴¹. Recent modeling of future water demand from pasture irrigation⁴² considered scenarios of 10% and 35% of existing dairy land being irrigated by 2050 (both scenarios yielding net marginal benefit on average milk solids payout prices). These scenarios involved irrigation of approximately 9,000 and 22,000 ha of irrigated pasture by 2010 and 20,000 and 60,000 ha by 2020.

Water resources in the Pukekohe area are intensively used for irrigating market gardening. Local streams are currently over-allocated and irrigation now from the Kaawa aquifer poses risks to local stream flows.

Increases for primary production are taking place against a backdrop of increased demand for *municipal/community* supplies. Demand is forecast to increase significantly of the next 10 years and there has recently been many applications for increased municipal takes to cope with actual and potential growth. In many cases, the volume of water applied for exceeds the actual volume of water in streams or assumes a limitless ground water resource. The abstraction of water from the lower Waikato to meet Auckland's needs is expected to need to double in the next 35 years.

Many of the region's surface water bodies are already reaching or are over the allocation limits specified in the proposed Waikato Regional Plan. In the near future a greater portion of the irrigation demand will need to come from groundwater.

Given the strong focus on renewable energy in the context of the national need to reduce the carbon content of the electricity sector, there can also be expected to be demand for hydro electric development (albeit, given existing levels of hydro development, most future demand will likely be for mini and micro hydro projects).

5.9 Additional issues and possible changes

5.9.1 Groundwater

The issues and objectives of the RPS currently make no explicit reference to groundwater.

While groundwater issues can be inferred from the generalised statements about managing surface water flows and water quality (indeed the discussion of water quality above assumes groundwater quality to be relevant) the specific issues associated with groundwater are not canvassed.

Groundwater issues are becoming significant and look set to continue to be some of the most pressing water management issues for the region.

As noted above in many areas surface water is fully or near fully allocated and future demand will need to be increasing met from ground water resources.

Ground water resources are not evenly distributed across the region and the quality of groundwater is highly variable. In some parts of the region suitable groundwater

⁴¹ Doak M, 2002. Water Markets. MAF paper presented to conference on Water: The lifeblood of New Zealand, Wellington, 23 July 2002.

⁴² Brown, E and Haigh A, 2004, Future Water Demand from Pasture Irrigation in the Waikato Region

is not available. In other parts (such as the Pukekohe Hill area) recharge zones are being compromised by urban development.

The need to protect the *recharge zones* of key aquifers to safeguard municipal supply (in terms of both quantity and quality of water) is likely to be a major issue over the next decade.

The *quality* of groundwater is determined by geology and overlying land use. As discussed in section 5.1.1, microbial contamination and nitrates can be significant land use induced issues. Naturally occurring high boron levels also constrain groundwater use in some parts of the region. There is also a potential issue with certain pesticides leaching to groundwater in vulnerable parts of the region.

A further issue associated with groundwater not currently acknowledged is that of *saltwater intrusion*. Coromandel beaches and other areas with shallow sand systems are particularly vulnerable to saltwater intrusion as too much freshwater is abstracted. This is becoming a significant issue for both private and municipal supplies and is likely to worsen as demand for groundwater increases in coastal areas and could be exacerbated by any sea level rise.

Management issues are made more difficult by incomplete knowledge about the size of aquifers and their interactions with surface water (and the freshwater ecosystems they support).

In the absence of good information, management of groundwater resources needs to be conservative meaning that current practice potentially *under* allocates such water to productive uses.

5.9.2 Lakes

The management of *lakes* (particularly shallow lakes) and their associated values is another issue not explicitly addressed by the current RPS. Although the RPS addresses characteristics of lakes it does not recognise lakes as valued resources in their own right.

Research shows that the region is gradually losing its shallow lakes (both peat and mineralised). Many are filling with silt and both water quantity and quality is deteriorating. In most cases the threats are not related to direct inputs to or abstractions from the lakes themselves but rather the management of the wider environment on which the lakes' long term health relies. Issues are different for each type of lake.

- *Dune lakes* are currently not acknowledged by the RPS at all yet there are some very good examples in the region. Land use around these lakes is intensifying.
- *Peat lakes*, as discussed in section 4.4.1, are also threatened by land use change and more especially by land drainage in the vicinity of peat lakes causing land levels around the lakes to fall below lake levels leading to dewatering (notwithstanding that weirs may have been installed at outflows).
- *Mineralised lakes* such as Whangape and Waikare are particularly vulnerable to siltation associated with land use in the catchment. Some of these lakes are also subject to modified flow regimes associated with the need to provide flood protection for other areas. There are conflicting community views on the legitimacy of using these lakes for hazard control as opposed to

protecting the natural integrity of the lake systems. Issues are compounded by the fact that these lakes are generally in private ownership.

The long term solutions to the issues faced by the Region's lakes would be similar to those recently established (by way of a variation to the regional plan) for Lake Taupo.

The RPS will need to consider whether similar (or alternative) approaches are warranted for the shallow lakes and what level of protection or improvement is feasible.

Setting out the level of change (and control) required in respect of land use, and the level of improvement possible is important context particularly in the face of community pressure for improved shallow lake water quality. However it will also be important to identify *values* (including biodiversity, recreational and community values) associated with lakes and to promote a strategy that acknowledges these values and makes deliberate choices.

At present there is an implied strategy to largely ignore the opportunity to recognise and improve values of shallow lakes.

While changes in land management will be critical to the future of the shallow lakes, securing long term protection of lake margins is also important. In that respect, the RPS offers opportunities to direct territorial authorities' exercise of land use planning control including, for example, taking of esplanade reserves and use of subdivision opportunities to bring about planting and protection works.

5.9.3 Freshwater ecosystem health

The other issue not explicitly recognised in the water section of the current RPS is the risk to *freshwater ecosystem health*. The potential for water use to affect viability and diversity of freshwater ecosystems is not currently described.

Similarly, the RPS currently omits to discuss either *freshwater fisheries* or, more broadly *Mahinga Kai*.

Freshwater fisheries is something of a grey area in resource management terms since management responsibility is split between three agencies, local government, the Department of Conservation and the Ministry of Fisheries. The RMA's biodiversity focus means that regional councils are required to maintain the species but they cannot control fishing activity (which is managed under specific statutes - the Fisheries Acts).

The availability and quality of mahinga kai, (and access to these resources), is another potentially significant issue. The RPS needs to include resource management issues *of significance to iwi authorities* and iwi have previously indicated that mahinga kai is an issue of significance to them.

The information available about the state of freshwater fish suggests that many species have suffered significant decline. This includes species valued as food sources such as whitebait, eels, and freshwater mussels as well as other species. The main issues are: poor water quality (particularly high sediment loads), habitat loss/disturbance (including drainage and stream "cleaning") and impeded migration routes (particularly poorly designed culverts, dams and floodgates).

Much of the decline can be attributed to historical works and (in some cases) past over fishing of slow growing species but on-going threats remain. In some cases,

recovery of species necessitates (amongst other things) modification of existing in-stream structures to improve access to habitat and open migration routes.

The regional plan does address key issues such the proper installation of future culverts and seeks to protect some remaining inanga spawning grounds but these actions are not currently rooted in the RPS.

Pest fish pose another threat to indigenous freshwater fish. Although these are addressed through EW's Regional Pest Management Strategy (RPMS) the issue could be acknowledged in the RPS as this would promote integrated water management.

5.9.4 Mauri

Mauri is recognised in the RPS but the concept is only discussed in terms of the effect of the disposal of contaminants to water. Mauri can be potentially affected by many other activities including for example over abstraction or temperature or other non contaminant changes that adversely affect that ability of a water way to sustain life.

The future RPS may need to broaden out the concept of mauri to include these other matters.

5.10 Structural implications for RPS

The structure for the water chapter needs to be considered in the context of other RPS wide issues. However the many issues outlined above do suggest that the water chapter of the RPS might be usefully structured to specifically address different water resources. That is:

- lakes (distinguishing between shallow mineralised and lakes and Lake Taupo);
- rivers; and
- groundwater.

6 Coast

The *Coast* chapter of the RPS identifies five issues with associated objectives. These are:

- Natural character and coastal processes
- Coastal water quality
- Integrated management
- Public access
- Noise emissions

Each of these is discussed in below.

6.1 Natural character and coastal processes

Inappropriate subdivision, use and development within the coastal environment results in loss of natural character.

The objective is:

Preservation of the natural character of the coastal environment including the physical and ecological processes which ensure its dynamic stability.

6.1.1 Evaluation of the natural character objective

Natural character is defined in the RPS to mean:

... the qualities of the coastal environment that together give the coast of New Zealand recognisable character. These qualities may be ecological, physical, spiritual, cultural or aesthetic in nature, whether modified or managed or not.

This definition takes a broad approach that includes qualities other than just “natural” qualities. While this approach appears inconsistent with the common meaning of the words “natural character” the definition is consistent with the New Zealand Coastal Policy Statement (NZCPS) that states in policy 1.1.3(c) that (amongst other things) *significant places or areas of historic or cultural significance* are “essential or important elements of the natural character of the coastal environment”.

The RPS’s definition also states that *natural character* can include qualities that are modified. (That is, an area can have natural character even if the qualities/elements are no longer purely “natural” or unaltered). That broad definition is also backed up by Court findings which have found that the word *natural* does not necessarily equate with the word ‘pristine’⁴³.

Notwithstanding the RPS definition and Environment Court judgments, what is meant by natural character is a source of on-going debate (even within EW).

Some of the elements of natural character are quantifiable (such as the number of species that inhabit the coastal zone). But other elements (particularly the aesthetic and spiritual elements) are inherently subjective and because the definition

⁴³ See, for example, *Harrison v Tasman District Council* W042/93, and *Browning v Marlborough District Council* W020/97 2 NZED 179.

provides for a spectrum of natural character (spanning different degrees of modification) rather than a definable “hard” boundary, the “amount” of natural character in the region and the change over time cannot be quantitatively measured.

Although natural character is not defined with precision, we do know that certain activities degrade the “naturalness” of the coastal environment and we know that the degree of *naturalness* (or lack of disturbance) is at least one measure of an area’s natural character.

We know, for example, that the building of structures, removal of vegetation (or planting of unsuitable vegetation), re-contouring of land and disruption or natural processes (i.e. processes that create and sustain coastal land forms and associated ecosystems) all erode natural character. In areas where natural character is already significantly reduced these impacts may not represent a major failure in terms of the objective set. However, in areas where the natural character values are relatively undisturbed the impacts described will, to the extent they occur, militate against the achievement of the objective.

6.1.2 Physical and aesthetic qualities

Ideally, assessing the change in physical and aesthetic qualities of natural character would involve detailed assessment of physical change in the natural features, landscapes and seascapes of the coastal environment and in community perceptions about that change.

No information of that nature is currently available. As a proxy it is possible to assess the extent of development in coastal areas over the past decade (assuming that development provides an indicator of reduced natural character).

Again, it is necessary to consider the Region’s coastal environment in three parts the West Coast, the Kaiaua Coast/Firth of Thames and the Coromandel Peninsula. Anecdotal evidence suggests little change in development of the first two of these coastal sub areas. (Although there may be some development pressure in the southern West Coast). The Coromandel, however, provides a marked contrast.

Between 1991 and 2001 the number of dwellings on the Coromandel increased by 2848 (45.7%). What is most interesting however is where this growth occurred. While the district policy attempted to focus development on the Peninsula’s seven main existing settlements, around a third of the housing growth (close to 1000 new houses) actually occurred outside these settlements. Building permits for the period 2001-2006 suggest the trend is increasing with another 883 building permits issued for new dwellings outside of the seven main settlements (equating to 37% of all new dwelling permits for that period).

The background planning studies for the Coromandel coastal strategy (“Blueprint” project) suggest that new housing development is overwhelmingly traditional low density. The scale of development in previously very small coastal settlements not only has direct impacts but also indirect effects as infrastructure needs (roading, sewage treatment and other utilities) escalate to cope with growth.

While it cannot be assumed that all this additional development necessarily detracts from the physical and natural character it seems reasonable to assume that there is a close relationship between development (particularly development outside of main settlements) and risk to landscape and natural character.

It would be possible to review the change in the coastal development pattern over the past decade in more detail by comparison of aerial photographs. This methodology was used in the 1998 State of the Environment Report (SOE) with the extent of beaches, estuaries and rocky and cliffed coastlines in developed/undeveloped state calculated. That task is, however, outside the scope of this evaluation.

6.1.3 Ecological qualities

- *Coastal biology*

Environmental Waikato monitors taxa composition and abundance of benthic macrofauna communities found in estuarine intertidal sand and mud flat habitats in the southern Firth of Thames and Whaingaroa (Raglan) Harbour.

Benthic macrofauna have been widely used as indicators of estuary health and trends in environmental monitoring programmes. Benthic macrofauna respond predictably to many kinds of natural and human-made stresses. Changes in taxa abundance and composition can indicate changes in the estuary environment (including changes in biological and, possibly, physical character).

Available information spans from April 2001 to April 2006. The time span of monitoring information is too short to draw any firm conclusions on the diversity of benthic macrofauna (and therefore health and character of the Region's main estuaries).

Results show that the number of taxa is up and down from year to year (or fluctuates over periods of several years). These fluctuations in data may reflect natural processes or they may be part of a long term trend that we are not yet able to see clearly. All that is known for certain is that the biological character is not static.

- *Sediment*

Although we cannot yet draw firm conclusions about trends in the diversity of benthic macrofauna, it is clear that benthic communities can be affected by sediment. We also know that the levels of sediment in many of the Region's estuaries continue to increase and sedimentation is probably the most serious environmental threat in the coastal area.

In 1986 net sedimentation rates in the Whaingaroa and Kawhia Harbours was occurring at a rate of about <1mm/year⁴⁴. There is little more recent data on sedimentation rates in these west coast harbours although EW's Regional Estuary Monitoring Programme (REMP) has measured the "muddiness" of sediments in the Whaingaroa Harbour since 2001. All five monitoring sites show an increasing proportion of mud in Raglan Harbour since 2001. Although not all these sites show increases that are statistically significant one monitoring site recorded an increase from about 6% mud in 2001 to 26% in 2006.

⁴⁴ Turner S and Riddle B 2001, Estuarine Sedimentation and Vegetation –Management Issues and Monitoring priorities, Environment Waikato 686944.

In the Firth of Thames, three 1992 monitoring sites recorded post European settlement sedimentation rates ranging from 0.5 to 1.5 mm/year⁴⁵. Again, the REMP shows increasing muddiness of sediments between 2001 and 2006 although this is from a low base and the increases are less than in Raglan (with the biggest increase being from 1% to 4%).

Various studies between 1988 and 1994 show sedimentation rates in the Coromandel harbours typically ranging from 0.3 to 5 mm/year (although up to 11mm in one study)⁴⁶. Variation in sedimentation rates reflects land use change in the catchment and climatic conditions.

While information on sedimentation over the past decade is not definitive, it seems reasonable to suggest that sedimentation has continued over this period, and possibly (as the Firth of Thames data would suggest) got worse, with consequences for the character of the coast.

▪ *Vegetation*

One of the other impacts of sedimentation (in conjunction with other processes) is the change it brings about to marine vegetation.

There is some clear aerial photographic evidence of trends in marine vegetation including most obviously mangrove colonisation and a concurrent loss of other habitats such as sea grass (*Zostera*). A spread of weeds (e.g. *Spartina* and saltwater paspalum) has also been noted in baseline surveys of Aotea, Kawhia, Port Waikato and Raglan but the rate of spread has not been measured.

Information on marine vegetation change across the region is not comprehensive, however, good data does exist for the Firth of Thames. Mapping has shown that mangrove habitat has increased by 20m/year on average over the past 50 years. Initial results from radioisotope analysis of core sample collected from mangrove forest show the sediments accumulation rates have averaged 30-80mm/yr during the last several decades⁴⁷. The initial observations suggest that re-suspended sediment from the Firth is a major source of sediment accumulated by the mangroves (in other words much of the sediment is already in the marine system).

6.1.4 Spiritual and cultural

The spiritual and cultural qualities of natural character are difficult to access and EW holds no directly relevant information. However, it is likely that there is a close relationship between the physical and ecological qualities discussed above and the intangible spiritual and cultural qualities. In that respect, it seems unlikely that these qualities have been “preserved”.

6.1.5 Conclusion

Although it is hard to quantitatively measure natural character, based on what is known (which is inevitably partial) it does seem difficult to conclude that natural character is being “preserved”. There is no doubt that changes are occurring both

⁴⁵ Ibid.

⁴⁶ Hauraki Gulf Forum, 2004, The Hauraki Gulf State of the Environment Report.

⁴⁷ Mangrove-habitat expansion and sedimentation, southern Firth of Thames Progress Report –July 2006.

as a result of development landward of MHWS and natural and human induced changes to processes occurring seaward of MHWS.

6.2 Coastal water quality

Any decline in coastal water quality may reduce its life supporting capacity, and/or result in decreased amenity, cultural, recreational and commercial value.

The objective is:

The quality of coastal water in the Waikato Region maintained or enhanced

6.2.1 Evaluation of coastal water quality objective

Overall, there is not yet a clear picture of the state of the regional coastal water quality. Indications are that water quality is generally good and has remained good over the past decade. Two aspects of coastal water quality are monitored: beach waters and estuarine water.

- *State of swimming beaches*

The state of water at swimming beaches assessed by monitoring *enterococci* levels each summer at 26 sites bathing beaches. This monitoring has been carried out regularly since the early 1990s.

The most recent results show West Coast beaches unsatisfactory (meaning having *enterococci* levels higher than 280/100ml) in 3.6% of samples. Hauraki Gulf beaches are unsatisfactory in 5.6% samples and on the Coromandel's east coast beaches in 9.7% of samples.

The bathing beach monitoring programme is not designed for long term trend analysis and little such analysis has been conducted. Indications are, however, that there are no discernible trends and it is likely that bathing beach quality has remained generally high over the past decade. Actual beach water quality at any point in time is inevitably dependent on the level of rainfall prior to monitoring since contamination levels relate to land based discharges following rainfall. There are known to be some particular hotspots of contamination although these are not thought to be worsening.

- *Estuarine water quality*

Estuarine water quality has been studied in the Raglan Harbour, Whangaporoa Harbour and Firth of Thames. These studies followed up earlier research reported in the 1998 Waikato State of the Environment Report.

The 1998 report concluded that *"the Region's coastal water is well suited for coastal plants and animals to live in, as it is well oxygenated and contaminate levels are generally low"*. A review of key water quality parameters suggested that there was little cause for concern although water quality was not as high in enclosed (estuarine) environments.

The more recent monitoring basically confirms the earlier findings. Estuarine water quality remains good although water quality (particularly bacteria levels and nutrients) in enclosed areas is not as good as in open water. Again, water quality varies greatly depending on rainfall. In short, quality is not as good in enclosed areas after rain.

There is some suggestion that certain coastal areas are receiving more nutrients than in the past. This issue (and its potential ecological effects) will need to be further monitored. At this stage, however, there is no evidence that increased nutrients is having adverse effects in the CMA.

Overall, available data do not suggest that the average coastal water quality conditions have changed over the past decade.

6.3 Integrated management

Failure to consider the interconnected nature of coastal processes and inter-agency responsibilities may result in unforeseen adverse effects.

The objective is:

Integrated management achieved and unforeseen adverse effects avoided.

6.3.1 Evaluation of integrated management objective

The concept of integrated management has many dimensions and it is not entirely clear what is expected by this objective.

Policies in relation to this objective, however, suggest that the focus of the objective is on *jurisdictional management alignment*. That is, on consistent management of coastal resources by organisations with different functions (and the taking into account of tangata whenua's relationship with the coast).

Measuring the extent to which various jurisdictions have aligned their policy and operational decision making towards common goals for the coast is difficult to assess by considering environmental outcomes. Such an evaluation would require a review of the consistency of agencies' policies and regulatory/operational decisions. No such review has, however, been undertaken.

Nevertheless, considerable progress towards this objective has occurred in the form of cross agency planning/management studies and strategies. Examples include the *Blueprint* (West Coast), *Shore Futures* (Coromandel) and *Kaiaua Coastal Compartment Plan* multi-party coastal planning projects.

Notwithstanding these clear advancements, integrated management is something that requires constant effort on a range of fronts and there are examples where poor integration continues (for example the inability of either EW or the territorial authorities to deal with the issue of motorcycles on dunes).

The other dimension of integrated management where progress has not yet been made is in management *across environmental media* (particularly across the land/coast interface).

Although EW is involved in catchment works (stream restoration etc) no past or current projects are aimed at protecting or improving outcomes in the coastal marine area. Freshwater and land use is managed to address effects on those resources. There has yet to be a conscious effort address freshwater and land use effects out of concern for the coastal environment.

6.4 Public access

Conflict between the demand for public access to and along the coastal marine area, and the need to protect areas of the coast or restrict access for conservation, safety, security or defence purposes.

The objective is:

Public access to and along the coastal marine area, and to public coastal land maintained or enhanced except in defined circumstances.

6.4.1 Evaluation of public access objective

A study of the extent of the Region's coastline in public ownership was completed in 2002. That study found that, overall, 46% of the coastline is in public ownership (including 9% in public road). This includes land holdings of variable width (e.g. territorial authority held esplanade reserves and public conservation land held by the Department of Conservation).

There is, however, significant intra regional variation. On the West Coast public ownership is much lower at just 28%. On the east coast of the Coromandel public ownership is 72% (including 4% public road). On the west coast of the Coromandel 44% is in public ownership. The greater public ownership on the east coast of the Coromandel reflects, in part, the roading pattern and the opportunity that intensive development has presented over the years to secure esplanade reserves.

There is no data held on historical land ownership and the next survey of ownership is not due to 2012. However, the extent of public access is not thought to have changed significantly. Some semi public access may have been lost with the sale of a number of camping grounds but this is likely to have been off set by the vesting of new esplanade reserves where development has occurred.

6.5 Noise emissions

The emission of excessive noise from within the coastal environment can adversely affect amenity and conservation values.

The objective is:

The adverse effects on amenity and conservation values resulting from excessive noise emissions in the coastal environment minimised.

6.5.1 Evaluation of noise emissions objective

No information is held on the effects of noise on amenity and conservation values in the coastal environment.

6.6 Overview of current coastal issue identification

6.6.1 Existing Issues

The coastal issues identified in the RPS present a mixed bag. There is no doubt that natural character, coastal water quality, and public access are enduring issues that remain valid. Questions may be asked, however, about the relevance of the integrated management and noise issues.

- *Integrated Management*

While *integrated management* is an important consideration it would seem to be relevant to *all* chapters of the RPS and not just a coastal issues. Furthermore, the integrated management issue sits oddly in a RPS structure that has all other objectives focused on environmental outcomes. Integrated management is a management objective rather than an environmental outcome and its inclusion in the coastal section represents a structural anomaly. It may well be that the future RPS deals with integrated management as a subject in its own right and one that applies across the region.

- *Noise*

The issue of noise in the coastal environment also sits oddly in the RPS. Certainly it is recognised that there is no district plan applying over the CMA and for that reason issues normally addressed by territorial authorities on land may need to be addressed by regional councils in the CMA.

However, two issues remain unanswered at this stage. The first is whether noise is in a *regionally significant* issue. The second is even if noise is a significant issue in the CMA why the RPS needs to address noise in the broader *coastal environment* (part of which is, in any event, managed by the noise provisions district plans).

This Regional Coastal Plan contains no rules about noise. Although there is an obvious potential for noise in the CMA (from either moored or working vessels), there appears to be no information held in EW about noise complaints, nor has there been any enforcement action taken under section 16 of the Act. These factors tend to cast further doubt over just how regionally significant the issue may be.

Whether this issue needs to remain in the RPS depends on the overall approach taken to the future RMA and in particular on how regionally significant issues are identified. This is discussed further in Section 16 of this report.

6.6.2 Overall assessment of progress

Progress towards achieving objectives for the coastal environment is more difficult to evaluate than for many other parts of the RPS. Many coastal objectives deal inevitably with *values, characteristics and management approaches* rather than easily quantifiable, scientifically based benchmarks.

Aspects that lend themselves to more quantitative evaluation such as ecological systems are complex and not fully understood. It would not be robust to draw firm conclusions on the basis of existing data. Understanding trends in coastal ecology (and coastal water quality) require long term monitoring and research.

That said, there is reasonable evidence to suggest that water quality objective has been met. Progress has also clearly been made on promoting greater integration in the management of at least aspects of the coastal environment. Due to lack of information no conclusions may be drawn about noise.

- *Natural character*

Only in respect of natural character is there a suggestion that the RPS's coastal objectives are not being met. In some respects that is inevitable. Assessment of

natural character is complicated by the multi-value nature of the term (including as it does ecological, physical, spiritual and aesthetic dimensions).

In many cases, despite considerable research over the past decade, understanding of ecological impacts on natural character is still incomplete. In that respect, the significance of changes in the ecological dimensions of natural character is not known. Similarly, although there is reasonable baseline data there is insufficient understanding of long term trends to be certain of the continuing rate of change.

Information on the change in physical and aesthetic character of the coast is similarly incomplete, although available data on development landward of MHWS suggests that there has been significant change on the Coromandel coast (though much less so elsewhere).

As noted earlier, case law suggests that the coast does not have to be “pristine” to have natural character. This line of argument can be used to ensure that modified parts of the coastal environment are still regarded as having qualities deserving of protection. However, it does seem axiomatic that if an area was pristine and changes to something less than pristine (even if it retains some qualities of natural character) the natural character cannot be said to have been *preserved*. “Preservation” is an extremely high standard⁴⁸.

Indeed, the notion of preservation of natural character is probably unrealistically high, especially when many of the threats to the ecological qualities are a result of past decisions and events the effects of which continue to be felt (and will continue to be felt) almost irrespective of EW’s actions. The notion of *preservation* does not acknowledge that the coastal environment and coastal processes (particularly sediment and nutrient flows and effects on vegetation change) are dynamic and that some change (at least over the short to medium term) is inevitable.

Similarly, the notion of preservation represents a significant hurdle in terms of physical and aesthetic change on the landward side of MHWS. Strict preservation, or keeping aesthetic qualities as they were at a point in time, has very significant implications in terms of the ability to provide to for *any* growth and development (except perhaps outside of areas where natural character has been seriously eroded already).

In short, the preservation objective has not been met but it may be is unrealistic to suggest that it will in any absolute way. Implications for the way the future RPS deals with natural character are canvassed in section 6.8.1.

- *Water quality*

Although this evaluation concludes that the water quality objective appears to have been met on the basis of available information, some observations of the objective are relevant.

⁴⁸ Although it is important to note Justice Grieg’s finding in the High Court (*NZ Rail Ltd vs Marlborough District Council and the Port of Marlborough NZ Ltd*) that “preservation of natural character is subordinate to the primary purpose of the promotion of sustainable management. It is not an end or an objective on its own but is accessory to the principal purpose”.

The water quality issue is currently broadly expressed and does not distinguish between enclosed water and open water nor do policies distinguish between land based and sea-based threats to water quality.

Interestingly although the freshwater water quality objective refers to *net* improvement in water quality, the coastal water quality objective refers merely to *maintenance or enhancement*.

This does beg the question about whether coastal water must be maintained or enhanced at *each and every* coastal site whereas freshwater is allowed deteriorate in some areas provided the net *regional* position is an improvement.

Greater clarity about what and how the objective to maintain water quality is to be assessed would seem appropriate.

6.7 Contextual changes

- *Review of the NZCPS*

The NZCPS is currently under review and may include policies that need to be reflected in the RPS. At this point there is little specific indication of the nature of new national level policies to guide RPSs and regional coastal plans.

- *Marine pollution regulations*

Marine Pollution Regulations were promulgated in 1998. These regulations prohibit certain (dumping and discharge) activities from ships outright, authorise particular levels of discharge and ensure that regional councils regulate certain activities. The Regulations were amended in 2002 to increase protection for marine farms, customary fishing reserves and marine reserves.

- *Aquaculture Reforms*

The Aquaculture Reform Act was passed in 2004 and came into effect in January 2005. That Act amended five existing statutes (including the RMA). The reform has major implications for regional councils in terms of planning for marine farms - which may only occur in defined Aquaculture Management Areas (AMAs), in allocating coastal space within AMAs and in managing the effects of marine farms.

- *Regional Coastal Plan*

The Waikato Regional Coastal Plan (RCP) was made operative 2005. Variations to deal with marine farming and marinas were notified in 1999 and 2003 respectively. The RCP addresses many issues that are not referenced in the RPS.

- *Coastal growth and changing forms of development*

The issue of significant growth and development in coastal area of the Coromandel has been discussed earlier. It is also worth noting that the *nature* of development is also changing. Less traditional forms of urban development such as canal housing, medium/high density residential development and coastal farm parks are all more commonly promoted today than they were a decade ago.

- *Emerging issues – renewable energy*

Also noted earlier is the trend towards renewable energy development. The Waikato coastal environment includes potential renewable energy opportunities – particularly wind farms in exposed West Coast coastal hill country but also potentially in marine (tidal and wave) energy.

- *Biodiversity function*

Regional councils' new function to maintain biological diversity relates to the CMA as well as to land. Biodiversity protection no longer be a sub-issue of natural character but is an issue in its own right.

- *Foreshore and seabed legislation*

The Resource Management (Foreshore and seabed) Amendment Act was passed in 2004. That Act contains many changes for the way customary activities in the CMA are managed and how territorial customary rights may be recognised⁴⁹.

6.8 Additional issues and possible changes

6.8.1 Natural character

Two main difficulties may be identified with the way the natural character issue and objective are currently articulated.

- *Attainability of objective*

As discussed above, the objective of preserving natural character (although consistent with the current NZCPS) appears to present an unachievable target. In particular it lacks the context within which it can be interpreted. It is clear from the NZCPS that some areas are to be accorded greater priority than others in terms of preservation. This is not reflected in the RPS at present (nor is it reflected in the RCP which deals only with the CMA). Similarly a certain degree of ecological change associated with natural process and induced from past human actions is inevitable.

The lack of “resolution” with which the preservation objective is expressed implies a “no change” approach at a regional scale. Clearly that merely serves to set the RPS up to fail.

- *Lack of clarity about the scope of the term “natural character”*

A consequence of grouping so many issues under one heading (e.g. effects of land use change on landscape and amenity values, land use change effects on natural processes and systems of the CMA, and effects of development within the CMA on the marine environment), key priorities are lost and it can be difficult to sustain an argument that any one issue deserves particular recognition.

One solution to these problems may be to tease apart the ecological/natural process dimensions from the physical and aesthetic dimensions. While the RPS

⁴⁹ This issue is further discussed in section 14 of this report.

needs to provide for the preservation of natural character it does not need to do so by way of a single objective.

Such an approach would recognise that:

- ecological change is inevitable given the dynamic coastal processes (and changes already “in the system”); and
- ecological considerations deserve specific recognition (consistent with the council’s biodiversity function) rather than being seen merely as a sub set of natural character.

The approach would also allow physical and aesthetic dimensions to be addressed separately by objectives that provide for more control over use and development—particularly landward of MHWS.

The absence of any direct focus on managing land use change (use and development) in the coastal environment is one of the defining characteristics of the coastal chapter of the RPS. It is clearly such a significant issue that it would seem to deserve specific attention.

It might even be argued that the RPS is considerably less expansive on this point than the NZCPS which includes particular policies that direct, for example, that *subdivision, use and development should be encouraged where natural character has been compromised* and that policy statements and plans should define *what form of subdivision use and development will be appropriate in the coastal environment and where it would be appropriate*. The RCP cannot do this in its current form because it only addresses the CMA. Therefore, these policies need to be reflected in the RPS to give effect to the NZCPS. Currently they are not.

6.8.2 Sedimentation

Sedimentation currently receives no specific recognition in the RPS yet it is widely considered (within EW and amongst affected communities) to be one of the most significant issues facing the coast.

Although it can be considered as relating to the water quality, it can equally be regarded as relating to land management, ecological change and natural character.

Sedimentation is an issue that demonstrates the need for integrated management in terms of managing across the coastal environment (and further up catchment).

6.8.3 Cumulative effects

Cumulative effects are not mentioned in the coastal chapter of the RPS. Like integrated management the concept of *cumulative effects* applies to all media and all issues. However, it is particularly prominent in discussions about the coast.

The question of “how much is too much” is one faced in the management of all resources and one that the RPS has a particular role in addressing. In simple terms, environmental effects can be managed at the site level (in terms of individual resource consents) and at the strategic level (in terms of setting boundaries through policy that apply across a defined resource). While both approaches are important, without the latter it is impossible to manage cumulative effects.

Yet the RPS currently establishes few policy boundaries that can effectively manage cumulative effects in the coastal environment. As noted above, the absence of

policy to guide land use change and, in particular, to set limits around the loss of the physical, spiritual and aesthetic qualities associated with natural character is a feature of the current RPS and undoubtedly a major contributing factor to the apparent failure to achieve preservation of the coastal environment.

The current approach rather assumes that effects can be assessed and adequately mitigated on a site by site (application by application) basis. That is clearly not the case. Arguments to avoid effects by, if necessary, avoiding the activity, need strong policy support.

It is also important to remember that the concept of cumulative effects has two dimensions. A single effect can occur multiple times so as to accumulate to the extent that the total impact breaches a threshold of acceptability. Or, an effect can interact with other sorts of effects to produce an unacceptable result (This may happen, for example, in an ecological context where two different stresses combine to tip an ecosystem beyond its ability to recover).

The RPS may need to recognise and seek to manage both forms of cumulative effect.

6.8.4 Coastal allocation

The RPS currently provides no guidance on how the Regional Council will control the occupation of coastal space.

Council clearly has a role in identifying AMAs and in allocating coastal space within these defined AMAs. However, it also has a broader role of deciding what uses (in addition to marine farming) should be able to occupy coastal space to the exclusion of others.

Although the details of how control is to be exercised will be addressed by the Regional Coastal Plan, the RPS might be expected to set the broad framework. Currently it does not. In fact the coastal chapter of the RPS currently has very little relevance to the management of the CMA with most objectives and policies directed at the landward component of the coastal environment.

6.9 Structural implications for the RPS

One of the structural anomalies of the RPS is that it has a coastal chapter which purports (through the articulation of issues) to address the *coastal environment*. The coastal environment of course includes a significant landward component and the management of that (land) area is subject not just to the provisions of the coastal chapter but to the provisions of all the other chapters.

In other words, the coastal chapter is spatially defined while the other chapters of the RPS relate to particular resources (e.g. air) or issues (e.g. hazardous substances) that are not spatially defined. This creates an overlap of policies that is not in itself problematic but which reduces general clarity of purpose and potentially militates against integrated policy responses.

One means around this might be to dispense with a coastal chapter entirely and deal with pressures on the coastal environment through objectives and policies integrated into the respective resource/issue-based chapters. A *marine* chapter could be retained to deal with any residual issues (such as coastal occupation).

This approach would have the disadvantages of having to duplicate provisions or find a home for provisions that properly apply across the region – coastal and non coastal (including many of the issues discussed above).

This might for example see each chapter have a policy in relation to effects on the coast. This and other options are discussed further in section 16 of this report.

7 Air

The *Air* chapter of the RPS identifies three issues with associated objectives. These are:

- Regional and local air quality
- Greenhouse gases and climate change
- Ozone.

Each of these is discussed in turn.

7.1 Regional and local air quality

In the majority of areas in the Region, air quality is perceived to be high. This air quality can be adversely affected by point source or cumulative discharges to air.

The objective is:

Significant characteristics of areas of:

- **high air quality protected**
- **degraded air quality enhanced**
- **other air quality maintained.**

7.1.1 Evaluation of air quality objective

This objective is another high level statement - one that requires considerable interpretation for evaluation purposes.

The RPS is currently silent on what the “significant characteristics” of air are but the Regional Plan describes the significant characteristics of air as the:

- (a) ability of the air to sustain healthy populations of all forms of life
- (b) level of odour
- (c) level of particulate matter
- (d) visibility
- (e) capacity of air to assimilate contaminants
- (f) matters of importance to tangata whenua

Similarly, the RPS does not define what is meant by *degraded*, *high* or *other* air quality or what the distinction might be between “protected” and “maintained”. However, again, the Regional Plan attempts to provide clarity. It states that:

- *degraded* means air that either (i) exceeds Regional Ambient Air Quality Guideline (RAAQG) values (air of this quality is to be *enhanced*) or (ii) is between 66% and 100% of the Regional Ambient Air Quality Guideline values (air of this quality is to be *maintained or enhanced*)
- *acceptable* means between 33% and 66% of the RAAQG (air of this standard is to be *maintained*)

- *high* means air that either (i) between 10% and 33% of the RAAQG (air of this quality is to be *maintained/protected*); or (ii) between less than 10% of the RAAQG (air of this quality is to be *protected*).

The RAAQGs include values for eight different contaminants. Monitoring has been carried out for six of these contaminants. This has yielded some information for some areas.

- *Carbon monoxide*

Monitoring of CO in Hamilton between 1999 and 2004 found levels of CO to be *excellent* between 97-100% of the time. In all other occasions CO was considered *good*⁵⁰.

- *Benzene*

Benzene levels have been monitored in Tokoroa and in Hamilton. In 2003/04 levels in both centres were well below the current 10 µg/m³ guideline. However the guideline level is due to reduce to 3.6 µg/m³ in 2010 and on that basis one of the two monitoring sites in Hamilton (at Bridge Street) would have exceeded the guideline.

- *Lead*

Airborne lead levels have also been monitored in Hamilton. Monitoring has recorded a fall in lead between 1983-2001 with levels consistently been below the Ministry for the Environment guideline value (0.2 µg/m³) since August 1993. This is a consequence of the removal of lead from petrol. Lead is no longer considered a concern.

- *Nitrogen Dioxide*

NO₂ has also been monitored in Hamilton from 1998-2003. Recorded levels have been excellent or good in 100% of samples in 2003, 96% of samples in 1999 and 84% of samples in 1998.

- *Ozone*

Ozone levels in Hamilton are *good* or *excellent* most of the time. About 10% of ozone levels measured over an eight hour period are described as *acceptable* being around a third of the guideline level.

- *Fine particles*

Fine particles are now monitored in six of the region's urban centres. Information is currently available for four of these sites. It shows that in the smaller regional towns (Tokoroa, Te Kuiti, Taupo) there is a reasonable proportion of samples that indicate air quality to be degraded (in terms of fine particle levels). In 2004, Tokoroa recorded alert or action levels for 25% of samples, Te Kuiti 9% and Taupo 12%. These high levels of PM₁₀ coincide with still winter days and reflect

⁵⁰ Excellent equates to being less than 10% of the guideline. Good is between 10-33% of the guideline. In other words, "excellent" and/or "high" equate to the RPSs description of "High" air quality.

the use of solid fuel home heating. The historical monitoring record (going back 3-6 years depending on the site) shows no particular pattern with fluctuations likely to reflect climatic conditions. The situation in Hamilton is generally much better, presumably reflecting (a) a suspected move away from coal; and (b) much lower reliance of solid fuel burners for home heating.

The trend in fine particles from other (industrial) sources is not clear. Certainly there have been many new discharges over the past decade but the quality of discharges (including pre-existing discharges) has been improved through the resource consent process. Staff suggest an overall improvement from these other sources may have occurred but there is no hard data on what this means for the overall effect on ambient air quality.

We do know that such discharges continue to represent a small share of total fine particle concentrations during the winter months when levels are at their worst in urban centres.

Rural and forestry burn-offs continue to be an issues but, again, there is no information on the size and frequency of these emissions relative to a decade ago.

- *Odour*

There is currently no formal regional odour monitoring information. EW Staff advise, nevertheless, that the level of odour has reduced over the past decade. However, the degree of community *satisfaction* regarding odour may not have increased since the community's expectations in that regard have risen accordingly.

EW's efforts to respond odour issues has not been driven by the RPS. Rather, the action has been driven by councillors, the regional plan process and by the need to respond to complaints in a cost effective manner.

7.1.2 Overview of information

In summary, considerably more air quality information is available now than was the case when the RPS was first developed. Although there is still no comprehensive *regional* picture of levels of all eight contaminants identified as defining the state of air, there is enough information to suggest that the region's air quality is generally good. While in many cases monitoring has only occurred in Hamilton, it seems unlikely that there will be air quality issues in smaller towns that are not experienced in Hamilton. It is equally clear, however, that one of the "significant characteristics" of air quality is degraded in several of the region's towns during winter months.

A key question is whether air quality as degraded by fine particles has been *enhanced* over the past decade (as is the RPS objective). Information suggests that is not the case at least one the Region's smaller southern towns. The reason for this suggestion is that there has been no control over the main source (home heating) and only in centres (such as Hamilton) that have experienced changes in home heating technology can we expect to have experienced an improvement. It is important to note, however, that levels of other contaminants have reduced in urban areas as a result of changes in fuel specifications and in more stringent consenting requirements.

The second question is whether the significant characteristics of high or "other" air quality have been respectively protected and maintained. Areas where there is high

or other air quality tend to be outside main urban centres. The main issue in these locations is odour. Indications are that this is a growing issue although, paradoxically, staff advise that the level of odour is generally thought to have improved. The RPS is of little guidance or direction on the issue of odour management.

7.2 Climate Change and Greenhouse Gases

The discharge of greenhouse gases has the potential to modify atmospheric processes and adversely affect the environment. Although this is a matter which requires management at a global level and central government has responsibilities in this area, the Waikato Region needs to determine an appropriate role.

The objective is:

Greenhouse gases managed in a way that is not inconsistent with Central Government policy.

7.2.1 Evaluation of Climate Change objective

Central government policy on climate change has changed and evolved several times over the life of the RPS.

- *Central Government policy*

When the RPS was first notified central government did not have an official climate change policy but in early 1994 central government decided it would make a decision on whether to introduce a low level carbon charge (tax) in 1997 based on an assessment of whether New Zealand was on track to achieve its goal of reducing the rate of growth in gross CO₂ emissions by 20% and stabilising *net* CO₂ emissions at 1990 levels by 2000. The policy also promoted voluntary negotiated agreements with industry – of which a number were agreed.

The 1994 policy did not specifically address the role of local government or of the RMA. However, the clear intent was that GHG emissions, ought to be addressed at a *national* level and that the ability of regional councils to *regulate* GHG emissions would be removed from the RMA when a credible national level instrument was implemented. The inappropriateness of regional scale regulation was highlighted by the Minister's (called-in) decision on the Taranaki Combined Cycle (TCC) power station and the break-up of ECNZ which made it unfeasible to for the TCC plant to meet mitigation conditions. (This principle was later confirmed by Environment Court decisions in relation to other energy projects).

As it turned out, the government deferred its decision on whether to introduce a carbon tax given the uncertainty around the Kyoto Protocol negotiations and whether the 1997 agreement would come into effect.

The Government changed in 1999. The new government announced its climate change policy package in 2002. That package included so called “foundation policies”⁵¹ and a suite of *new* policies including a carbon tax on energy, industrial and transport emissions, capped at \$25 per tonne of carbon dioxide equivalent

⁵¹ These are initiatives already being done for reasons other than climate change. They included example the National Energy Efficiency and Conservation Strategy, the NZ Transport Strategy, the Waste Strategy the Business and Innovation Strategy and Research programmes).

(CO₂e). The carbon tax was to operate in conjunction with Negotiated Greenhouse Agreements (NGAs) for eligible firms whose international competitiveness would be placed at risk by the tax.

The package included recognition and clarity of the role of local government in climate change acknowledging a role for community leadership, land use planning (making urban centres more transport efficient) transport planning, waste management and other infrastructure delivery. However, it reiterated the inappropriateness of direct regulation of GHG discharges through the RMA.

In 2004, with the commitment to introduce a broad based national price measure, the government legislated to formally remove the ability of regional councils to regulate GHG discharges to air.

In 2005, however, the government decided that it would not, after all, introduce the proposed carbon tax model or any other broad-based greenhouse gas tax before the end of the first Kyoto commitment period (2012). However, this decision did not "preclude putting in place a more narrowly based tax on large emitters if that was deemed appropriate".

A replacement policy (for both pre and post 2012) has yet to be announced although consultation has been undertaken and at the time of writing an announcement is imminent.

- *EW's response*

Given that complex, uncertain and constantly shifting policy context, EW's ability to manage GHG in a way that is "not inconsistent with government policy" has been a challenge.

However, from a purely pragmatic perspective it has been either implied or stated policy that regional councils should not attempt to *directly* control discharge to GHG via the RMA since the mid 1990s. EW has certainly been consistent with that general policy direction. Discharge to air consent applications have not sought to tackle GHG emissions and the matter is not addressed in the air chapter of the Regional Plan.

In terms of managing GHG emissions *indirectly*, via influence over transport, energy efficiency, waste, and (importantly) its management of the region's renewable energy resources, EW has acknowledged the opportunities for GHG reduction. The Council's recent decision to join the CCP-NZ local government climate change programme⁵² is another indication of EW's consistency with central government policy on this issue.

7.3 Ozone Depletion

The discharge of ozone depleting chemicals has the potential to modify the ozone layer which may cause adverse effects on the environment. Although this is a matter which requires management at a global level and Central Government has primary responsibility for policy development and regulation in this area, the Waikato Region needs to determine an appropriate role in this area.

⁵² The CCP-NZ programme is a government funded programme that seeks to provide a framework and technical support for local government action on climate change.

The objective is:

Ozone depleting chemicals managed in a way that is not inconsistent with Central Government policy.

7.3.1 Evaluation of ozone depletion objective

Central government's policy on ozone depleting chemicals is embodied in the Ozone Layer Protection (OLP) Act 1996 (which replaces the 1990 Act) and the Ozone Layer Protection Regulations 1996.

The OLP Act essentially prohibits the import, export manufacture or sale of ozone depleting substances except as allowed by regulations. The OLP Regulations set out prohibitions, restrictions and exemptions (with phase out schedules) in relation to particular substances.

The legislative framework does not seek to regulate the discharge of ozone depleting chemicals as that would not be a practical approach. It has chosen instead to regulate and phase out the availability (input) of chemicals at a national level.

It is difficult to see how Environmental Waikato could exercise functions in such a way as to be inconsistent with this general policy direction. Certainly there has been no attempt by EW to control the discharge of ozone depleting substances.

In its general environmental advocacy role EW may, from time to time, provide information about the ozone layer issue but that is entirely consistent with central government policy.

7.4 Overview of current air issue identification

The current *air* chapter of the RPS contains just one all embracing issue covering *local/regional air quality*. The two additional issues have little relationship to air but relate instead to the *global atmosphere*. The continued relevance of these issues and their appropriate location within the RPS (if any) is discussed below.

7.4.1 Local and regional air quality

Local and regional air quality obviously continues to be a highly relevant issue for the RPS to address. Indeed, as discussed later, some teasing out of the specific issues may be warranted.

The major deficiency of the current wording is the failure to emphasise what is clearly the main air quality issue - namely highly fine particle levels caused by home heating. This is the regionally significant air quality issue yet it currently receives no specific mention in the RPS.

As outlined above, the objective is broadly met with air quality generally good – except in localised urban areas (i.e. where people live) where fine particles degrade air quality. The issue statement's observation that people perceive air quality to be high may continue to be true but that perception is at least partly wrong – certainly over the winter months when localised air quality comes under pressure from the cumulative effects of multiple small sources of contaminants.

Although local and regional air quality looks (with the exception of fine particles in regional towns) looks to have been maintained and enhanced broadly consistent with the RPSs objective, it is not clear that the RPS itself has had a strong influence

on that outcome. The reduction in benzene and lead levels is attributable to national changes in motor fuel specifications. The National Environmental Standard (NES) on air quality is driven action on fine particles. Responses to the growing odour issue have not been driven from the RPS. Indeed the RPS is currently silent on potential policy and regulatory responses to this issue relating to the management of reverse sensitivity.

7.4.2 Global issues

- *Ozone depletion*

The continuing relevance of the two global issues to the air chapter of the RPS is more questionable. Certainly the management of ozone depleting substances has always been conducted at the national level with no significant role for the Regional Council - except perhaps in the sense of general advocacy/information provision to the regional community⁵³.

While ozone depleting substances remain an issue, New Zealand is well on the way to phasing out such substances. Although there are still CFCs in old refrigeration units no CFCs have been imported since 1996. HCFCs will be phased out by 2015. Methyl bromide for non quarantine purposes was phased out in 2005. The import of halons was banned in 1990 - although large stocks are thought to remain in the fire protection industry. A national strategy is in place to encourage decommissioning of halon based systems and minimise emissions.

Given the current position and level of national involvement it is questionable whether ozone depletion needs to be identified as a regionally significant issue.

The RPS objective has undoubtedly been met though it would be a long stretch to suggest that this has anything to do with the issue being well on the way to being resolved.

- *Greenhouse gases*

There is no doubt that climate change is a bigger issue now than when the RPS was first developed. There have been three IPCC assessment reports released over the past decade (1995, 2001, 2007) which have drawn increasingly stronger conclusions about anthropogenic influence on climate change. These have helped climate change to become the most significant environmental issue globally.

Notwithstanding that EW does not have a regulatory role in the direct control of GHG emissions, it would be remiss not to identify climate change as an issue of regional significance. Waikato will be affected by climate change and EW does have a role to play in responding to the threat.

To locate the issue within the *Air* chapter does, however, misrepresent EW's role in responding to the issue. Climate change responses pervade almost all regional council functions and the issue itself represents a major cross cutting theme.

It is fair to conclude that the current RPS's objective has been met but it will be necessary for the future RPS to be a great deal clearer about what actions *will be* consistent with government policy. Although final policy decisions have not at this

⁵³ Providing advice to people on the disposal of refrigerants is an important role.

point been made, it seems likely that the key policy responses will be price-based and remain at the national level. However, it seems equally clear that local authorities will continue to have a secondary role in ensuring communities can individually and collectively respond to price signals. For example, EW responsibilities in public transport provision, in regulating access to renewable energy resources, in (potentially) growth management, in the promotion of energy efficiency, waste minimisation and other areas ought to be exercised in such a way as to assist the regional community to respond effectively to nationally imposed price signals.

7.5 Relevant contextual changes

▪ *National Environmental Standards on Air Quality*

Probably the most significant contextual change for the Air chapter has been the introduction of national environmental standards (NESs) for air quality in 2004 (and subsequently the amendments introduced in 2005). These 14 standards comprise:

- seven *activity standards* that ban various activities that discharge unacceptable quantities of dioxins and other toxics into the air.
- five *ambient air quality standards* for carbon monoxide (CO), fine particles (PM₁₀), nitrogen dioxide (NO₂), sulphur dioxide (SO₂) and ozone (O₃).
- a *design standard* for new small-scale domestic wood-burning appliances.
- a *design standard* for the collection and destruction of landfill gas at large landfills.

The introduction of these NESs impose obligations on EW in terms of (amongst other things) the enforcement of bans and the landfill gas standard, and monitoring if it is likely that standard concentrations will be exceeded in an airshed. Of particular relevance, the NES states that in airsheds⁵⁴ where ambient air quality exceeds the fine particle standard, emission reduction strategies should be implemented to improve air quality so that the standard concentration is achieved no later than 2013.

Where levels of fine particles exceed the standard, EW must not give consent for significant discharges of fine particles to air if the discharges are likely to cause the airshed to be above the 'straight line path' or 'curved line path' to meeting the standard.

These standards need to sit within and give effect to a coherent regional policy framework.

▪ *Change in fine particle standard.*

Also significant is the NES's ambient air quality concentration limit of 50 µg/m³ for fine particles (currently defined as PM₁₀ or smaller) as a 24-hour average. The standard must be met *every day of the year but one*. This standard is consistent with the revised WHO guideline. The previous WHO guideline level of 120 µg/m³ had

⁵⁴ There are four gazettted airsheds in the Waikato Region

been the benchmark at the time the current RPS was developed and Waikato urban air quality had met that standard. The downwards revision of the WHO standard has effectively changed the “acceptability” of Waikato’s air quality.

- *Wood industry fuel switching*

In terms of changes to air discharges in the region, the most significant change has probably been the trend within the wood processing industry to replace gas with wood waste as the main energy source.

7.6 Additional issues and possible changes

7.6.1 Overall policy approach

The principal difficulty created by the current RPS objective is that it does not appear to allow for additional point source discharges (particularly where airsheds are full in terms of fine particles) since each and every discharge adds to contaminant loads. The objective refers to protecting, maintaining and enhancing and this creates some difficulty in terms of managing individual consent applications. This is especially so where the vast bulk of fine particle emissions are from an unregulated source and the individual discharge for which consent is sought is minor by comparison to the volume of unregulated emissions.

While the current wording has not brought the granting of discharge to air permits to a halt, it has necessitated some creative interpretation of RPS policy and it would seem more transparent and helpful to create a policy context that acknowledged that some additional effect is to be expected (whilst maintaining consistency with the NES).

The related issue of what is to be done to resolve the home heating issue will also require specific attention. EW’s existing planning instruments do not provide a mechanism that it is likely to see fine particle levels meeting the NES by 2013. New and innovative means of addressing this issue (such as improving the standard of wood supplied for domestic burning) may be necessary. Work is apparently in underway to achieve the NES objective.

7.6.2 Additional issues

There are a number of air quality issues that are not currently addressed in the RPS and consideration will need to be given as to how regionally significant these are. The issues include the following:

- *Ozone as a contaminant in the lower atmosphere.* As noted earlier, ozone has previously been monitored around Hamilton (Hamilton being the most likely location of significant ozone contamination). While that monitoring did not detect any significant issue, it is possible that the Coromandel Peninsula is exposed to high levels of ozone as a result of Auckland transport emissions (with nitrogen dioxide and volatile organic compounds (VOCs) coming together under influence of UV to form ozone) which may be drifting across Hauraki Gulf to Coromandel. The extent, if any, of this issue is not confirmed, however, Auckland Regional Council modelling suggests that it may be the case. Should this be confirmed, it would be a significant cross boundary issue that the RPS will need to recognise.

- *Hazardous air pollutants (HAPs)*. As noted earlier, some HAPs are already monitored. While there are no widespread contamination problems there may be local issues and more monitoring is required.
- *Transport emissions*. Emissions from the transport sector are only an issue in Hamilton and even then they are not currently considered significant. However, with the growth in motor vehicles and the opportunity for air quality to be a key issue in consenting individual road projects transport emissions may well become a greater issue in the Waikato in the future.
- *Emissions from the primary production sector*. The primary production sector gives rise to a number of emissions that are currently not recognised in the RPS but which are increasingly significant. These include: odour (with a number of recent prosecutions by EW); dust, spray drift and the bacteria associated with the spraying of animal and wood waste. One of the main issues for the RPS to address is to establish clear expectations about reverse sensitivity and where responsibility for avoiding or mitigating primary sector air quality effects should lie.

7.7 Structural implications for the RPS

The main structural implication is the need to separate genuine regional air quality issues from issues relating to the state of the global atmosphere. Climate change in particular could be broadened away from being treated as an “emission to air” issue to more of a cross-cutting theme of the RPS (to which many other chapters could contribute).

The second structural change that could be made would be to distinguish more clearly the different forms of risk. These might focus on risks to human health, risk to enjoyment and amenity, and risk to ecosystems.

8 Natural Hazards

The *Natural Hazards* chapter of the RPS identifies two issues with associated objectives. Those issues relate to:

- management of natural hazards
- adverse effects [of natural hazards]

8.1 Management of natural hazards

The roles and responsibilities of local authorities and other agencies for the management of natural hazards in the Waikato Region have not been agreed or clearly identified. Until this is done, inefficiencies and/or a duplication of functions may occur.

The objective is:

The roles of all relevant agencies for the management of natural hazards in the Waikato Region clearly identified and their responsibilities consistently implemented.

8.1.1 Evaluation of management of natural hazards objective

The RPS itself allocates responsibilities for managing natural hazards between the regional council and territorial authorities. To that extent the objective has been met.

There are, however, issues with the consistency of implementation partly perhaps as a result of variation in capacity (resources and expertise) amongst territorial authorities.

EW staff advise that EW has lodged 4 appeals in relation to perceived district plan inadequacies in implementing hazards management responsibilities. The level of disagreement on land use indicates that there is often a poor level of consistency between what EW considers appropriate management of hazard risk and the decisions taken by territorial authorities (or on appeal by the Courts).

EW is undertaking its hazard management responsibilities consistent with its stated responsibilities. The role in information provision is challenging since it can be expensive to collect. EW acknowledges that territorial authorities often assert that information needs to be more site-specific.

The objective does not lend itself to quantitative evaluation but overall it is questionable whether there is consistent (integrated) management of hazard risk across the region.

8.2 Adverse effects

A lack of public awareness of the causes and potential effects of natural hazard events increases the likelihood of adverse effects when these events occur.

The objective is:

The adverse effects associated with natural hazards minimised, the resilience of the community and public awareness of the causes and potential effects of natural hazards events increased.

8.2.1 Evaluation of adverse effects objective

The objective has three parts:

- adverse effects of hazards being minimised;
 - increased community resilience; and
 - increased public awareness.
- *Hazard minimisation*

Adverse effects of natural hazards relate to the loss of, or damage to, people and property. These effects can be minimised by development being kept away from hazard risk areas (such as erosion prone land) and by maintaining the functioning of natural hazard mitigation systems (such as flood plains, dunes and wetlands).

Available information on the risk associated with coastal erosion indicates greater exposure to risk and loss of property. EW monitors the number of properties on the Coromandel's eastern sandy beaches at risk from coastal erosion and these data show that a greater number of properties are at risk in 2004 (670) than were the case in 1995 (590). A 2002 assessment of the Coromandel sandy shoreline showed that 35% of the shore was at risk and this was predicted to increase to 53% by 2100 based on a possible 0.5m sea level rise.

There is currently no corresponding data in relation to building on natural floodplains though anecdotal evidence suggests that floodplain (storage) has continued to be lost to development.

- *Increased community resilience*

It is not clear what is meant by the term *resilience* in the context used. Resilience usually refers to the ability to withstand and recover from hazard events. This is partly dealt with under hazard mitigation above and partly to do with emergency management and recovery planning which is outside the scope of the RMA. No further information relevant to this matter is available.

- *Increased public awareness*

EW conducts 3 yearly public awareness surveys. Three such surveys have been carried out (1998, 2000 and 2003). In terms of evaluating the attainment of the RPS objective the results are inconclusive. Essentially, awareness was greater in 2003 (67% of respondents) than in 1999 (57% of respondents). However, the 2003 results indicated less awareness and readiness than in 2000 (81%).

It is difficult to draw firm conclusions from these data about whether public hazard awareness is growing or not. However it is noteworthy that both the 2000 and 2003 awareness levels are higher than in 1998.

8.3 Overview of natural hazards issues

Information is reasonably sparse on whether hazard objectives have been achieved. Indications are that roles have been clarified but not consistently implemented while public awareness of hazards seems to be improving.

Although there is a lack of hard data to substantiate claims, EW staff believe that hazard risk is not reducing (in some areas at least), that development is still

occurring in hazard prone areas and that there is on-going loss of flood storage areas. Erosion/slip risk in some areas is threatening property and is not a risk that is currently well recognised.

Hazard issues remain highly relevant.

8.4 Relevant contextual changes

Much has changed since the mid 1990s with regard to the way hazards are to be managed. Key changes are outlined below:

- *Civil Defence Emergency Management Act (CDEM Act)*

The CDEM Act was enacted in 2002 and replaced the Civil Defence Act 1983. That legislation introduced a four part planning framework based around *reduction, readiness, response* and *recovery* and requires the development of a national and regional scale CDEM planning framework.

The Act encourages a risk management approach to hazards planning and takes a broad approach to the notion of *hazard* (i.e. broader than natural hazards as understood in the RMA context).

Although much of the CDEM responsibility is to be exercised in accordance with the national and regional level plans (see below), the expectation is that the *reduction* dimension is to be implemented through the RMA to the extent that it is relevant to the purpose of that Act.

- *Civil Defence Emergency Management Group Plan*

The Waikato Civil Emergency Group (consisting of EW and all territorial authorities – excluding Franklin and Rotorua districts) published the Waikato CDEM Group Plan in 2005. The plan is required under the CDEM Act.

The CDEM Group Plan provides a strategic framework for identifying hazard risk and agreeing operational arrangements. In particular, the plan sets out goals, risk evaluation criteria and identifies (and ranks) the most significant hazards and risks for the Waikato⁵⁵.

Although there is no statutory requirement for the RPS to be consistent with the CDEM Group Plan, it would seem logical for it to be so, particularly with regard to hazard risk and to the general goals and roles already agreed at a regional scale (noting that these are not all relevant to the RPS).

- *Central government guidance*

Central government has two significant work streams underway that could change the approach to hazard management under the RMA and related legislation. The first is the *Flood Risk Management Review* which looks at the adequacy of the whole current flood risk management regime (including legislative frameworks, responsibilities, management tools and funding arrangements). In March 2007 Cabinet agreed that it would be desirable to prepare a *national policy statement (NPS)* on flood risk management under the RMA.

⁵⁵ The highest risk is a tsunami. Earthquakes and flooding in the lower Waikato and Waihou/Piako systems are also rated as high risks.

A separate but related process is being promoted by LGNZ's Regional Affairs Committee. This has involved development of the draft *Managing Flood Risk Protocol* into a New Zealand Standard under the Standards Act.

This work stresses the need to recognise rivers as natural systems that change over time and that management should focus on keeping people away from hazards rather than keeping hazards away from people.

The second work stream is the updating of planning guidance (for the *QP website*). This work is due for completion late 2007. Although not yet complete, it is likely to place much greater emphasis on *land use control* (avoiding risk) in preference to *engineering solutions* to managing/mitigate hazard risk. This renewed emphasis recognises greater unpredictability in weather events (due to current and future climatic changes) and the recent flood events where engineered solutions have failed with catastrophic results.

Both these work streams emphasise the need to take climate change into account in risk assessment.

- *EW's Flood Risk Strategy*

EW has recently prepared a *Flood Risk Strategy* designed to provide clear guidance on how flood hazard risk will be managed. The Strategy sets out visions, outcomes and action plans that build on EW's existing work programme and identify where new work is required to achieve desired outcomes. The actions integrate the management of flood risk by bringing into one strategy co-ordinated actions relating to improving information, policy, flood protection and river management, catchment management and emergency management.

8.5 Additional issues and possible changes

The RPS does seem deficient in one important respect: it provides little guidance on *how* natural hazard risk should be managed. There may not be any additional issues that the RPS needs to address but it may need to address current issues in a more direct and detailed manner.

- *Managing development proposals in hazard prone areas*

The lack of consistency in approach to hazards management may be partly explained by a lack of clarity in the RPS policy itself. Essentially, while the objective focuses on consistent implementation the relevant policy allows choice between *avoidance* or *mitigation* – interpreted to mean not allowing development in certain locations *or* ensuring the hazard risk is mitigated by new development including appropriate engineered “solutions”.

The RPS might usefully provide clearer guidance about *avoidance* of hazard risk being the first priority. The RPS should be able to be relied on to support decisions to prevent development in hazard prone areas.

Similarly, the RPS might usefully acknowledge the potential for development to contribute *cumulative effects* including, in particular, the loss of flood storage through clean-filling, re-contouring and similar activities that might exacerbate flood risk. RPS provisions that seek more explicitly to maintain the extent and functioning of remaining flood plains should be considered. These could seek the protection of

flood storage areas from individually small losses that could, over the life of the RPS, accumulate to contribute to system wide risk exacerbation.

- *Managing existing hazard risk*

The other issue that the RPS may need to address relates to how building and other development *already exposed* to hazard risk is to be managed. This will need to link to emerging national guidance. However, it may mean the RPS needs to include provisions relating to:

- What approach will be taken to existing use rights and the rights to rebuild/redevelop (i.e. whether EW will remove rights for existing development in hazard prone areas).
- When asset relocation/staged retreat will be considered necessary and appropriate; and
- What approach ought to be taken to requests by landowners for protection structures (or indeed to illegal protection structures)
- Community/landowner responsibility in respect of hazard risk and, in particular, for meeting costs associated with risk minimisation.

- *Specifying acceptable/unacceptable hazard risk*

The RPS should also set out the approach to acceptable/unacceptable risk. The *de facto* approach has been to advocate for a 1% AEP for flood risk for new development as this is consistent with the Building Act. The RPS could confirm this approach or, alternatively promote an alternative, more fine-grained approach. Certainly LGNZ is advocating that there be no national standard and the acceptable risk be determined by the scale and value of assets at risk and consequences for particular communities. The RPS might establish a similar approach that provides for different protection levels recognising the different levels of risk across the region (reflecting the nature of different flood protection schemes and river system characteristics).

The RPS should also set out the approach to be taken to planning for sea level rise. This might involve setting out sea level rise predictions/assumptions over an appropriate planning horizon.

- *Planning guidance*

One way in which the RPS may look to secure better hazard risk reduction is to take a greater interest in land use planning (possibly as part of stronger interest in land use/growth planning more generally). This might involve support for *structure planning* for major urban development that includes appropriate attention being given to identifying hazard risk. Regional *best practice guidelines* on reducing hazard risk through land use planning is another possible (complementary) approach.

8.6 Structural implications for the RPS

There are no major structural implications associated with the suggested made above.

9 Waste

The *Waste* chapter of the RPS identifies just one issue with an associated objective.

9.1 Waste management

Resource use with significant waste production results in the unnecessary use of natural and physical resources, which can have adverse effects on the environment. The generation and disposal of wastes can be costly and have further adverse effects on the environment.

The objective is:

The efficient use of resources and a reduction in the quantities of wastes requiring disposal in the Waikato Region, and the adverse effects associated with their generation and disposal.

9.1.1 Evaluation waste objective

The objective is a broad one. It deals with all forms of waste: gas, liquid and solid. It addresses the concepts of:

- resource efficiency;
- waste/disposal reduction; and
- adverse effects of waste generation and disposal.

Unfortunately the waste issue is characterised by generally poor information. EW does not yet publish waste indicators (other than a contaminated sites indicator). Although the 2003 Regional Waste Strategy commits EW to becoming a “clearing house” for waste management information in the Waikato Region, information continues to be incomplete and patchy in quality. There are also issues between the comparability of data between years (given that surveys have used different methodologies⁵⁶).

9.1.2 Waste volumes

Although information is not good it is clear that solid waste volumes requiring disposal within the region have not reduced over the past decade. Regional waste surveys in 1995 and in 2001 found volumes of solid waste per person per year to have remained about the same⁵⁷. At the same time the population and household numbers have increased and solid waste generated outside the region -but disposed of in the Waikato - has increased with the development of the Hampton Downs landfill in the north of the region and Tirohia landfill in the east of the region (in 2005 and 2001 respectively). The logical inference being that the volume of solid waste disposed of in the Waikato Region is likely to have increased, perhaps substantially.

There is no consolidated information on volumes of liquid and gaseous wastes although it would seem unlikely that these waste streams will have reduced given

⁵⁶ Waste Not Consulting, 2005, *Summary of Waikato Waste Data 1995 to 2005*. Environment Waikato Technical Report 2006/01.

⁵⁷ Waikato Regional Waste Strategy, 2003

growth in some of the bigger liquid and gaseous waste generating activities (such as dairy farming/processing and electricity generation).

9.1.3 Adverse effects

The adverse effects of solid waste are perhaps most easily assessed by measuring (a) the number of landfills in the region; and (b) the status of closed landfills. On that basis considerable progress has been made. Waikato currently has 7 operating landfills with more than 40 closed over the past decade or so.

Twenty-three closed landfills are consented (as required by the Regional Plan). A further 18 sites remain un-consented at this point. Environmental effects and risks are reduced though imposition and monitoring of consent conditions.

Environmental effects of liquid and gaseous waste are also managed by the resource consent process and progress (in terms of outcomes) is discussed elsewhere in this report.

9.2 Overview of waste chapter

The waste chapter does not sit comfortably within the RPS as currently structured.

Any discussion of waste tends to have two basic dimensions; (a) *reduction* of the creation of waste (through resource efficiency, reuse and recycling); and (b) *disposal* of waste (and consequent adverse effects).

As noted above, the current objective refers to both these dimensions (although the methods tend to be more focussed on reducing the need for waste disposal). The issue also purports to deal with waste in all its forms – solid, liquid and gaseous.

Yet, it is quiet clear that the *effects* of *waste disposal* are managed in accordance with other, resource-specific policies of the RPS (i.e. water, air and land). This creates a sense of duplication which calls into question the broader purpose and value of the RPS including a separate “waste” chapter.

The legitimacy of a separate *waste* chapter is dependent on there being regionally important waste issues - in addition to the effects of waste disposal.

Essentially, there are two ways to consider the issue:

- (a) that waste reduction initiatives are simply *methods* that may be employed to reduce the volume (and hence adverse effects) of waste; or
- (b) that there is a *rationale* for waste reduction that goes beyond the obvious need to reduce the residual effects of waste disposal. For example, resource efficiency can be said to have benefit in its own right.

The RPS is currently not clear on which approach to take. To some extent this reflects a lack of clarity within the broader legislative context. The effects of waste disposal are squarely within the RMA. However, responsibilities for waste management (and non RMA-related functions relating to waste minimisation) are more generally seen as mandated by the Local Government Act⁵⁸.

⁵⁸ Reinforced by territorial authorities’ function under the LGA to encourage efficient waste management and prepare and implement waste management plans.

The other point that requires careful analysis is whether, even if waste minimisation activities are considered to be relevant under RMA, they need to be mandated through the RPS. There is certainly an argument to say that commitments by EW to engage in waste management/minimisation activities do not need to be subject to the RMA's First Schedule process and can be advanced more efficiently through EW's LTCCP programme mandating process.

9.3 Relevant contextual changes

The current RPS was developed at a time when the foremost regional waste issue was the large number of poorly performing (and largely un-consented) landfills. The waste hierarchy was a relatively new concept at the regional level and the relationship between waste and other resource issues (such as energy efficiency and water quality) not well developed.

Understanding of waste issues at all levels of government has moved on considerably over the past decade.

- *Local Government Amendment Act 1996*

The Local Government Amendment Act 1996 introduced the 5R hierarchy of reduction, reuse, recycling, recovery and residual disposal into law and more clearly defined a role for territorial authorities in waste management – including the requirement to prepare waste management plans. Regional councils were given no specific role.

- *NZ Waste strategy*

The NZ Waste Strategy was published in 2002. It sets national goals and targets for all the main waste streams as well as committing to five core policies to deliver on those targets. Those policies are to develop a sound legislative basis for waste management, introduce efficient pricing for waste disposal, commit to high environmental standards (through new regulation if necessary), ensuring better availability of waste information, and promoting efficient use of materials.

- *Regional waste strategy*

EW released its own (non statutory) Waste Strategy in 2003. This committed to regional leadership through reducing its own corporate waste; acting as a waste information clearing house; advocacy to improve incentives and remove barriers to greater waste minimisation and diversion; and co-ordinate regional wide waste education programmes.

- *Recent experience*

EW has now had a decade of experience with waste programmes of various kinds. Some of the initiatives EW has been involved with include the co-ordination of a regional waste liaison group, an agri-chemical collection scheme, a waste exchange and a business waste advisory service. The later two initiatives have had limited success and future options are currently being considered. Less than half of New Zealand's regional councils are thought to be involved in specific resource efficiency/waste minimisation initiatives. Some such as Auckland have been involved in the past but are no longer active.

- *Waste Minimisation (Solids) Bill*

There is currently a private member's bill before Parliament that would if passed, have significant implications for waste policy at regional levels. While the Bill is unlikely to be passed in its current state it is possible that some variation could be supported by the Government consistent with its commitment in the NZ Waste strategy to provide a sound legislative basis for waste management.

The current Bill includes provision for a levy on industrial waste, sets targets for reducing waste in landfills and cleanfills, provides for producer responsibility programmes, and provides for public procurement programmes to spur the development of markets for products and services that result in waste reduction.

Significantly the Bill would also establish a national Waste Minimisation Authority and establish territorial authorities (either individually or jointly) and Waste Control Authorities with various enhanced waste minimisation functions.

The management model contemplated by the Bill would have no obvious role for regional councils.

9.4 Additional issues and possible changes

In some respects waste is just another way to think about many of the issues addressed elsewhere in the RPS. Pollution issues such as land, air and water contamination may all be characterised as been about the generation and poor disposal of “waste”. In that sense it may be difficult to justify a separate waste chapter.

The term “waste” tends to be used when there is a need to become involved “up the pipe” (or up the production chain) in order to address the issue (because, for example, it is not feasible to require resource consent for the waste's creation or disposal).

As discussed earlier, the big waste-related question for the review of the RPS is whether the waste policies and methods should be organised around the need to protect land, air or water quality. Or, alternatively, whether they should be organised around their own issues and objectives - possibly located within a separate waste chapter.

If the later approach is adopted the relevant issues might include:

- *Resource (including energy) efficiency* - the desire to maximise potential of resources to meet future needs. [Note some care may need to be taken here as many wastes are derived from *minerals* – silica, hydrocarbons etc – and an argument might be advanced that the RMA does not allow regional councils to consider the potential of minerals to meet the needs of future generations – see s.5 (2) (a) of the Act];
- Desirability of minimising *residual* solid, liquid, gaseous waste effects (recognising that waste disposal has residual adverse environmental effects notwithstanding the resource consent processes);
- Avoiding on *demand for more landfill* space and hence ongoing land use conflicts and greater areas of land compromised for future intensive use;
- Maintaining potential for future *recovery of waste* from landfills; and

- The need to ensure that the design of *urban development* incorporates necessary household and community level infrastructure necessary to encourage waste recycling.

As discussed above, the relevance of these issues to *environmental management* is unquestionable. It is also clear that, based on public perception surveys around a quarter of the regional population rate waste as the most important *environmental* issue. However, the RMA (and therefore the RPS) is about *sustainable management of natural and physical resources* rather than the broader field of environmental management. Waste's relevance to resource management (as defined by the RMA) is, as described above, indirect.

Furthermore, before including a focus on waste minimisation in the future RPS further consideration will need to be given to:

- Whether the issues outlined above justify *regional* (as opposed to territorial authority) attention.
- Whether regional councils have the ability to make significant gains with (a) the tools available at the regional level; and (b) territorial authority waste management plans not having to have regard to the RPS.

9.5 Structural implications for the RPS

As noted above, subject to further analysis, a separate waste chapter may not be required in the next generation RPS. If the decision is made to continue with a Waste chapter, that chapter should not attempt to address the separate issue of the effects of waste disposal.

Therefore, as a minimum, it would seem necessary to split the waste chapter in two with the first 4 “Rs” of waste policy (reduction, reuse, recycling and recovery) dealt with separately from *residual disposal* (which should be integrated into the respectively resource-specific chapters of the RPS).

It would seem doubtful that waste issues focussed on the first 4 Rs of waste policy would warrant a separate chapter. Consideration will need to be given as to where they might be located within a restructured RPS.

10 Hazardous Substances

The *Hazardous Substances* chapter of the RPS identifies three issues with associated objectives. Those issues relate to:

- management of hazardous substances;
- storage, transportation, use and disposal of hazardous substances; and
- existing contaminated sites.

10.1 Management of hazardous substances

Central government agencies, regional and territorial authorities all hold responsibilities for the storage, transport, use and disposal of hazardous substances. This duplication of roles has the potential to create inefficiencies and/or uncertainty for resource users and the community.

The objective is:

The roles of all the agencies responsible for the management of hazardous substances in the Waikato Region clearly identified and their responsibilities consistently implemented

10.1.1 Evaluation of management of hazardous substances objective

The first part of the objective is achieved by the RPS itself which sets out regional and territorial functions.

The key role for territorial authorities is that they must *control the use of land* to prevent or mitigate adverse effects associated with the storage, use, disposal or transportation of hazardous substances. There are other roles not directly related to the district plan, including education, information provision, provision of collection facilities and emergency planning.

The RPS gives little guidance on *how* the key land use control responsibility ought to be exercised by local authorities although the explanation makes clear that a common means for determining risk is expected and that the Hazardous Facilities Screening Procedure (HFSP) provides an appropriate tool.

A review of the region's district plans reveals a variety of approaches taken to assessing and managing risk of hazardous substances in the land use planning context. Some territorial authorities such as Hamilton City and the Thames-Coromandel and Matamata-Piako district councils use the HFSP⁵⁹ while others (such as Franklin and Waipa districts) use a "threshold approach"⁶⁰. Others (such as Taupo) use a different approach entirely.

In summary, while responsibilities might be clear, there is little consistency in the way territorial authority responsibilities are implemented. Inconsistency in

⁵⁹ Waikato District did use the HFSP but replaced it with a more user friendly alternative.

⁶⁰ A threshold approach involves the use of hazardous substance threshold lists which show classes of substances sometimes in line with HSNO Act classifications, together with permissible quantities. The thresholds will vary depending on the zoning of the site on which the hazardous facility is to be located.

approach is also experienced nationally a recent MfE commissioned study⁶¹ found that only 64% of local authorities used the HFSP. Experience in the Waikato appears to be similar.

10.2 Storage, transportation, use and disposal of hazardous substances

The release of hazardous substances from storage facilities or during their use, transport or disposal has the potential to cause significant adverse effects on the environment and human health.

The objective is:

No significant risk of adverse environmental and human health effects deriving from the storage, transport, use and disposal of hazardous substances.

10.2.1 Evaluation of storage, transportation, use and disposal objective

The objective is largely immeasurable since *risk* is difficult to determine except on a site by site basis. Furthermore, as much of the risk is managed by controls imposed under the Hazardous Substances and New Organisms (HSNO) Act the risk reduction attributable to the RPS (and measures undertaken in accordance with the RPS) will only be a proportion of the total risk reduction.

Certainly EW can point to some actions that have been taken in accordance with the RPS that have (or will) reduce risk associated with the use, storage and transport of hazardous substances (for example, EW has a proposed rule on spray drift)⁶².

But it is also possible to identify some ongoing risks. In short, information required to assess this objective has not been systematically collected and collated. It is difficult, therefore, to confirm one way or the other that this objective has been met.

10.3 Existing contaminated sites

The release of contaminants from existing contaminated sites has the potential to cause adverse effects on the environment including human health.

The objective is:

No significant risk of adverse effects on human health of the wider environment from existing contaminated sites.

10.3.1 Evaluation of management of contaminated sites objective

Again, this “no significant risk” objective is difficult to measure. EW is working on a register of contaminated sites. That list currently identifies 118 sites in the Region

⁶¹ Hill Young Cooper, 2007, *Hazardous Substances Screening Procedure : Investigation and Identification of Local Authority Approaches and Issues*

⁶² There is also some snapshot information (for example between 1992 and 1997 a total of 81 incidents involving the transport of hazardous substances in the Waikato Region were recorded).

as *Confirmed Contaminated*. However, the actual number of contaminated sites is likely to grow as further testing is carried out (rather than, necessarily, because new sites are being created). When sites are known, the risk reduces since the effects can be managed. Therefore the number of contaminated sites is not a good indicator of risk.

A better indicator is the number of contaminated sites that have been cleaned up. As at 2007, 140 sites in the Region had been remediated (or actively managed).

However, it is also possible to identify on-going risk. Contaminated sites that present some of the more significant on-going risks are thought to include:

- the bed sediments of the eight hydroelectric lakes on the Waikato River (which contain seasonally high levels of arsenic⁶³),
- the Moanataiira reclamation (originally constructed using mine tailings);
- the bed sediments of Lakes Waikare⁶⁴, Hotoananga⁶⁵ and Hamilton;
- the Tui mine tailings (although the Government has recently announced its intention to fund a clean-up of this site);
- former large industrial facilities such as the Cambridge Gasworks, and the Rotowaro carbonisation plant;

In addition, there remain in the region up to an estimated 100 former timber treatment sites, an estimated 7000-10000 sheep dips sites (and small number of dieldrin dump sites) which present potentially significant risk as well as less site specific risks associated with lead in urban areas, copper chrome arsenic treated fence posts (which cause ground water contamination) as well as lead arsenic, DDT and copper sprays used in horticulture.

Given the large number of actual and potential contaminated sites (and the incomplete assessment of these sites - let alone remediation) it is difficult to form a conclusion as to whether the objective of “no significant risk” has been attained.

10.4 Overview of hazardous substances issues

The evaluation of the *Hazardous Substances* chapter of the RPS is limited, as evaluation of several other chapters is limited, by an absence of information and/or imprecise objectives.

While responsibilities for hazardous substance management are broadly identified the chapter appears to lack a coherent description of the role of the HSNO Act or ERMA, and by implication, the *residual* “value-adding” role of local authorities.

The focus on *consistent implementation* (by way of the adoption of the HFSP) does not appear to have been successful but may well, in any event, be misplaced (see discussion in section 10.5).

⁶³ From both natural sources (in Lake Taupo) and from discharges associated with Wairakei geothermal power station. The arsenic in hydro dams is mobilised due to the different chemistry that occurs in impounded water.

⁶⁴ Mercury from natural (geothermal) sources.

⁶⁵ Thought to contain old munitions.

Similarly, seeking “no significant risk” from the storage, transport, use and disposal of hazardous substances is sensible but to be relevant and meaningful the section needs to acknowledge the role of HSNO and ERMA in that objective and more clearly describe what additional risk reduction is to be achieved through the RPS/RMA.

Seeking no significant risk from contaminated sites appears overly ambitious given the large number of actual and potential sites and the incomplete knowledge of those sites.

A more realistic objective might focus on a *reduced level* of (regional scale) risk associated with contaminated sites or even *no increase* in overall risk.

10.5 Relevant contextual changes

A number of legislative developments have occurred since the RPS was notified. These include the following matters.

- *Enactment of the HSNO Act 1996 and hazardous substance provisions*

The HSNO Act was enacted in 1996 but due to concerns about the workability of the new regime the hazardous substances provisions of the HSNO Act were not made operative in 2001. Once operative the new regime involved consolidation of responsibility for protecting people and the environment from the adverse effects of hazardous substances in the Environmental Risk Management Authority (ERMA).

ERMA classifies substances, assesses applications for new substances, and places controls on substances to manage risk throughout their lifecycle using a tool box of regulations.

Most hazardous substances were transferred into the HSNO regime (with new risk-based controls between 2003 and 2006).

After several years of experience with HSNO, the high level of uncertainty about how the HSNO might work for hazardous substances that existed when the RPS was notified has receded.

- *HSNO Amendment Act 2005*

The HSNO Act has been amended a number of times since 1996. However the latest (2005) amendment has the most significant implications.

Amongst other things, the 2005 Amendment introduced a new Part 6A to enable the control of hazardous substances to be grouped under “group standards”. This means the similar substances can be controlled as a group of substances (rather than through individual controls)⁶⁶. The main reason behind this change was to facilitate the transfer of all hazardous substances already existing in NZ into the new regime.

Group standards generally contain information requirements (labelling and advertising requirements), site and storage requirements (such as quantity limits and separation zones etc), approved handling requirements, packaging

⁶⁶ Group standards do not apply to pesticides although similar provisions apply.

requirements, equipment requirements, transportation, disposal, exposure limits and notification requirements.

Group standards are significant because their introduction has raised the questions about the need for extensive controls on hazardous substances under the RMA.

- *Amendment to section 62 of the RMA*

Section 62 (contents of Regional Policy Statements) was replaced by the Resource Management Amendment Act 2003. In 1993 the Act required that the RPS state “*which local authority shall have responsibility ... for the prevention of mitigation of any adverse effects of the storage, use, disposal, or transportation of hazardous substances*”. If no such responsibility was stated the Regional Council was deemed to be responsible.

The 2003 Amendment still requires the RPS to specify responsibility but if no responsibility is specified *territorial authorities* are deemed to be responsible.

- *Amendment to section 30 of the RMA*

Section 30 of the RMA was amended in 2005 to give regional councils the additional function of “*investigating land for the purposes of identifying and monitoring contaminated land*”.

This expanded regional councils’ responsibility in two ways. First, it broadened out concern from *sites* to *land* (which is defined as discussed below). Second, it has meant that regional councils’ interest in contaminated sites relates not only to the actual or potential discharge from a site but more broadly to the state of the site itself (whether or not there is a discharge issue).

Contaminated land is defined to include land that is more contaminated than a national environmental standard allows; or land that has a hazardous substance⁶⁷ on it that has or is reasonably likely to have a significant adverse effect on the environment.

- *Update and Review of HFSP*

The Ministry for the Environment is currently reviewing the HFSP. This review is in part recognition that the HFSP predated the introduction of the HSNO Act regime and served an interim purpose. As part of this review a number of implementation issues have been identified, including a generally poor understanding of the tool, confusion between the original HFSP and the 2002 update, highly variable use and sometimes misuse of the tool, and a tendency for many authorities to have developed simplified or alternative approaches. Duplication of controls imposed under HSNO and RMA have also been identified

Furthermore, on the basis of the review work and noting the potential for group standards to adequately control most risks, MfE is currently considering whether the HFSP should be phased out entirely and perhaps be replaced by a simpler set of guidance.

⁶⁷ Hazardous substance is defined to include but not be limited to a hazardous substance defined in accordance with the HSNO Act.

10.6 Additional issues and possible changes

10.6.1 Hazardous substance management

▪ *Clarifying relationship between RMA and HSNO*

The most important role for the future Waikato RPS as it relates to hazardous substances is to develop and promote a clear understanding of *when* an RMA management tool is necessary, *who* should exercise that control and *how*.

Exercising management controls over hazardous substances under the RMA must be for an RMA purpose.

Assuming EW does not want to exercise control over the use of land to manage risks associated with hazardous substances, it might be appropriate to set out the circumstances when RMA controls (through district plans) will be warranted⁶⁸.

In general terms this will be when:

- there is heightened risk beyond that contemplated by the controls imposed nationally by ERMA because of specific locational issues (i.e. proximity to sensitive environments or established uses); or
- the hazard risk arises from a substance that is not a hazardous substance defined under the HSNO Act (such as tallow or milk).

It will then need to be clear about how this control is exercised. Given the uncertainty about the future of the HFSP it would seem prudent to take a wait and see approach at this time. Two basic policy options seem available. The first would be to direct local authorities to consider certain risks (and/or develop a risk assessment process) and allow for different approaches to result (or, rather, continue). The second option would be to seek to promote a more regionally consistent methodology (potentially aligned to whatever national methodology replaces the HFSP).

A third option is to remain silent on the question of land use control to manage hazardous substance risk meaning that the default position will prevail with territorial authorities responsible and free to adopt whatever approach they consider necessary (recognising that Group Controls imposed by ERMA impose a “regulatory backstop”). The key issue here is whether the potential for variation in risk assessment in land use planning represents a significant resource management issue for the Region.

▪ *Management of hazardous substances not controlled by district plans or HSNO*

District plans can control the location and to some extent management of hazardous facilities but they cannot control the disposal of hazardous substances (in the form of waste).

The RPS does offer the opportunity to promote the universal adoption of *trade waste by laws* at the territorial level as a means of addressing the disposal issue. This

⁶⁸ Issue might be described in terms of there being circumstances when generalised national level controls imposed may not be adequate to manage risk to RMA outcomes. Alternatively, the issue might be described in general terms (much as now) with the HSNO controls identified as one method by which hazardous substance risks are expected to be managed.

might be achieved by directing the regional plan to adopt rules that encourage the use of trade waste by laws. For example, a regional plan might differentiate how it controls discharges depending on whether the discharge is from a system subject to a trade waste bylaw.

A similar approach might be used to promote integration of land use and stormwater.

10.7 Structural implications for the RPS

The *Hazardous Substances* chapter does raise structural implications for the RPS. Currently the chapter address hazardous substances and contaminated sites as issues that are clearly connected.

However, there are definitional issues to be resolved since there are also connections between *hazardous substances* and *hazardous wastes* and between EW's expanded function in terms of *contaminated land* and some of the issues addressed in the land management chapter.

Whether the hazardous substances/contaminated sites chapter should remain or be integrated (in whole or part) into other chapters will need to be resolved as part of the wider consideration of the future RPS structure.

The change in scope of the contaminated land function does, however, suggest that some reorganisation may be warranted.

11 Energy

The *Energy* chapter of the RPS identifies one issue with an associated objective. That issue relates to efficient energy use.

11.1 Efficient energy use

Inefficient energy production and use uses natural resources at a greater rate than is needed and results in unnecessary adverse effects on natural and physical resources.

The objective is:

The efficient use of energy within the Waikato Region.

11.1.1 Evaluation energy objective

EW has conducted a baseline survey of energy use in the Waikato Region⁶⁹. Data collected (and estimated) were used to produce *energy use* and *energy use relative to economic growth* indicators.

- *Regional energy use and regional energy intensity baseline*

The data show that 109,043 terajoules (TJ) of energy were used in Waikato in 2003. Based on a regional economy producing a GDP of just over \$9 billion that provides an energy intensity (or efficiency index) of 12.1 megajoules (MJ) per dollar earned.

There is currently no measure of what level of energy use per unit of GDP represents an “efficient use of energy”. Such a measure would in any event have little value for regional analysis since it depends on the particular make up of the regional economy. Care needs to be taken in comparison of energy use and efficiency at the regional scale.

A robust approach would need to consider energy intensity by *industry or by sector*. In the absence of this a comparison with the energy intensity of other regional economies to gauge relative efficiency could be misleading.

Efficiency is a relative term. The only robust way to assess the objective would be to monitor energy intensity by sector over time. At this point that information does not exist.

- *National scale efficiency and sectoral trends*

A 2004 review of the National Energy Efficiency and Conservation Strategy (NEECS) found that New Zealand as a whole was experiencing modest energy efficiency gains of between 0.5% and 1% per annum. Since then the Ministry of Economic Development (MED) has published *New Zealand Energy Indicators*⁷⁰. One such indicator relates to efficiency and it shows that between 1990 and 2005 energy intensity (energy use/GDP) has improved by 11% nationally.

⁶⁹ Emily Wilton, 2003, *Regional Energy Survey*

⁷⁰ Ministry of Economic Development, 2006, *New Zealand Energy Indicators*

The national indicator found that energy intensity at the national scale to be 4.2 MJ per dollar of GDP (i.e. significantly less than energy intensity of the Waikato). Again, however, care needs to be taken in making comparisons between regional and national energy efficiency. It needs to be remembered that the Waikato imports and “uses” energy (in the form of coal and gas) to convert to electricity much of which it then exported to other regions (in other words considerable energy consumption is driven by demand from outside the Waikato Region and is not necessarily a reflection of Waikato’s energy efficiency - although the energy consumed per kWh of electricity produced is a valid measure of energy efficiency in the electricity sector).

Of more interest is the national indicator’s finding that between 1997 and 2003 the agriculture, wood processing, mining and non metallic mineral production sectors all experienced a deterioration in energy efficiency (despite energy efficiency improvements occurring at the economy wide scale)⁷¹. Given that these sectors form a significant part of the Waikato economy it is likely that any efficiency gains would be below national average (and possibly negative).

Huntly power station’s switch of from gas to less efficient (imported) coal (and high use of the relatively inefficient Huntly 1000MW station⁷²) will also have had an impact on the overall efficiency of energy use in the region.

11.2 Overview of energy issue

Efficient energy use within the region remains a valid issue not least because of the link between energy use and carbon emissions.

With available information it is not, however, possible to confirm whether energy efficiency at regional scale has improved or not, either across time or relative to other regions. Indications from national data, however, would suggest that efficiency gains are unlikely to have occurred (or if they have they are almost certainly less than those achieved at the national level).

11.3 Relevant contextual changes

- *Increased emphasis on energy efficiency*

As noted above, the main contextual change relevant to this objective is increased concern about climate change (and hence in the production and consumption of fossil-based energy). While the key national policy responses are yet to materialise, it seems likely that this will involve a price-based measure that will send strong signals for fuel switching and fuel reduction relative to energy output (i.e. efficiency gains).

That does not, however, suggest that EW’s role is necessarily less important than when the RPS was first notified. In fact, in terms of statutory requirements the contrary is true. The other major change for the future RPS to consider is the addition to section 7 of the RMA new subsection (ba) *The efficient end use of energy*.

⁷¹ Balancing this however is the efficiency gains in the transport and storage sector

⁷² The original 1000MW Huntly plant is a conventional steam power station with 50% less efficiency than modern combined cycle plant.

- *Increased demand for energy – particularly renewable energy*

New Zealand is currently experiencing *security of energy supply* challenges (and consequent price volatility) including increasing dependence on imported energy, electricity generation capacity shortfalls and gas supply constraints. This is occurring at a time of a firming desire to meet future energy demands as much as possible from renewable sources (as articulated in the *draft NZ Energy Strategy*).

This has led to increased interest in investing in new (including some novel) energy projects. This interest includes considerable activity in geothermal development (as recently addressed by the geothermal change to the RPS), windfarm development, further hydro development (albeit likely to be small scale) and bio-fuel production - potentially from both dairy sector waste and wood (production forest) waste. It is not inconceivable that there could also be future interest in marine energy potential.

At the same time there is a need to upgrade some energy sector infrastructure to ensure energy can be conveyed to demand centres. The upgrading of both the national grid and the gas pipelines are currently in advanced planning stages.

- *Strategic integration of electricity generation and land use planning*

The 2005 amendment to the RMA introduced a new function to regional councils being *the strategic integration of infrastructure and land use*. Infrastructure was defined to include facilities for the generation of electricity, lines used for conveying electricity and pipelines the distribute gas petroleum of geothermal energy.

This new function means that in managing land use regional councils must consider how energy needs are to be used, managed and protected.

11.4 Additional issues and possible changes

- *Clarification of role*

There are a number of agencies with an interest in energy efficiency. The addition of section 7 (ba) seems to strengthen EW's potential role in energy efficiency. However, the nature of this role and its relationship with others ought to be clarified.

While there is some uncertainty about how this role should be exercised it would be helpful for any future RPS to more specifically set out EW's potential role in each of the main energy using sectors (i.e. the industrial/commercial, transportation and domestic sectors).

- EW's role in energy efficiency the *industrial/commercial* sectors may relate to an interest in technology employed to meet efficiency standards (controlled though, for example, discharge to air consent processes).
- EW's role in energy efficiency in the *transportation* sector might relate (i) spatial control of land uses to reduce long term transport needs; (ii) support for the provision of low energy transport options in new development (walkways, cycleways public transport infrastructure etc).
- EW's role in energy efficiency in the domestic sector will be closely aligned with the need to address the home heating issues to comply with the NES on air quality.

These functions are, to a greater or lesser extent, already undertaken but they are not currently articulated (or integrated) in EW's policy framework.

▪ *Clarification of objective*

As noted above, the concept of efficiency is a relative one. While the 2003 baseline energy use research establishes a benchmark against which changes in energy use and energy intensity can be measured, the objective itself provides no indication of how efficiency is to be assessed and what level of energy use will be considered "efficient". For example although efficiency *may* have decreased in the Waikato in recent years it may still be regarded as "efficient" depending on the benchmark used for assessment. The objective does not refer to an *improvement* in efficiency and this allows for considerable uncertainty.

The final point to note is that energy efficiency with the Region is dependant on many decisions outside the control of EW. A sweeping objective of "energy efficiency" does expose the RPS to a level of accountability out of proportion to EW's level of influence.

▪ *Energy production/conversion*

At present the *Energy* chapter deals exclusively with energy efficiency. In that sense it is very limited in its scope. It does not deal with the *adverse effects* of energy production and consumption. Those matters are dealt with in other chapters.

Perhaps more significantly, the chapter does not currently address the need to recognise and manage the energy potential of resources.

The RPS could add value to current and future energy development planning if it provided a policy framework that:

- Offered some protection or priority for key renewable energy opportunities over competing uses for the same resource (for example, protecting prime wind resource sites from activities that might compromise future development)
- Provided guidance on when renewable energy generation might be given precedence over protection of other values.

11.5 Structural Implications for the RPS

Energy is integral to issues discussed in a number of other chapters including infrastructure, water management, geothermal resources, discharges to air and other matters.

Whether it should be the subject of a separate (and potentially expanded) chapter or the issues integrated in other chapters depends on the overall structure adopted for the future RPS.

As it currently stands the energy chapter appears "thin" and somewhat out of proportion to other chapters.

12 Structures (Infrastructure)

The *Structures* chapter of the RPS identifies one issue with an associated objective.

12.1 Infrastructure

Infrastructure (including network utilities) enables people and communities to meet their social, economic and cultural needs and is therefore important to the region. Inappropriate subdivision, use and development of land can result in conflicts and incompatibilities between activities which may significantly compromise the operation of regionally significant infrastructure.

The objective is:

The continued operation of regionally significant infrastructure maintained or enhanced.

12.1.1 Evaluation of infrastructure objective

The first point of note is that the *Structures* Chapter appears mis-named since it deals solely with infrastructure.

It is also important to note that the term *infrastructure* is not defined by the RPS although the discussion in the chapter clearly implies that the objective relates to network utilities as defined by the section 166 of the RMA which includes networks related to water supply, waste water disposal, drainage, transport (both road and rail), electricity transmission and distribution, irrigation, telecommunications, fuel or gas conveyance (i.e. pipelines) as well and as airports. The RPS also refers to hydro electric dams. Other non network infrastructure such as electricity generation and facilities of a “public works” nature (such as prisons, schools, hospitals etc) which have access to designation provisions under the RMA do not appear to be included.

No information is collected by EW that would assist in determining whether, or to what extent, the infrastructure objective has been met. However, incidences where the operation of regionally significant infrastructure has been discontinued or reduced in scale or output due to conflicts with land use are not obvious.

A robust analysis would require detailed assessment of the operational constraints faced by infrastructure operators, the source of those constraints and how they have changed (intensified or reduced) over time.

The sorts of effects that might constrain the operation of infrastructure include:

- *reverse sensitivity effects* which result in pressure being placed on infrastructure operators by newly established, “sensitive” activities, to modify infrastructure use to (for example) reduce noise or enhance public safety. In the roading context, for example, this might mean reduced speed limits on what had been open road.
- *Physical* effects on infrastructure that interferes with efficient operation. Again, in the roading context this may be a greater number of access ways which reduces traffic flow and safety. In the electricity transmission context it might relate to deposition of substances on conductors and insulators that necessitates additional maintenance or increases risk of electrical hazard.

While it would be possible to evaluate the extent to which infrastructure within the Waikato has been affected by land use conflict, the task would require primary research and is well beyond this report.

In the absence of such information, it is possible only to suggest that there is likely to have been some affect on the operation of regionally significant infrastructure⁷³ but that there are no obvious instances of the operation of such infrastructure being fatally compromised.

12.2 Overview of Infrastructure

The existing infrastructure chapter is limited in scope and attainment of the single objective is difficult to measure without the establishment of a dedicated monitoring programme.

The chapter may need to be substantially revised taking into account the new infrastructure function (see following sections).

12.3 Relevant contextual changes

- *Amendment to Section 30 of the RMA*

The most significant contextual change is the addition of section 30 (1) (gb) to the RMA providing for a new regional council function of “*the strategic integration of infrastructure with land use through objectives, policies and methods*”.

Associated with this amendment was the inclusion in the RMA of a definition of infrastructure. That definition is broader than that contemplated by the current RPS and includes electricity generation, ports (including inland ports) and transport terminals.

The possible implications of this new function are discussed in section 12.4

- *Concern about infrastructure investment*

Following growing concern about possible under-investment in infrastructure the Government funded an infrastructure stocktake in 2003. The stocktake raised concerns about electricity security of supply, lack of investment in electricity transmission, road congestion in some areas, water allocation issues and poor drinking water.

As a result of the stocktake a number of national policy initiatives were introduced to (amongst other things) improve the regulatory environment within which infrastructure investment decisions are made. These initiatives include commitment to develop national policy statements under the RMA on electricity generation and transmission. At this point only the electricity transmission NPS has been notified and is currently being considered by a board of inquiry.

⁷³ Transpower monitoring, for example, suggests that that there may be 5000 instances nationally of people building too close to transmission lines risking electrical hazard to the extent that corrective action is required. Although data is not reported regionally it seems highly likely that some of these infringements will be in the Waikato region.

- *Amendment transport legislation*

A number of changes have been made to the transport legislation over the past decade including most significantly the enactment of the Land Transport Management Act 2003. The purpose of that Act is to contribute to the aim of achieving an integrated, safe, responsive, and sustainable land transport system.

Amongst other things, it seeks to improve social and environmental responsibility in land transport funding, planning, and management⁷⁴. This is part of a desire to move transport planning and funding away from a traditional road focussed approach to a more multi-modal integrated transport system.

Also relevant is Land Transport Act 1998 which requires the preparation of regional land transport strategies (RLTS) that must also contribute to the overall aim of achieving an integrated, safe, responsive, and sustainable land transport system and ensure environmental sustainability. The RLTS must be not inconsistent with RPSs – meaning the RPS has some control of transport planning. However, the new regional council function (described above) now suggests that the relationship is not “one way” and that land use control needs to be directed by the RPS in ways that integrates with the strategies and policies of the RLTS.

- *The Waikato Regional Land Transport Strategy*

Consistent with the requirements of the Land Transport Act, EW recently released its 2006-2016 Regional Land Transport Strategy (RLTS). The Waikato RLTS identifies outcomes, policies and actions. In terms of the RPS the three most relevant policies are (a) the identification of strategic transport *corridors*; (b) Land use and transport *planning integration* (and implementation of a multimodal transport systems); and (c) development of *alternative transport* modes. More detailed policies refer to, for example, promoting an *urban form* that does not preclude future provision of passenger transport; applying land use principles that reduce need to travel and encourage more energy efficient transport modes; and local authorities ensuring land use policies protect strategic transport corridors.

The RLTS explicitly⁷⁵ commits to reviewing the RPS to integrate regional land transport policies, the NZ Transport Strategy and the principles of the Land Transport Management Act 2003.

12.4 Additional issues and possible changes

Currently the RPS is focused on a single infrastructure issue; the potential of infrastructure to be compromised by land use and land use change.

Given the broadening of EW’s function in this area (and the commitments made in the RLTS) it seems clear that the future RPS will need to address a wider range of infrastructure issues.

⁷⁴ Environmental sustainability is identified as a criteria against which land transport programmes are assessed.

⁷⁵ See action A6.1

12.4.1 Strategic Integration

There is currently no guidance on how regional councils are expected to carry out the new land use and transport integration function. Nor, indeed, is there any guidance on exactly what the *scope* of the function might be in practice. The notion of *strategic integration* does seem open to various interpretations.

Some of the more obvious potential “integration” roles for the RPS to explore might involve some or all of the following matters.

- *Planning for current and future need*

Ensuring adequate provision is made for appropriate infrastructure in territorial authorities’ land use planning. (Including (a) future proofing the ability to provide infrastructure for future as well as current needs; and (b) ensuring that opportunities for non traditional infrastructure are taken/maintained as part of large developments)

- *Making efficient use of existing capacity*

Ensuring land use is planned in a way that recognises opportunities (capacity) provided by existing and proposed infrastructure and directing land use intensification to locations where infrastructure capacity exists or can be most efficiently provided (i.e. ensuring recognition is given to “sunk” and committed investment and to the relative viability of future investment).

- *Recognising capacity constraints*

Ensuring land use is planned and sequenced in such a way that recognises the limits (capacity constraints) of infrastructure. This could (if necessary) extend beyond small scale utility capacity constraints and address transport and electricity transmission limitations. This would aim to ensure capacity is in place or committed in a timeframe that will ensure land uses to be served and infrastructure “deficits” avoided.

- *Protection of infrastructure and corridors*

Consistent with the existing RPS objective it will remain necessary for the RPS to address the need to protect existing infrastructure but this should be expanded to recognise the notion of transport (and potentially other infrastructure) corridors.

- *Urban design/form and regional settlement planning*

Ensuring land use patterns (including the *type* – not just location - of urban development) supports the provision of environmentally responsible and energy efficient infrastructure, including alternative transport infrastructure. (This may involve taking an interest in the pattern, density and regional distribution of urban development).

- *Protecting resources for infrastructure development*

Infrastructure development, particularly transport infrastructure, requires access to aggregate in large quantities. The price of aggregate, and therefore the cost of transport infrastructure, is directly related to transport distance. Having access to local aggregate supplies is, therefore, an important factor in facilitating

infrastructure provision at reasonable cost. Ensuring land use is managed so as to maintain access to local aggregate supplies may, therefore, be another dimension of the “strategic integration” function.

The issue may not rest with aggregates however. Managing land to protect recharge zones for municipal water supply is another issue (mentioned earlier in this report) that is relevant to the strategic integration function.

Similarly, as mentioned in section 11.4, identification and recognition of land associated with significant wind resources will also require further consideration given the new statutory definition of *infrastructure* includes electricity generation.

12.4.2 Potential implications and policy options

Urban limits policies to manage growth and infrastructure issues have already been adopted in two neighbouring regions (Auckland and Bay of Plenty). However, it is important to note that regionally set urban limits is just one growth management tool that would be available to EW should it take a stronger role in these issues through the future RPS.

There are many other alternative and less prescriptive approaches that could be adopted by EW that may be more suited to addressing Waikato’s land use and infrastructure issues. Clearly, these will need to be investigated more fully.

Urban limits is a potentially costly tool and difficult to manage across multiple territorial authorities. Recent research⁷⁶ in the Auckland context indicates that the Metropolitan Urban Limit (MUL) policy imposed through the ARC RPS has resulted in land within the MUL becoming around 10 times more expensive than land outside the MUL with consequent implications for property values and housing affordability⁷⁷.

A less directive, and perhaps less risky, approach that the future RPS might consider would be to identify those areas that are *not suitable* for urban development due to actual or potential infrastructure constraints or because of the presence of other regionally important environmental values (such as soil quality, landscape, recharge areas, mineral deposits etc). Such an approach contrasts with a metropolitan limits approach that essentially identifies and limits development to those areas that *are* suitable for urban development. The approach suggested here would allow for greater flexibility and territorial discretion to be exercised. Furthermore it provides a long term certainty within which territorial land use planning can proceed without EW subsuming the territorial authority role entirely.

⁷⁶ Grimes, A and Liang Y, *Spatial Determinants of Land prices in Auckland: Does the Metropolitan Urban Limit Have an Effect?*

⁷⁷ At the same time Auckland has not achieved the level of housing intensification needed to maintain supply at levels that mitigate upward pressure on house prices. This is one of the reasons cited for Auckland having a net internal migration out of the region of some 16,000 people between 2001 and 2006 (with the 12.4% overall population growth attributable largely to immigration).

12.5 Structural implications for the RPS

The infrastructure issue as redefined by the additional regional function of “strategic integration” is closely linked to the issue of growth management discussed in section 4 of this report.

Managing regional growth (i.e. taking an interest in land use at a strategic scale) and the related issues of infrastructure could well form an important integrating theme of the future RPS.

A stand alone *infrastructure* chapter would seem less appropriate now than when the current RPS was prepared. However, given the new strategic integration function and RLTS commitments, infrastructural issues will need to feature prominently in the future Waikato RPS. This may be achieved by a *land use and infrastructure* chapter.

13 Minerals

The *Minerals* chapter of the RPS identifies two issues with associated objectives. These are:

- the ability to extract mineral resources; and
- adverse effects of mineral exploration and development.

Each of these is discussed in turn.

13.1 The ability to extract mineral resources

The ability to extract mineral resources can be compromised through land uses or developments above or in close proximity to mineral deposits.

The objective is:

The ability to extract mineral resources not unnecessarily restricted by sensitive activities. The ability to extract mineral resources neither prevented nor protected by unnecessary plan provisions.

13.1.1 Evaluation mineral extraction objective

Evaluation of this objective requires an assessment of:

- the extent to which extraction of mineral resources is restricted; and
 - the regional and district plan provisions that apply plan.
- *Restriction of mineral extraction*

EW does not collect information on the extent of land use change overlaying or adjacent to mineral resources. As indicated in the RPS, mineral resources in the region are extensive and it would seem unrealistic to expect that land use change within these areas has not restricted access to some potential resources to some extent.

However, as noted, EW does not hold information on exactly how much, what the value of compromised minerals might be, or how realistic it is that those minerals will be (or would otherwise have been) extracted. Gathering such information is well beyond the scope of this evaluation exercise.

EW resource consent database does, however, record 581 resource consents issued in respect of quarries and mines in the past 10 years⁷⁸. At a superficial level at least, this would suggest that at this stage there not any unnecessary restrictions being placed on mineral extraction to protect sensitive activities or for any other reason.

Production figures collected from Crown Minerals suggest that mineral extraction in the region is a growing industry. As shown in Figure 1, in the six years between 2000 and 2005, gold production has increased 74% and silver 1780%. Similarly, Figure 2 shows that aggregate production (a category that includes coarse and fine aggregates as well as limestone) has increased 40% over the same period. Although

⁷⁸ This includes wholly new quarries/mines as well and extensions to existing quarries/mines (and other amendments to existing resources).

iron sand extraction is down on its 2000 high, coal production has increased nearly 50% between 1995 and 2005.

Figure 1 - Waikato precious metal production 200-2005

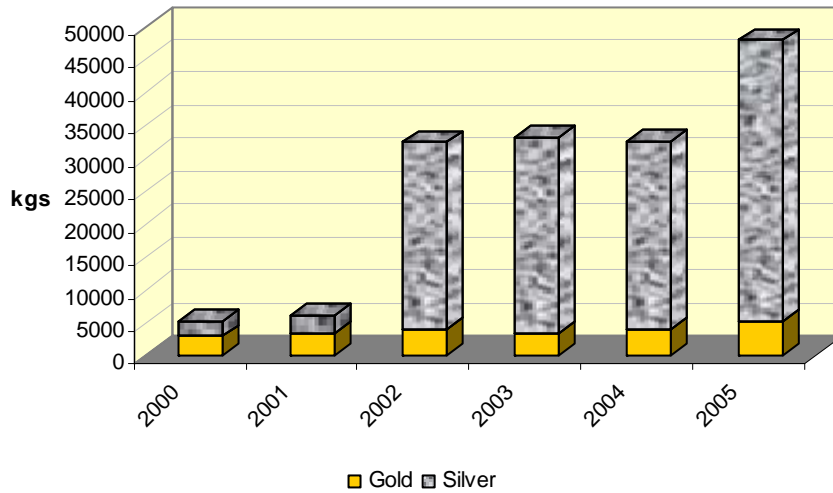
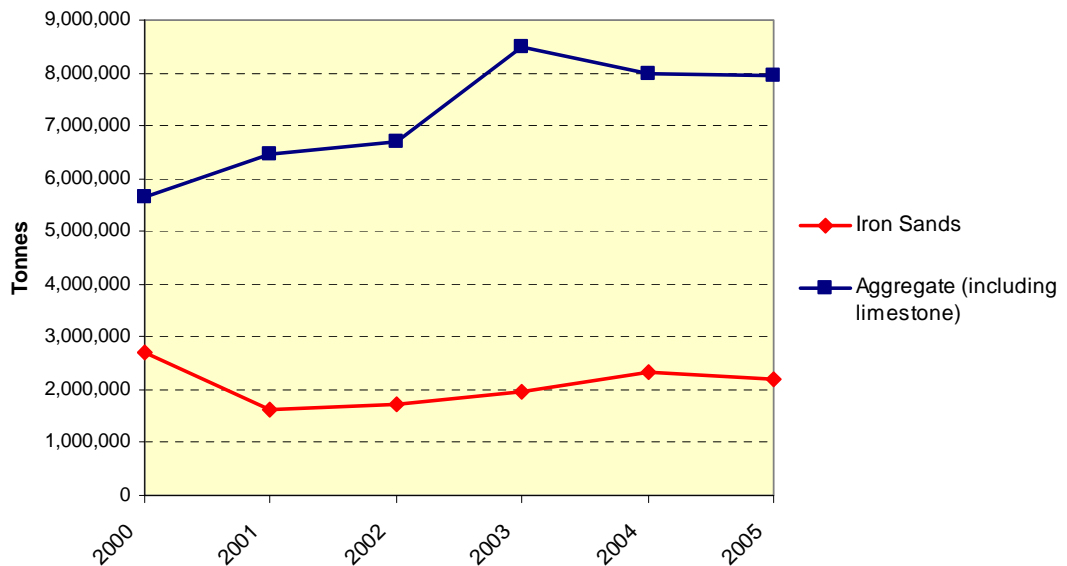


Figure 2- Waikato bulk mineral production 2000-2005



▪ *Regional and district plan provisions*

The wording of this objective is curious in that it clearly favours plan provisions that do not unnecessarily prevent mineral extraction but at the same time provides clear direction the district plan provisions should not *protect* mineral resources. In

practical terms this seems to favour district plans *enabling* mineral extraction but not protecting minerals from uses that might compromise future extraction.

A detailed review of the region's nine district plans has not been carried out as part of this evaluation. However, the minerals industry (via the NZ Mineral Industry Association and the Aggregate and Quarry Association) has taken an active interest in submitting on district plans to promote industry interests. Representatives have advised that district plans address minerals variably and that there is little if any consistency across the region.

At least two of the region's district plans have attempted to make mineral extraction a prohibited activity in large parts of their districts. Uncertainty about the appropriateness of these provisions has been costly for affected parties as the provisions have been challenged through the Courts (one of these, relating to Thames-Coromandel, remains unresolved after 10 years). The RPS has been unhelpful in resolving these vexed issues.

While most plans provide some level of recognition and protection for *existing* mineral extraction (by way of special zones or buffer areas) there has been little recognition given to other areas of known (but currently unexploited) mineral resources. Hence the potential to extract minerals from new sites in the future remains at risk of being compromised by on going land use intensification.

13.2 Adverse effects of mineral exploration and development

Mineral exploration and development has the potential to produce adverse environmental effects.

The objective is:

Integrated management of the adverse effects of mineral exploration and development

13.2.1 Evaluation effects of mineral extraction objective

This objective cannot be evaluated in any robust way. Whilst the objective focuses on *integrated management*, the explanation of the objective emphasises the need to manage effects through plan provisions and consent processes.

It is assumed that in the context used, *integrated management* refers to the setting of policies and rules across the regional and district planning framework that are mutually supportive (e.g. provisions in district plans do not promote mineral extraction in areas where adverse effects could not meet requirements of the regional plan and visa versa⁷⁹).

While the RPS and regional plan are consistent in this regard, no assessment of district plans has yet been carried out. That is perhaps a priority for subsequent analysis.

On the subject of integrated management, it may also be relevant to note that several large mineral extraction applications have been the subject of joint hearings.

⁷⁹ This is just one simplistic example. Internal consistency within the regional plan such that control of soil disturbance, water and air are aligned is another example.

13.3 Overview of minerals issues

As the RPS indicates, there are broadly two issues associated with minerals: maintain physical and practical access; and managing adverse effects.

13.3.1 Maintaining access to minerals

There is no question that minerals are natural resources that need to be sustainably managed under the RMA. Waikato's local authorities do have responsibility for ensuring minerals are available to meet the social and economic needs of people and communities (albeit they cannot seek to "ration" minerals in an attempt to accommodate the needs of future generations).

To that extent it is valid for the RPS to include provisions that seek to manage access to minerals and ensure that the ability to extract minerals is not unreasonably foreclosed by other uses. In the absence of any control it is plausible that mineral resources could be effectively removed from potential exploitation and that could displace extraction to less desirable resources and less appropriate locations with (possible) adverse environmental and economic consequences.

However, minerals (particularly aggregates) are potentially available over broad parts of the region⁸⁰ and it would be unreasonable to limit land use intensification over all these areas on the chance that some aggregate supplier *might*, at some future point, wish to access the underlying minerals. Such an approach would effectively lock up large parts of the region when future mineral extraction would be focused on a relatively small number of relatively small sites.

This conundrum has resulted in a RPS policy that is somewhat confusing and, apparently, not greatly helpful in terms of guiding district plans.

It is clear that mineral extraction has increased significantly in the Waikato over the past decade, it is likely that the ability of some, known but not currently exploited mineral resources has been compromised by urban development, rural residential and other intensive land uses in rural areas. While the potential for compromised access to minerals remains relevant there is no information on which to base a conclusion on the extent of significance of this issue.

Further information will need to be collected as part of the RPS review.

13.3.2 Managing effects of mineral extraction

The second of the two issues identified in the current RPS also continues to be relevant but only to the extent that the effects of *any* major resource use need to be appropriately managed (including ensuring the various points of control are properly integrated). In that regard it would seem difficult to justify special recognition for the effects of mineral extraction (given that the effects are managed according to the provisions of other parts of the RPS).

⁸⁰ The map the RPS currently contains, for example, indicates vast areas of indicative mineral deposits.

13.4 Relevant contextual changes

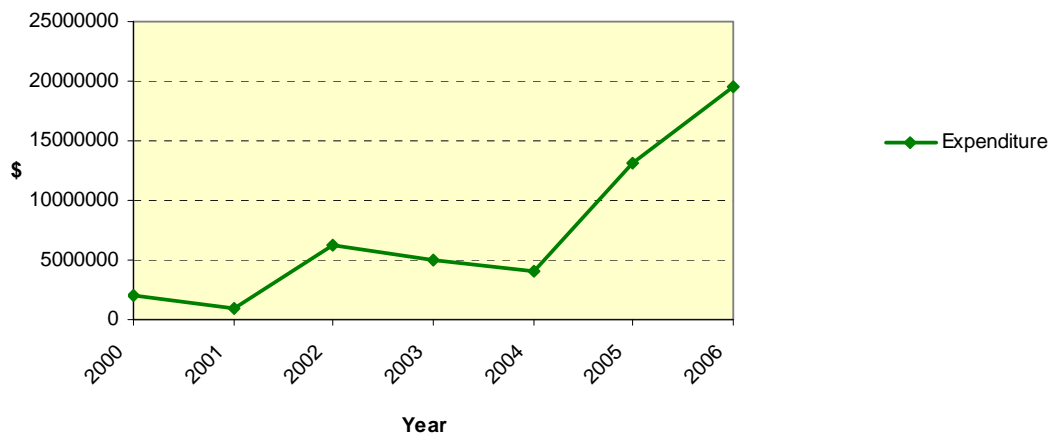
▪ *Demand Growth*

The main significant change that ought to be considered in the review of the minerals chapter of the RPS is the continued growth in demand for aggregates and other industrial minerals and precious metals.

One recent study⁸¹ showed that aggregate demand has increased from around 4 tonnes per capita per year in 1991 to around 8.1 tonnes per capita per year in 2004. Demand is projected to reach the all time maximum annual demand of 10.5 t per capita (in 1966) possibly as early as 2009.

However, it is not only aggregate production that can be expected to increase over the next decade. Indications from recent expenditure on prospecting and exploration in the Region (see Figure 3) suggest that production of other forms of minerals may continue to increase.

Figure 3 - Expenditure on prospecting and exploration in the Waikato Region



▪ *Supply constraints and aggregate export*

During the life of the current RPS the supply of aggregates in the *Auckland* region has reduced with the closure of quarries at Mt Wellington, Manukau, Wiri, Greenmount and elsewhere. There is currently almost no basalt being quarried in Auckland. Although overall aggregate production has increased in Auckland in recent years (albeit from fewer quarries) Auckland now imports around 20% of its aggregates from outside the region (Northland and Waikato). That has obvious implications for the cost of aggregates and building/construction in general but it also has implications for future demand for Waikato resources – particularly those in the north of the region.

13.5 Additional issues and possible changes

It is not clear at this point whether there are additional minerals issues that the RPS should address. Although recent production seems to be on the increase, the

⁸¹ O'Brian J, 2006, Planning for Growth? Determinants of Aggregates Demand in New Zealand.

potential of land use change to compromise future access to minerals is an on-going issue.

Whether the RPS needs, necessarily, to devote a chapter to this issue is debateable. However, to the extent that the issue is recognised in the next generation RPS it should make allowance for the following matters.

- *Clarification of intent*

The RPS could be clearer about what it is attempting to achieve. It should specify what, if any, mineral deposits should be protected from overlying or adjacent uses that might compromise future extraction and what forms of control are and are not appropriate for district councils to exercise.

- *A finer-grained approach*

The current RPS takes a broad brush approach to minerals. It does not distinguish between *aggregates*, *industrial minerals* and *precious metals*. Nor does it distinguish between *premium* aggregate resources (like basalt) in limited supply or *lower grade* resources in plentiful supply; nor between *existing/committed* extraction operations and *potential* areas of extraction; nor between deposits with *high* potential for future production and those with *low* potential for future production.

In clarifying the intent of the policy approach the RPS might usefully make some of these distinctions (or encourage local authorities to make these distinctions) and develop management strategies accordingly.

- *Minerals in growth management planning*

The RPS need not seek to protect mineral deposits outright. Indeed as discussed earlier there are risks in doing so. However, it should certainly ensure that the presence of minerals (and the type, value and likely commercial potential of the resource) is to be taken into account by territorial authorities in any *growth planning* exercises in much the same way as other resources (such as high quality soils) and environmental values (such as landscape values) are taken into account.

In that way urban and rural residential development can be guided away from high potential mineral deposits.

13.6 Structural implications for the RPS

Given that there is only one unique issue associated with minerals, a separate chapter could perhaps be dispensed with. Instead, the RPS might discuss minerals and the desirability of maintaining reasonable access to mineral resources in the context of regional growth management and in other chapters. For example, there are clear links between coal and energy, between industrial minerals (like lime) and agriculture and between aggregates and infrastructure.

Obviously, this issue needs to be considered in relation to the wider structural options discussed in section 16 of this report.

14 Heritage

The *Heritage* chapter of the RPS identifies two issues with associated objectives. These are:

- the region's heritage; and
- Maori heritage.

Each of these is discussed in turn.

14.1 The Region's heritage

Natural and cultural heritage resources are integral parts of the Region's heritage. Subdivision use and development have the potential to degrade and destroy natural and cultural heritage.

The objective is:

The protection of regionally significant heritage resources, and allowing subdivision, use and development of other heritage resources, while ensuring that there is no net loss in the region.

14.1.1 Evaluation heritage objective

Heritage is defined by the RPS to include both *natural* heritage (flora and fauna, ecosystems, landscapes, geological and geomorphic features, soils, and the natural character of the coastline) and *cultural* heritage (sites, places, place names, areas, wahi tapu, taonga, structures, objects, artefacts, natural features of cultural and historic significance, historic associations, people and institutions).

Criteria are included in the RPS to assist in determining the significance of cultural heritage resources. What heritage resources are and are not *regionally significant* is not specifically defined but rather argued on a case by case basis.

EW does not carry out systematic monitoring of heritage in the region. So it is not possible to quantitatively evaluate whether the heritage objective is being met. It is also worth noting the objective's use of the term "no net loss". It is difficult to determine how the concept of *no net loss* could apply in the heritage context (since most heritage resources are, by definition, finite resources that cannot be created or reinstated elsewhere to compensate for loss – that is, that are non *substitutable* resources).

▪ *Natural heritage*

Although there has been no specific natural heritage monitoring, it is clear from information reported elsewhere in this report that there is real doubt about the extent to which a number of heritage resources have been protected over the past decade. Other sections of this report have concluded, for example, that there has likely been deterioration in the quantity and/or quality of soils (including regionally significant high class soils), wetlands and the natural character of the coast.

▪ *Cultural heritage*

Again there is no regional level monitoring of cultural heritage protection/loss. EW staff report that they attempt to protect cultural heritage via conditions on

resource consents. This is only partially successful, however, because the existence of heritage values is not always known. Furthermore, EW does not have control over all the activities that adversely affect heritage values. Some effects (e.g. coastal erosion) are natural, while others are controlled by territorial authorities or result from activities that have existing use rights.

The NZ Historic Places Trust's (HPT) heritage register currently records 448 historic places within the Waikato Region. However, there will be many further heritage sites not on the register. As noted above, no research has been carried out on the rate at which heritage resources are added to the HPT Register (or indeed recognised by district plans) or the rate at which consents are granted to modify heritage resources (or are otherwise being lost or degraded).

This information will need to be collected in order to make an informed decision about the significance of heritage as a regional issue.

14.2 Maori heritage

Maori heritage resources are of significant spiritual and cultural value to tangata whenua, and are an integral part of the Region's heritage. Subdivision, use, development, and interference have the potential to degrade and destroy Maori heritage resources.

The objective is:

The protection of heritage resources of significance to Maori

14.2.1 Evaluation Maori heritage objective

Maori heritage is ostensibly protected under the general heritage objective discussed above. However, this specific Maori heritage objective seems aimed at providing a higher degree of protection (omitting as it does reference to "no net loss").

Again, however, there is no available information on which to evaluate the achievement or otherwise of the Maori heritage objective. Anecdotal accounts from EW iwi liaison staff do, however, suggest concern amongst the Regions' iwi about on-going loss of taonga.

14.3 Overview of heritage issues

There simply is not the information to say whether the heritage objectives have been achieved. Anecdotal evidence, however, suggests that the RPS policies on heritage are too general and unspecific to have been useful for those seeking to promote heritage protection in the region.

Rather like the relationship between waste and discharges, the concept of *heritage* provides another lens through which many resource management issues can be considered.

The definition of heritage used in the RPS creates a degree of duplication with policies in the *Land*, *Coast* and *Biodiversity* chapters of the RPS. In so doing it undermines the heritage issues that are not addressed elsewhere in the RPS and detracts from a sense of clear purpose.

The future RPS may need to separate *natural* from *cultural* heritage and apply concepts and definitions consistent with the legislation (see below).

14.4 Relevant contextual changes

There have been two significant legislative changes that affect how the RPS will need to address heritage issues.

- “*Historic Heritage*” *Amendment to the RMA*

In 2003, the RMA was amended to give effect to the Heritage Review. Amendments to the RMA included:

- an addition to Section 6 to introduce “*the protection of historic heritage from inappropriate subdivision use and development*” as a matter of national importance;
- a definition of *historic heritage*;
- a new restriction on the use of the CMA meaning that the foreshore and seabed cannot be disturbed in a manner likely to adversely affect historic heritage (unless permitted by a rule in a plan or a resource consent); and
- a requirement to have regard to relevant entries in the Historic Places Register when preparing an RPS.

In 2004 the HTP published comprehensive guidance on management of historic heritage under the RMA including recommended content of RPSs.

- *Resource Management (Foreshore and Seabed) Amendment Act 2004*

Section 6 of the RMA was also amended in 2004 to give effect to the foreshore and seabed policy.

This included:

- an addition to Section 6 to introduce “*the protection of recognised customary activities*” as a matter of national importance;
- a requirement (i) to take into account any *relevant planning document* recognised by an iwi authority and lodged with the local authority; and (ii) recognise and provide for a foreshore and seabed reserve *management plan*⁸² when preparing an RPS; and
- a requirement for RPSs to state the resource management issues of significance to iwi authorities or the board of any foreshore and sea bed reserve.

Not all these requirements relate specifically to heritage but there are likely to be heritage implications associated with these new requirements.

14.5 Additional issues and possible changes

While there might be some additional issues to address (particularly around the marine heritage issues), the more significant change required to the *Heritage* chapter relates to the need provide focus and avoid duplication. This may be achieved by separating out three distinct components.

⁸² A foreshore and seabed reserve management plan is prepared for reserve placed over an area confirmed by the High Court as being subject to territorial customary rights under the Foreshore and Seabed Act 2004.

- *Natural heritage* (essentially resources that are, or should be, dealt with in other parts of the RPS - e.g. flora and fauna, soils, natural character).
- Heritage resources that come under the Act's definition of *historic heritage* (being historic sites/structures, archaeological sites, sites of significance to Maori and the surroundings of these places).
- *Cultural heritage* not dealt with in other parts of the RPS and which does not come under the Act's definition of *historic heritage* (such as landscape).

15 Iwi and integrated management

Chapter 2 of the RPS sets out general provisions relating to resource management *processes*. Specifically it deals with:

- Treaty of Waitangi and matters of significance to Maori; and
- integrated management.

These matters are reviewed briefly below.

15.1 Treaty of Waitangi and matters of significance to Maori

15.1.1 Treaty of Waitangi

The principles of the Treaty of Waitangi have been defined by the Crown, the Waitangi Tribunal and the Courts, who have emphasised the evolving and fluid nature of the Treaty interpretation. Tangata Whenua and local authorities may differ in their interpretation of the principles of the Treaty which may result in conflict in the management of natural and physical resources

The objective is:

Mutual understanding between tangata whenua and local authorities on the application of the principles of the Treaty of Waitangi under the RMA

15.1.2 Evaluation of the Treaty of Waitangi objective

No specific research has been carried on whether there is mutual understanding of the application of the Treaty principles in the resource management context.

It is clear that there may have been some convergence of opinion since the RPS was notified about what the Treaty principles are. Some high level initiatives, such as the commitment to MOUs and MOAs, are clearly aimed at applying some of those principles.

However, EW staff report that at the more detailed level (for example in the context of individual resource consents) there continues to be a lack of alignment between what is sought by Iwi in terms of the *application* of Treaty principles and what EW believe they can deliver. This suggests that different interpretations persist.

15.1.3 Tangata whenua relationship with natural and physical resources

The relationship tangata whenua have with the environment is given specific recognition in the purpose and principles of the RMA. To date there has been limited involvement of tangata whenua in resource management decision-making regarding the protection and enhancement of ancestral lands, water, site, wahi tapu and other taonga, and in the practical expression of kaitiakitanga. This lack of involvement has the potential to lead to conflict about the management of natural and physical resources under the RMA.

The objective is:

The relationship which tangata whenua have with natural and physical resources recognised.

15.1.4 Evaluation of the tangata whenua objective

The achievement of objective cannot be quantitatively assessed. However, EW staff have suggested that the relationship is generally recognised in planning and policy documents and consent processes although recognition is at times ad hoc.

15.2 Iwi issues for further consideration

While the high level objectives contained in the current RPS remain relevant, the future RPS may need to consider a range of more specific iwi related issues including the following matters.

- *Lack of capacity*

There is a lack of capacity (staff knowledge and resources) both within iwi organisations and in territorial authorities to effectively address the range of iwi issues that arise. This can be a significant obstacle to addressing iwi concerns through resource management processes.

- *Changing nature of iwi participation*

The nature of iwi interests in resource management processes is changing. In the early 1990s iwi interest in resource management was almost exclusively related to kaitiakitanga. Today iwi interests can be much broader with iwi now sometimes an applicant or a submitter with a financial interest in an application. This changing role can create tensions that require specific management.

- *Early involvement of iwi in decision-making*

Although iwi are now generally more aware of opportunities for involvement in RMA decision-making, they continue to express dissatisfaction in not being involved early enough in those decision-making processes. Iwi still claim that consultation is an afterthought rather than an integral part of policy development. This can lead to scepticism on the part of iwi about the value of becoming engaged.

- *Relationship management*

Management of the relationship between EW and the Region's iwi can present particular challenges especially when there are reputedly around 200 hapu within the Region. Maintaining a level of contact that builds and sustains an effective relationship with that many entities requires significant resources and effort.

This is especially so given hapu's dislike for *issue-based relationships*. That is, when there is only engagement when and where there is an issue to be addressed. Local authorities tend to operate on the basis that contact is made when an issue arises. Iwi expect that there is a long term relationship is established first and only then is it appropriate to engage on specific issues.

Furthermore, relationships that take many years effort to establish can be easily damaged by a single episode of poor consultation.

- *Mandate Issues*

Concern has been expressed that resource consent applicants sometimes consult selectively (i.e. only with those groups who support their proposals) and/or with

the “wrong” iwi/hapu group (i.e. groups who don’t have mandate). This can sour iwi perceptions of the RMA.

- *Consultation requirements at the resource consent stage*

The 2005 amendment to the RMA clarified that resource consent applicants are under no obligation to consult any person about an application for resource consent.

This amendment effectively transferred any implied obligation on an applicant to consult to the local authority.

- *Joint management agreement*

The 2005 amendment to the RMA also introduced the concept of a *joint management agreement*. Such an agreement involves a public authority and iwi groups agreeing to jointly perform a function under the RMA either generally or in relation to a specific resource. Essentially the joint management agreement is a means of formally providing for co-management arrangements.

15.2.1 Overview of Iwi issues

Few of the issues raised above could be discussed as “new” or peculiar to Waikato. Most have been apparent for some time at in many parts of the country.

However, the RPS does provide an opportunity to examine whether there are ways in which the issues can be better addressed in the Waikato. Much of the discussion will centre on the particular *methods* that the RPS should promote to protect and enhance appropriate iwi involvement in resource management.

The issues expressed in the current RPS do not adequately reflect the matters that now challenge iwi participation in RMAS processes.

In developing the second generation RPS, consideration will need to be given to the level of guidance and direction on more detailed matters including:

- how *iwi management plans* and other documents recognised by iwi and lodged with councils ought to be recognised;
- The use and content of *MOUs and MOAs*;
- how *capacity* might be built both amongst iwi and amongst territorial authorities (by, for example advocating for Maori interns/cadetships at local authorities and for appointment of iwi liaison staff at territorial level);
- the nature and timing of *consultation* expected to be undertaken by local authorities;
- how iwi issues should be recognised in plan and consenting processes;
- how *Maori input* might be best provided for (with consideration given to, for example, forums and advisory committees and representation on local authority committees); and
- how progress on Maori issues and involvement can be *measured* (i.e. the development of cultural indicators and the possible use of section 33 transfers to provide iwi groups with a monitoring function).

15.3 Integrated management

Consistent with the purpose as set out in the Act, the current RPS sets an overall objective that:

The integrated management of natural and physical resources in the Waikato achieved.

As discussed in the following section, *integrated management* has many forms and its achievement is dependent on multiple factors including: how policy documents such as the RPS are *structured* (and therefore how issues are conceptualised and response strategies developed); the *relationships* that develop between management agencies; and the *processes and procedures* that are set up for management agencies to work through issues of joint interest.

However, the ultimate measure of whether integrated management has been achieved rests with the question of whether the desired *outcomes* have been achieved effectively and efficiently or, conversely, whether their achievement has been undermined or compromised by non aligned decision-making between or within relevant management agencies.

In the Waikato context it is clear that there are still many instances where regional objectives (as articulated in the RPS) have not been supported by the decisions and actions of other parties. Although no rigorous stocktake of such instances has been undertaken as part of this evaluation examples are abundant.

This evaluation has itself reported against many objectives and, taking an open and transparent approach, has acknowledged many areas where success has been limited. In most of those cases, at least part of the reason for the limited success lies with the inability to align territorial policy and regulatory decision-making to regionally agreed objectives for matters such as water quality, preservation of natural character, avoidance of natural hazard risk.

This is despite the fact that: (a) the *processes* and actions designed to promote integration (as identified in the RPS) have generally been carried out and; (b) there are examples of joint approaches and a good level of integration between EW and other agencies at some levels and on some issues.

Various aspects of integrated management have been discussed throughout this report and will not be repeated here. The following section discusses integrated management more fully and addresses the question of how the future RPS might be structured to better promoted integrated management.

15.4 Issues for the future RPS

The key question (particularly given the ability of the RPS to regional/district policy alignment) is whether the RPS needs to go beyond setting out issues in a way that promotes integrating thinking about, and management of, the Region's issues.

The approach of having a separate chapter in the RPS on integrated management (focused largely on process matters) may not be robust since it focuses on one aspect of integrated management only. Furthermore, integrated management is the purpose of entire RPS – not just one chapter.

16 Structural options for the second generation Waikato RPS

This section deals with *structure* and *style/scope*. By this we mean (a) the way the RPS is divided up (for example the way issues are described and delimited); and (b) the approach taken to the way provisions are expressed (for example, whether the RPS is comprehensive or strategic, whether provisions are high level or specific; whether they express general directions or whether they represent clear measurable targets).

The Act itself provides little guidance on these matters. There is no right or wrong way and there are many options each with their own advantages and disadvantages.

16.1 Structural options

The purpose of the RPS is, of course:

...to achieve the purpose of the Act by providing an overview of the resource management issues of the region and policies and methods to achieve integrated management of the natural and physical resources of the whole region.

Resource management issues can be expressed in many ways. Natural and physical resources (and the environment of which they form a part) have many complex inter-relationships such that it is hard to refer to (or manage) one in isolation from others. Similarly, each resource is associated with diverse values reflecting the many interests people have in that resource (for example, production values, recreation values, spiritual values, aesthetic values, and ecological values).

Any division of the environment by policy makers will, in that sense, be an artificial and imperfect construct that militates against one or other aspect of integration.

16.1.1 Structure of the current RPS

The current RPS is structured in a way typical of RPSs produced at that time. It is structured loosely around the definition of “*natural and physical resources*” provided in section 2 of the Act - *land, water, air, soil, minerals and energy, all forms of plants and animals (biodiversity) and all structures*. In addition it picks up on additional matters flowing from regional council functions – namely *coastal matters, natural hazards, hazardous substances, and heritage* (heritage is not a specific function but both natural and cultural heritage is affected by the exercise of regional council functions).

▪ *Issues with the current RPS structure*

There is an inherent logic behind the current structure. However, as already discussed in the context of each chapter review, this structure also has its limitations. For example, it fails to provide for the identification of cross-jurisdictional issues (such as growth management), or cross-resource issues (such as climate change); cross media effects (such a sedimentation) and significant regional values (such as landscape). The approach also creates overlaps (such as the overlap between the coastal environment chapter and other chapters).

Furthermore the evaluation has highlighted very wide variation in the general “importance” of individual chapters. This is reflected in amongst other things the number of issues identified, the nature of these issues and the amount of information available to evaluate success. It is clear from what information is collected and by the depth of that information what EW believes the significant

issues to be. Several chapters appear to exist solely to complete the framework rather than as a reflection of careful risk/problem analysis. There is a sense of the RPS trying to force issues (by identifying *potential* risks or by identifying matters over which the regional council has very little control) to fit a predetermined structure.

On the other hand, there are issues identified in a broad sense in the current RPS that remain highly valid but which appear not to have been strenuously implemented or monitored over the past decade. These issues tend to relate to what might be called non traditional regional functions (including matters such as infrastructure, heritage and landscape).

While the RPS does not identify any matters that are irrelevant to the purpose of the RPS, the variability in the significance of issues/risks identified does tend to undermine the integrity of the policy document.

16.1.2 Alternative structures

In broad terms it is conceivable to structure the RPS according to:

- regional council *functions* (e.g. land management, discharges to water, water allocation, discharges to air etc);
- the natural and physical *resources* of the region (land, air, water, energy, structures etc);
- the main *activities* in the region (agriculture, forestry, urban development, energy production etc);
- the main *effects* being experienced (land erosion, water contamination, sedimentation, landscape degradation, etc);
- main issues/*themes*/desired outcomes (climate change responses, sustainable agriculture, sustainable settlement etc);
- specific *spatial zones* or sub regional areas (e.g. coastal zone, wetlands, high class soils, hill country, geothermal areas, peatlands, Taupo Basin etc); and
- combinations of two or more of the above.

Policies and methods could be organised around these headings providing an opportunity to bring several functions to bear on one issue – in other words to develop *strategies* to response to issues rather than policies representing single function responses.

16.2 Style and scope

Section 62 of the Act says that the RPS must state:

(a) the significant resource management issues for the region [emphasis added]

The first question to address is how the term *significant* is to be applied. There are basically two approaches.

- *Comprehensive*

The first is to set out issues *comprehensively* for the region but to express those issues at a high, *broad level* so that they provide the basis for regional plans to specify greater detail (including various sub issues). This approach is based on a desire to

see the regional policy framework as a direct cascade from RPS to regional plan. This approach is necessary when there is an absence of a comprehensive regional plan framework and therefore a need for the RPS to provide policy direction for regional plan development and for consent decision-making. In that sense the comprehensive approach to RPS issue identification was necessary for first generation RPSs.

- *Strategic*

A second approach is, however, available for second generation RPSs. Regional plans may exist independent of RPSs – they are certainly not limited to addressing just the *significant* issues of the region but rather aim to “*assist the regional council to carry out any of its functions*”. In other words, it is not necessary for every issue addressed by regional plans to be reflected in the RPS.

Therefore the RPS can be deliberately developed not as a comprehensive statement of issues but as a more document focused on narrower range of priority issues. This might be termed the *strategic* approach. For example, it would be possible for the RPS to identify only the 5 or 10 most significant issues likely to face the region over the next decade. This approach does have the advantage that a narrow range of priority issues allows for the development of cross-resource policy responses. In other words, keeping issues and objectives limited more easily allows integrated policy responses to be developed drawing on and aligning all regional council functions.

Decisions about the structure and style of the future RPS need to be taken together. A decision to organise the RPS according to functions forces the RPS to take a comprehensive approach to issue identification. Whereas, a structure based on themes or outcomes is more consistent with a strategic approach.

16.2.1 Visions and measurability

Currently the RPSs’ objectives are neither ambitious long term goals (“visions”) nor specific measurable targets. They tend to sit somewhere in between.

There is obvious benefit (in terms of the ability to evaluate progress) of objectives that are clear and easily measured. Objectives of this nature might be:

- time bound (potentially with interim targets);
- spatially bound (with differentiated targets for different areas); and
- associated with particular indicators.

16.3 Achieving integrated management

One of the key issues when deciding on structure and style will be which approach best achieves *integrated management* – the purpose of the RPS.

There are many definitions of integrated management. The commonality among the various definitions stems from the desire to ensure that decisions taken at different times, by different people or in different places (whether regulatory or operational) do not undermine or subvert the reasonable decisions (and outcomes) of others. Indeed, and to the extent that common goals are possible, there is a clear preference that decisions taken should be mutually supportive.

In the resource management context it is generally held that integration relates to consistency of management across environmental media (e.g. air, land and water) to recognise the natural inter-relationships of environmental systems. In other words, integrated environmental management means making decisions on one resource taking account of the effects on other resources (“*systems recognising*” integration).

Because the management of these media/resources is split between jurisdictions (central, regional and local government) integration also relates to the co-ordination of different agencies’ responses to environmental issues (*inter-jurisdictional integration*). It is also possible for different parts of the same organisation to exercise different functions in ways that affect a single outcome. Therefore integration also refers to *intra-jurisdictional integration*.

Where multiple decision-makers have jurisdiction over matters that are inherently inter-connected, all decision-makers need to be aware of others’ goals (and/or be guided by a *common* goal) and both take and be seen to take those goals into account when taking decisions. Furthermore, integrated management of natural systems necessitates good information and understanding of the implications of decisions.

In resource management terms, the purpose of integration is, as outlined above, to ensure effective, co-ordinated achievement of outcomes. But it is also about administrative cohesion. The objectives of integration also focus on administrative and economic goals such as process efficiency, and the minimisation of compliance costs. Achieving integrated management also means ensuring that resource users do not face (for example) duplicative processes or multiple consent requirements where this is not necessary.

Integration is usually achieved by *instrumental* means – such as a policy that guides an organisation’s (or multiple organisations’ responses) or by *process* means – such as decision-making arrangements that involve all parties who have an interest (or potential affect on) an outcome.

RPSs represent an instrumental approach to achieving integration. There is inherent integrating utility in RPS policies because the Act states that district and regional plans must “give effect” to them. Therefore *inter-jurisdictional* integration is automatically achieved simply by having an RPS policy that a district plan can give effect to. That is, there is a “locked in” mechanism to ensure regional/territorial policy alignment. Furthermore, RPSs are *council* policies and (for the avoidance of doubt) the RMA states that regional plans must also “give effect” to those RPSs. Therefore RPSs also have utility in promoting intra-jurisdictional integration.

However, to fully achieve *systems recognising integration* an RPS’s policies and methods must themselves display and promote management that demonstrates *how* functions under the RMA will be exercised in mutually supportive ways. The development of cross-functional strategies is one way to do this. Identifying areas or resources for either protection or development (having taken into account the full range of values) is another possible approach⁸³.

⁸³ The Auckland Region’s metropolitan limits are an example of this form of integration – a variety of issues and values were considered together to develop a spatially bound policy response.

The RPS must also address jurisdictional integration not guaranteed by the “nesting”⁸⁴ provisions of the Act. This includes, in particular, cross boundary issues between regional councils and cross boundary issues between parties exercising functions under other statutes.

The RPS policies and methods can also promote integration though *process* means. For example, the RPS could establish a framework for greater *co-management* of particular resources or promote the use of joint hearings in certain circumstances. Other (existing) mechanisms include EW’s participation as an observer on the Auckland Regional Growth Forum and its participation in the Hauraki Gulf Forum.

16.4 The structure of the future RPS

It is too earlier to determine what the best structure and approach will be for the next generation RPS. However, taking account of the preceding analysis, a model that deserves further consideration might involve a *hybrid* comprehensive/strategic approach. Such an approach would recognise the lead provided by the existing RPS and build on the structure of that RPS by dealing with *cross cutting* issues separately from the single resource issues.

Building on the existing structure also has the advantage of allowing recently adopted provisions (such as the geothermal provisions) to remain without change.

An RPS following a hybrid approach might be structured as follows

16.4.1 Cross-cutting issues

Part 1 would set out *issues and objectives*. The identification of issues would focus on cross cutting themes/challenges faced by the region. They would be “cross-cutting” in the sense that prudent management of multiple resources is necessary for the objectives to be met.

The likely list of such issues would include:

- Sustainable agriculture
- Urban growth management (including potentially transport and infrastructure)
- Community health and well-being
- Climate change
- Tangata whenua relationships with natural resources
- Minimising natural hazard risk
- Maintaining biological diversity

Ideally, each of these themes would include a full description of the issues and challenges, a long term vision/goal and measureable, time bound targets identified in respect of each vision/goal.

⁸⁴ The nesting provisions are those provisions that require regional and district plans to give effect to the RPS.

Part 2 of such a hybrid RPS would be a series of *policies* organised around the individual natural resources including

- Air
- Water
- Soil (including policies on contaminated sites)
- Land and Landscapes
- Coastal Marine Area
- Geothermal
- Minerals.

Policies organised under those headings would be cross-referenced back to the strategic objectives and would refer to all matters that affect the achievement of the strategic objectives.

One of the benefits of this approach is that it encourages integrated policy development and implementation and allows for the specification of genuinely meaningful objectives (issues and objectives linked to specific resources tend to be formulaic, are not Waikato-specific and add little to requirement of the Act itself).

Such a hybrid approach would be novel and would be at the forefront of regional councils' efforts to better promote integrated management of resources through their second generation regional policy statements.

Following such an approach provides an opportunity for Environment Waikato to further enhance its leadership position on these issues.

17 Conclusion

This evaluation asked two primary questions: (a) does the RPS focus on current regionally significant issues; and (b) is the RPS achieving the objectives it set for itself?

Table 3 below provides an overview of the evaluation results that help provide answers to those questions.

It shows that of the 33 objectives evaluated only three could be said to have been met in full. A further six objectives could be said to be met in part or that some progress had been made. Seven other objectives have clearly not been met.

There was insufficient data to determine whether nine of the objectives have been met or not. In another four cases the objectives were too imprecise to allow robust evaluation and in four further cases the available data were inclusive (with some evidence of progress and some of regression).

It is important to note that these evaluation results are strongly influenced by the monitoring programmes in place and the data that is available. The results show a clear bias in data availability towards “core” regional functions (land, air and water quality) with very little, and in some cases no, information available to evaluate objectives that relate to non core functions (such as those relating to the waste, energy, structures, minerals and heritage objectives).

Accordingly, results are able to show a relatively high level of under-achievement in land and water areas largely because of the extensive monitoring that has been carried out.

17.1 Answers to core evaluation questions

The answer to the first of the primary questions described above is difficult to summarise. Certainly, most of the issues included in the current RPS remain valid on the basis either that (i) objectives have not been met or have only been met in part; and (ii) in many cases the drivers (such as, for example, growth of the dairy industry) behind these issues have increased in strength over the past decade.

However, it is also true there are other significant issues that are not dealt with by the current RPS or which are only dealt with in an oblique fashion. Many of these issues are strategic and/or *cross-cutting* in nature and do not fit easily within the existing “silo” approach of Chapter 3 of the current RPS. These new issues emerge partly in response to new and additional functions given to regional councils under amendments to the RMA and partly from changing demands on the region’s resources and environmental values.

New issues to emerge relate to climate change, energy, sustainable agriculture, and urban growth.

The answer to the second question is that only around 10% of the RPS’s objectives have been met in full. However, care should be taken in drawing firm conclusions from that result. Another 20% of objectives have been met in part, or at least progress towards the objective is clearly being made. The failure to record a “met in full” result is, in most cases, attributable to the ambitiousness of the objective rather than classic policy failure. In short, objectives are seldom articulated in such a way as to set realistic 10 year targets given pressures faced.

Furthermore, some of the 50% of objectives that could not be robustly evaluated might also have found to have been met if information had enabled proper evaluation.

Overall, while the Waikato RPS represents a good first effort and regional policy development, a series of changes will need to be considered (in terms of structure, content and monitoring commitments) if the second generation RPS is to remain relevant for the next ten years and to ensure that the 2020 RPS evaluation is able to record a greater degree of progress.

Table 3 - Summary of Waikato RPS Evaluation

	Objective met in full	Objective met in part/Some progress made	Objective not met	Not sufficient information (not monitored)	Objective too imprecise to assess	Evaluation inconclusive
Land and soil						
Accelerated erosion		✓				
Soil contamination			✓			
Soil health			✓			
Moisture Mgt			✓			
River and lake beds		✓				
Water						
Water quality			✓			
Flow regimes					✓	
Efficient use of water		✓				
Wetlands			✓			
Public access				✓		
Mauri					✓	
Coast						
Natural character			✓			
Water quality	✓					

	Objective met in full	Objective met in part/Some progress made	Objective not met	Not sufficient information (not monitored)	Objective too imprecise to assess	Evaluation inconclusive
Integrated management		✓				
Public access				✓		
Noise				✓		
Air						
Regional and local air quality		✓				
Climate Change	✓					
Ozone depletion	✓					
Natural hazards						
Management of natural hazards						✓
Adverse effects						✓
Waste						
Waste management				✓		
Hazardous substances						
Management of hazardous substances		✓				
Storage transportation and disposal				✓		
Contaminated sites						✓
Energy						
Efficient use				✓		
Structures						
Continued operation of				✓		

	Objective met in full	Objective met in part/Some progress made	Objective not met	Not sufficient information (not monitored)	Objective too imprecise to assess	Evaluation inconclusive
infrastructure						
Minerals						
Ability to extract minerals not restricted				✓		
Adverse effects					✓	
Heritage						
Protection of heritage resources				✓		
Iwi and integrated management						
Understanding of ToW			✓			
Relationship of tangata whenua					✓	
Integrated management						✓