

3 MANAGEMENT AREAS

3.1 INTRODUCTION

Air, land and water resources within the region vary enormously. Accordingly, their sustainable management means that the Plan has developed a range of different management approaches, depending on the location and characteristics of the resources being managed. For example, water quality in rivers and streams within the highly urbanised areas of metropolitan Auckland is significantly different than in pastoral farming areas and different again where there is significant riparian vegetation and little or no development.

This section describes these management areas in terms of their physical characteristics, and describes the adopted management approach. The more specific provisions, issues, objectives, policies and methods, including the rules which determine how these areas are to be managed, are contained in Parts 2 and 3 of the plan.

A variety of management areas have been developed along with management approaches, and are set out below:

- Wetland Management Areas
- Natural Lake Management Areas
- Natural Stream Management Areas
- Urban River and Stream Management Areas
- Urban Lake Management Areas
- High Use Stream Management Areas
- High Use Aquifer Management Areas
- Quality Sensitive Aquifer Management Areas
- Industrial Air Quality Management Areas
- Urban Air Quality Management Areas
- Rural Air Quality Management Areas
- Coastal Marine Air Quality Management Area

Some of these management areas are shown on Map Series 1, 1A or Map Series 2 of the Plan Maps.

3.2 WETLAND MANAGEMENT AREAS

3.2.1 DESCRIPTION

Significant wetlands have been identified and included in Schedule 1 and indicated on the maps in Map Series 1. These scheduled wetlands constitute the Wetlands Management Areas. Information on the boundaries of particular wetlands is contained in the ARC's Natural Heritage Information database.

Wetlands are a very diverse habitat type with numerous values and functions. Wetlands include permanently or intermittently wet areas, shallow water, and land/water margins that support a natural ecosystem of ***predominantly indigenous plants*** and animals that are adapted to wet conditions. Generally these include areas of marsh, fen, peatland or brackish water. The largest and probably best-known wetland is the Te Henga wetland in Waitakere City and Rodney District.

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In the Auckland Region, freshwater wetlands and swamp forests (with kahikatea, cabbage tree, pukatea and swamp maire) would have once covered large stretches of the low-lying land. The vast majority have now been drained or modified for farmland or urban development. Freshwater wetlands now only cover less than 0.4 per cent of the region's land cover. This means that wetlands are now one of the region's rarest and most at-risk ecosystems.

Wetlands are valued for the plant and animal communities they support as well as their important functions in regulating water flows. Wetlands have complex associations of plants depending on water flow conditions and the degree of salinity. They provide key habitats for native fish and birds and contain high levels of biodiversity. As a result of habitat loss and modification, many wetland species are now classified as being rare or threatened and include birds such as the bittern, fern bird, banded rail, brown teal and freshwater fish such as the giant kokopu. Protecting and restoring wetland areas affords **protection** to rare and unique native plants and animals.

Lakes and wetlands form part of the region's natural landscape and offer many options for **recreation** such as passive enjoyment, fishing, hunting, canoeing and bird watching. These water bodies also hold special character for Maori who view wetlands and **lakes** as **taonga** or valued treasures. Additional values include acting as recharge areas for **groundwater** and purifying water by removing contaminants, trapping sediment, and providing storage areas for flood waters.

3.2.2 MANAGEMENT APPROACH

The preservation of wetlands is a matter of national importance under the RMA. This means that all persons exercising functions and powers under the Act must "recognise and provide for" wetland preservation. **Protection** is also influenced by New Zealand's international responsibility under the RAMSAR Convention, to provide a level of **protection** to all wetlands, irrespective of whether they are listed as being of international importance. Given the rarity and value associated with wetlands it is necessary to apply a strict management regime to ensure the remaining wetlands are not destroyed and that the quality of them is not degraded further. The majority of activities that have the potential to directly or indirectly affect the values of the wetlands will require some form of resource consent.

3.3 NATURAL LAKE MANAGEMENT AREAS

3.3.1 DESCRIPTION

This Management Area applies to the rural **lakes** of the Auckland Region. Many of these are "dune **lakes**" formed by the impoundment of water behind sand dunes formed adjacent to coastal beaches. They include Tomarata, Slipper and Spectacle in the north-east of Rodney District, Ototoa, Kuwakatai and Kereta on the South Kaipara peninsula and Wainamu near Bethells Beach. There are also **lakes** Pehiakura, Pokorua and Whatihua on the Awhitu Peninsula.

The larger **lakes**, which form permanent bodies of water are identified on the Plan Maps as Natural Lake Management Areas and described in Schedule 4. These Management Areas consist of the **lake** itself and a 50 metre buffer strip surrounding the **lake** edge. This buffer distance is measured landward from

the Mean Annual Water Level. Other smaller **lakes** are identified as water bodies on the Plan Maps, but are not included in the Natural Lake Management Areas.

The **lakes**, in terms of water quality range from high quality (Lake Ototoa) to Lake Kereta and Lake Spectacle that have been severely degraded for many years. However all the **lakes** show signs of a gradual deterioration in water quality with Tomarata and Wainamu showing a significant drop in quality over the last 10 years. These **lakes** are sensitive aquatic environments because they have little or no outflow, and thus are poorly flushed, accumulate contaminants, and are prone to nutrient enrichment (i.e. eutrophication). They reflect the cumulative effects of many years of human activities in their catchments. Their ecology is also complicated by the introduction (both lawfully and unlawfully) of **exotic plants** and fish over the last 150 years.

Despite human modification and a reduced water quality, many of the region's **lakes** are also important wildlife areas, being the habitat for several regionally threatened bird species such as the fern bird, bittern and Caspian tern. For these reasons the **lakes** have been identified by the Department of Conservation as being Sites of Special Wildlife Interest (SSWIs). These values are derived in many instances from the presence of important swamp and marginal vegetation which provides areas for breeding and feeding.

The region's **lakes** are important habitats for freshwater fish species. Although originally found in all of the **lakes**, native freshwater fish are now the dominant species only in Lake Ototoa. In other **lakes** the introduction of more aggressive exotic species such as perch, rudd, and trout have resulted in the reduction of native freshwater fish species and numbers.

Protecting the habitat of trout and salmon is a matter of national importance. Lake Ototoa and Lake Whatihua hold important trout fisheries that have been identified by New Zealand Fish and Game as being of regional significance.

3.3.2 MANAGEMENT APPROACH

The management approach is to maintain and where possible enhance water quality in these **lakes** to protect the in-lake ecological and **amenity** values. However in most cases it is not realistic to fully restore these natural **lakes** to pristine condition. This is because the ecological and water quality changes that have already occurred, in general, cannot be reversed. Therefore the highest priority is to keep the **lakes** from deteriorating further, especially those with high water quality. Opportunities to maintain and possibly improve **lake** quality include protection of the **lake** fringe, fencing out stock, restricting access, and restricting the release of **exotic plant** pests and further species of exotic fish. While the ARC has responsibility for weed pests under the Biosecurity Act 1993, the control of exotic fish is the responsibility of the Department of Conservation under the Freshwater Fisheries Regulations 1983. The establishment of riparian buffer strips along the streams that drain into **lakes** will also enhance their quality by acting as contaminant filters for **non-point source discharges** and by protecting the margins from physical disturbance.

Due to their physical characteristics, natural **lakes** are sensitive to a wide range of activities, both within the **lakes** themselves and on the land adjacent to them. For this reason the majority of activities that have the potential to

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directly or indirectly affect natural **lakes** will require some form of resource consent.

3.4 NATURAL STREAM MANAGEMENT AREAS

[All 3.4 - E528/04/01 Auckland City Council]

3.4.1 DESCRIPTION

Many rivers and streams in rural parts of the Auckland Region have been significantly modified. However some stretches retain a significant amount of '**natural character**' mainly through the retention of significant indigenous riparian vegetation. Rivers and streams that meet the following criteria have been included in the Natural Stream Management Areas.

3.4.2 CRITERIA FOR NATURAL STREAM MANAGEMENT AREAS

A Natural Stream Management Area is defined as follows:

*Any **Permanent river or stream**, outside of the **Urban Areas** as defined in the Auckland Regional Policy Statement, with **predominantly indigenous vegetation** cover along a length (reach) of not less than 600 metres; and*

- (a) an average total width of vegetation cover of 80 metres (i.e. an average width of 40 metres on either side); and*
- (b) a minimum total width of vegetation cover of 10 metres from the stream edge, for a length not exceeding 10 percent of the total reach.*

Where there are cleared areas for tracks and stream crossings, these are included in the measurements of vegetation length and width.

NB: A Natural Stream Management Area may be determined from measurements taken from an aerial photograph or an accurately scaled plan.

*See Chapter 12: Definitions for definition of "**Predominantly Indigenous Vegetation**".*

Note: Natural Stream Management Areas are also illustrated in an indicative fashion in Map Series 1 of this Plan. For the avoidance of doubt, the criteria stated above is the primary reference for defining Natural Stream Management Areas. Compliance with any rules relating to Natural Stream Management Areas shall be determined with reference to the definition above and not with reference to the Plan Maps.

In some areas, indigenous vegetation extends beyond 40 metres from the stream channel. This vegetation does not form part of the Natural Stream Management Area. The criteria are based on several pieces of research which indicate that 600 metres in length and 40 metres either side of the stream channel is the minimum area of indigenous vegetation required to re-establish high quality freshwater ecosystems.

Despite their generally small size, stream reaches identified as Natural Stream Management Areas provide habitat for a wide range of biota including native plants, insect larvae, freshwater crayfish, shrimps, freshwater mussels, snails, limpets and native fish. Sixteen species of fish have been recorded of which 80 per cent are *diadromous*, i.e. require access to or from the sea. The values are particularly high where the adjacent land remains in indigenous vegetation. The presence of indigenous vegetation provides a food source for aquatic biota, as well as providing shade which helps maintain water

temperatures at a level suitable for aquatic species. It also acts as a filter to contaminants, particularly sediment and reduces levels entering the river or stream, thereby maintaining water quality. The combination of suitable temperature, pH and water quality and the presence of native plants and aquatic fauna are collectively referred to as “instream values”.

The removal of indigenous vegetation and its replacement with exotic forestry, pasture or urban land uses results in a significant reduction in instream habitat for fish and other aquatic organisms. The decline in habitat quality increases as land use changes from indigenous cover to pastoral land and finally to urban land uses. The purpose of the management area is to protect the instream values of these rivers and streams and the values of the riparian vegetation adjacent to these rivers and streams, by controlling water takes and contaminant discharges.

Much of the riparian vegetation associated with the Natural Stream Management Areas is identified in district plans which often have some controls on the removal of indigenous vegetation. These and the provisions of this plan relating to Natural Stream Management Areas need to be complied with. Other mechanisms such as covenanting of areas of indigenous vegetation and the establishment of riparian margins through revegetation programmes also complement district plan provisions and the rules in this Plan relating to Natural Stream Management Areas.

[E509/04/25 Watercare Services Ltd]

3.4.3 MANAGEMENT APPROACH

The purpose of the Natural Stream Management Area is to protect the instream values of these stretches of river and streams. While there is a range of provisions applying to this management area, many of which are similar to the other river and stream management areas, of particular importance is the retention of the riparian vegetation. The 600 metres by 80 metres riparian buffer is critical to the maintenance of water quality and instream habitat diversity. The provision for and maintenance of **fish passage** up and down the rivers and streams and to and from the coastal marine area is also an important management approach. To ensure the maintenance of the high water and instream values and the provision of **fish passage**, the majority of activities, which have the potential to directly or indirectly affect these natural streams, will require some form of resource consent.

[E509/04/26 and E509/04/27 Watercare Services Ltd]

3.4.4 OTHER STREAMS

Streams outside the **Urban Areas** which are not classified as Natural Stream Management Areas, (i.e. do not meet the criteria in Section 3.4.2) are not included in a particular management area. Rather they are covered by the general provisions of the Plan, which apply to activities affecting rivers and streams.

3.5 URBAN RIVER AND STREAM MANAGEMENT AREAS

3.5.1 INTRODUCTION

This management area applies to all rivers and streams within **Urban Areas** as defined by the Auckland Regional Policy Statement. Urban rivers and streams are highly variable depending on their size, distance from the sea, extent and type of development in the catchment, and the degree of physical alteration of the channel and adjacent floodplain. These factors largely determine their quality and use potential. In this Plan they are categorised by “reaches” that exhibit similar characteristics which are used to identify the overall stream quality along that reach. The proportion of impervious area is the primary catchment variable that is used in this Plan as a ‘default’ to define the type of a reach, while in highly disturbed urban rivers and streams the presence of an artificial stream bed is the key reach characteristic defining the stream type.

Additional characteristics that can influence the management of streams are riparian vegetation and barriers to fish passage, amenity, natural character, public access and stormwater conveyance values. Wherever possible these characteristics should be taken into account when managing urban rivers and streams.

For the purpose of management in this Plan, **urban rivers and streams** have been divided into six reach types.

- (1) Stream Mouths – and Tidal reaches of **Urban Rivers and Streams**
- (2) High Value Low Disturbance **Urban Rivers and Streams**
- (3) Moderately Disturbed **Urban Rivers and Streams**
- (4) Highly Disturbed **Urban Rivers and Streams**
- (5) Artificial or Concrete Channelised **Urban Rivers and Streams**
- (6) Piped **Urban Rivers and Streams**

These types are discussed in more detail in Section 3.5.2.3, but additional categorisation that includes a wider range of values is also possible.

The majority of these rivers and streams have a key role in protecting public safety by conveying stormwater away from **Urban Areas** and reducing flooding. However, many have been substantially altered by development, including land use development (buildings and roads), vegetation clearance, the creation of impervious areas and roads generating greater runoff, discharges (**stormwater, wastewater**, sediment and contaminants); structural alteration of natural channels (channelisation, piping, **culverting** and concrete lining); and modification of the floodplain for development and to facilitate **drainage** and conveyance of flood waters.

Some **urban rivers and streams** currently retain a relatively high level of ecological and/or **amenity** function and use because stream reaches or entire sub-catchments are undeveloped or in parkland or reserves.

Management of **urban rivers and streams** is required at both a catchment scale and at a reach scale.

Catchment scale management actions include impervious area controls, controlling the quality and quantity of direct and diffuse discharges of

stormwater, **wastewater** and sediment, enhancing and restoring riparian vegetation, and protecting and enhancing wetlands, floodplains and natural stream channels. Enhancements at the reach scale include riparian planting, management of stream channels, and providing for the passage of fish and other aquatic life.

There are a number of approaches that contribute to stream management including:

- Integrated catchment management planning, structure planning and stormwater and wastewater network resource consents;
- Controls through this Plan, including permitted activities and resource consents, for works and activities that are undertaken in a river or stream;
- Land use controls under district plans for stream channels and riparian margins;
- Non-regulatory activities including education, funding assistance and incentives and community enhancement projects.

The management of network stormwater and wastewater diversions and discharges in Chapter 5 recognises the importance of management at a catchment or sub-catchment basis, or at a network basis. It also recognises that stormwater may discharge from significant areas of impervious surfaces associated with regionally significant infrastructure. Management actions will need to be developed in the context of the overall Best Practicable Option at the catchment or network level. However, given that resources for improvement are often limited, it is important that the management of **urban rivers and streams** is also considered in the context of an overall district, catchment or network wide prioritization process, to deliver the greatest benefit to ecosystems and the community.

Integrated Catchment Management Plans (CMPs), structure plans and territorial authority stream classifications will be used as the principal tools to guide stream management when available. However if these management tools have not been developed, the **urban rivers and stream** types and policies set out in this chapter provide management guidance. When the extent of impervious area in a catchment changes because of further urban development, the type of **urban rivers and streams** may also change. This may necessitate a change to the management approach.

The **urban rivers and streams** framework is also referenced in Chapters 2.1, 6 and 7 of this Plan and will need to be considered in resource consent applications for activities controlled by these chapters.

3.5.2 MANAGEMENT APPROACH

3.5.2.1 Overall Approach

Issue 2.2.2.1 of this Plan identifies the need to use resources to accommodate regional growth. It is noted within the issue text that *“lakes, rivers and streams outside of **Urban Areas** are given a higher level of protection through Plan policies and rules than those within **Urban Areas**”* and that *“future development within Urban Areas...cannot occur without having environmental impacts”*. This issue is a key driver for the development of the following management approach seeking to balance competing demands on **urban rivers and streams**.

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Note that the status of rivers and streams outside of **Urban Areas** identified in Issue 2.2.2.1 also relates to the generally greater opportunities for enhancement and protection of those streams compared to rivers and streams within **Urban Areas**.

The broad management approach for **urban rivers and streams** in the Plan is to:

- (a) categorise **urban rivers and streams** on a reach scale using:
 - i. the methods in this Plan as a default; or
 - ii. more detailed assessments through **Integrated Catchment Management Plans** or other methods; and
- (b) manage **urban rivers and streams** at both a catchment and reach scale based on the categorisation, giving greater priority to more detailed categorisations or assessments.

3.5.2.2 River and Stream Reaches

For the purposes of this Plan, **urban rivers and streams** in Auckland are categorised by 'reach'. A reach is defined by the distance between significant changes in river and stream or catchment characteristics, e.g. where land use changes from residential to commercial, or the stream changes from an open channel to a piped section. For the purpose of this Plan, the minimum length of a reach is 100 metres. Longer reaches which are homogeneous with regard to channel type and quality may be used.

River and stream reaches that contain natural channels usually provide a larger variety and higher levels of ecosystem function than artificial channels. These natural channel rivers and streams have been divided into three categories using the catchment variable 'percent impervious area'. The proportion of impervious area in a catchment has been shown to be an important factor affecting ecosystem function in **urban rivers and streams**. "Artificial channels" are divided into two categories using the 'channel base material' and 'extent of piping' as the defining variables.

A reach-scale approach to assessment has been adopted to ensure that individual attributes are identified. However management methods may be applied on a catchment or reach basis as appropriate.

3.5.2.3 Urban River and Stream Types

Six river and stream management types have been defined and are described below. Figure 3.1 illustrates how they are assigned using reach and catchment scale attributes.

Type 1 - Stream Mouths and Tidal Reaches of Urban Rivers and Streams

This category includes the lower reaches of **urban rivers and streams** affected directly by tidal flow. The interface between rivers and streams and the marine **receiving environment** at the river and stream mouth are particularly important habitats for inanga spawning. Key spawning zones are grasses or native vegetation on banks around the lower and upper tidal zones.

This category is adjacent to the Coastal Marine Area. Objectives, policies and rules associated with Coastal Protection Areas 1 and 2 in the Auckland Regional Plan: Coastal (ARP:C) have the potential to affect the management of streams in this category. The provisions for network discharges in Chapter

20 of the ARP:C are also linked to the stormwater and wastewater discharge provisions of Chapter 5 of this Plan, including the preparation of ***Integrated Catchment Management Plans*** and network resource consents.

Type 2 - High Value Low Disturbance *Urban Rivers and Streams*

These reaches are relatively unaffected by urban development, characterised by a low amount of impervious area (< 10 percent) in the catchment. Water quality and habitat value in these reaches would be expected to be high. However habitat may be affected by past land management and use. This quality of habitat is rare in ***Urban Areas*** and is valued for ecological function and ***amenity*** value.

Type 3 - Moderately Disturbed *Urban Rivers and Streams*

These reaches occur in catchments with moderate amounts of impervious area (10 – 25 percent), and have been affected by their surroundings, but are typically not highly modified. Natural values are somewhat degraded, however these reaches offer some of the best opportunities for restorative action. Moderately disturbed natural channels are likely to be important for ***fish passage*** and provide habitat for a diverse range of aquatic biota.

Type 4 - Highly Disturbed *Urban Rivers and Streams*

Type 4 ***urban rivers and streams*** have a higher proportion of impervious area (>25 percent) in the catchment, and have often suffered significant erosion. In many cases, the banks of the stream have been modified, but the channel bed is not deemed 'artificial'. Bank side modification may include concrete walls, gabions, and battering. These reaches have lower natural value, but may allow ***fish passage*** to higher quality upper reaches and have populations of more tolerant species present. Within this type a range of values may be present; higher stream quality will likely be represented by a greater complexity of habitat, morphology and vegetation.

Type 5 - Artificial or Concrete Channelised *Urban Rivers and Streams*

Where greater than 50 percent of the channel bed within a reach is constructed of artificial material it is most likely that the catchment is highly urbanised (and tends to have a high proportion of impervious area), and channel modification is the result of works to manage flooding and erosion. Often the natural floodplain has also been confined by development or infilling, and the opportunities for full riparian restoration works are limited, although planting to provide for shade is often feasible.

Type 5 streams tend to have higher and more uniform flow velocities than natural channels. High velocities restrict ***fish passage*** and the uniform channel shape also removes the features that fish and aquatic biota need for shelter such as pools, undercut banks, instream debris and bends. A smooth concrete base also limits the variety of channel substrata (e.g. rocks and woody debris) available to be colonised by plants and animals within the channel, which further limits habitat diversity and food sources. Generally Type 5 ***Urban Rivers and Streams*** have limited riparian cover and this results in higher water temperatures which adversely affect water quality for aquatic biota.

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Type 6 - Piped *Urban Rivers and Streams*

Where more than 50 percent of a reach is piped, the reach can be categorised as a 'piped section'. Piped sections are usually located in highly urbanised areas and are/were often installed for flood protection and to maximise the density of development. Piped reaches represent an almost complete loss of ecosystem function and provide little or no removal of contaminants. The lack of light precludes the establishment of plants and other aquatic biota. A smooth concrete base does not provide the protection needed by fish and other aquatic biota for breeding and resting. Piped reaches have little or no natural value, and represent the maximum degree of stream alteration.

Piped channels affect **fish passage** and the movement of other aquatic biota. Flows in a pipe tend to exhibit higher velocities than natural channels. This can be a barrier to **fish passage** if velocities exceed fish swimming ability. Channel length can also be a problem where no resting areas (low flow zones) exist. **Fish passage** can be restricted through a combination of stream velocity, drop structures, and **culvert** length.

3.5.3 OBJECTIVES

3.5.3.1 To manage **urban rivers and streams** in a way that:

- (a) Maintains high values and enhances degraded values of **urban rivers and streams** in terms of in-stream, amenity, natural character and public access values;
- (b) Recognises the essential function of **urban rivers and streams** in conveying stormwater; and
- (c) Provides for the appropriate use and development of **urban rivers and streams** to accommodate existing development and future growth within **Urban Areas**.

3.5.4 POLICIES

3.5.4.1 In preparing an **Integrated Catchment Management Plan**, a territorial authority should categorise **urban rivers and streams** within the catchment based on the quality of individual reaches and then identify and implement a management approach for those **urban rivers and streams**.

3.5.4.2 In **Urban Areas** which have undergone urban development, **urban rivers and streams** categorisation shall be either:

- (a) The default as defined in Figure 3.1 of this Plan, or
- (b) As contained within a district plan, structure plan, or an **Integrated Catchment Management Plan**, or
- (c) Undertaken as part of a resource consent process.

3.5.4.3 In **Urban Areas** which have yet to undergo urban development, the categorisation in Figure 3.1 of this Plan does not apply. An assessment of the quality of **urban rivers and streams** in these areas should include, but is not limited to the following matters:

- (a) The extent and quality of riparian vegetation (with greater value placed on larger areas of riparian vegetation and native vegetation);

- (b) Stream morphology (with greater value placed upon greater complexity);
- (c) The number and type of macro-invertebrate species present;
- (d) The number and type of native fish present (with greater value placed upon higher numbers of fish and greater variety of fish species);
- (e) The value of the stream in relation to the presence of flood flows;
- (f) The value of the stream in relation to natural character and amenity values;
- (g) Whether the river or stream provides a connection to an area of high in-stream value upstream.

3.5.4.4 The management of **urban rivers and streams** shall recognise the categorisation of the rivers and streams and:

- (a) Provide for their use and development in a manner consistent with the growth projections developed under the Auckland Regional Growth Strategy and related Sector Agreements, and in particular provide for the conveyance of stormwater;

And where practicable

- (b) Avoid adverse effects on **urban rivers and streams** with high in-stream values;
- (c) Maintain and enhance public access;
- (d) Maintain high quality and enhance degraded natural character values;
- (e) Maintain and enhance amenity values;
- (f) Maintain and enhance fish passage having regard to the matters in Policy 2.1.4.7;
- (g) Maintain and enhance riparian vegetation;
- (h) Avoid, remedy or mitigate the adverse effects of erosion on the banks and bed;
- (i) Minimise modification of the bed and banks, particularly in those streams that have low levels of modification or high in-stream values.

3.5.4.5 In addition to the matters in Policy 3.5.4.4 the management of **urban rivers and streams** in **Urban Areas** undergoing development shall:

- (a) Be consistent with any structure plan adopted into a district plan for the area;
- (b) Take opportunities to enhance in-stream, natural character, public access and amenity values.

3.5.4.6 In managing **urban rivers and streams**, the highest priority is to maintain those **urban rivers and streams** with a large proportion of high quality reaches.

3.5.4.7 Those effects on **urban rivers and streams** that are related to catchment wide factors (such as non-point source contaminants and hydrology) shall be managed as part of the Best Practicable Option determined in the relevant **Integrated Catchment Management Plan** or network resource consents.

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3.5.5 MANAGEMENT METHODS

A range of management methods will be required for **urban rivers and streams** including:

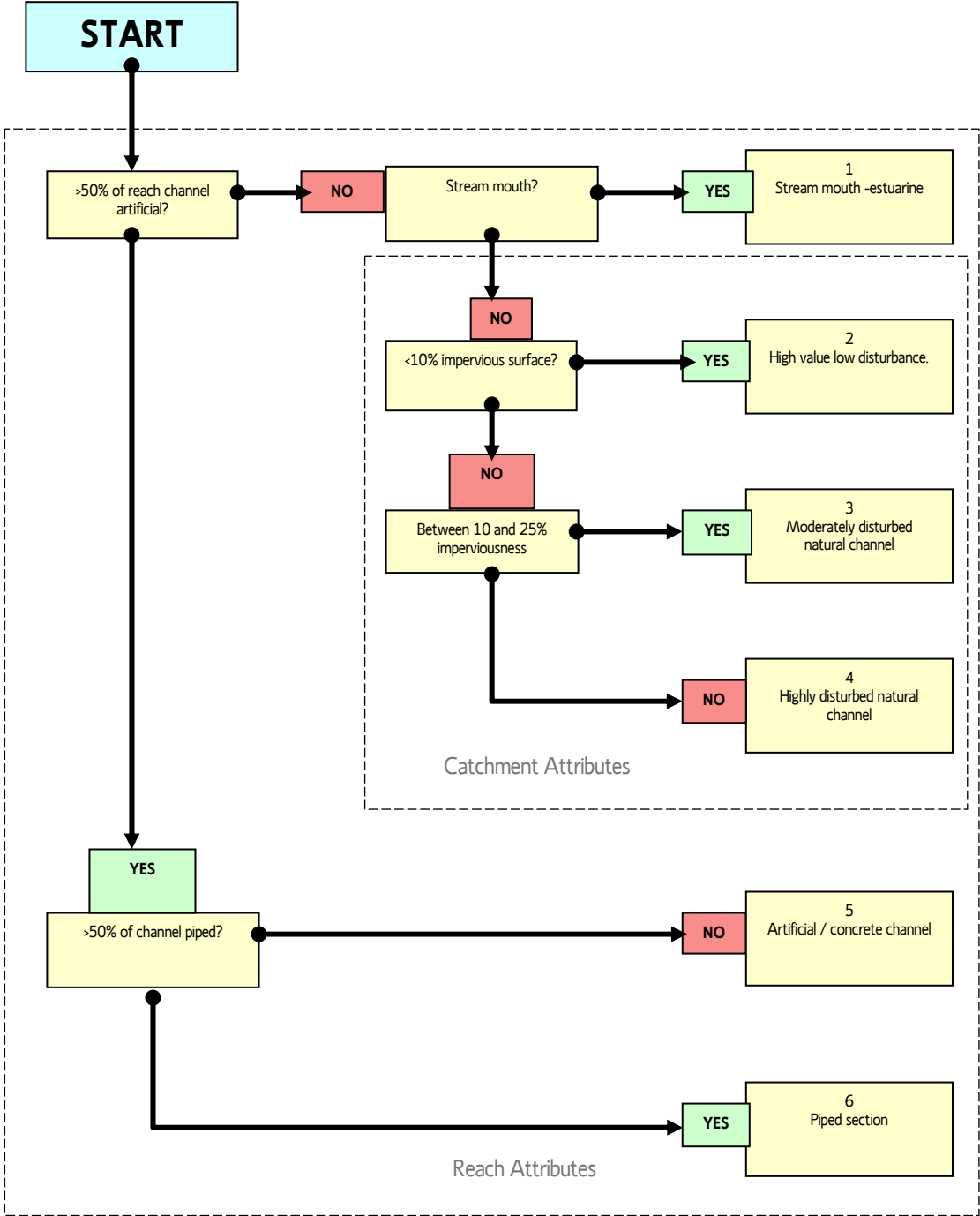
- Catchment scale methods to manage the adverse effects of impervious area on water quality and hydrology;
- Reach scale methods to manage the adverse effects on structural modifications and lack of riparian cover on habitat quality; and
- Site scale methods to manage the adverse effects of structures and activities.

The objectives and policies set out in Sections 3.5.3 and 3.5.4 provide a framework for the development of policies and actions which should be considered in the development of structure plans, **Integrated Catchment Management Plans** and the processing of resource consents.

TAs must inevitably prioritise the implementation of management actions, taking into account the resources that are available. A district or catchment wide prioritisation process could be used to ensure the greatest benefit to ecosystems and the community is achieved. Urban catchments with native bush, semi-rural land use, and in the early stages of urban development should receive the highest priority for implementation through local and district plans, catchment management plans, and **structure plans**. Alternatives to **culverting** and piping of **urban rivers and streams** should also be considered as part of development and **structure planning** processes and by resource consent applications for regionally significant infrastructure or other development affecting significant areas of land.

A Technical Publication called “Framework for the Assessment and Management of Urban Streams in the Auckland Region” has been developed and is available to assist in the implementation of these management areas (ARC TP 232 August 2004). Note that this document may be updated to reflect changing management methods over time.

Figure 3.1 Flow Chart for Assigning Urban River and Stream Types Described in Section 3.5.2.2.



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3.6 URBAN LAKE MANAGEMENT AREAS

3.6.1 DESCRIPTION

There are two urban **lakes** in the Auckland Region – Lake Pupuke and Western Springs Lake. Lake Pupuke is formed from an old volcano and is characterised by the absence of any streams flowing in and out of it, with the main source and discharge of water through **groundwater** flow. Western Springs similarly derives its water from **groundwater** flow, but it has an outlet, via a weir into Motions Creek.

Lake Pupuke is surrounded by residential and commercial development. Areas of publicly owned land are interspersed with many private sections fronting directly onto the **lake** shore. In comparison, Western Springs **lake** is surrounded by public reserves.

Both **lakes** are important for their open space, recreational and **amenity** values.

The ARC Lakes Monitoring Programme has shown that Lake Pupuke has the second highest water quality of the seven **lakes** surveyed. However there are signs that this quality is deteriorating, which is mainly due to elevated levels of nutrients. Much of the nitrogen input comes from existing sediments on the **lake** bed, but other nutrient inputs come from discharges of **stormwater**, **wastewater overflows** as well as **fertiliser** runoff from surrounding private gardens and public reserve land.

The ARC does not have detailed information on the water quality of Western Springs Lakes, but it is known to be of lower quality than that of Pupuke. The main sources of contaminants for Western Springs is from faecal matter associated with the duck population.

3.6.2 MANAGEMENT APPROACH

The purpose of the Urban Lake Management Areas is to recognise the importance of the region's urban **lakes** for recreational and **amenity** purposes. In both **lakes**, effects on the **lake** margins and the quality of water entering the **lakes** is significantly influenced not only by the provisions of this plan, but also by district plan controls, management practices on publicly owned reserves and public education. For example, education of landowners with properties fronting Lake Pupuke on best management practices for the application of garden **fertiliser** will help to reduce levels of nutrients entering the **lake** by **surface water** flows.

The overall management approach of this plan is to maintain and where practicable enhance water quality for ecosystem health and **amenity** values. The emphasis is on avoiding further modification to the margins of Lake Pupuke by **reclamation** and shoreline protection works, minimising discharges of contaminants, maintaining the open nature of both **lakes** by controlling further structures within them and avoiding significant disturbance to the **lake** beds.

As both **lakes** are surrounded by urban development, both have been impacted by discharges of **stormwater** and **wastewater**. It is recognised that this may continue in the foreseeable future. The ability to reduce discharges of **stormwater** or **wastewater overflows** will be addressed as part of the overall **stormwater** and **wastewater network** management strategy.

3.7 HIGH USE STREAM MANAGEMENT AREAS

3.7.1 DESCRIPTION

A number of streams in the Auckland Region are under pressure from demands for water **take**, or use by a number of users. The values of these streams are threatened by high use or **take** and they are identified as ‘high use streams’. High Use Streams are all the streams within the following catchments and sub-catchments:

- Whangaripo Stream (a sub-catchment of the Hoteo River catchment);
- Mahurangi River;
- Waitoki, Waikahikatea and Waipapakura Streams (sub-catchments of the Kaukapakapa River catchment);
- Waimauku Stream and Kumeu River (sub-catchments of the Kaipara River catchment);
- Puhinui Stream in Manukau City;
- Taitaia Stream (a sub-catchment of the Wairoa River catchment);
- Hays Creek;
- Ngakoroa, Mauku and Waitangi Streams in Franklin District.

These rivers and streams are identified on the plan maps.

3.7.2 MANAGEMENT APPROACH

The purpose of this management area is to ensure that **take** is enabled while maintaining the life-supporting capacity and amenity values of these streams. Accordingly, other than the ability to **take** water as permitted by section 14 of the RMA, the majority of **takes** will need to be carefully evaluated and managed, generally through the resource consent process, to ensure that the use, ecological and amenity values of these rivers and streams are maintained and where possible enhanced.

3.8 HIGH USE AQUIFER MANAGEMENT AREAS

3.8.1 DESCRIPTION

Aquifers are important as direct sources of water supply for domestic, industrial and rural use. They are also the major contributors to the **base flow** of many streams, particularly in the southern parts of the region. As such, **aquifers** contribute to the overall quality and diversity of **surface water** bodies.

Some **aquifers** in the Auckland Region are under threat, being highly allocated (more than fifty per cent allocated and/or are major sources of spring and stream flow), and/or being adversely affected by over pumping, or are in areas of high potential growth where they are very likely to become highly allocated over the life of the Plan. These **aquifers** have been identified as High Use Aquifer Management Areas. In order to continue to meet existing and future water **take** demands and to provide **base flow** for surface streams, careful management of **water availability** within these **aquifers** is required. The management areas are:

- Kumeu Waitemata

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- Omaha Waitemata
- Tomarata Waitemata
- Onehunga Volcanic
- Mt Wellington Volcanic
- Waiheke (all aquifers)
- Manukau City Waitemata
- Manukau Kaawa
- Clevedon East Waitemata
- Clevedon West Waitemata
- Franklin Volcanic comprising the following aquifers:
 - Bombay Volcanic
 - Glenbrook Volcanic
 - Pukekohe Central Volcanic
 - Pukekohe North Volcanic
 - Pukekohe South Volcanic
 - Pukekohe West Volcanic
- Franklin Kaawa Aquifer comprising the following sub zones:
 - Bombay-Drury Kaawa
 - Karaka Kaawa
 - Pukekohe Kaawa
 - Pukekohe West Kaawa
 - Waiau Pa Kaawa
 - Waiuku Kaawa
- Drury Sand
- Waiwera Geothermal
- Parakai Geothermal

Note:

*The spatial extent of these aquifers is identified on the Management Area Maps. The areas on the ground surface under which these **aquifers** are located are identified on the Management Area Maps. However the 3-dimensional nature of **aquifers** is difficult to portray on a map. There may be more than one **aquifer** under the areas identified on the maps. Only the **aquifers** listed above are High Use Aquifer Management Areas. **Aquifers** not listed above, but located under these areas identified on the maps are not High Use Aquifer Management Areas.*

All aquifers referred to in the Plan, including High Use Aquifer Management Areas are shown on Map Series 2.

Further geological description is provided below to provide plan users with more information on High Use Aquifer Management Areas:

1. *Kumeu Waitemata refers to all aquifers below the ground surface shown on the maps.*

2. *Omaha Waitemata includes all rocks of the Waitemata Group, but does not include alluvium (Tauranga Group) or the underlying greywacke rocks (Waipapa Group).*
3. *Tomarata Waitemata refers to all aquifers below the ground surface.*
4. *Onehunga Volcanic and Mt Wellington Volcanic includes all rocks of the Auckland Volcanic Field within the area shown on the maps; it includes all aquifers below the ground surface and above the Waitemata Group rocks.*
5. *Waiheke refers to all aquifers.*
6. *Manukau City Waitemata includes all rocks of the Waitemata Group, but does not include overlying Tauranga Group or Kaawa Formation.*
7. *Manukau Kaawa includes all aquifers from the ground surface down to the Waitemata Group rocks.*
8. *Clevedon East Waitemata and Clevedon West Waitemata includes all rocks of the Waitemata Group, but does not include the underlying greywacke (Waipapa Group) or the overlying Tauranga Group or Kaawa Formation.*
9. *Franklin Volcanic includes all aquifers from the ground surface to the base of the South Auckland Volcanic Field but does not include the underlying Kaawa Formation or Waitemata Group.*
10. *Franklin Kaawa refers to Kaawa Formation only. It may be overlain by South Auckland Volcanic Field or Tauranga Group, which are not included. The underlying Waitemata Group is not included.*
11. *Drury sand includes Tauranga Group and Kaawa Formation and does not include overlying South Auckland Volcanic Field or underlying Waitemata Group.*
12. *Waiwera Geothermal and Parakai Geothermal refers to all aquifers below the ground surface.*

Plan users are referred to Edbrooke (2001). Geology of the Auckland Area. 1:250,000 Geological Map 3. Institute of Geological and Nuclear Sciences, for further guidance.

3.8.2 MANAGEMENT APPROACH

The purpose of this management area is to manage **aquifers** which are under threat by being highly allocated and/or being adversely affected by over pumping. These **aquifers** have been identified as High Use Aquifer Management Areas. In order to continue to meet existing and future water **take** demands and to provide **base flow** for surface streams, water taken from these **aquifers** needs to be carefully controlled and managed. Accordingly, the majority of **take** proposals will require some form of resource consent to ensure that these **aquifers** are sustained over time.

3.9 QUALITY SENSITIVE AQUIFER MANAGEMENT AREAS

3.9.1 DESCRIPTION

Quality Sensitive Aquifer Management Areas include those **aquifers** which, due to their geology, have the potential for contamination from the discharge of contaminants to land or into **groundwater**. These **aquifers** are shallow

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and unconfined and hence are susceptible to pollution from surface sources, such as excess **fertiliser** application or discharges of contaminants such as **stormwater** or **sewage**. The potential for contamination is highest in the volcanic **aquifers** where discharge to **aquifers** is most direct. **Protection** of both the quality and quantity of water within **aquifers** is therefore critical. They are important sources of water for rural and industrial purposes, as well as providing **base flow** to surface streams in some areas. There are two main groupings of Quality Sensitive Aquifers. The first are rural:

- Kaipara Sand
- Franklin Volcanic
- Awhitu Sand

The second group of **aquifers** underlies the city on the Auckland isthmus. Land uses include both residential development as well as areas of industry. They are known as the Auckland Isthmus Volcanics and include the Onehunga and Mt Wellington aquifers. These urban **aquifers** are used to dispose of **stormwater** from both roads and private property. Some **aquifers** such as Onehunga and the Wiri Volcanic aquifer (located outside of the Auckland isthmus) also provide municipal water supply.

[E479/04/41 and E479/04/44 Contact Energy Ltd]

3.9.2 MANAGEMENT APPROACH

The main purpose of this management area is to protect the quality of the water within the **aquifers**. Discharges of contaminants are discouraged where this is likely to have significant adverse effect on the quality of water within these **aquifers**. A discharge consent application will generally require a determination of the potential effects of the discharge on the **aquifer** concerned.

[E509/04/32 and E509/04/33 and 119 Watercare Services Ltd]

3.10 INDUSTRIAL AIR QUALITY MANAGEMENT AREAS

3.10.1 DESCRIPTION

The Industrial Air Quality Management Areas apply to specific industrial areas within the Metropolitan Urban Limits as defined in the Auckland Regional Policy Statement. They overlay specific industrial zones within some district plans. These zones are generally the larger industrial areas catering for ‘heavier’ industrial activities. Auckland City, Manukau City and Papakura District Councils have specific provision within their District plans for the discharge of contaminants to air from heavy industry. These district plans support **reduced** amenity and are therefore suitable as areas to promote industrial intensification. The Industrial Air Quality Management Areas apply to:

- Most of the Business 5, and all of the Business 6 zones within the Auckland City Isthmus Plan. The areas are, Penrose, Otahuhu, Onehunga and Avondale;
- The Business 6, and some Quarry zones in the Manukau City District Plan. These areas are, Otahuhu, Favona, Wiri, and East Tamaki;

- The ‘Auckland International Airport’ zone and the Mangere Waste Water Treatment Plant (including the Odour Boundary) as designated in the Manukau City District Plan;
- The Contact Energy Ltd power station site at Otara either side, and including part, of Highbrook Drive, Otara; and
- The Industrial 3 and 4 zones within the Papakura District Plan.

While the land designated for the Auckland International Airport has been included within the Industrial Air Quality Management Area it not appropriate for heavy industrial activities to be located within this area. The land has been included to provide for the continued operation and sustainable management of the Auckland International Airport and associated activities. The management approach for the Auckland International Airport land designation within the Industrial AQMA is to maintain levels of **amenity** while enabling ‘airport’ related activities as outlined in Designation 231 and the Airport Zone in the Operative Manukau District Plan.

Land designated in the Operative Manukau District Plan for the operation of Mangere Wastewater Treatment Plant (including the Odour Boundary) has also been classified as an Industrial Air Quality Management Area. This facility is regionally significant infrastructure and the land has been included to allow for the continued operation of the Mangere Wastewater Treatment Plant and associated activities. It is not appropriate that other industrial activities unrelated to wastewater treatment locate within this area or for the Odour Boundary area to be utilised for activities that may discharge contaminants into air.

The land owned by Contact Energy Ltd (contained in Certificates of Title NA 137B/367, NA 93A/818 and NA 137B/366, and including that part of Highbrook Drive between SH1 and Otara Lake), used for the generation of electricity, has also been classified as an Industrial Air Quality Management Area. The site provides for regionally significant infrastructure and has been included to allow for the continued generation of energy and associated activities. It is not appropriate that other industrial activities that discharge contaminants into air and which are unrelated to energy generation locate within this area.

The Industrial Air Quality Management Areas are shown on the Maps.

3.10.2 MANAGEMENT APPROACH

The ARC has responsibility for managing the effects of the discharge of contaminants into air while the TAs of the Region have responsibility for managing the effects of the use and development of land.

The purpose of the Industrial Air Quality Management Areas is to integrate the management of land use planning, set out in the district plans, and air quality in terms of the ARC’s responsibilities. The land use zonings established in the district plans are generally considered the appropriate locations for a range of industrial activities. Accordingly, to ‘encourage’ industrial activities to locate within these zones there is a ‘less stringent’ consenting and policy regime for activities that discharge contaminants into air within the Industrial Air Quality Management Areas.

This approach seeks to avoid issues of **reverse sensitivity** and conflicts between incompatible and competing land uses. That is, the Industrial Air

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Quality Management Areas, in conjunction with the district plan provisions, seek to limit the establishment of activities sensitive to heavy industry within these areas. Activities sensitive to air discharges include residential and community facilities, which bring significant numbers of people, particularly children, sick or the elderly into the area, and other activities such as retail premises, offices, and car sales yards.

It is important to recognise that conflicts along boundaries where expectations of **amenity** levels are likely to differ need to be managed, taking into account, among other matters, the relevant underlying District Plan zone provisions.

The Plan recognises that there are discharges to air from existing industrial activities located outside the Industrial Air Quality Management Areas. These activities will be required to manage their effects in a manner that is commensurate with their receiving environment, including the underlying District Plan zoning, and the Air Quality Management Areas in which they are located.

The Air Quality Targets that apply to Industrial Air Quality Management Areas and All Areas are set out in Table 4.2 Auckland Regional Air Quality Targets of the Plan.

3.11 URBAN AIR QUALITY MANAGEMENT AREAS

3.11.1 DESCRIPTION

The Urban Air Quality Management Areas include the majority of the highly populated areas of the Auckland Region and incorporate residential, commercial, light industrial and other sensitive land uses. The relatively high density of the urban area combined with a wide range of discharges of contaminants into air can result in significant adverse effects on air quality.

The Urban Air Quality Management Area applies to all of the air space within the **Urban Areas** as defined in the Regional Policy Statement, excluding the air space within the Industrial Air Quality Management Areas.

The **Urban Areas** consist of a range of land use zones including most business zones, and all mixed use and residential zones.

Within the Urban Air Quality Management Areas it is recognized that some areas may not be urbanised, in particular areas on the urban fringe and those identified for future urban growth in the district plans of the Region. These areas are usually referred to as Future Urban/Future Urban Development/Urban Growth Special Area/Residential Expansion under the district plan.

In order to address this issue, discharges of contaminants into air from **outdoor burning**, land cultivation or the application of **fertilizer** or lime within Urban Air Quality Management Areas that do not have an operative urban zoning under the relevant district plan and where production land activities are still a permitted activity may be undertaken in accordance with the provisions relating to Rural Air Quality Management Areas in this Plan until the zoning is changed to operative urban zoning through the district plan statutory process.

The Urban Air Quality Management Areas are shown on the maps. Areas that are subsequently included within the MUL through future changes to the ARPS will be brought within the Urban Air Quality Management Area through

a Variation or Change to Map Series 1 and 1A of the Plan either jointly with the Change by which the MUL is extended or if this is not possible then at the earliest practicable time thereafter.

3.11.2 MANAGEMENT APPROACH

The purpose of the Urban Air Quality Management Areas is to ensure a high level of **amenity** commensurate with the relevant provisions of the underlying District Plan zones and to protect human health, particularly for sensitive sectors of the population from the adverse effects of air discharges.

A wide range of activities that discharge contaminants to air are permitted within the Urban Air Quality Management Areas. This approach recognises that people need to be able to discharge contaminants into air from various activities such as **domestic heating**, restaurant cooking, **barbecues**, spray painting and lawn mowers. These Permitted Activities are subject to conditions that control aspects of the discharge including odour, dust, fumes, smoke, mists, haze, vapours, **hazardous air pollutants** and the over-spraying of paints and other substances.

Where proposed activities are known to have potentially significant adverse effects, either a resource consent is required or in some cases the activities are prohibited. An example of a Prohibited Activity within the Urban Air Quality Management Areas, primarily due to a reduction in **amenity** from smoke and odour, is the discharge of contaminants from **outdoor burning**.

It is important to recognise that conflicts along boundaries where expectations of **amenity** levels are likely to differ need to be managed, taking into account, among other matters, the relevant underlying District Plan Zone provisions.

The Air Quality Targets that apply to Urban Air Quality Management Areas and All Areas are set out in Table 4.2 Auckland Regional Air Quality Targets of the Plan.

3.12 RURAL AIR QUALITY MANAGEMENT AREAS

3.12.1 DESCRIPTION

The Rural Air Quality Management Areas applies to all of the air space outside of the Urban, Industrial, and Coastal Marine Air Quality Management Areas. The Rural Air Quality Management Areas are shown in Map Series 1 and 1A and include Little Barrier and Great Barrier Islands.

3.12.2 MANAGEMENT APPROACH

The purpose of the Rural Air Quality Management Area is to enable 'rural' activities to exist whilst maintaining appropriate levels of **amenity**. Activities that may discharge contaminants into air include pastoral farming, horticulture, **intensive livestock farming**, forestry and quarrying. Many of these discharges into air are permitted activities subject to conditions which aim to protect human health and achieve an appropriate level of **amenity** for people who live and work within these areas.

One of the main differences between the provisions of the Rural and Urban Air Quality Management Areas is that **outdoor burning** of vegetation is permitted

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in rural areas. Discharges to air from the type of industrial activities expected within the Industrial Air Quality Management Area are generally not considered appropriate within the Rural Air Quality Management Area due to the potential adverse effects on human health and **amenity**. At the same time activities such as quarrying do not have a choice in terms of location in the same way that other industrial activities do because mineral extraction relies on the presence of natural resources. In some cases a resource consent would be required for discharges from industrial activities such as quarrying within the Rural Air Quality Management Areas.

It is important to recognise that conflicts along boundaries where expectations of **amenity** levels are likely to differ need to be managed.

The Air Quality Targets that apply to Rural Air Quality Management Areas and All Areas are set out in Table 4.2 Auckland Regional Air Quality Targets of the Plan.

3.13 COASTAL MARINE AIR QUALITY MANAGEMENT AREA

3.13.1 DESCRIPTION

The Coastal Marine Air Quality Management Area applies to the coastal marine area of the Auckland Region. The coastal marine area is defined in the Operative Regional Plan: Coastal. It includes all of the sea within the Auckland Region. Discharges of contaminants to land or water in the coastal marine area are covered by the Operative Regional Plan; Coastal. However discharges of contaminants into air from activities within the coastal marine area are covered in this plan (Proposed Auckland Regional Plan: Air, Land and Water).

3.13.2 MANAGEMENT APPROACH

There are few direct discharges of contaminants into air from the coastal marine area other than from marine vessels and dry dock activities. Due to this and the nature of the coastal marine area the management approach in this section of the plan is to maintain existing high levels of **amenity**. Unlike the other Air Quality Management Areas, there are no specific provisions that apply to the coastal marine area in this plan. The provisions that do apply are those applying to most discharges of contaminants into air in this Plan and the general objectives and policies of the Operative Auckland Regional Plan: Coastal.

It is important to recognise that conflicts along boundaries where expectations of **amenity** levels are likely to differ need to be managed.