

2. Background

2.1 The District Plan

Marsden Point incorporates an area of around 560 hectares of land zoned 'Business 4' for heavy industrial purposes. At the time of writing, this industrial area encompasses the New Zealand Refining Company (NZRC) oil refinery and associated deep-water port, and a cargo port operated by Northport Limited. Other developments in the same area include the Carter Holt Harvey Ltd Laminated Veneer Lumber Plant and sawmill, utilities and several light industrial operations.

Most of the land in the Marsden Point business zone is currently used for pastoral farming and is under-utilised for industrial purposes. Industrial development is likely to occur in these areas, for example, the recent proposal to re-power the Marsden B power station up to 320 MW. This and other such proposals need to be considered in the light of their potential to have cumulative effects on air quality when combined with existing emissions.

Areas zoned *Living* under the Whangarei District Plan are located at Ruakaka and One Tree Point. Areas to the north and east of Marsden Point at Whangarei Heads are also zoned *Living* including the coastal communities of Urquharts Bay, McGregors Bay, McLeods Bay and Taurikura Bay. Notably, the *Living* zone at One Tree Point is in relatively close proximity to the oil refinery, the largest source of sulphur dioxide discharges in the area.

The District Plan also incorporates areas for future environments including *Business* and *Living* areas and a *Future Marine Village* at Marsden Point. *Future environments* are areas that have been identified to accommodate growth of a particular type over time. If these are developed in the Marsden Point area the present buffer between *Living* and *Business* Environments will be reduced. Any development or land use that proposes to utilise the provisions of the future environment is a discretionary activity and requires consent.

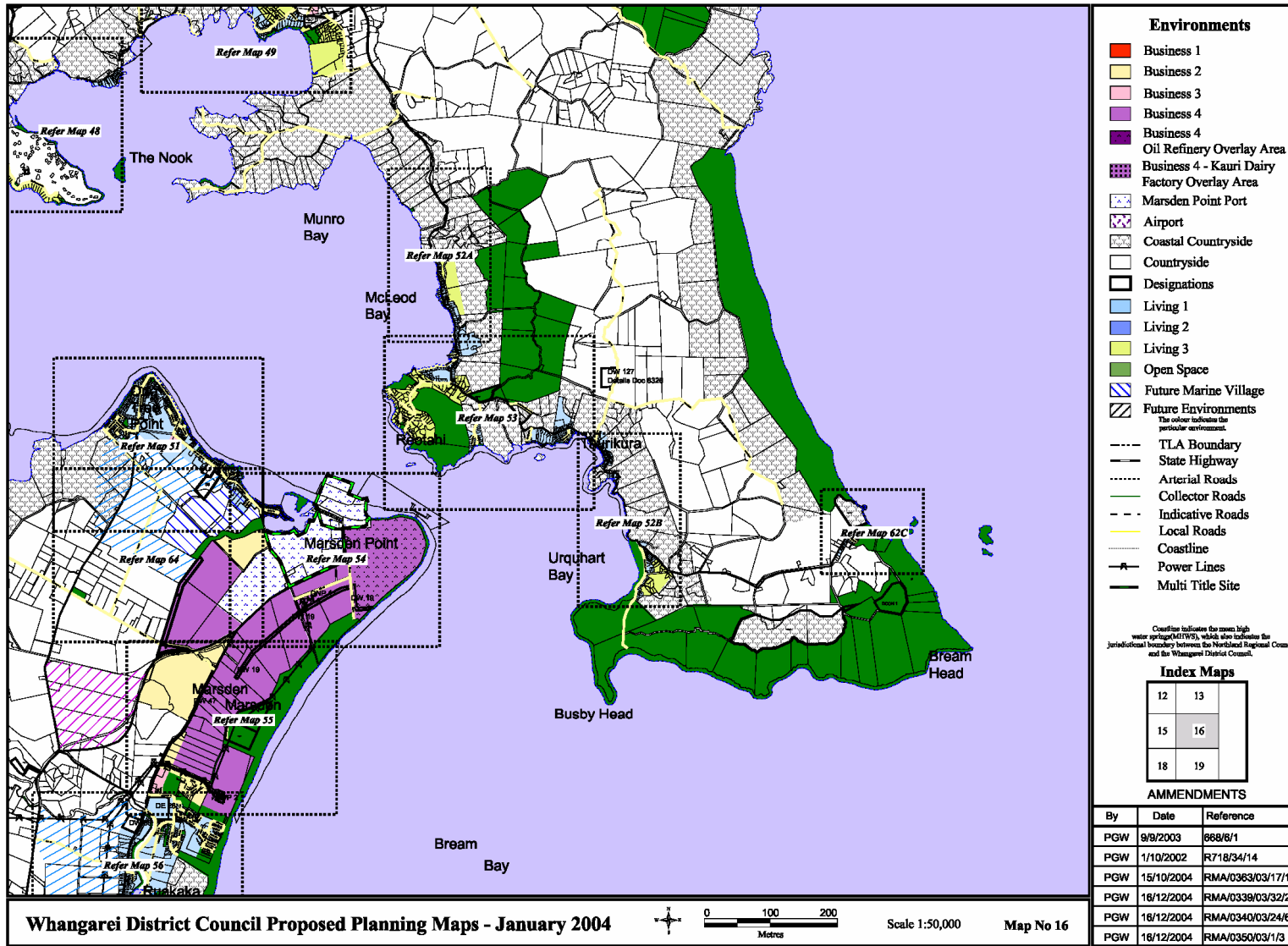
A decreasing buffer between *Living* and *Business* zones creates the potential for conflict from local air quality impacts and introduces the issue of reverse sensitivity. Reverse sensitivity is where a proposed sensitive activity may impose constraints on an existing less-sensitive activity already located within the area. *Auckland RC v Auckland CC (EnvC) A010/97* confirmed that it is appropriate in some circumstances to make provisions addressing reverse sensitivity in district plans. Reverse sensitivity has been specifically incorporated into the Whangarei District Plan as a consideration for consent decisions involving Future, Living and Business Environments and the Future Marine Village Environment. In addition the Plan requires an amenity or buffer strip of at least a 50 m to minimise the reverse sensitivity effects between any Future Living Environment and adjoining Business Environments.

The NRC will continue to promote the consideration of reverse sensitivity effects in the Marsden Point area.

The District Plan classifies land as having significant ecological value within the vicinity of Marsden Point including Mt Manaia, Mt Aubrey and the Bream Head Scenic Reserve.

Figure 2.1 illustrates the District Plan zoning boundaries for the area in question.

■ Figure 2.1 District Plan Zones



2.2 Regional Air Quality Plan

The Regional Air Quality Plan for Northland (RAQP) contains specific policies (Section 6.17) for Marsden Point, which give priority to developing an air quality strategy for the Marsden Point area.

A number of options for the strategy are identified in the RAQP, including relying on the policies in the plan, formulating ambient air quality standards, identifying maximum allowable discharge volumes of particular contaminants, and allowing the transfer of discharge volume allocations between discharges.

The policies for the entire Northland region are set out in section 6.7 of the RAQP. They include ambient air quality guidelines for the region, listed in Table 1, although the RAQP recognises that these guidelines may be subject to change. More recent guidelines have been developed by the Ministry for the Environment (MfE) and may therefore be used as preference.

■ Table 1 Ambient Air Quality Guidelines Listed in the Northland Regional Plan

Indicator	Maximum Acceptable Level ($\mu\text{g}/\text{m}^3$)	Averaging Time
Particulates (PM10)	120	24-hr
	40	Annual
Sulphur dioxide	500	10-min
	350	1-hr
	125	24-hr
Carbon monoxide	50	Annual
	30,000	1-hr
Ozone	10,000	8-hr
	150	1-hr
Nitrogen dioxide	100	8-hr
	300	1-hr
Lead	100	24-hr
	0.5-1.0	3-month
Fluoride –special land use	1.8	12-hr
	1.5	24-hr
	0.8	7-day
	0.4	30-day
	0.25	90-day
	3.7	12-hr
Fluoride – general land use	2.9	24-hr
	1.7	7-day
	0.84	30-day
Fluoride – conservation areas	0.5	90-day
	0.1	90-day
Hydrogen Sulphide	7	30-min

The Regional Coastal Plan for Northland (RCP) covers air quality management in the Coastal Marine Area (CMA) of the Northland Region. The Marsden Point area is influenced by emissions arising from the CMA particularly from shipping, emissions from sources at Marsden Point also influence air quality in the CMA.

The policies relating to the discharge of contaminants into air from activities located within or near to the CMA are set out in section 20.4 of the RCP.

While regard has been had to the policies of the RAQP and the RCP in preparing this strategy, the Strategy has been developed recognising that the Marsden Point area is unique in Northland and requires its own framework of objectives and policies to ensure its future use as an industrial area while maintaining air quality within acceptable limits as set out below.

2.3 National Environmental Standards

The National Environmental Standards (NES) set ambient air quality standards that provide bottom lines for air quality for the whole of New Zealand.

The NES for ambient air quality took effect on 1 September 2005. Table 2 presents the National Environmental Standards 2004. For the full regulations the reader should refer to the *Resource Management (National Environmental Standards Relating to Certain Air Pollutants, Dioxins and Other Toxics) Regulation 2004*, or Ministry for the Environment's website www.mfe.govt.nz.

■ Table 2 National Environmental Standards 2004

Indicator	Threshold Concentration $\mu\text{g}/\text{m}^3$	Averaging Time	Permissible excess
Particulate matter (PM ₁₀)	50	24 hour	One 24-hour period in a 12-month period
Sulphur dioxide (SO ₂)	350	1 hour	9 hours in a 12 month period
	570	1 hour	Not to be exceeded at any time
Carbon monoxide	10,000	8 hour	One 8-hour period in a 12-month period
Nitrogen dioxide (NO ₂)	200	1 hour	9 hours in a 12-month period
Ozone	150	1-hour	Not to be exceeded at any time

These standards supersede two of the guidelines listed in the RAQP. The NES is more stringent than the corresponding NRC guideline, as follows:

- The 24-hour guideline for PM₁₀. The NES allows only one excursion a year above 50 $\mu\text{g}/\text{m}^3$, compared to the NRC guideline of 120 $\mu\text{g}/\text{m}^3$, as a maximum acceptable level; and
- The 1-hour guideline for nitrogen dioxide. The NES allows 9 excursions per year above 200 $\mu\text{g}/\text{m}^3$ compared to the NRC guideline of 300 $\mu\text{g}/\text{m}^3$ as a maximum acceptable level.

2.4 New Zealand Ambient Air Quality Guidelines

New Zealand also has Ambient Air Quality Guidelines (MfE 2002), which provide criteria for the same contaminants listed in the NES but include other averaging periods and other contaminants. Table 3 lists the Ambient Air Quality Guidelines for criteria that are not addressed by the NES.

- **Table 3 New Zealand Ambient Air Quality Guidelines (MfE 2002), excluding criteria addressed by the NES**

Contaminant	Guideline Value ($\mu\text{g}/\text{m}^3$)	Averaging Time
Particulate matter (PM ₁₀)	20	Annual
Sulphur dioxide	120	24-hr
Ozone	100	8-hr
Nitrogen dioxide	100	24-hr
Hydrogen Sulphide	7	1-hour
Lead	0.2	3-month moving average
Benzene	10	Annual
Benzene (year 2010)	3.6	Annual
1.3 Butadiene	2.4	Annual
Formaldehyde	100	30-minutes
Acetaldehyde	30	Annual
Benzo(a)pyrene	0.0003	Annual
Mercury (inorganic)	0.33	Annual
Mercury (organic)	0.13	Annual
Chromium VI	0.0011	Annual
Chromium metal and Cr III	0.11	Annual
Arsenic	0.0055	Annual
Arsine	0.055	Annual
Carbon monoxide	10 000	8-hr

The guidelines listed in the RAQP have stated that any revised national guidelines will be recognised, so the guidelines listed in Table 3 can be applied under the existing Plan. However, it may be appropriate to update the regional guidelines to accommodate the more recent national guidelines, still allowing for future developments. Whatever is done, air quality objectives for the Marsden Point area will, as a minimum, need to comply with the National Environmental Standards.

2.5 Airsheds or Local Air Management Areas (LAMAs)

Several regulations in the NES refer to 'airsheds'. These attach monitoring, reporting, and consent decision requirements. The term 'airsheds' is also referred to as a 'Local Air Quality Management Area' (LAMA), since it does not necessarily represent a strict geophysical airshed. At Marsden Point the area of interest centres on the location of large industrial air discharges and extends to areas where future industry may develop (business zones), i.e. it is not a geophysical airshed.

Subclause 14(a) of the NES regulations stipulates that the Minister for the Environment can specify airsheds (which some have referred to as LAMAs) by notice in the *New Zealand Gazette*. Furthermore, the Ministry invited councils to advise decisions for defined airshed(s) by 1 July 2005. Gazetting by this date was to allow 28 days for notification prior to the ambient standards coming into force on 1 September 2005.

Some 'prototype' LAMAs have been defined in a report prepared under the foundation for research, science and technology programme (Fisher *et al*, February 2004). The basis for the prototypes is primarily census area units from Statistics New Zealand, but estimates of emission flux for PM₁₀ from emissions inventory calculations have also been used to categorise the areas. For the Marsden Point area, Fisher *et al* suggest dividing into two airsheds or LAMAs. One is defined as 'Bream Bay', which includes One Tree Point, Ruakaka and areas across the harbour. However the report also suggests a larger LAMA may be necessary for this area.

For many reasons relatively small airsheds may be preferred over larger ones. However, two factors suggest a large airshed (or LAMA) should be considered for Marsden Point:

- The presence of large industrial sources with wide ranging effects; and
- The need to accommodate for transfers of discharge permits.

The need to accommodate permit transfers may be considered the driving factor for a large airshed, particularly given the potential interest in providing for emissions trading. The *Resource Management Amendment Act 2005* is designed to encourage regional council management of resource allocation. However, the Amendment Act specifically states that air discharge permits may only be transferred if "*both sites are in the same airshed as defined by the regulations*". This does not appear to allow for discharges that may cross airshed/LAMA boundaries.

Given this situation, the NRC has defined a relatively large airshed/LAMA that is bounded by the range to the west of Ruakaka and the terrain on Bream Head and encompasses:

- The areas where existing discharges impact to the extent that potential cumulative effects may occur if new sources were developed in their vicinity¹;
- Areas within the vicinity that are zoned *Business* in the District Plan;
- Other areas where future industrial development is likely, such as areas zoned future environments that may become business zones; and

¹ This is tentatively suggested to be where modelled contaminant concentrations are more than one tenth of the relevant ambient air quality standard. Ten percent is chosen to be consistent with the air-quality reporting concept developed for the national indicators programme.

Figure 2.2 is a map of the Marsden Point airshed boundary. This airshed covers an area similar to that discussed by Air and Environmental Sciences Ltd in the pre-planning report for the Marsden Point strategy (Stevenson *et al*, August 2002).

- **Figure 2.2: Airshed for Marsden Point.**

