

**Yashili New Zealand Dairy Company Limited**  
Proposed Milk Processing Plant at Pokeno

**Assessment of Environmental  
Effects related to an Application  
for a Discharges to Air Permit**

**Kevin Rolfe Consulting Limited**

in association with Tonkin & Taylor Limited

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**Kevin Rolfe Consulting Limited**  
Chemical Engineer and Environmental Management Specialist  
26/44 Esplanade Road, Mt Eden, Auckland 1023  
Ph: + 64 9 630 4648      [krolfe@xtra.co.nz](mailto:krolfe@xtra.co.nz)

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## EXECUTIVE SUMMARY

Yashili New Zealand Dairy Company Limited proposes to build a milk processing plant in Pokeno, South Auckland. The two most significant sources of discharges to air from the proposed plant are the milk drier discharge and the combustion processes (i.e., an air heater for the drier and a steam raising boiler). It is proposed that the drier will have a capacity of about 8 tonnes per hour of finished product. The air heating and the steam raising will be achieved solely from the combustion of natural gas. The maximum rate of heat release from the air heater will be about 11 megawatts (MWt) and the boiler about 16 MWt. That is a total rate of heat release of about 27 MWt.

Under the Waikato Regional Plan, the drying of milk or milk products that singly or together has a raw material capacity exceeding 2 tonnes per hour is a discretionary activity. Also the combustion of natural gas with a rate of heat release exceeding 10 MWt is a discretionary activity. Hence, the proposed plant requires a discharges to air permit.

This report is an Assessment of Environmental Effects (AEE) to accompany the application to the Waikato Regional Council for the discharges to air permit. It considers:

- the Statutory requirements;
- the location of the site;
- the sensitivity of the receiving environment;
- the plant and processes relevant to discharges to air;
- the estimated quantities of discharges; and
- the predicted likely ambient air concentrations of contaminants.

The likely ambient concentrations are predicted by dispersion modelling, using methodology approved for use in New Zealand for such assessments.

This assessment concludes:

1. The use of natural gas as the fuel for both the boiler and the air heater much reduces the quantities of discharges of contaminants from those processes.
2. The use of an appropriately sized bag filtration unit at the milk spray drier is the “best practicable option” for collection of PM<sub>10</sub> from the drying process.
3. The atmospheric dispersion modelling shows that the air quality impacts of the discharges from the boiler and the air heater will be negligible and from the milk spray drier will be significant (but less than air quality criteria) at the point of maximum ground level concentration, but minor elsewhere.

## 1. Introduction

Yashili International is a listed company in the Hong Kong Stock Exchange market, with over 20 years of experience in the dairy products and nutritional foods industry. Yashili is now one of the leading suppliers of infant formula milk powder products in the Chinese market manufacturing and marketing a wide range of products under Yashili, Scient and Merla brands. Approximately 80% of the company's revenue achieved from formulated milk powders.

Over the years, Yashili has established good working relationship with New Zealand, using the high quality raw materials imported from New Zealand companies, including Fonterra, Synlait Milk and Open Country Dairy.

Besides strong capability in manufacturing and marketing, Yashili has also invested heavily in research and product development. The R&D Centre has 32 full time research scientists and technicians, who have introduced a number of innovative products to the market. In addition to in house research facilities Yashili engages with external resources, for example industrial experts, nutrition consultants, universities and research institutes, some of them are from overseas.

Yashili has grown its business dramatically and remains focussed on continuous market expansion of infant formula products, so the stable supply of high quality products to meet growing market demand becomes one of company's priorities. Yashili New Zealand Dairy Company Limited is a recently formed company solely owned by Yashili International, with the intention to purchase land in New Zealand and build a plant that will manufacture product to supply China market. The products are nutritional powders and New Zealand has been chosen for its reputation for high standards of product safety, manufacturing expertise and overall image of good product quality.

This green field project will take up to 2 years to complete. The factory will employ about 100 local staff for manufacturing operations, its output capacity will be 50,000 tonnes of formulated milk powder products per year once it is in full commercial production.

The manufacture of nutritional powders for the infant formula market involves mixing imported milk based whey powders and lactose with locally sourced milk that is either supplied from the farm or is recombined from milk powder. Vegetable oils and some milkfat is added and the batch is pasteurised, evaporated then dried. The product is packed under an inert atmosphere in 25 kilogram bags. A proportion of the product will be packed in cans for the consumer market.

Before the plant can be established, various consents under the Resource Management Act 1992 are required. One of those is a discharge permit to authorise discharges of contaminants into air (henceforth referred to as a discharges to air permit). This is an Assessment of Environmental Effects (AEE) to accompany the application for the discharges to air permit. This is that Assessment.

## 2. Statutory Requirements

The proposed site is in the Waikato District and the Waikato Region. Hence the relevant consent granting authorities are the Waikato District Council and the Waikato Regional Council.

Waikato District Council is responsible for processing the applications for land use and earthworks construction consents. The Waikato District Plan has the land use zoning as “Light Industrial”<sup>1</sup>.

The Waikato Regional Council is responsible for processing the application for the discharges to air permit. As will be outlined in section 5, the two most significant sources of discharges to air from the proposed plant are the milk drier discharge and the combustion processes (i.e., an air heater for the drier and a steam raising boiler). It is proposed<sup>2</sup> that the drier will have a capacity of about 8 tonnes per hour of finished product. The air heating and the steam raising will be achieved solely from the combustion of natural gas. The maximum rate of heat release from the air heater will be about 11 megawatts (MWt) and the boiler will each be about 16 MWt. That is a total rate of heat release of about 27 MWt.

Under the Waikato Regional Plan, the drying of milk or milk products that singly or together has a raw material capacity exceeding 2 tonnes per hour is a discretionary activity<sup>3</sup>. Also the combustion of natural gas with a rate of heat release exceeding 10 MWt is a discretionary activity<sup>4</sup>. Hence, the proposed plant requires a discharges to air permit.

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<sup>1</sup> Email from Richard Matthews, Mitchell Partnerships, 25 January 2013.

<sup>2</sup> Email from Jon Tommy, Project Manager, Babbage Consultants Limited, 15 January 2013.

<sup>3</sup> Waikato Regional Plan, Rule 6.1.9.2, which refers to the capacity limit in item 6 of Rule 6.1.9.1.

<sup>4</sup> Waikato Regional Plan, Rule 6.1.9.2, which refers to the rate of heat release limit in Rule 6.1.12.1.

### 3. Location of the Site

The plant is proposed to be built in a site in Pokeno, south of Auckland. An approximate location is identified by the yellow circle in Figure 1. It is about 550m south west of the township of Pokeno. As mentioned in section 2 the land is zoned “light industrial”. The adjacent (lighter purple) area is zoned “Industrial 2”.

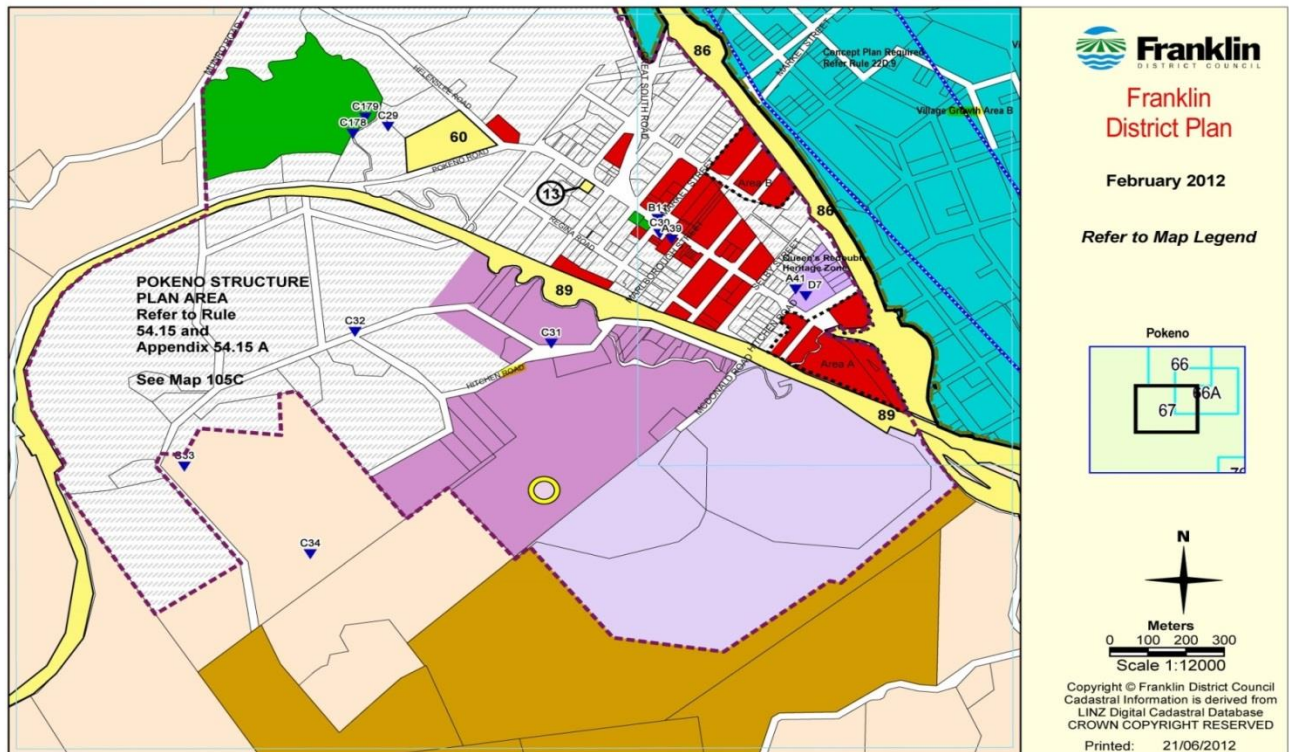


Figure 1: Approximate Location of the Plant

Figure 2 (next page) shows an overlay of the industrial land area of Pokeno on a Goggle map. The red star marks the approximate location of the plant. Covering a wider area than Figure 1, it shows the Auckland-Hamilton Motorway (No. 1 Highway). At its closest point the Motorway is about 990m away.

The most obvious feature of the surrounding area is the predominant rural activities. To the south west of the site is a hill with a telecommunications tower. The sensitivity of the receiving environment is discussed in the next section (section 4).



Figure 2: Google Earth Map of Area with an Overlay of the Industrial Land Area

## 4. Sensitivity of the Receiving Environment

The land use around most of the site is currently agricultural activities. To the south west is a hill with a telecommunications tower. The township of Pokeno is to the north and north east of the site. Beyond that is the Auckland-Hamilton Motorway (No. 1 Highway). Pokeno is well known as the “bacon capital” of the Waikato Region. Whilst the Motorway bypasses the township (whereas the previous No. 1 Highway was up the main street) there are outlets for the bacon at a nearby service centre on the Motorway.

According to the 2006 Census<sup>5</sup>, Pokeno had a population of 1,761 and there were 597 occupied dwellings. Compared with the Waikato region as a whole, Pokeno has:

- a higher percent of the population aged under 15 years and a lower percent aged 65 years and over;
- a higher percent being of European ethnicity and a lower percent Maori;
- a higher percent of employed people in the Manager classification and a lower percent Labourers;
- similar levels of education;
- higher income levels;
- a higher house access to motor vehicles;
- a higher level of home ownership; and
- a greater level of access to telephones (both fixed line and cell phones), the internet and facsimile.

With the changing land use around Pokeno indicated in the Franklin District Plan (see Figure 1) – i.e., the establishment of the industrial areas to the SW and residential/village concepts to the NE – those income, education and home ownership statistics are likely to continue to exceed those for the Waikato region as a whole. Also, with its location next to the Motorway and relatively close proximity to both Auckland and Hamilton, Pokeno is ideally placed to continue to expand as a residential area for people working in those cities.

In Figures 3 & 4 are wind roses from the nearby Pukekohe meteorological station, for respectively 2009 and 2010. They show the prevailing winds are from the W, WSW and WNW. Hence it is likely that the locations of the concentrations will be down those prevailing wind directions (that is, towards the southern end of Pokeno township and beyond).

However, the presence of the hill will influence the dispersion. Also, the location of the points of discharge will be an important factor. These matters will be addressed in the atmospheric dispersion modelling.

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<sup>5</sup> <http://www.stats.govt.nz/Census/2006HomePage>

CALMET.DAT: Interpolated to [(I,J)=( 40.500, 40.500)] [(X,Y)km=( 324.500, 5875.500) in MODEL Projection]  
Height = 10.00 m; [Jan 1, 2009 - 2:00:00 AM to Dec 31, 2009 - 11:00:00 PM (UTC+1200)]  
Annual(Jan to Dec): Total Periods = 8758; Valid Periods = 8758 (100%); Calm Wind Periods = 152

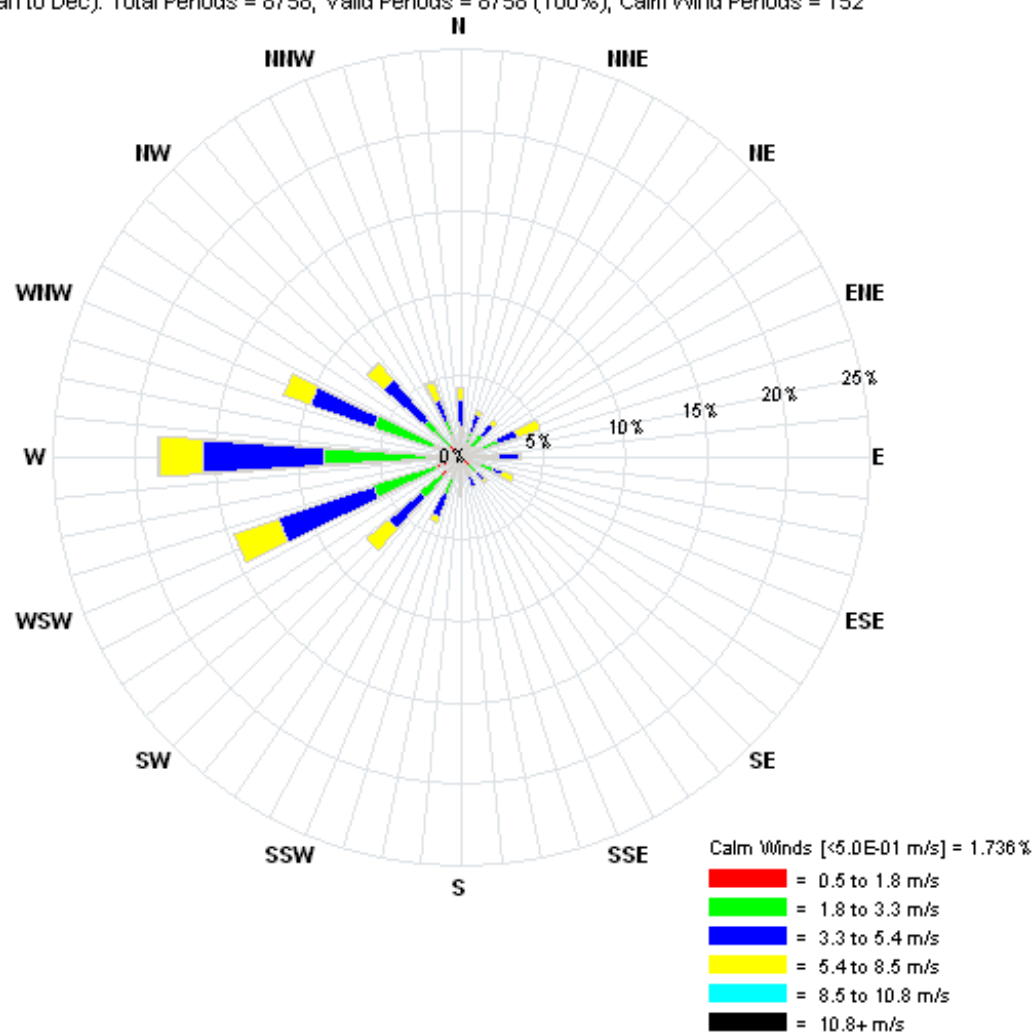


Figure 3: Wind Rose from Pukekohe Meteorological Station for 2009

CALMET.DAT: Interpolated to [(I,J)=( 40.500, 40.500))][(X,Y)km=( 324.500, 5875.500) in MODEL Projection]

Height = 10.00 m; [Dec 30, 2009 - 2:00:00 AM to Dec 31, 2010 - 11:00:00 PM (UTC+1200)]

Annual(Jan to Dec): Total Periods = 8806; Valid Periods = 8806 (100%); Calm Wind Periods = 160

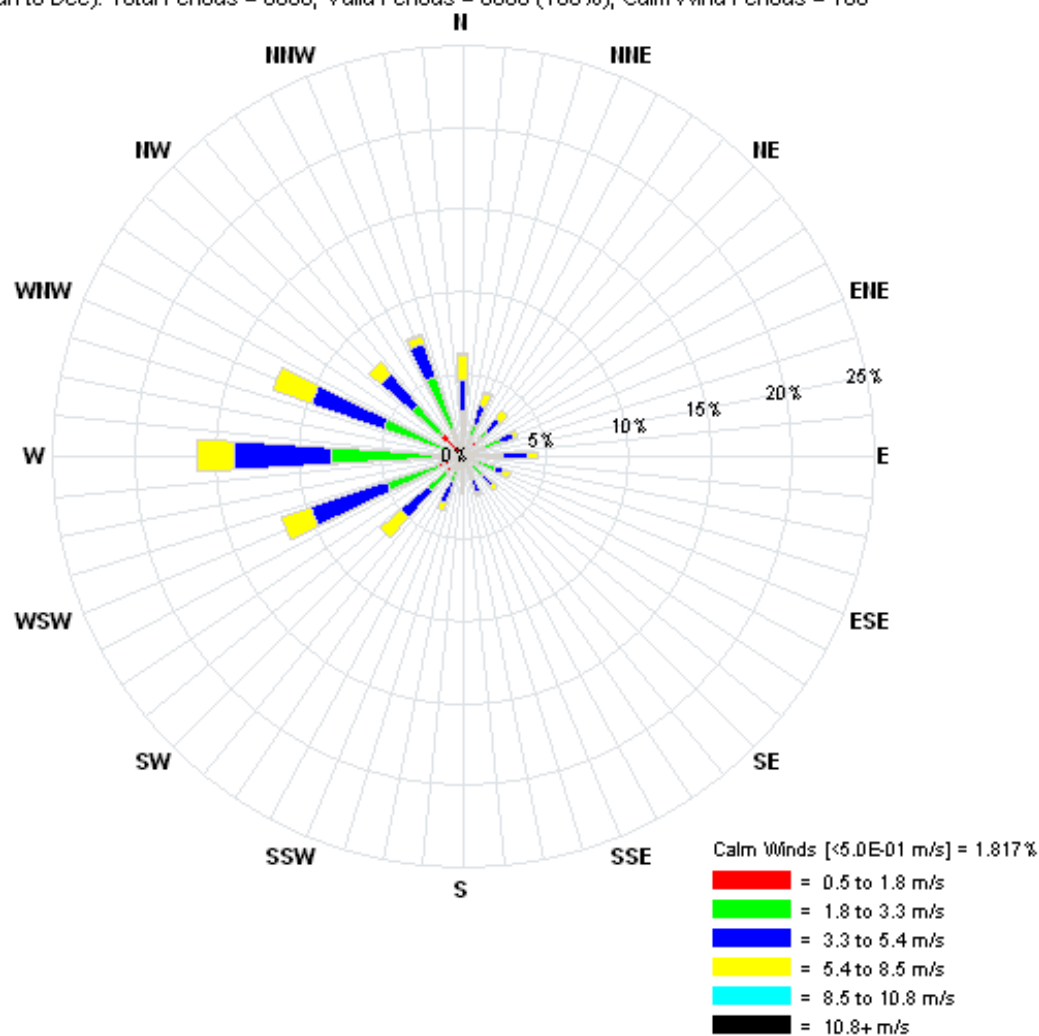


Figure 4: Wind Rose from Pukekohe Meteorological Station for 2010

## 5. Plant and Processes relevant to Discharges to Air

The two most significant sources of discharges to air from the proposed plant would be the milk drier discharge and the combustion processes (i.e., an air heater for the drier and a steam raising boiler). It is proposed<sup>6</sup> that the drier will have a capacity of about 8 tonnes per hour of finished product.

The energy for the drier will be provided by an air heater and a steam boiler. The air heating and the steam raising will be achieved solely from the combustion of natural gas. The energy input to the air heater will be equivalent to about 13 megawatts (MWt), whereas the energy input to the steam boiler heater will be about 20 MWt. The maximum rate of heat release from the air heater will be about 11 MWt and the boiler about 16 MWt.

It is proposed that the milk spray drier will operate 24 hours a day, seven days a week during the dairy season. The actual production rate will vary from day to day depending on the quantity of milk received.

A site layout plan is given in Figure 5 and site elevations in Figure 6.

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<sup>6</sup> Email correspondence from Jon Tommy, Project Manager, Babbage Consultants Limited, 15 January 2013.

AEE for Discharges to Air Permit

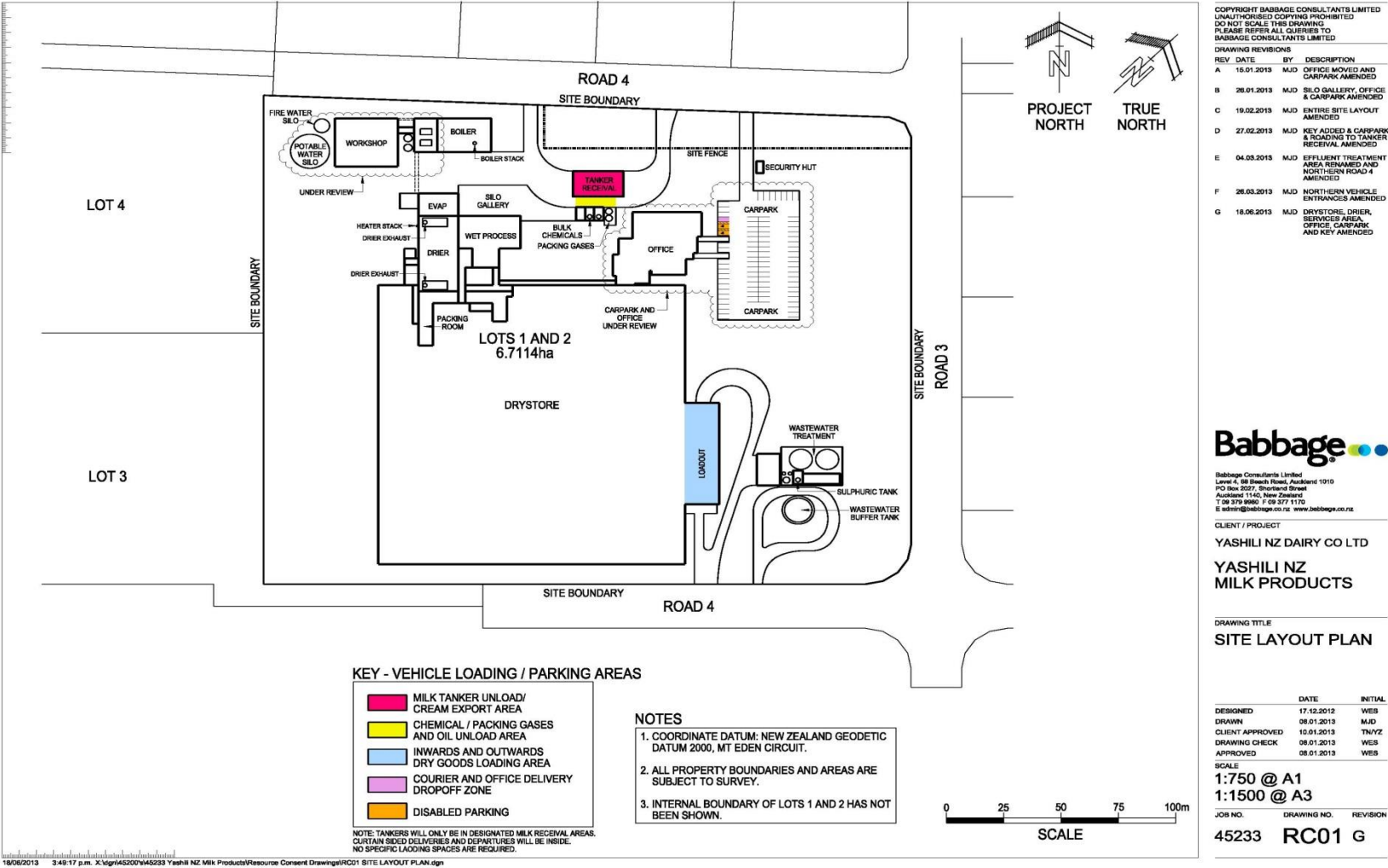


Figure 5: Site Layout Plan

AEE for Discharges to Air Permit

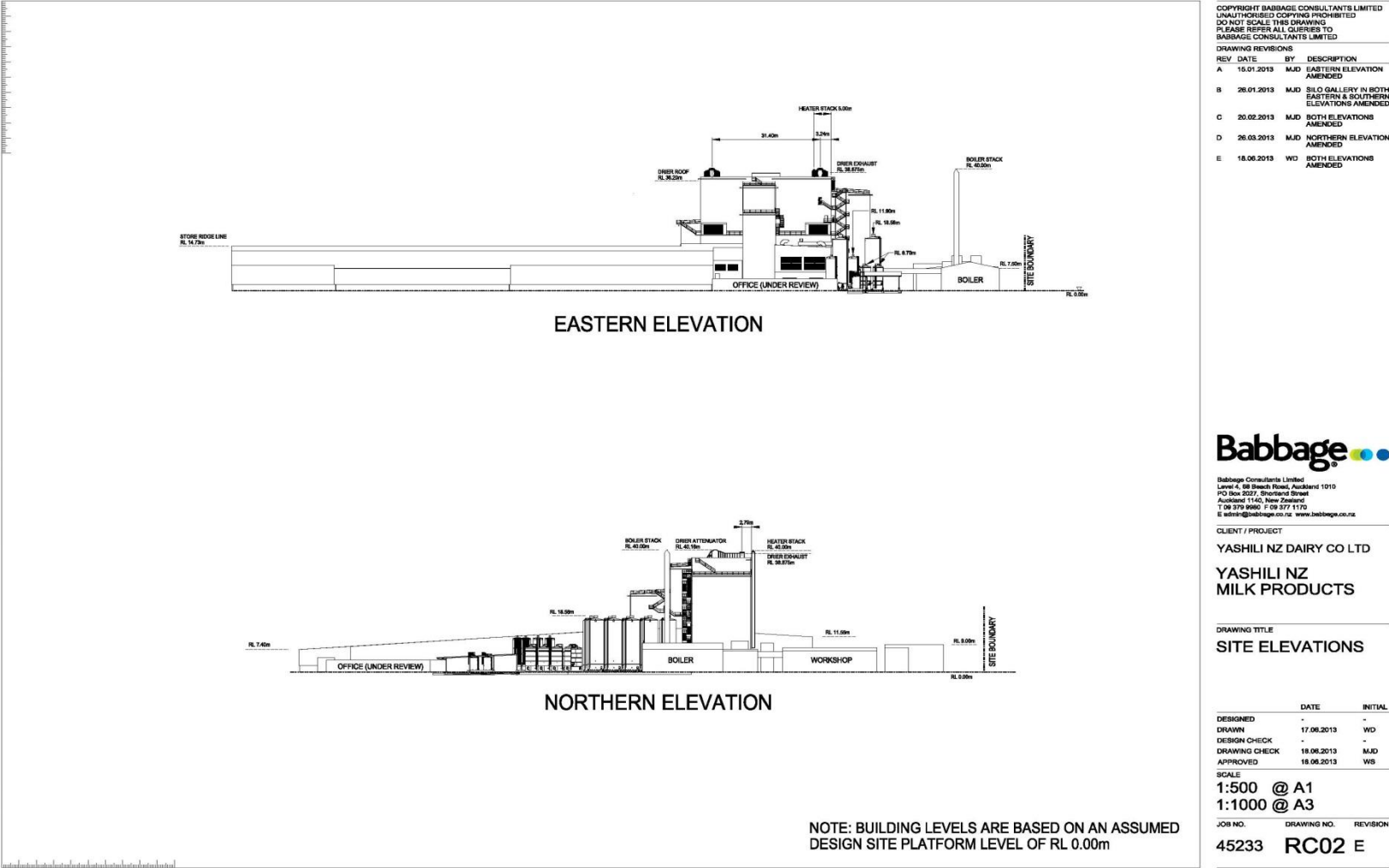


Figure 6: Site Elevations

## 6. Quantities of Discharges

There three sources of discharges will contain the contaminants listed in Table 1.

Table 1: Sources and Nature of Discharges

Source	Contaminants
Gas fired Boiler	PM <sub>10</sub> Nitrogen oxides Carbon monoxide
Gas fired Air Heater	PM <sub>10</sub> Nitrogen oxides Carbon monoxide
Milk Spray Drier	PM <sub>10</sub>

In Tables 2, 3 and 4 (next two pages) the estimated maximum quantities of those discharges are provided. For the discharges from the gas fired boiler and the gas fired air heater, the PM<sub>10</sub> and carbon monoxide concentrations are based on those given in the United States Environmental Protection Agency publication<sup>7</sup> of emission factors for external combustion sources, whereas the concentrations of nitrogen oxides are based on Australian emission factors<sup>8</sup>. The latter were considered more appropriate because they were developed for low NOx burners, the technology proposed to be used at both the boiler and the air heater. In both cases the discharges are estimated at the maximum combustion rates. The concentrations are converted to discharge rates using gas flow rates of 9.6 m<sup>3</sup>/s at 150°C and 5.4 m<sup>3</sup>/s at 150°C, respectively, supplied on behalf<sup>9</sup> of the Yashili New Zealand Dairy Company Limited.

<sup>7</sup> "Compilation of Air Pollutant Emission Factors", United States Environmental Protection Agency publication AP-42, Fifth Edition, January 1995, Chapter 1.4 (Final Section: Supplement D, July 1998), External Combustion Sources - Natural Gas Combustion, Tables 1.4-1 and 1.4-2.

<sup>8</sup> "NPI Emission Estimation Technique Manual for Combustion in Boilers", Australian National Environmental Council publication, version 3.6, December 2011.

<sup>9</sup> Email from Jon Tommy, Project Manager, Babbage Consultants Limited, 17 June 2013.

Table 2: Discharges from Gas fired Boiler

<b>Contaminant</b>	<b>Concentration (mg/m<sup>3</sup>, at 0°C, 1 atm, dry gas basis)</b>	<b>Discharge Rate (g/s)</b>
<b>PM<sub>10</sub></b>	2	0.02
<b>Nitrogen oxides</b>	83	0.51
<b>Carbon monoxide</b>	112	0.69

Table 3: Discharges from Gas fired Air Heater

<b>Contaminant</b>	<b>Concentration (mg/m<sup>3</sup>, at 0°C, 1 atm, dry gas basis)</b>	<b>Discharge Rate (g/s)</b>
<b>PM<sub>10</sub></b>	2	0.01
<b>Nitrogen oxides</b>	46	0.28
<b>Carbon monoxide</b>	109	0.38

For the collection of PM<sub>10</sub> from the milk spray drier a bag filtration unit with polyester bags will be used. This technology is considered the “best practicable option” (as defined in the Resource Management Act 1991<sup>10</sup>). The size of the bag filtration unit has been assessed and it was found that the maximum filtration velocity (i.e., the volumetric flow rate divided by the surface area of the bags) complies with standard criteria for such equipment. The concentration of PM<sub>10</sub> should not exceed 15 mg/m<sup>3</sup> (0°C, 1 atm, dry gas basis). That is the value used in Table 4. Again, the concentrations are converted to discharge rates using gas flow rates for each of the two stacks of 59.6 m<sup>3</sup>/s at 90°C, supplied on behalf<sup>11</sup> of the Yashili New Zealand Dairy Company Limited.

Table 4: Discharges from Milk Spray Drier Stacks

Contaminant	Concentration (mg/m <sup>3</sup> , at 0°C, 1 atm, dry gas basis)	Discharge Rate (g/s)
PM <sub>10</sub>	15	0.41

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<sup>10</sup> Resource Management Act 1991, Public Act 1991 No. 69, section 2 (Interpretation).

<sup>11</sup> Email from Jon Tommy, Project Manager, Babbage Consultants Limited, 17 June 2013.

## 7. Likely Ambient Concentrations of Contaminants

To estimate ambient concentrations of contaminants, atmospheric dispersion modelling is used. The models use the following data:

- contaminant discharge rate;
- characteristics (height, efflux velocity, presence of buildings, etc) of the discharge point;
- local topography;
- meteorology of the area; and
- background ambient concentrations of contaminants

The contaminants considered are particulate matter (PM<sub>10</sub>) from the drier stacks, and the products of combustion (nitrogen oxides, carbon monoxide and PM<sub>10</sub>) from the boiler stack. It is assumed that the drier will be indirectly-fired, and hence the drier discharge will not contain any combustion gases.

Use is made of the CALPUFF/CALMET<sup>12</sup> and The Air Pollution Model (TAPM)<sup>13</sup> dispersion models. These are recommended<sup>14</sup> for use for air quality assessments in New Zealand, and they have become the most commonly used. As the names suggest, CALPUFF/CALMET were developed by researchers in California, USA, whereas TAPM was developed by scientists at the Australian Commonwealth Scientific and Industrial Research Organisation (CSIRO). The latest available versions of the two models were used.

The specific methodology is the CALPUFF/CALMET dispersion model suite, with a two year meteorological dataset based on available surface meteorological data (eg. from the Pukekohe meteorological station. A 'synthetic' upper air dataset was prepared using the TAPM meteorological model. The CALMET model produced the wind roses given in Figures 3 and 4 above.

The physical characteristics of the discharge points are given in Table 5 (next page).

Detailed results of the dispersion modelling are given in the Appendix. Table 6 (two pages over) gives a summary of those results including the locations of the points of maximum ground level concentrations at or beyond the boundary of the plant. Those locations occur on or near the south western, eastern and southern site boundaries. The wind roses shown in Figures 3 and 4 indicate the prevailing winds are from the W, WSW and WNW, suggesting the locations of the concentrations will be down those prevailing wind directions. The fact that they are not is fully explained by building downwash. That is, the locations of the points of maximum ground level concentrations are consequence of building downwash.

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<sup>12</sup> [www.src.com/calpuff/calpuff1.htm](http://www.src.com/calpuff/calpuff1.htm)

<sup>13</sup> [www.dar.csiro.au/tapm](http://www.dar.csiro.au/tapm)

<sup>14</sup> "Good Practice Guide for Assessing Discharges to Air from Industry", Ministry for the Environment, June 2008.

Table 5: Physical parameters of discharge points<sup>15</sup>

Source	Diameter (m)	Height (m)	Efflux Velocity (m/s)	Temperature (°C)
Boiler Stack	0.9	40	15.1	150
Air Heater Stack	0.67	40	15.0	150
Milk Spray Drier Stacks	1.8	39	14.3	90

The concentrations indicated in Table 6 are the incremental increases on ambient air concentrations of the contaminants. To estimate the overall concentrations of the contaminants, allowance needs to be made of background concentrations. Table 7 (two pages over) gives default background air quality concentrations for Auckland<sup>16</sup> for the three contaminants relevant to this assessment, viz. PM<sub>10</sub>, nitrogen dioxide and carbon monoxide. It is considered appropriate to use the Rural default values for PM<sub>10</sub> and nitrogen dioxide, and the Rural Town value for carbon monoxide, as the background concentrations for the Pokeno location.

To assess the significance of the estimated concentrations, they need to be compared with air quality criteria. These are the National Environmental Standards for Air Quality<sup>17</sup>, and these are given in Table 8. For the 1-hr concentrations the 99.9<sup>th</sup> percentile value (i.e., the ninth highest result) are used, in line with standard practice<sup>18</sup>.

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<sup>15</sup> Email from Jon Tommy, Project Manager, Babbage Consultants Limited, 17 June 2013.

<sup>16</sup> Metcalfe, J. and Rolfe, K. (2011), "Use of Background Air Quality Data in Resource Consent Applications", Auckland Council Guideline Document 2011/002.

<sup>17</sup> Resource Management (National Environmental Standards for Air Quality) Regulations 2004, SR 2004/309, as amended by SR 2011/103.

<sup>18</sup> "Good Practice Guide for Atmospheric Dispersion Modelling", Ministry for the Environment, June 2004.

Table 6: Summary of Atmospheric Dispersion Modelling

<b>Year</b>	<b>Contaminant</b>	<b>Maximum Ground Level Concentrations (MGLC) (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>Location of MGLC</b>
<b>2009</b>	PM <sub>10</sub> (24 hour)	15.3	On the south western site boundary
	PM <sub>10</sub> (Annual)	1.5	On the eastern site boundary
	NO <sub>2</sub> (1hr -99.9%ile)	1.5	Approximately 150 metres from the southern site boundary
	NO <sub>2</sub> (24 hr)	1.2	South western site boundary
	NO <sub>2</sub> (Annual)	0.14	Eastern site boundary
	CO (1hr -99.9%ile)	0.020	Approximately 150 metres from the southern site boundary
	CO (8hr)	0.018	Approximately 150 metres from the southern site boundary
<b>2010</b>	PM <sub>10</sub> (24 hour)	13.9	On the south western site boundary
	PM <sub>10</sub> (Annual)	1.3	On the eastern site boundary
	NO <sub>2</sub> (1hr -99.9%ile)	1.6	Approximately 150 metres from the southern site boundary
	NO <sub>2</sub> (24 hr)	1.1	South western site boundary
	NO <sub>2</sub> (Annual)	0.13	Eastern site boundary
	CO (1hr -99.9%ile)	0.022	Approximately 150 metres from the southern site boundary
	CO (8hr)	0.020	Approximately 150 metres from the southern site boundary

Note: The NO<sub>2</sub> values are based on the assumption that 10% of the NO<sub>x</sub> is NO<sub>2</sub>.

Table 7: Default Background Air Quality Concentrations for Auckland

Contaminant	Airshed(s)	Averaging Time	Default Value
<b>PM<sub>10</sub></b>	Auckland Urban (Roadside)	24-hour Annual	51 µg/m <sup>3</sup> 19 µg/m <sup>3</sup>
	Auckland Urban & Rural Town	24-hour Annual	40 µg/m <sup>3</sup> 15 µg/m <sup>3</sup>
	Rural	24-hour Annual	23 µg/m <sup>3</sup> 12 µg/m <sup>3</sup>
	Urban	1-hour 24-hour	20 µg/m <sup>3</sup> 8.0 µg/m <sup>3</sup>
	Auckland Urban	Annual	1.0 µg/m <sup>3</sup>
<b>Nitrogen dioxide</b>	Auckland Urban (Roadside)	1-hour 24-hour	115 µg/m <sup>3</sup> 56 µg/m <sup>3</sup>
	Auckland Urban	1-hour 24-hour	80 µg/m <sup>3</sup> 41 µg/m <sup>3</sup>
	Rural Town	1-hour 24-hour	74 µg/m <sup>3</sup> 33 µg/m <sup>3</sup>
	Rural	1-hour 24-hour	37 µg/m <sup>3</sup> 15 µg/m <sup>3</sup>
<b>Carbon monoxide</b>	Auckland Urban (Roadside)	1-hour 8-hour	8.5 mg/m <sup>3</sup> 5.5 mg/m <sup>3</sup>
	Auckland Urban	1-hour 8-hour	5.0 mg/m <sup>3</sup> 2.5 mg/m <sup>3</sup>
	Rural Town	1-hour 8-hour	4.0 mg/m <sup>3</sup> 2.0 mg/m <sup>3</sup>

Table 8: Assessment Criteria

Contaminant	Concentration	Averaging Time	Allowable Exceedances of Standards per year
<b>PM<sub>10</sub></b>	50 µg/m <sup>3</sup>	24-hour	One
	20 µg/m <sup>3</sup>	Annual	-
<b>Nitrogen dioxide</b>	200 µg/m <sup>3</sup>	1-hour	Nine
	100 µg/m <sup>3</sup>	24-hour	-
<b>Carbon monoxide</b>	30 mg/m <sup>3</sup>	1-hour	-
	10 mg/m <sup>3</sup>	8-hour	One

Table 9 gives a comparison of the estimated concentrations (that is, the maximum ground level concentrations plus the background concentrations) with the assessment criteria.

Table 9: Comparison with Assessment Criteria

Contaminant	MGLC plus background concentration ( $\mu\text{g}/\text{m}^3$ )	Assessment Criteria ( $\mu\text{g}/\text{m}^3$ )	Comparison with Assessment Criteria
PM <sub>10</sub> (24 hour)	38	50	74%
PM <sub>10</sub> (Annual)	13	20	55%
NO <sub>2</sub> (1hr -99.9%ile)	38	200	19%
NO <sub>2</sub> (24 hr)	16	100	16%
CO (1hr -99.9%ile)	4,000	30,000	13%
CO (8hr)	2,000	10,000	20%

For all three contaminants the estimated concentrations are less than the assessment criteria. The background concentrations are dominant, as indicated in Table 10. The ratios of the MGLCs to the background concentrations vary from 0.000005 to 0.6. That is, the contributions of the discharges to the MGLCs range from negligible to significant.

Table 10: Contribution of Discharges to Estimated Concentrations

Contaminant	MGLC ( $\mu\text{g}/\text{m}^3$ )	Background Concentration ( $\mu\text{g}/\text{m}^3$ )	MGLC/Background Concentration
PM <sub>10</sub> (24 hour)	15	23	0.6
PM <sub>10</sub> (Annual)	1.4	12	0.1
NO <sub>2</sub> (1hr -99.9%ile)	1.6	37	0.04
NO <sub>2</sub> (24 hr)	1.2	15	0.08
CO (1hr -99.9%ile)	0.02	4,000	0.000005
CO (8hr)	0.02	2,000	0.00001

## 8. Conclusions

This assessment concludes:

1. The use of natural gas as the fuel for both the boiler and the air heater much reduces the quantities of discharges of contaminants from those processes.
2. The use of an appropriately sized bag filtration unit at the milk spray drier is the “best practicable option” for collection of PM<sub>10</sub> from the drying process.
3. The atmospheric dispersion modelling shows that the air quality impacts of the discharges from the boiler and the air heater will be negligible and from the milk spray drier will be significant (but less than air quality criteria) at the point of maximum ground level concentration, but minor elsewhere.

## **APPENDIX: Atmospheric Dispersion Modelling**