



Waitakere City Council
Te Taiao o Waitakere

Cleaner Production Programme

Cleaner Production Hazardous Substances Project

**A Survey of the Use, Storage, Recycling and Disposal of
Hazardous Substances by New Lynn and Henderson
Commercial and Industrial Businesses**

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1.0 Introduction

1.1 Hazardous Substance Use in Waitakere City

In early 2000, Waitakere City Council's dangerous goods inspector had estimated that there were potentially 800 – 1,000 commercial, industrial and rural sites that could be storing or using hazardous substances on-site. Approximately 474 of these sites have been identified through Waitakere City Council's dangerous goods database, which identifies sites with dangerous goods licences.

Businesses are "registered" on the database (as a licensed premises for Dangerous Goods storage) because they have a liability to do so under the transitional provisions of the Hazardous Substances and New Organism Act 1996 (replacing the Dangerous Goods 1974). The Hazardous Substance and New Organisms Act, and Regulations, set the threshold quantities over which Dangerous Goods Licences are required – making issues of compliance applicable, for example minimum requirements for storage depots and fire fighting equipment. The onus is on the premises occupier to seek advice on licensing matters including issues of compliance. Waitakere City Council is the agency (as required by the HZNO Act) to administer and enforce the current legislation

Waitakere City Council has been aiding local businesses reduce their environmental impact through cleaner production programmes since 1996. Waitakere City Council has delivered these programmes because it recognises that reactive approaches directed at treating unwanted and undesirable conditions often deal only with symptoms and may leave the causes unchanged, allowing problems, and their associated environmental impacts to reoccur.

The most advanced initiatives have been within the printing industry, which has had a number of issues arising out of the use and disposal of hazardous materials.¹ The programme has been successful with businesses forming a local network, Print Product Information Group (PPIG), to help with the development and maintenance of initiatives, including toxicity reductions for hazardous substances.

The next step was to build upon the experience from the cleaner production printing industry project in reducing the toxicity of hazardous substances used by businesses. Waitakere City Council's Waste Management Plan (draft 1999) proposed to develop a toxic substance database from which less toxic alternatives could then later be researched.

1.2 Cleaner Production Hazardous Substance Project

The full project was entitled the Cleaner Production Hazardous Substance Project. The three stages of the project are:

- | | |
|---------|--|
| Stage 1 | Develop a database of hazardous substances used by businesses in Waitakere City (2001 - 02). |
| Stage 2 | Identify education opportunities to raise the standards of practice in storage, use, recycling and disposal of hazardous substances (2002 - 03). |
| Stage 3 | Identify opportunities to reduce the toxicity of hazardous substances used in Waitakere City (2003 - 04). |

A partnership has been developed between Waitakere City Council's 'cleaner production team' and the Auckland Regional Council's 'pollution control team' for this project as it is seen as an ideal opportunity to connect 'end-of-pipe' pollution control issues with prevention education through cleaner production programmes.

¹ Waitakere City Council Draft Waste Management Plan, April 1999 p 49

1.3 The Survey

The primary objectives of the survey were to:

- Identify the nature and quantity of hazardous substances used by businesses.
- Gain information on company practices in regards to the storage, recycling and disposal of hazardous substances.
- Identify potential environmental issues arising from company practices.
- Gain information to develop targeted education for Stage 2.

To gain in-depth information it was decided to begin the project through area surveys to provide initial data for analysis of the current situation and for comparability. The resulting hazardous substance database would then continue to be added to as ‘Cleaner production’ began working with further businesses.

1.4 Target Areas

New Lynn and Henderson were chosen as appropriate locations for survey areas due to:

- High concentration of businesses within immediate areas.
- Both areas are industrialised with high potential for site usage of hazardous substance.

Table 1 is a summary of industries in Waitakere City as identified by Statistics New Zealand, using the Australian and New Zealand Standard Industrial Classification codes.²

Table 1 ANZSIC Industry Breakdown 2001

Industry Type	New Lynn	Henderson	Waitakere City	Waitakere City %
Manufacturing	135	304	1,082	9.8%
Construction	92	220	2,336	21.1%
Wholesale Trade	86	166	684	6.2%
Retail Trade	284	366	1,507	13.6%
Transport & Storage	23	75	521	4.7%
Property & Business Services	205	436	2,806	25.4%
Personal & Other Services	46	83	451	4.1%
Remaining Industry Codes	148	396	1,667	15.1%
Total	1,019	2,046	11,054	

The predominant industries in Waitakere City are property & business services, 25.4% and construction, 21.1%.

Specifically the predominant industries in New Lynn are retail trade, 27.9%; property & business services, 20.1%; and manufacturing 13.2%. While in Henderson property & business services, 21.3%; retail trade, 17.7%; and manufacturing, 14.9% made up the majority of commerce.

² Coverage consists of all Economically Significant Enterprises (ESE), and these are generally defined as enterprises with greater than \$30,000 annual GST expenses or sales, or enterprises in a GST exempt industry. Data for 2001 may not be comparable with data for 2000 due to the new 'birthing' practice for new units from June 2000. Results therefore may be slightly understated.

1.5 Definition and Classification of Hazardous Substances

The overall objective of the Hazardous Substances and New Organisms Act 1996 (HSNO) is to provide a streamlined and up-to-date system for managing risks from hazardous substances and new organisms (including genetically modified organisms) in New Zealand.

A hazardous substance, as defined by the act, is any substance with one or more of the following intrinsic properties:

- Explosiveness (including both substances and articles and pyrotechnics such as fireworks)
- Flammability
- A capacity to oxidise (that is, to accelerate a fire)
- Corrosiveness
- Toxicity (including chronic toxicity)
- Eco-toxicity, with or without bioaccumulation; (that is, it can kill living things either directly or by building up in the environment)
- Or which on contact with air or water (other than air or water where the temperature or pressure has been artificially increased or decreased) generates a substance with any one or more of the properties mentioned.

Worth noting that a substance can fall into several different classifications, as an example Acetone is a toxic substance as well as flammable.

The HSNO Act also controls compressed containers, if the substance contained falls into any of the afore mentioned categories.

Some examples of hazardous substances are:

- Solvents, for example dry-cleaning fluid or paint thinners
- Printing inks and dyes
- Many resins
- Paints
- Adhesives
- Cleaners

Table 2 *Classification of Dangerous Goods Under the United Nations Classification System*

UN Hazard Class	Sub Class Division	Description
1	1.1	Explosives, Mass
	1.2	Projection
	1.3	Fire and minor projection
	1.4	Minor fire and projection
	1.5	Intensive mass explosion
	1.6	Extremely intensive
2	2.1.1	Flammable Gases
	2.1.2	Aerosols
3	3.1	Flammable Liquids
	3.2	Liquid explosives
4	4.1	Flammable Solids
	4.2	Spontaneously combustible
	4.3	Dangerous when wet
5	5.1	Inorganic oxidisers
	5.2	Organic oxidisers
6	6.1	Acute effects
	6.3	Skin irritation
	6.4	Eye irritation
	6.5	Sensitisation
	6.6	Mutagenicity
	6.7	Carcinogenic
	6.8	Reproductive effects
6.9	Target Organ Effects	
8		Corrosives
9	9.1	Eco-toxin effects (Aquatic)
	9.2	(Soil)
	9.3	(Terrestrial Vertebrate)

For more information on Hazardous Substances and New Organism Act 1996 refer to www.hsno.govt.nz.

2.0 Methodology

2.1 General Approach

To gain the maximum benefit from the survey it was decided to concentrate the effort of the survey to the industrial centres of New Lynn and Henderson.

All volumes of hazardous substances would be included, both large and small. Identifying and quantifying hazardous substances held on commercial or industrial sites would allow for site and area quantification. As it was thought that many businesses might not consider many of the substances used on site as potentially hazardous substances, a door-to-door survey would gain wider coverage of hazardous substances held on site. If it became highly probable that the site did not contain any hazardous substances then the site was discounted from the survey.

The interviewer had some knowledge of hazardous substances for identification, and could provide observational commentary on issues relating to hazardous substance while conducting the survey.

2.2 Description of Areas Surveyed

The data was collected from April to June 2001 with approximately half the time spent in each survey area. A summary of the streets included in the survey are summarised in Table 3.

Table 3 *Names of Streets Surveyed*

New Lynn	Henderson
Astley Avenue	Amokura Street
Binstead Road	Henderson Valley Road
Clark Street	Hickory Avenue
Crum Avenue	Keeling Road
Delta Avenue	Rabone Street
Drury Street	Smythe Road
Great North Road	Southgate Place
Hetana Street	Te Pai Place
McWhirter Street	The Concourse
Portage Road	Woodruffe Avenue
Puriri Street	
Rankin Avenue	
Stock Road	
Titirangi Road	
Veronica Street	
Ward Street	

2.3 Hazardous Substance Questionnaire

The survey questionnaire was broadly based upon the Auckland Regional Council's pollution control form with additional questions added to gain information on environmental management processes, identifying and quantifying the nature of hazardous substances held on site, and information on recycling and disposal methods. A copy is provided in Appendix 1.

The questionnaire was divided into the following sections:

- Business Details and Description
- Environmental Management Policies & Practices
- Hazardous Substance Use
- Hazardous Substance Storage
- Hazardous Substance Recycling & Disposal
- Observations (including follow-up priority)
- Hazardous Substance Inventory

'Prompt sheets' (refer to Appendix 2 for an example) were generated as data was entered into the hazardous substance database to act as a prompt for identifying hazardous substances held on the similar industry group sites. The prompt sheets were designed to minimise hand written content as well as ensure comparability of product names.

2.4 Cleaner Production Hazardous Substance Database

The data from the survey was entered into a Microsoft Access database developed specifically for the project by the Project Manager. The database was tested using data from the pre-survey questionnaire test of six sites and the resulting data was excluded from the survey results for comparability.

The hazardous substance database was developed to be an ongoing tool and data will continue to be added as it is gained through Waitakere City Council's cleaner production programmes or as provided from the Auckland Regional Council's pollution control team.

2.5 Identification of UN Hazard Class

The UN hazard substance class was identified from container labels or Material Safety Data Sheets (MSDS) where possible for each site. Where such information was not available, previous entries for substances entered into the cleaner production hazardous substance database were reviewed for identical product or supplier information or UN number for the hazardous substance in which to gain the hazardous substance class.

If the information could not be gained from the cleaner production hazardous substance database the UN hazard class was verified through an internet based Hazardous Chemical Database developed by the Department of Chemistry, University of Akron, located in Ohio, USA. The Hazardous Chemical Database is intended to be an academic publication and sources information from the 2000 Emergency Response Guidebook ERG2000, 2000; Hazardous Chemicals Data NFPA 49, PC-49-94, 1994; manufacturer/supplier MSDS sheets and a wide range of publicly available governmental documents. The Hazardous Chemical Database can be found at <http://ull.chemistry.uakron.edu/erd/>.

3.0 Results

3.1 Industry Breakdown

In total 187 commercial and industrial sites were visited, 49.2% in Henderson and 50.8% in New Lynn. The approximate even split of sites surveyed in Henderson and New Lynn was an unintended outcome.

In Henderson the majority of the 92 sites were either manufacturing (60.4%) or retail trade (28.5%). Of the 55 sites manufacturing there were 13 metal related sites; 8 food related sites; and 6 furniture related sites. All but one of the Henderson retail trade sites was an automotive related, including 14 smash repairs sites, and 9 automotive repair and services site.

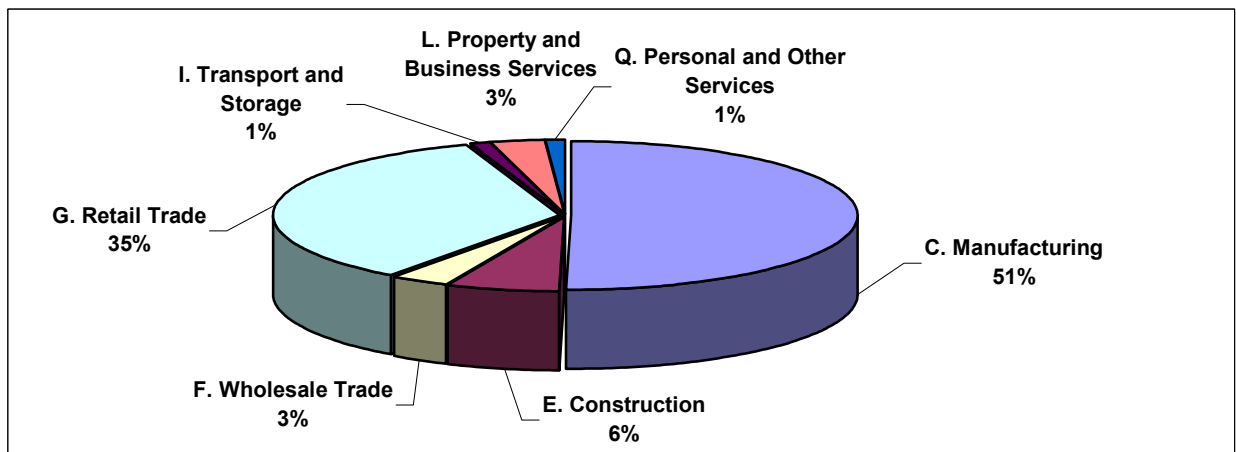
In New Lynn the majority of the 95 sites were either manufacturing (40.6%) or retail trade (40.6%). The nature of the New Lynn manufacturing sites was mixed with no significant group of related industry types present. The majority of New Lynn retail trade sites were automotive related, with 21 automotive repair and services sites, and 9 smash repairs sites.

Table 4 ANZSIC Industry Groups of Sites Surveyed

	Henderson	New Lynn	Total	Total %
C. Manufacturing	55	39	94	50.2%
E. Construction	5	7	12	6.4%
F. Wholesale Trade	2	4	6	3.2%
G. Retail Trade	27	38	65	34.8%
I. Transport and Storage	1	1	2	1.1%
L. Property and Business Services	2	4	6	3.2%
Q. Personal and Other Services	0	2	2	1.1%
Total	92	95	187	100%
	49.2%	50.8%		

Refer to Appendix 3 for a detailed breakdown of the ANZSIC Industry Groups of the sites surveyed and Appendix 4 for summary of the survey results by suburb and by all sites.

Figure 1 ANZSIC Industry Breakdown of Sites



3.2 Environmental Management & Practices

To benchmark the level of consideration given to environmental issues by Henderson and New Lynn businesses specific information was asked about environmental policies and practices.

Of the 187 sites 7.5% had a formal environmental policy and only 5.3% of the sites had some kind of an environmental management system in place.

Staff environmental education was delivered, to some extent, on 24 sites. Predominately located in New Lynn with 18 sites, 13 of which were manufacturing and 5 retail trade.

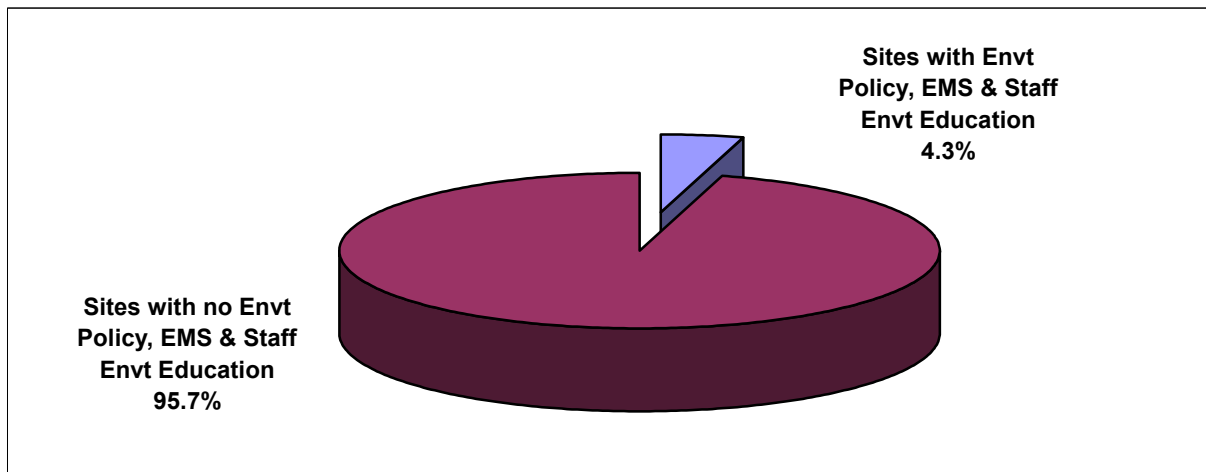
Table 5 Responses to Environmental Management & Practices

Question	Henderson	New Lynn	Total	Total %
Environmental Policy	5	9	14	7.5%
Environmental Management System (EMS)	3	7	10	5.3%
Staff Environmental Education	6	18	24	12.8%
Participation in a Cleaner Production Project	0	5	5	2.7%
Sign Visitor Register Before Walking Around Site	4	10	14	7.5%

Of the sites that indicated they had either an environmental policy, environmental management system or provided staff environmental education, 8 sites (4.3%) indicated they had all three implemented on their site.

The ANZSIC industry categories for the sites with an environmental policy, environmental management system and provided staff environmental education were 3 sites manufacturing; 2 sites construction; 2 sites wholesale trade; and 1 site retail trade.

Figure 2 Sites with Environmental Policy, EMS and Staff Environmental Education



From the 187 sites visited only 14 of the sites (7.5%) required the interviewer to sign the visitor register before walking around the business site of which the majority, 10 sites, were based in New Lynn. The ANZSIC industry categories for the sites requiring the interviewer to sign the visitor register were 10 sites manufacturing; 2 sites construction; and 2 sites wholesale trade.

3.3 Usage of Hazardous Substances

The first step in identifying and quantifying the hazardous substances held on site by businesses was to gain a copy of an inventory list. Only 18, of the sites (9.6%) could provide a copy of an inventory list of hazardous substances held on site at the time of the interview or were able to fax/email a copy at a later date. Some sites thought they may be able to print a list from their purchasing database but were not confident such a list would identify all hazardous substances stored on the site.

If sites did not have an onsite hazardous substance inventory available the interviewer created an inventory from surveying containers or reviewing the Material Safety Data Sheets (MSDS).

There were 8 sites where hazardous substances could be identified from MSDS but could not be quantified. They were still included in the results as it was felt that the overall objective of the survey would still be met and that the missing information would only affect a section of the results, namely that referring to quantities of hazardous substances.

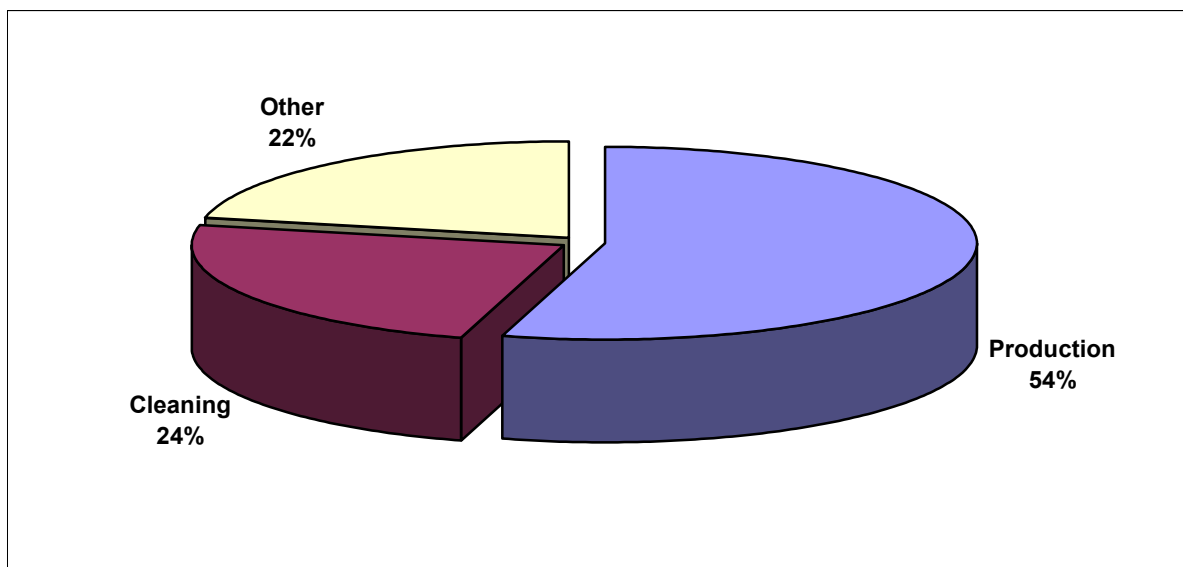
Table 6 Responses to Usage of Hazardous Substances

Question	Henderson	New Lynn	Total	Total %
On-site HS Inventory Available	0	18	18	9.6%
Average of Use in Production	53.9%*	52.5%*		53.2%*
Average of Use for Cleaning	25.4%*	21.0%*		23.2%*
Average of Other Uses	16.8%*	25.4%*		21.1%*

* As percentages are average for each item the total percentage will not sum to 100% but will provide an indication on the nature of usage.

There were approximately 1,800 different types hazardous substances identified as being used by the 179 quantifiable sites. On average sites used approximately 53.2% of the hazardous substances in production, 23.2% for cleaning and 21.1% for other uses. The predominant 'other use' identified was lubrication, followed by product content, heating, ground spraying, and testing.

Figure 3 Breakdown on How Sites Use Hazardous Substances



Of the 179 sites 95.7% could quantify the hazardous substances on site. The most significant quantity of hazardous substances was aqueous, approximately 464,189 litres. Overall, New Lynn held the greatest quantity of hazardous substances by a substantial difference and again the majority was aqueous, approximately 346,639 litres.

Table 7 *Quantity Hazardous Substances*

Measure	Henderson	New Lynn	Total
Cubic Metres	1,926	1,151	3,077
Kilograms	8,484	83,070	91,554
Litres	200,722	346,639	547,361

The United Nations Hazard Class number was identified for 1,131 of the 2,624 lines of hazardous substance information, 43.3%, provided by the 179 sites. Again the most significant quantities identified are liquid, with a UN Hazard Class of 3.1 indicating flammable liquids.

Table 8 *Quantity of Hazardous Substances by UN Hazard Class*

UN Hazard Class	Sub Class Division	Description	Cubic Metres (M ³)	Kilograms (Kg)	Litres (L)
1	1.1 – 1.6	Explosives (Not Included in Survey)			
2	2.1.1	Flammable Gases	57		631
	2.1.2	Flammable Aerosols	156		271
		Unspecified Gas	2,256	7,451	20,582
3	3.1	Flammable Liquids			245,621
	3.2	Liquid Desensitised explosives			16,283
		Unspecified Liquid			98,875
4	4.1	Flammable Solids		428	
	4.2	Spontaneously combustible		333	
	4.3	Dangerous when wet		21	
5	5.1	Inorganic oxidisers		716	
	5.2	Organic oxidisers		91	506
6	6.1	Acute effects		40	1,633
	6.3	Skin irritation			
	6.4	Eye irritation			
	6.5	Sensitisation			
	6.6	Mutagenicity			
	6.7	Carcinogenic			
	6.8	Reproductive effects			
	6.9	Target Organ Effects			
		Unspecified Toxic	556	37.2	16
8		Corrosives		4,963	3,728
9	9.1	Eco-toxin effects (Aquatic)		80	
	9.2	(Soil)		2,497	
	9.3	(Terrestrial Vertebrate)		100	
		Unspecified Eco-toxic			
			10	350	691

* Unspecified: Due to the lack of information on container labels at time of survey.

Table 9 Summary of Sites Holding Specific Hazardous Substances

Question	Henderson	New Lynn	Total	Total %
Oxygen	58	42	100	53.5%
Acetylene	56	37	93	49.7%
Paint	45	29	74	39.6%
Thinners	41	28	69	36.9%
Oil	28	30	58	31.0%
Kerosene	23	22	45	24.1%
Waste Oil	19	23	42	22.5%
Adhesives	7	11	28	15.0%
LPG	16	11	27	14.4%
Fuels (diesel, fuel, racing fuel)	14	6	20	10.7%
Inks	10	8	18	9.6%
MEK or MEKP	11	4	15	8.0%
Acetone	5	5	10	5.3%
Epoxy	9	1	10	5.3%
Gun wash	4	5	9	4.8%

The two most abundant hazardous substances identified were oxygen at 53.5%, and acetylene at 49.7%. Approximately one third of sites held paint, 39.6%; thinners, 36.9%; and oil, 31.0%. Nearly one quarter of sites held kerosene, 24.1%, and waste oil, 22.5%.

There are approximately 1,800 different types of hazardous substances held by the 187 sites surveyed. The 15 most common substances identified in Table 9 are held by many sites and the majority varying types and brands of hazardous substances are held by very few sites, i.e. less than 10 sites out of 187 sites. For further information on the variety of hazardous substances held on sites refer to Appendix 5.

Table 10 Suppliers of Hazardous Substances

Number of Suppliers	Total Quantity	Number of Suppliers Providing > 1,000 Kg, CM or L to Henderson and New Lynn
73 suppliers	31,990 Kg	4 Suppliers
3 suppliers	2,354 CM	1 Suppliers
292 suppliers	118,296 L	22 Suppliers

Approximately 356 different manufacturers and suppliers are identified as supplying hazardous substances to the 178 sites. The suppliers are unknown for all hazardous substances For 9 of the sites (4.8%).

From the 356 suppliers, 26 provide over 1,000 units (kg, L, m³) to Henderson and New Lynn areas. One of the 26 suppliers product is measured in kg and m³, as it is a gas.

Table 11 **Quantity Hazardous Substances**

Container Type	Cubic Metres	Kilograms	Litres
Aerosol		106	1,006
Above Ground Storage Tank		20,040	65,190
Bag/Sack		24,390	
Bath			4,070
Box		595	
Carboy		65	11,740
Cylinder	3,038	3,647	
Drum		715	198,175
Plastic Container		3,090	12,836
Tin		576	36,969
Under Ground Storage Tank			58,300
Total	3,038	53,224	388,286

The majority of hazardous substances are stored in drums, above ground storage tanks or under ground storage tanks, with aqueous solution summing to 321,665 litres (82.8%); and mass summing to 20,755 kilograms (39%).

3.4 Storage of Hazardous Substances

Of the 187 sites surveyed, 144 sites (77%) kept the majority of their hazardous substances (HS) separated from non-hazardous substances (Non-HS). The remaining 43 sites (33%) tended to have quantities of hazardous substances located around the site and tended to be non-segregated in hazardous substance classification or from non-hazardous substances.

Table 12 **Responses to Hazardous Substance Storage**

Question	Henderson	New Lynn	Total	Total %
HS Separated From Non-HS	74	70	144	77.0%
Separate DG Store	46	61	107	57.2%
Bunded	31	37	68	36.4%
Covered	40	54	94	50.3%
Paved	44	65	109	58.3%
Underground Storage Tanks	10	13	23	12.3%

The majority of sites, 107 (57.2%), had a separate dangerous store. This figure was notably less than the 144 sites (77%), which separated their hazardous substances from their non-hazardous substances. From the 187 sites (49.7%), 93 sites separated their hazardous substances from non-hazardous substances and had a separate dangerous goods storage area. In contrast 29 sites (15.5%) had neither separated their hazardous substances from non-hazardous substances nor had a separate dangerous good (DG) storage area.

In comparing the number of sites that held aqueous hazardous substances (i.e. the most common type of hazardous substance) 181 sites (96.8%). Of these 137 (75.7%) of the sites separated their hazardous substance from non-hazardous substances. The number of sites was fairly evenly split across the varying levels of liquid hazardous substances. The 44 sites (24.3%) that did not separate hazardous substances from non-hazardous substances were predominately those at either end of the scale, i.e. quantities between 100 – 499 litres or over 1,000 litres of hazardous substances.

Table 13 Responses to Separating Hazardous Substances from Non- Hazardous Substances

Quantity (Litres)	HS Separated from Non-HS	HS Not Separated from Non-HS	Total	Total %
> 1,000 L	38	11	49	26.2%
500 – 1,000 L	23	5	28	15.0%
100 – 499 L	46	22	68	36.4%
< 100 L	30	6	36	19.2%
Total	137	44	181	96.8%

Of the 107 sites, which had a dangerous goods store, 68 sites had them bunded, 94 sites have them covered and all 107 sites had them paved. Another 2 sites had the hazardous substance storage areas paved but they are not considered an isolated dangerous goods store.

Only 56 sites (29.9%) had their dangerous good store bunded, covered and paved. These 56 sites hold approximately 72,300 litres of hazardous substances, with 17 sites (9.1%) holding over 1,000 litres of hazardous substances. The remaining 51 sites (27.3%) which had a dangerous good store that were either bunded, covered or paved (but not doing all three), held approximately 25,019 litres of hazardous substances, with 8 sites (4.3%) holding over 1,000 litres on their sites. The sites which had no dangerous good store, totalling 80 (42.8%), held approximately 86,000 litres of hazardous substances, with 21 sites (11.2%) holding over 1,000 litres on their sites.

Currently 16 of the total sites (8.6%) have storage tanks with 6 sites using them for diesel or oil storage. Fat sumps were found on 2 sites, 2 sites for solvents, a Car wash tank, modified lined pits, solaprou pits, and settling waste was found on 1 site each, and 2 storage tanks were no longer in use. A total of 7 sites (3.7%) had removed their storage tanks, 5 sites, had done so within the last ten years, and no removal date was provided for the other 2 sites.

From the 13 sites that currently have storage tanks 12 (7.0%) were able to identify the age of the tanks, 40% of these sites had storage tanks less than 10 years old, 40% had storage tanks between 10 – 20 years old and the remaining 20% had tanks over 20 years old. Only 6 of the sites (3.2%) could identify their monitoring procedures for the storage tanks at the time of the interview. With 3 sites being monitored visually by staff, 1 site each had their tank checked by their diesel supplier, conducted electrical monitoring, or conducted annual monitoring.

Of the 187 sites, only 20 sites (10.7%) had a spill response plan for their site, all of which were manufacturers. More sites, 25 (13.4%) had a drainage plan rather than a spill response plan for their sites, made up predominately of manufacturing, 15 sites, or mixed industry automotive related sites, 7 sites.

Slightly more sites, 32 (17.1%) conducted spill training, consisting of 20 manufacturing sites, 9 retail sites (automotive related), 2 construction sites and 1 wholesale trade site. On average 2-3 times more sites in New Lynn tended to have a spill response plan, drainage plan and conducted spill training than Henderson.

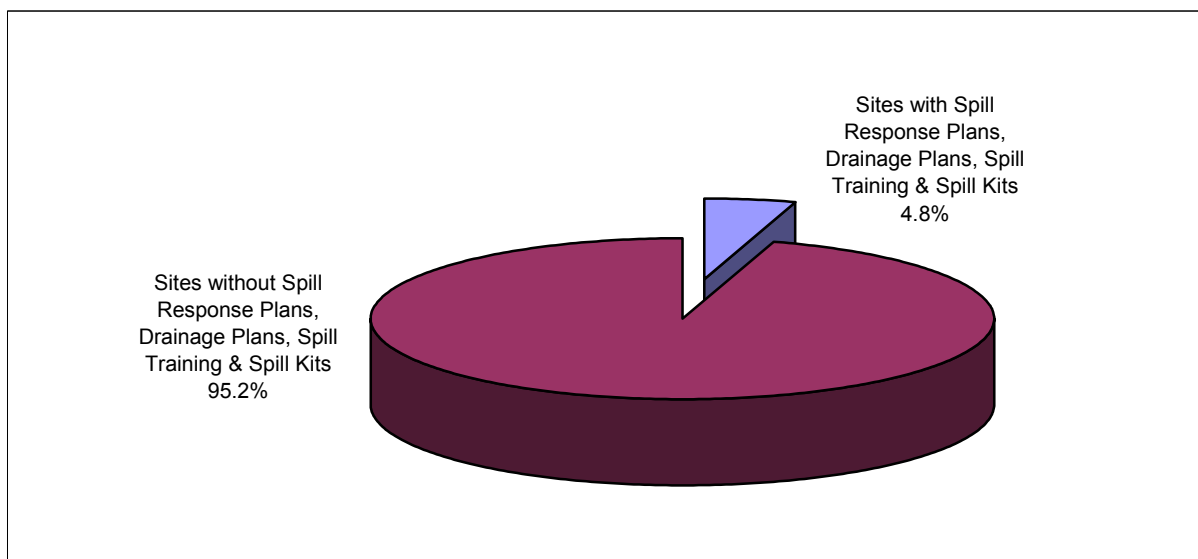
Table 14 Responses to Spill Preparation

Question	Henderson	New Lynn	Total	Total %
Spill Response Plan	5	15	20	10.7%
Drainage Plan	6	19	25	13.4%
Spill Training	10	22	32	17.1%
Spill Kit	45	47	92	49.2%
Appropriate Location	33	36	69	36.9%
Inappropriate Location	11	11	22	11.8%

Almost half 92 (49.2%) of the sites had a spill kit of some kind, of these 38 sites are manufacturing, 22 sites being either furniture manufacturing, industrial machinery & equipment manufacturing, machine tool and part manufacturing, leather tanning & fur dressing and printing, retail trade automotive related. Construction consisted of 5 sites, and 3 sites wholesale trade. The majority of these, 69 sites (36.9%), were deemed to locate their spill kit appropriately near areas where potential spills could occur and 22 sites (11.8%) deemed to be inappropriately located. The number of sites with spill kits was evenly split over Henderson and New Lynn.

Only 9 sites (4.8%) had a spill response plan, a drainage plan, conducted spill training and had a spill kit, including 7 manufacturing sites, and 2 construction sites.

Figure 4 Sites with Spill Response Plans, Drainage Plans, Spill Training and Spill Kits



Of the 187 sites only 56 sites (30%) had a dangerous goods licence. Consisting predominantly of manufacturing, 30 sites, which included printing, furniture making or metal related industries. Retail trade totalled 20 sites, which were all automotive related, and 3 sites where construction.

Approximately half of the sites, 27 (48.2%) , with dangerous goods licences could make them available to the interviewer. The 55 sites that held aqueous hazardous substances and had dangerous goods licences held approximately 388,000 litres of hazardous substances in total.

Of the 187 sites surveyed 122 sites (65.2%) held liquid hazardous substances and did not or could not verify if they had a dangerous good licence held approximately 75,800 litres of hazardous substances. There were 8 sites (4.3%) that had firewater plans and 5 sites (2.7%) had containment structures of which all were located in New Lynn. Of the 8 sites only 2 (2.5%) had both firewater plans and containment structures.

Table 15 Responses to Dangerous Goods Licences and Fire Water

Question	Henderson	New Lynn	Total	Total %
Dangerous Goods Licence	35	21	56	29.9%
Dangerous Goods Licence Available	11	16	27	14.4%
Fire Water Plan	0	8	8	4.3%
Containment Structure	0	5	5	2.7%

3.5 Recycling

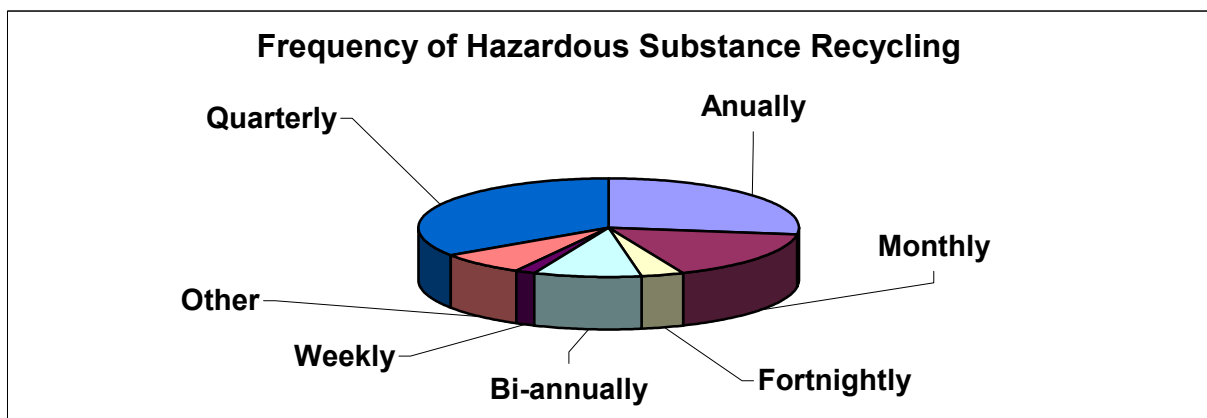
Of all sites 63 (33.6%) identified that they recycled hazardous substances in some manner with approximately 86,296 litres per annum being recycled. Waste oil was by far the most predominant hazardous substance being collected, 82,276 litres for recycling from 41, of the sites (21.9%) of which 31 sites are automotive related. Waste oil was identified as being found on 5 sites (2.7%) but was not identified as being recycled in any manner.

Table 16 Responses to Recycling of Hazardous Substances

Question	Henderson	New Lynn	Total	Total %
Sites Recycling HS	30	33	63	33.6%
In-house Recycling Systems	3	2	5	2.7%
Types of Hazardous Substances Recycled				
Waste Oil	18	23	41	21.9%
Solvents & Thinners	5	6	11	5.9%
Paint	2	0	2	1.1%
Other	0	4	4	2.1%

The frequency of recycling was identified by 54 of the 68 sites as being quarterly 35.2%, annually 27.7%, monthly 16.6%, six-monthly 9.3%, fortnightly 3.7%, weekly 1.9% and various other frequencies 7.4%.

Figure 5 Frequency of Hazardous Substance Recycling



From the 63 sites recycling hazardous substances 16 different recycling collectors were identified, with the majority of hazardous substances being collected by 2 recyclers. Both these recyclers collected waste oil from 27 different sites. In-house recycling is conducted for solvent, thinners, silver nitrate and paint by 5 sites.

3.6 Disposal

Around 39 of all sites (20.9%) identified how they disposed of their hazardous substances or wastes. There were 56 different hazardous wastes identified totalling 67,721 m³, 8,540 kg, and 4,659,686 L. Of the sites identifying hazardous substances or wastes being disposed 10 sites (5.3%) identified more than one hazardous substance or waste.

Also, unlike hazardous substance recycling there is significant variation in the type of hazardous substances or wastes disposed of, including 7 sites (3.7%) producing sludge & slurries; 7 sites (3.7%) producing solvents & thinner wastes; 4 sites (2.7%) producing paint waste; 3 sites (1.6 %) producing radiator flush wastes; and other hazardous substances and waste being produced by 34 (18.2) of the sites 18.2%.

Table 17 Responses to Disposal of Hazardous Substances

Question	Henderson	New Lynn	Total	Total %
Sites Identified Disposal Methods	13	26	39	20.9%
Types of Hazardous Substances or Waste Disposed				
Sludge & Slurries	1	6	7	3.7%
Solvents & Thinners	1	6	7	3.7%
Paint	2	3	5	2.7%
Radiator Flush	1	2	3	1.6%
Other Hazardous Substances & Waste	10	24	34	18.2%

The 39 sites involved identified 56 different hazardous substances or wastes for disposal, 40 of such substances were collected by commercial collection services; 11 substances were identified as trade waste; and 2 substances were stored in pits; 1 substance was identified as being collected by the supplier and 1 substance as being poured down the sink.

From the 39 sites identifying the hazardous substances or wastes they dispose of 18 different collectors were identified, with the majority of hazardous substances or wastes being collected by 2 waste collectors and Watercare (via trade waste).

Table 18 Responses to Method of Disposal for Hazardous Substances or Wastes

Question	Henderson	New Lynn	Total	Total %
Commercial Collection Service	11	29	40	21.4%
Trade Waste	4	7	11	5.8%
Storage Pits	0	2	2	1.1%
Collected by Supplier	1	0	1	0.5%
Down Sink	0	1	1	0.5%

From the 39 sites identifying the hazardous substances or wastes they dispose of 37 (95%) of the sites identified the frequency of disposal. Bi annually 5 sites (13.5%), Annually 13 sites (35.1%), Quarterly 13 sites (35.1%), Monthly 5 sites (13.5%), Daily 5 sites (13.5%) and various other frequencies totalled 8 sites (31.6%).

Note some sites disposed of their hazardous substances with more than one frequency:

3.7 Site Issues

To assist with focusing education and follow-up from this project the interviewer provided a summary of issues observed while on-site conducting the survey. The interviewer identified follow-up priority and a summary of issues for 186 sites (99.5%). Of the 186 sites 29 sites (15.5%) were identified as high priority for follow-up, 54 sites (28.9%) for medium priority and 103 sites (55.1%) for low priority.

The area with the largest quantity of aqueous hazardous substances, of 292,736 litres, is in Henderson and has a medium follow-up priority

Table 19 Identification of Follow-up Priority

Priority	Henderson	New Lynn	Total	Total %
High	13	16	29	15.5%
Medium	28	26	54	28.9%
Low	51	52	103	55.1%
Not Identified	0	1	1	0.5%
High (L)	54,146	33,043	87,189	18.8%
Medium (L)	36,025	292,736	328,761	70.8%
Low (L)	27,173	20,949	48,122	10.4%

The interviewer made a total of 401 observations for 145 sites specifically noting no issues for follow-up for 41 sites. For many sites, where issues were identified, there tended to be more than one issue for the site. Table 20 summarises the observations of the interviewer.

Table 20 Summary of Observations by Number of Sites

Observation	Low		Medium		High		Total	Total %
	*HSN	*NL	HSN	NL	HSN	NL		
Problem Storage	3	3	17	9	11	11	54	28.9%
DG Licence Issues	3	1	9	5	6	3	27	14.5%
Disposal	2	4	7	5	6	2	26	14.0%
Storm water	2	2	5	7		7	23	12.4%
Recycling	2	3	1	3	5	3	17	9.1%
Labelling	4	4	1	2	3	3	17	9.1%
MSDS/Information	1	1	2	2		2	8	4.3%
Spill Prevention		1	1	1		3	6	3.2%
Spray Booth	3		2			1	6	3.2%
Containers	1	1		3			5	2.7%
Storage Tank		1		2	1	1	5	2.7%
Further HS Identification Required			1	1	1	1	4	2.1%
Ventilation			1	1	2		4	2.1%
Bath/Wash bay	2	1				1	4	2.1%
Reduce Quantity		1			3		4	2.1%
Extent of Contamination			2		1		3	1.6%
Trade Waste				2			2	1.1%
Fire Potential				1	1		2	1.1%
Dust		1		1			2	1.1%
Bunding					1	1	2	1.1%
Cesspit				1			1	0.5%
Health		1					1	0.5%
Building					1		1	0.5%
Substitution					1		1	0.5%
Small Quantity	26	16	8	3			53	28.5%
Large Quantity	1		1	5	3	1	11	5.9%
No issues	18	23					41	22.0%
Good Storage	16	19	2	2	1		40	21.5%
Good Practice	10	8	1	2	2		23	12.4%
Communication		1	2	3		2	8	4.3%
Total	94	92	63	61	49	42	401	

*HSN Henderson

*NL New Lynn

The most significant issues observed at the sites were 28.9% in relation to problems with storage facilities or practices. The majority of problems relating to storage were noted in 26 sites as a medium priority, followed by 22 sites as high priority. Of which 27 sites were located in Henderson and 21 sites in New Lynn.

The next significant group to note is that involving issues concerning a licence to handle hazardous substances, totalling 27 sites (14.5%). The disposal of hazardous substances at 26 sites (14%), and finally 23 sites (12.3%) concerned with the possible impact of hazardous substances on storm water.

Waste oil was the most predominant hazardous substance mentioned with observations made for 15 of the sites (8%), the majority of observations were made about improving storage practices for 13 of the sites (7%) and 7 of the sites (3.7%) expressed concern of possible contamination of soil or storm water.

Observations in relation to disposal of hazardous substances or wastes were made for 26 of the sites (13.9%). Of which 11 sites (5.8%) required information about better practices for disposal; 7 of the sites (3.7%) needed to dispose of old stock no longer required and 2 sites seeking information on commercial services for disposal of hazardous substance.

Observations in relation to recycling were made for 17 of the sites (9.1%). Good recycling practices were identified on 9 of the sites (4.8%), 5 of which were based in Henderson and 4 in New Lynn. Observations for the remaining 8 of the sites (4.3%), were in relation to potential opportunities for recycling hazardous substances, particularly waste oil.

Determining the nature, UN Hazard Class, of the hazardous substances was found to be difficult at times due to 17 of the sites (9.1%) having poor container labelling, or lack of Material Safety Data Sheets (MSDS), or information on the MSDS as noted at 8 of the sites (4.3%).

The interviewer noted suitable storage facilities at 40 (21.5%) of the sites and good practices at 23 (12.4%) of the sites. A number of these sites still had issues that required addressing but did excel in the indicated areas.

Communication was noted as an issue for 8 (4.3%) of the sites. At 1 site the interviewee commented on a lack of coordination between Waitakere City Council, Auckland Regional Council and other bodies in relation to requirements for hazardous substance management and avoiding or mitigating environmental effects. Only 2 of the 187 sites interviewed displayed an apprehension at the mention of Waitakere City Council. In contrast 1 site noted friendly contact with Waitakere City Council. Communication was noted as difficult at 1 site due to language limitations.

4.0 Analysis

4.1 Industry breakdown

It was anticipated that there could potentially be 800 – 1000 commercial, industrial or rural sites in Waitakere City that may be using or storing hazardous substances on their sites. This survey has provided snap shot of around 20% of these sites, although it only includes commercial and industrial sites.

It was therefore not surprising that the majority of the sites included in the survey were manufacturing, 50.2% and retail trade, 34.8%. It was not anticipated that automotive-related retailers would be identified as the significant subgroup, 32.6%, in the survey.

4.2 Environmental Management and Practises

In attempting to benchmark the level of consideration given to environmental issues by businesses using, or storing hazardous substances on site, it was found that only 4.3% of the sites had all three environmental management initiatives, i.e. an environmental policy, an environmental management system and provided some environmental education to staff.

In general it was more common for the sites to either: provide environmental education to staff (12.8%); or to have an environmental policy (7.5%), than to have an environmental management system in place (5.3%). This indicates that minimal attention is given towards the environment at the strategic level by most sites included in the survey.

In the environmental management category, approximately two thirds more sites in New Lynn had undertaken some form of environmental management action than in Henderson. This trend was also reflected in comparing the number of sites requiring the interviewer to sign-in before touring the site.

Only 2.7% of the sites had indicated that they had previously been involved in cleaner production projects, of which all were located in New Lynn. This suggests that there has been little focus of Waitakere City Council or Auckland Regional Council cleaner production projects with businesses storing or using hazardous substances in the past.

4.3 Usage of Hazardous Substances

At the sites themselves, a vast range of hazardous substances was identified with the majority identified being in aqueous form. Only a handful of sites were able to provide an inventory of the hazardous substances they held on site. The process of collecting the data was therefore considerably difficult, even more so due to the lack of information on the containers themselves and the variety of design and information content of the Material Safety Data Sheets (MSDS). This implies that although many sites may have knowledge of the hazardous substances they use on site, they have minimal information about the hazardous classification of the substances and therefore implications on health, safety and the environment.

The large variety of hazardous substances and brand names meant that only 14 hazardous substances could be found on more than 10 sites. It was surprising that oxygen was the main hazardous substance found on 53.5% of the sites. In terms of aqueous hazardous substances, paint was the most abundant, found on 40% of the sites surveyed.

Overall, only a relatively small number of suppliers, 326, supplied the 1,800 different types and brands of hazardous substances to the sites. The majority of the suppliers (93%) provide less than 1,000 L, kg or m³ of their products in total to New Lynn or Henderson sites. This means that there may be opportunities to influence the level and nature of information suppliers provide with their products, i.e. MSDS, health and safety, and environmental information for training purposes.

4.4 Storage of Hazardous Substances

There were significant levels of separation concerning the storage of hazardous substances and the majority of sites, 77%, kept their hazardous substances separated from non-hazardous substances. However this reflects 33% of business not separating hazardous from non-hazardous substances around the workshop. The most significant problems were identified on sites with small quantities of

hazardous substances with haphazard storage practises and co-mingled substances that should have stored apart.

Around 57% of sites surveyed had a dangerous goods store and only 30% of these had their dangerous goods store bunded, covered and paved. The 57% with a dangerous goods store currently hold approximately 403,147 L of hazardous substances altogether. The 43% of the remaining sites had no dangerous goods store and hold approximately 81,166 L. The main issue highlighted around storage practises were regarding lack of labelling and unlined storage areas. Issues highlighted for sites with no dangerous goods store were regarding unsafe containers, the haphazard storage methods around the site, and the need for better-organised storage around the site or the need to construct a dangerous goods store. The sites that had issues with storage were almost evenly spread across both New Lynn and Henderson.

Almost half of all sites had a spill kit of some kind but only one-third of these sites conducted spill training. On average 2-3 times more sites in New Lynn tended to have a spill response plan, drainage plan and conducted spill training than in Henderson. Only 4.8% of the surveyed sites had a spill response plan, drainage plan, conducted spill training and had spill kits. This indicates that very few sites have formal action plans to prevent contamination from hazardous substance spills as compared to having a spill kit that was available once a spill occurred.

Around one-third of the sites hold a dangerous goods licence, indicating that around two-thirds of all sites do not hold quantities of hazardous substances that require them to hold a license. This indicates that most of the sites surveyed would not be specifically targeted by any agency to ensure effective storage of hazardous substances (although this may change as a result of the HSNO act).

4.5 Recycling and Disposal of Hazardous Substances

Around one-third of the sites identified that they recycled their hazardous substances in some manner with approximately 86,296 L per annum of hazardous substances being recycled. Waste oil was by far the most predominant hazardous substance being collected, 82,276 L per annum, for recycling from 22% of the sites surveyed. Storage practises for waste oil were identified as a major cause of possible ground contamination and some storm water contamination as the containers tended to be stored on unpaved, un-bunded and uncovered areas.

Only one-fifth of all sites identified the method of disposal for their hazardous substances or wastes. Unlike hazardous substance recycling there is greater variation in the type of hazardous substances or wastes disposed. While the information on hazardous substance or waste disposal was thin it does provide some indication of practises. There were few sites the substances were being hoarded, as the sites did not know how to dispose of the substances or had found it very difficult to do so. Further research will need to be undertaken to identify the issues confronting the sites in disposing of hazardous substances or waste and this information can be gained during stage 2 of this project. The information gained from this research will also inform the Auckland Regional Council commercial hazardous waste project.

The sites identified a small number of recycling and hazardous waste collectors. Again there may be opportunities to work with collectors to ensure that sites use best practises to store the hazardous substances or waste until they are collected for recycling or disposal.

4.6 Site Issues

The interviewer indicated that follow up would be required for 88% of sites to address the 24 different type of issues identified through the survey. The issues effecting 10%-30% of sites were problems in relation to storage, Hazardous substances licences, disposal of hazardous substances and storm water issues.

As detailed observations are provided in Appendix 6, consultation will be sought with stakeholders to develop an education and follow-up strategy to ensure that the issues identified are addressed through the most suitable agency.

5.0 Summary

5.1 Context of Report

Stage 1 of the Cleaner Production Hazardous Substance project was to identify the nature and quantities, storage methods, recycling and disposal methods of hazardous substances used by commercial and industrial sites in Waitakere City. The basis of this information would then allow cleaner production to support better hazardous substance management by sites to reduce workplace toxicity and to include hazardous substance management in the portfolio of services supporting businesses within the cleaner production programmes, as it does with other resource (e.g. energy, materials, and water) management initiatives.

Stage 2 of the Cleaner Production Hazardous Substance project will identify specific educational opportunities to address the issues identified in Stage 1 to improve practices in relation to current hazardous substance storage and use, as well as ongoing education.

Stage 3 will concentrate more on researching and identifying opportunities to reduce workplace toxicity through substituting safer substances, as similarly achieved in the printing industry project.

Waitakere City Council's Cleaner Production team are facilitators of change that support businesses work through issues such as business sustainability, increasing efficiency in resource use (materials, energy, water), waste minimisation and recycling. As facilitators of change Cleaner Production can identify potential areas for change but quite often need to bring in more expert advice to address issues identified to ensure best practice is achieved. This project reflects that approach, in that Cleaner Production will be seeking more expert advice on how businesses can address the issues identified during this survey and how best practice can be encouraged with hazardous substances through cleaner production programme.

5.2 Consultation

The information from this report will be the basis for consultation with internal and external stakeholders to discuss how better practices in relation to hazardous substances can be supported through cleaner production processors or practices. Internal and external stakeholders identified for consultation are noted in Table 21.

Waitakere City Council Cleaner Production team will seek specific advice from the organisations in Table 21 to:

- Confirm the issues identified in the report and their significance.
- Identify current educational strategies or initiatives for consistency in messages.
- Identify resources and publications to support best practice for hazardous substance management for commercial and industrial sites, and cleaner production facilitators.
- Identify appropriate commercial services for recycling or disposing of hazardous substances and wastes.
- Identify opportunities to substitute hazardous substances to reduce workplace toxicity.

Table 21 *Potential Parties to be Included in the Consultation Process*

Waitakere City Council	External
Dangerous Goods Inspector	ARC Pollution Control Team
Sustainable Business Network	ARC Hazardous Waste Officer
Hazard Network	Environmental Risk Management Authority (ERMA)
Green Network	OSH
EcoWater	Business Care
Environmental Policy	Accident Compensation Corporation (ACC)
	Cleaner Production Practitioners
	Ministry for the Environment (Trade Waste Project)

As a result of this project, in Stage 2 Waitakere City Council cleaner production team will:

- Work with stakeholders to ensure that the best method for follow-up of issues for each site is identified.
- Provide updated copies of the hazardous substance inventories to all participating sites (with the offer of an electronic copy).
- Communicate the results of the survey and on-going educational articles in 'Wise Resource Use', Waitakere City Council's cleaner production newsletter that reaches 4,500 commercial and industrial businesses.
- Offer assistance to sites to work through the issues identified where the cleaner production team's expertise is applicable or to link with another agency.

6.0 Stage II

Stage two will be able to stand alone in providing a basis for an educational strategy to develop and initiate an educational programme for hazardous substances, in regards to cleaner production. The programmes intention is to focus on points that arose from the survey including hazardous waste disposal, storm water, educational material, land contamination, recycling, correct storage, and quantity reduction. The strategy will utilise currently available material from the ARC, OSH, the Ministry for the Environment and the Internet.

The method of delivery will be dependant on the individual business but methods will include Internet, educational material, newspaper articles, and consultant recommendations. The programme will target the larger percentage of issues such as problem storage (28.9%), Disposal (14%), Storm water (12.4%), Recycling (9.1%) and health and safety first.

Appendices

Appendix 1



Cleaner Production Substance Audit Form

(In conjunction with Auckland Regional Council)

Company Name:	_____
Trading as:	_____
Business Type:	_____
Physical Address:	_____
Postal Address:	_____
Officer:	_____
Visit Date:	_____
Sign in at Site:	<input type="checkbox"/>

- Brief description of operations/activities carried out on-site/by company:

- What were the previous activities of the site?

- Does the Company have:
 - An Environmental policy?
 - An Environmental management plan/system?
 - Staff environmental education?
- Has the company previously participated in a Cleaner Production project?

Use

- Is an inventory available for chemicals stored/used on-site?
(Ask for a copy or fill in the Hazardous Substance Inventory)
- Are the hazardous material stored in covered containers during use?

- How does your company use the hazardous substances?

Production	%
Cleaning	%
Other, state	%

Storage

- Are hazardous substances stored separately from non-hazardous substances?
- Does the company have a hazardous substance storage area?
- Is it:
 - Bunded Covered
 - Paved
- Does the company have a spill response plan?
 - Spill kit
 - Appropriate location
 - Drainage plan (SW/TW)
 - Staff spill training
- Does the company have a Dangerous Goods Licence?
- Is a copy available?
- Is there a firewater plan? Containment structures?
- Are there any underground storage tanks on-site currently/historically?
 - Type: _____ Age: _____
 - When removed: _____ Supplier: _____
 - Is leak detection/ullage monitoring undertaken?
 - How _____

Recycling & Disposal

- Which substances are recycled?

Substances	Recycler Name	Quantity	Frequency

- Which substances are disposed of and how?

Substances	Disposal method	Collector	Quantity	Frequency

Observations

Priority of follow-up required for site:

Low

Medium

High

Comments:
