



Report

BARWON REGIONAL WASTE MANAGEMENT GROUP- REGIONAL WASTE SURVEY 2004-2005

Prepared by Barwon Regional Waste Management Group

EXECUTIVE SUMMARY

The Barwon Regional Waste Management Group (BRWVG) has conducted its third survey of all waste being deposited into landfills and all materials being collected for recycling in the Barwon region for the financial year 2004-2005.

2004-2005

- Total waste deposited into **landfill = 395,170 tonnes**
- Total **recyclables** collected = **220,732 tonnes**

Of the total volume of waste going into landfill the following items were the most significant:

- Clean fill (34%)
- Industrial waste (21%)
- Municipal waste (18%)
- Contaminated soil (14%)
- Mixed Rubble (4%)

Of the total volume of recyclable materials being collected the following items were the most significant:

- Soil & Rubble (57%)
- Mixed Recyclables (21%)
- Green waste (17%)

Comparisons were able to be made with the waste survey produced in the 2002-2003 financial year that showed:

- Land filled material up 20% from 2002-2003
- Recycled material up 500% from 2002-2003
- Average quantity of kerbside waste produced by each household in the region down 17% from 2002-2003

RECOMMENDATIONS

1. Standardization

It is highly recommended that Transfer Station and Landfill Operators within the region standardize its record keeping. Standard product names should be used in accordance with the Environmental Protection Authorities guidelines, and staff operating the landfill sites and transfer station facilities should be encouraged to document the waste as specifically as possible. Also where possible the same recording system should be used.

2. Reduce reusable materials from entering landfill

The data shows that significant quantities of clean fill and construction materials are being deposited to landfill. With this data it is possible to encourage landfill operators to address this issue further.

3. Continue efforts to reduce household waste going to landfill

The data shows that there has been a consistent reduction in the average quantity of kerbside waste deposited by households in the Barwon region since 2001-2002. However municipal waste comprises a significant portion (18%) of the total materials being deposited to landfill. It is recommended that programs aimed at reducing household waste production continue to be developed and implemented by councils and the waste management group in the region.

4. Include industry reuse and recycle activities in the region

This survey was unable to determine the quantity of materials, such as tyres, oil, and molasses, which are reused or recycled by industries in the region. It is recommended that if possible this data be included in future surveys.

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1. INTRODUCTION

The aim of this report is for the Barwon Regional Waste Management Group to identify and quantify materials going to landfill and recyclable materials collected in the Barwon region for the financial year 2004-2005. This report aims to build on the historical data from past surveys to demonstrate changing trends in the volumes of materials going to landfill and the volumes of materials being recycled.

Analysis of the different characteristics of materials going to both landfill and recyclers was made. It is anticipated that this survey will continue to be a benchmark for future waste management strategic planning and reporting in the Barwon region.

2. DATA COLLECTION METHODS

Operators of the various private and public waste handling facilities in the Barwon region were asked to provide data on waste volumes for the financial year 2004-2005. The data requested was for all materials going to landfills, transfer stations and recyclers. The contributions were voluntary and confidentiality of the materials was assured.

Unfortunately not all of the operators were able or willing to contribute their data to this survey. Some private operators did not keep records relating to materials collected specifically from the Barwon region. Significant concern was raised by some private operators regarding the confidentiality of the data requested for commercial reasons.

2.1 City of Greater Geelong

The City of Greater Geelong (COGG) provided data for materials deposited to its landfill sites at Corio and Drysdale. The data was provided on spread sheets and was measured in tonnes. The COGG has a weigh bridge at both landfill sites. The researcher was also able to acquire data relating to the kerbside collection of recyclables for the COGG and data from the Geelong Recycling and Resource Recovery Centre (GRRRC).

2.2 Surf Coast Shire

The Surf Coast Shire supplied information from Anglesea landfill, parts of this data was only available in cubic metres and was converted to tonnes for the purpose of comparisons made in this report (see Appendix 1 for conversion rates). Data was supplied for the Anglesea, Lorne, Winchelsea, and Deans Marsh transfer stations. Data relating to the kerbside collection of both waste and recyclables was also acquired.

2.3 Colac Otway Shire

Colac Otway Shire kerbside collection was deposited to the Naroghid landfill in 2004-2005, and is currently deposited to Corio landfill, as the Alvie landfill is an inert landfill. Data was provided for the Alvie landfill, and from the transfer stations at Alvie, Birregurra, and Marengo.

2.4 Private Operators

Numerous private operators across the region provided data relating to waste they collected. Landfill data was recorded in the product reports for the landfill sites that received the waste (Corio, Drysdale, Anglesea, Fyansford, and Alvie), so has not been included separately in this report. Recyclables have been recorded under the general heading of Commercial Operators to maintain confidentiality.

3. AVAILABLE REGIONAL DATA

The data in this survey was provided by:

- City of Greater Geelong
 - All waste going to landfills at Corio and Drysdale. This data incorporates the materials collection from the Borough of Queenscliffe.
 - Kerbside recycling data from the Geelong regions.
 - Waste and recyclables collected at GRRRC.

- Surf Coast Shire
 - All data from Anglesea landfill.
 - The data from Deans Marsh, Lorne, Anglesea, and Winchelsea transfer stations.

- Colac Otway Shire
 - All data from the Alvie landfill.
 - Alvie, Marengo and Birregurra transfer stations.
 - Kerbside collection data including greenwaste, recyclables, and inert waste.

- Private Operators
 - Barwon region commercial waste and recycling data.

- Fyansford Waste
 - All waste going to the Fyansford landfill.

- Meinhardt Infrastructure & Environment
 - All waste from kerbside collection in the region.
 - All green waste from kerbside collection in the region.
 - All recyclables from kerbside collection in the region.

The data has been collated and is presented as follows:

4. BARWON REGIONAL WASTE DATA

JULY 2004- JUNE 2005

Table 1: Total waste deposited into landfill in the Barwon region 2004-2005

Description	Corio	Drysdale	Colac#	Surfcoast Ψ	Fyansford	Total
Animal Carcass	17.82	14.90	-	-	-	32.72
Asbestos	-	35.60	-	-	4,797.82	4,833.42
Batteries	-	-	-	2.02	-	2.02
Bitumen/Asph/Crushed Rock	4,548.29	33.80	-	2,178.08	-	6,760.17
Carbon	-	-	-	-	37.38	37.38
Clean Fill	94,634.72	13,485.90	-	23,524.66	3,062.58	134,707.86
Contaminated Soil	54,400.56	-	-	-	-	54,400.56
Contaminates- soil	6,251.31	-	-	-	-	6,251.31
Filter Cake	574.11	-	-	-	-	574.11
Fish Waste	661.72	19.40	-	-	-	681.12
Green Waste (contaminated)	383.30	-	-	-	-	383.30
Green Waste (non council)	431.22	-	-	-	-	431.22
Industrial Waste	33,734.70	12,425.46	-	9,718.91	25,685.99	81,565.06
Mattress	-	-	-	1165*	638.00	638.00
Mixed rubble	6,600.52	7,507.27	-	-	-	14,107.79
Municipal External Councils	3,347.38	1,188.46	-	-	-	4,535.84
Municipal Waste (Kerbside)	36,516.90	14,126.50	4,489.33	4,644.03	-	59,776.76
Municipal Waste(Drop-off)	633.72	7,287.43	1,687.50	3,802.53	-	13,411.18
Offal treated	39.98	-	-	-	-	39.98
Offal untreated	9.78	0.26	-	-	-	10.04
Prescribed waste	213.92	62.44	-	-	-	276.36
Sand	8,237.42	-	-	-	2,088.98	10,326.40
Scallop Shells	292.74	0.54	-	-	-	293.28
Seaweed	371.74	11.62	-	-	-	383.36
Squid	107.58	-	-	-	-	107.58
Street Sweepings	-	-	-	603.18	-	603.18
Tandem Trailer*	-	-	-	888.50	-	-
Total Tonnage	252,009.43	56,199.58	6,176.83	44,473.41	36,310.75	395,170.00

* Indicates materials measured by item and total tonnage does not include these figures.

Colac kerbside municipal waste was deposited to Naroghid landfill for 2004-2005

Ψ **Surfcoast** 'Municipal Waste (drop off)' is materials from shire transfer bins from Anglesea, Deans Marsh, Lorne and Winchelsea transfer stations.

Total Waste Deposited into Landfill 2004-2005 (395,170 tonnes)

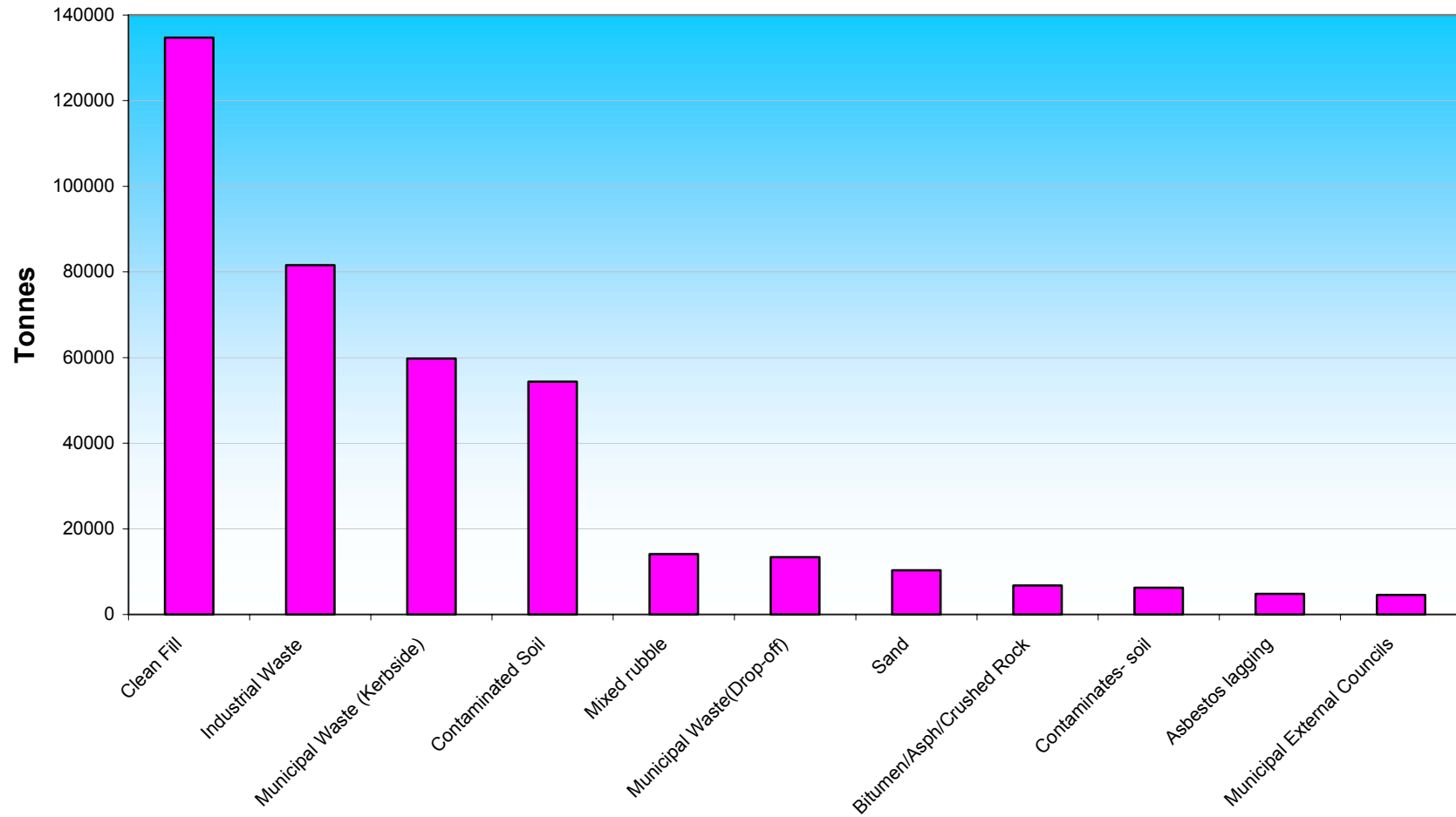


Figure 1: Total waste deposited into landfill in the Barwon region 2004-2005.

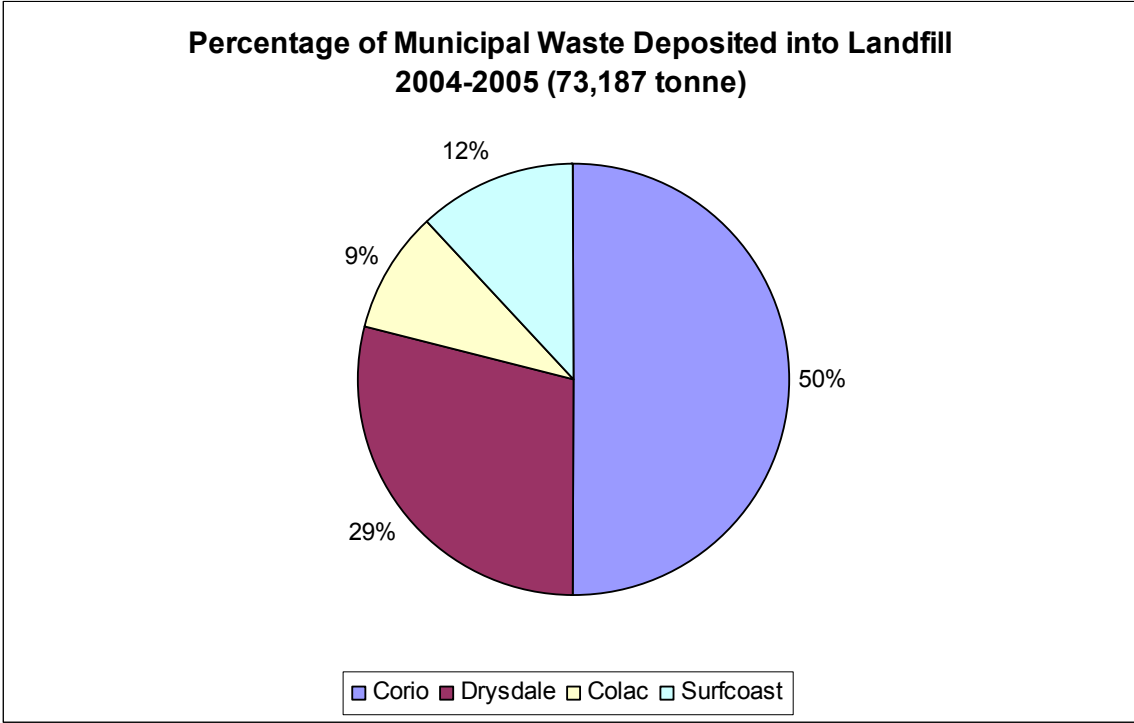


Figure 2: Percentage of Municipal waste deposited into landfill in the Barwon region 2004-2005

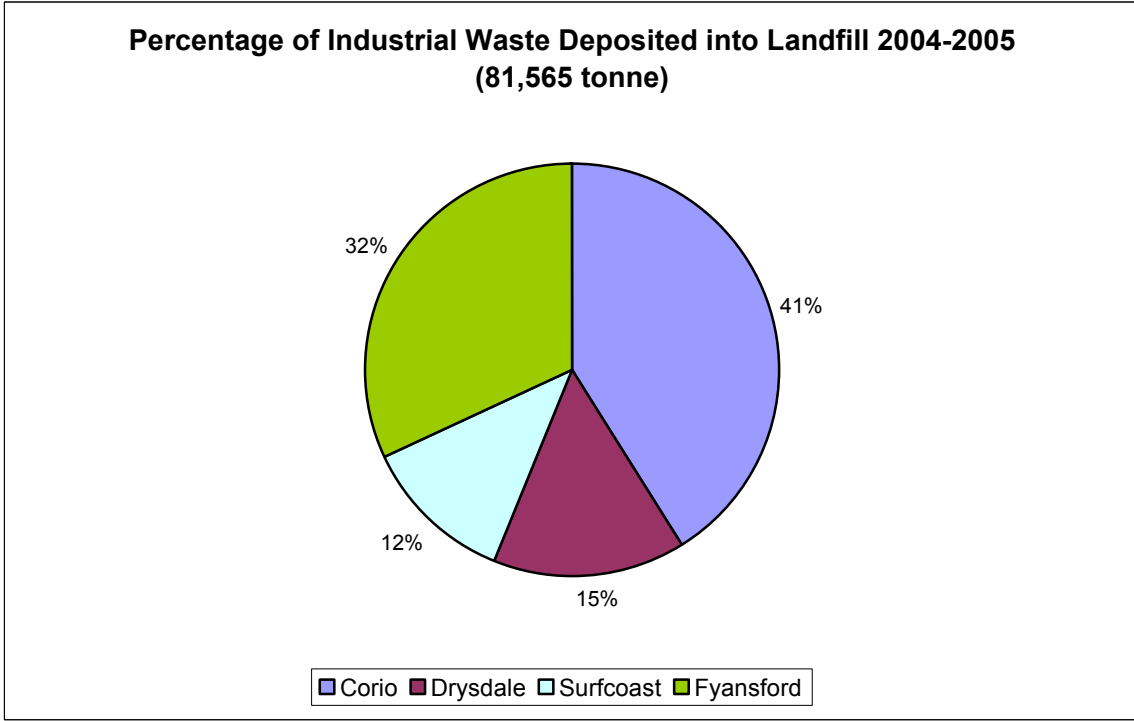


Figure 3: Percentage of Industrial waste deposited into landfill in the Barwon region 2004-2005

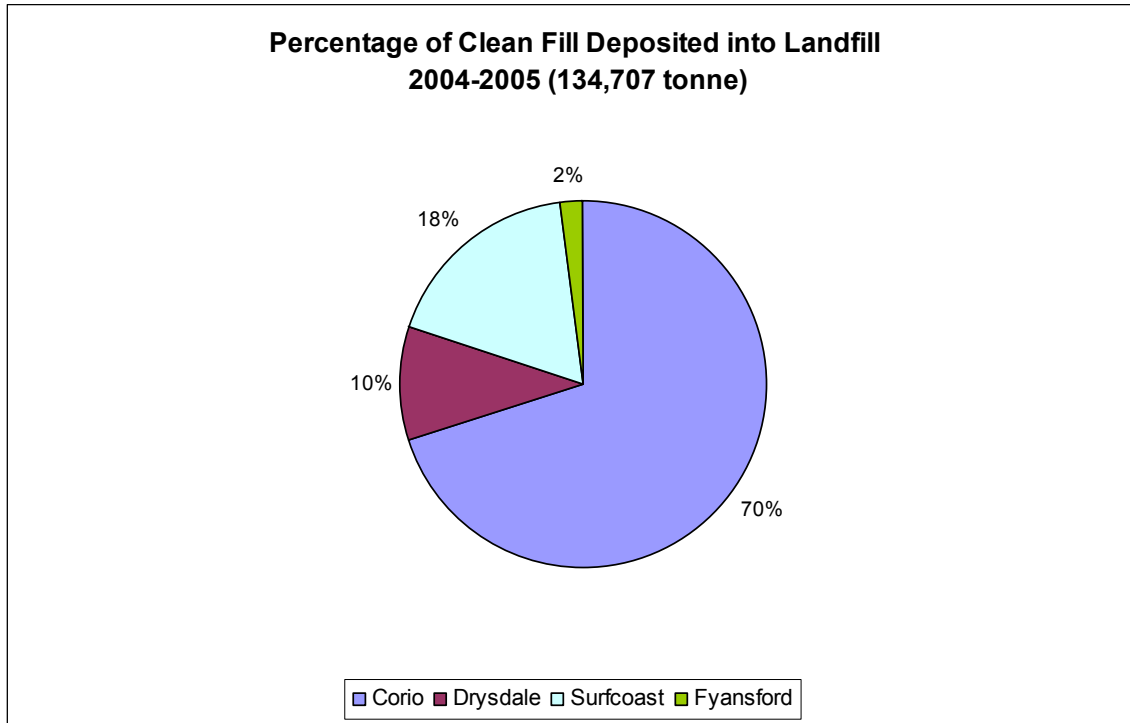


Figure 4: Percentage of Clean Fill deposited into landfill in the Barwon region 2004-2005

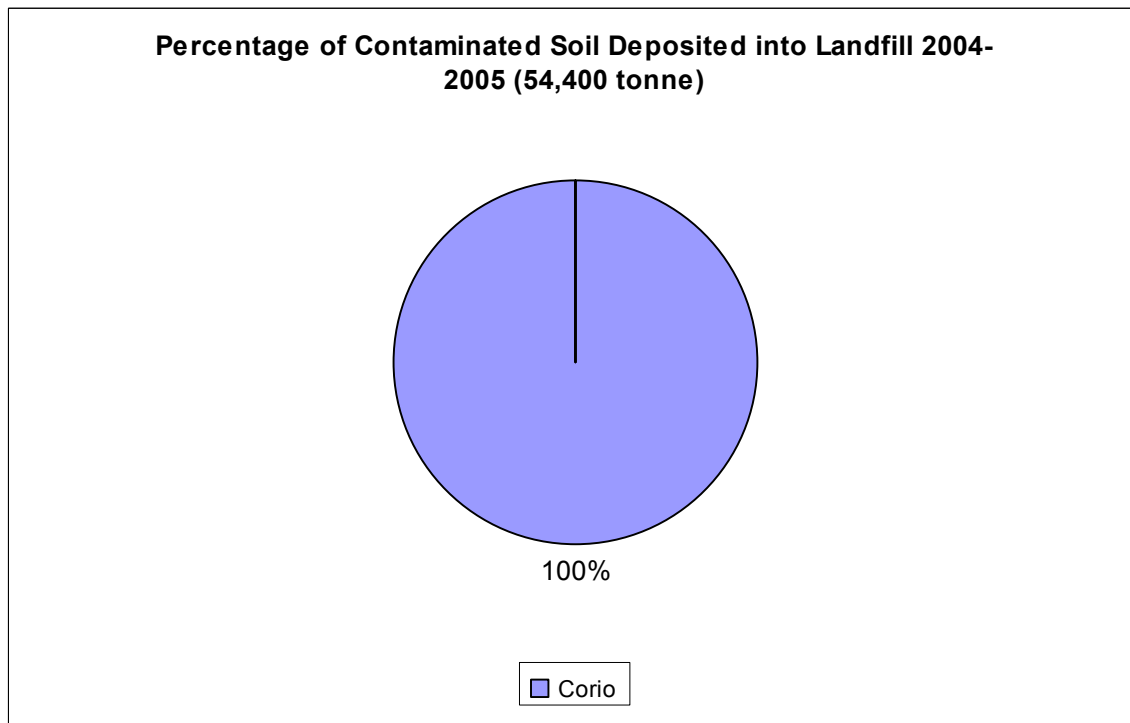


Figure 5: Percentage of Contaminated Soil deposited into landfill in the Barwon region 2004-2005

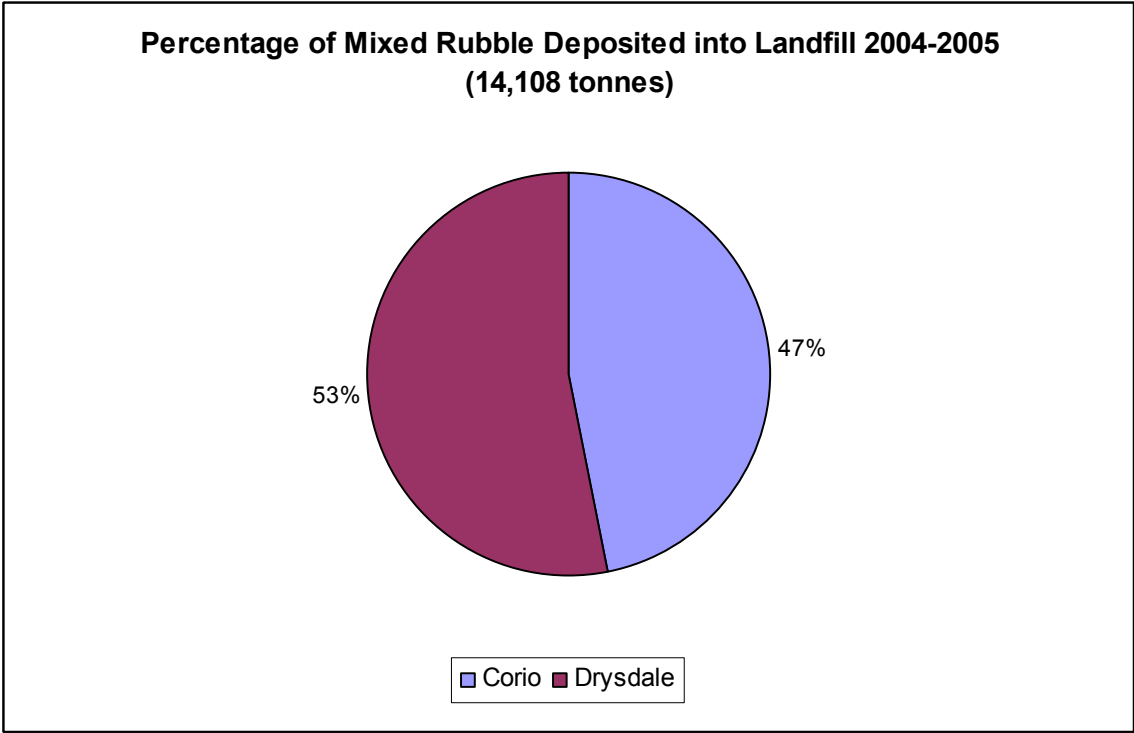


Figure 6: Percentage of Mixed Rubble deposited into landfill in the Barwon region 2004-2005

Table 2: Costs of depositing materials to landfill in the Barwon region 2004-2005

Description	Corio	Drysdale	SCS	Alvie	GRRC	Fyansford	Pt Henry RRC
Skip- general waste	-	-	-	-	-	-	\$40.00
Inert Waste \$/m3	-	-	-	\$21.60	-	-	-
Mixed Rubble/Roadbase	\$30.60	\$30.60	\$30.00	-	-	-	\$33.00
Builders Rubble	-	-	-	-	-	-	\$45.00
Concrete	-	-	-	-	-	\$20.00	\$10.00
Prescribed Waste	\$18-60.60	\$18-60.60	-	-	-	\$110.00	-
Prescribed Waste- Asbestos	-	-	-	-	-	\$110.00	-
Putrescible Waste \$/m3	-	-	-	\$36.00	-	-	-
Industrial	\$29-43.30	\$43.30	\$45.00	-	-	\$40.00	\$40.00
Commercial Industrial#	-	-	\$35.50	-	-	-	-
Truck Tyre*	\$27.50	\$27.50	\$5.30-24.50	\$14.40	-	\$9-16	\$10-20
Car Tyre*	\$7-8	\$7-8	\$4.80-6	\$3.60-4.75	-	\$6.00	\$7.50
Car Body*	\$18.50	\$18.50	\$30.00	\$36.00	-	-	-
Tractor*	-	-	-	-	-	\$55-80	-
Steel Scrap	-	-	-	\$14.40/m3	-	-	-
Chemical Drums*	-	-	-	\$0.60	-	-	-
Batteries*	-	-	-	\$3.60	-	-	-
Clean Fill	\$6.00	\$7.50	\$6.00	-	-	\$15.00	\$10.00
Waste Oil	-	-	-	\$0.60/litre	-	-	-
Greenwaste	\$35.40	\$35.40	-	\$12.40/m3	-	-	-
Seaweed	\$30.30	\$30.30	-	-	-	-	-
Car Boot*	-	\$8.00	\$8.50	-	\$8.00	-	-
Car Boot-Green*	-	-	\$6.00	-	-	-	-
Single axle trailer/Ute/Wagon (waterline)*	-	\$15.50	\$15.00	-	\$15.50	\$15.00	\$17.50
Single axle trailer/Ute/Wagon (waterline)-Greenwaste*	-	-	\$11.00	-	-	-	\$15.00
Single axle trailer/Ute/Wagon (heaped)*	-	\$18.00	\$18.50	-	\$18.00	\$23.00	\$20-25
Single axle trailer/Ute/Wagon (heaped) Greenwaste*	-	-	\$14.50	-	-	-	>\$15
Tandem trailer (waterline)*	-	\$18.00	\$18.50	-	\$18.00	\$23.00	\$35.00
Tandem trailer (waterline) Greenwaste*	-	-	\$14.50	-	-	-	\$30.00
Tandem trailer (heaped)*	-	\$36.00	\$20.00	-	\$36.00	\$40.00	>\$35
Tandem trailer (heaped) Greenwaste*	-	-	\$16.50	-	-	-	>\$30
Domestic Trucks/Skips Greenwaste	-	-	\$16.50	-	-	-	-
Mattresses*	-	\$7.50	\$9.50	-	\$7.50	\$6.00	\$7.50
Commercial Recyclable \$/m3	-	-	\$21.00	-	-	-	-
Commingled recycling	-	-	-	\$17.50/m3	-	-	\$17.50
Sorted Recycling	-	-	no charge	no charge	no charge	-	-

* indicates price per item, all other categories are priced per tonne unless otherwise specified.
 # for Lorne, Winchelsea and Deans Marsh only

Table 3: Total Recyclables collected in the Barwon region 2004-2005

Description	COGG	COS	SCS	BOQ	Commercial	Total
Batteries	-	0.18	6.85	-	0.24	7.27
Cardboard	-	-	-	-	3,667.00	3,667.00
Clean Fill	-	-	-	-	899.62	899.62
Gas Bottles*	-	-	-	-	1,200.00	-
Glass	-	-	-	-	-	-
Green waste	26,834.76	2,092.48	1,184.11	137.00	8,110.61	38,358.96
Metal	-	-	-	-	1,440.00	1,440.00
Mixed Recyclables	23,002.00	4,497.79	3,157.89	435.00	15,000.00	46,092.68
Oil	-	0.31	3.71	-	28.80	32.82
Paper	-	-	-	-	1,404.00	1,404.00
Plastic	-	-	-	-	36.00	36.00
Soil & Rubble	-	-	-	-	125,138.47	125,138.47
Steel	-	34.10	451.44	-	-	485.54
Timber	-	-	-	-	3,156.54	3,156.54
Tyres	-	2.18	9.97	-	1.00	13.15
Total Tonnage	49,836.76	6,627.04	4,813.97	572.00	160,082.28	220,732.06

* Indicates materials measured by item and total tonnage does not include these figures.

Total Recycled Material 2004-2005 (220,732 tonnes)

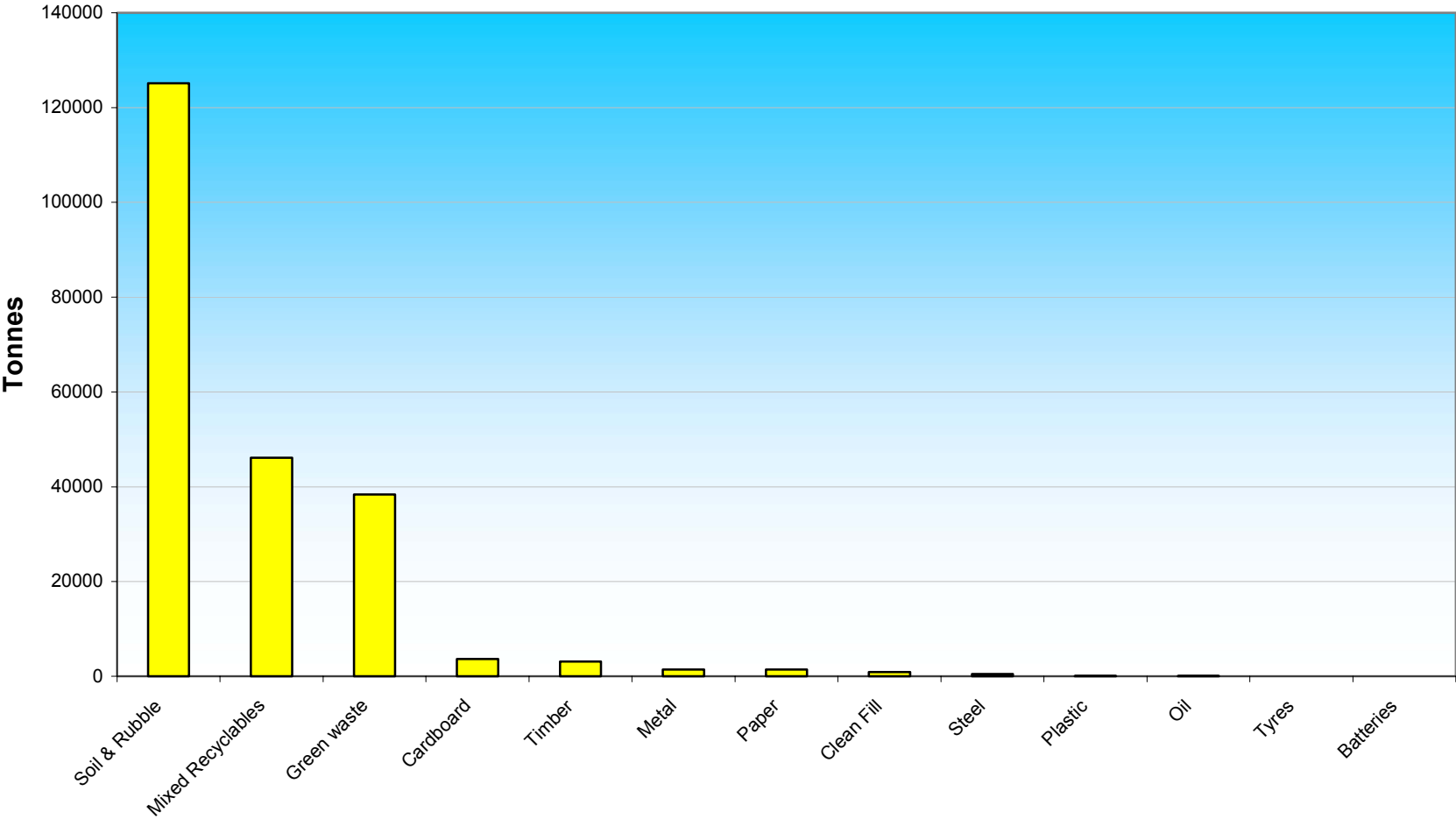


Figure 7: Total Recyclables collected in the Barwon region 2004-2005

Figure 8: Average waste produced per household per annum in each municipality 2004-2005

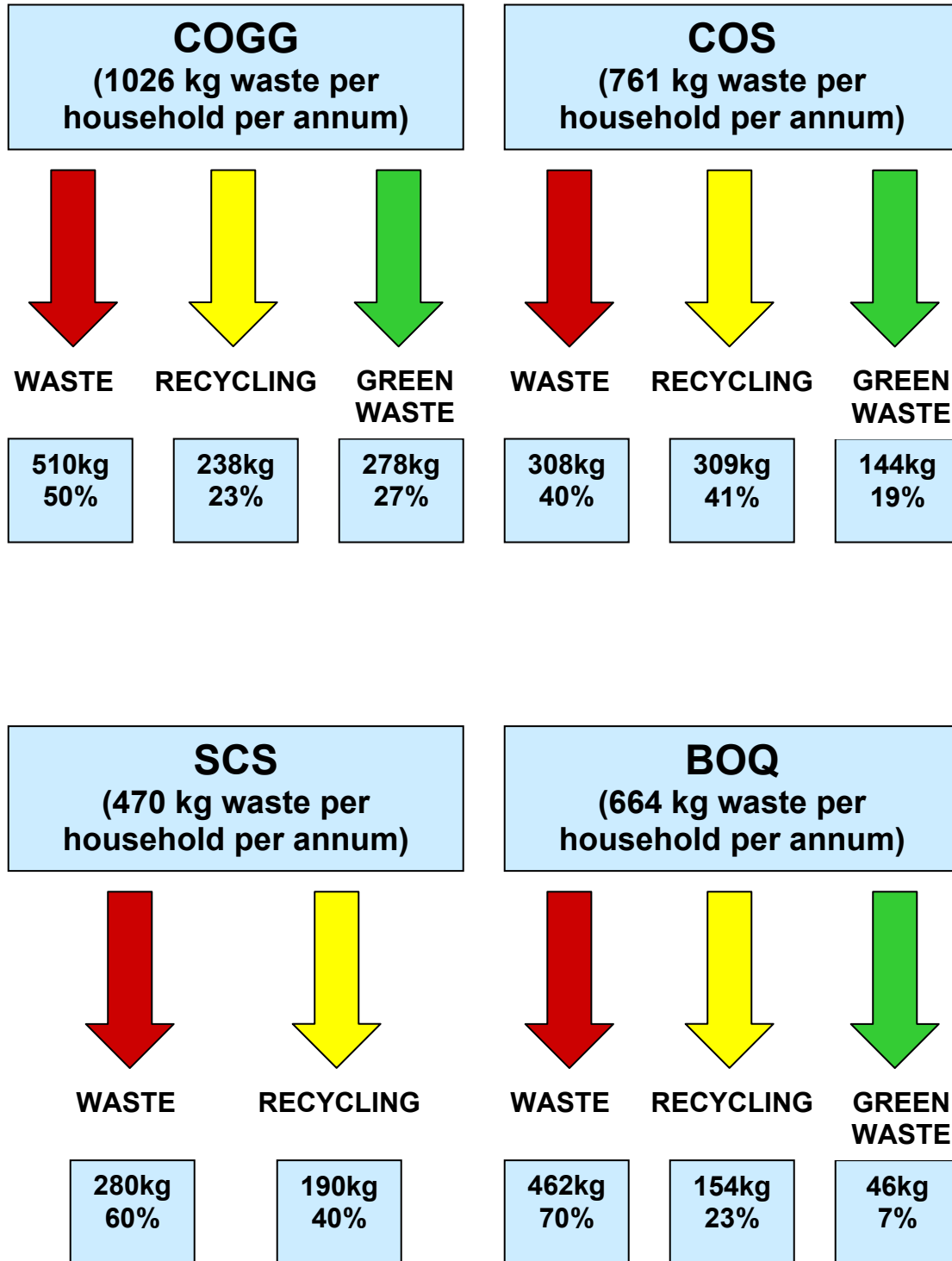
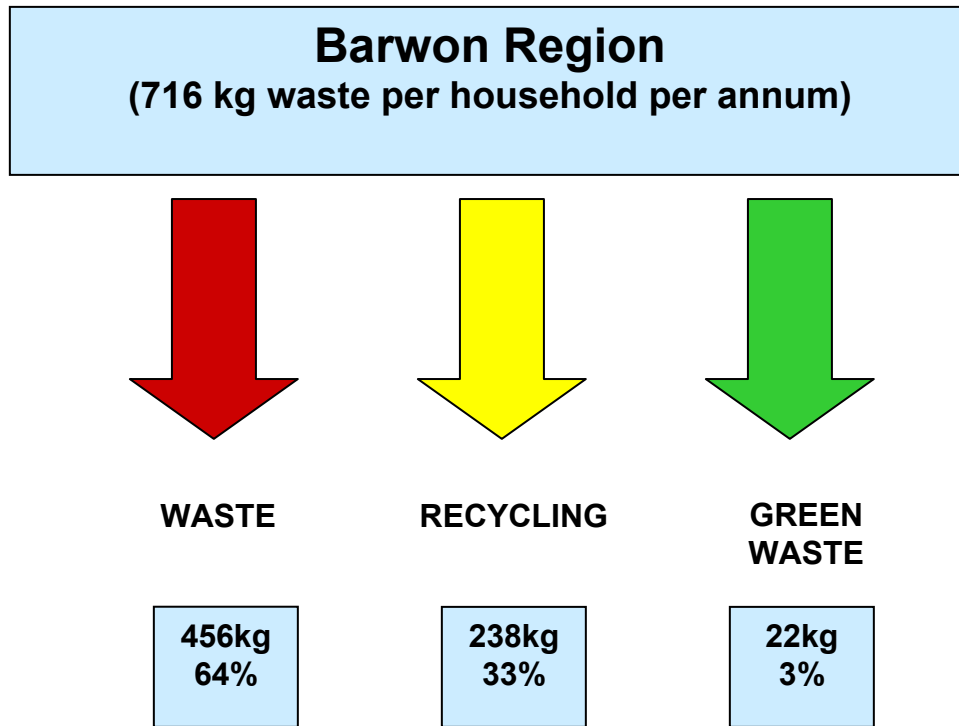


Figure 9: Average waste produced per household per annum in the Barwon Region 2004-2005



Historical Data

Regional

- **Waste to landfill in the Barwon Region 2001-2005**
- **Recyclables in the Barwon Region 2001-2005**

City of Greater Geelong

- **Corio Landfill: 1998-2005**
- **Drysdale Landfill: 1998-2005**

Table 4: Total waste deposited into landfill in the Barwon region 2001-2002, 2002-2003 and 2004-2005

Description	2001-2002	2002-2003	2004-2005	Total
Animal Carcass	20.98	28.28	32.72	81.98
Asbestos lagging	-	-	4,797.82	4,797.82
Asbestos Sheeting	5.70	-	35.60	41.30
Batteries	-	-	2.02	2.02
Bitumen/Asph/Crushed Rock	-	532.54	6,760.17	7,292.71
Carbon	-	-	37.38	37.38
Clean Fill	134,006.41	104,903.56	134,707.86	373,617.83
Contaminated Soil	5,428.80	24,992.20	54,400.56	84,821.56
Contaminates- soil	693.80	3,004.94	6,251.31	9,950.05
Cover Material (Dandos)	20,725.27	9,751.78	-	30,477.05
Deep Burial	0.34	2.74	-	3.08
Filter Cake	504.42	583.24	574.11	1,661.77
Fish Waste	672.10	1,030.30	681.12	2,383.52
Green Waste (contaminated)	-	28.26	383.30	411.56
Green Waste (municipal)	-	521.31	-	521.31
Green Waste (non-council)	8,632.96	2,068.05	431.22	11,132.23
Industrial Waste	65,693.43	51,509.11	81,565.06	198,767.60
Mattress	-	-	638.00	638.00
Mill Scale	7.72	-	-	7.72
Mixed rubble	23,528.56	22,392.26	14,107.79	60,028.61
Municipal External Councils	-	950.04	4,535.84	5,485.88
Municipal Waste (Kerbside)	81,569.27	67,767.26	59,776.76	209,113.29
Municipal Waste(Drop-off)	-	-	13,411.18	13,411.18
Offal treated	4,094.41	3,888.76	39.98	8,023.15
Offal untreated	11.68	32.18	10.04	53.90
Prescribed waste	940.22	717.22	276.36	1,933.80
Quarantine Waste	97.98	81.66	-	179.64
Sand	-	2,246.42	10,326.40	12,572.82
Scallop Shells	317.94	271.50	293.28	882.72
Seaweed	161.00	589.21	383.36	1,133.57
Squid	189.50	197.34	107.58	494.42
Street Sweepings	-	197.62	603.18	800.80
Unspecified inert & putrescible*	30,000.00	30,000.00	-	60,000.00
Wool Scour	264.41	68.90	-	333.31
Total Tonnage	377,566.90	328,356.68	395,170.00	1,101,093.58

* In 2001/2002 and 2002/2003 itemized data was not available for the **Fyansford Landfill** and the materials deposited were categorized as '**Unspecified inert & putrescible**'. Itemized data was available in 2004/2005 and the quantities of waste deposited to **Fyansford Landfill** are included under the appropriate description.

Table 5: Average waste deposited per household in the Barwon region 2001-2002, 2002-2003 and 2004-2005

Year	2001-2002	2002-2003	2004-2005
Total No. of Households	122,928.00	123,154.00	130,694.00
Total Domestic Waste	81,569.27	67,767.26	59,776.76
Waste per Household	664kg	550kg	457kg

Total Waste Deposited into Landfill 2001-2002, 2002-2003 and 2004-2005

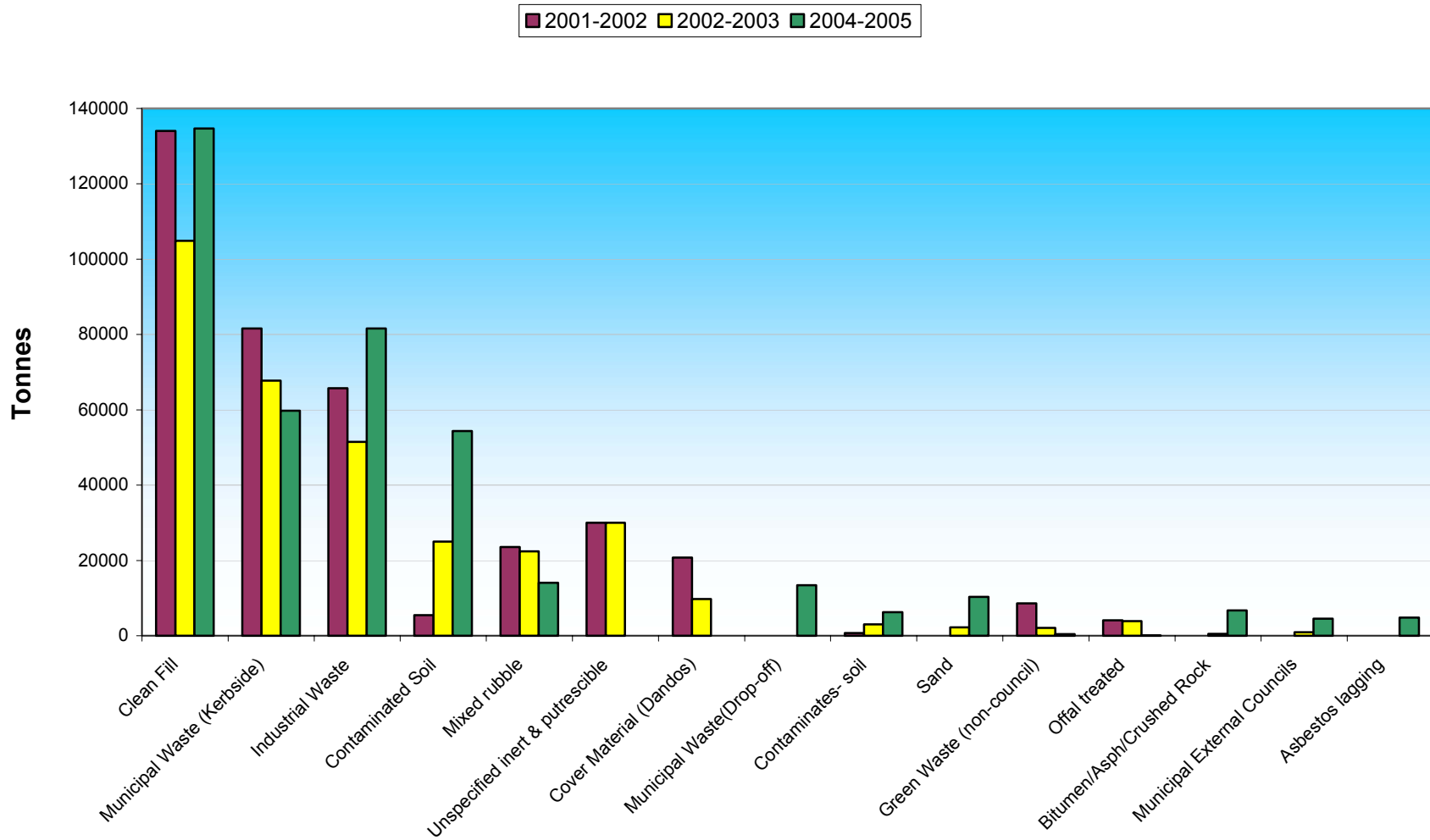


Figure10: Comparison between waste deposited into landfill 2001-2002, 2002-2003 and 2004-2005

Total Waste Deposited into Landfill 2001-2002, 2002-2003 and 2004-2005

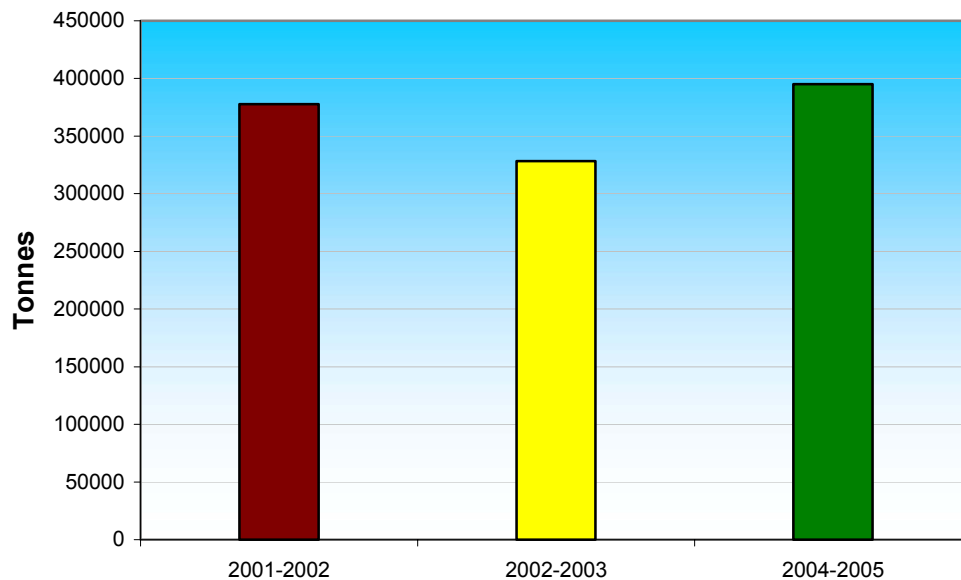


Figure 11: Comparison between total waste deposited into landfill 2001-2002, 2002-2003 and 2004-2005

Table 6: Total Recyclables collected in the Barwon region 2001-2002, 2002-2003 and 2004-2005

Description	2001-2002	2002-2003	2004-2005	Total
Aluminium	122.56	-	-	122.56
Batteries	24.00	67.33	7.27	98.60
Cardboard	3,718.70	213.10	3,667.00	7,598.80
Clean Fill	-	-	899.62	899.62
Glass	4,626.40	282.31	0.00	4,908.71
Green waste	2,587.70	4,788.69	38,358.96	45,735.35
Metal	-	-	1,440.00	1,440.00
Mixed Recyclables	9,000.00	25,170.75	46,092.68	80,263.43
Non ferrous metal	215.10	-	-	215.10
Oil	-	0.43	32.82	33.25
Paper	5,059.96	17.81	1,404.00	6,481.77
Plastic	764.48	0.62	36.00	801.10
Soil and Rubble	6,018.00	3,427.20	125,138.47	134,583.67
Steel	2,251.92	2,486.02	485.54	5,223.48
Timber	-	-	3,156.54	3,156.54
Tyres	50.00	362.00	13.15	425.15
Total Tonnage	34,316.26	36,816.26	220,732.06	291,864.58

Total Recyclables collected in the Barwon Region 2001-2001, 2002-2003 and 2004-2005

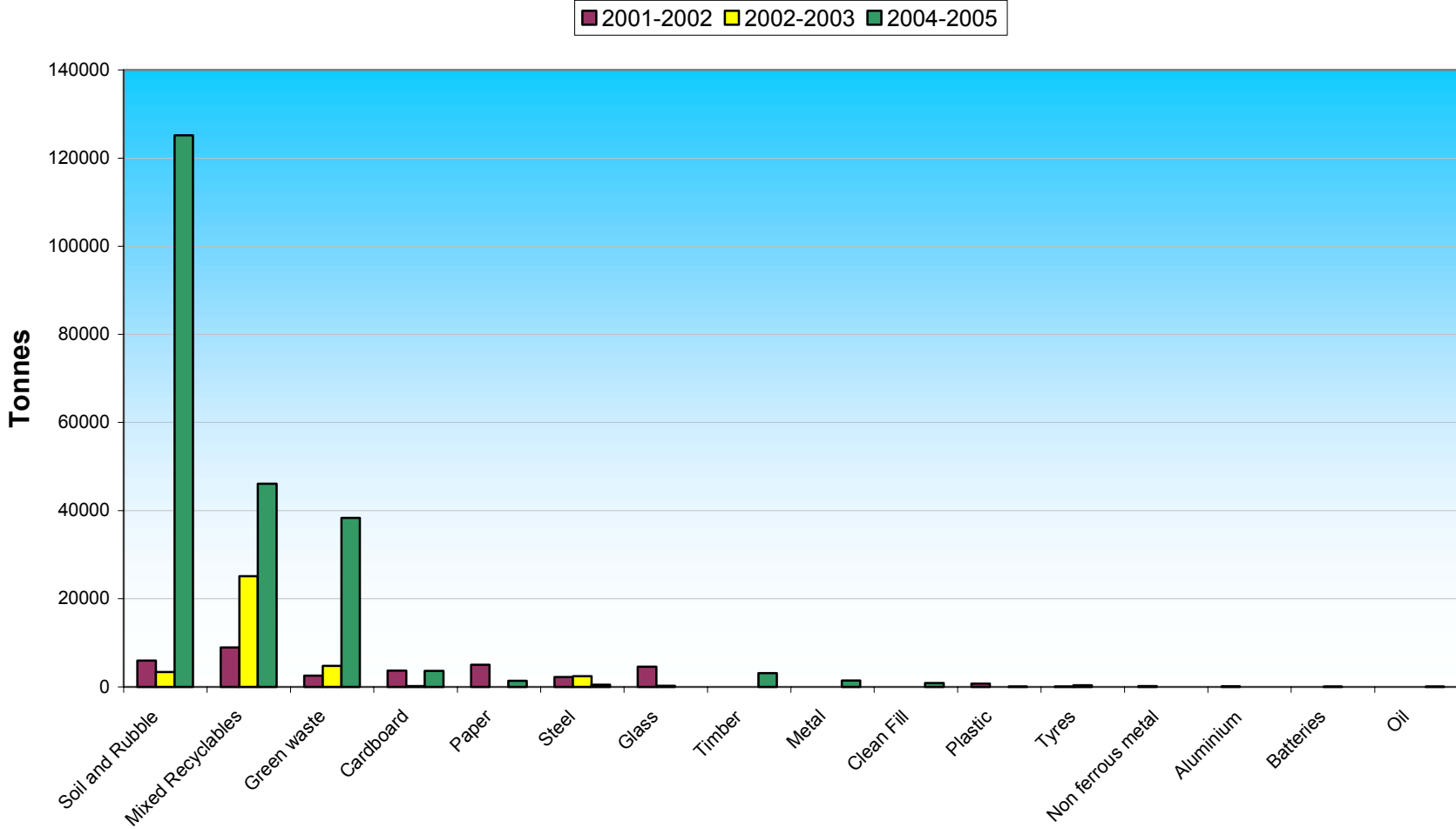


Figure 12: Comparison between Recyclables collected in the Barwon region 2001-2002, 2003-2003 & 2004-2005

Table 7: Corio landfill historical data 1998-2005

Description	98/1999	99/2000	20/2001	2002/03	2003/04	2004/05
Cover - Construction & Rehabilitation Soil	61,121	20,487	84,672	104,507	149,150	94,635
Low Level Contaminated Soil	61,469	24,775	28,504	27,997	117,266	54,400
Waste (All Types)	115,646	100,570	100,094	81,273	71,682	102,974
Total into Landfill	238,236	145,832	213,270	213,778	338,098	252,009

Table 8: Drysdale landfill historical data 1998-2005

Description	98/1999	99/2000	20/2001	2002/03	2003/04	2004/05
Cover	3,168	16,278	12,770	6,714	8,347	13,575
Waste (All Types)	49,199	55,036	57,170	54,977	42,476	43,535
Total into Landfill	52,367	71,314	69,940	61,691	50,823	57,110

Note : Cover at Drysdale is mainly found on-site.

Total Tonnage deposited into landfill at Corio and Drysdale 1998-2005

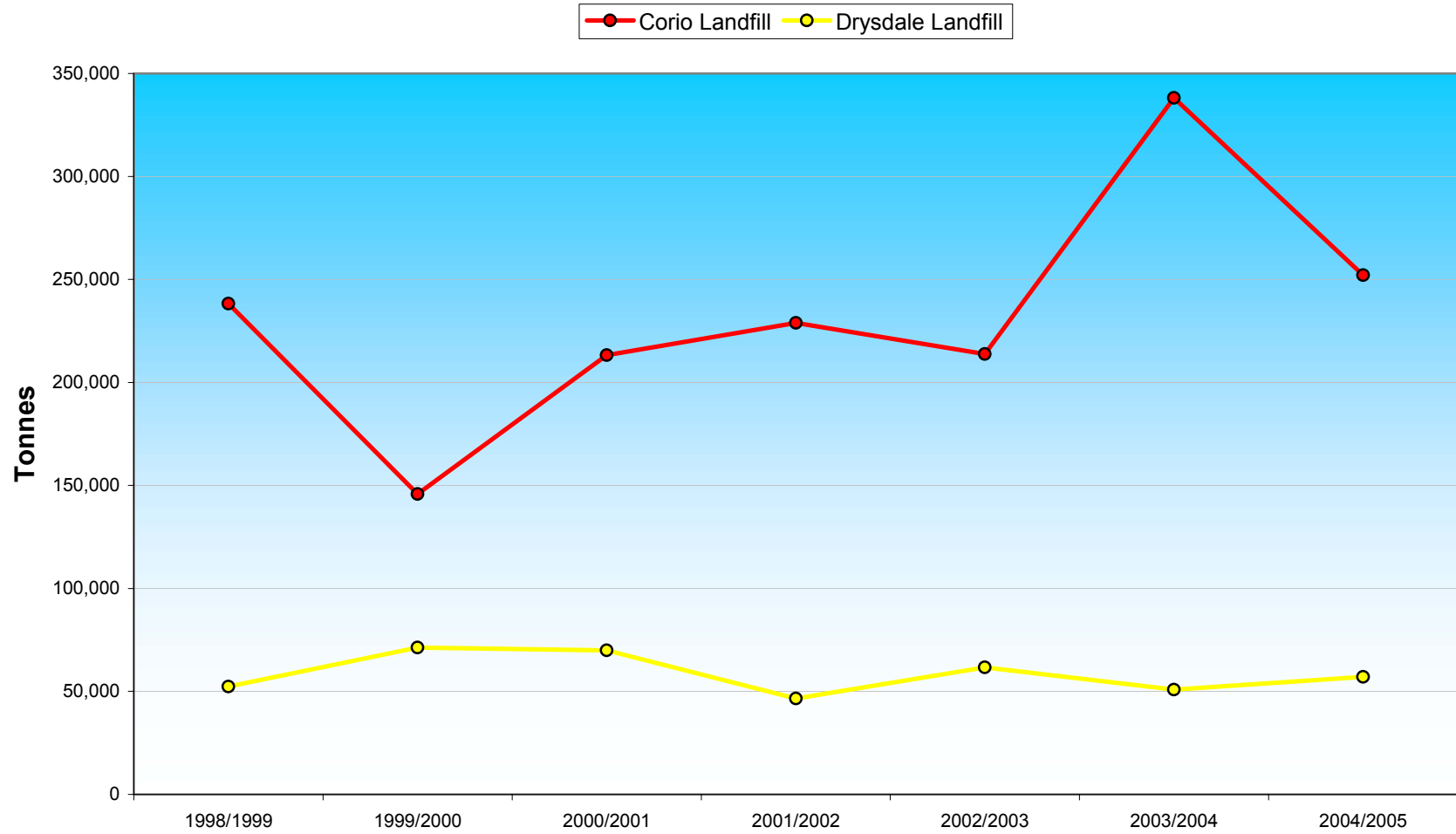


Figure 13: Comparison between total tonnes being deposited into landfill at Corio and Drysdale Landfills 1998-1995

5. DISCUSSION

5.1 Analysis

For the financial year 2004-2005 the total materials going to landfill was 395,170 tonnes. The most significant quantities coming from clean fill (34%), industrial waste (21%), municipal waste (18%), contaminated soil (14%), and mixed rubble (4%). Also 28,821 tonnes of materials produced in the region was deposited to landfills outside the region by commercial operators- this figure has not been included in the regions total waste data.

For the financial year of 2004-2005 the total material being recycled was 220,732 tonnes. The most significant quantities coming from soil & rubble (57%), mixed recyclables- which includes kerbside collections (21%), and green waste (17%). Significant quantities of timber are also recycled in the region; however data on the weights of timber were unavailable because of difficulties in estimating the m³ of milled timber.

The historical data shows interesting trends over several years. The data shows 12% decrease in municipal waste between 2002-2003 and 2004-2005. However there was an overall increase of 20% in total waste being deposited into landfill. The most significant increases were from clean fill, industrial waste, and contaminated soil being deposited into landfill. It is important to note that this is the first survey to include the data from the Fyansford Landfill as itemized quantities, rather than just an estimate of general total tonnage.

Over the past 4 years the data shows an over-all increase of 26,237 tonnes being deposited into landfill, although in 2002-2003 there was a decrease in quantities of material being deposited. This increase is due largely to the increase in industrial waste and contaminated soil being deposited into landfill. Despite this overall increase the data does show a decrease of 17% in kerbside waste per household. In 2002-2003 each household in the region deposited an average 550kg of material, and in 2004-2005 this average dropped to 457kg of material.

The historical data shows a 500% increase on the quantities of materials being recycled in 2002-2003.. The most significant increases coming from, soil & rubble (up by 3551%), green waste (up by 701%) and mixed recyclables (up by 83%). These percentages are impressive, but it must be noted that the size of the increases is at least in part due to more thorough data collection. This is especially relevant for soil & rubble; this year's survey saw the inclusion of data from the regions commercial rubble recyclers that weren't included in previous surveys. Also this is the first year that commercial recycling data has been included in the survey, and this inclusion accounts for 15000 tonnes of the increase recorded for mixed recyclables.

5.2 Limitations

Whilst attempts were made to obtain all of the data relating to landfill, transfer stations and recyclers, for this survey some gaps remain. Significantly data for metals recycling are missing due to concerns regarding confidentiality. There were difficulties in obtaining copies of data records for some of the facilities, resulting in some of the data being received as estimates over the phone.

Data recording inconsistencies also proved problematic. Coupling and categorizing of data was a significant weakness in the recording. While the researcher was able to collect accurate data for both municipal and commercial waste, the data recording methods used by the landfill operators were inconsistent. The different collection site operators differed in how they categorized the different types of waste and whether their records differentiated between commercial and municipal waste. This made the comparison of data difficult.

Attempts were also made to determine the level of industry that is reducing and recycling materials- such as tyre, molasses and oil reuse and recycling, however at this point in time accurate data for these activities is not available.

For the recyclable materials data, there were limitations in the comparison of historical data. This was due to the changes in processing, with all kerbside recycling now being categorized as 'mixed recyclables', rather than the detailed itemization that occurred in the past.

The conversion of volumes in cubic metres and litres into tonnes is also liable to produce inaccuracies. Given that the data recorded in cubic metres is based on a visual inspection of boot and trailer loads, it is difficult to make exact comparisons with the waste weighed at a weigh bridge. Further, how the materials are collected and prepared i.e. crushed or baled, also varies, and affects the accuracy of conversions. Therefore the volumes in this survey can only be considered close to accurate.

6. CONCLUSION

For the financial year of 2004-2005 the materials deposited into landfill was 395,170 tonnes. Of the materials being deposited into landfill, the greatest quantities were from clean fill, contaminated soil, and industrial waste.

For this same period recyclable materials collected in the region totaled 220,732 tonnes. Of these materials the most significant quantities collected were for soil & rubble, mixed recyclables, and green waste.

The historical data shows a 12% decrease in the amount of municipal waste being deposited into landfill in the region between 2002-2003 and 2004-2005, this equates to a 17% decrease in waste deposited per household. The data shows an overall increase of 20% in total land filled materials. For this same period there was a 500% increase the volume of material being collected for recycling.

With a much clearer picture of the waste generated by the region, planning for the future management of the Barwon region's waste will be significantly enhanced. Using the historical data, projections can be made that will allow for the adoption of quantity appropriate technology and waste planning systems.

APPENDIX 1

CONVERSION RATIOS

In an attempt to standardize the data collected, the following assumptions were made:

Aluminium	1m ³ : 1.4 tonne
Cardboard (bale)	1.5m ³ : 900kg
Cardboard (loose)	10m ³ : 1 tonne
Clean fill	1m ³ : 1.5 tonne
Glass (44 gallon drum)	1m ³ : 411kg
Glass (crushed)	1m ³ : 1 tonne
Green waste	4m ³ : 1 tonne
Industrial waste	2m ³ : 1 tonne
Mixed rubble/concrete	0.5m ³ : 1 tonne
Municipal waste	2m ³ : 1 tonne
Paper (bale)	1.5m ³ : 900kg
Plastic HDPE	1m ³ : 0.01 tonne
Steel	6.7m ³ : 1 tonne

This information was supplied with thanks to:
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GRRRC
And BRWVG

