



**BARWON REGIONAL WASTE
MANAGEMENT GROUP**

**REGIONAL
WASTE SURVEY
2005-2006**

Prepared by Barwon Regional Waste Management Group



EXECUTIVE SUMMARY

The Barwon Regional Waste Management Group (BRWWMG) has conducted its fourth annual survey of waste being deposited into landfills and materials being collected for recycling in the Barwon region. The following is a summary of the survey results for the financial year 2005-2006.

2005-2006

- Total waste deposited into **landfill = 339,500 tonnes**
- Total **recyclables** collected = **188,277 tonnes**

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

- Industrial waste- 89,312 tonnes (26%)
- Clean fill- 74,946 tonnes (22%)
- Contaminated soil- 54,030 tonnes (16%)
- Municipal waste (kerbside)- 39,568 tonnes (12%)
- Municipal waste (excluding kerbside waste)- 26,319 tonnes (7.7%)
- Mixed Rubble-14,107 tonnes (4%)

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

- Soil & Rubble- 92,525 tonnes (49%)
- Mixed Recyclables- 50,256 tonnes (27%)
- Green waste- 34,064 tonnes (18%)

Comparisons with the waste 2004-2005 survey produced showed:

- There was 14% less material deposited to landfill in 2005-2006
- There was 15% less material collected for recycling in 2005-2006
- On average there was 3% less kerbside waste produced by each rateable property in the region in 2005-2006

The following historical data shows a downward trend in the average quantity of waste produced per rateable property per year in the Barwon Region:

- 2001-2002- 664kg per rateable property
- 2002-2003- 550kg per rateable property
- 2004-2005- 345kg per rateable property
- 2005-2006- 335kg per rateable property

RECOMMENDATIONS

1. Standardization

It is recommended that Transfer Station and Landfill Operators within the region standardize their record keeping. Member councils owned sites were involved in a Transfer Station and Landfill product standardization project in 2006. This product standardization was implemented from July 2006. However this project should be extended to non-council managed landfills and transfer stations.

2. Reduce reusable materials from entering landfill

The data shows that significant quantities of clean fill and construction materials are being deposited to landfill. The data suggests there is potential for 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. The average quantity of kerbside waste deposited by households in 2005-2006 is 49% less than that of 2001-2002. However kerbside waste comprises a significant portion (12%) 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 Member Councils and the Barwon Regional Waste Management Group.

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 this data be included in future surveys.

5. Expanding the scope of the Barwon Regional Waste Survey

It is recommended that future surveys include calculations of the Greenhouse benefits of resource recovery in the region.

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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 2005-2006. 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 has been conducted. 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 2005-2006. The data requested was for all materials going to landfills, transfer stations and other recycling facilities. The contributions were voluntary and confidentiality of the information 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 Corio and Drysdale landfills in 2005-2006, as the Alvie landfill is an inert landfill. Data was provided for the materials deposited to the Alvie landfill, and from the transfer stations at Alvie, Birregurra, and Marengo. The COS is in the process of installing a weigh bridge at the Alvie site- for the purposes of this report the data was submit in cubic metres and was converted to tonnes for the purpose of comparisons made in this report (see Appendix 1 for conversion rates).

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. Some private operators deposited materials to landfills outside our region- these quantities have been noted. 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 materials collection from the Borough of Queenscliffe and Colac Otway Shire.
 - Kerbside recycling data for the Geelong region.
 - Waste and recyclables collected at GRRC.
- 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.
- VISY Recycling
 - All recyclables from kerbside collection in the region.
 - All other recyclables collected from the region (commercial, industrial and non kerbside municipal).

The data has been collated and is presented as follow:

4. BARWON REGIONAL WASTE DATA

JULY 2005- JUNE 2006

Table 1: Total waste deposited into landfill in the Barwon region 2005-2006

Description	Corio	Drysdale	Colac	Surfcoast	Fyansford	Total
Asbestos	-	-	-	-	6,660.53	6,660.53
Animal Carcass	32*	14*	-	-	-	-
Animal Carcasses	10.12	20.30	-	-	-	30.42
Bitumen/Asph/Crushed Rock	9,156.82	-	-	-	-	9,156.82
Clean Fill	25,986.08	16,785.85	-	22,709.36	9,465.65	74,946.94
Contaminated Soil	54,030.03	-	-	-	-	54,030.03
Filter Cake	508.52	-	-	-	-	508.52
Fish Waste	703.94	3.08	-	-	-	707.02
Green Waste (municipal)	187.44	444.47	-	-	-	631.91
Green Waste (non council)	424.28	1,041.20	-	-	-	1,465.48
Green Waste Contaminates	166.18	2.08	-	-	-	168.26
Industrial Waste	35,417.09	14,844.29	665.85	10,614.17	27,770.96	89,312.36
Mattress	1311*	555*	-	1186*	-	-
Mixed rubble	6,763.25	7,170.43	-	-	-	13,933.68
Municipal External Councils	5,794.18	1,092.48	-	-	-	6,886.66
Municipal Waste	15,498.26	2,838.71	414.25	3,577.04	3,990.89	26,319.15
Municipal Waste (Kerbside)	23,323.00	11,285.00	4284.56#	4,960.18	-	39,568.18
Offal untreated	563.70	-	-	-	-	563.70
Poultry	226.40	-	-	-	-	226.40
Prescribed waste	134.54	95.76	-	-	-	230.30
Public Asbestos	-	196*	-	-	-	-
Sand	8,816.44	-	-	-	-	8,816.44
Scallop Shells	777.78	127.68	-	-	-	905.46
Seaweed	698.58	10.38	-	-	-	708.96
Squid	154.74	-	-	-	-	154.74
Street Sweeper Material	40.22	-	698.00	425.90	-	1,164.12
VISY waste	2,404.02	-	-	-	-	2,404.02
Total Tonnage	191,785.61	55,761.71	1,778.10	42,286.65	41,227.50	339,500.10

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

Colac Otway Shire's kerbside municipal waste was deposited to Corio landfill in 05/06- this figure has not been included in total tonnage as it is captured in Municipal External Councils for Corio.

^ This figure includes the 1,076 tonnes of kerbside waste collected from the Borough of Queenscliffe in 2005-2006

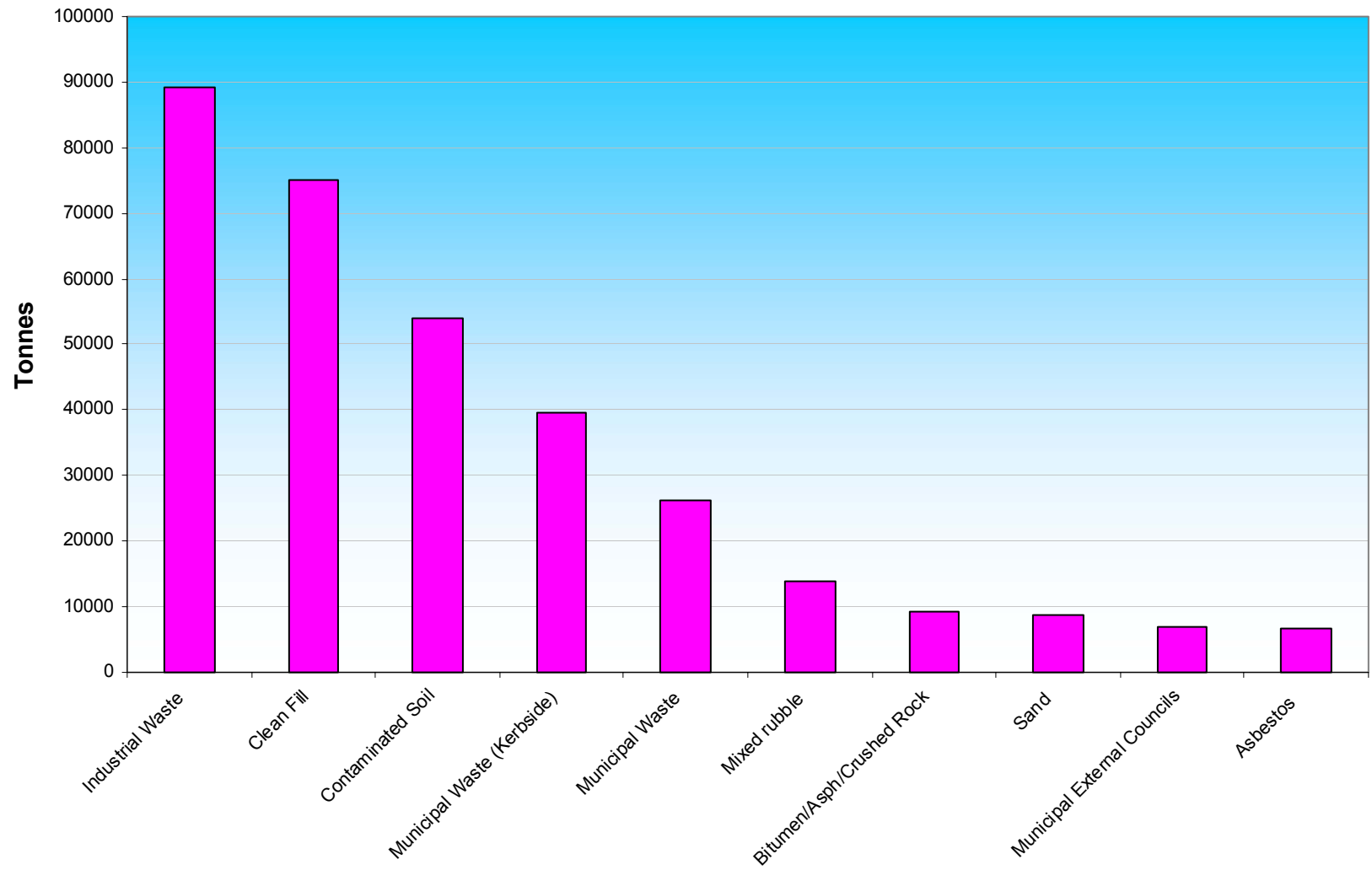


Figure 1: Total waste deposited into landfill in the Barwon region 2005-2006 (339,500tonnes)

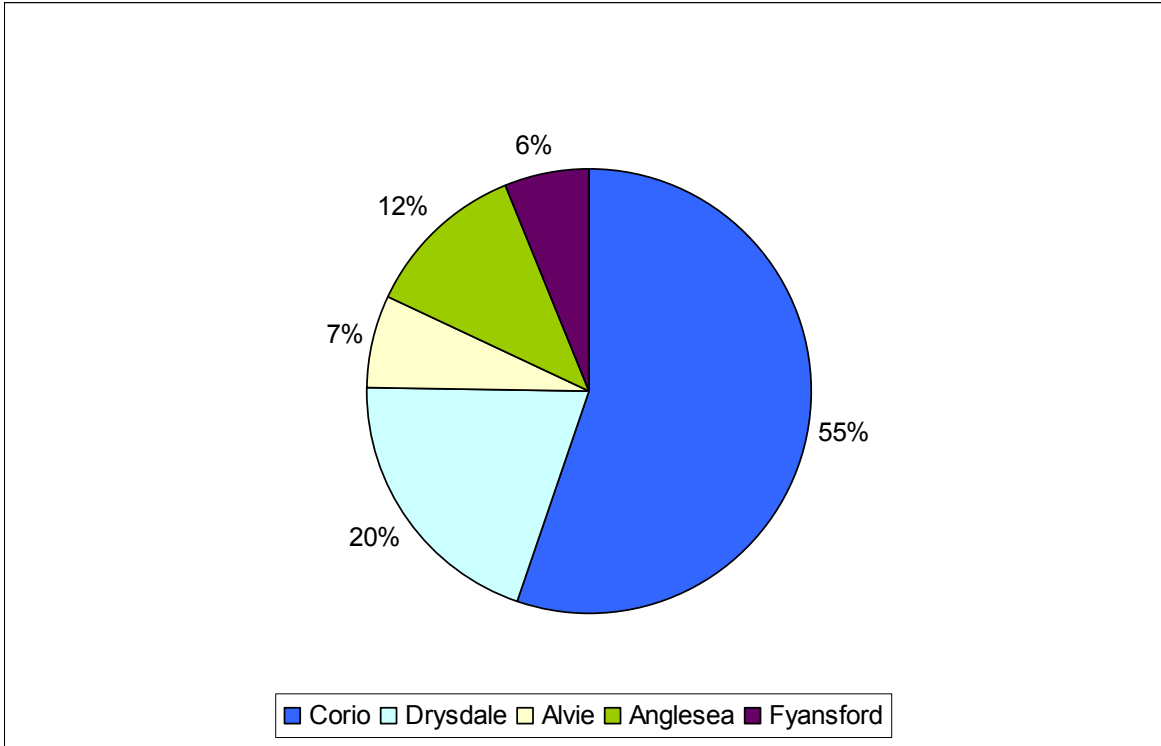


Figure 2: Percentage of Municipal waste deposited into landfills in the Barwon region 2005-06 (total of 70,171 tonnes)

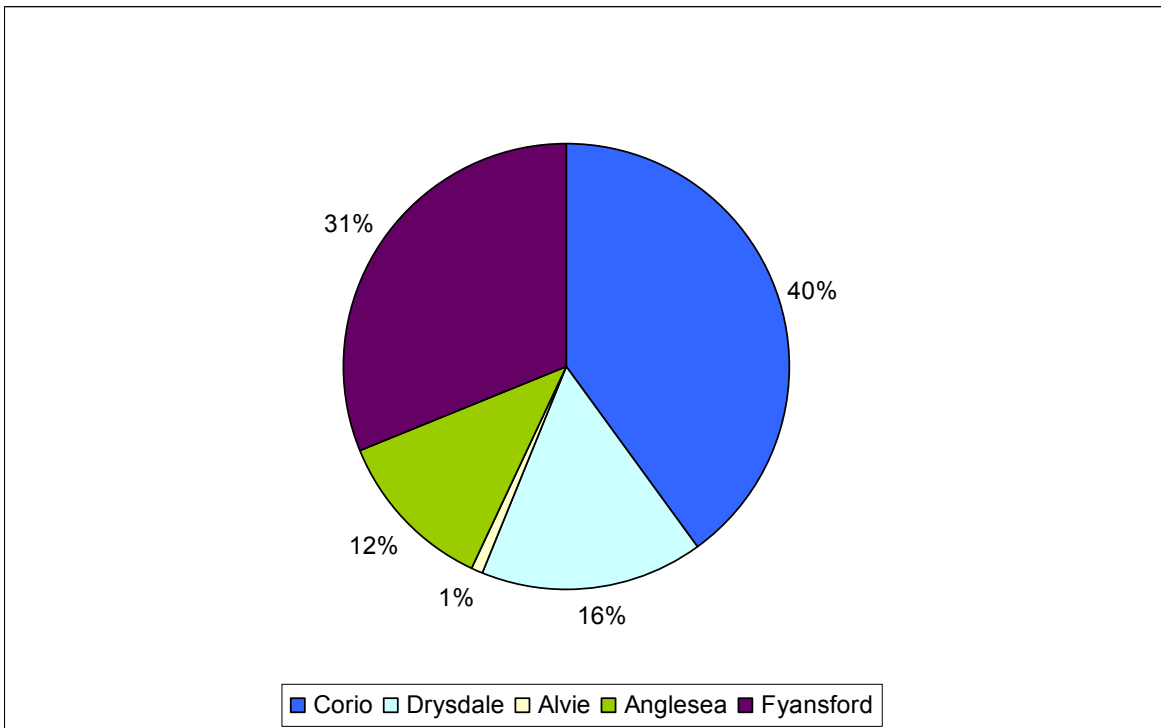


Figure 3: Percentage of Industrial waste deposited into landfill in the Barwon region 2005-06 (total of 89,312 tonnes)

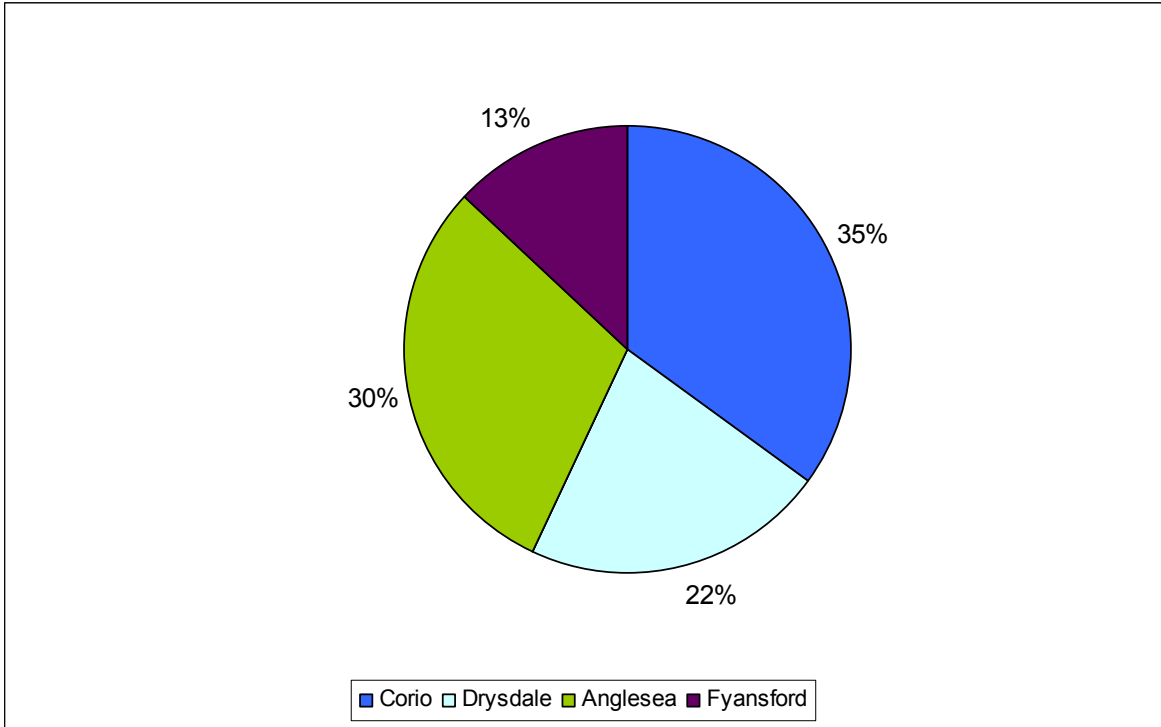


Figure 4: Percentage of Clean Fill deposited in landfill in the Barwon region 2005-06 (total of 74,946 tonnes)

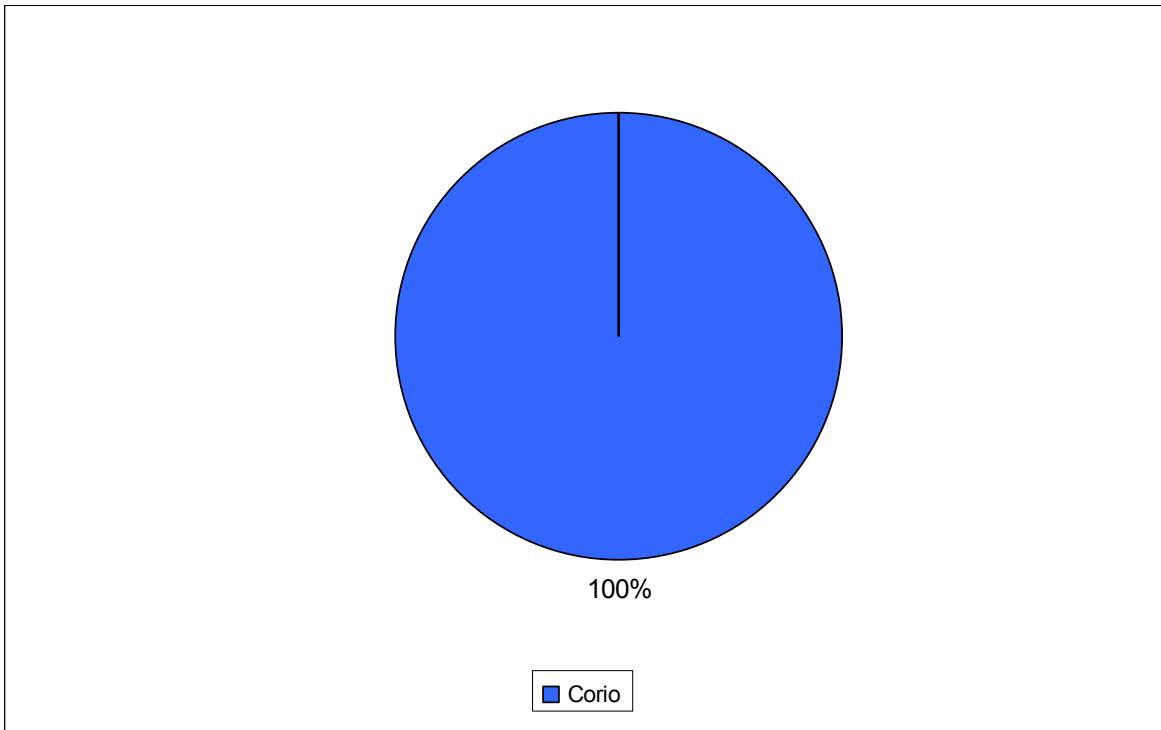


Figure 5: Percentage of Contaminated Soil deposited into landfill in the Barwon region 2005-06 (total of 54,030 tonnes)

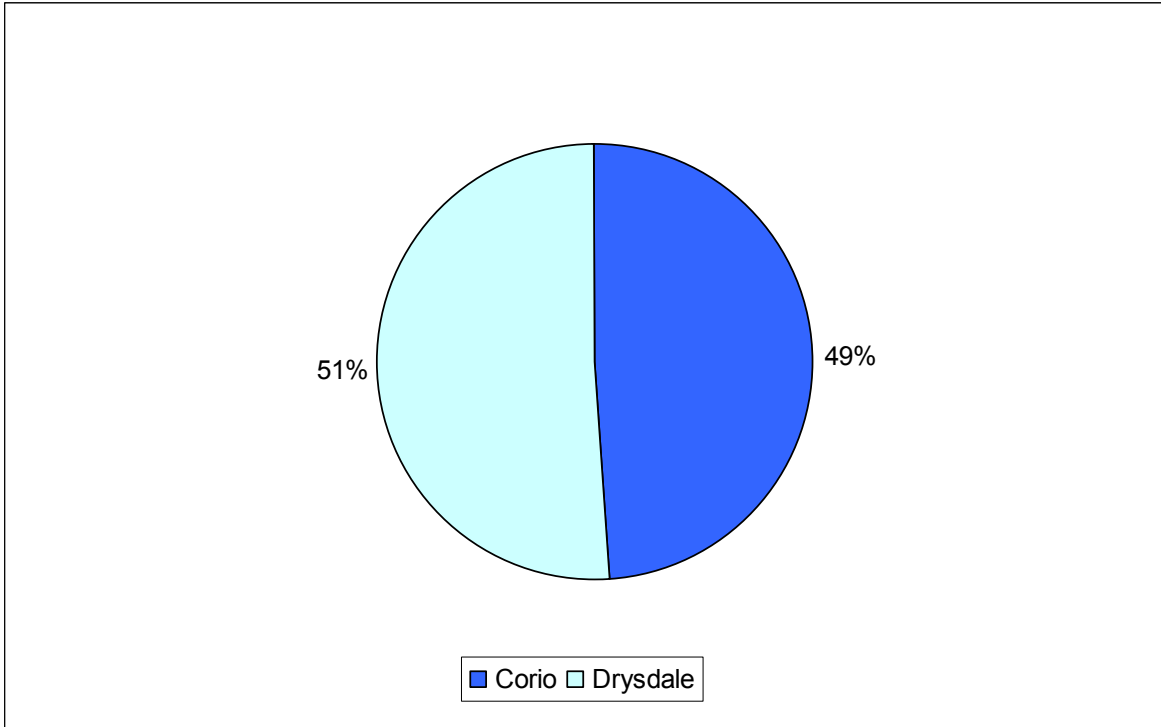


Figure 6: Percentage of Mixed Rubble deposited into landfill in the Barwon region 2005-06 (total of 14,108 tonnes)

Table 2: Costs of depositing materials to transfer stations in the Barwon region

Description	Corio	Drysdale	SCS	Alvie	GRRC	Fyansford	Pt Henry RRC
Skip- general waste	-	-	-	-	-	-	\$35.00
Inert Waste \$/m3	-	-	-	\$21.60	-	-	-
Mixed Rubble/Road base	\$32.20	\$32.20	\$32.50	-	-	-	\$50.00
Builders Rubble	-	-	\$49.00	-	-	-	\$50.00
Concrete	-	-	-	-	-	\$25.00	\$10.00
Prescribed Waste	\$19.50-\$64.80	\$19.50-\$64.80	-	-	-	-	-
Prescribed Waste- Asbestos	-	-	-	-	-	\$118.00	-
Putrescible Waste \$/m3	-	-	-	\$36.00	-	-	-
Industrial	\$31-45.60	\$45.60	\$49.00	-	-	\$44.00	\$50.00
Commercial Industrial#	-	-	\$37.50	-	-	-	-
Truck Tyre*	\$29.00	\$29.00	\$6-\$25.50	\$14.40	\$29.00	\$9-55	\$10-20
Car Tyre*	\$7.50-8.50	\$7.50-8.50	\$5-\$6.50	\$3.60-4.75	\$7.50-8.50	\$7.00	\$7.50
Car Body*	\$19.50	\$19.50	\$31.50	\$36.00	-	free	-
Tractor*	-	-	-	-	-	free	-
Steel Scrap	-	-	-	\$14.40/m3	-	-	-
Chemical Drums*	-	-	-	\$0.60	-	-	-
Batteries*	-	-	-	\$3.60	-	-	-
Clean Fill	\$8.00	\$8.50	\$7.00	-	-	\$15.00	\$10.00
Waste Oil	-	-	-	\$0.60/litre	-	-	-
Greenwaste	\$37.30	\$37.30	-	\$12.40/m3	-	-	-
Seaweed	\$31.90	\$31.90	-	-	-	-	-
Car Boot*	-	\$8.50	\$9.00	-	\$8.50	-	-
Car Boot-Green*	-	-	\$6.50	-	-	-	-
Single axle trailer/Ute/Wagon (waterline)*	-	\$16.50	\$16.00	-	\$16.50	\$16.00	\$16.50
Single axle trailer/Ute/Wagon (waterline)-Greenwaste*	-	-	\$11.50	-	-	-	\$16.50
Single axle trailer/Ute/Wagon (heaped)*	-	\$19.00	\$20.00	-	\$19.00	\$20.00	\$19
Single axle trailer/Ute/Wagon (heaped) Greenwaste*	-	-	\$15.50	-	-	-	\$19.00
Tandem trailer (waterline)*	-	\$19.00	\$20.00	-	\$19.00	\$20.00	\$35.00
Tandem trailer (waterline) Greenwaste*	-	-	\$15.50	-	-	-	\$30.00
Tandem trailer (heaped)*	-	\$38.00	\$22.00	-	\$38.00	\$25.00	>\$38
Tandem trailer (heaped) Greenwaste*	-	-	\$17.50	-	-	-	>\$35
Domestic Trucks/Skips Greenwaste	-	-	\$17.50	-	-	-	-
Mattresses*	-	\$8.50	\$10.00	\$11.50	\$8.50	\$7.00	\$8.50
Commercial Recyclable \$/m3	-	-	\$22.00	-	-	-	-
Commingled recycling	-	-	-	\$17.50/m3	-	-	up to \$35.00
Sorted Recycling	-	-	no charge	no charge	no charge	-	-

* indicated price per item, all other categories are priced per tonne unless otherwise specified.

Table 3: Total recyclables collected in the Barwon region 2005-2006

Description	COGG	COS	SCS	BOQ	Commercial	Total
Batteries	-	0.22	46.73	-	-	46.95
Cardboard	-	-	-	-	218.98	218.98
Clean Fill	-	-	-	-	3,181.68	3,181.68
Gas Bottles*	-	-	-	-	-	-
Glass	-	-	-	-	-	-
Green waste	27,523.25	1,477.95	1,996.97	96.00	2,970.45	34,064.62
Metal	271.72	153.04	730.99	-	3,172.63	4,328.38
Mixed Recyclables	26,013.83	1,876.54	3,899.25	426.72	18,040.00	50,256.34
Oil	-	-	12.74	-	29.20	41.94
Paper	-	-	-	-	1,300.00	1,300.00
Plastic	-	-	-	-	1,322.86	1,322.86
Soil & Rubble	-	-	1,829.18	-	90,695.97	92,525.15
Timber	-	-	-	-	974.23	974.23
Tyres	3.57	0.75	12.20	-	383*	16.52
Total	53,812.37	3,508.50	8,528.06	522.72	121,117.80	188,277.65

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

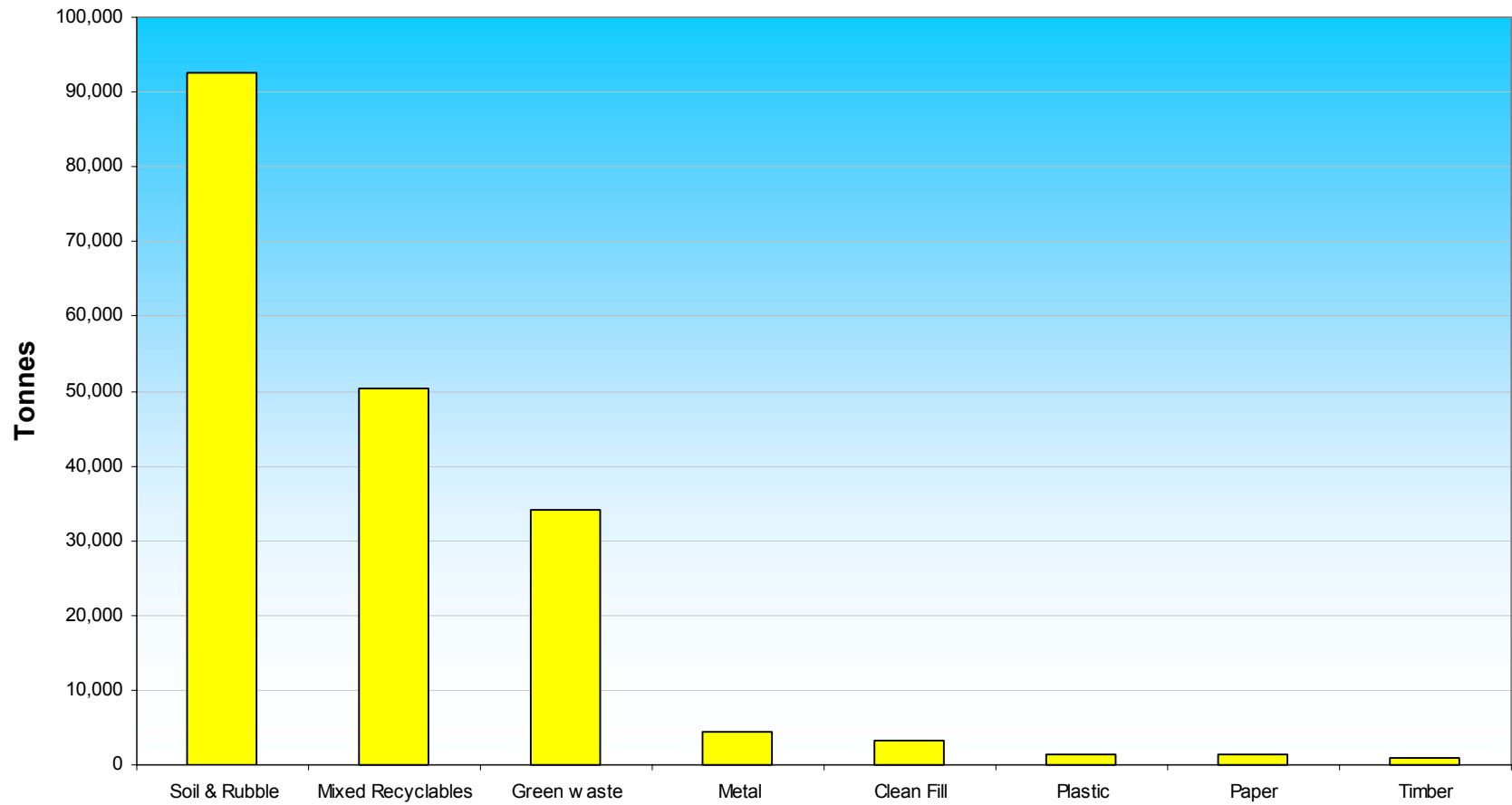


Figure 7: Total Recyclables collected in the Barwon region 2005-2006 (188,277 tonnes)

Figure 8: Average waste produced per rateable property (rp) per annum in each municipality 2005-2006

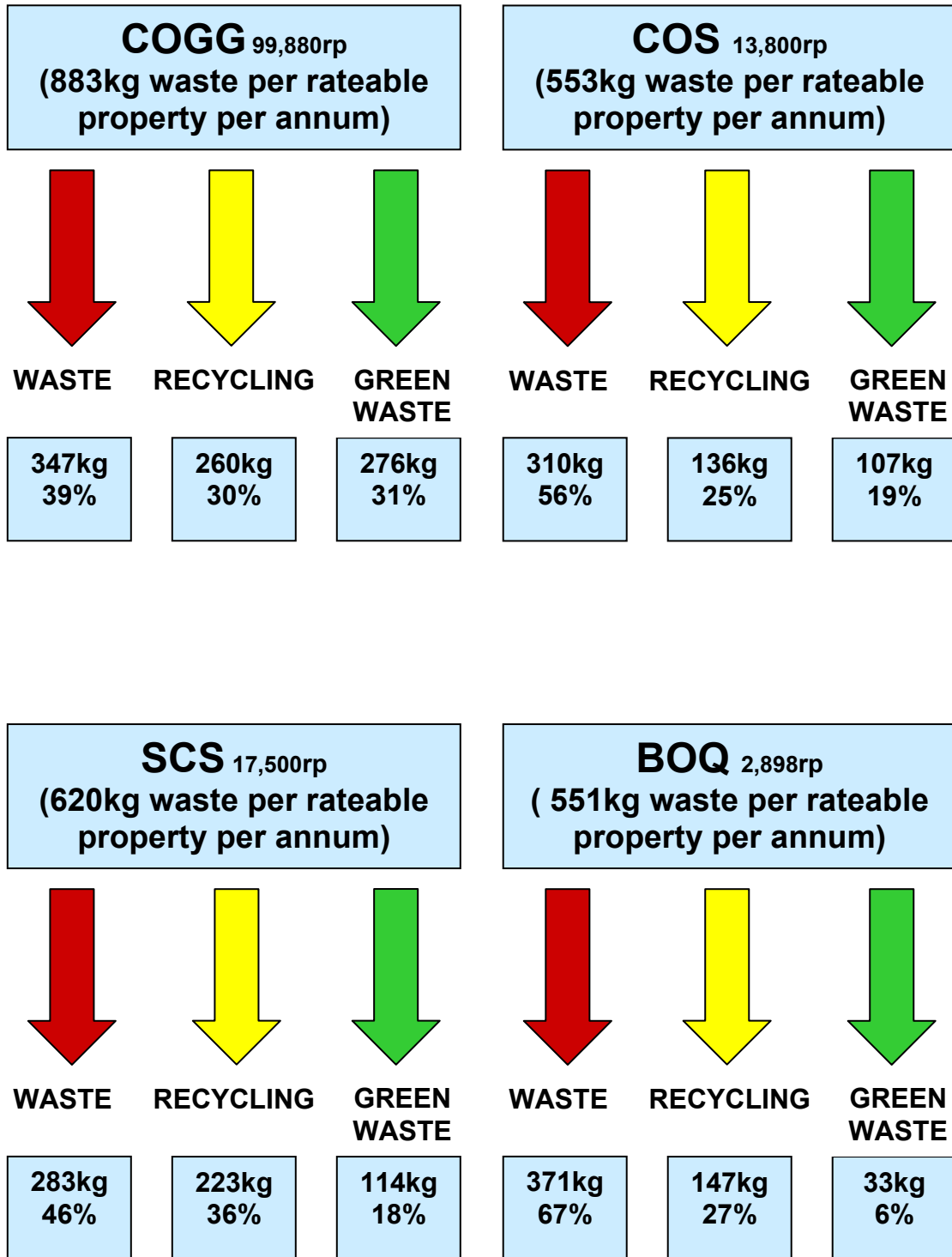
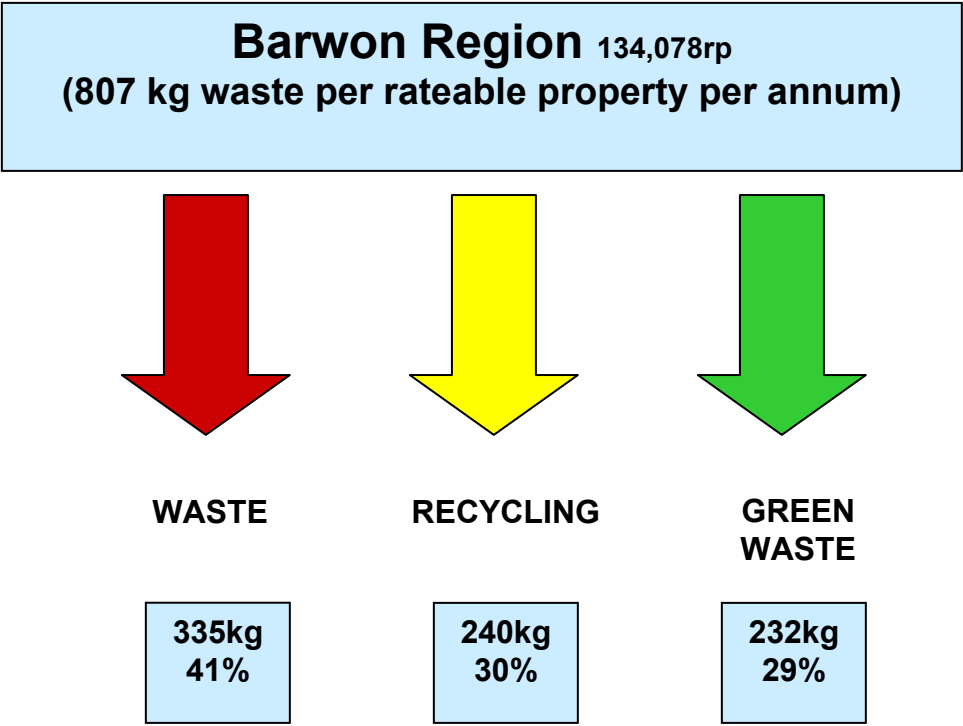


Figure 9: Average waste produced per rateable property (rp) per annum in the Barwon Region 2005-2006



Historical Data

Regional

- **Waste to landfill in the Barwon Region 2001-2006**
- **Recyclables in the Barwon Region 2001-2006**

City of Greater Geelong

- **Corio Landfill: 1998-2006**
- **Drysdale Landfill: 1998-2006**

Table 4: Total waste deposited into landfill in the Barwon region 2001-2002, 2002-2003, 2004-2005, and 2005-2006

Description	2001-2002	2002-2003	2004-2005	2005-2006	Total
Animal Carcass	20.98	28.28	32.72	30.42	112.40
Asbestos lagging	-	-	4,797.82	6,660.53	11,458.35
Asbestos Sheeting	5.70	-	35.60	-	41.30
Batteries	-	-	2.02	-	2.02
Bitumen/Asph/Crushed Rock	-	532.54	6,760.17	9,156.82	16,449.53
Carbon	-	-	37.38	-	37.38
Clean Fill	134,006.41	104,903.56	134,707.86	74,946.94	448,564.77
Contaminated Soil	5,428.80	24,992.20	54,400.56	54,030.03	138,851.59
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	508.52	2,170.29
Fish Waste	672.10	1,030.30	681.12	707.02	3,090.54
Green Waste (contaminated)	-	28.26	383.30	168.26	579.82
Green Waste (municipal)	-	521.31	-	631.91	1,153.22
Green Waste (non-council)	8,632.96	2,068.05	431.22	1,465.48	12,597.71
Industrial Waste	65,693.43	51,509.11	81,565.06	89,312.36	288,079.96
Mattress	-	-	638.00	-	638.00
Mill Scale	7.72	-	-	-	7.72
Mixed rubble	23,528.56	22,392.26	14,107.79	13,933.68	73,962.29
Municipal External Councils	-	950.04	3,225.84	6,886.66	11,062.54
Municipal Waste	-	-	29,720.58	26,319.15	56,039.73
Municipal Waste (Kerbside)	81,569.27	67,767.26	44,777.36	39,568.18	233,682.07
Offal	4,106.09	3,920.94	50.02	563.70	8,640.75
Poultry	-	-	-	226.40	226.40
Prescribed waste	940.22	717.22	276.36	230.30	2,164.10
Quarantine Waste	97.98	81.66	-	-	179.64
Sand	-	2,246.42	10,326.40	8,816.44	21,389.26
Scallop Shells	317.94	271.50	293.28	905.46	1,788.18
Seaweed	161.00	589.21	383.36	708.96	1,842.53
Squid	189.50	197.34	107.58	154.74	649.16
Street Sweepings	-	197.62	603.18	1,164.12	1,964.92
Unspecified inert & putrescible*	30,000.00	30,000.00	-	-	60,000.00
VISY Waste	-	-	-	2,404.02	2,404.02
Wool Scour	264.41	68.90	-	-	333.31
Total Tonnage	377,302.49	328,287.78	395,170.00	339,500.10	1,440,260.37

* 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 quantity of garbage deposited kerbside per rateable property in the Barwon region 2001-2002, 2002-2003, 2004-2005, and 2005-2006

Year	2001-2002	2002-2003	2004-2005	2005-2006
Total No. of Households	122,928.00	123,154.00	130,694.00	134,078
Total Kerbside Garbage	81,569.27	67,767.26	44,777.36	44,928.78
Garbage per Household	664kg	550kg	345kg	335kg

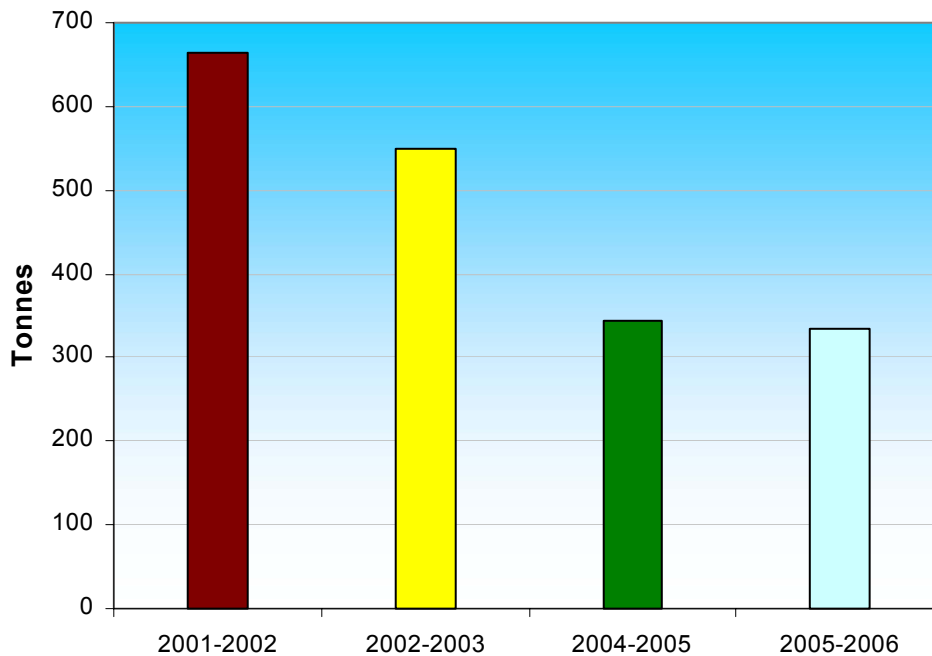


Figure 10: Average quantity of garbage deposited kerbside per rateable property in the Barwon region 2001-2002, 2002-2003, 2004-2005 and 2005-2006

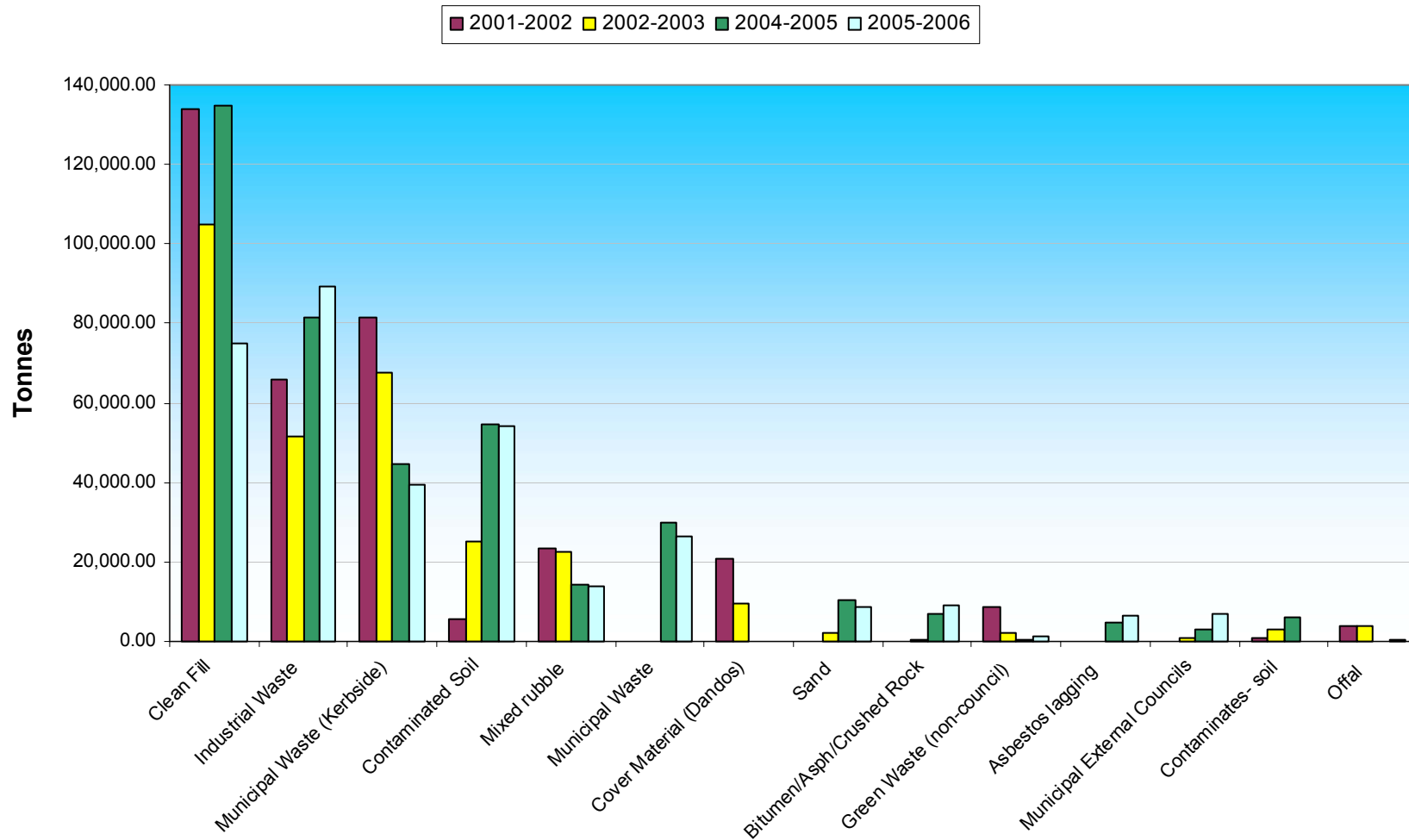


Figure 11: Comparison between waste deposited into landfill 2001-2002, 2002-2003, 2004-2005 and 2005-2006

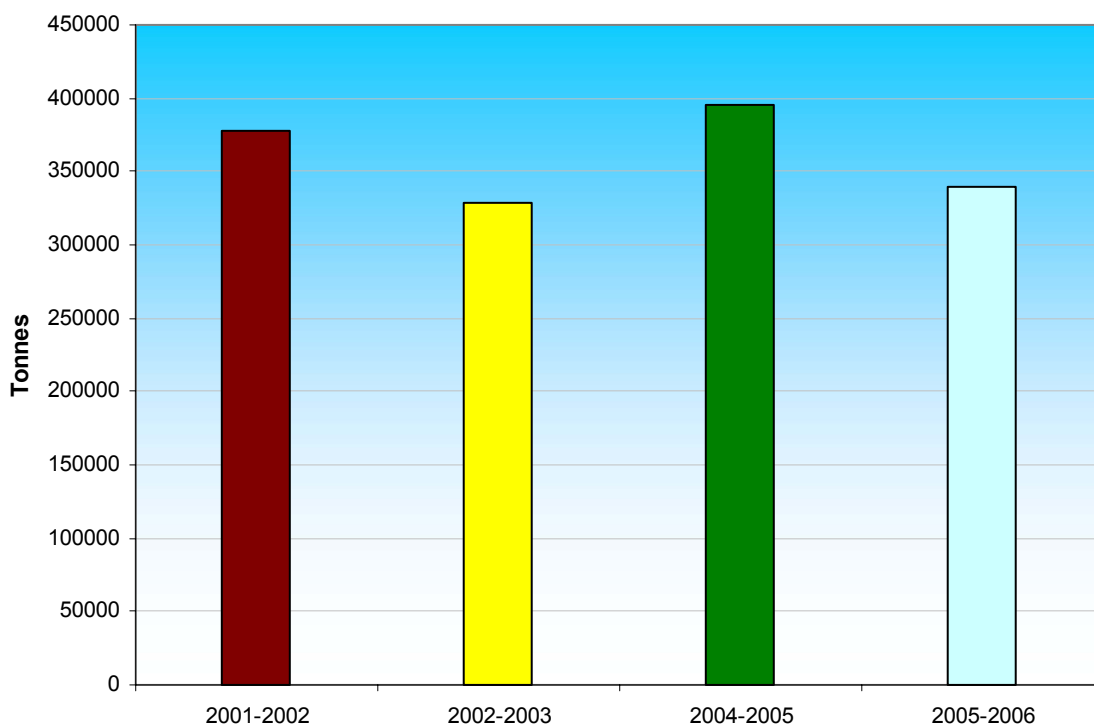


Figure 12: Comparison between total waste deposited into landfill 2001-2002, 2002-2003, 2004-2005, and 2005-2006

Table 6: Total Recyclables collected in the Barwon region 2001-2002, 2002-2003, 2004-2005, and 2005-2006

Description	2001-2002	2002-2003	2004-2005	2005-2006	Total
Aluminium	122.56	-	-	-	122.56
Batteries	24.00	67.33	7.27	46.95	145.55
Cardboard	3,718.70	213.10	3,667.00	218.98	7,817.78
Clean Fill	-	-	899.62	3,181.68	4,081.30
Glass	4,626.40	282.31	-	-	4,908.71
Green waste	2,587.70	4,788.69	38,358.96	34,064.62	79,799.96
Metal	-	-	1,440.00	4,328.38	5,768.38
Mixed Recyclables	9,000.00	25,170.75	46,092.68	50,256.34	130,519.77
Non ferrous metal	215.10	-	-	-	215.10
Oil	-	0.43	32.82	41.94	75.19
Paper	5,059.96	17.81	1,404.00	1,300.00	7,781.77
Plastic	764.48	0.62	36.00	1,322.86	2,123.96
Soil and Rubble	6,018.00	3,427.20	125,138.47	92,525.15	227,108.82
Steel	2,251.92	2,486.02	485.54	-	5,223.48
Timber	-	-	3,156.54	974.23	4,130.77
Tyres	50.00	362.00	13.15	16.52	441.67
Total	34,316.26	36,816.26	220,732.06	188,277.65	480,142.23

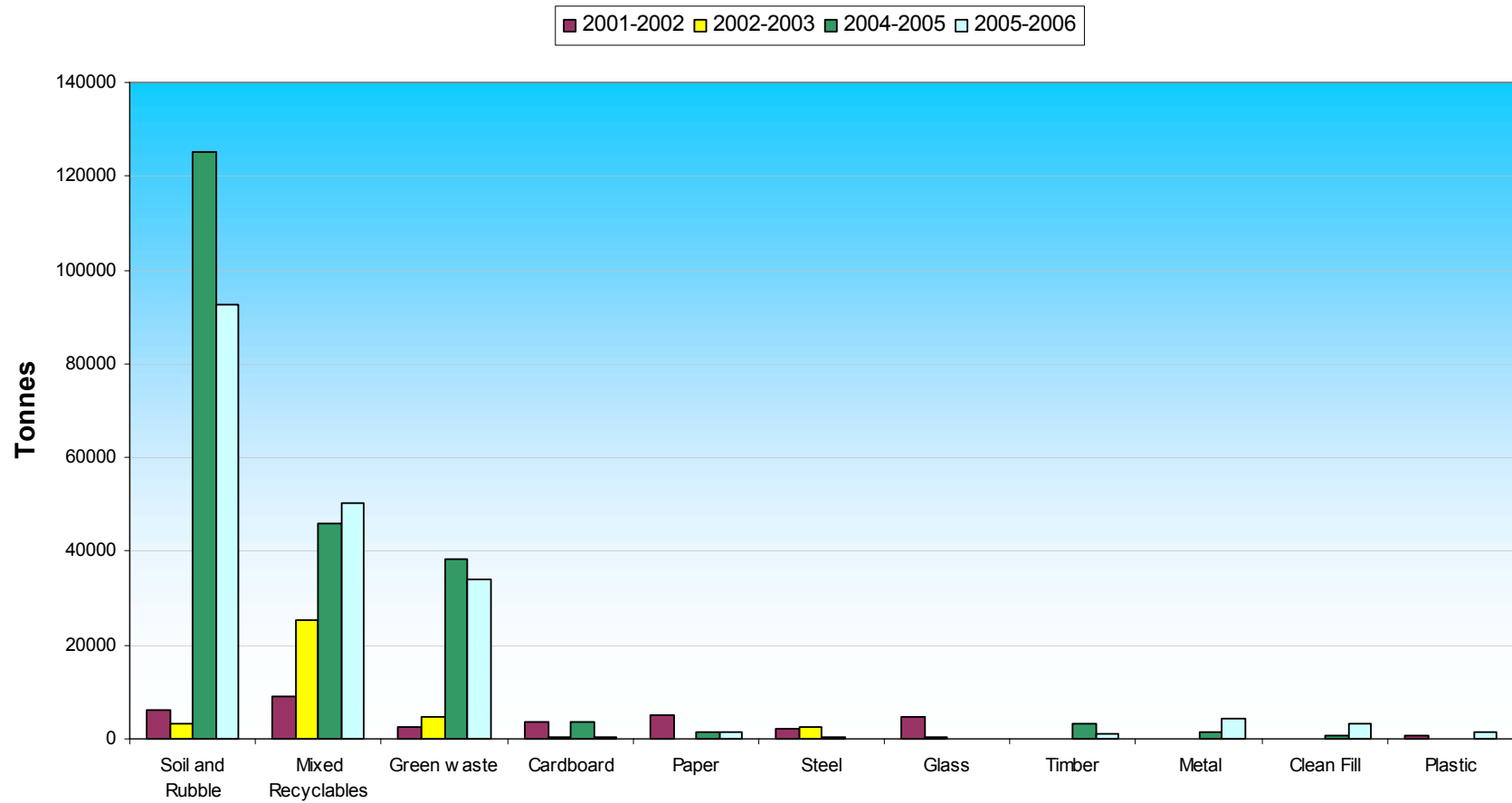


Figure 13: Comparison between Recyclables collected in the Barwon region 2001-2002, 2003-2003, 2004-2005 & 2005-2006

Table 7: Corio landfill historical data 1998-2006

Description	98/1999	99/2000	20/2001	2002/03	2003/04	2004/05	2005/06
Cover - Construction & Rehabilitation Soil	61,121	20,487	84,672	104,507	149,150	94,635	25,986
Low Level Contaminated Soil	61,469	24,775	28,504	27,997	117,266	54,400	54,030
Waste (All Types)	115,646	100,570	100,094	81,273	71,682	102,974	111,770
Total into Landfill	238,236	145,832	213,270	213,778	338,098	252,009	191,786

Table 8: Drysdale landfill historical data 1998-2006

Description	98/1999	99/2000	20/2001	2002/03	2003/04	2004/05	2005/06
Cover	3,168	16,278	12,770	6,714	8,347	13,575	16,786
Waste (All Types)	49,199	55,036	57,170	54,977	42,476	43,535	38,976
Total into Landfill	52,367	71,314	69,940	61,691	50,823	57,110	55,762

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

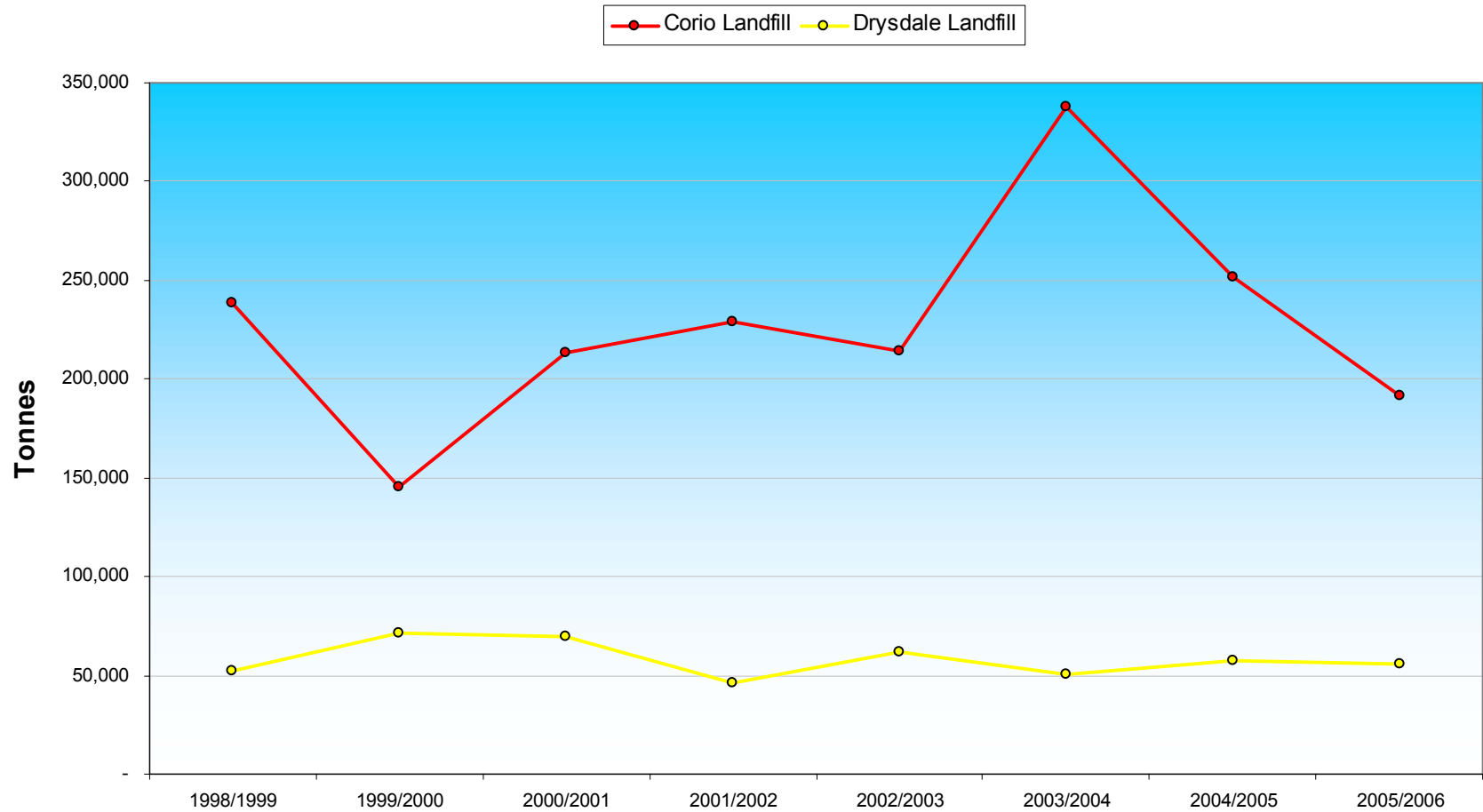


Figure 14: Comparison between total tonnes being deposited into landfill at Corio and Drysdale Landfills 1998-2006

5. DISCUSSION

5.1 Analysis

For the financial year 2005-2006 the total materials deposited in landfill was 339,500 tonnes. The most significant quantities coming from industrial waste (26%), clean fill (22%), municipal waste- including kerbside, drop-off and council works (20%), contaminated soil (16%), and mixed rubble (4%). Also 5,504 tonnes of materials produced in the region is known to be 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 188,277 tonnes. The most significant quantities coming from soil & rubble (49%), mixed recyclables- which includes kerbside collections (27%), and green waste- which also included kerbside collections (18%). Significant quantities of timber are also recycled in the region; however data on the weight of timber was unavailable because of difficulties in estimating the m³ of milled timber.

The historical data shows interesting trends over several years. The data shows an overall decrease of 14% in total waste being deposited into landfill. The most significant decreases were in clean fill, municipal waste, sand and contaminated soil being deposited into landfill. It is interesting to note a significant decrease of 12% in total municipal waste (including kerbside, and municipal drop-off) between 2004-2005 and 2005-2006.

Over the past 5 years the data shows a total over-all decrease of 38,061 tonnes being deposited into landfill; the waste being deposited to landfill is significantly lower this survey than in the last survey, although the 2002-2003 survey recorded the lowest quantity of material deposited. The survey has recorded decreases in all the most significant sources of waste to landfill except industrial waste which continues on an upward trend. There was an increase of 9% in industrial waste deposited to landfill between 2004-2005 and 2005-2006

This survey has also recorded a decrease of 3% in kerbside waste per rateable property between 2004-2005 and 2005-2006. In 2004-2005 each rateable property in the region deposited an average 345kg of material, and in 2005-2006 this average dropped to 335kg of material.

The historical data shows a 15% decrease on the quantities of materials being recycled between 2004-2005 and 2005-2006. The most significant decreases were measured in soil & rubble (down by 26%). It must be noted that the size of the increases is at least in part due to the ability to collect thorough data collection (a facility that recorded 32% of the total soil and rubble collected for recycling in 2004-2005 was unable to provide data for the 2005-2006 survey). It is interesting to note a 9% increase in the quantity of mixed recyclables collected.

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 is 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 are still inconsistent. The materials 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. This issue was noted in last year's survey and all Council operated landfills and transfer stations in the Barwon Region committed to consistent data recording categories that will be used for all materials deposited from July 2006 onwards.

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. This said there is now three years of data available under the current categorization allowing for more comprehensive comparisons to be made.

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. Colac Otway Shire is in the process of installing a weigh bridge at the Alvie transfer station, which will allow for more accurate data analysis.

6. CONCLUSION

For the financial year of 2005-2006 the materials deposited into landfill was 339,500 tonnes. Of the materials being deposited into landfill, the greatest quantities were from industrial waste, clean fill, and municipal waste.

For this same period 188,277 tonnes of recyclable materials were collected in the region. 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 total municipal waste (including kerbside, and municipal drop-off) between 2004-2005 and 2005-2006. The data shows an overall decrease of 14% in total materials deposited to landfill. For this same period there was a 15% decrease in the quantity 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:

VISY Recycling
Officers at the Surf Coast Shire
GRRRC
And BRWMG

