



Government
of South Australia

Guide to Kerbside Performance Reporting

Zero Waste SA



October 2007



FLAVOURS
OR COLOURS

Juicy
NO ADDED SUGAR

mJuicy
NO ADDED SUGAR

PURA

Light

Apple

Up & Go
Liquid Breakfast
CHOCOLATE
COMPLY WITH AUSTRALIAN FOOD STANDARDS
SC RECYCLE AT COLLECTION POINTS WITH THIS SYMBOL



SC RECYCLE AT COLLECTION POINTS WITH THIS SYMBOL

COMPLY WITH AUSTRALIAN FOOD STANDARDS

JUS
JUICE

ICED
COFFEE

FLAVOURED DAIRY DRINK

Up & Go
Liquid Breakfast
COMPLY WITH AUSTRALIAN FOOD STANDARDS
SC RECYCLE AT COLLECTION POINTS WITH THIS SYMBOL



SC RECYCLE AT COLLECTION POINTS WITH THIS SYMBOL

Fruit Smoothie
OTILO

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1 Overview of the Kerbside Reporting Program



1.1 Kerbside Performance Incentives

Zero Waste SA's Kerbside Performance Incentives have been established to encourage South Australian Councils to introduce and upgrade kerbside recycling systems. A total of \$4.5m is being offered to councils over two years and focuses on systems that deliver high recycling yields and minimise the amount of waste being disposed to landfill.

The Kerbside Performance Incentives support councils and the community to move progressively towards the South Australian Government's target of recycling 75% of domestic waste by 2010. The financial incentives are proportional to the performance level achieved by waste reduction and recycling services provided by the council. Ultimately, they aim to encourage the adoption of high performance waste management services across South Australian councils.

As set out in the Guidelines for Applicants, these funds must be applied by councils to eliminate waste or its consignment to landfill and to advance the development of resource recovery and recycling.

1.2 Who should do a kerbside audit?

Apart from implementing a kerbside audit program as part of a council's obligations under the Zero Waste SA's Kerbside Performance Incentives program, this standard methodology and reporting format can be used by any council and can be applied for any of the following purposes:

- Report within a council and/or region on the performance of a chosen waste and recycling system
- Compare performance with that of other councils in similar circumstances
- Provide the State Government (including Zero Waste SA and the EPA) with data on the performance of kerbside systems
- Providing feedback to the community on their recycling efforts
- Reviewing the performance of a new system (for example, 6 months after its introduction)
- Reviewing an existing system prior to tendering for a new kerbside contract or at a mid-term review.

1 Overview of the Kerbside Reporting Program

Even if your council is not doing an audit, Zero Waste SA strongly encourages you to make use of the Kerbside Performance Reporting Form. Using the figures provided by your contractor, this format ensures that the data you are collecting and providing to Zero Waste SA is consistent with that supplied by other councils. This assists you to compare your performance with that of similar councils in other areas and helps us to collate information at a statewide level.

1.3 Why measure kerbside performance?

There are compelling reasons for Zero Waste SA and councils to have access to accurate, reliable and consistent data in order to plan future waste reduction strategies. The key paradigm is “what cannot be measured, cannot be managed”.

Kerbside Performance Reporting is a compulsory requirement of all councils that are funded through the ZWSA Kerbside Performance Incentives. In many cases, this will require the conduct of an audit of materials set out at the kerbside. This methodology sets out the manner in which such an audit should be conducted so as to meet the requirements of Zero Waste SA.

The data collected from councils will be collated by Zero Waste SA. These collated results will then be conveyed back to councils enabling them to track and measure efficiency of their waste management services in comparison with those used in other areas.

The purpose of this Manual is to provide a standard methodology for councils and others to undertake audits of kerbside waste and recyclables. The instructions contained within this Manual will assist those conducting audits in completing the Zero Waste SA ‘Kerbside Performance Reporting Form’.

Importantly, by adhering to the set methodology, performance comparisons can be made with other councils as well as with the data collected from future audits conducted on each individual council’s kerbside collection system(s).

The main purpose of the data collection program is to be able to determine:

- Total diversion of materials from landfill
- Which kerbside systems (and other initiatives) contribute to maximum diversion rates
- Types and quantities of contamination of the streams audited

This will then guide the development of programs that will improve current levels of performance in regards to maximising diversion of waste from landfill. To achieve the above, it is paramount that accurate data is collected.

The Manual is structured as follows:

- Section 2 provides a check list for the audit process
- Section 3 summarises the auditor’s responsibilities
- Section 4 discusses audit sample size criteria
- Section 5 outlines the specific methodology for sample collections
- Section 6 summarises auditor training requirements
- Section 7 provides the outline of the OHS aspects of the audit program
- Section 8 summarises the actual audit procedures
- Appendices provide pro-formas and other essential information

1.4 The benefits of a standard methodology

Data collection in the field of waste management has become complicated and disjointed in recent times, with a range of agencies contacting councils and others with requests for information. These requests are often very specific, yet use differing definitions and classifications of waste streams. As such, it is not currently possible for councils to maintain a set of data that will meet the requirements of all these agencies. This standard methodology for Kerbside Performance Reporting is designed to simplify that process by providing councils and others with a common method for recording kerbside yield data.

1 Overview of the Kerbside Reporting Program



1.5 Zero Waste SA training courses - kerbside performance audits

Zero Waste SA offers short training courses in the use of this audit template and methodology. The satisfactory completion of this course will be required of all those that are intending to submit Kerbside Performance Reports to Zero Waste SA. For details on courses and when they will be offered, please contact 8204 2051 or by email zerowaste@saugov.sa.gov.au.

1.6 Further information and assistance

In addition to the training course mentioned above, Zero Waste SA is coordinating a program of support and advice to those conducting kerbside audits. This service is offered on an at-call basis to councils and their auditors, and allows South Australian auditors to benefit from the knowledge and experience of those who have conducted similar audits in other states.

For more information on the support provided by Zero Waste SA for this process, please contact Zero Waste SA on 8204 2051 or by email zerowaste@saugov.sa.gov.au.

1.7 Confidentiality

Audit reports should not contain individual tenement information. Adequate notice should be given to the residents about the audit in order to enable them to notify the council should they choose not to participate. It is important to ensure such notification is provided with sufficient time allowed prior to the audit being conducted. In this way you can be sure that the results of your audit represent a 'typical week' in your council area. It is generally accepted that a minimum of six weeks' notice prior to the audit is required. Refer to Section 8.2 for more details.

Appendix L contains a sample newspaper advertisement that can be used to advise the community of the audit program.

2 Checklist for Audit Program

The following provides a list of requirements that must be addressed in preparing for, conducting and analysing data for the kerbside audit program.

Project scope and information

- Scope of the audit program finalised
 - ZWSA requirements
 - Council requirements
- Timing for audit program finalised
- Waste/recycling collection systems and schedules determined
- Determination of materials allowed in systems
- Contractor data on weights collected
- Demographic data for council obtained

Audit competency

- Qualified or experienced auditors
- Training/briefing program for all auditors developed
- Confidentiality agreements signed

Quality assurance program

- Data forms – controlled distribution, use and recovery
- Data input protocols designed to minimise error and highlight errors
- Data verification process in place
- Procedures developed to report any adverse findings (eg., illegal disposal of waste materials)

Insurance

- Public liability details provided to council
- Professional indemnity insurance details provided to council
- Appropriate workers compensation insurance in place

Occupational Health & Safety Program

- Full risk assessment conducted for this audit
- Developed and submitted an OH&S plan prior to commencing auditing
- Plan contains information including, but not limited to:
 - Sample collection procedures – kerbside collections
 - Waste handling and sorting procedures

- Waste storage and collection
- Specific responsibilities
- Medical monitoring program
- Vaccinations required identified (minimum Hepatitis A and B, and Tetanus)
- First-aid provision
- Training
- Specific audit site issues
- Audit site evacuation procedures
- Personal protective equipment – requirements, use and maintenance
- Risk matrix with hazard identification and risk management program
- Program developed to monitor ambient conditions
- OH&S plan approved by council

Sample

- Methodology based on:
 - ZWSA requirements
 - Timeframes
- Streets and houses nominated – based on random sampling
- Process communicated to sample collectors to account for households who do not place waste/recycling containers out for collection
- Procedures adopted to ensure confidentiality of origin of materials (ie., household street and number)
- Public notification issued minimum of 6 weeks prior to audit
- Letter provided to sample collectors authorising collection

Waste audit site

- Has the following attributes:
 - Adequate space for segregation of pre and posted audited waste; staff and equipment
 - Protects from environmental conditions such as weather/wind
 - Protects storm water drains and other environmentally sensitive areas
 - Ventilation adequate
 - Power and water provided
 - Secure to ensure audited materials are not tampered with
- Litter control program

2 Checklist for Audit Program



Auditing methodology

- Maintains integrity of sample size so that:
 - Samples are not removed prior to being analysed
 - Materials and/or streams are not mixed
- Planned to ensure efficient workflow and that audited and non-audited materials are not mixed
- Equipment available, including first-aid equipment
- Process to ensure correct disposal of audited materials
- Timing adequate for estimated quantity of waste sample
- Sorters instructed in process and categories
- Materials sorted according to ZWSA requirements
- Material data recorded in weight (to 0.01 kgs)

Validation procedures

- Compares quantity audited against historical data – variations explained.

Participation rate

- Data collected in accordance with ZWSA protocols

Report structure

- Provided in the specified manner – electronic and number of copies
- Validation data and analysis provided
- Comments provided in report for any issues identified
- Draft report provided to ZWSA and council
- Comments integrated into final report
- Submit final report

3 Waste Auditor Responsibilities

ZWSA and the council is relying on the waste auditor's expertise not only for the efficient delivery of the audit process and for the expected outcomes, but also for their experience in being able to identify what information is required and to request it in a timely manner.

To ensure that the selected audit meets all projected outcomes in a safe and efficient manner all parties have clear responsibilities and separate roles. However, to meet these responsibilities fully, the co-operation of all parties in supplying data and information is vital.

The waste auditor is responsible for the following:

- Requesting in writing all relevant information, and providing advice as to where the information may be available.
- Agreeing on the audit objectives and outcomes.
- Performing the audit in an efficient manner so as to achieve the stated objectives.
- Advising the client if timeframes cannot be met and providing a rationale as to why they cannot be met, as well as when they can be met.
- Ensuring that all audit samples are collected in accord with the developed methodology and in a safe manner.
- Conducting the audit in a safe manner. The lead auditor is responsible to ensure the safety of waste auditors, the environment surrounding the audit area, and site personnel that may come in contact with the audit process. The audit area should be secure at all times and waste must at all times be securely contained.
- Ensuring that waste is transported to the audit site in a safe and environmentally responsible manner.
- Ensuring the audit team is familiar with the site, taking note of any environmental issues that may need to be considered during the audit eg close proximity of storm water drain; close proximity of public places. Also availability of necessary utilities such as power, water and amenities.
- Estimating how much waste will be collected for sorting and ensuring adequate resources are available to effectively process this quantity.
- Ensuring all necessary equipment and resources are available as required and are in good order. Scales used for measuring should be calibrated, any electrical equipment used on site must be compliant.
- Ensuring that audit staff employed on the waste audit have the necessary competencies and skills to effectively complete the tasks assigned to them.
- Ensure the audit site manager has agreed in advance the use of any on-site facilities/resources. This will include the actual sorting area, access to power and water etc.
- Advising the client, immediately of any potential environmental issues that come to light as a result of the audit, even if this is outside of the scope of the audit.
- Ensuring all post sorted waste is deposited into appropriate containers for final disposal/recycling in line with EPA legislation or site licensing conditions.
- Maintain confidentiality.
- Prepare all reports as required.

4 Audit Samples

The following section provides an overview of the sampling criteria that are to be followed when conducting Kerbside Performance Reporting Audits. It is essential that the indicated sample sizes are followed so that the audits are valid and data can be used as described in Section 1.2.

4.1 Sampling for recyclables and residual waste

- A sample size of 100 serviced tenements (e.g. households) has been specified for both the recyclables and residual waste.
- This sample size has been determined based on statistical advice and from data collected from several kerbside audit programs. The required sample size provides a confidence level of 95% or higher that the results are accurate and reflect what is really happening in your community in regards to the residual waste and recycling streams. Due to the issues summarised in Section 4.2, the sample audited for the green organics is not statistically valid.
- The bins must be collected from randomly selected tenements in locations that represent the diverse demographics within the council. Refer to Section 5 for sample collection procedures.
- The following parameters should be considered in determining where the samples should be collected:
 - Tenement size and structure (eg., single parent households, two parent households, households with young children, single person households, elderly persons)
 - Home ownership (i.e. renting, purchasing or own outright)
 - Dwelling type (i.e. separate dwelling, semi detached or flats)
 - Tenement income
 - Vegetation cover

Each of these parameters may influence the type and quantity of recyclables and residual waste generated. Therefore, the potential variances must be considered when developing the sample collection methodology.

4.2 Sampling for green organics

Where a kerbside green organics bin collection service is provided, a random audit of 25 bins should be undertaken. As for recyclables and residual waste, care should be taken to ensure this sample represents the broader range of tenements using this service. In particular, attention should be paid to the size of blocks and vegetation cover.

It is important to note that the green organics sampling process will provide an indication of issues only, and is not one that can be considered statistically valid. There are several issues that can impact on accurately extrapolating the data to provide a representation of green organics generation (types and quantities), over a 12 month period. These issues include; demographics (eg., size of household blocks), the season sample collected and weather during the period green organics could be deposited into the kerbside bins. That is, the sample may be collected during autumn but unseasonable weather may mean that residents are not gardening.

To assist in classifying green organics, the following definitions have been provided:

- Lawn Clippings - wet or dried grass/lawn clippings (ie., from lawn mowing) - small quantities of weeds (eg., oxalis and dandelion), could be included in this category
- Shrubs/Branches - this includes whole shrubs, or cuttings from shrubs, and branches up to 5cm in diameter
- Logs - suitable for firewood (ie., over 5cm in diameter, excludes such materials as treated pine)
- Other Green Waste – this includes any defined weed species (ie., council specific), flower cuttings, treated pine, dismantled fences

4.3 Factoring single unit and MUD's

Your sample of tenements must include all categories that represent 5% or more of your total serviced tenements. That is, if your community has 7% multi-unit dwellings, your sample should also include 7% multi-unit dwellings.

4 Audit Samples

4.4 Audit timing

The following periods should be avoided for auditing of residual waste and recyclables.

- 1) 1st of December to 1st of February (to minimise the impact of Christmas holidays)
- 2) Easter period
- 3) Public holidays and long weekends
- 4) During major local events or festivals.

It has been demonstrated through many kerbside audits that the types and quantities of materials generated during these periods can be significantly different than what is “normally” generated. Therefore to conduct the audits during these times and then extrapolate data could lead to incorrect assumptions about such issues as diversion rates and contamination of the various streams.

If possible green organics should be audited in the Autumn months (i.e. within the months of February, March and April of any given year).

Councils should undertake the audit no less than 6 months following the introduction of a new system. Where applicable, the audit should be done within the period specified within the Funding Agreement with Zero Waste SA, under the Kerbside Performance Incentives program.

Councils that are required to undertake a kerbside audit as a condition of their Kerbside Performance Incentives will be provided with a due date for submission in their Funding Agreement with Zero Waste SA.

Additional audits may be undertaken by the councils at their discretion. A systematic audit program is highly recommended as it will allow councils to track the performance of existing kerbside services or any new services. In the interests of consistency, Zero Waste SA strongly recommends the use of this standard methodology in such instances. This will allow for ready comparison of results with those generated by other councils and, once provided to Zero Waste SA, will allow results to be collated in a consistent manner.

4.5 Participation rate calculations

Ascertaining accurate participation rate data is essential for extrapolating audit data to provide a representation of “per annum” rates of material generation, diversion and contamination.

Participation rates are determined by dividing the number of tenements putting out their kerbside container by the total amount of tenements surveyed.

Participation rates are not to be calculated by the information provided by contractors in regards to the number of tenements serviced.

The following methodology should be adopted in calculating the participation rate for all kerbside services (recyclables, residual waste and green organics). Please note that is likely to get different rates for each waste stream. It is also likely that the participation rate will change throughout the year due to many circumstances such as weather; season; holiday period etc. As such it is strongly recommended that the participation rate is calculated at the same time as the audit is conducted.

The participation rate calculations should be conducted at around the same time as the sample is collected for the kerbside audit program.

STEP 1

A minimum of 100 premises are to be considered for determining participation rates. If this exercise is being conducted at the same time as the audit, then the same sample can be used. If it is being conducted at a different time then a random sample must be selected – refer to section 5 for sample determination procedures.

STEP 2

If doing this as part of the audit, then during the collection of the samples mark on the run sheet if the selected household placed their bin out for collection. This is done for each waste stream serviced ie recycling; organics; residue.

4 Audit Samples



If doing this exercise separately from the audit, then arrange for a person to drive past each of the selected households as close as possible to the normal collection time. If this exercise is carried out several hours before the normal collection time, or the night before the information may be inaccurate as households that may be late at putting out their bins will be recorded incorrectly as not participating, hence reducing the real participation rate.

Count how many of the selected premises have put out bins for collection in the street/s. Check that at least 100 premises have been surveyed. Ensure that the households selected are serviced on the day audited. For example some recycling services are fortnightly, so certain streets in the area would be excluded from the sample.

STEP 3

Fill out the table on the CD (on the inside front page of this booklet). The form can also be found on the website www.zerowaste.sa.gov.au.

You will arrive at a percentage for each stream. For example if 80 households placed their residual waste bin out and 75 placed their recycling bin out, then given a sample size of 100, the participation rates would be:

- Residual waste - 80%
- Recycling stream - 75%

The methodology for determining participation rates as outlined in the ZWSA audit methodology applies to single-unit dwellings only. Determining participation rates for MUDs is a far more complex process. For the purposes of this project, where the percentage of MUDs in a council is less than 20%, the participation rate as determined for households will be applied to MUDs. Where the percentage of MUDs is greater than 20% an alternative methodology is to be discussed with ZWSA.

5 Sample collection procedures

This section provides the detailed and required methodology to be used for:

- Sample selection
- Sample collection procedures
- Procedures for bins not present at selected tenements
- Inclusion/exclusion of commercial premises

It is essential for accurate extrapolation of data collected through the audits, from contractors and the participation rates that this methodology be followed precisely.

This methodology refers to “houses”, but if required to collect from other tenements such as MUD’s (refer to Section 4.3), then this would be considered in the interpretation of the following.

If there is any doubt over the validity of the sample, then it is important that you cease collection and re-start the process once the issues have been resolved.

5.1 Sample Selection

Kerbside audits have demonstrated that different socio-economic profiles within a council do generate different types and quantities of waste materials. There can also be differing adherence to segregation requirements for these materials.

The following details provide the methodology to be followed in determining your sample and ensuring a safe audit.

5.1.1 Step 1

Determine the different socio-demographic regions within each council collection area. This can be ascertained using the following criteria as a guide:

- Tenement size and structure (eg., average number of people living in houses)
- Home ownership
- Type of dwelling
- Tenement income
- Block size and vegetation cover (pertinent for the green organics audit)
- Rates valuations

This information may be accessed from areas within council where resident profiles have been developed for annual reporting purposes or development of social programs, or from data provided through the Australian Bureau of Statistics.

Your waste contractor may also be able to provide some input to this process as they will be aware of areas where recycling works well and areas where contamination is high.

Three to five demographic regions would be the average number identified within any one council. The purpose of defining the different areas is to ensure that any aspects of an area that may impact on the type or quantity of waste generated is identified and included in the sample.

5.1.2 Step 2

Determine the appropriate percentage of tenements within each defined demographic region that receive the service to be audited. Where different bin sizes are offered for the one service (eg., residents have a choice of either a 120 litre or 240 litre wheelie bin for recycling), each bin size should also be proportionally represented within your sample.

5.1.3 Step 3

Determine the percentage composition for each demographic region and for each bin type. For example, the following table may illustrate your analysis:

Demographic	% of population
Demographic A	15%
Demographic B	35%
Demographic C	50%
Bin types	% of total services
240 MGB (general)	100%
240 MGB recycling	80%
120 MGB recycling	20%

5 Sample collection procedures



Based on the data in the table, to collect a statistically valid sample, you would need to ensure the following for both the residual waste and recycling streams:

- 15 tenements collected from Demographic A
- 35 tenements collected from Demographic B
- 50 tenements collected from Demographic C

In addition, there would be a need to ensure that:

- 80 of the selected tenements use the 240 MGB for recycling
- 20 of the selected tenements use the 120 MGB for recycling

The selection of these different sized MGB would be spread across the Demographics that use them. Refer to Sections 5.1.5 and 5.2 for instructions on the actual sample collection procedures.

5.1.4 Step 4

Map the demographic areas, (as identified above), over the existing contractors collection map. See attached example of such a mapping process (Section 5.1.6 Demonstration council map) of how this may appear.

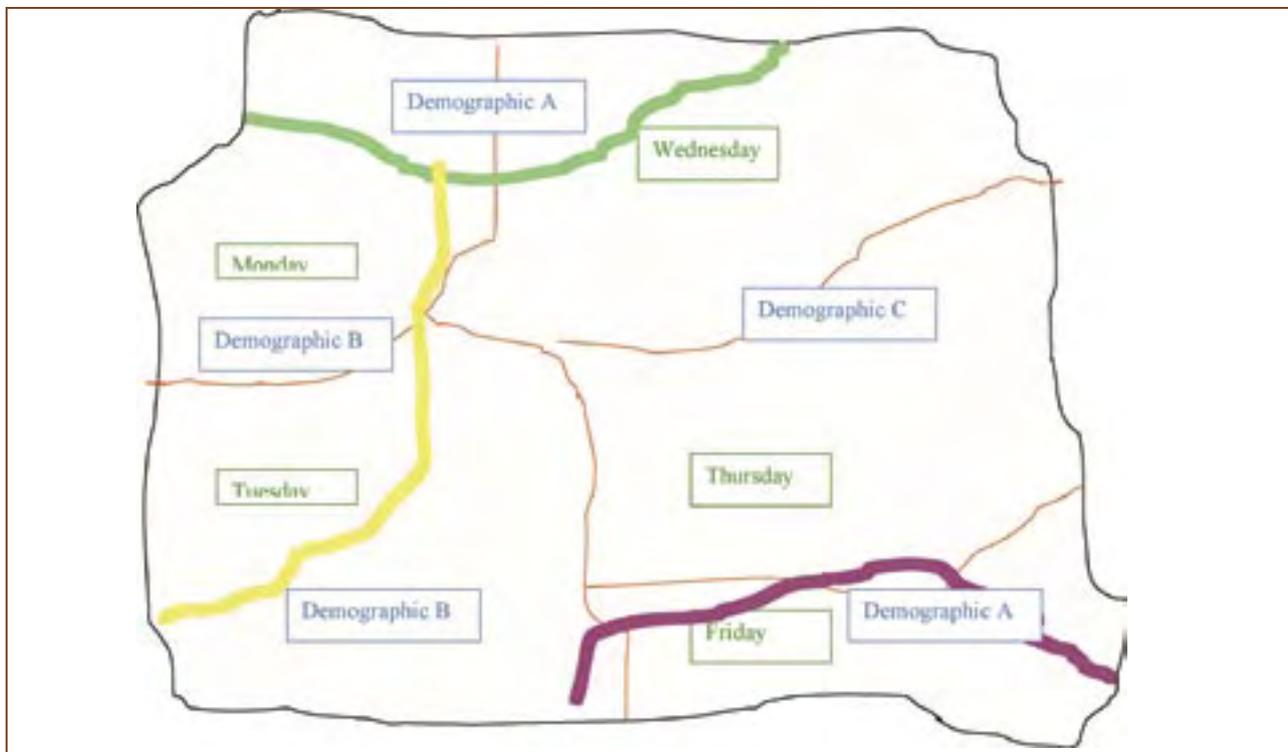
5.1.5 Step 5

Using a random number generator program obtain a set of random numbers. The total should be set at the total number of tenements in the collection zone.

These numbers should then be applied to a separate table of tenements, (rates database) for each type (house and MUD), to identify the starting sample tenements. You will need to ensure that the selected tenements are within your demographic area and fall on the designated collection day. Continue sampling until you have the required number of tenements within each demographic profile and on the required days. If a random number falls outside the required area it is discarded and the next number used. Additional tenements should be selected in case a sample needs to be voided for example when the sample collection truck arrives and the street has already been collected.

5 Sample collection procedures

5.1.6 Demonstration council map



The above is a mock council map. The red lines show the weekly collection cycle for general waste. The council is split into five collection days. Transposed over this are the demographic boundaries. There are 3 main demographic profiles within the council. From the above, you can see the following:

- Demographic A sample could be collected on Monday; Wednesday or Friday.
- Demographic B sample could be collected on Monday, Tuesday or limited area on Thursday.
- Demographic C sample could be collected on Wednesday or Thursday.

To ensure a good coverage of the whole council, as well as to be efficient in regards to sample collection, you would probably collect the required samples as follows:

- Monday – Demographic A and B
- Tuesday – Demographic B
- Wednesday – Demographic C
- Thursday – Demographic C
- Friday – Demographic A

Each demographic area sample is collected in proportion to their percentage representation of the total population.

It is also important to include in the collection schedule planning the necessity to collect from MUD's or to consider those tenements that have different size containers.

To add another layer to this map, you will also need to include the recycling collection schedule. In many areas, recycling is only collected on a fortnightly basis, so that in any given week, only half the council has a recycling collection. This will need to be mapped to ensure that each of your demographic profiles is covered in the recycling week selected.

5 Sample collection procedures



5.2 Sample Collection Procedures

5.2.1 Sample Collection

The audit samples are to be collected as follows, starting with the first randomly generated tenement as per Section 5.1.5:

1. Where the street selected is in excess of 50 houses, every 5th house is to be collected to a maximum of 10 houses per street
2. Where the street is less than 50 houses, every 2nd house is to be collected to a maximum of 10 houses per street
3. When a selected house does not place out a general waste or a recycling container, (ie no bin is placed out for collection), then the next house is to be sampled and the progression started again from this new sampled house. As our sample requires 100 houses, it is critical that a full sample is collected and that the sampling process is accurate in regards to tenements collected from. The participation rate will be calculated separately and used to extrapolate the sample (refer to Section 4.5).
4. When a house places out only 1 container, then that container is collected. The missing container is collected from the next house and the progression started again from this house. That is, it would be the next 5th or 2nd house depending on the number of houses within the street as indicated above.
5. Details of “no show” or missing containers are to be recorded on the audit sample collection sheet. This information will also be recorded on the participation audit sheet as outlined in the methodology.
6. No commercial sites are to be included in the audit.
7. **A selected tenement is not to be missed or replaced by another one on the basis of the characteristics of their waste (eg., an over full bin; heavy bin). The only time a selected tenement is to be missed and therefore replaced by another is it is clearly a commercial premise.**

Appendix M contains a sample of a “run sheet”. This sheet should be completed once all designated streets and tenements have been determined as per the methodology described for sample selection. This sheet should then be provided to the person in charge of the audit sample collection process.

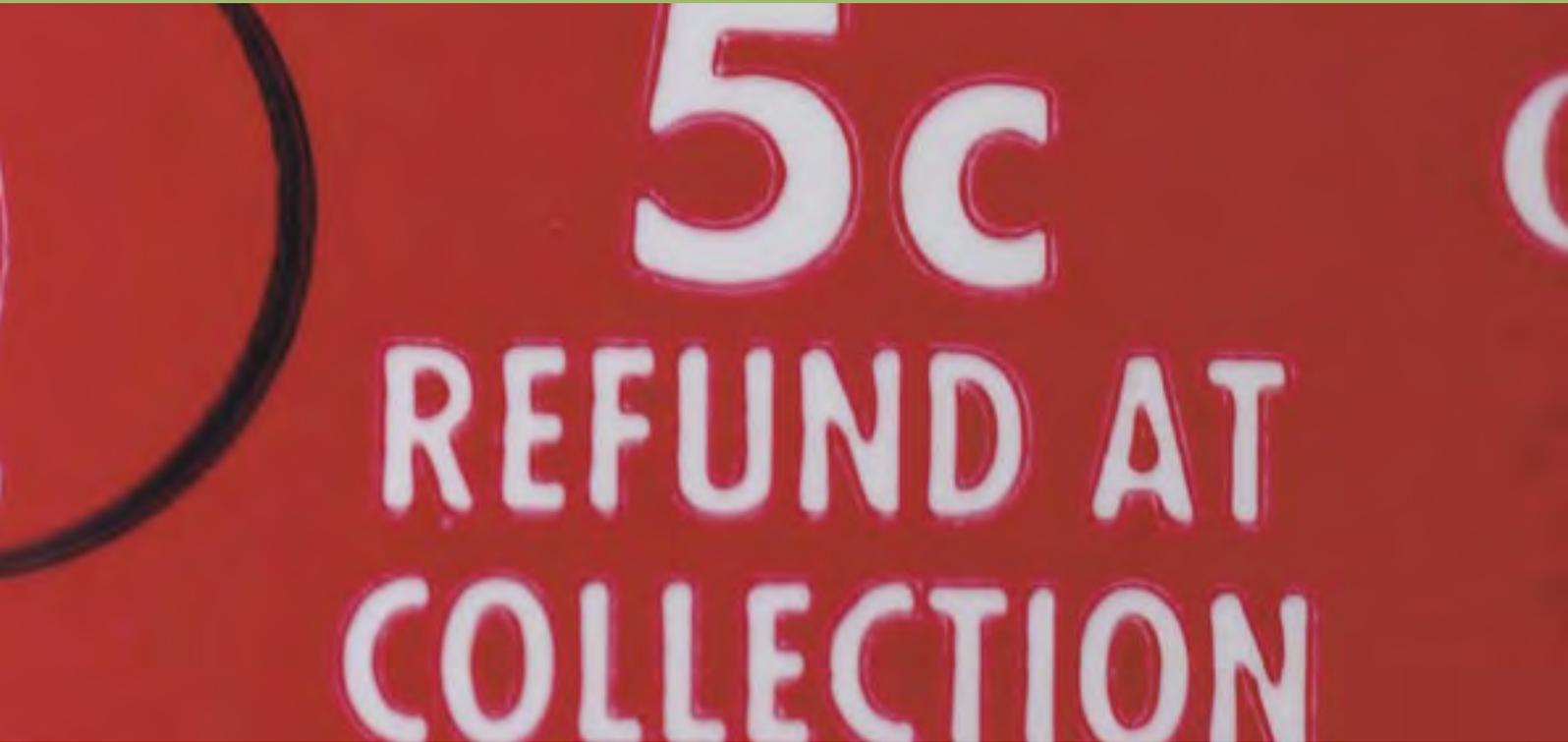
5 Sample collection procedures

Example of selection protocol

House 42 Hill Street is the house that corresponds to the randomly selected number. From this house the collection is commenced. Note if the household selected is at the end of the street you can work backwards in terms of house numbers.

Street		House Number	Bins Presented	Action
Hill		42		Collect both bins
Hill		48	No Bins Presented	Re-commence collection from next house ie house no. 50
Hill		50		Collect garbage bin Go to 52 for Recycling bins.
Hill		52		Collect Recycling Bin. Then re commence collection at Household 54
Hill		54		Collect garbage and recycling Bins

5 Sample collection procedures



5.2.2 Protocols

1. It is necessary that the sample is collected ahead of the normal service. However this should be done as close as possible to normal collection times. Collecting the sample too early may result in many of the selected tenements not having their bins out for collection, and hence the need to alter the collection plan.
2. As a minimum, the samples must be separated by stream. While ZWSA only requires total audit data for the whole sample, you should consider whether separating certain sectors may be of value to you in terms of developing education programs or comparing systems. For example by segregating MUDs and SUDs you may find that the average recycling rates and contamination levels for these two sectors is quite different, hence education programs may be developed to target relevant sectors. Similarly you may find that residents utilising smaller general waste bins have different contamination rates. This should be discussed with the auditor managing the program as there is likely to be additional cost involved in increasing the number of categories audited and analysed.
3. The samples are to be collected by mechanical means only. It is recommended that the samples be collected by the normal vehicles servicing these runs. In this way manual handling of bins at kerbside is avoided. In addition, the use of the normal collection vehicle attracts less attention of residents and is less likely to raise concerns of privacy etc.
4. As each sample is collected, the tenement is recorded on the collection sheet. Where a change is made to the designated tenement (due to no waste or recycling bins being presented), the new tenement number is to be recorded and the reason for the change documented, (Refer sample run sheet).
5. The collection supervisor is to be instructed to bypass any resident raising an objection to the process.
6. The collection supervisor is to have a letter authorising them of the process to distribute to residents as required.
7. The collection supervisor is to be instructed to contact the lead auditor immediately if any issues in relation to sample collection arise.

6 Staff Training

The training provided to all personnel participating in the program, will form the integral part of the health and safety program as well as to ensure that the audit process is conducted efficiently.

Records of training provided will be kept on file by the Safety Officer/Lead Auditor. Councils should review training provided by lead auditors and assure themselves that it covers all key elements.

There are three levels of training required:

1. ZWSA Program Course – This course has been specifically developed for this audit program. All councils participating in the compulsory audits plus all lead auditors from consultancies wishing to conduct the audits must attend this course. In addition, lead auditors must attend an annual refresher session that will be run in conjunction with the annual course program.
2. Auditor training – it is the responsibility of the trained lead auditor to ensure that all those participating in the actual audit and sample collection have received specific auditing training. This training is to cover all the OHS requirements as well as material classification and specific requirements of the ZWSA audits. All councils should request written evidence of this training prior to commencement of the audit program.
3. Daily refresher training – during the actual audit, daily sessions should be held to remind auditors of the process to be followed, and importantly the OHS issues. (Refer Appendices G and H).

Personnel who have not participated in the relevant training sessions will at no time be allowed onto the waste audit site or participate in the collection of waste/ recyclable samples as part of this the project. They may be allowed on-site as observers, but only when accompanied by the site supervisor at all times.

7 Occupational Health & Safety

7.1 Potential hazards

The sample collection and physical audit processes pose risks to personnel involved in these activities. The following are some possible hazards that may occur during the physical sorting of solid waste.

Councils should ensure that a full risk assessment is conducted for each audit. This assessment should be signed off by the relevant officer and used as the basis of the OHS plan.

7.1.1 Sample collection process

- Effects of exposure to hazardous materials
- Back injury
- Slipping and falling
- Heat stress and fatigue
- Traffic
- Heavy equipment movement

7.1.2 Physical audit process

Physical hazards

- Cuts and punctures from sharp items in the sample: e.g. hypodermic needles, broken glass, razor blades
- Effects of exposure to hazardous materials such as medical waste, aerosol cans, chemicals (powder and liquid), bottles of unknown/unlabelled substances, plastic bottles containing used syringes, and other hazardous materials
- Back injury
- Slipping and falling
- Heat stress and fatigue
- Traffic or heavy equipment movement
- Noise exposure from operation of heavy equipment
- Animal and/or insect bites
- Airborne contaminants
- Dust from solid waste
- Fire

Chemical hazards

- Liquid spills from containers
- Household and hazardous chemicals

Biological hazards

- Household hazardous wastes
- Medical wastes and sharps
- Bloody rags or objects
- Hypodermic needles

7.2 Health and safety guidelines for undertaking waste audits

Due to the potentially hazardous nature of waste auditing, the preparation of a site specific Health and Safety Plan is considered by Zero Waste SA to be an essential component of any waste auditing process.

These Zero Waste SA protocols for Health and Safety have been developed with reference to previous audits undertaken for the Environment Protection Authority in South Australia. It is to be noted also that all lead auditors and councils are required by Zero Waste SA to have completed the training for Kerbside Performance Reporting. These courses will include a strong focus on health and safety issues and will be offered by Zero Waste SA on a periodic basis (refer to Section 1.6).

A waste auditing exercise involves a number of activities that can potentially be hazardous to the participating personnel. It is therefore critically important that councils and other relevant people prepare a site specific health and safety plan to address these risks before starting an audit. Such a plan should address at least the following:

- Health and safety policy
- Sample collection procedures
- Specific responsibilities - Safety Officer and Waste Auditors
- Medical monitoring
- Vaccinations required identified (minimum Hepatitis A and B and Tetanus)
- First-aid provision
- Training
- Specific audit site issues
- Audit site evacuation procedures
- Personal protective equipment – requirements, use and maintenance
- Risk identification management program
- Monitoring of ambient conditions

7 Occupational Health & Safety

To assist in preparation of this plan, Appendix A contains a risk management matrix and forms that can be used for the development of the risk management strategy.

Appendices B and C summarise the more common hazards that may arise during both the audit sample collection process and the physical audit. Management strategies have also been included in these appendices as a guide.

Essentially a risk assessment should be conducted that enables all hazards for all aspects of the program to be identified and acceptable management strategies implemented.

The following information should be made available to all auditors. This will assist in timely resolution of any issues that may arise during the sample collection and/or waste audit process.

Health and safety plan

On-site contact

- Main point of contact
- Telephone number
- Facility manager
- Telephone number(s)

Site resources locations

- Site map
- Toilet facilities
- Drinking water
- Telephone
- Emergency assembly area
- First aid facility
- Designated smoking area (if required)
- Water and soap for washing

Medical information

- Local emergency medical facility
- Telephone

Important telephone numbers

- Fire Department phone number
- Police Department phone number
- Local ambulance phone number
- Local medical practitioner mentioned under medical monitoring and vaccinations

Appendices G and H contain the safety induction checklists that are to be used for the audit processes. Appendix I contains a pro-forma of a statement that should be signed by audit project staff when receiving the project occupational health and safety plan.

7.3 Responsible Personnel

The following section lists some of the duties and responsibilities of personnel who are supervising and conducting a physical sort of solid waste.

Supervising Waste Auditor's/Project Manager's duties and responsibilities

- Delegate health and safety responsibilities to the Site Safety Officer:
- Ensure that qualified personnel implement proper procedures in a safe manner
- Make available proper personal protective equipment, adequate time, and budget.
- Ensure that all field personnel have read, understood, and signed the master copy of the health and safety plan.
- Check that all the auditors have received training on waste characterisation methods, recognising hazardous wastes, potential risks from handling hazardous materials, managing site traffic, controlling dust/airborne contaminants, and back injury prevention.
- Ensure that staff has a good understanding of incident/emergency procedures.

Site Safety Officer's duties and responsibilities (can be the same person as above)

- Prepare a site specific health and safety plan (including evacuation procedures) prior to the start of any activity on site.
- Ensure that the plan is approved by council officer responsible for managing the audit.
- Duty and authority to stop unsafe operations, supervise the delivery of appropriate first aid, and decide when to summon emergency services.
- Ensure that the guidelines, rules, and procedures in this document are followed for all site work.
- Be familiar with local emergency services, and maintain a list of emergency phone numbers. Provide a map with the quickest route to a medical facility.

7 Occupational Health & Safety

- Conduct health and safety meetings before each shift, and a summary meeting at the end of each shift to discuss safety issues, possible solutions, and notify personnel of all changes associated with health, safety, and protocol.
- Maintain and inspect personal protective equipment. Ensure proper use of personal protective equipment by all employees.
- Monitor on site hazards and the early health warning signs (e.g., heat stress/stroke, dehydration, or fatigue) of auditors. It is recommended that in hot weather, outdoor sampling should be done during the cooler hours of the day.
- Has completed appropriate health and safety training (including a appropriate waste auditing course and Level II First Aid Certificate).

Contact numbers of local medical practitioners, hospital and ambulance service must be provided to all auditors and site supervisors. The Safety Officer must be contactable by all site supervisors in order to provide prompt responses to any incident.

Appendix F summarises the issues that must be incorporated into the medical monitoring program.

7.4 General Safety Procedures

Appendix D contains a summary of the general procedures that should be followed to ensure a safe audit program.

It is essential that a risk management plan be prepared for all separate audits that are to be undertaken so any specific issues are identified and appropriate strategies implemented.

7.5 Personal Protective Equipment

Appendix E contains a list of the recommended Personal Protective Equipment (PPE), which is essential for the safe conduct of the audit program.

It is important that those conducting the audit recognise that the use of PPE does not replace the need to observe other aspects of safe handling procedures. PPE should be seen as an essential part of an overall safety plan.

7.6 Medical Monitoring

All staff must ensure that they are medically fit to perform any duties requested and that these duties will not aggravate any existing conditions. Should any issues be identified that may impact on the physical well-being of a staff member, the Safety Officer will discuss such issues with the individual staff member.

8 Audit Procedures

This section summarises the procedures that need to be followed to ensure the audit is conducted in a safe manner and that data generated is valid and allows for accurate extrapolation.

Appendix J outlines the type of equipment necessary for the conduct of a safe audit.

8.1 Quality assurance/quality control

The audit should be undertaken with appropriate quality assurance/quality control procedures with particular emphasis on ensuring good:

- Data recording and entering procedures
- Data verification processes
- Sample integrity procedures
- Sample handling and disposal procedures
- Document control

8.2 Confidentiality

All information contained in audit reports and obtained during the audit process should be considered confidential. All personnel employed in the kerbside audit project must be made aware of the need for confidentiality and should sign a specific agreement to this conduction prior to commencing activities for the audit.

In the case of Kerbside audits, confidentiality is a particularly sensitive issue. The auditor must detail measures that will be taken to maintain confidentiality. Examples of such measures include:-

- households are allocated a reference number. This number is used throughout the report and analysis;
- the cross reference between to the household is kept discreet from the main data and audit report;

Information contained in the audit reports (ie., electronic or more detailed), can only be communicated to third parties with the express written permission of the council and/or ZWSA. Where the client and the council being audited are two separate entities (such as an audit commissioned by ZWSA of a council's kerbside system), it is the responsibility of the client to obtain written approval of the both entities before any audit information is made available to a wider audience.

In addition, to avoid households objecting after or during the audit, many councils now issue a public notice that a waste audit is to be undertaken (refer Section 1.7 and Appendix L). This can be done through the local paper as a stand-alone advertisement. Residents should be given the opportunity to not participate in the audit by registering their details. It is important that such a notice is placed at least six weeks before the audit is scheduled, and that no specific date is given in the advertisement. This should avoid any temporary focus on waste by residents and subsequent changes in practices.

8.3 Audit site set up

Undertake sorting in a dedicated shed or a marquee. The sorting area should be dry, ventilated and well protected from natural elements. Place traffic cones or high visibility warning tape around the active sorting area.

Include waste storage areas for pre-sorted waste and post-sorted waste to be kept separate and away from main traffic areas and the sorting table.

Place plastic sheeting or tarp over the surface where the solid waste is to be sorted. Tape the edges of the cover down with duct tape or weight it down. The cover will protect the surface from stains.

Each site supervisor is responsible for the monitoring of ambient conditions (e.g. air quality, temperature, humidity) prior to commencement of the working day and at regular times during the day. If the ambient conditions are found to be causing discomfort to the auditors, then the site supervisor should direct appropriate changes to auditing and sample collection procedures to ensure the health and safety of all personnel.

8.4 Physical waste auditing

The sorting of the material and handling of the waste bags is the most hazardous aspect of the process. It is critical that a full risk assessment is conducted and that a clear work process has been determined.

Specified occupational health and safety protocols must be followed at all times.

8 Audit Procedures

Once the samples are collected, the load should be carefully emptied onto a tarp or into a holding bin. Each stream must be stored in a clearly separated area. Using rakes or other suitable equipment, bags should be separated to enable them to be safely placed on the audit table for emptying and sorting. Larger items and loose material should be separated to allow safe removal and sorting.

Bags of waste must never be supported by hands or other body parts, regardless of the PPE being worn.

Fine materials not able to be accurately sorted should be collected using hand brooms or “dust pans” or shovels. A visual estimate of the composition of this material should be made (based on weight) and recorded as such, (eg., 50% glass less than 5mm; 5% paper fines; 45% dust/soil).

The sorting table should be positioned in a way to ensure that the auditing personnel are able to carry out their tasks in a safe manner. The table should not obstruct movement of the personnel and should provide adequate room to undertake auditing tasks. It is recommended that the buckets/tubs be placed around the table so that the buckets that will receive the most material are nearest to the table. To reduce reaching distances, all buckets within a broad material category (i.e. paper) should be positioned close together.

A recommended minimum of three persons should conduct each sort, two people to characterise the solid waste, the other to record data and supervise.

The following summarises the actual steps to be undertaken:

- Carefully place bags of waste on the audit table. Carefully tear open garbage bags with hand rake or other suitable equipment and visually inspect for potential hazards. If hazardous or medical wastes are detected, the sort will be halted and the Site Safety Officer must be notified.
- If no hazardous materials obvious, carefully begin the sort by removing and characterising the largest, bulkiest elements. Sort the remaining items into the categories and material types shown on the sample sheet.
- When sorting glass, remove and sort the larger pieces that are on top first. Never use your hands to dig down through the waste. Use a rake or small shovel to pull/push the material to the side and continue sorting.
- When a sorter has a question regarding the material category or type into which an element should be placed, the lead auditor should be consulted.
- If a bucket/tub becomes full, the full bucket is weighed, the data recorded on the data sheet, and the bucket is emptied and reused. Weigh and record the total mass (contents + bucket) on the data sheet. Then weigh and record the empty weight of the bucket/tub. This will allow the net weight of the material to be calculated..
- Return all sorted materials to the bin it was collected from or into the bins for disposal.
- At the end of each shift, disposable clothing should be removed and disposed properly. Reusable equipment should be cleaned and sanitised with an antibacterial agent after use. All sorters must shower at the end of each shift.

8 Audit Procedures

8.5 Material classification(s) – determining correct streams for different materials

Appendix K which contains a sample of the data recording form specifies the categories that waste materials must be sorted into.

Advice must be obtained from the recycling contractor that services your council as to what they do actually recycle. This should also be compared with the information provided to residents as to what they are allowed to deposit into the kerbside recycling system.

It is important to ensure that describing specific contaminants or any other issues identified during the audit process are recorded in the “comments” section of the kerbside audit reporting form.

Unidentifiable materials as well as material outside the auditing parameters should be put into the “other category”. Notes should be made in the “comments” section of the spreadsheet reporting form as to what these contaminants are.

8.6 Data Recording

8.6.1 Data recording

All waste quantity measurements should be conducted in weight (mass) units (to 100g) using standard metric units.

8.6.2 Data collection sheet

Data collection sheets are designed to be photocopied and used to record weights during the auditing process. A blank sheet is provided as Appendix K to this document to assist you in classifying your sample in accordance with the reporting format provided by Zero Waste SA. Copies of this sheet should be made to allow for recording of data during the audit.

Some extra lines are provided to allow you to enter items that are not covered in the list but are particularly relevant for your sample.

All contaminants in the recycling stream should be individually identified and have their weight recorded.

Use of the comments section of the report form can assist in further describing the type and condition of these contaminants.

8.6.3 Composition tables

Tables are provided within the kerbside reporting form to allow for the direct entry of weights, participation rates, etc. These tables will assist you by self-calculating key results such as annual yields and contamination rates.

8.7 Audit validation

The Kerbside Reporting Form is designed to assist councils to validate the audit data against contractor reports that have been submitted. You may also wish to check your data against previous audit reports (if available), the report entitled ‘Kerbside Waste and Recycling Practices’ (see the Zero Waste SA web-site) and other state and national waste indicators.

The Excel table provided as part of the Kerbside Reporting Form will calculate the variation between the audit data and that which your contractor has provided. A larger than normal variation (e.g. +/-10% or greater) indicates that further investigations by the council and/or contractor into the reason for the difference may be warranted.

8.8 Report

8.8.1 Draft report

A draft report should be submitted to Zero Waste SA to ensure that all reporting requirements have been met in regards to data/information and so any issues in regards to accuracy, audit methodology and completion of all reporting requirements can be determined and corrective action(s) undertaken.

8.8.2 Due Date for submitting your Kerbside Performance Report

Councils that are required to undertake a kerbside audit as a condition of their Kerbside Performance Incentives will be provided with a due date for submission in their Funding Agreement with Zero Waste SA.

Audit FAQ's

The following are some of the issues that have been raised during the Kerbside Reporting Program.

A bag of recyclables has been deposited into the residual waste bin, how do I classify this?

Carefully empty the contents of the bag and classify contents as per the normal process. If small items are tightly wrapped in paper or other material refer to the lead auditor. If considered unsafe to open, ie would require manual handling, then classify as "residue".

A bag of recyclables has been deposited into the recycling bin, how do I classify this?

This would normally be classified as "contamination". While some MRFs will open plastic bags and recover the recyclables, typically council education sheets and signage would show this as a contaminant. This type of contamination should be separately recorded as "bagged recyclables" as it is different from normal contamination.

There is half a pizza in a cardboard pizza box in the Residual waste stream.

If the food is easily separated then separate and classify the two accordingly, ie the box could have been easily recycled. If the box is heavily stained and would not be accepted in the recycling stream then classify as "residual". Be careful in these situations that it is clear that the contamination is due to the contents of the box and not to the fact that it has been lying in general waste within the bin, ie was it contaminated prior to disposal or subsequent to disposal.

A needle has been found in on the sorting table.

All sorters are to immediately stop sorting waste. The lead auditor is to be notified who will safely remove the needle and deposit it into a sharps container. Notes of the incident to be recorded in the "comments" section of the audit report. The needle should be recorded as 0.01 kg so that it does form part of the audit data and report. Procedures for managing this type of incident, and any others involving hazardous materials must be addressed in the OHS plan.

A soft drink bottle has about 1/3 liquid in it and is deposited in the recycling stream.

Firstly never empty the liquid contents of a bottle or container, as you do not know what this material maybe. Reference should be made to the MRF acceptance criteria and council signage. In most instances this would be classified as a contaminant as MRFs do not accept containers containing liquids.

There is some material that should have been deposited into the residual waste bin, in a recycling bin.

This is to be classified as a contaminant.

A tenement that has been designated as one that I should collect the residual waste from has not placed their bin out for collection. What should I do?

Refer to section 5.2. There are requirements as to what to do so as to maintain the statistical validity of the audit process.

A sorter has arrived for work to replace another that is off ill, but cannot demonstrate that they have had the necessary vaccinations.

If a sorter cannot demonstrate that they have been appropriately vaccinated and that these vaccinations are current, then they should not be allowed to participate in the audit program. If their vaccinations are up to date they must undertake the audit training (refer Section 6) before they can commence work.

Staff have come back to the waste audit site with the samples they have collected. They indicate that they had some problems as some bins had not been placed out for collection and others had already been emptied. They do not appear to be confident in explaining the methodology they adopted.

This is where the integrity of the sample may be compromised. If this is the case, then the audit must be postponed and the sample collected again.

Audit FAQ's



Sample collection staff have been instructed to collect the residual waste and recycling samples from a designated premise. When they go to collect, there is a sign out front indicating that the premise is used for a home based business.

Sample collectors should be instructed as to what to do prior to commencing their tasks. In addition, nominated tenements should be cross-referenced against known commercial premises so they can be excluded. If this tenement is clearly a commercial premise (or used for these activities), then the sample should not be collected and the methodology contained in Section 4.2 should be followed.

The recycling contractor that the council uses has informed me that they sometimes open plastic bags to take out any recyclables. However this depends on how busy they are. Should I do the same when auditing?

Materials that are placed into plastic bags and then this is deposited into the recycling bin should be classified as contamination and separately classified as “bagged recyclables”. The “comments” section of the report should be used to explain this.

How should batteries be classified?

Generally all batteries are classified as hazardous. Some jurisdictions make allowances depending on the volume in the load (eg., a few batteries in a cubic metre of waste would not be classified as hazardous in regards to disposing of the total load to landfill). However, there needs to be a determination so that auditors are not having to consider either numbers or types of batteries - therefore they should be classified as hazardous and put in a comment to that effect in the space provided in the report. Note the type, and number of batteries found.

Plastic film is something that can be found in kerbside waste. How would this be classified?

There are many different types of plastic film. Discussions with your recycling contractor will be able to guide as to how they classify if (ie., is it a recyclable or contaminant). Most recycling contractors would classify this as “Other Packaging” if it is able to be recycled.



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Appendix A – Risk Management Form

The following form is an example of a risk management process. There are many variations of this form. This form has been adapted from the SafeWork SA web site (2005).

1. IDENTIFY THE HAZARD (s)

(a) Describe the hazard (s):

2. ASSESS THE RISK

Risk assessment calculator indicates:

	Insignificant	Minor	Moderate	Major	Catastrophic
Almost Certain	High	High	Very High	Very High	Very High
Likely	Moderate	Moderate	High	Very High	Very High
Possible	Low	Moderate	High	High	Very High
Unlikely	Low	Low	Moderate	Moderate	High
Rare	Low	Low	Low	Low	Moderate

Identify the risk:

3. DETERMINE WHAT CONTROL MEASURES TO TAKE

(a) Short term/Immediate control measures:

(b) Long term control measures:

Appendix A – Risk Management Form

4. REVIEW, APPLY AND MONITOR CONTROL MEASURES	
(a) Review the possible control measure:	
(i) Will the control measure introduce a new hazard?	YES/NO
If no, continue	
If yes, undertake the risk management procedure again.	
(ii) Is the revised control measure effective?	
If yes, continue.	
If no, re-do step 3.	
(b) Control measure finally applied:	
<input type="text"/>	
<input type="text"/>	
(c) Monitor the control measure:	
(i) Does the control measure continue to be effective?	YES/NO
If yes, continue to monitor	
If no, re-do the risk management procedure again.	

ORGANISATION DETAILS	
(a) Audit Project:	
<input type="text"/>	
(b) Prepared by:	
<input type="text"/>	
(c) Signature:	
<input type="text"/>	
(d) Date:	
<input type="text"/>	

Appendix B – Risk Management Strategies (Sample Collection)

Risk

Management Strategy

Vehicle accident while in transit

- All employees will be advised of this risk and reminded of the requirement to observe all traffic rules especially speed restraints when travelling to and from sites.
- Only fully licensed personnel will be permitted to drive vehicles.

Skin puncture due to contact with sharp object

- Employees will be advised that no physical handling of waste is to occur.
- Employees will wear covered safety shoes; long sleeve shirts and long pants to minimise any accidental contact.
- First aid kits will be provided in case of accident.

Odorous materials

- Employees will be issued with facemask.
- The site supervisor will monitor reactions during the audit when odorous samples are present to determine if any employee requires a break.

Injury from slipping/fall

- Employees will discuss sample collection procedures.
- All employees will wear sturdy boots and advised to exercise due care when moving at any location.

Knocked down/run over by vehicle

- All employees will be briefed of this risk
- The use of mobile phones will be restricted to breaks when the employee is not in a traffic area.
- Get other trucks out of the path of auditors.
- Employees will be trained to ensure visual contact is made with any vehicle in the vicinity prior to moving off the kerbside or traversing driveways.
- Prior to moving around any corners the employee will make a visual and auditory inspection to determine if any vehicles are approaching – if yes, then the employee will position themselves to ensure that they will not be knocked down.
- Employees will wear highly visible safety vests.

Muscle injury from lifting waste

- All employees will be trained in safe lifting techniques.
- All employees will be required to 'test' each load prior to lifting to determine if assistance is required.

Appendix B – Risk Management Strategies (Sample Collection)

Risk	Management Strategy
Skin burn due to contact with chemicals	<ul style="list-style-type: none"> ■ Employees are advised not to handle any waste or container without wearing gloves and other PPE. ■ First aid kit and water will be available on each site.
Eye injury due to dust/chemical contact	<ul style="list-style-type: none"> ■ Employees will wear safety glasses at all times. ■ The first aid kit should contain sterile eye wash liquid.
Breathing difficulties due to dust	<ul style="list-style-type: none"> ■ Employees will be provided with face masks.
Dehydration	<ul style="list-style-type: none"> ■ All employees are expected to have their own water bottle that must be filled and taken on site each day. ■ Drinking water must be available throughout the day. ■ Employees will be made aware of the risk and the early warning signs of dehydration.
Fatigue from collection procedures	<ul style="list-style-type: none"> ■ Regular breaks will be scheduled during the collection processes. ■ Staff will be encouraged to report to the site supervisor if they are feeling fatigued and be allowed to take breaks. ■ Adequate food and water will be provided for employees to consume during breaks.
Waste spill – water or land contamination	<ul style="list-style-type: none"> ■ Where waste is being bagged – the employee will work on a paved area or roadway wherever possible. ■ Each truck will carry a cleanup kit. Any spills will immediately be cleaned up. ■ Waste will not be bagged near to or over a storm water drain or other sensitive area.
Sun/wind burn due to exposure to elements	<ul style="list-style-type: none"> ■ Employees will be required to wear broad brimmed hats if working outdoors. ■ Sunscreen will be provided and is required to be worn and regularly re-applied during the day if working outdoors. ■ Employees will be made aware of the risk and advised to monitor site conditions.

Appendix C - Risk Management Strategies (Waste Audit)

Risk

Management Strategy

Skin puncture due to contact with sharp object

- Employees shall wear covered safety shoes; gloves; long sleeve shirts and long pants to minimise any accidental contact.
- Collection and site staff advised of correct handling procedure of waste and bags to avoid contact with body.
- Employees will be advised that no physical handling of waste is to occur. Tongs are to be used where appropriate.
- First aid kits will be provided in case of accident.

Odorous materials

- Audit sites will be located in areas where there is adequate ventilation.
- Employees will be issued with face mask.
- The site supervisor will monitor staff reactions during the audit when odorous samples are present to determine if any employee requires a break.

Illness due to contact with bacterial/infectious substances

- Employees will wear facemask and gloves.
- Employees will be advised of correct hygiene - water and soap will be provided for cleaning.
- Employees will be advised to wash up at each break and at end of day.
- Employees will wear coveralls. They will also be advised to wash their clothes separately.

Muscle injury from lifting waste

- All employees will be trained in safe lifting techniques.
- All employees will be required to 'test' each load prior to lifting to determine if assistance is required.
- Tasks will be rotated so that lifting tasks are shared throughout the day.

Skin burn due to contact with chemicals

- Employees are advised not to handle any waste or container brought onto the audit site.
- First aid kit and water will be available on each site.
- Employees will be advised to stand clear of any vehicle or person emptying a waste/recyclables container due to risk of splashes.
- Employees will wear full clothing to ensure minimal skin is exposed.

Eye injury due to dust/chemical contact

- Employees will wear safety glasses on site at all times.
- The first aid kit should contain sterile eye wash liquid.

Appendix C - Risk Management Strategies (Waste Audit)

Risk

Management Strategy

Breathing difficulties due to dust

- Employees will be provided with face masks.

Dehydration

- All employees are expected to have their own water bottle that must be filled and taken on site each day.
- Drinking water must be available throughout the day.
- Employees will be made aware of the risk and the early warning signs of dehydration.

Fatigue from auditing

- Regular breaks will be scheduled during the audit processes.
- Staff will be encouraged to report to the site supervisor if they are feeling fatigued and be allowed to take breaks.
- Adequate food and water will be provided for employees to consume during breaks.

Sun/wind burn due to exposure to elements

- Employees will be required to wear broad brimmed hat if working outdoors.
- Sunscreen will be provided and is required to be worn and regularly re-applied during the day if working outdoors.
- Employees will be made aware of the risk and advised to monitor site conditions.

Hit by vehicle

- The audit site will be clearly defined
- Employees will be given a site specific induction advising of presence of traffic and hazards.
- No-go areas will be defined.
- The site supervisor will be aware of this risk.

Appendix D – General Safety Procedures

This section lists some of the general safety procedures recommended for a physical sort of solid waste.

- All waste sorting personnel should be in good physical condition, have had a recent medical exam, maintain a current tetanus booster and Hepatitis B shot, not be sensitive to odours and dust, and be able to read warning signs/labels on waste containers.
- There should be absolutely no eating, smoking, or drinking during sorting activities. Food and liquids are to be kept away from the sorting area. Plenty of fluids (e.g. water, sports drinks, etc.) and single use, disposable cups must be available at all times. Hands and faces should be washed before eating, drinking or smoking. Consume drinks and rest frequently during hot days. Any smoking is to be done at a safe, approved location away from the main auditing area.
- The sorters should be grouped into pairs and each member should periodically assess the physical condition of his/her partner.
- Always wear the following before beginning the sorting procedure: both pairs of gloves (outer rubber and inner latex), chemical goggles or safety glasses with splash shields, a dust mask, and disposable overalls.
- Do not attempt to identify unknown chemical substances present in the waste stream: vials of chemicals, unlabelled pesticide/herbicide containers, and substances (e.g. chemicals, or needles) in unlabelled plastic/glass bottles/jugs.
- Household hazardous wastes are those wastes resulting from products purchased by the public for household use which because of their quantity, concentration, physical, or infectious, characteristics, may pose a substantial known or potential hazard to human or environmental health when improperly disposed.
- Empty containers of household hazardous wastes are generally not considered to be a hazardous waste. If hazardous wastes are detected, the Site Safety Officer should be notified.
- Hazardous materials and hazardous wastes should not be present in non-residential sources of municipal solid waste. If hazardous wastes are present in the municipal waste stream, from a commercial or industrial source, the material is not a household hazardous waste, it is a hazardous waste and the Site Safety Officer must be notified.
- A potential hazard that can arise in waste sampling is the presence of medical wastes. Sorters must be on alert for the indicators of medical wastes: hypodermic needles, needle covers, medical tubing, articles contaminated with red (blood) coloured substances, and medical device packaging. If medical wastes are detected, the sort will be halted and the Site Safety Officer notified.
- When sorting glass, remove the large pieces first, and then remove the clear glass. Never use your hands to dig down through the waste. Use a rake or small shovel to pull/push the material to the side and continue sorting.
- At the end of each shift, remove all disposable clothing into a plastic garbage bag, and place the bag into a solid waste receptacle. All sorters must shower at the end of each shift.

Appendix E – Recommended personal safety/protective equipment

Recommended personal safety/protective equipment (PPE) is used by individuals to prevent injuries, exposure or contact with hazardous substances or objects. The following section lists some of the personal safety/protective equipment recommended for a visual and physical sort of solid waste.

Body protection

- Sun screen
- Broad brimmed hats
- Disposable coveralls
- Chemical resistant coveralls, if appropriate
- Hard bottomed, non-slip, steel capped boots
- A supply of outer rubber (cut and puncture resistant) gloves
- Chemical goggles or safety glasses with splash shields
- Dust masks
- A supply of inner (latex) gloves
- Insect repellent
- Hearing protection eg ear plugs or ear muffs if site has equipment or activities that generate loud noises

Other safety equipment

- Supply of water and soap for washing/flushing etc.
- Industrial first aid kit
- Field blanket
- Eye wash kit
- Moist, disposable towels/wipes (e.g., baby wipes)
- Small fire extinguisher
- Portable telephone
- Liquids to replenish fluids (water and cups for dehydration)

Personnel required to collect the audit sample should be issued with (and required to wear):

- High visibility safety vests
- Overalls
- Safety foot wear
- Gloves
- Masks
- Broad brimmed hats if collecting during daylight areas

Appendix F – Medical Monitoring

Medical monitoring

All employees will be required to provide information to the Safety Officer of any conditions and/or medication programs that may be compromised during any phase of the project. For example, if an employee is prone to asthma attacks as a result of exposure to dust then this should be brought to the attention of the Safety Officer.

Confidentiality

The confidentiality of all records and reports provided as a requirement of the medical monitoring program and/or medical treatment will be maintained by the Safety Officer. At no times should these records/reports be provided to any other person except with the express permission, in writing, of the person to whom the records/reports are referring.

Vaccinations

All employees undertaking physical auditing will be required to show evidence that their immunity levels are at sufficient levels for Hepatitis A and B and that Tetanus immunisation is current. Contract staff will be requested to show similar evidence.

First aid precautions

First aid kits will be present at all waste audit sites and within all waste/recyclables sample collection vehicles. All staff will be provided with appropriate training during the initial orientation to manage minor incidents.

The following basic first aid items should be available in the first aid kit:

- Antibacterial ointment packets
- Alcohol prep pads
- Povidone iodine prep pads
- Reusable hot and cold gel pack
- Ice bags
- Plastic whistle
- Sting relief pads (for insect bites)
- Arm splint (wood)
- Insect repellent packets
- Antiseptic towelettes
- Scissors
- Burn spray pump
- CPR face shield
- Ibuprofen tablets
- Non aspirin tablets
- Metal tweezer
- Adhesive bandages
- Butterfly closures
- Wound closure strips
- Elastic wrap
- Adhesive tape rolls
- Knuckle bandages
- Triangular bandage
- Finger splints
- Eye wash
- First aid guide
- Eye pad
- Sterile sponge dressings
- Sterile trauma pad
- Gauze rolls
- Examination gloves
- Cold pack

Appendix G – Safety Induction Checklist (Sample Collection)

The collection of waste containers from the kerbside is inherently hazardous. You are responsible to ensure that you conduct all activities in a safe manner and immediately alert your supervisor of any practice or situation you consider to be unsafe – for you or any other person. You must not undertake any activity that you consider to be unsafe.

The following safety procedures MUST be followed at all times:

- Personal protective equipment must be worn correctly at all times whenever working. This includes; safety vests, safety glasses, covered shoes, gloves, face masks and overalls.
- All containers and/or individual bags of waste must never be carried near the body.
- Bags should never be supported by placing hands under the bag – bags must be held from the top.
- Always test the weight of the bag prior to lifting. Always ask for assistance if the bag is beyond your ability to lift it. Whenever lifting, bend the knees and lift from the legs – not the back.
- Always be aware of other traffic and pay attention to other waste collectors and if they are placing themselves in any danger from the traffic. Be aware of traffic coming from driveways.
- NEVER enter or exit a vehicle that is moving – always wait until it has stopped and look for any traffic.
- Be aware of other hazards such as slippery surfaces, overhanging branches and other materials near the kerbside.
- Always ensure that all containers are physically secured prior to moving the vehicle.
- If a waste spill occurs, take immediate action to prevent the spill from spreading, use safe clean up practices and INFORM your supervisor IMMEDIATELY.
- Always confirm with your supervisor as to where waste should be deposited upon arriving at the waste audit site.
- When having a break IMMEDIATELY wash hands with disinfectant. Do not eat, drink or smoke or touch your face until hands have been thoroughly washed.
- Leave all personal items in the designated secure area and do not touch until you have thoroughly cleaned hands.
- Smoking, eating or drinking is not permitted in the immediate vicinity of any area where waste is located.
- Upon completion of the day, all personal protective equipment including overalls are to be deposited into the specific bags/containers provided. After depositing this equipment, IMMEDIATELY wash hands with disinfectant.
- Stop for breaks as you feel necessary. Ensure you have an adequate intake of fluids and nourishment.
- If you feel unwell report to the supervisor immediately.
- If the waste collection is conducted in sunny weather, wear a sunhat and apply sunscreen on a regular basis.

I have read the procedures described above and been given a verbal occupational health and safety briefing on the hazards associated with the collection of the waste and my responsibilities.

Signed: _____

Date: _____

Appendix H – Safety Induction Checklist (Audit Personnel)

The waste audit process is inherently hazardous. You are responsible to ensure that you conduct all activities in a safe manner and immediately alert your supervisor of any practice or situation you consider to be unsafe – for you or any other person. You must not undertake any activity that you consider to be unsafe.

The following safety procedures MUST be followed at all times:

- Personal protective equipment must be worn correctly at all times whenever working. This includes; safety glasses, covered shoes, gloves, face masks and overalls.
- Never place hands blindly into piles of waste. All waste must be spread on the table and be fully visible prior to sorting. Where this is not possible, instruments such as tongs should be used to spread waste.
- All bags of waste (sorted and unsorted), must never be carried near the body.
- Bags should never be supported by placing hands under the bag – bags must be held from the top.
- Always test the weight of the bag prior to lifting. Always ask for assistance if the bag is beyond your ability to lift it. Whenever lifting, bend the knees and lift from the legs – not the back.
- If a needle or any sharp item is identified in the waste, IMMEDIATELY cease sorting and alert all auditors and the supervisor. DO NOT attempt to pick up the sharp item under any circumstances.
- Do not place hands near face while sorting.
- When having a break IMMEDIATELY wash hands with disinfectant. Do not eat, drink or spoke or touch your face until hands have been thoroughly washed.
- Leave all personal items in the designated secure area and do not touch until you have thoroughly cleaned hands.
- Smoking, eating or drinking is not permitted in the immediate vicinity of any area where waste is located.
- Upon completion of the day, all personal protective equipment including overalls are to be deposited into the specific bags/containers provided. After depositing this equipment, IMMEDIATELY wash hands with disinfectant.
- Stop for breaks as you feel necessary. Ensure you have an adequate intake of fluids and nourishment.
- If you feel unwell report to the supervisor immediately.
- If the audit is conducted in the open, wear a sunhat and apply sunscreen on a regular basis.

I have read the procedures described above and been given a verbal occupational health and safety briefing on the hazards associated with the conduct of the audit and my responsibilities.

Signed: _____

Date: _____

Appendix I – Declaration

All site personnel (including auditors, visitors, and observers) should be handed a copy of the health and safety plan. The following declaration should be signed and a copy maintained by the Safety officer.

I _____ (print name)
have read and understand the health and safety plan and
will follow the procedures and protocols detailed in the
plan for waste auditing at all designated sites.

Signed: _____

Date: _____

Appendix J – Recommended Auditing Equipment

- Small rake (or knife with a fixed blade).
- Small bins or buckets for weighing sorted materials.
- Sorting table.
- A scale that is accurate to 100 grams. Depending upon the waste stream, a larger capacity scale may be useful.
- Tongs.
- Permanent markers.
- Clipboard and data sheets.
- Large magnets.
- Calculator.
- Garbage bags.
- A long stick, approximately 150mm (6 inches) in length.
- Rake with a long handle.
- Rake with a short handle.
- Shovel with a long handle.
- Broom
- Camera
- Duct tape
- Plastic sheeting (minimum of 10mm thick)

Appendix K – Data Collection Sheet

Sheet No. of	
Council:	Date:
Waste Stream:	Auditor:
Area Code /Demographic:	Household No./ Sample ID:

Waste category	Kgs	Comments
■ Paper – White office		
■ Paper – mixed		
■ Cardboard		
■ LPB(CDL)		
■ LPB		
Total Paper		
■ Glass white (CDL)		
■ Glass green (CDL)		
■ Glass brown (CDL)		
■ Glass white		
■ Glass green		
■ Glass brown		
Total Glass		
■ PET (CDL) (1)		
■ PET (1)		
■ HDPE (CDL) (2)		
■ HDPE (2)		
■ PVC (CDL) (3)		
■ PVC (3)		
■ Polystyrene (CDL) (6)		
■ Polystyrene (6)		
■ Polypropylene (5)		
■ Polyethylene (4)		
Total Plastics		

Appendix K – Data Collection Sheet

Waste category	Kgs	Comments
■ Aluminium		
■ Aluminium (CDL)		
■ Steel		
■ Steel (CDL)		
■ Hazardous		
■ Lawn Clippings		
■ Shrubs/Branches		
■ Logs		
■ Other Green waste		
■ Food waste		
■ Textiles - scrap		
■ Textiles – re-usable		
■ Other Packaging		
■ Glass Fines		
■ Home healthcare		
■ Disposable nappies		
■ Residue		
Total Other		
Total		

Comments:

Please note that it is not essential that you record entries in all of the above fields. Room is allowed for entry of additional fields that are particularly relevant to your sample. **All contaminants in the recycling stream should be described and have their weights recorded.**

Appendix L – Sample Newspaper Advertisement

Below is an example of the type of advertisement that should be placed in local newspapers a minimum of 6 weeks before the audit. Note the following:

- do not use the term “audit”, rather refer to it as a waste survey
- do not give specific dates for the survey – be vague
- try and focus on positive outcomes rather than detail of the process.
- Ensure your customer service people are briefed so that they can answer questions and importantly refer any details to the audit team.

Waste Survey

A part of the ongoing commitment to minimising the environmental impacts of waste management, <council> has in partnership with Zero Waste SA commenced a program to evaluate the success of kerbside waste collection programs. This evaluation will look at the materials currently being deposited into the residual waste, recycling and green organics collection systems.

The objective is to look at the overall analysis of waste generation within <council> and measure our performance with standards across South Australia.

A waste survey will be conducted early next year and will involve the random selection of waste and recycling from 100 households across the municipality. The wastes and recyclables generated by these households will be collected in the normal way and individual households waste will be mixed with other households. The survey will then look at what recycling is still in the general waste and whether or not the recycling is contaminated.

No individual household waste is identified. However, if you specifically do not wish to participate, please contact <name and details> by <date>.

Appendix M

Sample Run Sheet

Run Sheet No:	
Date of Collection	Area:
Demographic:	Author:

Starting address		Alternative address	Tick bins collected		Comments re change or issues observed
Street	No.		G	R	
Hill	12		✓	✓	
	16		X	✓	No General
		18	✓		Collect missing general
	20		✓	✓	recommence
	24		✓	✓	
	28		X	X	Neither bin
		30	✓	✓	recommence
	32		✓	✓	
	36		✓	✓	



Further Information

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