BEST PRACTICE
TRADE WASTE MANAGEMENT
BY WATER BUSINESSES
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FOREWORD

The approach that is taken to trade waste management can result in significant positive or negative impacts on individual water businesses and their communities. When well managed, trade waste acceptance can be an important source of revenue for water businesses, as well as providing a community least cost approach to waste management. However, if poorly managed, trade waste can be a financial drain on businesses through asset damage and increased treatment costs. In addition, there can be increased risks to occupational health and safety and contaminants can constrain water and biosolids recycling and cause environmental degradation from surface water discharges. Poor management frameworks can also cause significant impacts on trade waste generators and the broader community through inconsistent or inequitable requirements.

Recent years have seen important steps being taken to tackle trade waste as part of Victorian water businesses’ journey towards a sustainable industry. In 2002, a VicWater – EPA partnership was established to provide practical tools to assist the industry. More broadly, the industry has also recognised the significant benefits to be gained from best practice trade waste management, such as implementing cleaner production initiatives rather than investing significant capital in sewage treatment plant capacity upgrades.

This document provides a further significant step, by describing practical, up-to date guidance to Victorian water businesses on the implementation of best practice trade waste management frameworks and practices. A working group involving water industry and EPA trade waste representatives developed this guideline over 18 months, including direct consultation with the broader Victorian water industry. The guideline also builds on a recent survey of trade waste management in Australian and international water businesses. It will be an important complement to water businesses current activities, regardless of business size and the characteristics of their trade waste customers.

We strongly encourage all water businesses to consider the framework and practices described in this guideline, adapt the provisions to match their circumstances and proactively pursue the benefits associated with best practice management of trade waste.

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7. IMPLEMENTATION AND REVIEW
1. **BACKGROUND TO GUIDELINE**

In 2001, EPA Victoria and the Victorian Water Industry Association Inc (VicWater) formed a partnership with the aim of identifying ways to improve trade waste management and reduce the generation of trade waste. This partnership was a response on behalf of the water industry and EPA Victoria to a number of policy commitments, issues and events that had occurred during the preceding three years, including:

- the ‘Greener Cities’ policy, that aims to ensure Victoria develops a state-wide strategy for the management of all industrial wastes;
- the Government signalling it’s intent to actively pursue the reduction of prescribed industrial wastes across Victoria in its response to the recommendations of the Hazardous Waste Consultative Committee’s recommendations;
- a recommendation by the Victorian Auditor-General’s Office that consideration be given to improve the consistency and control of trade waste discharges to sewers following a performance audit of regional urban water businesses;
- the release of the *Industrial Waste Management Policy (Prescribed Industrial Wastes)* 2000 and the relevant clauses requiring annual reporting of trade waste management and providing a framework and tools for implementing the waste management hierarchy for trade waste; and
- circumstances leading to EPA Victoria promulgating its first ever trade waste standard under the *Environment Protection Act 1970*. While the standard was for a benzene limit of 1ppm, restricting trade waste discharges requires that a notice be served on individual trade waste generators.

In order to implement the partnership, a steering committee was formed with membership from VicWater, EPA Victoria, Melbourne Water and the metropolitan and regional urban water businesses.

As a first step in the partnership, a brief survey was undertaken to understand trade waste practices in the Victorian water industry. This survey produced three important findings that shaped the subsequent activities under the partnership:

1. trade waste agreements between the generator and the water industry have typically established trade waste discharge criteria which focus on the protection of occupational health and safety, assets, treatment processes and compliance with EPA licenses for sewage treatment plants. Trade waste agreements have had less focus on minimising the generation of trade waste and on protecting the quality of recycled water;
2. approaches to trade waste management vary considerably across the State; and
3. water businesses, particularly the smaller businesses, needed access to information and support to help them implement best practice trade waste management. While guidance from documents such as the *Guidelines for Sewerage Systems: Acceptance of Trade Waste* (ARMCANZ/ANZECC, 1994) was considered useful, the businesses supported the development of guidance with a practical focus and more detailed coverage of issues such as waste minimisation.
As a consequence of these early survey findings, the partnership steering committee identified a number of initiatives to help build the capacity of the Victorian water industry to implement best practice trade waste management. These initiatives included tools to influence their customer bases to achieve reductions in trade waste discharges. The initiatives identified for immediate action were:

- Development of a best practice guideline for trade waste management (focusing on water business management of trade waste);
- Development of waste management planning guidelines for trade waste generators;
- Cleaner production projects in key industry sectors;
- Documentation and promotion of successful waste minimisation case studies; and
- Establishment of waste minimisation and trade waste management training for the water industry.

A working group was established to focus on the development of the best practice trade waste management guideline, with the development process involving:

- A survey of Victorian, Australian and international trade waste managers to determine practical approaches and identify examples of good and best practice in a range of management areas, for example compliance management through to policy development;
- Literature reviews of key trade waste management areas to develop the guidance and identify good and best practice;
- A workshop in April 2003 with Victorian water businesses to discuss the draft guideline, with subsequent widespread consultation on the draft guideline in January 2004; and
- Redrafting of the guideline and formal endorsement by EPA Victoria and VicWater.

The working group leading the development of the guideline contained the following members:

Rosemary Bissett (City West Water) joint chair
Steve Muir (South East Water) joint chair
Lidia Harvey (initially representing Barwon Water before joining Melbourne Water)
Hamish Reid (EPA Victoria)
Steve Shinners (Gippsland Water)
Rebecca Tierney (Melbourne Water)
2. INTRODUCTION TO GUIDELINE

2.1 Purpose
This guideline has been developed to provide practical guidance to Victorian water businesses for developing best practice trade waste management and thereby meet legislative and business drivers. This guideline moves well beyond generic principles of trade waste management and provides specific examples of what is considered to be representative of good and best practice management. This guideline is not intended to be a prescriptive ‘recipe book’ nor is it considered to be definitive, due to the need for continuous improvement of trade waste practices over time.

While best practice trade waste management involves consideration of all the topics in this guideline, the specific measures that are adopted may vary between individual water businesses. The measures that are adopted will reflect a range of factors that may be unique to individual water businesses, including: organisation size; sewerage management strategies and the characteristics of the sewerage system and the trade waste discharges.

2.2 Structure of this guideline
This guideline is structured to take readers through a logical sequence of applying best practice trade waste management to individual businesses. As a result, the guideline flows through a sequence of chapters describing:

- The key legislative and business drivers and trade waste management principles that enable a water business to establish a trade waste management policy (Chapter 3);
- Risk identification and system management processes in implementing trade waste strategies, including identification of system capacity and management drivers. This enables identification of priority activities and provides direction for detailed trade waste management processes including the establishment of trade waste standards and waste minimisation initiatives (Chapter 4);
- The management of trade waste generators by translating risk management processes into trade waste agreements and charges, and managing agreements through customer segmentation, discharge monitoring and compliance management. It also includes the integration of specific activity areas such as programs for greasy waste generators (Chapter 5); and
- Providing support for trade waste management through research and development, appropriate resources for activities, information management systems and delivery of additional services to customers (Chapter 6).

These chapter areas are broken into individual sections that describe discrete areas such as ‘customer identification’ and ‘data management’. Each section is presented in a consistent format, involving a description of the purpose of the section, relevant background and examples of what are considered good and best practice management.
2.3 Updates to this guideline

It is intended that this guideline will undergo progressive updates to reflect changes in legislation and feedback on implementation and best practice.

The update process will be undertaken electronically. To register for updates visit www.epa.vic.gov.au/Lists or e-mail your details to trade.waste@epa.vic.gov.au.
3. **TRADE WASTE MANAGEMENT DRIVERS, PRINCIPLES AND POLICY**

In the development of best practice trade waste management, a critical initial activity for a water business is to identify and acknowledge:

1. The legislative requirements relevant to trade waste within which the business operates (section 3.1);
2. The internal 'business case' and drivers for trade waste management (section 3.2);
3. The key principles relevant to trade waste management (section 3.3); and
4. The expectations of the water business and key stakeholders (section 3.4).

The information from this initial process enables the establishment of a trade waste policy (section 3.4) for the business. These policies are key mechanisms:

- to ensure that stakeholders hold consistent expectations of the business;
- to provide good governance and ensure due diligence, transparency and direction for decision-making; and
- to establish detailed programs.

Without this initial process and the associated articulation of a trade waste policy, a water business increases the risk of conflict between legislative requirements, business drivers, and stakeholder expectations.

### 3.1 Trade waste legislative drivers

Within Victoria, there are numerous pieces of legislation that are either directly or indirectly relevant to how a water business manages trade waste. The key pieces of legislation include the:

- **Water Industry Act 1994** and the **Water Industry Regulations 1995**;
- **Water Act 1989**;
- **Trade Practices Act 1974**;
- **Occupational Health and Safety Act 1985**; and
- **Essential Services Commission Act 2001** and associated regulations.

In addition, several pieces of legislation provide requirements for dispute resolution involving the Energy and Water Ombudsman of Victoria.

**Water Act and Water Industry Act**

The primary power for water businesses to impose restrictions on trade waste discharges, to charge fees and otherwise administer trade waste, is provided in the **Water Industry Act** (for metropolitan water businesses) and the **Water Act** (for regional water businesses). These Acts and the associated regulations are not prescriptive about trade waste management, that is, they provide overarching powers for water businesses to administer trade waste rather than detailed direction. Nevertheless, in reflecting the two separate pieces of legislation, there are some important differences between the
trade waste frameworks that apply in the metropolitan versus regional areas.

**Metropolitan Melbourne water businesses**

In the metropolitan area, the retail water companies and Melbourne Water have clearly defined roles in the management of trade waste. The retail companies are responsible for the oversight of individual trade waste generators and trade waste discharges, while Melbourne Water is responsible for bulk transfer and treatment of sewage, including trade waste.

The *Water Industry Act* provides for such activities as the issuing of water and sewerage, and sewage treatment licences, charges for trade waste collection and treatment and the establishment of trade waste regulations. The current regulations (*Water Industry Regulations 1995* (incorporating amendments up to 1998)) provide a definition of trade waste, and specify that trade waste can be discharged if a trade waste agreement is in place and the agreement is complied with. In the event of non-compliance, the water business is able to serve a notice on the discharger, leading to termination of the agreement.

The general conditions under which retail water companies provide trade waste disposal services are described within their operating licences, through the trade waste policies of the individual businesses and through contractual arrangements between Melbourne Water and the retail water companies under *Bulk Sewage Transfer, Treatment and Disposal Agreements*.

A schedule in the retail companies’ operating licences makes reference to the *Standards for Trade Waste*. The *Standards for Trade Waste* include quality and quantity criteria for a range of trade waste parameters; the retail companies are required to accept trade waste discharges that comply with the *Standards for Trade Waste*. The only exception is if the retail business can demonstrate that there would be unacceptable impacts from the acceptance of trade waste that complied with the *Standards for Trade Waste*. The operating licences allow retail water companies to accept trade waste that exceeds the *Standards for Trade Waste* via a ‘variation’, however, this requires approval from the ‘bulk’ sewage treater - Melbourne Water.

The retail water businesses and Melbourne Water have established a process to review and make recommendations for changing of the trade waste standards included in the retail water companies’ operating licences. The Trade Waste Acceptance Advisory Committee (TWAAC) is an independent group appointed by Melbourne Water and the three retail water companies to provide this advice. TWAAC is managed by a steering group consisting of one representative from each of the four water businesses and the chairperson of the committee.

When the steering group asks TWAAC to review the limits for a particular substance, TWAAC advertises for submissions from interested parties. The four water companies invite submissions from customers, community groups and other interested bodies during the process. TWAAC formulates a technical position and produces a draft report that is issued for public review and comment. TWAAC considers comments from the steering group and from submissions received and a final report is then prepared for consideration. Once the four companies reach agreement, they then make
individual submissions to the Governor-in-council to have their operating licences amended.

**Regional water businesses**

The *Water Act* 1989 provides key provisions for trade waste control, with s178 making it an offence for any person to cause or permit anything other than domestic waste to be discharged in a businesses sewerage system without the permission of the business, that is, via a trade waste agreement. Section 173 of the Act empowers the business to accept trade waste if the business so decides. While it is not a requirement on the water business to accept and treat trade waste, most businesses do provide this service.

Detailed management controls are developed by individual water businesses and described in by-laws developed under s181 of the *Water Act*. The development of these by-laws is therefore relatively flexible, however they do require Ministerial approval. These by-laws can be established to:

- Regulate trade waste discharges;
- Describe the necessary terms and conditions for a trade waste agreement;
- Describe the charges that apply to trade waste discharges;
- Describe the information required to be provided to the water business as part of a trade waste agreement; and
- Impose penalties for non-compliance with a trade waste agreement.

**Environment Protection Act and Statutory Policies**

While the primary powers for water businesses to administer trade waste management are described under the *Water Act* and the *Water Industry Act*, the *Environment Protection (EP) Act* includes a range of provisions that have a significant bearing on trade waste management. These provisions are both directly within the Act and within statutory policies that underpin the Act – the State environment protection policies (SEPP) and waste management policies (WMPs - previously known as industrial waste management policies).

The EP Act includes the waste hierarchy as a core principle, which in the context of trade waste means management needs to focus on avoidance of generation as the preferred option, followed by reuse and recycling, with disposal (that is, discharge to sewer) the least preferred option. The waste hierarchy and its application to trade waste management is also specifically highlighted within the *IWMP (Prescribed Industrial Waste)*.

The EP Act provides the basis for EPA Victoria’s licensing of sewage treatment plants (STPs). STP treatment capacity and discharge requirements have a direct relationship to the necessary trade waste controls. Also relevant to trade waste control is the requirement in the recently revised SEPP (*Waters of Victoria*) 2003, that water businesses must implement programs to progressively reduce the size of STP discharge mixing zones. Improvements in trade waste discharge quality and activities such as beneficial reuse of reclaimed water will be critical in achieving this requirement.

In addition to direct licensing of sewage treatment plants, EPA guidelines for biosolids land application
and water recycling can also have a significant influence on the necessary controls on trade waste.

In recent years, the statutory policies described above have replaced more prescriptive requirements in earlier statutory policies. The removal of these prescriptive requirements reflects the importance of wholistic approaches to achieve the policy objectives. However, the requirements described remain important potential policy delivery mechanisms. The prescriptive requirements were in the Industrial Waste Management (Waste Minimisation) Policy, which ceased to be in force in 2002 and the State Environment Protection Policy (Waters of Victoria) 1988. The relevant clauses in these policies were:

- Commonly available waste minimisation technology needs to be applied to all discharges, with best available waste minimisation technologies applied to priority wastes (IWMP (Waste Minimisation)); and
- Water businesses need to require, where practical, trade waste generators to prepare waste management plans; and hazardous substances (for example mercury and cadmium) need to be controlled at source to the lowest practical levels prior to discharge to water (SEPP (Waters of Victoria)).

**Other legislation**

While the sewerage system may be principally recognised as a transport mechanism for sewage, during sewer maintenance activities it is also a workplace. As a result, water business obligations under the Occupational Health and Safety Act 1985 are an important driver for managing trade waste discharges.

An additional important piece of legislation is the Trade Practices Act 1974 due to the service provision aspects of water business operation. The Act was developed by the Commonwealth and is administered by the Australian Competition and Consumer Commission (ACCC). Key issues addressed by the Act are: anti-competitive and unfair market practices; product safety/liability; and third party access to facilities of national significance.

The Water Industry Regulatory Order (2003) lists trade waste acceptance as a prescribed service. As a result, the Essential Services Commission (ESC) will regulate trade waste service levels and trade waste pricing by Victorian water businesses. The primary influence of the ESC is expected to be in regard to water businesses needing to abide by a Statement of Pricing Principles in their pricing behaviour. However, ESC may also choose to establish performance indicators for trade waste or service codes.

The function of the pricing principles is to articulate in greater detail than is possible in current regulatory orders, what the ESC considers is and is not acceptable pricing behaviour. The general objectives of this approach are:

- To improve transparency of pricing decisions;
- To ensure pricing structures reflect costs; and
- To ensure pricing reflects the externalities associated with trade waste.

Pricing (charging practices) is covered in greater detail in section 5.8.
The Energy and Water Ombudsman of Victoria (EWOV) provides a dispute resolution scheme for water industry customers. EWOV's services are free and available to all Victorians, including residential and business customers. Customers must have attempted to resolve the dispute with the relevant water business before EWOV becomes involved.

EWOV's role in the water industry reflects a requirement for the water industry to establish a disputes resolution scheme approved by the ESC. This requirement was established through amendments to the Water Industry Act and the Essential Services Legislation (Dispute Resolution) Act 2000. More information on EWOV can be found at the web site www.ewov.com.au/index.htm.

**Legislative comparisons – trade waste acceptance**

In this section, interstate and international approaches to regulating trade waste are overviewed. The purpose is to provide context for subsequent sections and discussions, because the regulatory framework can be a driver or barrier in the implementation of best practice trade waste management programs.

**Sydney**

Sydney Water has a licence under the New South Wales Water Board (Corporatisation) Act (1994) to provide sewerage services. Trade waste agreements are required for trade waste discharges, with the agreements describing the conditions of discharge such as quantity and quality limits, sampling and monitoring. The trade waste charges are determined on a commercial basis, but also include a charge as an incentive for trade waste reductions. There are restrictions on pricing that are established by the Independent Pricing and Regulatory Tribunal.

Trade waste acceptance standards are set by Sydney Water based on factors including:

- ‘Typical’ domestic levels for the ‘domestic substances’ - suspended solids and grease;
- Concentrations believed obtainable by the use of best available practical technology which is economically achievable;
- Pollution reduction targets set by the NSW EPA; and
- Consideration of the reuse guidelines for wastewater and biosolids established by the NSW EPA.

**United States**

At a federal level within the United States, the key piece of legislation impacting on trade waste management is the National Pretreatment Program within the Clean Water Act 1972. This program delivers two potential levels of trade waste regulation.

At the level of individual treatment plants, local trade waste limits are developed by the water businesses to address such issues as compliance with STP discharge requirements, asset management objectives, biosolids and reclaimed water use and OH&S. The local trade waste limits also implement generic federal prohibitions (such as not discharging explosive or flammable hazards) on trade waste discharge characteristics. Although developed and implemented at a local level, there are specific triggers for when the program requires the approval of a State/federal regulatory agency.
At a federal level, in addition to establishing generic prohibitions on trade waste, the National Pretreatment Program describes trade waste standards that automatically apply to specified industry sectors. These categorical standards are implemented by the relevant water business and are the minimum requirement for the trade waste discharge for that industry, but the local limits can be more stringent where needed. If a sewage treatment plant (STP) has a designated industry sector in the catchment, the trade waste management program is required to be formally submitted to the relevant state regulator.

The categorical standards are based on the wastewater characteristics and variability, industrial process involved, information on the availability and costs of control technologies and pollution measures, as well as industry performance. In 1999, there were pre-treatment standards for 32 categories of industry including battery manufacturing, electroplating, leather tanning and pharmaceutical manufacturing (US EPA, 1999).

Europe

The legislation driving trade waste management in Europe is multi-layered, with the overarching requirements and policy directions described in European Economic Commission Directives. The member States, such as the United Kingdom, are then required to implement the directives via their own legislative processes. There are a number of directives that have a significant bearing on trade waste management, either through generic controls on industrial wastes or through regulation of discharges from sewage treatment plants. These key directives and the implications for trade waste are:

- The Urban Waste Water Treatment Directive (91/271/EEC) (updated by 98/15/EEC) provides direction on environmental protection from sewerage management and includes generic requirements for pre-treatment of trade waste for standard considerations such as OH&S, protection of treatment plant processes and avoiding impacts on discharge environment;

- The Water Framework Directive (2000/60/EC) describes a program for identification of priority hazardous substances, coupled with objectives of eliminating priority hazardous substances and achieving near background levels for naturally occurring substances. The directive provides the ability to control trade waste discharges through either the use of best available techniques or through quantitative emission values; and

- The Directive on Integrated Pollution Prevention and Control, (IPPC Directive) (96/61/EC) which requires member states to permit discharges (including trade waste) from defined industry sectors based on Best Available Techniques. BAT reference documents are being developed for key industry sectors.

The United Kingdom provides a useful model of the application of these directives at a local level. Currently, water businesses have powers under the Water Industry Act to establish trade waste agreements to cover such things as trade waste quality and charges, sampling and monitoring. The Director General of Water Services can review agreements on appeal and place binding conditions on both parties, with the onus of proof on the sewerage undertaker to demonstrate the relevant
trade waste cannot be managed at the STP. The Director General of Water Services also regulates trade waste prices.

The delivery of the IPPC Directive will occur via specific regulations that will be administered by the Environment Agency and target specified industries. The UK is proposing a system of generic requirements for each industry sector that are based on the EC BAT reference documents (termed General Binding Rules) but with the potential for individual installations to have an installation-specific permit. It is estimated that some 6000 facilities in total will be captured by these requirements.

Comparisons

There are both important similarities and differences in the Victorian legislative framework compared to the international legislative approaches described above. The key similarity is the ability to establish ‘local’ trade waste limits on a plant-by-plant basis considering such issues as STP discharge limits, asset management and OH&S requirements. The most fundamental difference is the extent that the legislative framework drives trade waste management beyond these local limits. In the US and EC, the approach is to directly regulate discharges from key industry sectors based on the emissions that are achieved after the application of ‘best available techniques’. This process occurs independently from the water businesses. In Sydney, incentive charging by Sydney Water is permitted. However, while these principles are described in Victorian statutory policies, they do not appear to be reflected in trade waste standards, to the extent that industries complying with the generic standards in metropolitan Melbourne must be allowed to discharge their trade waste.

3.2 Water industry business drivers

In addition to the various legislative drivers for trade waste, water businesses have a variety of financial and corporate drivers for implementing best practice management. It is important that these drivers are identified by the individual businesses, as they enable ‘ownership’ of trade waste at the highest levels of the business. Examples of business drivers include:

- Reduced risks to directors from prosecutions under environmental and other legislation;
- Reduced costs for achieving required outcomes. Where treatment plant upgrades are being considered, it may be more cost effective to work with trade waste generators to reduce discharge loads, rather than invest in treatment plant capital;
- Reduced operational and maintenance costs from managing assets that are impacted by trade waste discharge parameters but are not included within charging frameworks. This may reflect issues such as potential damage to the sewage transfer system where the responsible contaminants are not cost recovered;
- Minimised risks to staff occupational health and safety and risks of non-compliance with other regulatory requirements;
- Protection of sewage quality to facilitate water and biosolids recycling. For the majority of contaminants, sustainable recycling becomes progressively more difficult and unattractive
with increasing contaminant loads. The trade waste management practices need to reflect this increasing constraint;

- Improved corporate standing within the community through stronger relationships with local industry and being seen to proactively manage trade waste; and

- Minimised environmental impacts associated with the businesses activities.

3.3 Trade waste management principles

Purpose

Trade waste management principles provide direction to a water business in establishing trade waste management policies and detailed management controls.

Key principles

Since trade waste management principles are a fundamental component of good trade waste management and often enshrined in statute, the principles are not structured here as typical practice and best practice. Rather, this section provides a prescriptive list of principles, with the expectation that all water businesses would use these principles to set the high level direction of their trade waste program. The principles described in this guideline reflect key legislative provisions in the *Water Act*, the *Water Industry Act*, the Statement of Obligations, the *Environment Protection Act* and current guidance such as Guidelines for Sewerage Systems (Acceptance of Trade Waste) ARMCANZ and ANZECC (1994).

The principles for the management of trade waste are:

- The safety of operations and maintenance personnel must be protected;

- The operation of the sewerage system and its assets must be protected;

- The treatment processes at sewage treatment plants must be protected;

- The quality of treated effluent and biosolids from sewage treatment plants must comply with licence conditions and maximise opportunities for recycling;

- The generation of trade wastes must be managed in accordance with the waste hierarchy, based on the following order of preference:
  - avoidance;
  - reuse;
  - recycling;
  - recovery of energy;
  - treatment;
  - containment; and
  - disposal;

- Economic, social and environmental considerations should be integrated into trade waste management processes, and the measures adopted should be cost effective and in proportion to the significance of the problems being addressed;

- The generators of pollution and waste should bear the cost of containment, avoidance and abatement;
• The management of trade waste should not negatively impact on the long term financial viability of the water business;

• Water businesses should adopt a consultative approach with the community in which it operates, including customers and other agencies;

• Trade waste should be managed by the waste generator using, at least, commonly available technology for most waste streams and best available technology for waste streams containing contaminants of particular concern in regard to protection of occupational health, assets or the environment; and

• The present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.

3.4 Trade waste policy

Purpose

To ensure that a water business articulates its trade waste policy, thereby providing clear information to its staff, customers and the broader community on how it intends to accept and manage trade waste. The process for establishing the policy also provides a mechanism to ensure the water business, at all levels, understands its trade waste management responsibilities.

Background

As described in sections 3.1 and 3.2, water businesses have a range of legislative and other responsibilities relating to preventing negative impacts from trade waste received. These responsibilities range from the prevention of significant adverse impacts upon OH&S and the environment, through to implementing waste minimisation programs and user-pays charging. While these responsibilities are relatively clear, their practical implementation can be complex and necessitate customised approaches by different water businesses, and even different facilities within an individual business. The management approach that is ultimately taken can potentially affect many stakeholders; including customers, senior management and staff of the water businesses, community members, regulators and Government Departments. All of these stakeholders could potentially hold quite different expectations regarding the priority management areas, costs and impacts of trade waste management.

Despite the broad implications of trade waste management, typically the responsibility for managing trade waste discharges is given to an individual or a discrete management unit within the water business. The preparation of a trade waste policy provides a mechanism to engage all levels of a water business, obtaining executive and board commitment to the management program. The policy development process can also clarify stakeholder expectations of consistency in trade waste management.

Typical format

A trade waste policy is typically a stand-alone document that is available to all stakeholders. The policy is formatted as a statement to accept trade waste discharges that accord with a listing of the water businesses key responsibilities for managing
trade waste. The survey underpinning this guideline indicated that these responsibilities were typically listed as the ‘traditional’ core activities of the water industry, namely protecting sewer assets, treatment processes, OH&S, complying with EPA licence conditions and facilitating cleaner production.

**Best practice**

Best practice measures for trade waste policies are suggested as:

1. Developing the policy through a consultative and transparent process involving all levels of the water business and including input from key stakeholders. The development process would be lead by a senior member of the water business and undergo a board endorsement process;

2. Having the policy available as a downloadable file on the water businesses website. This makes the policy readily available to stakeholders, at any time. It also facilitates better quality control by ensuring that the website always has the latest version of the policy;

3. Taking a broad approach to the principles that should be highlighted in the policy, based on the key trade waste principles highlighted in section 3.2;

4. Integration of the policy with a trade waste strategy, which describes the approach to be taken in key activity areas for implementing the policy directions. These activities may include the:
   - Formation and implementation of trade waste agreements;
   - Implementation of charging for trade waste management;
   - Processes for determining monitoring requirements, including self-monitoring;
   - Mechanisms for managing non-compliant processes; and
   - Implementation of cleaner production and waste minimisation programs.

**Case studies**

Sydney Water has produced a detailed *Trade Waste Policy and Management Plan*. This user-friendly document incorporates Sydney Water’s trade waste policy followed by a management plan for implementing the policy. A particularly useful feature of the document is that it uses special icons throughout, to differentiate between conditions for commercial and industrial customers. The document incorporates an extensive list of appendices, including providing details on: definition of terms, acceptance standards for trade waste, trade waste fees and charges, risk calculation formula and breach management.


City West Water recently published its *Trade Waste Policy and Guidelines* on its website [www.citywestwater.com.au](http://www.citywestwater.com.au). This is an extensive document, providing detail on all elements of trade
waste management. City West Water’s trade waste policy includes the common key objectives of user pays philosophy and enforcement of compliance. The policy also includes additional objectives of regularly benchmarking the performance of the trade waste management system, moving towards sustainable development, and providing an efficient, safe and lowest community cost trade waste disposal service.

Barwon Water developed a draft trade waste management policy in 2003 which is available on its website www.barwonwater.vic.gov.au. Development of the policy involved extensive stakeholder consultation and the policy provides direct linkages into a trade waste strategy for implementation of the key directions in the policy.

A summary of the policy drivers identified in the trade waste survey by the working group is included in Trade waste management survey 2003 – results available from the EPA website www.epa.vic.gov.au.
4. **SYSTEM, RISK AND TRADE WASTE MANAGEMENT**

While the key principles and objectives driving trade waste management (Chapter 3) can be broadly applied across all water businesses, the development of detailed trade waste management programs is more business specific. A wide range of factors influence the detail of the management programs required for trade waste, including the characteristics of the receiving sewage treatment plants, the businesses strategies for biosolids and water recycling, and the categories and numbers of trade waste customers involved. In accounting for these factors, it also needs to be recognised that negative incidents can occur, that some customer categories pose greater hazards than others and regulatory requirements may not be static. Therefore, achieving the trade waste policy objectives of a water business requires not just an understanding of the system, but also adoption of a risk management approach to identify, understand and efficiently manage potential risks.

The completion of system characterisation (Section 4.1) and risk identification/management systems (Section 4.2) enables a water business to begin to deliver the program objectives through establishing appropriate trade waste standards (Section 4.3) and implementing waste minimisation and cleaner production programs (Section 4.4).

### 4.1 System characterisation

**Purpose**

To provide detailed information on the sewerage system characteristics and trade waste customers, so that trade waste programs can be structured to deliver relevant management objectives. This information also assists broader business planning, such as the capital expenditure implications of increased trade waste loads to sewerage systems.

**Background**

Although the management of trade waste discharges may be the responsibility of a discrete unit within a water business, the discharges can have significant implications across a wide range of business activities. System characterisation is a critical data gathering exercise, in which detailed information on such issues as the capacity of the sewage system, relevant criteria for OH&S protection and strategies for effluent recycling are integrated. This process enables the trade waste management controls and strategies to be targeted at delivering the established business objectives.

Key business activity areas where trade waste management can have direct implications are listed below. This listing also includes some relevant references for the definition of management objectives:

- **Occupational Health and Safety** - toxic and noxious gases can be released from some wastes, posing occupational health and safety risks, particularly when concentrated in headspace areas within sewerage systems. Flammable, explosive and corrosive wastes can also pose OH&S issues. Management objectives can be established based on references such as the 1994 National Water Quality Management Strategy Guidelines for Sewerage Systems: Acceptance of Trade Waste (Industrial Waste) (ARMCANZ, ANZEEC). Workplace Exposure Standards for toxic gases can be obtained.
from the National Occupational Health and Safety Commission (NOHSC) (www.nohsc.gov.au/OHSLegalObligations/National Standards/nationalstandards.htm) and from the National Industrial Chemicals Notification and Assessment Scheme (NICNAS) (www.nicnas.gov.au). Expert OH&S advice should be sought if a Workplace Exposure Standard is not available for a specific compound. Information may also be available from reference material such as Material Safety Data Sheets.

**Water conservation** – As highlighted in the current Green Paper *Securing our Water Future*, the 15 per cent conservation target in Melbourne by 2010 will require water businesses to implement programs that deliver increased water conservation. Trade waste generators can be significant users of water, therefore trade waste controls can be significant in reducing potable demand and encouraging on-site recycling.

**Water recycling** – The suitability of recycled water for sustainable water recycling can be influenced by contaminants such as dissolved salts, particularly sodium. Recycled water quality can also be impacted by heavy metals and organic contaminants, although this is not typically a significant issue unless the treatment plant has particularly large industrial inputs. Management objectives can be established by integrating recycling strategies with information on reclaimed water quality objectives from the *Guideline for Environmental Management: Use of Reclaimed Water* (EPA, 2003) the *Guidelines for Wastewater Irrigation* (EPA 1991), and the Australian and New Zealand *Guidelines for Fresh and Marine Water Quality* (ANZEEC & ARMCANZ, 2000).

**Biosolids recycling** – The suitability of biosolids for sustainable land application or energy recovery can be restricted by heavy metal contaminants such as cadmium. Biosolids quality can also be impacted by organic contaminants, particularly where inputs at a treatment plant are dominated by industrial inputs. Management objectives can be established by integrating recycling strategies with information on biosolids quality objectives from the *Guideline for Environmental Management: Biosolids Land Application* (EPA, 2004).

**Transfer system** – sewers can be blocked through the accumulation of greasy wastes and suspended solids, leading to maintenance difficulties and potentially sewer spills. This problem can be exacerbated by the presence of solid barriers such as penetrated tree roots or solid litter dumped in the sewer. Flammable or explosive wastes can damage the transfer system catastrophically if ignited, while materials such as acids, salts and hydrogen sulphide gas can corrode sewers. In addition, trade waste can contribute to the generation of offensive odours from the transfer system, either directly through odorous parameters or indirectly through the development of anaerobic sewerage. The acceptance of trade waste needs to be integrated with other elements of transfer system management, such as sewer maintenance and tree root control. The *Guidelines for Sewerage Systems: Acceptance of Trade Waste (Industrial Waste)* (ARMCANZ, ANZEEC, 1994) provides information on trade waste acceptance for managing the transfer system.

**Treatment plant processes** – wastes containing toxic materials can impair biological waste treatment processes such as activated sludge plants. Accumulation of grease and fats in treatment...
plants can cause odours and reduce plant efficiencies, while organic overloading can result in the generation of offensive odours. If a business has concerns regarding the potential impact of a trade waste discharge on a sewage treatment plant, the generator could be required to undertake bench scale trials to demonstrate the likely impact on biological processes. The *Guidelines for Sewerage Systems: Acceptance of Trade Waste (Industrial Waste)* (ARMCANZ, ANZEEC, 1994) provides information on trade waste acceptance for managing treatment plant processes.

**Effluent disposal** – heavy metals, organic contaminants that are not readily degraded, hydraulic, nutrient or organic overloading can result in breaches of effluent quality and quantity standards in EPA waste discharge licences. In addition, although the contaminants may comply with the standards listed in the EPA licence, they may cause impacts on beneficial uses of the receiving waterways. As a result, EPA requires water businesses to implement programs to progressively reduce the size of mixing zones. Some trade wastes may also have broader impacts, such as on the efficacy of UV-sterilisation processes for the destruction of microbiological pathogens. Information on effluent quality objectives and objectives for protection of surface receiving waters can be found in SEPP (*Waters of Victoria*) 2003 and its schedules, the *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZECC and ARMCANZ 2000) and *Managing Sewage Discharges to Inland Waters* (EPA, 1995).

**Waste minimisation** – establishing objectives for waste minimisation needs to be based on the practical considerations for each industry. Details are discussed further in section 4.4. Information on waste minimisation and best practice for industry sectors can be obtained from the joint VicWater – EPA publication – *Trade Waste Management Plans* (2003) and from such sites as the US pre-treatment program ([http://cfpub.epa.gov/npdes/home.cfm?program_id=3](http://cfpub.epa.gov/npdes/home.cfm?program_id=3)), EC ([http://eippcb.jrc.es/pages/FActivities.htm](http://eippcb.jrc.es/pages/FActivities.htm)) and NSW EPA ([http://www.epa.nsw.gov.au/home.htm](http://www.epa.nsw.gov.au/home.htm)). Further information on waste minimisation will also be available from the EPA and VicWater websites.

**Typical and best practice**

It is difficult to clearly differentiate between typical and best practice for assessing system capacity and drivers, since the key steps in the process are integral to the establishment of effective trade waste management. A nominal separation between typical and best practice can be defined based on the relative sophistication of the analysis undertaken and the level of detail achieved. However, the sophistication of the analysis should reflect the size and characteristics of the business and the characteristics of the trade waste, therefore potential ‘best practice’ for one business may be inadequate for another more complex business.

The process for establishing system capacity and drivers is considered to involve:

**System characterisation**, including:

- A description of the trade waste transfer system and the sewage treatment plant and processes;
- Preparation of treatment plant capacity statements for organic, nutrient and hydraulic loads;
• Cross linkages to reclaimed water and biosolids recycling strategies and identification of key contaminants that may constrain the recycling strategies;

• Cross linkages to effluent disposal strategies for ensuring compliance with licence standards and achieving progressive reductions in the impacts on beneficial uses of the receiving environment; and

• Definition of the relevant criteria for managing OH&S risks, asset/transfer system protection and offensive odour generation risks;

**Input identification**, based on either desktop analysis (that is, input estimates based on published information or experience) and/or specific monitoring of influent, catchment or trade waste discharge monitoring to understand the sources of key critical parameters;

**Trend analysis**, based on an examination of historical trends in trade waste quantity and quality and treatment plant influent composition, and forecasting future trends for forward planning of asset maintenance and improvement. This latter activity may require liaison with local government, planning and regulatory agencies and/or industry associations/chambers of commerce; and

**Monitoring and review**, establishment of a process to monitor changes to inputs and update the above information either as a cyclic process or in response to specified triggers.

With the collection and integration of the above information, the water business is positioned to implement a detailed program that delivers the key trade waste management objectives.

**Case studies**

Melbourne Water prepares plant capacity statements for both the Western and Eastern Treatment Plant at the end of each financial year. The objective of the plant capacity statements is to define the capacity of the plant to treat a number of pollutants. These pollutants are of concern to the treatment plant for their impact on the treatment processes, and/or their potential to cause environmental impact or breach the EPA waste discharge licence. These plant capacity statements are made available to the retail companies so that they are aware of the most significant concerns and limitations relating to each of the treatment plants.

**Sydney Water- Trade Waste Mass Calculation System**

Sydney Water has developed a biosolids, effluent quality and capacity model called the Trade Waste Mass Model. Each quarter Sydney Water uses the Trade Waste Mass Model to assess the impact of accepting trade wastewater at each sewerage system. Where a substance needs to be restricted, the substance, for charging purposes, is declared critical or over capacity.

The Trade Waste Mass Model is an integral part of Sydney Water's Management Plan for industrial customers and is also the management tool used to determine if a request for trade wastewater discharge is approved, modified or rejected. It creates the details for inclusion in new provisional trade waste permits, and has become an essential part of how they operate. This model is incorporated into Sydney Water's Waste Water – Integrated Management System (WW-IMS). This system is one tool used to ensure Sydney Water does not
jeopardise the conditions of EPA licences at sewage treatment plants (STPs).

The Trade Waste Mass Model allows users to enter details relating to the type and mass of each substance to be discharged to sewer and compares this to the mass of that substance already being delivered to the receiving sewage treatment. The system is loaded with removal efficiency rates for each STP and calculates the effect the additional load would place on the quality of biosolids produced at each respective STP and its ability to comply with EPA license conditions. The critical mass model system is the management tool used to determine if a request for trade waste discharge is approved, modified or rejected and to identify critical substances for charging purposes.

Details relating to type and mass of substances to be discharged are entered into trade waste database along with other information relating to pretreatment on site and contact information. Data entered into the mainframe is used to establish patterns for customer sampling requirements, billing, establishing the template for charging purposes, identifying, and signalling breaches of critical components of the agreement.

4.2 Risk identification and management

Purpose

To ensure that risks to achieving trade waste management objectives are identified and efficiently addressed.

Overview

While the previous section overviewed the mechanics of characterising the trade waste/sewage system and defining the management objectives, the translation of this information into a trade waste management program needs to occur within a risk identification and management framework.

Risk identification and management needs to occur at the level of individual customers, the transfer system network and across the business. The risks that need to be considered with the development and implementation of a trade waste program include:

- Risks to aspects such as assets, OH&S, STPs and the environment due to trade waste customers discharging non-compliant trade waste, customers discharging unregulated compounds that are nevertheless harmful, interactions between the trade waste discharges of neighbouring customers, and illegal discharges from companies that have not entered into a trade waste agreement;
- Risks to customers resulting from unplanned restriction of a discharge caused by access to a sewer being limited by the actions of another generator, such as a blockage, gross contamination or hydraulic overload or unprecedented wet weather contributing to excess volumes of trade waste on site or severely reduced sewer capacity;
- Risks to the water business corporate standing and community perception if the management of trade waste causes significant impacts to the environment or customer operations; and
- Risks due to changes in regulatory environments such as changes in discharge standards or occupational health and safety requirements.
In addressing these risks, the measures that are undertaken need to be commensurate with the likelihood of the risk eventuating and the magnitude of the impact if the risk eventuated. To do otherwise would result in inefficient management controls, potentially excessive costs for the business and/or customer in managing the trade waste, and increased potential for a high risk activity to be inadequately managed through the inappropriate diversion of management resources.

This guideline provides information on a range of measures that are important within the risk identification/management framework, including a section on customer risk assessment (Section 5.3); tools for managing risks such as customer segmentation; and the use of quality assurance systems (Section 6.1). This guideline does not provide additional detail on the process for undertaking risk identification or implementing a risk management system, since this aspect is adequately covered through QA programs and the Australian Standard AS/NZS 4360:1999 Risk management.

**Case studies**

Using compliance history as a risk identification tool.

Compliance history and knowledge of customers’ responsiveness to addressing compliance issues can be invaluable in identifying the risk represented by a particular customer’s discharge. A customer that is regularly non-compliant and unwilling to address and resolve the problem can represent a significantly high risk to a water business. Whereas, a customer with good systems and responsive management can still remain a reasonably low risk if it has a compliance problem on rare occasions.

City West Water, and other major water companies around Australia, typically consider compliance history when assessing the potential risk posed by both existing and new customers.

Compliance history can provide information on the likelihood that a particular non-compliance event will occur. This then provides justification for placing requirements on a customer to undertake waste minimisation or improved trade waste management to reduce the likelihood of future non-compliance events. Showing trade waste customers’ their compliance history can also assist in negotiations to improve their management of trade waste. It provides convincing evidence of the need for change and ensures that trade waste quality does not become out of sight and out of mind.

Monitoring and evaluation of compliance across an industry group can also provide very important information to trade waste managers. For example, City West Water identified a compliance issue being experienced regularly by two companies within a particular industry sector. The regularity of this non-compliance raised the risk profile of these customers and led to an investigation of all the customers in that industry group. The industry wide problem of an inadequacy in the pre-treatment technologies used to remove contaminants from the waste stream was subsequently identified. This led to a cooperative approach to solving the problem through improved treatment and cleaner production. As a result, the overall risk of the industry and its waste stream was reduced.
In addition, industry compliance trends and knowledge of the typical treatment system used to treat wastes within an industry can assist in assessing the risk of trade waste from a new customer that has no discharge history in that industry type. This may mean you can provide advice before the discharge commences to change the proposed management and improve the potential quality of the future discharge.

4.3 Trade waste standards

Purpose
Trade waste acceptance standards are a critical component of a trade waste management framework, providing an enforceable mechanism to protect the sewerage system, including worker occupational health and safety and treatment plant processes. Through using structures such as multiple tier acceptance standards, the standards can also be used as a mechanism to drive strategic improvements in trade waste discharges and underpin cleaner production initiatives.

Background
There is a range of information available on the mechanics of calculating trade waste standards. The 1994 National Water Quality Management Strategy guideline *Acceptance of Trade Waste (Industrial Waste)* (ARMCANZ, ANZECC) includes an example of a mass load calculation. Additional information can be found in publications such as the US EPA Draft *Local Limits Development Guidance* (US EPA, 2001). Therefore, this section does not detail a methodology for calculating trade waste acceptance standards but rather focuses on the processes and key principles that should underpin the establishment of trade waste acceptance standards.

In determining how to structure and use trade waste acceptance standards, a water business will need to integrate a range of potential considerations including:

- The objectives of trade waste management (Chapters 3 and 4);
- Establishing priority parameters from the system capacity review and the risk identification processes (Sections 4.1 and 4.2);
- The parameters being considered and whether they are treatable at STPs (such as biochemical oxygen demand) or are largely unmodified by the treatment process (such as inorganic salts and heavy metals) and therefore require a greater focus on waste minimisation and elimination prior to the trade waste discharge;
- How the standards will be integrated with other activities, such as cleaner production initiatives (Section 4.4), to achieve the trade waste management objectives;
- Integration with the monitoring and charging of customers (Sections 5.7 - 5.8);
- The resources available for establishing and administering trade waste standards. For example a small water business with a limited number of trade waste customers may establish generic standards across the business, while a larger business with a greater number or a broader range of customers may develop specific standards for individual plants or customer segments. (Some guidance on staff
training and resourcing is provided in section 6.4);

- The capacity of customers to achieve trade waste standards. This is with regards to achieving best community outcomes where generic standards may be impractical to achieve. To address this consideration, customer requirements for implementing trade waste technologies (management practices and treatment levels) are often structured based on CAT (commonly available technologies) and BAT (best available technologies). Requirements for BAT are typically linked to critical parameters that may have significant impacts on achieving trade waste objectives, while CAT is typically linked to parameters that are either treatable and within treatment plant capacity or from low risk customers; and

- The structure of the standards adopted, particularly regarding the use of load based limits or concentration limits, as well as single tier or multiple tier standards. As an example of using multiple tier standards, a relatively low contaminant concentration or load limit may be specified as a trigger for the preparation and submission of a waste management plan. A higher limit may be specified as the maximum concentration or load permitted to be discharged, or act as a progressive trigger for such activities as an independent trade waste audit.

**Typical practice**

In Victoria, two separate legislative approaches currently exist for the establishment of trade waste standards. In Melbourne, trade waste acceptance standards are prescribed within Schedule 4 of the retail water business operating licences. For each parameter, the standards are typically structured as a single concentration limit that applies generically across Melbourne, however it is possible to vary the standards depending on factors such as OH&S risk and the treatment plant capacity. There is also the potential to apply load-based limits rather than concentration limits for selected parameters. Trade waste discharges that comply with the default standards are required to be accepted by the retail water companies, while discharges that exceed the standards require the approval of the retail water business and Melbourne Water. This approval may be conditional on the development of a waste management plan. Changes to trade waste standards are coordinated by the Critical Pollutant Management Group (CPMG) through referral to the Trade Waste Acceptance Advisory Committee (TWAAC), a panel that is independent of the water businesses, with membership based on relevant expertise.

In regional Victoria, trade waste acceptance standards are established in by-laws prepared internally by each regional urban water business. The by-laws vary in complexity and structure, depending on the nature of trade waste being managed by the regional urban waste business.

**Best practice**

It is difficult to describe a single example of best practice for establishing trade waste acceptance standards, since best practice needs to reflect an individual and potentially unique set of considerations. However, it is possible to identify
some specific components that represent best practice for trade waste standards and provide relevant examples for each component:

- The process to establish the standards needs to be transparent and involve a process for stakeholder input. In this regard, the CPMG/TWAAC model in Melbourne has elements of best practice, involving a formal consultation process with all relevant stakeholders and the standards recommended by an expert committee independent of the water businesses. The US EPA approach (described as a case study) could also be considered as best practice, since critical parameters are set by an independent authority in a transparent and consultative manner;

- Trade waste standards cannot be inflexible tools applied across different STP catchments. There needs to be flexibility to reflect specific issues and priorities at individual treatment facilities, particularly with regard to differences in plant capacity for organic loads (Section 4.1). In this regard, the ability of Victorian regional urban water businesses and US water businesses to establish local trade waste acceptance standards can be considered best practice;

- The trade waste standards and associated measures should drive good practice for critical parameters across all trade waste generators, rather than only impacting on trade waste generators with relatively elevated contaminant levels. In this regard, the use of industry specific trade waste standards in the US is considered to represent best practice. The use of multiple tier standards for an individual parameter could also be best practice, whereby a relatively low standard triggers the need for waste management audits and an upper standard applies as a ‘backstop’; and

- Trade waste standards need to be progressively reviewed as part of the trade waste framework management.

**Case studies**

In the United States, trade waste standards are established at multiple levels:

- At a federal level there are generic qualitative prohibitions on the discharge of trade waste that would impact on treatment plant performance or present a hazard such as an explosion;

- Also at a federal level, there are national standards, termed categorical pre-treatment standard, which apply to specific industrial categories. The categorical standards are derived based on the wastewater characteristics and variability, industrial process involved, information on the availability and costs of control technologies, pollution measures, and industry performance. In 1999, there were pre-treatment standards for 32 categories of industry including battery manufacturing, electroplating, leather tanning and pharmaceutical manufacturing (US EPA, 1999); and

- At the level of individual treatment plants, there are customised trade waste standards designed to enable compliance with STP discharge
requirements, asset management objectives, biosolids and reclaimed water use and OH&S.

Europe is moving to a model that partially reflects the United States approach, with a requirement that member States establish the trade waste standards for defined industry sectors based on best available techniques (BAT). This approach applies to identified critical pollutants, and BAT reference documents are being developed for key industry sectors. This approach is integrated with the existing framework such as in the United Kingdom, whereby local treatment standards can be established by the relevant water business. A central regulator establishes industry sector-specific limits for priority parameters.

The Bulk Sewage Transfer, Treatment and Disposal Agreements between Melbourne Water and the three metropolitan retail water companies included the requirement that higher risk customers seeking to discharge above the default trade waste standards needed to prepare a waste management plan to provide justification. This could be best practice if associated with such measures as two tier trade waste standards and rigorous assessment of the potential for cleaner production initiatives to improve trade waste quality.

As part of the development of their new trade waste management system, Barwon Water sought significant contribution from stakeholders when determining their revised acceptance standards. Several drafts of the acceptance standards, including the background and reasoning behind the limits, were distributed to customers and industry groups for review and comment. As a result of comments received, Barwon Water changed the acceptance standards for metals from a concentration limit to a multi-tiered concentration and upper/lower load limit structure.

4.4 Waste minimisation/cleaner production

Purpose

To outline the principles and advantages of waste minimisation and cleaner production programs.

Background

Waste minimisation is the principle of reducing concentrations and loads of waste materials in the final trade waste stream. This is achieved through resource recovery and reuse or recycling of materials prior to discharge as waste.

Cleaner production is the principle of reducing materials, including water, entering the trade waste stream. The principle also relates to reduction of energy consumption and gaseous emissions during production.

While the two principles are very similar, cleaner production tends to be a more wholistic approach to the management of waste sources throughout the production process. Broadly, the underlying philosophy is that waste production and disposal represents lost revenue for trade waste customers.

Cleaner production/waste minimisation programs can be a critical component for a water business to achieve trade waste management objectives such as improvements in effluent or biosolids contaminant quality. Cleaner production/waste minimisation programs are focused on delivering the optimal improvements in trade waste quality for individual trade waste generators. Since the approach is based
around practical and achievable steps and can often have attractive pay-back periods, they can be a more effective tool than generic trade waste standards for achieving improved trade waste performance. Cleaner production/waste minimisation programs can be voluntary or used as part of the regulatory program to drive improvements in targeted contaminants or resolve non-compliance issues.

**Typical practice**

Waste minimisation and cleaner production principles can only be applied if waste sources throughout an operation are well understood. In order to best understand these waste sources, a waste management plan should be developed for each significant trade waste customer. Details on preparing waste management plans are provided in the VicWater companion document, *Trade Waste Management Plans: A Guide and Industry Template for Improving Trade Waste Discharges*. EPA Publication IB383, *Guidelines for Preparation of Waste Management Plans* is a generic document to assist with preparation of more wholistic waste management plans.

Where a strategic focus is placed on a specific trade waste management issue, such as controlling a parameter of concern within the sewerage system that is sourced from a number of trade waste customers, a common waste management plan can be developed. This requires the cooperation of all relevant trade waste customers to provide a common solution.

Communication of trade waste management requirements to all trade waste customers is undertaken using a number of forums, including the circulation of information sheets and bulletins, hosting of forums and information sessions, and dedicated pages for trade waste information on the water business website.

Tariffs for trade waste treatment and disposal may be an impediment to waste minimisation and cleaner production initiatives if the fixed-charge component is high relative to the load component. Tariff structures should be reviewed to ensure that initiatives to reduce or eliminate wastes are rewarded with lower tariffs, whilst ensuring that operational costs to the water business of waste management are still met.

**Best practice**

Waste minimisation plans are prepared and implemented by all significant trade waste producers, and waste minimisation and cleaner production initiatives are regularly discussed at liaison meetings, and communicated to relevant stakeholders.

Communication with trade waste generators is important to ensure that they are aware of the economic and environmental benefits of waste minimisation and cleaner production. The topic is a standing agenda item on regular meeting programs. Initiatives are communicated to all stakeholders through newsletters, seminars, reports and websites. Benefits are measured and reported in annual reports, such as sustainability reports and public environment reports. Partnerships with industry groups and regulatory agencies provide the opportunity to drive change and develop strategic initiatives for that sector.
Tariff structures are modified to encourage and reward waste minimisation and cleaner production initiatives. Introduction of multi-tiered tariff structures provides an incentive for trade waste customers to implement waste minimisation initiatives, while meeting tier thresholds can provide the trigger for the requirement to develop and implement a waste management plan. Incentives to drive cleaner production initiatives are transparent in tariff structures and outlined in documentation relating to trade waste management and tariff structures.

**Case studies**

**SPC Ardmona** is a top ASX-listed food manufacturing company. Its core product range is deciduous fruit (pears, peaches, apricots, plums and apples), baked beans, spaghetti and tomato sauces. Its two facilities in the Goulburn Valley process approximately 260,000 tonnes of fruit annually, and contribute significant seasonal loading to Goulburn Valley Water’s sewage treatment plants.

After consultation with Goulburn Valley Water, the company undertook a waste management program which identified the root causes of waste on-site then identified and assessed possible options. The company focussed on improving equipment design and operator techniques that included:

- Employing dry cleanup methods;
- Ensuring hoses/taps were turned off when not in use;
- Fixing leaks;
- Appointing water monitors on each shift to communicate responsibilities;
- Installing a medium pressure ring main system;
- Directing condensate return from evaporators to the boilers;
- Upgrading the trade waste facility, including solids recovery and the introduction of telemetry systems; and
- Incorporating bonuses and responsibilities into job descriptions.

The company saved approximately 550ML/year of potable water (30 per cent reduction) and reduced its trade waste by 475ML/year. It is estimated approximately 70 per cent of the water and trade waste reductions were associated with culture change.

**Riverland Oilseed Processors** is an oilseed crushing and extraction plant located at Numurkah, Northern Victoria. A plant expansion in 1996 created a number of environmental problems including hydrogen sulfide emissions, particulate and fugitive dust emissions and product loss to sewer. The company decided to implement an environmental improvement plan in consultation with EPA, Goulburn Valley Water and the local community. A key component to the reductions achieved was the ability to convert a waste product into a stockfeed. A 50 per cent reduction in trade waste saves from $100,000 to less than $50,000 per annum which is directly attributable to reductions in flow, sodium (salt), phosphorus and nitrogen emissions.

An **automotive components** supplier in southeastern Melbourne was having trouble with rising zinc levels in its trade waste discharge. Investigation revealed that staff were complying with stringent housekeeping procedures, and the company was unable to source any apparent problems.
The company then re-visited a waste management plan that had been prepared previously, and recognised that a project for measuring water consumption at each source had not been undertaken. Consequently, flow gauges were installed and detected that flow inputs were greater than required, contributing to the zinc problem. By adjusting the flow rates accordingly, the load on the company's treatment plant was reduced by 30 per cent, overcoming the immediate problems with zinc.

CMI Operation Pty Ltd is a manufacturer of pressed metal components for the automotive industry. They worked in partnership with their local water business Central Highlands Water to develop a trade waste management plan focusing on trade waste volume and heavy metal reductions. By using a cleaner production approach the company was able to reduce their flow by 57,000L/day, eliminate the use of caustic soda in their cleaning process and as a result stop their heavy metal discharge to sewer. These initiatives saved the company $12,700 per year resulting in a payback period of less than one year.
5. **MANAGING TRADE WASTE GENERATORS**

Once the system characterisation has been undertaken and the trade waste acceptance framework defined (chapter 4), water businesses are positioned to implement detailed programs that focus on managing individual trade waste generators. In this guideline, these activity areas are considered to fall into:

- The identification of individual customers to ensure all trade waste discharges are appropriately managed (Section 5.1);
- The establishment of trade waste application forms to ensure adequate information is provided with customer applications and to establish an efficient process (Section 5.2);
- Undertaking tailored customer risk assessment exercises and establishing customer segments (Sections 5.3 and 5.4);
- The development of trade waste agreements (Section 5.5) and tailored approaches for specific customer groups such as greasy waste generators (Section 5.6);
- Trade waste discharge monitoring (Section 5.7);
- Charging practices and quality assessment (Section 5.8); and
- Compliance management (Section 5.9).

### 5.1 Customer identification

**Purpose**

To ensure that the water business is aware of all customers that are discharging trade waste to sewer and that they are doing so with the appropriate permission.

**Background**

A water business managing trade waste should have appropriate systems in place for identifying and locating all possible trade waste generators. The systems should be able to deal with customers that understand their responsibilities (and therefore make application to discharge trade waste to sewer) as well as those that set up their business without any understanding of the water businesses requirements.

It is important that all businesses discharging to the sewer system are identified to:

- Provide meaningful information on mass loads and sources of these loads in the sewerage system;
- Treat all trade waste customers equitably;
- Ensure all the potential risks to the system are identified and managed; and
- Recover the costs associated with treating the trade waste discharges.

**Typical format**

There are numerous ways to capture all the businesses that could be potentially discharging trade waste to the sewerage system. The following is a list of alternative methods that can be a useful in identifying the customers in the region. Note, availability of information may be commercially sensitive or subject to privacy restrictions.

**Plumbing applications** - any business that needs to make an application to the water business for
connection to sewer could be captured and a trade waste application form issued.

**Water and sewer billing records** - the records of the water business could be used for comparing with trade waste records and identifying any gaps. These records could also be used to compare changes in occupancy.

**Local telephone directory** - this is an extensive list that can be used for comparison of existing customers and any new potential customers.

**Chamber of commerce** - can provide a list of existing members that are potentially involved in commercial activity generating liquid trade waste.

**EPA licensed contractors** - this is often a good source of up to date information of businesses that may be maintaining pre-treatment devices for businesses that discharge trade waste to sewer.

**Council and local business directories** - the local councils are often able to provide lists of businesses that have permits for food preparation, and may be able to assist with local businesses in the region.

**Conveyancing/solicitors** - local conveyancing firms and solicitors offices involved in sale of businesses may be able to advise water businesses on any changes, and if the business has complied with all appropriate legal requirements.

**Internet** - general searches using various search engines for a variety of different businesses.

**Field observations and surveys** - local knowledge of the area, and observing changes to the local businesses is often a great method of identifying customers.

**Utility information** - there may be opportunities to share information with the other utilities, however, this may be limited due to the *Privacy Act*.

**Business licence records** - details of customers with ABN numbers may be available from Government business directories.

**Commercial data bases** - such as Australia On Disk are very useful as they include land use codes for categorisation.

**Industry associations** - may be able to provide records of their members.

**Best practice**

Best practice involves a systematic approach to the identification of customers using a range of information sources such as described above. The identification exercise should be reviewed on a periodic basis to ensure the data is current.

**Case studies**

City West Water launched a program to ensure that all cooling towers had a trade waste discharge agreement, rather than undertaking inappropriate disposal directly to stormwater. City West Water recruited an environment graduate as part of their summer program to approach all commercial and industrial businesses identified as potentially having a cooling tower, but lacking a trade waste agreement. This initiative included providing the businesses with a letter from the EPA that explained the penalties for inappropriate disposal of contaminated cooling tower water. This program resulted in the identification of numerous cooling towers that needed a trade waste discharge agreement.
5.2 Trade waste applications

**Purpose**

The purpose of trade waste applications is to provide a systematic process for the collection of data relating to a proposed trade waste discharge. The completed trade waste application should provide sufficient information to enable the water business to: ascertain whether the trade waste can be accepted; and assist in finalising the trade waste agreement.

**Background**

A key factor in a trade waste agreement is that it is a legal document binding two parties. It is therefore critical that the application establishes the legal identity of both parties so that the agreement can be actioned. In addition, the potential customer’s signature provides a legal endorsement of the details provided as part of the application process.

A trade waste agreement is also a tool for managing risk, so it is important that all relevant elements of risk are disclosed prior to formulating the agreement.

An appropriately formatted trade waste application is the most appropriate way for drawing out the necessary legal and risk issues, prior to formulating the trade waste agreement.

** Typical practice**

Typically, a trade waste application would be a form containing a number of sections to be completed by the potential customer. There should be sufficient room in each section for the amount of information required. The information required would usually be:

- Identity of the site;
- Identity of the legal entity responsible for running the site;
- Site contact details;
- Trading hours at the site;
- Details of all substances that are used on the site and which can be discharged to sewer, including material safety data sheets (MSDS);
- Description of processes or activities on the site, including methods of trade waste treatment and expected maximum discharges;
- Process and instrumentation diagram;
- Site plan; and
- Name and signature of applicant.

The application form should be readily available to applicants, generally made available on request via mail or fax. It is now common for forms to be available on water businesses websites, in pdf format.

Similarly to other important documents, it is now common practice that trade waste application forms are quality controlled. This means that it would be reviewed regularly, updated as required and only the most current version would be issued.

Typically, many water businesses now have separate trade waste application forms for industrial and commercial customers. The application for commercial customers would be simpler – in recognition of the lower risk of the activity and higher turnover of occupancy – and would focus on information related to generation of grease and fats.
Best practice

Best practice for trade waste applications would include:

- Application forms are readily accessible to customers, through a variety of means (hard copy, fax, e-mail), and from a variety of sources (front office, website, other organisations such as councils and post offices);
- Application forms are set out in a logical, easy-to-follow manner, with questions either self-explanatory or with an attached explanatory guide. Use of jargon terms is avoided;
- Application forms capture all relevant data required to prepare a trade waste agreement. If the application form is in electronic format then progression through the form would require specific fields to be entered. Fields in an electronic application form could be programmed to reject nonsensical or obviously wrong data; and
- The information in the application form will be in a format that is readily processed by the water business, that is, it will be compatible with the trade waste database. Ideally, the information should be able to be electronically transferred or scanned directly into the database, to minimise potential errors from manual entry.

Case study

Potential customers of Sydney Water can lodge their information directly into trade waste application forms available on its website. This reduces the time taken to download a form, fill out the details and return it to the water business. It also ensures information is provided on all relevant sections of the form, otherwise the form cannot be completed.

5.3 Customer risk assessment

Purpose

Undertaking a risk identification and management exercise with key customers is an integral part of trade waste management, assisting water businesses to put measures in place to avoid negative impacts on the business, staff, customers and the environment.

Background

As described earlier in the risk identification overview (section 4.2), it is not sufficient to rely solely on desktop capacity reviews, trade waste agreements and ongoing monitoring to deliver an effective trade waste management program. Customers need to be subjected to a risk identification and management exercise to ensure any necessary additional measures are in place to avoid negative environment/health/corporate impacts of the trade waste discharge. At the level of individual customers, the key considerations in the risk identification/management exercise are:

- The types and volumes of chemicals used and stored on-site and the potential for spills to enter the trade waste stream. Material safety data sheets may provide useful information on identified compounds that may enter the trade waste discharge;
- The pre-treatment used for trade waste compliance and the risks of treatment failure or poor performance;
• The history of compliance with trade waste agreements for the customer and for similar operations, for example whether particular industry sectors have a history of high ammonia discharges;

• The potential impacts associated with combinations of waste streams, both on-site and through interactions of different trade waste streams in the sewer system;

• The sensitivity of the trade waste discharge to human error or procedures not being followed;

• Potential accidents or incidents such as process plant failure that may impact on trade waste quality and the measures that are in place to manage such incidents (for major customers this could potentially involve a 24-hour incident response capacity);

• The receiving environment of the treated trade waste discharge;

• The availability of warning systems and/or discharge control measures to provide an alert to trade waste quality problems and requirement to cease discharge;

• The likely magnitude and consequence if risks eventuate, that is, a risk of non-compliant trade waste from a commercial kitchen may be relatively minor compared to the risk associated with a major process failure at a petro-chemical complex;

• The resources required to administer the risk identification/management framework against the level of the potential risks; and

• The significance of altered regulatory standards on the necessary requirements of the trade waste agreement.

**Best practice**

Due to the significance of this aspect of trade waste management, this section does not differentiate between typical and best practice management. It is considered important that the risk identification process includes:

• An established risk ranking process to prioritise customer groupings and to tailor the risk identification/management activities to these customer groupings based on a combination of the likelihood of the risk eventuating and the magnitude of impacts;

• Site inspections with the customer to compile a risk profile for individual sites (refer section 5.7 for more information on site inspection issues);

• A proforma approach for risk profiling of customer groupings. For low risk customers, this may involve a brief checklist of critical issues to ensure that they are implemented, for example presence of a grease interceptor. At a high risk level, this may involve a proforma that is completed with detailed investigated descriptions of potential risk areas;

• A readily accessible process to record information on the risk assessment, incidents and other activities that may influence the customer risk profile. This could include utilisation of a computer database;

• Inclusion of individual customer risk identification and management activities into
the integrated trade waste management framework and processes; and

- A defined cyclic process involving the initial risk identification/management activities, recording of the activities, ongoing analysis of the effectiveness of implementation and a timeframe for review.

**Case study**

**Barwon Water**

As part of the review of the trade waste management system, Barwon Water recognised the potential benefits to both its operations and its customers from accurately quantifying the risk posed by each trade waste discharger. As a result a simple risk assessment tool was developed comprising four sections: 1) Site management; 2) Site inspection; 3) Processes; and 4) Management and costs. These sections were then incorporated into the process of assessing trade waste applications. The risk assessment tool has been targeted towards the more industrial trade waste sites but can be adapted to differentiate between commercial customers.

Each section is made up of a series of questions with several defined responses that result in a final percentage, indicating the risk to Barwon Water from accepting the trade waste discharge. The percentage is used to categorise each business into a risk category from one (very low) to five (very high). The risk category determines the frequency of monitoring required by Barwon Water officers and, adhering to the user pays principle, sets the annual fee for customers in each risk category. The annual fee has been structured to recoup actual costs involved with the varying frequencies of monitoring and testing customers in each risk category.

Customers benefit from this process by understanding the drivers behind the management of trade waste at Barwon Water and by gaining valuable feedback on areas of potential improvement that may enable them to reduce their risk category, and hence the annual fee. Barwon Water benefits by targeting monitoring at the most appropriate customers, allowing the preparation of detailed contingency plans and gaining a clearer perception of the potential consequences of accepting trade waste.

**South East Water**

South East Water manages the risks associated with accepting trade waste effluent by assigning all trade waste customers a risk ranking based on their business activities, trade waste volume and quality, their history and their location in relation to proximity to a sewage treatment plant. An algorithm calculates the risk rank, which ranges from one to five (see tables below). Risk rank one customers pose the highest risk and risk rank five customers the least. The risk ranking determines the frequency of site inspections and self monitoring.
**Determining risk ranking**

<table>
<thead>
<tr>
<th>RR Calculation Total</th>
<th>Risk Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 151</td>
<td>1 (Extreme)</td>
</tr>
<tr>
<td>121 – 150</td>
<td>2 (High)</td>
</tr>
<tr>
<td>91 – 120</td>
<td>3 (Moderate)</td>
</tr>
<tr>
<td>51 – 90</td>
<td>4 (Low)</td>
</tr>
<tr>
<td>≤ 50</td>
<td>5 (Minimal)</td>
</tr>
</tbody>
</table>

Risk rank = Location (Volume + History + Activity)

<table>
<thead>
<tr>
<th>RR Criteria</th>
<th>Variables</th>
<th>Weighting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location</td>
<td>ETP or WTP, Greater than 5km</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td>ETP or WTP, Less than 5km</td>
<td>1.2</td>
</tr>
<tr>
<td></td>
<td>Somers, Mt Martha or Pakenham Treatment Plants</td>
<td>1.2</td>
</tr>
<tr>
<td></td>
<td>Other Local Treatment Plants</td>
<td>1.5</td>
</tr>
<tr>
<td>Volume (per day)</td>
<td>&lt; 5kL</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>&gt; 5kL to &lt; 25kL</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>&gt; 25kL to &lt; 50kL</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>&gt; 50kL to &lt; 75kL</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>&gt; 75kL to &lt; 100kL</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>&gt; 100kL to &lt; 500kL</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>&gt; 500kL to &lt; 1000kL</td>
<td>75</td>
</tr>
<tr>
<td></td>
<td>&gt; 1000kL to &lt; 2000kL</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>&gt; 2000kL</td>
<td>150</td>
</tr>
<tr>
<td>History</td>
<td>New work/change of occupier only</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Environmental concern –</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Cases issued with initial notice in the past two years for parameter breach</td>
<td></td>
</tr>
<tr>
<td></td>
<td>OH&amp;S concern –</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Cases issued with initial notice in the past two years for OH&amp;S parameters listed in system guide</td>
<td></td>
</tr>
<tr>
<td>Activity</td>
<td>Highest risk rating activity.</td>
<td>Highest Risk Rating Activity (ranges from 1 to 150)</td>
</tr>
<tr>
<td></td>
<td>Complete list of activities set out in system guide</td>
<td></td>
</tr>
</tbody>
</table>
Sydney Water

Sydney Water has developed a risk assessment process that is applied to all industrial customers’ processes to determine the degree of risk presented by a particular customer. The risk factor considers the volume of trade wastewater discharge, the capacity of the receiving sewage treatment plant, the substances discharged, the customer’s compliance history and the activity factor for the process conducted on site.

A risk factor is calculated for each consent to discharge trade wastewater as follows:

Risk Factor = \( \frac{V^{0.1} A^{0.5}}{L^{0.1}} \) + P + H

Where

<table>
<thead>
<tr>
<th>V =</th>
<th>The maximum daily volume in the consent (or requested in the application)</th>
</tr>
</thead>
<tbody>
<tr>
<td>L =</td>
<td>The average dry weather flow into the sewage treatment plant in kL/day, to which the customer discharges</td>
</tr>
<tr>
<td>A =</td>
<td>The activity factor accounts for the range of hazards presented to the sewerage system for each process. Activity factors are determined by Sydney Water. The hazards considered include sewer blockage, corrosion, occupational health and safety, fire and explosion, odour, foam and toxicity to receiving waters, biosolids or treatment processes. Activity factors range from six to 70.</td>
</tr>
<tr>
<td>P =</td>
<td>The performance history factor (Total number of analyses results in the previous 12 months (excluding BOD) greater than the respective acceptance standards) / (total number of analyses results in the previous 12 months (excluding BOD)) OR For each substance calculate Total number of sample results greater than the acceptance standard in the previous 12 months (excluding BOD) / total number of sample results in the previous 12 months. Add together the results for all substances, this is the performance history factor. *Missed sample results may be replaced with the highest value in the previous 12 months</td>
</tr>
<tr>
<td>H =</td>
<td>The historical incident factor (maximum measured concentration – acceptance standard)^0.5 / 10 x acceptance standard calculated for each substance with a sample result greater than the acceptance standard and then totalled for all substances. It is based on the previous 12 months and missing sample results may be replaced with the highest value in the previous 12 months</td>
</tr>
</tbody>
</table>
The table below helps the business to identify the respective Risk Index.

<table>
<thead>
<tr>
<th>Risk Factor Range</th>
<th>Risk Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 1.50</td>
<td>7</td>
</tr>
<tr>
<td>1.51 – 2.50</td>
<td>6</td>
</tr>
<tr>
<td>2.51 – 3.50</td>
<td>5</td>
</tr>
<tr>
<td>3.51 – 4.50</td>
<td>4</td>
</tr>
<tr>
<td>4.51 – 5.50</td>
<td>3</td>
</tr>
<tr>
<td>5.51 – 10.50</td>
<td>2</td>
</tr>
<tr>
<td>10.51 and above</td>
<td>1</td>
</tr>
</tbody>
</table>

5.4 Customer Segmentation

**Purpose**

To categorise trade waste generating businesses into pre-determined segments, for the purpose of efficient management of their discharges and the associated risks.

**Background**

Trade waste customer segmentation can be based on a number of pre-determined criteria. Whatever criteria is chosen, the objectives are: efficient management of customers such as in establishing terms and conditions and charges for like businesses; equity amongst like businesses; and effective risk management.

**Typical/best practice**

There are numerous ways in which to segment trade waste generating customers, with the specific approach needing to reflect the nature of the water business customer base. As a generic rule, it appears to be desirable to have two or more customer categories, however, greater than six categories appears to introduce management difficulties. The water business will need to develop a system for categorising the customers that is robust enough to suit its unique composition including the size of the customer base, types of industries in the region, the number of trade waste officers available and expertise of the officers. Suggested options for categorising customers are:

- **Commercial/industrial** - this includes having a list of predetermined commercial customers. Any businesses that do not appear on the commercial list would be considered to be industrial customers and potentially attract additional attention. This approach appears most suited where a water business has a small number of customers or primarily low risk commercial customers.

- **Volume and/or strength of waste** – categorisation is typically based on the volumes of trade waste discharge or loads of parameters such as BOD and suspended solids. This approach is particularly suited to discharge locations (such as at treatment
plant capacity) where management needs are dominated by parameters such as BOD, for example food production areas. This approach may also be relevant where a business is implementing programs to tackle priority parameters;

**Industry categories** - examples could include restaurants, food processing and metal finishing. This option provides mechanisms to customise controls to reflect specific issues with different businesses, however it may have limited application if the water business has numerous customer categories in the region.

**Geographic location** - this could include a listing of businesses discharging to various sewer catchments, pumping stations or treatment plants. This would assist in managing specific issues linked to a particular treatment plant or catchment. This approach does not address risks inherent to specific business categories and therefore it would typically need to be supplemented with additional categorisation.

**Risk ranked categories** - this involves evaluating the businesses based on a number of indicators for degree and likelihood of risk. Potential considerations are described in Section 5.3, with this approach most suited to water businesses with relatively diverse trade waste customers.

**Case studies**

**Brisbane Water’s** trade waste customers are divided into four categories: A, B, C and D. These categories determine charging rates as well as inspection and monitoring procedures.

**Category A and B customers**

Category A and B customers’ premises are inspected at least once every two years. Customers in this category must have waste treatment facilities regularly cleaned by council-approved waste transporters and by the complete evacuation process. As a guideline, traps in regular use must be cleaned at least every three months.

**Category C customers**

Category C customers, such as metal finishing traders, will have their premises inspected at least twice a year, and their trade waste effluent routinely sampled for chemical analysis.

**Category D customers**

Trade waste officers sample Category D customers’ premises every one to three months. Eight to 24-hour composite sampling procedures are used over a number of randomly selected days. Where possible, automatic samplers are used to take time proportional composite sampling.
### Trade waste categories

<table>
<thead>
<tr>
<th>Category</th>
<th>Classification</th>
<th>Charge</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Category A</strong></td>
<td>Minor trader (e.g. small food outlet or workshop) - less than 250kL/annum</td>
<td>$240/annum (minimum charge)</td>
</tr>
<tr>
<td><strong>Category B</strong></td>
<td>Discharge greater than 250kL/annum (e.g. larger restaurant, lower impact food processor) - Assumed domestic strength - BOD5 250mg/L, Suspended Solids 250mg/L, Total Kjeldahl Nitrogen (TKN) 35mg/L, Total Phosphorus (TP) 10mg/L</td>
<td>$0.88/kL</td>
</tr>
<tr>
<td><strong>Category C</strong></td>
<td>Discharge greater than 250kL/annum (e.g. anodising plant, electroplater, low impact manufacturers) - Assumed less than domestic strength: BOD5 100mg/L, Suspended Solids 200mg/L, Total Kjeldahl Nitrogen (TKN) 13mg/L, Total Phosphorus (TP) 10mg/L</td>
<td>$0.69/kL</td>
</tr>
<tr>
<td><strong>Category D</strong></td>
<td>Large discharge and high strength waste &gt;20kg/day BOD (e.g. major manufacturer, brewery, cannery, synthetic polymers, abattoirs). Fully assessed for quality by routine sampling and chemical testing -</td>
<td>Assessed quality charged on: Flow - $0.43/kL, BOD5 - $1.14/kg or $0.97/kg, SS - $0.48/kg, TKN - $0.43/kg, TP - $0.71/kg</td>
</tr>
</tbody>
</table>

Further details of the categories are available on the website: www.brisbane.qld.gov.au

### 5.5 Trade waste agreements

**Purpose**

The purpose of a trade waste agreement is to effectively manage the risks to the water business associated with the trade waste discharge.

**Background**

Trade waste agreements are a critical component of a trade waste management program. The trade waste agreement is the primary instrument for ensuring that permission to discharge trade waste to sewer is well documented, and clearly describes the
terms and conditions associated with being allowed to discharge to sewer. The customer should be expected to apply for a trade waste agreement, prior to permission to discharge being granted. The agreements may be structured as a detailed document specific to the customer, that is signed by both the customer and the business. A consent or permit acting as a much shorter (abridged) generic version of the trade waste agreement is usually issued to low risk customers. The detail in the trade waste agreement should be commensurate with the level of risk associated with each trade waste customer.

**Typical/best practice**

The structure of trade waste agreements needs to reflect the specifics of individual water businesses and their trade waste customers. As such, it is problematic to differentiate between typical and best practice, and this section provides an overview of the key features of the agreements:

**Standard document** - trade waste acceptance agreements should be developed as standard documents to allow a uniform approach for the management of trade waste. As necessary, the documents should be tailored for different customer categories. The agreements could be customised based on the industrial versus commercial categories, customer risk rankings or such criteria as the volumes of discharge. In some instances, trade waste agreements may be customised for specific industry types, for example the dairy industry.

**Life of agreement** - should have a fixed life, the actual life span reflecting the risks posed by the trade waste customer and the potential for changes in trade waste composition. Examples include one to three years for industrial or high-risk customers and up to 10 years for low risk commercial customers. It should be noted that due to high turnover of commercial customers, the practical life of agreements is in the order of one to three years.

**Interim discharge agreements**, which are issued for new companies and provide information to establish full agreements, should generally be six to 12 months in length. If there is a reluctance from the water business to establish agreements with a fixed life, there should be a fixed review period. This enables the water business and the customer to make formal contact and determine what if any changes have occurred, since the original agreement was established.

**Review of agreement** - the agreement should be reviewed when significant changes occur at the site of the business, on change of occupancy, or when agreement expires (typically more than three years).

**Agreement content** - a number of suggestions have been listed below and consideration should be given to including some or all of the following sections in the standard agreements/consents.

- A glossary of terms in the agreement would be helpful to the reader;
- Standards that need to be complied with when discharging trade waste to sewer and any variations to these standards need to be set out clearly;
- The rate and flow of trade waste as stated or agreed to by both parties and an indication of the point of discharge to sewer;
- A description of the nature of the waste being discharged;
The treatment facilities that should be installed to meet the water business requirements and the obligations for maintaining these facilities should also be noted in the agreement;

The fees and charges payable should be set out in the agreement, together with the methodology to be adopted for measuring the trade waste quality and quality discharged to sewer;

The business should clearly define the requirements expected for officers to gain access to the premises for the purposes of sampling and compliance monitoring;

The agreement should describe the consequences breaching the terms and conditions of the agreement. These consequences could include varying or ceasing discharge, incurring additional charges, termination of the agreement or even the potential for prosecution;

Legal statements releasing the water business from claims for loss of damage, costs or expense when accepting the waste to sewer or ceasing discharge may wish to be considered;

The water business may also want to be able to terminate the agreement at any time giving notice, and this may need to be specified in the agreement; and

Obligations to undertake waste management requirements, how notices will be issued by the water business and any other general requirements or provisions should be stated clearly in the agreement or permit.

**Legal review** - the format and content of standard trade waste agreements should undergo review by legal adviser to ensure that they are sound. This process should be repeated where customised agreements are prepared for individual customers.

**Case studies**

A specific case study is not included as examples of trade waste agreements can be readily obtained from most water businesses.

**5.6 Managing specific customers**

Trade waste is generated from both commercial and industrial businesses and while it is generally considered that the industrial customers pose that greatest risk to the water businesses, it is important to recognise the potential impact that commercial trade waste can also have on the sewerage system. Therefore while significant attention may be placed on the large individual customer, some focus on the cumulative effect that smaller types of businesses can have on the system needs to be considered.

One of the trade waste generators that need some specific attention is the greasy waste generator. Collectively this type of waste can have significant effect on the sewerage system and therefore particular attention to this trade waste sector is worthwhile and included in this guideline.

Revisions of this guideline will focus on developing guidance for specific additional categories of trade waste generators.
5.6.1  Greasy waste generators

Purpose

To manage greasy wastes in the most efficient and effective way to minimise potential impacts on the sewer system from fats, oils, grease and solids. This will minimise the blockages, overflows and odours associated with these wastes entering the sewerage system and assist in segregation of these wastes at the source.

Background

Historically, the impact of greasy waste generators on the sewerage system appears to have been underestimated. This has reflected that the greasy waste customers are predominantly small commercial businesses involved in what have been considered low risk food preparation activities such as take-away shops and eat-in restaurants. However, as an example of the impact from greasy waste customers, South East Water Limited discovered that they contributed more than 80 per cent of the total fats in the system, with 30 per cent of the blockages experienced in the sewerage system due to fat build up.

Typical management difficulties presented by greasy waste customers include inadequate frequencies for pumping out of the pre-treatment apparatus (for example, grease trap), installation of undersized apparatus, and poor compliance with trade waste acceptance standards, in particular pH requirements. Practical difficulties can also arise with such activities as obtaining a sample from the outlet of the pre-treatment apparatus.

These issues justify water businesses having specific strategies to manage greasy waste generators.

Typical practice

In order to manage customers that produce greasy waste it is necessary to implement a range of activity areas, such as:

Issuing agreements - ensuring that all greasy waste customers have trade waste agreements, consents or permits, that the customer details are always kept up to date, and any changes to the processes can be checked;

Installation of pre-treatment devices – a correctly sized pre-treatment device needs to be fitted immediately prior to the discharge to ensure that the fats, oils, greases and solids are removed. The grease interceptor trap/arrestor is commonly used, however there are a number of emerging grease removal technologies that may be able to be considered. These include the vertical gravity separator (VGS), portable grease traps, grease guardians, filters and even biological additives for consuming the greasy material. In selecting a pre-treatment device, it is important that it is fit for purpose and able to be managed effectively by the customer. The water business should recommend a minimum size for a grease trap that will be accepted.

Regular pre-treatment device maintenance - Once the pre-treatment device has been installed it is important that it is serviced regularly to ensure that it continues to work effectively. Grease traps need to be pumped out at a pre-determined frequency by a licensed contractor, while the oil/fat collected in a
A separate drum using the VGS and grease guardian systems needs to be transported off-site by a licensed contractor, and the apparatus cleaned out as per the manufacturer’s instructions.

**Monitoring compliance** - the customers producing greasy waste need to be monitored for compliance, and this can be done at different times and in a number of ways. Typically, water businesses deem compliance to occur if an appropriate pump-out frequency is undertaken. This is supported by compliance checks that involve either: random sampling based on a percentage of the customer base; sampling on change of occupiers; or sampling following incidents, blockages or based on historical knowledge.

**Frequency of pump-outs** - if compliance is determined on the basis of grease trap pump-outs, then the necessary frequency of pump-outs needs to be pre-determined. A number of different methods are currently adopted for determining the frequency of the pump-out. These include: officers inspecting and undertaking audits; taking a sample; setting the frequency at three months subject to review by the trade waste officer; being based on the accumulation of grease and solids; the number and size of the fixtures; advice from the cartage contractors; the size of the apparatus; business turnover; seating capacity; volume and strength; industry type; experience; and benchmarking.

**Monitoring grease trap pump-outs** - if compliance is deemed on the basis of grease trap pump-outs then it is important that the pump out frequency is monitored. Methods of determining if grease trap has been pumped out can include relying on cartage contractors to advise the business that that grease trap has been cleaned out, inspection and audit of transport dockets, random inspections and database alerts with customer follow-up. Smaller authorities may be able to rely on EPA waste cartage records for cross-checking and managing appropriate cleanout frequency and inspections of grease traps.

**Non-compliance** – see section 5.9 for options available for managing non-compliance.

**Best practice**

It is suggested that best practice for managing greasy waste customers should consist of the following aspects:

- Customers should be on agreements/permits with requirements to have appropriately sized pre-treatment devices installed and maintained at a pre-determined frequency based on a consistent approach to be adopted for all the customers.
- The maintenance of these facilities should be monitored regularly and occasionally audited by the trade waste officer. Non-compliance notices should be issued for un-maintained pre-treatment apparatuses. Monitoring of the maintenance (cleanouts) should be carried out with the assistance of the cleanout contractors using a computer database that automatically generates overdue cleanout lists.
- Customers should be educated by the water business on waste minimisation techniques in the kitchen as well as explaining to the occupier the purpose of the pre-treatment device and advise on the importance of maintaining these devices. City West Water promotes waste
minimisation in this area by issuing all greasy waste customers with a poster entitled *Stop and Think before using the Sink* which contains ten simple tips for minimising waste and conserving water in the kitchen.

- The businesses should develop a close working relationship with the cartage contractors that service the area and could work with the Victorian Waste Management Association (VWMA) to assist in this process.

- The permits need to be updated regularly given the rapid turnover of customers generally experienced in these commercial businesses. Targeted programs need to be in place to ensure that the customer database is kept up to date. Refer to the section 5.1 on Customer Identification for ways to identify potential customers.

**Case studies**

In 1995, the Melbourne retail water companies embarked on programs to reduce the amount of fats and grease discharged to sewer from commercial customers. This fat and grease needed to be addressed because it was causing blockages in the sewer system, and spills to the environment.

South East Water implemented a three-phase program to address commercial fats and grease in its sewers.

**Phase 1** consisted of putting commercial customers on trade waste consents. Visits to the premises were generated from the Yellow Pages and teams were formed to commence site visits. 8,000 visits resulted in 4,100 new customers.

**Phase 2** involved ensuring that adequately sized grease traps were installed. From the 4,100 customers, 1,650 were non-compliant.

**Phase 3** required that the grease interceptors were regularly pumped, customer education was undertaken and a solution called Wastelog developed. Daily monitoring of pump-outs commenced.

Wastelog was developed in-house in consultation with the Victorian Waste Management Association (VWMA). Wastelog enforces compliance by generating daily reminder letters and phone calls, following information received by the waste transporters who phone in the information of cleanouts using interactive voice response.

In a contrasting approach to managing greasy waste, Barwon Water has introduced an asset protection charge for all customers who are unable or unwilling to install an appropriate pre-treatment device. While Barwon Water agrees that the installation of pre-treatment is best practice this fee provides an option for greasy waste customers to discharge untreated trade waste where it is determined that installation of a grease interceptor trap in an existing building or premises is impractical. The asset protection charge is determined at a level that will, over time, allow the business to recover most of the additional cleaning and inspection costs for main and branch sewerage pipelines as a result of allowing the discharge of untreated trade waste.

Sydney Water recommend that the grease trap must have a minimum capacity of 1,000 litres (or Sydney Water authorised equivalent), with the final capacity equivalent to the volume of wastewater discharged
in one hour at maximum flow. Restaurants, hotels and motels can determine the approximate grease trap size from the number of seats or beds on the premises.

For example:

<table>
<thead>
<tr>
<th>Maximum volume of wastewater discharged (litres/hour)</th>
<th>Seats/Beds (guide only)</th>
<th>Grease trap required</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,100</td>
<td>1-69</td>
<td>1,000 litres</td>
</tr>
<tr>
<td>1,500</td>
<td>70-199</td>
<td>1,500 litres</td>
</tr>
<tr>
<td>2,000</td>
<td>200-399</td>
<td>2,000 litres</td>
</tr>
<tr>
<td>3,000</td>
<td>400-599</td>
<td>3,000 litres</td>
</tr>
<tr>
<td>4,000</td>
<td>600-799</td>
<td>4,000 litres</td>
</tr>
<tr>
<td>5,000</td>
<td>800-1,000</td>
<td>5,000 litres</td>
</tr>
</tbody>
</table>

Sydney Water’s customer service representatives can help work out the required capacity of the grease trap.

5.7 Trade waste monitoring

Purpose

To enable trade waste managers to identify and assess risks to operators, assets and the environment in managing the trade wastes, while providing contaminant load data for invoicing of treatment charges by the trade waste manager.

Background

Monitoring of trade waste discharges is a critical component in achieving the trade waste management objectives described in Section 4.1. Without monitoring of discharges for compliance with trade waste agreements, a water business is at increased risk of treatment plant loads exceeding capacity, the treatment plant products being contaminated and issues arising with occupational health and safety, and impacts on the condition and health of the receiving environment. The monitoring information is also critical for charging purposes and understanding discharge trends with regard to altered risks and for assisting preparation of strategic reviews of the trade waste program. Care must therefore be taken to design and implement a monitoring program that addresses the total risks associated with treatment and disposal of a trade waste stream, and not just immediate risks to assets and treatment processes.

The monitoring parameters and frequency are established following the capacity review (Section 4.1) and customer risk assessment (5.3), with
Care must be taken to differentiate between concentration and load when monitoring data for a specific trade waste parameter. Concentration simply gives a snapshot of how much of a given pollutant is present in a specific sample, whereas load is a truer indication of the total amount of a pollutant being discharged. Load is calculated as concentration of a parameter x volume of trade waste discharged. Example: 10ML (10,000,000 L) of trade waste containing 0.5mg/L phosphorus causes a phosphorus load of (0.5 x 10,000,000) mg or 5kg.

Monitoring parameters must be expressed in units of concentration to be calculated as a load. Examples of typical parameters that cannot be calculated as loads include pH, electrical conductivity, turbidity and colour. In these instances, statistical values are expressed to represent typical values, such as average and 90th percentile values.

Both load and concentration need to be considered when assessing potential impact on the environment. A low volume of very high concentration pollutant may disrupt treatment processes and have an acute impact on the receiving environment, while very high volumes of a low concentration pollutant may cause a gradual accumulation of pollutants in the receiving environment. This is particularly relevant for heavy metals and persistent organic compounds.

To understand true loads of a specific monitoring parameter, concentrations must be obtained over a period of time to ensure that they are representative of the trade waste stream. The concentration must also be related to flow at the time of sampling, as concentration can often vary with flow volume.

**Typical/best practice**

Due to the variable and complex nature of trade wastes generated, it is difficult to differentiate between typical and best practice monitoring. Therefore, this section is presented as the key considerations and activities underpinning the establishment of a monitoring program.

**Site Visits**

Visits by trade waste managers to facilities generating trade waste are integral to understanding the processes that lead to the generation of trade waste streams. Visits should be undertaken under normal operating conditions, to provide the opportunity to ask questions and offer advice regarding trade waste management. Site visits are also critical for understanding the roles and responsibilities of key personnel, and developing working relationships.

In undertaking site visits, trade waste officers need to be aware of their legal powers and requirements under the relevant Act (*Water Act 1989* or *Water Industry Act 1994*). Further, it is likely that individual sites will have induction requirements that need to be undertaken.
Reciprocal visits by customer representatives to view the waste treatment facilities of the water business should be encouraged, to allow them to better understand the reticulation and treatment system, constraints on the system of waste quantity and quality, and hence the need to enforce trade waste acceptance limits. Importantly, an exercise such as this will help in the understanding of operational and asset maintenance costs of trade waste treatment.

**Audit sampling**

A key aspect of due diligence in the management of trade wastes is the undertaking of independent monitoring of trade waste quality received in the reticulation system. Auditing of trade waste quality is necessary to understand the current nature of trade waste loads for asset and waste treatment management and planning. It is also necessary for confirmation of data reported by trade waste clients, regulation of compliance with trade waste quality limits and providing an indication of potential problems in meeting sewage treatment plant licence requirements. Random audit sampling is also necessary to verify trade waste charges, if tariffs are based on trade waste quality.

Trade waste streams are inherently heterogeneous, due to changes in production activity on either a daily basis, or throughout the year. This is particularly pertinent when trade waste streams become mixed in a reticulation system. Sampling techniques must therefore be adopted to ensure that monitoring and analysis data obtained are representative of the trade waste stream at the time.

Grab or point sampling is the simplest form of sampling. It is efficient, and sample integrity can be assured, with the sample either tested *in situ* or preserved immediately, prior to dispatch to a laboratory. Grab sampling can also be undertaken in response to specific incidents. Because it represents a ‘snapshot’ of condition, grab sampling can deliberately or accidentally give a false impression of trade waste stream quality. A number of sampling events are therefore required before a true indication of pollutant load can be established.

Composite samples of a trade waste stream can be collected on either the basis of specified time periods or following specific flow events. Due to the fact that the sample is ‘built’ from a number of aliquots of the trade waste stream, it can be a better overall representation of the quality of trade waste discharged. Composite sampling is costly, due to either labour demands in regular aliquot collection, or to the purchase and maintenance of an automated composite sampler. Sample handling and storage is an issue; refrigeration is necessary for the preservation of biodegradable parameters, some parameters may be lost or changed with time, and samples may be tampered with if the sampler is in an uncontrolled location. A composite sample may ‘smooth out’ spikes in concentration of pollutants that can impact on assets, treatment processes or compliance of discharge, hence hide potential trade waste management risks.

While strictly an analytical technique, semi-quantitative scans provide the opportunity to characterise the chemical composition of a trade waste sample, to identify constituents in the waste stream that could potentially cause problems in the reticulation, treatment and disposal of the trade waste. Organic constituents can be characterised by gas chromatography-mass spectrometry, while
inorganic compounds can be identified using inductively coupled plasma-mass spectrometry. Use of this technique on a trade waste stream is complex and expensive, so reference should be made to a laboratory skilled in the technique prior to undertaking an investigation.

Outcomes of audit sampling and monitoring programs should always be discussed with the relevant trade waste customer, particularly when problems or questions emerge from the information obtained.

**Self-monitoring of trade waste**

Self-monitoring of trade waste quality provides a trade waste generator with a number of operational and strategic advantages. Understanding of the typical constitution of waste streams provides the opportunity to detect process changes or problems when variances in quality are detected, and to reduce or eliminate the loss of valuable resources in the waste stream.

Self-monitoring provides greater control over trade waste agreement compliance issues, the opportunity to benchmark performance against other industries, influence charging by controlling and reducing waste loads, and provides assurance that monitoring is truly representative of trade waste quality by providing details on appropriate sampling frequency, location and analytical parameters.

Demonstration of ownership of trade waste management issues through self-monitoring of waste streams inevitably leads to trust developing between the waste generator, receiver and regulator, as there is a common understanding of the trade waste management needs. The trade waste generator should never be in a position of being ‘caught-out’ or surprised by compliance and management issues communicated to them by the water business or a regulator.

**On-line real time monitoring**

While initially expensive to establish, on-line real time monitoring of trade waste quality parameters can lead to longer term cost savings in sampling and laboratory expenses. Real time monitoring provides a more complete understanding of waste loads, and variances in quality with time. The data obtained is integral to developing process improvements, with associated cost savings in tariff reductions, waste minimisation and resource loss, or avoidance of disputes with the waste receiver and/or regulator.

The locations of instruments in the reticulation system needs to be carefully considered to take into account both separate and consolidated waste streams, for a more detailed understanding of key waste loads. Care must be taken to calibrate and maintain monitoring equipment to ensure true measurement of parameters.

It is important to note that on-line real time monitoring equipment is currently limited to gross quality indicators, such as pH, ammonia, electrical conductivity, turbidity and dissolved oxygen. While there are developments in the real-time monitoring of specific chemical constituents such as nutrients and sulfide, performance of the instruments in trade waste streams may be limited.

**Frequency of monitoring**

There are no categorical criteria for establishment of frequency of trade waste monitoring for a specific
customer. A range of issues need to be considered, such as:

- The presence and loads of key contaminant parameters in the trade waste stream;
- the level of variation in trade waste quality;
- historical compliance;
- identified risks of the trade waste customer or industry group;
- nature and capacity of sewerage reticulation and treatment system;
- risks to the receiving environment; and
- the outcomes of routine and audit sampling and monitoring programs.

Case Studies

SA Water has, for several years, used real time electronic monitoring of key industrial areas within the sewer network and surveillance of potential high impact industries. The real time monitoring and recording of data with immediate notification of alarm conditions provides for early warning of discharges that may create operational problems, corrosive and/or odorous environments in localised sewer networks and detection of rouge industrial discharges that could impact on treatment plant operations, effluent or biosolids reuse options.

A major petrochemical plant trade waste customer in Melbourne has installed on-line detection using gas chromatography for analysis of organic compounds and early warning of potential trade waste quality issues.

Sydney Water’s Trade Waste Critical Mass Calculation System

The Trade Waste Critical Mass Calculation System is a Microsoft Access version of a system adapted and improved by Sydney Water from a US EPA process. The system calculates mass balances for sewage treatment systems to determine MAIL (maximum allowable industrial loading), and determine which substances are critical to output limitations (biosolids, licence limits, reuse requirements).

As well as calculating the permissible allowable mass for each substance, it allows any proposed industrial load to be checked almost instantly, and the parameters for an agreement document to be derived quickly and accurately.

Sydney Water has incorporated critical substances into its trade waste pricing, publishes critical substances on its website each quarter, and is in the process of incorporating the mass model onto the trade waste mainframe database.
South East Water establishes the frequency of site inspections and the frequency of self-monitoring based on the risk ranking of the customer:

<table>
<thead>
<tr>
<th>Risk Ranking</th>
<th>Freq. of Site Inspections</th>
<th>Freq. of Self Monitoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - Extreme</td>
<td>4 Weekly</td>
<td>4 Weekly</td>
</tr>
<tr>
<td>2 - High</td>
<td>9 Weekly</td>
<td>9 Weekly</td>
</tr>
<tr>
<td>3 - Moderate</td>
<td>13 Weekly</td>
<td>13 Weekly</td>
</tr>
<tr>
<td>4 - Low</td>
<td>26 Weekly</td>
<td>Generally not required</td>
</tr>
<tr>
<td>5 – Very Low</td>
<td>As required</td>
<td>Not required</td>
</tr>
</tbody>
</table>

5.8 Pricing and quality assessment

Purpose
To ensure fair and accurate pricing mechanisms to assist in achieving the overall aims for trade waste management.

Background
Pricing mechanisms can be used to achieve a number of aims. They can be used to recover the costs of providing a service and as incentives for customers to use a particular waste management option in preference to others. Alternatively, they can be used as penalty incentives to discourage the use of a particular waste management option.

Traditionally, pricing mechanisms for trade waste customers have taken the form of charges based on cost recovery. In recent years, however, many water companies have moved to include incentives and penalties in their trade waste pricing mechanisms. From June 2004, the principles of trade waste charging by the Victorian water industry became subject to oversight by the Essential Services Commission. The commission will look for accuracy in charging, particularly with regard to actual costs incurred, and also for equity in charging between customers.

Typical practice
Guiding principles for trade waste charges are based on principles of the Council of Australian Governments (COAG). These principles include that:

- Charges should provide a full cost recovery of the services provided;
- Customers should pay for use of the service; and
- There should be no cross subsidies of the services between customer user groups.

The key principle of trade waste pricing is the equitable recovery of all costs associated with the administration, monitoring, discharge, transfer and treatment of the waste. Prices need to be equitable to avoid potential breaches of the Trades Practices Act, so accordingly the charges need to be transparent and consistently applied.
Trade waste charges can be broadly categorised into ‘one-off’ and ‘ongoing’ charges.

**One-Off Charges**

A one-off **trade waste application fee** may be charged to all new trade waste customers, to cover the assessment and processing costs associated with the trade waste customer’s application. This application fee may also be re-applied for any future renewals of the trade waste agreement.

The time taken to process a trade waste application will vary depending on the scale and complexity of the customer’s business. Therefore, a common method of determining the application fee is to link it on a sliding scale to the customer’s maximum discharge rate. The assumption being that customers with higher flows will have more complex processes, and require more time to process their application.

New trade waste customers, or existing customers that increase their maximum rate of discharge to sewer, may be liable for a one-off **trade waste headworks or area contribution fee**. The purpose of the contribution fee is to cover the capital costs of meeting additional demands placed on the volumetric capacity of the sewerage network.

Contribution fees generally vary depending on the specific sewerage catchment affected, and the maximum discharge rate. Varying contribution fees with specific sewer catchments recognises that different catchments will have different capacities for additional flows. The maximum discharge rate may be calculated as a peak daily flow, or a maximum hourly rate, depending on factors such as availability of data and criticality of impact of flows.

**Ongoing Charges**

An ongoing **trade waste agreement charge** is applied to cover the costs of monitoring and administering the customer’s trade waste agreement. This can be charged based on the risk ranking of the customer, with higher risks requiring higher charges to cover increased monitoring requirements. Alternatively, the agreement charges can be implemented based on annual discharge levels, with the presumption that customers with higher flows will need more frequent monitoring. A third alternative is that customers are charged a flat rate for renewal of trade waste agreements with additional fees for services such as sampling, inspections and meter reading.

Customers should be charged ongoing **volumetric and quality charges**, to cover the costs of treating and disposing of trade waste. Typically, these costs are based on actual flows, and the loads of a few selected parameters. Some of these parameters may have charges based directly on the costs of treatment (for example, biochemical oxygen demand, phosphorus, suspended solids and total nitrogen), others for their potential impact on the life span of the sewerage asset (for example, total oxidised sulfur) while others may be charged for the effect they have on reuse programs (for example, total dissolved solids and sodium). Parameter charges can be based on a sliding scale or they can be discretely stepped.

In order to maintain accurate levels of trade waste quality to be used for charging purposes, most water businesses have a standard quality pricing review process, particularly for their larger customers. The process involves taking daily composite samples for
between four and seven days – depending on the operational phases of the customer – at intervals from one to twelve months dependent on variation in quality, and the size of the revenue. Charges can be based on average sample quality or the 90th percentile as is the case for Sydney Water. The results are then applied to the measured flows until the next scheduled pricing monitoring takes place. Either party can request a review during the intervening period, should there be reason to suspect that the trade waste quality has changed significantly.

Volumetric charging would ideally be measured directly by a flow meter on the trade waste discharge line. However, the relatively high cost of suitable meters often makes it impractical for smaller, low risk customers to install them. In these situations, the water business and the customer agree upon a trade waste factor as a proportion of the incoming metered potable water. Water companies may develop, review and update a range of industry standard flow factors.

Ideally, quality charging should be measured using flow weighted composite sampling. The sampling should be undertaken over an appropriate timeframe, to encompass all phases of the customer’s normal discharge to sewer. Also, the sampling results should be reviewed at an appropriate frequency, to ensure both parties are comfortable with the ongoing accuracy of the quality pricing results. However, as with volumetric charging, it is not generally practicable or necessary for all trade waste customers to implement ‘ideal’ monitoring, in this case flow weighted composites. For most low risk customers, it is suitable to apply a trade waste quality industry factor for charging purposes. Also, it should be noted that some parameters – for example BOD, ammonia and sulfide – are likely to change without appropriate storage and preservations, and hence can only be measured accurately with instantaneous grab samples.

**Best practice**

Ongoing charges for administering and monitoring trade waste agreements should in principle be linked directly to level of service provided. Therefore, it would be more appropriate to use risk ranking as the determinant of these charges rather than flow discharge values. Risk ranking incorporates a broader range of variables than just discharge, and is already used for determining appropriate monitoring frequencies. Therefore, appropriate charges can be calculated in a transparent and accurate manner that better reflects the true costs incurred.

Water businesses should consider charges for more than just the normal treatable parameters. Parameters such as salinity and metals may impose an opportunity cost to the business through reduction of applicable reuse/recycling schemes for treated wastewater and biosolids. This ‘opportunity cost’ can be used as the basis for incentive trade waste charging, that is customers would have an incentive to reduce non-treated parameters.

Water businesses may consider special incentives, through further reducing trade waste charges, for customers who implement cleaner production. While these customers would already benefit under the existing trade waste charges by reducing their discharge, it can be argued that there is merit in further reducing the charges for a customer who
reuses and recycles compared to one who solely relies on final treatment.

General information on trade waste charges would typically already be broadly available to customers via brochures and on web sites. For further improvement, individual customers should have ready access to their own trade waste charging information: for example, how they are charged, what they have paid, and what their current quality charging results are. This information could be made available via ring-fenced, password-protected access to relevant sections of the water business’ web site.

Case studies

Yarra Valley Water provides detailed information on its trade waste area contributions on its website www.yarravalleywater.com.au. The business also offers an alternative to a one-off area contributions charge: ongoing quarterly charges. Each ongoing quarterly charge is approximately 2.3 per cent of the one-off charge. This allows customers to be charged only for the peak capacity that they need at a particular time.

Barwon Water was concerned that biochemical oxygen demand (BOD) is an unreliable parameter to use for billing purposes. It has a high analytical variability, and fails to measure oxygen demand from inorganic sources. In addition, BOD has a slow turnaround time of at least five days. Therefore, the business is moving towards using chemical oxygen demand (COD) for billing purposes. Barwon Water is also proposing to use risk ranking as the basis for its trade waste charges.

Sydney Water has introduced trade waste charges for nearly 50 different substances. With the exception of the few treatable parameters as described above, these charges are to provide incentives to reduce the loads of the substances. In addition, if the level of any of these substances exceeds the nominated acceptance standard, then the corresponding mass will be charged at double the standard rate.

Western Australia Water Corporation calculates trade waste application fees based on actual time taken multiplied by a standard hourly rate.

5.9 Compliance management

Purpose

To encourage trade waste customers to comply with trade waste agreements, minimise risks to the sewerage system from non-compliance and to ensure prompt return to compliant status when non-compliance is detected.

Background

Trade waste standards and the terms and conditions outlined in trade waste agreements aim to protect the trade waste management objectives. Failure to comply with these standards, terms and conditions will lead to a non-compliance with the trade waste agreement. The water business will then have to assess the significance of the non-compliance, and take rectification actions appropriate to the scale and extent of the non-compliance.
Typical practice

Typically, trade waste non-compliances will be identified through one or more of the following means:

- Non-compliant sample result either from the water businesses monitoring or the customer’s self monitoring;
- Site inspection revealed that trade waste pre-treatment apparatus was not in appropriate condition;
- Failure of the customer to submit a report by a due date; and/or
- Failure of the customer to pay their trade waste account by a due date

Compliance management by the Australian water industry is typically a five-stage process. Given the highly consultative nature of the compliance management process, stages one to three are more commonly exercised steps:

**Stage 1.** A standard non-compliance notice is issued immediately when non-compliance has been detected. The notice requires the customer to remedy the problem immediately and should require the customer to supply written documentation why the non-compliance occurred and how the problem has been rectified.

**Stage 2.** Should a subsequent sample also indicate non-compliance, the customer’s compliance status is formalised in a letter. The water business requires further information and usually the customer’s attendance at a formal meeting. Information to be provided by the customer includes why non-compliance is occurring, works required and timeframes required to rectify the problem. At this stage some water businesses impose a non-compliance fee, apply additional quality/load charges and/or impose penalties for the discharge of the non-compliant waste stream.

**Stage 3.** Where ongoing non-compliance is detected and the customer is either posing a significant impact on the objectives of the trade waste policy or is not providing the water business sufficient information and timeframes regarding the rectification of the non-compliance problem, the water business may cancel or suspend the trade waste agreement. At this point the discharge should be restrained, as it will breach the Act(s) to continue to discharge.

Good practice is to assist the customer with a program to negotiate a new trade waste agreement (with a management plan to return to compliance in a sustainable timeframe for the customer and the water business) so as to allow resumption of discharge and continued operation of the customer’s business. This could be especially important in smaller country towns where the discharger might be a large employer.

**Stage 4.** Should the customer continue to discharge non-compliant trade waste, the water business may forcibly either disconnect the customer from the sewerage system or restrict the supply of water to the site.

**Stage 5.** The trade waste customer is prosecuted under the *Water Industry Act* (metropolitan) or the *Water Act* (regional Victoria).

Best practice

A water business’s non-compliance process should be clearly documented in order to specify the steps
that the water company will take if a trade waste customer commits a breach. The non-compliance process should outline what constitutes a breach and what is the consequence of committing a breach. This non-compliance will usually be managed in a number of stages as discussed above.

A flowchart or a number of dot points in a procedure is usually the clearest way of describing the actions that will be taken if a breach is committed. The flowchart will describe the timelines associated with each step of the process ensuring that all parties understand their obligations, and should describe how to move from one stage to another, how the procedure is able to be closed off, deferred or stopped at any time.

The non-compliance procedure should also describe the manner in which the ongoing non-compliant discharge will be managed, such as reduced flows, additional monitoring and status reporting.

The methods of communicating the non-compliance to the customer (for example via letter, fax or email) and how soon after the non-compliance is detected should be documented. In-house communications should also be considered if the non-compliance is of a particularly sensitive nature.

The trade waste officers should also have specific training and procedures which assists them to commence logging the events of the non-compliance, gathering analytical data, and photographic and other evidence as required. All samples should be taken, stored and transported in accordance with the EPA publication *A guide to the sampling and analysis of Waters, Wastewaters, Soils and Wastes*, the samples should be split (the customer receiving a duplicate), tested by a laboratory that is NATA accredited and chains of custody for sampling used.

Legal advice may also need to be sought for failure to correct or unwillingness to remedy the non-compliance.

**Case Studies**

**Barwon Water** has included contravention charges for defined non-compliances in its new trade waste management policy. The contravention charges are designed as a genuine pre-estimate of the cost to Barwon Water as a consequence of a breach and will be applied using a defined procedure for non-compliant customers.

**South East Water** has found that involving the local municipal environmental health department is an effective way to coerce recalcitrant commercial customers to achieve compliance without resorting to termination of the trade waste agreement. Occasionally, a commercial customer fails to respond to the initial non-compliance steps for getting a grease interceptor installed or pumped out. Approximately one week prior to the step of terminating the trade waste agreement, South East Water will advise the relevant local environmental health department of the situation. They are requested to visit the customer to advise them of the health department’s concerns if they fail to have a current trade waste agreement. This action generally elicits a quick positive response from the customer, and removes the need to terminate their agreement.
6. MANAGING THE TRADE WASTE PROGRAM

In Chapter 5, the focus was on suggested approaches and tools for managing trade generators, however, equally important can be the internal water business management approaches. Without effective internal processes and activity areas such as staff training and reporting, the detailed programs focussing on trade waste generators would be ineffective and the trade waste management objectives would be at risk. The internal water business processes important for trade waste management are grouped in this chapter as being:

• Quality systems (6.1);
• Information and data management (6.2)
• Customer relationships, communication and education (6.3)
• Staff training and resourcing (6.4);
• Reporting and performance measures (6.5);
• Research and development (6.6); and
• Additional services (6.7).

6.1 Quality systems

Purpose

To ensure that suitable trade waste management processes are adopted to meet the quality requirements of the trade waste manager, and comply with all applicable agreements, regulations and environmental standards.

Background

Quality management systems have evolved as business processes have become more complex, and are under increasing external scrutiny and regulatory control. International standards have been developed to provide an organisation with a model to follow in setting up and operating a quality management system. Adherence to these standards provides regulators and stakeholders with a common understanding of the systems and processes in place to manage trade waste.

The International Organisation of Standardisation (ISO) administers the two key quality management systems: ISO 9000 and ISO 14000. The ISO 9000 series of standards relates to systems developed to ensure quality of a product or services, while the ISO 14000 series of standards relate to systems implemented to minimise environmental harm from the provision of goods and services. In Australia, these standards are available from Standards Australia (www.standards.com.au), while further explanation is available from the ISO website (http://www.iso.ch/iso/en/ISOOnline.frontpage).

Typical practice

ISO 9000:

ISO 9000-based management systems are developed around the following key principles:

• Customer focus;
• Leadership;
• Involvement of people;
• Process approach;
• System approach to management;
• Continual improvement;
• Factual approach to decision making; and
• Mutually beneficial supplier relationships.

From the perspective of trade waste management, an ISO 9000-based quality management system would focus on co-operation between the trade waste producer (or ‘customer’) and receiver to ensure systems and processes were developed and implemented to maintain continuous improvement in trade waste management, to the satisfaction of both parties.

ISO 14000:

An ISO 14000-based environmental management system is based on the plan-do-check-act cycle of continuous review and improvement. The key elements are:

• Integration of environmental aspects in design and development;
• Prioritising environmental aspects;
• Developing environmental management system;
• Monitoring and reviewing environmental performance, and implementing improvements;
• Monitoring and reviewing system performance, and implementing improvements; and
• Communicating environmental performance.

While ISO 9000- and ISO 14000-based management systems can be externally reviewed, accredited and certified, it is important to note that this process is not compulsory. Quality management systems based on the ISO 9000 and ISO 14000 standards can be established without external verification.

Generally, verification is undertaken when there is a competitive business advantage to do so, or if there is stakeholder expectation for external review of quality systems.

**Best practice**

Establishment and implementation of externally-certified and verified ISO 9000- and ISO 14000-based quality management systems.

Integration of quality, OH&S, environmental and risk management systems into a single management framework.

**Case Studies**

Yarra Valley Water was one of the first Australian water businesses to get external accreditation for its environmental management system (ISO 14000).

Barwon Water and City West Water have integrated quality, OH&S and environment systems.

### 6.2 Information and data management

**Purpose**

To ensure that adequate and valid data and information are available to make informed, verifiable decisions regarding trade waste management.

**Background**

Trade waste systems are complex, and - due to the variable nature of trade wastes and the technologies required for monitoring, reticulation and treatment, management programs - can generate large volumes of data. As a result, the data can rapidly become resource intensive to manage, difficult and time-
consuming to obtain when required, become quickly outdated or simply lost over time.

Data obtained in the operation of trade waste systems must be collected and managed in an accurate and efficient manner that allows ready retrieval and interpretation regarding trade waste quality trends, asset protection and opportunities for operational improvement.

**Typical practice**

**Hardcopy reports**

Due to the complex nature of trade waste management, a significant amount of hardcopy reports are generated. Examples include field observation sheets and notes, laboratory reports, meeting minutes, faxed running sheets and consultants’ reports.

**Database**

An electronic database is typically used for the storage and archiving of trade waste monitoring data. The database should allow for searching and sorting of data, formatting for reporting and trend analysis, flagging of unusual data trends and highlighting of non-compliant data values.

The electronic database is secure. Only limited access is allowed for data editing, to avoid the risk of data corruption or manipulation. Regular back-ups and secure archiving of data is undertaken to ensure that the integrity of the historical dataset can be maintained.

**Best practice**

The establishment and utilisation of a relational database that allows electronic transfer of trade waste monitoring data and laboratory reports. Hard copy documents can be scanned directly onto an electronic database, thus reducing errors and the resources associated with manual transfer.

Data are readily available to all staff via networking of access to the database and the data is easy to access and recover. The database has the capacity to allow transparent reporting of data on the corporate website for the benefit of customers and the broader community.

There is independent inspection of trade waste systems and verification of data used to derive information relating to trade waste management. This provides assurance to stakeholders that trade waste is being managed according to established organisational and regulatory standards. Differing levels of verification can be undertaken, such as by consultative committees, independent officers or external auditors. See section 6.1 for further details of externally accredited quality systems, of which external verification of management data and information is a key aspect.

**Case studies**

**South East Water** has developed its trade waste information system (TWIS) in-house. TWIS incorporates an interrelation database which links data from site and customer details with laboratory results and inspection follow-ups. Hard copy documents are scanned then stored on TWIS as historical information in a correspondence section for each customer. Electronic data from laboratory analyses can be downloaded directly from the servicing laboratory onto TWIS. TWIS incorporates work bring-ups, to remind trade waste officers when particular actions are required. TWIS can
automatically flag non-compliant results, and can update customer risk ranking accordingly.

**City West Water** developed its environmental management information system (EMIS) out of a need for a fully integrated data and document management system. EMIS allows entry of trade waste application data which is then processed by the system to format trade waste agreements with standard or specialised clauses particular to the customer concerned. The system also risk ranks customers based on compliance history of samples obtained by customers and CWW, allocates inspection frequencies and generates monitoring schedules, pricing, compliance and OH &S risks and other reports relevant to operation of the trade waste management system.

**Barwon Water**’s trade waste management system (TWMS) has the capability to ‘talk’ to the various other information systems used by Barwon Water to manage its customers. The TWMS is able to bring up billing information from its customers, thus providing real time flow information, as well as the laboratory information system that manages the electronic data received from the laboratory on trade waste samples.

The TWMS is also able to retrieve Barwon Water’s GIS and customer database. As well as being able to view a customer’s location on an electronic map, a network trace is able to be generated either upstream or downstream of a point (for example, manhole, pump station or treatment plant). This trace produces a list of customers discharging to that point selected. This information can either be viewed on a map, or generated as a list of customers which can then be printed or exported to an excel file for further interpretation.

### 6.3 Customer relationships, communication and education

#### Purpose
To ensure that all stakeholders are provided with adequate and appropriate information to enable assessment of the risks and benefits of trade waste management processes.

To ensure a strong relationship of trust is established with all trade waste customers, and an understanding of both respective and mutual trade waste management requirements, to enable timely and appropriate response to issues and events that may arise.

#### Background
Key stakeholders in trade waste management processes can be broadly categorised as trade waste customers and the broader community. While the trade waste customers have an obvious interest in the management of its trade wastes, the broader community (including regulatory agencies) is becoming more concerned about the impacts that trade waste management, treatment and disposal have on the community and its environment.

In many respects, relationship building with customers and stakeholders can be one of the most challenging aspects of trade waste management. Implementation of communication and education strategies tailored to specific needs, however, will ensure that dialogue will be opened up to identify and address issues and concerns of all stakeholders.
Typical format

Customers

Regular scheduled meetings should be held with major trade waste customers to provide a forum for reviewing trade waste monitoring data and discussing emerging issues and matters of concern. In addition to providing a forum for discussion, the establishment of regular meetings allows relationships of trust to develop and ensures open communication in the future.

The distribution of regular newsletters to trade waste customers provides the opportunity to inform them of general or specific trade waste management developments, particularly where trade waste management has been a topical issue in the past. Apart from being a practical source of information, a newsletter can also serve to create a sense of community amongst trade waste customers. Newsletter content could include a summary of recent data, trend improvements, new technologies or processes, and waste minimisation/cleaner production initiatives. Publication of successful waste minimisation/cleaner production outcomes provides public recognition of a customer's achievements and creates a leadership example for others to follow. This type of recognition has been shown to be a useful driver of further improvement.

If provision of a dedicated trade waste newsletter is not possible due to resource constraints then water businesses should consider inclusion of trade waste updates as part of broader customer communication information. Water businesses could explore the possibility of a shared publication with other bodies, such as councils, that may also wish to communicate with the same target market from time to time. A monthly e-newsletter may also provide a cheaper and more convenient means of communicating regularly with key trade waste stakeholders.

Public reward and recognition of good customer performance is particularly important as this has been well proven to provide incentive for industry leaders to tell others about their waste minimisation and cleaner production achievements. It demonstrates their commitment to environmental sustainability in their community and can have positive benefits for their corporate profile and product marketing.

Public recognition can be provided in the form of awards given by a water business at a local industry gathering/special function, or by supporting the nomination of a company's achievements in other existing awards such as the Premier's Business Sustainability Award, the Banksia Environmental Awards, the Save Water Awards or the United Nations Association of Australia World Environment Day Awards. Public recognition ensures that others are exposed to what can be achieved and helps increase the adoption of waste minimisation and cleaner production practices.

Hosting of seminars dealing with trade waste management issues is a good opportunity for trade waste customers to share information in an open forum. Depending on the trade waste customer base, seminars can be industry-based and hosted by the industry group and/or EPA, regional/catchment based, or simply an opportunity for the trade waste receiver to discuss common issues with its customers. Participation in seminars provides the opportunity for waste generators to
benchmark their performance or put its trade waste impacts in either a regional or industry context. Importantly, seminars provide an opportunity for customers to network and communicate openly.

Annual customer satisfaction surveys, undertaken by professional market researchers, should be undertaken by the water business to allow the trade waste customers to give feedback on their perception of service quality provided. The outcomes of the survey can be used by the water business to identify strengths and weaknesses in service provision overall, and with specific customers. As surveys may contain commercially sensitive information, the results must be kept confidential to ensure trust and ongoing participation by the trade waste customers. Each water business must assess the resources they have available and develop a communication and education strategy that fits with the capability and capacity of the business to deliver.

Community

Community members often have little access to information regarding management of trade wastes in their region. This can create an environment of concern and a perception of secrecy and suspicion. Brochures and newsletters can be developed for the general community. These media can be used to explain production processes, and hence why wastes are generated, where the wastes go and what initiatives are being undertaken to improve trade waste management. Development of these methods of communication indicates commitment to understanding and improving trade waste management practices, particularly when issued jointly with trade waste generators.

Customers and water businesses alike should include information regarding trade waste management in formal reports such as corporate annual reports, sustainability reports and public environment reports (see Section 6.5). This provides the opportunity for the community to view trade waste management within the context of the total organisation, as well as communicate changes and improvements in trade waste management systems.

The use of the Internet, particularly via corporate websites, is ideal for community communication and education. Creation of a web-page dedicated to trade waste management issues can highlight the integral role of trade waste management to the business. Use of the website provides the opportunity to regularly update information, so the community is kept well informed of current issues. The Internet also provides the opportunity for two-way communication, with feedback sought on trade waste management issues via e-mail.

Establishment of a community consultative committee by a water business provides a forum for education about, and discussion of trade waste management issues, amongst many issues of interest to the general community. Details on the establishment of a Community Consultative Committee can be found in the VicWater publication, *Working Together: A Guide to Consultation for Victorian Water Businesses*.

A community consultative committee can include representatives of trade waste generating companies. It can also provide a forum for trade waste generators to address and communicate with the community. Where a specific trade waste management issue requires improvement, a
consultative committee can assist in developing an environment improvement plan. Further details are available in EPA Publication 739: Guidelines for the Preparation of Environment Improvement Plans.

Many large trade waste generators have established community liaison communities as a consequence of having to prepare an environment improvement plan as part of their EPA Licence requirements. These CLCs have representatives from both the waste discharger and the community and provide a valuable forum for dialogue with both these important stakeholder groups. Having a water business representative on these committees is extremely valuable and ensures that water and trade waste issues are discussed and managed transparently while building community understanding. The community will also assist in providing drivers for industry improvement of trade waste management. Trade waste issues can then be embedded in the environment improvement plan and the discharger will become publicly accountable for meeting improvement targets. Meetings of CLCs usually take place out of business hours.

**Best practice**

Establishment of a communications and education strategy including, but not limited to, the elements outlined above. The strategy must, however, be mindful of commercially sensitive information and communication must be undertaken in a manner that protects the viability and reputation of all trade waste customers.

**Case studies**

City West Water has conducted annual trade waste customer seminars in conjunction with Melbourne Water at the Western Treatment Plant since 1995. Seminars include presentations by CWW and Melbourne Water experts in the areas of sewage transfer system, sewage treatment, trade waste compliance management, health and safety impacts of trade waste in sewers and the trade waste acceptance standards. The seminars focus on the potential impacts of trade waste on these systems and include a guided tour of the Western Treatment Plant with Melbourne Water experts providing commentary.

City West Water also engages customers and the community through a quarterly newsletter Water Matters and participation in customer environment management teams or consultative groups comprising customer, local community, EPA Victoria and other stakeholder representatives. These groups provide a mechanism to influence customers to proactively manage their business in a wholistic manner leading to more sustainable practices including in trade waste management.

**Reward and recognition - City West Water and SA Water** both provide awards that publicly recognise the trade waste management, water conservation, waste minimisation and cleaner production achievements of their customers. To date, City West Water has held its community environment awards in 1998 and 2002; these awards include the Industry/Commercial (Trade Waste) Award.

SA Water provide a best practice award for commercial trade waste management to trade waste customers ‘with an outstanding record in managing trade waste in an environmentally responsible manner’.
Community Consultation

The Altona Complex Neighbourhood Consultative Committee (ACNCG) has been operating for more than 10 years. It consists of membership from key companies operating within the petrochemical precinct in Altona; the local community, the local council, EPA, WorkCover and City West Water. The ACNCG provides a forum in which all members have been able to develop a shared understanding of both waste management and occupational health and safety issue related to the member companies’ operations. Community members provide valuable input and engage actively with the companies leading to the resolution of waste management and OH&S issues and improvement in the companies’ environmental and OH&S performance.

6.4 Staff training and resourcing

Purpose

To ensure that trade waste staff have sufficient technical and practical knowledge to adequately implement the activities required for effective and efficient trade waste management.

Background

Appropriate trade waste management involves knowledge of a range of disciplines, including: plumbing; chemistry; wastewater sampling and analysis; negotiation; and customer service. Due to their unrelated nature, it is unlikely to find applicants for trade waste positions with skills in all these disciplines. Similarly, there are very few examples of useful industry-specific external training courses related to trade waste management. Therefore, most water businesses provide specific trade waste training for their staff.

Typical practice

The most common training provided for staff directly involved in trade waste management covers sampling and monitoring techniques. Other typical areas for training include environmental or water-related legislation, confined space entry, trade waste treatment billing and customer service. Further areas of training provided by a number of water businesses include risk management, cleaner production/waste minimisation, water conservation/auditing, wastewater re-use, wastewater treatment and environmental auditing.

Generally, trade waste training is provided by in-house coaching and mentoring or via industry association seminars. Otherwise, it is provided by in-house formal training, networks and very infrequently by external education providers. External service providers such as analytical laboratories may be able to provide training in sampling techniques and the interpretation of results.

The broad nature of training utilised by those responsible for trade waste management suggests that a structured course or group of units bringing the various aspects of trade waste management together would be well received by the industry.

Best practice

In order to be able to demonstrate achievement of pre-requisite skills and knowledge, trade waste training should be developed, delivered and assessed, where possible, by or in conjunction with, approved education providers.
The National Water Training Package is currently undergoing review. An outcome of the review will be to provide several trade waste units at Certificate III and IV and Diploma level. These units would provide a formal recognisable qualification that trade waste staff could undertake and which could then be linked to position descriptions and staff development plans. It is hoped that these units could also be made available via remote learning packages via the Internet, which would make it readily accessible across Australia.

It is important to ensure that all relevant staff engaged in water business operations are provided with some level of training and knowledge related to trade waste management. This includes service faults operators who take calls from customers that may be responding to incidents involving trade waste discharge compliance out of normal business hours, operations and maintenance contractors that must work in the sewer environment and treatment plant operators that may have to manage the receipt of trade waste at a sewage treatment plant. These staff should be provided with access to and back-up from technical trade waste specialists.

Training for maintenance contractors is particularly important so that they understand the risks involved with the acceptance of trade waste into the sewerage system and that they take proper precautions and follow confined space entry procedures with due diligence to protect themselves appropriately. Training of these staff members should ensure that they are fully familiar with seeking access permits for sewers and any special conditions that are put in place for access to sewers containing significant quantities of trade waste.

Training of maintenance contractors also provides an invaluable resource for capturing non-compliance and identifying areas of the sewerage system where there is potential for blockage or sewer damage caused by trade wastes. They can also provide a resource for conducting sewage sampling programs and conducting sewage quality investigations. Their awareness of, and involvement in, trade waste management can make a significant contribution to reducing the overall cost of sewerage system maintenance.

**Case studies**

City West Water has provided 'Tool Box Sessions’ on trade waste for its operations and maintenance contractors. These sessions have provided training in sampling of trade waste. The maintenance contractors have been issued with sampling equipment so that if they come across problems in a sewer related to a discharge or identify sewage with unusual characteristics they can take samples for analysis which can often help in tracing back to non-compliant discharge.

**6.5 Performance measurement and reporting**

**Purpose**

To ensure that the water business provides a clear indication to key stakeholders, to its own staff, customers and broader community on the effectiveness of the implementation of the trade waste management system. To ensure that the trade waste customer provides a clear indication of its compliance with its trade waste agreement conditions.
**Background**

Performance measures communicate to key stakeholders - such as government, staff, customers and the broader community – on the effectiveness of trade waste management. These performance measures need to be based on significant parameters and reported in a manner that is appropriate to the stakeholder groups. The performance measures need to describe progress towards achieving the objectives in the trade waste management strategy or any other plans (for example environmental plans).

**Typical/best practice**

Performance measures are pre-determined by the reporting requirements that can include trade waste agreement conditions, customer, management, board, government, and/or public reporting. The most common performance measures of a trade waste agreements (or specific customer) used in the Australian water industry include:

- Volume of trade waste discharged to sewer;
- Compliance with trade waste standard monitoring results;
- Incident notification and reporting; and
- Completion of a waste management plan.

Other more common performance measures of trade waste management used in the Australian water industry are:

- Number of trade waste customers;
- Total volume of trade waste discharged to sewer;
- Revenue generated by trade waste customers;
- Number of trade waste customers by risk rank;
- Trade waste compliance statistics;
- Number of site visits or samples taken, relative to proposed targets for each trade waste customer category; and
- Number of customers required to prepare effluent improvement programs.

Other typical trade waste indicators that indicate the performance of trade waste management could include:

- Number of valid trade waste customer complaints;
- Number and type of incidents in the wastewater collection system (for example, fat build up in pump stations, fat blockages);
- Number of unusual discharges at STPs attributable to trade waste;
- Efficiency of operations (trade waste revenue/cost of trade waste management);
- Cost of revenue collection (the reverse of efficiency);
- Degree of customer supervision (number of trade waste inspections/number of trade waste agreements and permits current);
- Management compliance (number of inspections fully compliant/total number of inspections); and
- Degree of management (number of customers with trade waste agreements or permits/estimated potential number of customers).
The expectations of the audience for which the performance measures and data are to be presented, determine the reporting requirements and frequency of reporting. The most common levels of reporting used in the Australian water industry are:

**Reports from customers** - provided as a condition of trade waste agreements. The frequency of this reporting is more commonly linked to risk ranking, and generally includes the reporting of analytical results, volumetric measurements, incident notification and the preparation of waste management plans.

**Internal** - routine reports made to management or the board. The frequency of this reporting is generally monthly or annually. Reported information more commonly reflects both customer and water business performance including: numbers of trade waste customers (total and by risk rank); samples taken; site visits made; and customers who are non-compliant and trade waste revenue.

**Government and public** - the majority of this reporting occurs on an annual basis and most commonly reports the same information as the internal reports. Newsletters can be a useful tool for providing information to the community and other stakeholders.

There is a trend to sustainability reporting, whereby a single annual report includes issues on environmental, social and financial issues.

**Case studies**

**Sydney Water** has integrated their annual report and the towards sustainability report into one single document, which provides a concise and wholistic picture of their performance. In addition the annual report is supported by specialised reports that provide more detailed information on their performance in specific areas of operations. The progress summary of trade waste management is specifically covered in the ecologically sustainable development (ESD) indicators and measures the performance of meeting the environmental plan.


### 6.6 Research and development

**Purpose**

To identify opportunities to improve the efficiency and effectiveness of trade waste management.

**Background**

Requirements for trade waste management are constantly changing. Changes in technology, processes and waste loads, legislative changes, industry involvement in waste management and cleaner production programs, risk profiling of assets, urban development and community expectations all need to be researched in order to develop improved trade waste management.

**Typical practice**

Research and development (R&D) programs can be undertaken by the trade waste receiver, trade waste producer, Government agency, third-party equipment producers or service providers, or typically as a joint partnership between some or all of these bodies. The R&D can be undertaken directly by staff members, by a commissioned research
agency or a combination of both. Examples of research agencies include universities, CSIRO, cooperative research centres (such as the CRC for Waste Management and Pollution Control) and the Australian Sustainable Industry Research Council.

R&D is not restricted to laboratory or bench-top investigations. Typically in trade waste management, it is more focussed on process changes on site to achieve required improvements.

If a trade waste generator is planning to undertake a R&D program that may impact on trade waste quality, the water business should review information on the program and potential risks to trade waste management objectives. If the program is being undertaken at a customer site that is a scheduled activity under the Environment Protection Act, an approval from EPA Victoria may also be required. This could be in the form of a research, development and demonstration (RD&D) approval or a works approval. Further information on the EPA approval process can be obtained from www.epa.vic.gov.au.

Communication of progress of an R&D program is important to ensure that the investigations remain valid and that stakeholders are aware of progress. Options for communication include the formation of a small project review team, updates in newsletters, and presentations to industry representatives and forums.

Best practice

Forums such as the WSAA National Trade Waste Network or VicWater can be utilised to better facilitate the sharing of research information and communicating new developments. There is an opportunity to expand the current membership of the regional trade waste manager’s group to cover all Victorian water companies.

Use of tertiary students for research projects represents a cost effective means of undertaking research and development, as well as providing an opportunity to support technical learning.

Water companies must provide trade waste staff with sufficient training, time and resources to be able to undertake appropriate research and development. Budget allocation for R&D development and training, as a percentage of trade waste management revenue, should be reported to the community annually to highlight this important aspect.

Case study

A common problem for water businesses in managing greasy waste customers is determining the appropriate size of grease traps and the frequency in which the trap should be pumped out. As a result, a research project was undertaken by Melbourne University, EPA Victoria, City West Water and South East water to overcome this issue.

From experiments on a range of standard grease traps, a spreadsheet to calculate appropriate sizing was developed. Greasy waste premises were divided into three types – low, medium and high greasy food outlets. By entering the number of fixtures into the spreadsheet an appropriate grease trap size is calculated for that premises.

The research also concluded that pump-out frequencies for the three premises types should be every three months for high greasy food outlets, four months for medium grease food outlets and four to
five months for small greasy food outlets. Further research is now being conducted on the affects of temperature and emulsions on the standard grease trap and how this could affect the calculations in spreadsheets developed. These projects have assisted management of greasy waste generators by providing targeted information for guiding decision making.

6.7 Additional services

Purpose
To increase the value of trade waste managers through the provision of additional services and to value-add to the services provided in the trade waste program.

Background
Trade waste remains one of relatively few areas where compliance is directly monitored by the regulator, as opposed to quality assurance provided by the customers. This puts trade waste officers in the unique position of regularly meeting customers face to face, on their own property. There is clearly an opportunity to take greater advantage of these visits to address a broader range of customer concerns than just trade waste issues. This provides benefits to both the customer and the water business.

Typical practice
Most water businesses provide customers with access to trade waste standards, trade waste policy and trade waste guidelines. Generally, customers are given access to a range of information brochures relating to trade waste. However, only a minority of businesses conduct seminars to directly provide information to trade waste customers. Generally, trade waste managers focus on providing technical advice to trade waste customers. However, some water businesses provide water and/or waste auditing services.

Account information and sample results are typically provided via hardcopy or electronic copy on a regular schedule and on request. In addition to the services mentioned above, some water businesses also provided access to trade waste agreement information and account details on the Internet, access to trade waste application forms on the Internet, project management of wastewater reuse initiatives, facilitation of partnerships between trade waste customers and additional sampling for customers.

Best practice
Trade waste officers provide on-site liaison with customers, and can provide a broad range of on-site services. For example, backflow prevention, meter reading, sampling services, explanation of water bill, assistance with water and waste audits, and identifying misuse of fire services. The trade waste officers should also be able to provide further information on a broad range of water business programs and processes.

Trade waste customers should have straightforward, accurate and comprehensive access to information pertaining to their activities. Information such as application forms, monitoring data, trade waste agreements and pricing details should be available 24 hours a day via password protected internet sites.
7. IMPLEMENTATION AND REVIEW

It is expected that this guideline will be used by Victorian water businesses to assist when developing or reviewing a trade waste management system. It has been deliberately prepared with the intention that the water businesses will be able to recognise a certain base level of trade waste management coverage, but then can choose to adopt best practices that are relevant to the scale and circumstances of the business.

It is anticipated that the information in this guideline will be reviewed for validity and relevance on a regular basis, approximately every three years. The EPA/VicWater Trade Waste Partnership is expected to be the appropriate forum to undertake these reviews.

Any comments on this document should be directed to:

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