Industry Sector:
Rural Waste Landfill Facilities
December 2002

Compliance Performance Report

ENVIRONMENT PROTECTION AUTHORITY

This *Compliance Performance Report—Industry Sector: Rural Waste Landfill Facilities* was prepared by the Compliance Audit Section, NSW Environment Protection Authority.

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CONTENTS

EXECUTIVE SUMMARY

As part of its Industry Sector Compliance Audit Program, the NSW Environment Protection Authority (EPA) conducted compliance audits of 30 rural landfill facilities across NSW. The objective of the audits was to assess each facility's compliance with the statutory instruments issued to it and with legislation administered by the EPA, and to outline a program of follow-up actions needed to address non-compliances and to improve environmental performance. This report is based on the audit findings. It provides an insight into the industry sector's overall compliance performance and a summary of other issues of environmental concern identified through 'further observations' during audits.

The procedures and protocols for conducting the audits are described in the *EPA Compliance Audit Handbook* (EPA 1997). Compliance was assessed at each facility by a detailed site inspection and a review of records and documentation relating to the facility. Officers of the EPA carried out the audits between July 2000 and May 2001.

Thirty facilities were audited out of a total of 85 licensed to operate landfill facilities outside the Sydney Metropolitan Area and Extended Regulated Area of NSW. It is therefore likely that issues identified in this report are generally typical of the whole rural landfill industry sector.

The results of the audits indicate that the industry could improve its compliance and environmental performance by:

- providing adequate controls to prevent surface water entering waste and leachate collection systems
- providing adequate controls to prevent sediment, litter and contaminants being carried off site
- providing adequate controls to prevent leachate escaping to groundwater and surface waters
- covering waste to minimise environmental impacts, including odour emissions, litter generation, leachate generation, landfill gas emissions, breeding of pests and the risk of fire
- monitoring emissions, discharges and pollution incidents at the facility and keeping records of the monitoring
- recording and reporting incoming and outgoing wastes and submitting other information required to be submitted to the EPA.

Twenty-eight of the 30 facilities audited are owned and operated by rural councils. Two factors that influence the current level of compliance seen within the industry sector are the relatively short period of time that the industry has been subject to the EPA's licensing requirements and the resources required by rural councils to operate landfills to required standards. During the five years that the sector has been regulated, the EPA has worked with councils to improve environmental performance, and will continue to do so. This Compliance Performance Report looks at ways to achieve this.

Although the EPA is ensuring that issues identified in the audits are being addressed through a systematic and rigorous process of follow-up action programs, the issues are likely to be of concern at all facilities where waste is used for landfill and thus warrant continuing attention by managers at all sites. The EPA will ensure that the issues identified are also addressed at the facilities that were not audited.

The EPA will also use the findings of this report to review how best its resources could be channelled to guide industry overall in addressing the issues identified here. This review will include considering the use of regulatory tools such as licence conditions and enforcement, as well as policy documents, education, consultation and negotiation.

The EPA hopes that the report will be of benefit to the waste industry and local government in understanding and managing the environmental risk of operating landfill facilities.

Key issues identified from the audits

Preventing air pollution

- The generation of or potential to generate landfill gas and odours from uncovered wastes.
- Inadequate measures in place to prevent or control fires at facilities.

Preventing water pollution

- The discharge or potential for discharge of leachate to surface waters, soil and groundwater.
- Controls not in place to prevent surface water mixing with waste or entering the leachate collection system.
- Controls not in place to prevent sediment, litter or contaminants from being carried off site.
- Inadequate maintenance of plant and equipment used for leachate and surface water control.
- Inadequate means to contain leaks or spills of material that could contaminate stormwater runoff.

Land management and conservation

- Not ensuring that the landfill space used is minimised.
- Inadequate procedures for waste acceptance and screening.
- Inadequate disposal of wastes requiring special handling and disposal methods.
- Inadequate containment of material likely to cause soil contamination.

Preventing hazards and loss of amenity

- Inadequate control over entry to the site.
- Inadequate covering of waste to minimise environmental impacts.
- Measures not in place or being implemented to control litter, pests, vermin and weeds to ensure that the local amenity is not degraded.

Monitoring

- Inadequate monitoring of surface water, groundwater and leachate.

Administrative requirements

- Failure to provide the EPA with information on the quantity of waste received at the facility and the quantity transported from the facility for each quarter.
- Failure to provide information and data to the EPA.
- Failure to record and keep monitoring records as required.

INTRODUCTION

Purpose of this report

This report presents the key findings of the compliance audits carried out on a representative sample of facilities across NSW within the rural landfill sector. The facilities are regulated by way of statutory instruments issued under environmental legislation administered by the EPA.

The EPA asks the rural landfill sector to use this report to identify areas in which it can improve its overall level of compliance, its environmental performance and individual facilities. To assist with this identification, the EPA will present the findings of the Industry Sector Compliance Audit Program to stakeholders. The EPA will consider the issues identified by the audits that were found to be prevalent across the industry.

This report has been prepared for the purpose described, and no responsibility is accepted for its use in any other context or for any other purpose.

Selection of industry sector

Industry sectors targeted in the EPA's Industry Sector Compliance Audit Program are chosen on the basis of an assessment of major community concerns, environmental problems and EPA corporate objectives and strategies.

Individual facilities within each industry sector are selected for audit in consultation with EPA regional offices to give a representative sample of the sector. Thirty of the 85 licensed landfills (35%) in rural NSW were audited. A description of the audited facilities is provided on page 3.

Audit methodology

EPA compliance audits were performed in accordance with the procedures and protocols in the *EPA Compliance Audit Handbook* (EPA 1997), copies of which are available from the EPA's Pollution Line on 131 555. The audits were limited to a review of each enterprise's compliance with legislation administered by, and statutory instruments issued by, the EPA.

When an audit is completed, the findings are presented to each enterprise as an individual report. The reports are based on information from the EPA's files, information supplied by the enterprise, and observations made during site inspections, which in this case were carried out between June 2000 and May 2001. The reports contain a plan of action, with recommendations on what each enterprise must do in order to comply and improve its environmental performance within an agreed time period.

EPA staff follow up on compliance audits to ensure that each enterprise is implementing the actions required of it. The EPA has a systematic and rigorous monitoring program that tracks these follow-ups to ensure that all actions are completed by the licensee. Individual compliance audit reports are publicly available in the EPA Library on Level 15, 59–61 Goulburn Street, Sydney. The findings presented in this report are a collation of the findings presented in the individual reports.

Description of industry sector

Landfills are facilities within the waste management industry that are used for disposal of waste that cannot be avoided, reused, recycled or reprocessed. A *landfill site* is defined in the *Protection of the Environment Operations Act 1997* (the POEO Act) as a waste facility used for the purpose of disposing of waste to land.

The rural landfill industry sector consists of landfills located outside the Sydney Metropolitan Area and Extended Regulated Area of NSW. Those areas are defined in the POEO Act as follows:

Extended Regulated Area means the area comprising the local government areas of Cessnock, Gosford, Hawkesbury (as of 8 October 2001), Kiama, Lake Macquarie, Maitland, Newcastle, Port Stephens, Shellharbour, Shoalhaven, Wingecarribee, Wollongong and Wyong.

Sydney Metropolitan Area means the local government areas of Ashfield, Auburn, Bankstown, Baulkham Hills, Blacktown, Botany, Burwood, Camden, Campbelltown, Canada Bay, Canterbury, Fairfield, Holroyd, Hornsby, Hunters Hill, Hurstville, Kogarah, Ku-ring-gai, Lane Cove, Leichhardt, Liverpool, Manly, Marrickville, Mosman, North Sydney, Parramatta, Penrith, Pittwater, Randwick, Rockdale, Ryde, South Sydney, Strathfield, Sutherland, Sydney, Warringah, Waverley, Willoughby and Woollahra.

Landfills are classified into five classes as listed in Table 1. Licence conditions set out what wastes are permitted to be received in accordance with this classification. The conditions of environment protection licences issued to scheduled landfill sites may permit the receipt of waste not listed in Table 1, such as specified types of liquid waste or small quantities of clinical waste at Solid Waste Class 1 landfills in rural areas.

Table 1: Disposal of waste to the different classes of landfills

Landfill class	Waste permitted to be received
Inert Waste Class 2	Waste that is not a physically, chemically or biologically fixed, treated or processed waste and that is assessed as *inert waste* according to Technical Appendix 1 of the Guidelines*, or that is specified as *inert waste* in Schedule 1 of the *Protection of the Environment Operations Act 1997* (POEO Act), **except** biosolids.
Inert Waste Class 1	Waste assessed as *inert waste* according to Technical Appendix 1 of the Guidelines*, or that is specified as *inert waste* in Schedule 1 of the POEO Act, or stabilised asbestos wastes in bonded matrix.
Solid Waste Class 2	Waste, **excluding** putrescible waste, that is assessed as *inert waste* or *solid waste* according to Technical Appendix 1 of the Guidelines*, or that is specified as *inert waste* or *solid waste* in Schedule 1 of the POEO Act, or any asbestos waste.
Solid Waste Class 1	Waste, **including** putrescible waste, that is assessed as *inert waste* or *solid waste* according to Technical Appendix 1 of the Guidelines*, or that is specified as *inert waste* or *solid waste* in Schedule 1 of the *POEO* Act, or any asbestos waste.
Industrial Waste	Waste that is assessed as *inert waste*, *solid waste* or *industrial waste* according to Technical Appendix 1 of the Guidelines*, or that is specified as *inert waste*, *solid waste* or *industrial waste* in Schedule 1 of the POEO Act, except putrescible waste (unless specifically permitted in the licence).

* *Environmental Guidelines: Assessment, Classification & Management of Liquid & Non-Liquid Wastes* (EPA, 1999).

Scheduled activity

Facilities where waste disposal or landfilling is undertaken are included as a class of waste facility in Schedule 1 of the POEO Act as follows.

(1) A waste facility that is of any one or more of the following classes:

. . .

(c) used tyre processing or disposal facilities, being waste facilities that:

(i) treat, process or dispose of more than 5,000 tonnes per year of used, rejected or unwanted tyres (including shredded tyres and tyre pieces), or

(ii) store such tyres at any one time in quantities of more than 50 tonnes,

. . .

(g) landfill or application sites in environmentally sensitive areas, being landfill or application sites that are located in an environmentally sensitive area described in Technical Appendix 8 of the Waste Guidelines, except those:

(i) that are within an environmentally sensitive area by reason only of being located within 250 metres of a residential zone or of a dwelling, school or hospital not associated with the landfill or application site and:

(A) receive only coal washery rejects or slags at a rate of not more than 20,000 tonnes per year, or

(B) were in operation as at 30 June 1997 and receive no more than 200 tonnes of waste per year, or

(ii) that are situated on residential premises, or on land used principally for farming operations, and only if the disposal of waste is carried out on site,

(h) solid waste landfill or application sites, being landfill or application sites that receive over 5,000 tonnes per year of solid waste or solid waste and inert waste,

(i) coal washery rejects or slags landfill or application sites, being landfill or application sites that receive over 20,000 tonnes per year of coal washery rejects or slags (or both),

(j) large-scale landfill or application sites, being landfill or application sites that receive over 20,000 tonnes per year of any waste.

Description of audited facilities

The EPA licenses 85 facilities in New South Wales as waste landfill facilities outside the Sydney Metropolitan Area and Extended Regulated Area. Thirty of these facilities (35%) were selected for auditing as a representative sample of the industry sector. The individual facilities audited are listed in Appendix A.

The facilities audited are used for the disposal of domestic, municipal, clinical, grease trap and other special types of waste. Some landfill facilities accept waste for recycling. Some accept waste such as stockpile tyres, green waste, steel (such as refrigerators and car bodies), and construction and demolition material.

Nineteen of the facilities audited were licensed to receive Solid Waste Class 1 and two were licensed to receive Solid Waste Class 1 and liquid waste. Four were licensed to receive Solid Waste Class 1 and clinical waste. One was licensed to receive Solid Waste Class 1 and clinical waste and to store lead compounds (classified as hazardous waste). One was licensed to receive Solid Waste Class 2 and Inert Waste Classes 1 and 2. One was licensed to receive Inert Waste Class 1, and one was licensed to receive Inert Waste Class 2. One was licensed to receive tyres only for disposal.

The scales of operation of the facilities audited are listed in Table 2.

Table 2. Scales of operation of facilities audited

Scale of facility	No. of facilities audited
Tyres (any amount)	1
Landfills located in environmentally sensitive or inappropriate areas for any amount of landfilling	9
5000–20 000 t/yr	15
20 000–100 000 t/yr	4
> 100 000 t/yr	1

EPA regions are shown in Figure 1. The numbers of rural landfill facilities licensed and audited in each region as at October 2001 are shown in Table 3.

Table 3. Numbers of facilities licensed as landfills and audited in each EPA region as at October 2001

EPA region	No. of facilities licensed	No. of facilities audited
South Coast—outside Extended Regulated Area	7	3
Hunter—outside Extended Regulated Area	13	6
Sydney—outside Sydney Metropolitan Area and Extended Regulated Area	5	0
North Coast	10	3
Central West	13	3
Northern Tablelands	12	3
Southern Tablelands	11	7
Murray	6	2
South West	8	3
Total	**85**	**30**

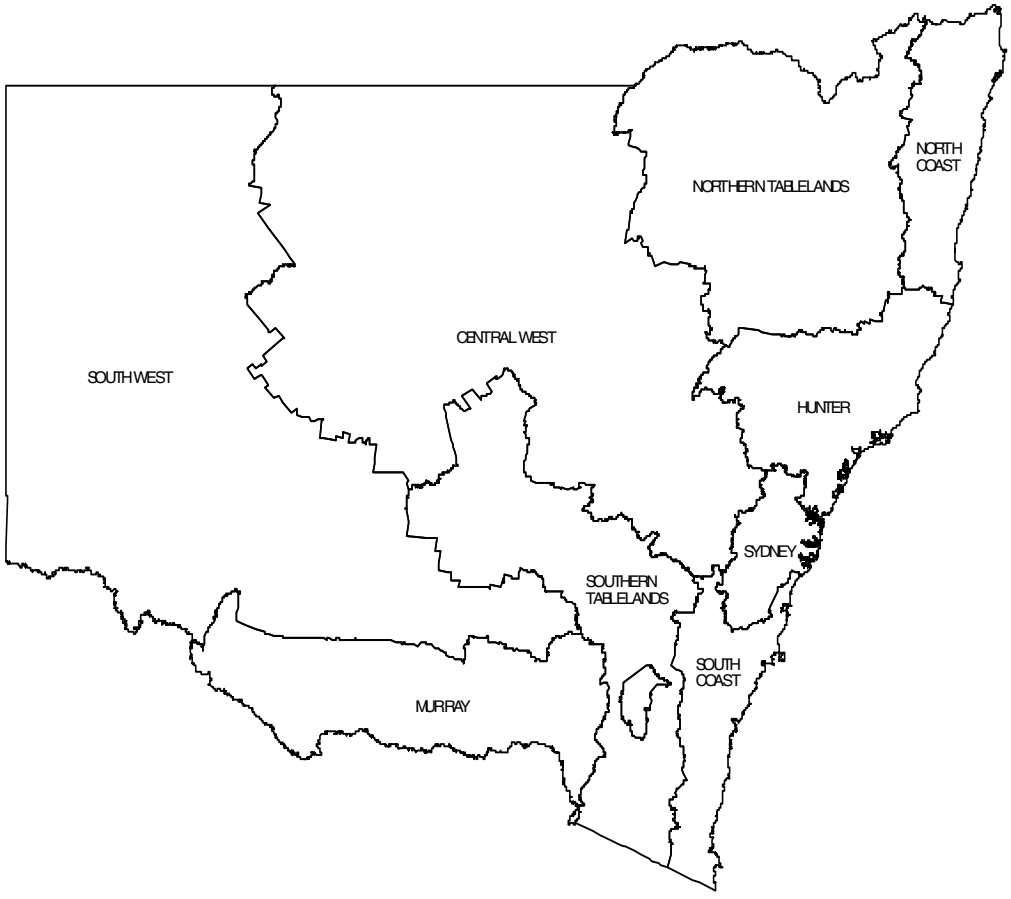

Figure 1—EPA Regions

Statutory instruments issued to enterprises

Twenty of the 30 audited facilities held environment protection licences issued under the POEO Act. Ten had previously held licences under the *Waste Minimisation and Management Act 1995* that were deemed to be environment protection licences under the Protection of the Environment Operations (Savings and Transitional) Regulation 1998 from 1 July 1999.

Five facilities had been issued with notices under the *Waste Minimisation and Management Act 1995* that were also deemed to be notices under the same Regulation.

Licensees were required by previous licence conditions to prepare a landfill environmental management plan (LEMP) and a covering statement in accordance with the *Environmental Guidelines: Solid Waste Landfills* (EPA, 1996). These guidelines set out environmental goals and possible benchmark techniques that can be used to achieve these goals. The licensees were required to identify any departures from these benchmark techniques in the covering statement, and to include a timetable for implementing the techniques or proposed alternatives. The licences issued to these licensees were developed in reference to the LEMP and covering statement.

IDENTIFICATION OF AREAS OF CONCERN

The compliance of each facility with the conditions attached to the statutory instruments and with environmental legislation administered by the EPA is described in the individual compliance audit reports in Appendix A. This report summarises the areas of concern identified from the 'non-compliances' and 'further observations' reported in the individual reports.

Non-compliances are reported where there is clear evidence of a breach of licence conditions. **Further observations** are indicators of potential non-compliances or areas where environmental performance may be improved. Where an issue of environmental concern is observed that does not strictly relate to the scope of the audit or assessment of compliance, it is reported as a further observation.

The areas of concern identified during the audits are presented in Table 4. Some areas of concern are interrelated; for example, where air pollution and loss of amenity are both affected by inadequate odour and gas controls. Similarly, inadequate covering of waste creates a flow-on effect, leading to possible problems with odour, litter and gas generation, contamination of surface water, the tracking of waste, and pests, vermin and weeds.

Table 4. Areas of concern and issues identified in the audits, and the number of facilities at which the issues were identified.

Area of concern	Issue	No. of facilities at which issue was identified (out of 30)
Preventing air pollution		**24**
	Inadequate dust controls	5
	Inadequate odour controls	21
	Inadequate gas controls	24
	Not implementing fire prevention measures	22
Preventing water pollution		**28**
	Failure to maintain plant and equipment used to control surface water	10
	Inadequate surface water controls	24
	Failure to maintain plant and equipment used to control leachate	4
	Inadequate leachate controls	22
	Pollution of surface water	5
	Pollution of groundwater	5
	Inadequate storage of materials and wastes	15
Land management and conservation		28
	Not minimising the amount of landfill space used	18
	Inadequate waste screening, acceptance procedures and controls	15
	Inadequate disposal methods for waste requiring special handling (e.g clinical waste, asbestos)	8
	Inadequate site capping and revegetation	3
	Inadequate storage of materials and wastes	15
Preventing hazards and loss of amenity		26
	Inadequate site security	11
	Lack of waste covering	23
	Not implementing fire prevention measures	22
	Inadequate odour controls	21
	Inadequate dust controls	5
	Inadequate litter controls	25
	Inadequate pest, vermin and weed controls	25
	Not minimising the tracking of mud and waste	4

Monitoring		21
	Not carrying out the required monitoring of surface water, groundwater and leachate	19
	Not carrying out the required monitoring of dust and gas	8
	Not carrying out the required monitoring of landfill space	4
Administration		26
	Failure to record and report incoming and outgoing wastes	16
	Failure to provide other information and data to the EPA	12
	Failure to report pollution events to the EPA	6
	Failure to record and keep monitoring records as required	21
	Failure to keep pollution complaint records	10
	Failure to notify public of or to operate complaints line	4
	Failure to keep a copy of the licence on the premises	13

Preventing air pollution

Air pollution arising from landfills can include offensive odours and dust and gas emissions that can be harmful to human health and to the environment. All operators should identify activities, plant and equipment that have the potential to cause air pollution. Operational procedures and process controls that minimise air emissions from the site should be developed and implemented. The effectiveness of controls should be continually monitored.

Issues relating to actual or potential air pollution were identified at 24 of the 30 audited facilities.

Dust controls

Issues relating to dust controls were identified at 5 of the 30 facilities audited:

- Sealed or gravel roads were not constructed from the public roadway to the gatehouse, with the potential for dust to be emitted from the facilities (1 facility).
- There was a lack of dust controls on unsealed access roads and on stockpiles of brick and concrete waste (1 facility).
- Dust deposition rates determined at the site were greater than 4 g per m^2 per month indicating that dust controls were likely to be inadequate at the site (1 facility).
- There were inadequate dust controls on an unsealed haul road and a large exposed area around the active tipping area (1 facility).
- Asbestos waste disposed of at the facility was left uncovered, with the potential for asbestos dust to be emitted (2 facilities).
- Contaminated material had been stockpiled at the facilities for a long period of time, with the potential for wind blown dust emissions containing lead particles (1 facility).

Dust controls should minimise pollutants leaving the site as airborne dust, reduce sediment pollutant load, and protect local amenity. The general expected maximum level for dust deposition is 4 g per m^2 per month as an annual mean for total solids, but the limit may be lower for landfills adjacent to sensitive areas. The effectiveness of controls should be continually monitored.

Odour controls

Issues relating to odour controls were identified at 21 of the 30 facilities audited:

- Grease trap wastes disposed of in a pit on the site were a source of significant odours (1 facility).

- Waste not adequately covered had the potential to emit odours (21 facilities). For details see comments under 'Covering of waste' on page 15. In particular, odorous or potentially odorous wastes were left uncovered, including putrescible waste from abattoirs (such as process wastes and sheep skins), and granary and mustard seed waste (7 facilities).

Acceptance of wastes that are highly biodegradable and improper gas management can lead to odour problems. All operators should take appropriate housekeeping steps to prevent the production of odours. The use of daily covering and immediate attention to odorous waste loads will minimise the transmission of odours off-site. Where odorous waste is disposed of in landfills near sensitive receptors, consider a buffer zone or increase the frequency of cover to minimise the impact.

Gas controls

Issues relating to gas controls were identified at 24 of the 30 facilities audited:

- Waste that was not adequately covered at 21 facilities (as identified under odour controls) had the potential for odorous compounds to be emitted. For details see comments under 'Covering of waste' on page 15.
- Landfill cells were not capped progressively or when waste reached final heights, with the potential for gas to be emitted in an uncontrollable manner (3 facilities). For details see comments under 'Site capping and revegetation' on page 14.
- A leachate barrier was not installed where waste is disposed of, with the potential for gas to migrate (5 facilities).
- Facilities did not ensure that the required compaction rate was being achieved or that effective compaction was achieved, with the potential for gas to be emitted (11 facilities).

Landfills primarily produce methane and carbon dioxide which, if not contained, can contribute to the greenhouse effect. Unmanaged gas emissions represent a possible loss of an energy source should the quantities be sufficiently large. Landfill gas can also contain a variety of odorous components. Methane represents an explosion risk, which may occur on site or off site.

Fire prevention

Measures were not in place or not being implemented to prevent or control fires at 22 of the 30 facilities audited:

- Fire prevention measures stated in the landfill environmental management plan (LEMP) were not in place or not implemented (14 facilities).
- Facilities did not ensure that personnel had access to fire fighting equipment or could manage fire outbreaks in accordance with the LEMP (6 facilities).
- A site-specific fire management plan was not in place (1 facility).
- Not all necessary steps were taken to extinguish fires burning in wastes as soon as possible—a fire was still smouldering after 2 months (1 facility).
- Tyres were not stockpiled in a clearly defined area away from the tipping face and were mixed with other waste or disposed of in the landfill, with the potential to increase the risk of fire (5 facilities).
- Timber was stacked at the base of the tyre stockpile, increasing the risk of fire (1 facility).
- Entry to the facilities was not adequately controlled, with the potential for fires to be lit (11 facilities). For details see comments under 'Site security' on page 15.
- Facilities did not ensure that the required compaction rate was being achieved or that effective compaction was achieved, with the potential for voids to increase the risk of fire (11 facilities).

Fires should be prevented at landfills to minimise emissions of pollutants into the atmosphere and to prevent the degradation of local amenity. As tyres are flammable, landfilling or stockpiling of tyres together with other flammable wastes increases the risk of fire and could increase the scale and intensity of the fire.

Preventing water pollution

Groundwater and surface waters can be contaminated by untreated leachate from landfill sites. Leachate is the liquid that percolates through landfills as a result of infiltration of rain and decomposition of the wastes. It may cause serious water pollution if it is not properly managed. Surface water runoff from a landfill can cause unacceptable sediment or litter loads in streams, and uncontrolled surface water runon can lead to excessive generation of leachate.

Issues relating to actual or potential water pollution were identified at 28 of the 30 facilities audited.

Surface water management

Maintenance of plant and equipment used to control surface water

Issues were identified relating to maintenance of plant and equipment used to control surface water at 10 of the 30 facilities audited:

- There was lack of maintenance on a contaminated stormwater collection pit, increasing the likelihood of contaminated stormwater overflowing the pit and polluting waters (1 facility).
- There was lack of maintenance on drains constructed to divert uncontaminated stormwater around areas used for landfilling, evidenced by sediment build-up or stockpiling of batteries in the drain, with the potential to cause water pollution and to increase the generation of leachate (5 facilities).
- Silt fences, erected to reduce sediment discharge from the facilities, were not maintained or were not being operated, with the potential to pollute waters (3 facilities).
- The capacity of the sedimentation dam was reduced by more than 20% of its design capacity and the dam was overflowing, causing the pollution of waters (1 facility).

All operators must ensure that all plant and equipment used to control surface water are maintained in a proper and efficient condition to prevent the pollution of waters and to minimise the generation of leachate.

Surface water controls

Controls were not in place to prevent surface water mixing with waste, or with the leachate collection system, at 24 of the 30 facilities audited:

- Surface drainage was not being effectively diverted away from areas where waste was being or has been landfilled, with the potential for surface water to infiltrate the waste and generate excess leachate (6 facilities).
- The landfill surface or perimeter was not contoured to minimise the runon of surface waters onto areas where waste has been landfilled, with the potential for surface water to infiltrate the waste and generate excess leachate (2 facilities).
- Uncontaminated stormwater was not being diverted away from the leachate collection dam or drainage channel, with the potential for surface water to mix with leachate and increase the quantity of leachate requiring disposal or reuse in a manner that does not pollute waters (2 facilities).
- Wastewater from washing down vehicles was directed to the disposal cell, with the potential to generate excess leachate (1 facility).
- Approved infrastructure for diverting surface water was not operational by the specified date (1 facility).

- Waste was not adequately covered to minimise environmental impacts, with the potential for surface water to infiltrate it and generate excess leachate (21 facilities). For details see comments under 'Covering of waste' on page 15.
- Facilities did not ensure that the required compaction rate was being achieved or that effective compaction was achieved, with the potential for excess leachate to be generated (10 facilities).
- Landfill cells were not capped progressively or when waste reached final heights, with the potential for surface water to enter the waste and increase the generation of leachate (3 facilities). See details under 'Site capping and revegetation' on page 14.

All operators should ensure that controls are in place to segregate clean stormwater from leachate and waste. Surface water infiltrating waste or mixing with leachate increases the quantity of leachate requiring disposal or reuse in a manner that does not pollute waters. The effectiveness of controls should be continually monitored.

Controls were not in place to prevent sediment, litter or contaminants from being carried off the landfill site at 25 of the 30 facilities audited:

- Disturbed areas of the landfill were not provided with separate water quality controls for treatment of runoff that contains suspended pollutants, with the potential to pollute waters (9 facilities).
- Stormwater runoff from green waste stockpiles and part of the landfill area was discharging to the clean stormwater area and to a wetland on the adjacent premises, with the potential to pollute waters (1 facility).
- A pond containing a bright green liquid was not contained within the surface water and leachate management system, with the potential to pollute waters (1 facility).
- There was disposal of contaminated drums and evidence of hydrocarbon contamination of soil, with the potential to contaminate surface waters, groundwater and leachate (2 facilities).
- There was inadequate collection of wastewater from vehicle wash-down areas, with the potential to pollute waters (2 facilities).
- Approved infrastructure for managing stormwater was not operational by the specified date (1 facility).
- The tracking of mud and waste by vehicles was not being minimised in accordance with the LEMP, with the potential for surface waters to be polluted (4 facilities). Specified actions included the installation of wash bays and the sealing and gravelling of roads.
- Litter was not being adequately controlled, with the potential for litter to pollute waters (25 facilities). For details see comments under 'Litter control' on page 16.

All operators must ensure that controls are in place to prevent contaminated runoff, wastewater and litter from polluting waters. The effectiveness of controls should be continually monitored.

Leachate management

Maintenance of plant and equipment

Issues related to maintenance of plant and equipment used to control leachate were identified at 4 of the 30 facilities audited:

- Linear fractures were observed on the landfill containment wall, with the potential for leachate and waste to pollute waters in the event of the wall's failing. An assessment report on the wall indicated that some remedial measures would be necessary (1 facility).
- There was lack of maintenance on the leachate collection system, with the potential for waters to be contaminated should leachate leak or overflow from or bypass the ponds (2 facilities).
- The capacity of some leachate holding ponds was reduced by more than 10% of the design capacity, and the ponds were overflowing, causing the pollution of waters (1 facility).

All operators must ensure that plant and equipment used to control leachate are maintained in a proper and efficient condition to prevent leachate contaminating water and land and to prevent the emission of odours.

Leachate control

Issues related to leachate control were identified at 22 of the 30 facilities audited:

- A leachate barrier was not installed where waste is disposed of and where leachate is impounded, with the potential to pollute waters (5 facilities).
- No system to collect leachate generated from waste disposed of at the facility was in place, with the potential to pollute waters (7 facilities).
- The leachate collection system was not installed in accordance with the quality assurance program (1 facility).
- Leachate was not being contained on the premises, although adequate capacity to contain it was available, causing the pollution of waters (1 facility).
- Wastewater being irrigated was not limited to collected leachate as required (1 facility).
- Drainage from the leachate irrigation area flowed to the clean stormwater pond, with the potential to contaminate stormwater (1 facility).
- A leachate spring was observed in the landfill batter, upslope of a stormwater drain, with the potential to contaminate stormwater (1 facility).
- Liquid wastes being received at the site where this is not permitted. No effective leachate barrier was in place, with the potential to contaminate groundwater (1 facility).
- Waste was observed on the batters of previously filled areas, which may have been the result of inadequate cover or erosion of the batters, with the potential to contaminate surface water runoff (1 facility).
- The approved leachate collection system was not operational by the specified date (1 facility).
- Waste acceptance and screening procedures were not being implemented, allowing the receipt and improper disposal of unauthorised waste, with the potential for pollution of waters (15 facilities). See comments under ‘Waste acceptance screening and disposal’ on page 13.

Operators must ensure that controls are in place to prevent leachate escaping to groundwater, surface water or soil. These controls should include the use of a leachate barrier and a leachate collection system, or an alternative system approved by the EPA. A leachate barrier is a liner that forms a barrier between the groundwater, soil and substrata on one side and the waste or stored leachate on the other. The collection system should collect and store all leachate generated at the landfill before the leachate is reused or disposed of in a manner that does not pollute waters. The effectiveness of controls should be continually monitored.

Pollution of waters

It is an offence to pollute waters. All operators must ensure that controls are in place to prevent the pollution of groundwater and surface waters. These controls should be maintained and monitored to ensure that they are effective. If monitoring indicates that the controls are not effective, operators need to take action quickly to stop any pollution, remediate the area and prevent pollution occurring in the future.

Pollution of surface water

Surface waters were being polluted at 5 of the 30 facilities audited:

- Leachate was being discharged from the facility under circumstances where a discharge is not permitted and was discharging to a drinking water catchment (1 facility).

- Leachate being discharged from the facility contained elevated levels of ammonium, nitrate, total nitrogen, chemical oxygen demand, conductivity, calcium, iron, manganese, magnesium, potassium, sodium and aluminium (2 facilities).
- Litter, including plastic bottles and paper, was observed on the premises in a stormwater drain that discharges to a creek (1 facility).
- Surface water samples collected downstream of the landfill contained pollutants that were higher than in samples collected upstream of the landfill. These pollutants indicated leachate (1 facility).

Pollution of groundwater

The pollution of groundwater was likely to be occurring at 5 of the 30 facilities audited:

- Groundwater monitoring results indicated pollutants characteristic of leachate. The pollutant levels were higher than background levels (2 facilities).
- A hydrogeological assessment report indicated that the leachate barriers were leaking and that groundwater contamination by leachate was occurring (1 facility).
- Pollution of groundwater was not controlled by the specified date (1 facility).

Storage of materials

Materials were not being stored in a manner that would contain spills and leaks, with the potential for pollution of waters at 15 of the 30 facilities audited:

- There was a lack of containment around stored materials, including diesel fuel, waste oil, fuel oil, cooking oil, batteries, miscellaneous unidentified liquids and contaminated soil, with the potential to contaminate stormwater runoff in the event of a leak or spill (11 facilities).
- There was evidence of spills or leaks of substances on unsealed ground without containment, with the potential to contaminate stormwater runoff (4 facilities).
- The containment around materials was inadequate owing to erosion or settling of earthen bunds, inadequate bund capacity, an overhead tank being stored too close to the bund, the bund drainage valve being left open, and waste oil being stored on top of the bund (5 facilities).
- The integrity of an underground waste oil storage tank that is more than 10 years old was not tested, with the potential for groundwater pollution by leakage (1 facility).
- There was a lack of containment around the loading point for three oil storage tanks that are located on unsealed ground, with the potential to cause water contamination in the event of spills and leaks (1 facility).
- Liquid that had collected within an oil storage bund was discharged without adequate treatment, and there was a lack of maintenance of the oil separator serving the bund, with the potential to cause water pollution (1 facility).
- There was a lack of containment around lead-contaminated material being stockpiled on the premises, with the potential for runoff to waters (1 facility).

All operators should identify activities, plant and equipment that may reduce the quality of waters discharged from the facility. Operational procedures and process controls should be developed and implemented to minimise the volume of leachate generated at the facility and to prevent leachate discharging to waters. This should include segregating clean stormwater from leachate and waste, collecting all leachate and contaminated stormwater, and storing chemicals in a contained area. Any contaminated water that is to be discharged from the site must be treated before discharge, to prevent pollution of waters. The effectiveness of controls should be continually monitored.

Land management and conservation

All land is valuable, and its use as a landfill site needs to be sustainable. Proper care of a landfill as a valuable asset should include effective remediation, enabling the land to be used for other purposes following closure. Land management and conservation goals include diverting waste materials that can be reused or recycled from landfills to minimise the loss of capacity, managing the site to ensure that unsuitable wastes are not received, and knowing the nature of wastes received. Spillages and leakages of chemicals that cause water pollution also have the potential to contaminate soil.

Issues relating to land management were identified at 28 of the 30 of the facilities audited.

Minimising landfill space used

Issues related to minimising landfill space used were identified at 18 of the 30 facilities audited:

- Facilities did not ensure that the required compaction rate was being achieved or that effective compaction was achieved, with the potential for the expected landfill lifetime to be reduced (11 facilities).
- Wastes, including timber, metal and whitegoods, being landfilled at the site instead of being recycled, with the potential for the expected landfill lifetime to be reduced (1 facility).
- The total tonnage of waste disposed of at the facility exceeded the annual limit (2 facilities).
- Facilities did not manage the disposal of waste in accordance with the filling plan, or did not update or maintain a filling plan, or did not develop a filling plan (7 facilities).
- Tyres were being mixed with other waste or being disposed of in the landfill, with the potential for the expected landfill lifetime to be reduced (4 facilities).

Landfill space should be used optimally, and valued as a scarce resource. Operators should implement procedures to maximise landfill space, including compaction of waste and recycling and reuse of wastes.

Waste acceptance, screening and disposal

The landfill occupier should have in place and implement waste acceptance and screening procedures to ensure that the site does not accept wastes that are prohibited from entry. Wastes that are not permitted to be received or disposed of have the potential to cause impacts on water, air, amenity and land. The types of waste received at a landfill determine the potential pollutants that can be generated and hence the potential environmental risk.

Waste acceptance and screening procedures were not being adequately implemented at 15 of the 30 facilities audited:

- Facilities did not implement procedures to control, screen and remove any waste not permitted by the licence to be received or disposed of at the facility, or did not implement the procedures in accordance with the LEMP (6 facilities).
- Disposal of waste that is not permitted to be disposed of by the licence, including grease trap waste, brine, tannery wastes, fuel drums, batteries, pesticide bottles and green waste (7 facilities).
- Entry to the facility was not adequately controlled, with the potential for illegal waste dumping to occur (11 facilities). For details see comments under ‘Site security’ on page 15.
- Staff were not trained in accordance with the LEMP, which included training in the identification of unacceptable wastes and recording of waste received (2 facilities).

Operators must receive only the wastes that they are licensed to receive, and must exercise due diligence in screening incoming wastes. Operators should ensure that landfill sites are managed effectively to avoid adverse environmental impacts.

Wastes requiring special handling and disposal methods

Wastes requiring special handling and disposal methods on account of its potential to cause an immediate risk or environmental impact were not adequately disposed of at 8 of the 30 facilities audited:

- Asbestos wastes disposed of at the facility were left uncovered, with the potential to cause adverse effects on human health (2 facilities).

Operators must ensure that asbestos wastes are disposed of in accordance with Clause 29(5) of the Protection of the Environment Operations (Waste) Regulation 1996.

- Ash disposed of at the facility caused a fire in the landfill (1 facility).

Operators should ensure that ash that is disposed of at the facility is fully extinguished and cooled to prevent reignition or spontaneous combustion of surrounding waste.

- Clinical wastes disposed of at the facility were left uncovered, with the potential to cause adverse effects on human health (1 facility).
- Odorous or potentially odorous wastes were left uncovered, including putrescible waste from abattoirs (such as process wastes and sheep skins), and granary and mustard seed waste (7 facilities).

All operators should develop and implement operational procedures for the handling and disposal of waste requiring special handling (e.g asbestos, clinical waste, ash) to ensure that the likely environmental impacts from such wastes are minimised.

Site capping and revegetation

Site capping and revegetation should ensure that the final surface provides a barrier to the migration of water into the waste, controls emissions to water and atmosphere, facilitates sound land management and conservation, prevents hazards and protects amenity.

Landfill cells were not capped progressively or when waste reached final heights at 3 of the 30 facilities audited:

- A revegetation layer was not installed over the seal-bearing surface (2 facilities).
- The 5 capping layers (seal-bearing surface, gas drainage layer, sealing layer, infiltration layer and revegetation layer) required were not installed as the final capping (1 facility).

Operators must implement operational and post-closure procedures to reduce the risk of a landfill polluting waters, soil and air.

Storage of materials

Materials were not being stored in a manner that would contain spills and leaks, with the potential for soil contamination to occur at 15 of the 30 facilities audited. See details under ‘Preventing water pollution’ on page 9.

All operators should identify activities, plant and equipment that have the potential to contaminate land. Operational procedures and process controls should be developed and implemented that minimise the likelihood of land contamination by preventing contaminants from coming into contact with the land. This should include disposing of only the wastes permitted by the licence, storing chemicals on sealed areas with containment, and immediately cleaning up any leakage or spillage of chemicals. The effectiveness of controls should be continually monitored.

Preventing hazards and loss of amenity

The potential hazards and impacts on amenity caused by landfills include fire, dust, odour, vermin, pests and litter.

Issues related to preventing hazards and loss of amenity were identified at 26 of the 30 facilities audited.

Site security

Entry to the facility was not adequately controlled at 11 of the 30 facilities audited:

- A stock-proof fence was not installed around the perimeter of the facility or the fence was not being maintained (7 facilities).
- Facilities did not ensure that the security gates were locked at all times when the landfill was unattended (1 facility).
- Lockable security gates were not installed at some access and departure locations (1 facility).
- A high wire mesh fence of not less than 1.8 metres was not installed along the access area or active tipping area or was not being maintained (4 facilities).
- Contractors had access to the site after hours, with the potential for disposal of unacceptable wastes (1 facility).

Operators should ensure that entry to the site is controlled to minimise the risk of illegal waste dumping, fires and vandalism of pollution control devices, as well as loss of amenity. The installation and maintenance of fences controls entry and reduces the potential for litter to leave the site.

Covering of waste

Use of cover material helps to protect the full range of environmental management objectives by limiting runon and infiltration of water, controlling and minimising risk of fire, minimising emission of landfill gas, suppressing odour, reducing fly propagation and rodent attraction, and decreasing litter and leachate generation. This activity has therefore been included in this sector report under each environmental issue it is likely to affect.

Waste was not being adequately covered to minimise environmental impacts at 23 of the 30 facilities audited:

- The required daily cover was not applied to exposed waste at the facility (11 facilities).
- Waste was not covered, or the depth of the cover was inadequate (8 facilities).
- Waste was not covered in accordance with the LEMP (1 facility).
- Cover did not consist of the required material or consisted of material that was not likely to minimise water infiltration (2 facilities).
- Odorous or potentially odorous wastes were left uncovered, including putrescible waste from abattoirs (such as process wastes and sheep skins), and granary and mustard seed waste (7 facilities).
- Asbestos waste and clinical wastes were not covered (3 facilities).

Operators should ensure that wastes are adequately covered to minimise environmental impacts, including the loss of amenity.

Fire prevention

Measures were not in place or not being implemented to prevent or control fires at 22 of the 30 facilities audited. See details under ‘Preventing air pollution’ on page 7.

Fires at landfills should be prevented to minimise emissions of pollutants into the atmosphere and to prevent the degradation of local amenity.

Odour controls

Issues related to odour controls were identified at 21 of the 30 facilities audited. See details under 'Preventing air pollution' on page 7.

Acceptance of wastes that are highly biodegradable and improper gas management can lead to odour problems. All operators should take appropriate housekeeping steps to prevent the production of odours. The use of daily cover and immediate attention to odorous waste loads will minimise the transmission of odours off-site. The use of sufficient distance between the landfill and sensitive receptors will minimise the requirement for more stringent controls.

Dust controls

Issues related to dust controls were identified at 5 of the 30 facilities audited. See details under 'Preventing air pollution' on page 7.

Dust controls should minimise pollutants leaving the site as airborne dust, reduce sediment pollutant load, and protect local amenity. The general expected maximum level for dust deposition is 4 g per m^2 per month as an annual mean for total solids, but the limit may be lower for landfills adjacent to sensitive areas.

Litter controls

Litter was not being adequately controlled at 25 of the 30 facilities audited:

- Litter was not being managed so as to ensure that the local amenity is not degraded (10 facilities).
- Movable litter control fences were not being used (1 facility).
- The litter management program was not being implemented in accordance with the LEMP (7 facilities).
- A stock-proof fence was not installed around the perimeter of the facility or the fence was not being maintained, with the potential for windblown litter to leave the site (7 facilities).
- A high wire mesh fence of not less than 1.8 metres was not installed along the access area or active tipping area or was not being maintained, with the potential for windblown litter to leave the site (4 facilities).
- Waste was not adequately covered to minimise environmental impacts, with the potential for litter to be blown off site (23 facilities). See details under 'Covering of waste' on page 15.

Litter from landfill activities must not degrade local amenity. Windblown litter is a nuisance to the community in the vicinity of landfill sites and causes water pollution.

Pest, vermin and noxious weed controls

Issues related to controlling pests, vermin and noxious weeds were identified at 25 of the 30 facilities audited:

- Pests, vermin and weeds were not being controlled in accordance with the specifications of the LEMP, which included the compaction and covering of waste to ensure that the amount of waste exposed is minimised, and the spraying of weeds (7 facilities).
- Waste was not adequately covered to minimise environmental impacts, with the potential to encourage pests and vermin and to disseminate weeds (21 facilities). See details under 'Covering of waste' on page 15.
- Facilities did not ensure that the required compaction rate was being achieved or that effective compaction was achieved, with the potential for voids to encourage pests and vermin (11 facilities).

Operators should ensure that pests, vermin and noxious weeds are not present at the site in sufficient numbers to pose an environmental hazard or loss of amenity in the neighbouring areas.

Cleaning of vehicles

The tracking of mud and waste by vehicles was not being minimised in accordance with the LEMP, which specified the installation of wash bays and the sealing and gravelling of roads (4 facilities).

Vehicles using landfill sites will inadvertently collect mud and litter on their wheels as they drive to and from the active tipping face. Operators should ensure that all mud and waste materials are removed from vehicles before the vehicles leave the site, to minimise the effects on both local amenity and quality of stormwater runoff. Controls may include sealing and gravelling roads and washing wheels.

Monitoring

Monitoring of air emissions and discharges to waters allows the operator to determine the nature of any pollution caused by activities at the facility, and provides the basis for actions required to rectify a problem. The occupier must monitor at sufficient frequency to characterise the level of pollutants discharged from the facility.

Issues related to monitoring were identified at 21 of the 30 facilities audited.

Monitoring of surface water, groundwater and leachate

Issues related to monitoring of surface water, groundwater and leachate were identified at 19 of the 30 facilities audited:

- Surface water was not monitored or was not monitored as required. This included monitoring for the required indicators, using the units of measure, monitoring at the required frequency, and monitoring at the required locations (13 facilities).
- Groundwater was not monitored or was not monitored as required. This included monitoring for the required indicators, using the units of measure, monitoring at the required frequency, monitoring at the required locations, and using the method detection limits (10 facilities).
- A sample of uncontaminated groundwater to establish the baseline concentrations had not been taken or was not analysed for some indicators (2 facilities).
- The groundwater assessment program was not carried out (1 facility).
- A groundwater monitoring program was not established by the specified date (1 facility).
- Groundwater monitoring bores were located at the site, but details could not be provided on how they were used to assess the effects the landfill operation was having on the surrounding groundwater (1 facility).
- Groundwater that was intercepted to reduce pressure on the landfill liner was discharged to a storage pond. Water in the pond was analysed for conductivity before discharge to the creek, but no other contaminants were analysed, raising the concern that contaminants may be discharged (1 facility).
- Leachate was not monitored (4 facilities).
- The volume of leachate in the leachate holding ponds or dams was not monitored or recorded as required (3 facilities).
- Monitoring points were not maintained (3 facilities).

Twenty of the facilities audited were required to monitor leachate and 16 were required to monitor groundwater and surface water.

Monitoring of dust and gas

Issues related to monitoring of dust and gas were identified at 8 of the 30 facilities audited:

- Dust deposition was not monitored or was not monitored at the required frequency (2 facilities).

- Gas was not being monitored or was not being monitored as required by the licence, including monitoring at the required frequency, using the units of measure, and monitoring at the required locations (7 facilities).
- There was failure to review the results of an initial gas survey to determine the risk of landfill gas build-up (1 facility).

Monitoring of landfill space

Failure to monitor the remaining disposal capacity of the landfill was identified at 4 of the 30 facilities audited.

All monitoring equipment must be maintained and operated in a manner that ensures that accurate monitoring is carried out at the facility. The effectiveness of all pollution control equipment should be monitored to enable the identification of equipment failure that would cause the discharge of pollutants to atmosphere or to waters. Operators should review and interpret monitoring results and use the results as part of the ongoing management of the landfill.

It is important for operators to demonstrate that the site operations are monitored and managed appropriately and to estimate the volume of waste landfilled and the volume of space remaining.

Administration

Issues related to administrative requirements were identified at 26 of the 30 facilities audited.

Waste recording and reporting

Issues related to waste recording and reporting were identified at 16 of the 30 facilities audited:

- Facilities failed to provide the EPA with information on the quantity of waste received at the facility and the quantity of waste transported from the facility for each quarter, or failed to provide this information after the due date (12 facilities).
- Facilities failed to report and pay the waste levy for waste received that has been generated in the Extended Regulated Area (1 facility).
- Facilities failed to record the quantity of contaminated soil received at the facility or the amount of remediated soil used for fill in accordance with a notice (1 facility).
- Facilities failed to record or accurately record the quantity of waste received (3 facilities).
- Composting was being carried out at the facility but the volume of material being received was not known. The activity may have been a scheduled activity and therefore would need to be specified on the existing licence (1 facility).

Operators should ensure that the quantities and types of waste received are recorded and kept. The types of waste received at a landfill determine the potential pollutants that can be generated and hence the potential environmental risk.

Submission of other information

Failure to provide information and data to the EPA was identified at 12 of the 30 facilities audited:

- The statement of compliance or certificate of compliance required to be submitted annually to the EPA was not submitted or was submitted after the due date (8 facilities).
- A certificate of compliance for a pollution control approval was not submitted (1 facility). (Note: Pollution control approvals are not required under the POEO Act.)
- Facilities did not submit an annual report to the EPA within 6 weeks of the anniversary date of the licence (3 facilities).
- The achieved compaction rate of landfilled waste was not reported in the annual report (1 facility).

- Facilities did not submitting information required by environmental improvement programs, including proposals, plans and results of investigations (4 facilities).
- Facilities failed to formally advise the EPA of the names and telephone numbers of those people authorised by the licensee, or did not advise of changes to the authorised persons (7 facilities).
- Facilities failed to provide the EPA with an after-hours telephone number, pager number or 24 hours contact number to allow the EPA to contact representatives of the licensee (6 facilities).
- Failure to provide the licence number and file number on all correspondence to the EPA as required (4 facilities).
- The licence information form provided to the EPA was incomplete, as an ancillary activity was not included (1 facility).

It is important that all information required by the EPA as a condition of a licence be provided within the required timeframe. The EPA uses this information to regulate the environmental impacts of the site.

Reporting of events

Failure to report events occurring at the facility as required was identified at 6 of the 30 facilities audited. Facilities did:

- not report when groundwater results indicated pollution (1 facility).
- not report discharge of leachate to surface waters as required (1 facility).
- not report the occurrence of fires (2 facilities).
- not report events which were likely to cause environmental harm, including discharges of leachate to surface waters (2 facilities).

It is important that operators report events to the EPA that are causing or have the potential to cause environmental harm so the EPA can monitor any environmental impacts and follow-up actions.

Records of monitoring

Failure to record and keep monitoring records as required was identified at 21 of the 30 facilities audited:

- Monitoring results submitted to the EPA did not show the required information, including the name of the laboratory used, whether the laboratory was accredited with the National Association of Testing Authorities, the licence number and the file number (3 facilities).
- Facilities failed to record all information required in relation to samples collected, including the time, date and name of collector (11 facilities).
- Facilities failed to record and retain the results of all monitoring as required (6 facilities).
- Facilities failed to carry out monitoring in accordance with the EPA's Approved Methods Manuals (see below), the licence or a method approved by the EPA (15 facilities).
- Analysis was not carried out by a certified laboratory, which was not independently accredited to perform an analysis (1 facility).
- Facilities did not maintain a log or record the specified information in relation to fires (9 facilities).

The operator should keep accurate and detailed records of monitoring for quality assurance purposes and to ensure that the monitoring data can be interpreted and acted upon.

Monitoring must be undertaken in accordance with the EPA's Approved Methods Manuals (*Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales* (EPA, 2001) or *Approved Methods for the Sampling and Analysis of Water Pollutants in New South Wales* (EPA, 1998)) to provide confidence that the results of the monitoring reflect the true nature and environmental

impact of emissions. If methods are not specified in the manuals, monitoring must be undertaken in accordance with any methodology that a licence condition requires or, if there is no such requirement, any methodology approved by the EPA in writing.

Pollution complaints

Issues related to pollution complaint records or telephone lines were identified at 13 of the 30 facilities audited:

- The record of pollution complaints kept by the licensee in accordance with the licence was incomplete or a record of complaints was not kept (10 facilities).
- Facilities did not notify the public of the existence of a telephone complaints line or did not operate a telephone line for the affected community (4 facilities).

Complaints received can be valuable tools for monitoring the environmental impact of an activity on the local community. By keeping the required information in relation to pollution complaints, operators will be in a position to clearly demonstrate that complaints are being satisfactorily addressed.

Keeping a copy of the licence on the premises

A copy of the licence was not kept on the premises and was not available for inspection by any employee or agent of the licensee working at the facility (13 of the 30 facilities audited).

The operator should keep a copy of the current licence on the premises. If all staff have access to the current licence they can be familiar with its requirements, and the potential for non-compliance with licence requirements will be minimised.

WHERE TO FROM HERE?

The issues identified in the representative sample of licensed rural landfill facilities (30 out of a total of 85 landfills licensed outside the Sydney Metropolitan Area and Extended Regulation Area) are likely to be generally typical of the whole rural landfill sector. Common issues identified related to land management and pollution or potential pollution of water. These issues were observed at 28 of the 30 audited facilities.

The results of the audits indicate that the industry could improve its compliance and environmental performance by:

- providing adequate controls to prevent surface water entering waste and leachate collection systems
- providing adequate controls to prevent sediment, litter and contaminants being carried off site
- providing adequate controls to prevent leachate escaping to groundwater and surface waters
- covering waste to minimise environmental impacts, including odour emissions, litter generation, leachate generation, landfill gas emissions, breeding of pests and the risk of fire
- monitoring emissions, discharges and pollution incidents at the facility and keeping records of the monitoring
- recording and reporting incoming and outgoing wastes and submitting other information to the EPA.

Although the EPA is ensuring that these issues are being addressed at the audited sites through a systematic and rigorous process of follow-up action programs, the issues are likely to be of concern at all facilities where waste is landfilled and thus warrant continuing attention by managers at all sites. The EPA will ensure that the issues identified are also addressed at the facilities that were not audited, encouraging managers to set priorities for action.

The EPA recognises that reporting on the state of the rural landfill industry's environmental performance will be a valuable management tool. It will therefore circulate information in this report to stakeholders and seek opportunities to work with the industry to improve its environmental performance.

The EPA will use the findings of this sector report to review how best it can use its resources to help the industry address the issues identified. The EPA will consider using a mix of education and regulatory instruments to address environmental issues that were found to be prevalent across the sector. The findings of this report will also be useful in the licence reviews that the EPA is required to undertake under the POEO Act.

APPENDIX A: LIST OF FACILITIES AUDITED

The findings of this report are based on the results of compliance audits on the following facilities:

Albury Landfill—Albury City Council

Armidale City Council Solid Waste Landfill—Armidale City Council

Bathurst Waste Management Centre—Bathurst City Council

Brobenah Hall Road Waste Depot—Leeton Shire Council

C & N Ruggiero Tyre Monofill—C & N Ruggiero Pty Ltd, Gibsonvale

Cooma Landfill—Cooma–Monaro Shire Council

Daroobalgie Waste Depot—Forbes Shire Council

Dungog Waste Facility—Dungog Shire Council

Glenlogan Road Landfill Facility—Cowra Shire Council

Goulburn City Council Waste Landfill Facility—Goulburn City Council

Grafton Regional Landfill—Grafton City Council

Gregadoo Waste Management Facility—Wagga Wagga City Council

Junee Waste Landfill Facility—Junee Shire Council

Lithgow Solid Waste Facility—Greater Lithgow City Council

Merimbula Waste Depot—Bega Valley Shire Council

Mudgee Waste Disposal Depot—Mudgee Shire Council

Murwillumbah Landfill—Tweed Shire Council

Muswellbrook Waste and Recycle Facility—Muswellbrook Shire Council

Nammoona Drive Landfill—Richmond Valley Council

Port Macquarie Waste Depot—Hastings Council

Red Hill Road Landfill Facility—Young Shire Council

Sawpit Creek Landfill—NSW National Parks and Wildlife Service, Sawpit Creek

Scone Waste Facility Area—Scone Shire Council

Singleton Waste Depot—Singleton Shire Council

Surf Beach Waste Depot—Eurobodalla Shire Council

Tamworth Forest Road Landfill—Tamworth City Council

Tuncurry Solid Waste Facility—Great Lakes Council

Victoria Street Landfill—Young Shire Council

Yarraman Landfill Controlled Waste Facility—Moree Plains Shire Council

Yenda Recycling and Waste Management Facility—Griffith City Council

Individual compliance audit reports for all of these facilities are publicly available in the EPA Library at Level 15, 59–61 Goulburn Street, Sydney.

REFERENCES

Environment Protection Authority. 1996. *Environmental Guidelines: Solid Waste Landfills.* EPA 95/85

Environment Protection Authority. 1997. *EPA Compliance Audit Handbook.* EPA 97/5

Environment Protection Authority. 1998. *Approved Methods for the Sampling and Analysis of Water Pollutants in New South Wales.* EPA December 1998

Environment Protection Authority. 1999. *Environmental Guidelines: Assessment, Classification & Management of Liquid & Non-Liquid Wastes*. EPA 99/21

Environment Protection Authority. 2001. *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales.* EPA 2001/55