

17 November 2008

Mr Anthony Lane
Environmental Auditor
Lane Piper Pty Ltd
Bldg 2, 154 Highbury Road
BURWOOD VIC 3125

Received Lane Piper Pty Ltd 19 NOV 2008	
Job No.	APL



Our ref: 61457

Dear Mr Lane

RE: DRAFT OBJECTIVES, SCOPE AND METHODOLOGY ENVIRONMENTAL
- GROUNDWATER, STEVENSONS ROAD LANDFILL, CRANBOURNE

Thank you for submitting the above scope of audit to EPA for review on the 10
November 2008.

As you are aware, since the last audit landfill gas sourced from the former
Stevensons Road Landfill and migrating under Brookland Greens Estate has
led to a state emergency management situation. Although CFA has now
assessed the risk as tolerable, the underlying hazard from landfill gas under the
estate remains.

EPA advises that the following areas should be incorporated into the audit.

- Advise on the extent of groundwater contamination beyond the premises boundary, or where information is unavailable, recommend measures to delineate any groundwater contamination in the shortest time achievable.
- Advise on the adequacy and recommend any measures necessary to enhance leachate extraction, storage and disposal in order to maximize gas extraction to reduce the off-site migration of landfill gas and leachate.

EPA further advises that the following areas should be included either the air or groundwater audit as appropriate:

- Assessment of the risk from the generation and transport of landfill gas from any leachate contaminated groundwater and the extent to which this source of landfill gas is effecting the environment and beneficial uses outside the boundary of the premises.
- It is unclear whether the audit will assess landfill gas pathways through the saturated and/or unsaturated zones outside the landfill: and in particular whether there is perching of groundwater outside the landfill and whether unsaturated zones exist beneath any perched groundwater layer which are providing a pathway for landfill gas to travel at distance off-site.
- Whether the mitigation options proposed by the occupier will be effective in controlling leachate and landfill gas at the boundary of the premises.
- Whether the current monitoring network within the estate and along the boundary of the landfill is adequate to assess the migration of landfill

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gas and leachate off-site, and where information is unavailable recommend improvements to the monitoring network which will assess the potential for landfill gas and leachate to migrate off-site prior to it effecting residents.

If you have any questions regarding the above, please contact me on 9695 2742.

Yours sincerely



JESSICA KRESS
WASTE MANAGEMENT UNIT

cc. Brian Eva

17 November 2008

Mr Brian Eva
Principal & Environmental Auditor
Eva & Associates Pty Ltd
PO Box 174
CARNEGIE VIC 3163

Our ref: 61457

Dear Mr Eva

RE: DRAFT OBJECTIVES, SCOPE AND METHODOLOGY ENVIRONMENTAL
– AIR, STEVENSONS ROAD LANDFILL, CRANBOURNE

Thank you for submitting the above scope of audit to EPA for review on the 10
November 2008.

As you are aware, since the last audit landfill gas sourced from the former
Stevensons Road Landfill and migrating under Brookland Greens Estate has
led to a state emergency management situation. Although CFA has now
assessed the risk as tolerable, the underlying hazard from landfill gas under the
estate remains.

EPA has the following comments in regards to the scope of audit:

- It is unclear what the audit won't be doing (no exclusions listed in the scope), eg will the audit be undertaking modeling, a health risk assessment, or independent sampling and laboratory analysis?
- Expert support has not been identified.
- Point 6 under Audit Methodology refers to a check of compliance with the EPA licence requirements for landfill gas monitoring. Please be advised that there is no licence currently on the site and that the Pollution Abatement Notice is the EPA statutory document in place.

EPA advises that the following areas should be incorporated into the audit.

- Advise on the extent of landfill gas migration beyond the premises boundary, or where information is unavailable, recommend measures to delineate any landfill gas migration in the shortest time achievable.
- Advise on the effectiveness of the landfill gas extraction system across the entire premises – ie. lots 7, 9 10, 11 and 12.
- If the level of risk to the air environment is considered unacceptable, then an assessment of the landfill gas management system against best practice requirements is conducted with recommendations and implementation timetable of actions to reduce the risk to acceptable levels.

EPA further advises that the following areas should be included either the air or groundwater audit as appropriate:



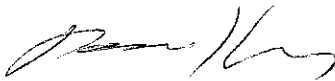
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- Assessment of the risk from the generation and transport of landfill gas from any leachate contaminated groundwater and the extent to which this source of landfill gas is effecting the environment and beneficial uses outside the boundary of the premises.
- It is unclear whether the audit will assess landfill gas pathways through the saturated and/or unsaturated zones outside the landfill: and in particular whether there is perching of groundwater outside the landfill and whether unsaturated zones exist beneath any perched groundwater layer which are providing a pathway for landfill gas to travel at distance off-site.
- Whether the mitigation options proposed by the occupier will be effective in controlling leachate and landfill gas at the boundary of the premises.
- Whether the current monitoring network within the estate and along the boundary of the landfill is adequate to assess the migration of landfill gas and leachate off-site, and where information is unavailable recommend improvements to the monitoring network which will assess the potential for landfill gas and leachate to migrate off-site prior to it effecting residents.

If you have any questions regarding the above, please contact me on 9695 2742.

Yours sincerely



JESSICA KRESS
WASTE MANAGEMENT UNIT

cc. Anthony Lane

Our Ref: 0664ALetter03.2

24 November 2008

EPA Victoria
Landfill Unit, Waste Management Unit,
40 City Road
Southbank, Vic 3006

Attention: Ms Jessica Kress

Dear Ms Kress,

Objectives, Scope & Methodology – Environmental Audit (s53V) Groundwater Quality Stevensons Road Landfill, Cranbourne, Vic

1 INTRODUCTION

I am writing to present my understanding of the objectives and required scope and methodology of an environmental audit requested at this site/facility. This audit would be undertaken under the provisions of Part IXD of the *Environment Protection Act 1970*, and in particular section 53V in relation to the risks of harm to the environment.

I have already notified the EPA Environmental Audit Team in Melbourne of the particulars of the audit request on 22 September 2008 as set out in the following section.

The Environmental Protection Authority (EPA) issued a Pollution Abatement Notice to Casey City Council for the site on 3 January 2007 under section 62 of the *Environment Protection Act 1970*.

The PAN includes a condition relating to an Environmental Audit of the “*the risk of any possible harm or detriment to groundwater or air¹ caused by current and past industrial processes and activities, waste or substance at the premises*” (Requirement 27 of the PAN), which will be in accordance with section 53V of the Act. That is the subject of the current audit.

The deadline for the audit in the licence is 30 October 2008. However, due to the late submission of the annual Groundwater and Leachate Monitoring Review (caused by the addition of 12 new monitoring boreholes), the Casey City Council sought an extension to 30 November 2008 for this year’s audit.

¹ A separate audit of air quality and landfill gas is being undertaken by another auditor in parallel with this audit.

2 AUDIT REQUEST DETAILS

The following summarises the key details on the site and the audit request, as provided to EPA in my letter of notification, for your information: **Table 1: Audit Request Details**

Information Required	
Auditor	Anthony Lane
Auditor Term of appointment	29 July 2005 to 28 July 2009
Name of Person Requesting Audit	Michael Jansen
Relationship to Premises	Senior Waste Management Officer, Casey City Council
Date of Request	
Proposed completion date of the audit	30 November 2008
Reason for Audit	Pollution Abatement Notice
Description of activity to be audited	Former Landfill –Disposal of municipal solid waste (including putrescibles) to land
EPA Region	South Metro
Site / Premises name	Stevensons Road Landfill
Building / complex sub-unit No	
Street / Lot - Lower No.	Lots 7, 9, 10, 11 & 12
Street / Lot - Upper No.	
Street Name	Stevensons
Street type (road, court, etc)	Road
Street suffix (North, South etc)	
Suburb	Cranbourne
Postcode	3977
GIS Coordinate of Site Centroid	
Longitude / Northing (GDA 94)	5779515
Latitude / Easting (GDA 94)	348070
Proposed members of support team	<ul style="list-style-type: none"> ● John Piper – Remedial technologies and geotechnology ● Jon Bartley – Hydrogeology ● Peter Gringinger – Remedial technologies and geotechnology, Hydrogeology ● Brian Eva – Air quality & OHS

3 AUDIT PURPOSE & OBJECTIVES

The purpose of the audit as understood by the Auditor is to provide the community, EPA, the client and other stakeholders with confidence in the process and outcomes of an assessment of the risk of any possible harm or detriment to groundwater caused by the premises' use as a landfill. The audit should also propose measures required to reduce any risks and subsequently maintain risks at an acceptable level for groundwater impacts, with a view to restoring relevant beneficial uses of the groundwater at and from the site, if necessary.

The objectives of this Environmental Audit as expressed in the EPA PAN for the site are:

- To develop a Conceptual Hydrogeological Model which provides an understanding of the occurrence of groundwater (both perched and permanent), the extent of contaminated groundwater and leachate occurrence and movement both beneath the site and beyond the site boundary. This should also provide some insight into the opportunity for landfill gas migration through the soil.
- To assess risks to the environment that may arise particularly from polluted groundwater;
- To assess the potential for generation of landfill gas from any leachate or contaminated groundwater migrating beyond the premises boundary.
- To assess the extent to which the landfill gas is affecting the beneficial uses of groundwater outside the boundary of the premises.
- To assess the adequacy of the groundwater and leachate monitoring program and recommend measures to further delineate any off-site groundwater contamination in order to determine the status of the groundwater quality.
- To assess the adequacy of the current and proposed leachate extraction, storage and disposal at the site and provide recommend measures to reduce off-site migration of leachate.

4 AUDIT SCOPE

This section provides a discussion of the scope to be applied to this audit for the purpose of achieving these objectives, and complying with relevant legislations, policies, regulations and EPA requirements.

The audit conducted under s53V of the Act will address the objectives set out above, from our understanding of the site and discussions with Casey City Council. The key aspects of the scope of the audit, in accordance with EPA Publication 953.2 are:

- The activity undertaken (and the components of the activity) in respect of which the audit is conducted
- The segments of the environment to be considered
- The elements of the environment to be considered
- The beneficial uses to be considered
- Risk assessment to be conducted
- The period of time over which the audit is to be conducted
- Exclusions from the scope of the Audit

It is understood that the scope presented in this letter and the criteria for the audit are subject to further negotiations and agreement between EPA, client and the Auditor.

The Activity Audited:

- The activity audited is the former municipal solid waste landfill at Stevensons Road, Cranbourne.

The Segment Audited:

- The segment audited is the former landfill located at Lots 7, 9, 10, 11 & 12 Stevensons Road, Cranbourne, Victoria, and any areas adjoining the landfill where leachate contaminated groundwater has migrated..

The Elements Audited:

- The element subject to auditing is the groundwater occurring within the segment in both the Brighton Group Aquifer and the Silurian Bedrock Aquifer.

The Beneficial Uses:

- The beneficial uses of groundwater are as set out in Table 2 of SEPP Groundwaters of Victoria (1997) for Segment A1 groundwater (based on previous audits).

The Risk Assessment to be Conducted:

- The risk assessment to be undertaken is described in the “Audit Methodology” section below, which is a qualitative assessment.

The Period of Time:

- The audit is intended to be completed on the basis of currently available information or that which is currently being acquired. Consequently, the audit report would be completed by 30 November 2008.

Exclusions from the Audit Scope:

The current audit is focussed on the determination of the risk of any possible harm or detriment to groundwater caused by current and past industrial processes and activities, waste or substance at the premises. The audit does not include:

- The assessment of other groundwater contaminants potentially arising from other nearby sources;
- A total assessment of the site to determine suitability for future use of the entire parcel of land at the site or surrounding areas.
- The generation, migration or risks associated with landfill gas (except to the extent identified in the audit scope).

5 AUDITOR’S SPECIALIST SUPPORT TEAM

The audit will be carried out with the assistance of the Auditor’s Specialist Support Team, approved by EPA, whose roles are outlined in the following table.

Table 2: Auditor’s Specialist Support Team

Person	Role	Company
John Piper	Remedial technologies and geotechnology	Lane Piper
Jon Bartley	Hydrogeology	Lane Piper
Peter Gringinger	Remedial technologies and geotechnology, Hydrogeology	Lane Piper

Person	Role	Company
Brian Eva	Environmental chemistry, Contaminant transport and assessment of exposure pathways and risk	Eva & Associates

6 AUDIT METHODOLOGY

The proposed methodology of work for this audit is as follows;

1. **Develop the Scope & Criteria of the Audit:** At commencement of the audit, the auditor will hold discussions with the client and EPA to ensure that the scope of the audit and the criteria to be applied and the extent of any risk assessment are defined. A draft Audit Scope letter will be prepared and submitted to the client for review. If required a draft will also be submitted to EPA and their comments will be considered and then the scope of the Audit finalised and formalised through the submission of a final Audit Scope letter to the EPA.
2. **Familiarisation and Preliminary Document Review:** This task will involve familiarisation with the reports and documents provided by client and assessor / engineer, and EPA directives, advice and PAN relevant to the audit.
3. **Site Inspection:** The Auditor and his assistant would normally perform at least one site inspection, preferably with the Assessor and client. Allowance is made in the cost estimate for only one site inspection. Further site inspections may be required if multiple phases of investigation, clean up or construction are involved.
4. **Review of Environmental Assessment & Monitoring Reports:** This includes an examination of the available data to verify its reliability, by discussion with the Assessor and others as necessary. Depending upon the completeness of the Assessor's work and their report, the Auditor may require further work and/or amplification of the ESA report. We have allowed for the review of the following documents:
 - Annual Groundwater and Leachate Monitoring Review 2008, Stevensons Road, Cranbourne, 30 October 2008
 - Previous Monitoring Reviews and all other available hydrogeological data of relevance to the Audit.
5. **Verification Sampling and Testing:** The Auditor's team may need to perform some limited sampling and testing to verify the results of the Assessor. In cases where a significant quantity of validation sampling is required to check on the effectiveness of remediation, the Auditor has the option of conducting the validation testing, thus satisfying these concerns. It is not proposed to undertake any sampling or testing at this time. However the Auditor's review might indicate the need for such work. This would be discussed with the client and EPA prior to conducting the further work.
6. **Preliminary Conceptual Hydrogeological Model (CHM):** Using all data available to the Auditor, a CHM will be developed which explores the natural and man-made (quarry and landfill) geological conditions, the occurrence and movement of leachate and groundwater beneath the site and beyond the site boundary. This will include as assessment of the potential for groundwater migrating off-site to generate significant volumes of landfill gas. More specifically, the CHM will address the following:
 - a. Assess the natural hydrogeological conditions controlling groundwater and leachate (both perched and permanent) occurrence and movement (and landfill gas migration) beneath the site and beyond the site boundary;
 - b. Assess the extent of groundwater contamination beyond the site boundary, or where information is unavailable recommend measures best options to delineate off-site groundwater contamination;

- c. Assess the risk from the generation and transport of landfill gas from any leachate contaminated groundwater and the extent to which this source of landfill gas is affecting the beneficial uses of groundwater outside the site boundary;
 - d. Assess the effectiveness of the current leachate control measures in place at the site and recommend measures to enhance the understanding of leachate generation, occurrence and mitigation.
7. **Development of the Preliminary Conceptual Hydrogeological Model:** The Auditor will lead a workshop attended by the Assessor (ENSR) and the Landfill Site Engineer. The aim of the workshop is to bring together the best available knowledge sources on site processes and ongoing investigation works in order to improve the preliminary CHM.
 8. **Assess Risk to Groundwater:** Undertake an assessment of risk, to determine the acceptability of the risk to protected beneficial uses of groundwater. The extent of this work includes a qualitative assessment based on water quality criteria and hydrogeological interpretations. The significance of risks would be assessed in the context of the likelihood of beneficial uses being realised, and the practicability of any remediation.
 9. **Prepare a Draft Audit Report:** Upon completion of the Audit (subject to any directions by EPA), a Draft Audit Report will be prepared in which reviews the adequacy of the assessment and presents a discussion on the environmental quality of the segment and elements under consideration. The draft report will be submitted to the client for review, although the Auditor is unlikely to make changes to the report other than those required due to the inclusion of incorrect factual information.
 10. **Issue of Audit Report:** Upon receipt of the client's comments on the draft, a detailed Audit Report will be finalised and issued. The format of the audit report documentation proposed to be issued by Lane Piper is as follows (depending on the size and complexity of report required):
 - The Audit Report and appendices are presented in digital form and e-Report on CD-ROM or similar storage medium, in file formats such as Adobe Acrobat and TIF. These would be in print-ready form acceptable to a printing shop.
 - One copy of the Audit Report would be forwarded on a CD ROM to each of the client, the EPA Audit Team and EPA client manager, in accordance with EPA guidelines.
 - Paper copies of the Executive Summary of the Audit Report are also provided to each of the client and the EPA
 - EPA have recently (EPA Pub 1147, Sept 2007) required a paper copy of the audit report, and a specially EPA archive format CD-ROM.

7 AUDIT CRITERIA

The criteria for the audit are found in the Environment Protection Act 1970 and the relevant policies for land and water protection. These policies in turn refer to guidelines such as contaminated land assessment and water quality guidelines.

Again, in accordance with guidance from EPA, any audit undertaken by an EPA-appointed Environmental Auditor in his statutory capacity is a statutory audit. In this case the audit is to be conducted under s.53V of the *Environment Protection Act 1970*.

The adopted Criteria for use in assessing data and other information provided in the course of the audit include:

Applicable Environmental Regulations

- *Environment Protection Act 1970*

- *Water Act 1989*
- *SEPP Groundwaters of Victoria*, and related water quality guidelines
- *SEPP Waters of Victoria*
- *SEPP Prevention and Management of Contamination of Land*
- *Waste Management Policy (Siting, Design & Management of Landfills)*

Guidelines

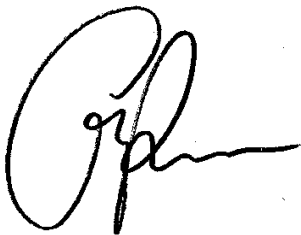
- EPA (2006) *Hydrogeological Assessments (Water Quality) Guidelines*. Publication 668, September 2006
- EPA (2002) *The Clean Up and Management of Polluted Groundwater*. Publication 840, April 2002.
- EPA (2007) *Environmental Auditor Guidelines for the Preparation for Environmental Audit Reports on Risk to the Environment*. Publication 952.2, August 2007
- EPA (2007) *Environmental Auditor Guidelines for Conducting Environmental Audits*. Publication 953.2, August 2007.
- Australian & New Zealand Environment & Conservation Council (1992) *Guidelines for the Assessment & Management of Contaminated Sites*

Site-Specific Environmental Licences, Plans and Reports

- Pollution Abatement Notice issued by EPA to Casey City Council on 3 January 2007;
- Lane Piper (2007). Environmental Audit Report – Groundwater: Stevensons Road Landfill, Cranbourne, Victoria, for Casey City Council, December 2007 (Ref: 0664ARreport01.1).
- ENSR Australia Pty Ltd (2008). Annual Groundwater and Leachate Monitoring Review, Stevensons Road, Cranbourne, October 2008 (Ref: M38809_RPT01_30Oct08.doc).

I seek your comments on this scope of audit, or concurrence that this is acceptable to EPA. If you have any queries or comments, please contact Anthony Lane or Rebecca Kelly on 03 9888 0100.

Yours faithfully
Lane Piper Pty Ltd



Anthony P Lane
Environmental Auditor
(appointed pursuant to the environment protection act 1970)

24 November 2008

Mr Anthony P Lane
Environmental Auditor
Land Piper Pty Ltd
Bldg 2, 154 Highbury Road
BURWOOD VIC 3125

Our ref: 61457-9

Dear Mr Lane

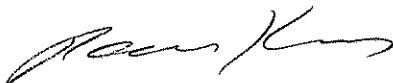
RE: OBJECTIVES, SCOPE & METHODOLOGY – ENVIRONMENTAL AUDIT
(s53V) GROUDWATER QUALITY
STEVENSONS ROAD LANDFILL, CRANBOURNE, VIC

Thank you for submitting your letter regarding the above scope of audit to EPA
for review on the 24 November 2008.

EPA accepts the scope of audit as detailed in the above letter.

If you have any questions regarding the above, please contact me on 9695
2742.

Yours sincerely



JESSICA KRESS
WASTE MANAGEMENT UNIT



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