



*Territory and
Municipal Services*

*Review of monitoring
and forecasting
practices associated
with Mugga Lane
Resource
Management Centre
landfill capacity*

Final

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pwc

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Disclaimer

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Our work was limited to that described in this report and was performed in accordance with International Standards for the Professional Practice of Internal Auditing from the Institute of Internal Auditors. It did not constitute an examination or a review in accordance with generally accepted auditing standards or assurance standards. Accordingly, we provide no opinion or other form of assurance with regard to our work or the information upon which our work was based. We did not audit or otherwise verify the information supplied to us in connection with this engagement, except to the extent specified in this report.

Our work was based on consultations undertaken with TAMS personnel and information provided to us by ACT NOWaste in response to documentation requests. No guarantee is made as to the completeness of the information provided. We did not consult with, or obtain information directly from, Remondis during this engagement.

1 Introduction

PwC was engaged to review certain practices and processes associated with the management of landfill operations at the Mugga Lane Resource Management Centre (Mugga Lane). Remondis Australia Pty Ltd (Remondis) is the contracted service provider of landfill operations at Mugga Lane, with the ACT NOWaste business unit (ACT NOWaste) responsible for contract management on behalf of the Territory and Municipal Services Directorate.

The Mugga Lane landfill site includes three active areas, being:

- the main current cell
- the v-notch, and
- the south east extension

These areas were forecast by ACT NOWaste to provide sufficient landfill capacity for Canberra and surrounding regions until approximately June 2015, by which time the construction of the new Area 2 and Copse (A2AC) landfill cell is expected to be complete and operational.

In early August 2014, it became apparent to ACT NOWaste that there was insufficient operational capacity at Mugga Lane to service the region until mid-2015 and that accessible airspace could run out as early as October 2014.

In response, the Territory has activated its standby/emergency landfill site at West Belconnen, taken steps to bring forward completion of the A2AC cell and is investigating other options to increase accessible airspace within the current cells.

2 Scope

The overarching objective of the engagement was to review practices, processes and related contract management activities associated with the earlier than expected consumption of landfill capacity at Mugga Lane. Specific areas to be addressed within the scope of the review included:

1. whether proper contract management practices have been applied by ACT NOWaste management
2. the methodology applied by ACT NOWaste in the calculation of timelines for landfill capacity at Mugga Lane
3. when and how it was known by ACT NOWaste that Mugga Lane would exceed capacity
4. what immediate actions were taken by ACT NOWaste management as a result of this discovery, including timelines of actions, and
5. the impact on the ACT's waste strategy, including meeting its waste targets.

Please refer to Appendix A for our methodology/approach in undertaking this review.

3 Overview of findings

Overall, adequate contract management practices have not been applied by ACT NOWaste management in relation to the monitoring and forecasting of landfill capacity at Mugga Lane. Particular areas for improvement identified during the review include:

1. **Clarity of roles, responsibilities and processes**

The review identified a lack of clarity in relation to roles, responsibilities and processes, with uncertainty as to which Section and personnel within ACT NOWaste have ultimate responsibility for monitoring landfill consumption and forecasting remaining landfill capacity, and how those processes are to be undertaken.

2. **Monitoring and forecasting**

Overall, landfill consumption monitoring and forecasting practices within ACT NOWaste have not been robust or well documented. This includes the use of reporting provided by Remondis. Landfill consumption and capacity forecasts are prepared by Remondis, however there was insufficient evidence of these reports from Remondis being adequately analysed, used or challenged by ACT NOWaste over the two year period to August 2014.

3. **Capacity and capability**

A consistent message received during stakeholder consultations was that there are long-standing capacity and capability issues from a staffing perspective within ACT NOWaste that need to be addressed in order to avoid future contract management failures. There is a need for increased communication between ACT NOWaste contract management personnel and Remondis operational and contract management personnel, including an increased onsite presence by ACT NOWaste to assist in understanding and managing operational site issues. An increased use of external landfill specialists by ACT NOWaste appears necessary, at least in the short-term, to provide advice and assist in the management of onsite landfill practices by Remondis.

During the review we were provided with numerous pieces of correspondence dating as far back as November 2012 that indicated concerns from Remondis related to the possibility of landfill capacity at Mugga Lane being reached prior to activation of the new A2AC cell. However, these correspondences were:

- not specific as to when Remondis believed capacity would be reached, or
- indicated that Remondis believed capacity would be reached in May or June 2015, which was largely consistent with ACT NOWaste forecasting, or
- indicated that Remondis had concerns over capacity, subject to additional capacity being obtained from the v-notch and the south east extension, both of which were implemented and provided additional capacity.

Based on the stakeholder consultations and information provided to us during our review, it was early August 2014 when ACT NOWaste became aware of serious concerns in relation to operational capacity at Mugga Lane. On or about 12 August 2014, an onsite meeting was held between Remondis and ACT NOWaste at the landfill site. At that meeting Remondis informed ACT NOWaste that operational capacity at the site was not sufficient to reach mid-2015 and space could run out as early as October 2014.

Emergency action has been taken by ACT NOWaste following this meeting, including activating the Territory's standby/emergency landfill site at West Belconnen, taking steps to bring forward completion of the A2AC cell and investigating other options to increase available airspace within the current cells, including via reshaping the current landfill area.

4 Detailed Findings

Below we have provided our response against the five specific scope items listed in section 2.

4.1 Resourcing and contract management

Scope item: Whether proper contract management practices have been applied by ACT NOWaste management

A consistent message received during stakeholder consultations was that there are long-standing capacity and capability issues from a staffing perspective within ACT NOWaste that need to be addressed in order to avoid future contract management failures.

In relation to the monitoring and forecasting of landfill capacity at Mugga Lane, adequate contract management practices have not been applied by ACT NOWaste management. Particular areas for improvement identified during the review include:

- **Clarification of roles and responsibilities** – in particular, clarification of which Section within ACT NOWaste has the responsibility for monitoring landfill consumption and forecasting remaining landfill capacity; Assets and Capital Works Section or Procurement and Contracts Section. An understanding of these roles and increased communication between the Sections appears necessary, especially in situations where existing service contracts are interdependent with new construction work.
- **Developing and documenting key processes** – in particular:
 - A defined methodology for landfill capacity forecast calculations, including guidance on what information sources are to be relied upon (e.g. landfill surveys, weighbridge data and Remondis reports) and what supporting assumptions are to be used (refer to section 4.2 for further details).
 - Processes for monitoring landfill consumption, including waste tonnage but also clean fill tonnage (refer to section 4.5 for further details).
- **Increased communication between ACT NOWaste and Remondis** – stakeholder consultations indicated a need for strengthening of relationships between ACT NOWaste and Remondis. There is a need for increased communication between ACT NOWaste contract management personnel and Remondis operational and contract management personnel, including an increased onsite presence by ACT NOWaste.
- **Increased use of external landfill specialists by ACT NOWaste** – given the capacity and capability issues reported within the ACT NOWaste team, an increased use of external landfill specialists by ACT NOWaste appears necessary, at least in the short term, to provide advice and assist in the management of onsite landfill practices by Remondis.

4.2 Forecasting of landfill capacity

Scope item: The methodology applied by ACT NOWaste in the calculation of timelines for landfill capacity at Mugga Lane

There is no documented or consistent methodology applied by ACT NOWaste for the forecasting of landfill capacity at Mugga Lane.

Inadequate records of forecasting have been maintained for the period up until August 2014. Based on the limited forecasting calculations provided for our review, our analysis identified differing methodologies and a number of factors impacting on the reliability, accuracy and usefulness of these forecasts:

1. Potential airspace v operational airspace

The majority of landfill capacity forecasts have been in relation to the total 'potential' airspace available (acknowledging that certain capacity forecasts by ACT NOWaste included a 20% reduction in capacity due to work on the adjacent A2AC cell limiting access to parts of the current landfill area).

'Operational' airspace, being the airspace that Remondis can access and utilise at a particular point in time, has not been adequately considered. Surveys and forecasts related to the total potential airspace available are useful as a means of measuring long-term landfill capacity, but are not useful as a measure of landfill capacity in the short-term if Remondis is not able to access all portions of the landfill site.

From a 'potential' airspace perspective, a survey undertaken by Phil Grace Contracting Pty Ltd on behalf of ACT NOWaste in September 2014 has confirmed at least two years of 'potential' airspace in the current landfill area (main cell, v-notch and south east extension).

However, in early August 2014, Remondis raised serious concerns with ACT NOWaste in relation to the operational capacity of Mugga Lane. On or about 12 August 2014, an onsite meeting was held between Remondis and ACT NOWaste at the landfill site. At that meeting Remondis informed ACT NOWaste that operational capacity at the site was not sufficient to reach mid-2015 and space could run out as early as October 2014. Remondis advised of a number of factors impacting on the operational airspace available, including, but not necessarily limited to:

- work on the adjacent the A2AC cell limiting access to parts of the current landfill area; and
- WHS concerns restricting accessibility of trucks and compactors to parts of the current landfill area.

As at the date of drafting this report, there had been no survey undertaken of the 'operational' airspace available at Mugga Lane. As a result, the current operational capacity of the site remains unknown. We were advised that a survey is being undertaken by Remondis to determine the amount of operational airspace that will be available following a proposed reshaping of the current landfill area.

Phil Grace Contracting Pty Ltd, in its report to ACT NOWaste dated 10 November 2014, has recommended aerial landfill surveys be conducted every three months for the next 12 months in order to obtain a better understanding of how the airspace is being consumed, and then at least every six months thereafter. We were advised by ACT NOWaste that these surveys will be in addition to quarterly surveys contractually required to be undertaken by Remondis. This will allow for comparison and confirmation of survey data.

2. Use of estimated figures

Based on records available, it appears that prior to August 2014, most ACT NOWaste landfill capacity forecasts used estimated amounts for prior years, including annual waste tonnages, volume consumed and volume remaining, rather than actuals. On the whole,

there was insufficient evidence of actual tonnage figures (e.g. via weighbridge data) and actual volume data (e.g. via survey reports) being used prior to August 2014 as the basis for forecasting future capacity, with varying impacts in terms of the accuracy of forecasts.

Subsequent to the landfill capacity concerns being identified in August 2014, forecasting practices and the use of 'actuals' have improved. This includes the use of landfill survey reports from Remondis. These reports provide, amongst other information, actual waste tonnages (advisedly from weighbridge data), surveyed volumes consumed (m³) from PHL Surveyors and an estimation of remaining capacity/time from Remondis based on a calculation of original potential volume less space consumed to date.

We note that certain figures and assumptions supporting Remondis' estimations require clarification and verification before they should be relied upon. For example, the source and accuracy of the 'Total Volume of Pile (m³)' figure¹ used and whether it includes the additional capacity created by the v-notch and south east extension.

Based on records available and stakeholder consultations undertaken, there is insufficient evidence of these landfill survey reports from Remondis being adequately analysed, used or challenged by ACT NOWaste over the two year period to August 2014.

3. Quality assurance

Improved quality assurance over the forecasting calculations is considered necessary. Some mathematical errors were identified in forecasts prior to August 2014 and forecasts did not adequately reference the source of supporting assumptions.

¹ This figure appears to refer to the total original capacity of the current landfill cell (i.e. the capacity assuming the landfill cell is empty)

4.3 Knowledge that landfill capacity may be reached

Scope item: When and how it was known by ACT NOWaste that Mugga Lane would exceed capacity

The current landfill area is not close to exceeding its 'potential' capacity

A survey undertaken by Phil Grace Contracting Pty Ltd on behalf of ACT NOWaste in September 2014 has confirmed at least two years of 'potential' airspace in the current landfill area (main cell, v-notch and south east corner extension). However, operational capacity is significantly less than the total potential capacity.

The exact 'operational' capacity remaining remains unknown

As at the date of drafting this report, there had been no survey undertaken of the 'operational' airspace available at Mugga Lane. As a result, the current operational capacity of the site remains unknown. We were advised that a survey is being undertaken by Remondis to determine the amount of operational airspace that will be available following a reshaping of the current landfill area.

Serious operational capacity concerns became known to ACT NOWaste in August 2014

In early August 2014, Remondis raised serious concerns with ACT NOWaste in relation to the operational capacity of the landfill.

On or about 12 August 2014, an onsite meeting was held between Remondis and ACT NOWaste at the landfill site. At that meeting Remondis informed ACT NOWaste that operational capacity at the site was not sufficient to reach mid-2015 and space could run out as early as October 2014. Remondis advised of a number of factors impacting on the operational airspace available, including, but not necessarily limited to:

- work on the adjacent the A2AC cell limiting access to parts of the current landfill area; and
- WHS concerns restricting accessibility of trucks and compactors to parts of the current landfill area.

Based on stakeholder consultations and documents reviewed, this meeting was the trigger for emergency action being taken, including activating the Territory's standby/emergency landfill site at West Belconnen.

Prior concerns

Although August 2014 appears to be when ACT NOWaste became aware of serious capacity risks at Mugga Lane, we were provided with numerous pieces of correspondence dating as far back as November 2012 that indicated concerns from Remondis related to the possibility of landfill capacity at Mugga Lane being reached prior to activation of the new A2AC cell. These correspondences include e-mails and letters from Remondis, together with internal ACT NOWaste e-mails that make reference to concerns being raised by Remondis.

These correspondences were:

- not specific as to when Remondis believed capacity would be reached, or
- indicated that Remondis believed capacity would be reached in May or June 2015, which was largely consistent with ACT NOWaste forecasting, or
- indicated that Remondis had concerns over capacity, subject to additional capacity being obtained from the v-notch and the south east extension (both of which were implemented and provided additional capacity).

Landfill capacity forecasts and timeframes were advisedly reviewed by ACT NOWaste as part of standard management practices and also in response to these concerns. However, as noted in section 4.2, forecasting practices and record keeping require improvement.

4.4 Actions taken by ACT NOWaste

Scope item: What immediate actions were taken by ACT NOWaste management as a result of the discovery, including timelines of actions

Key actions taken by ACT NOWaste management in response to the capacity concerns becoming known on or about 12 August 2014 were:

- action commenced immediately in relation to activating the Territory's standby/emergency landfill site at West Belconnen Resource Management Centre
- on or about 14 August 2014 the Director-General was verbally briefed on Mugga Lane landfill capacity by the Executive Director, Business Enterprises Division
- a brief for the Director-General was cleared on 4 September 2014 and signed by the Director-General on 8 September 2014
- Minister Rattenbury was briefed verbally on or about 12 September 2014 by the Director, ACT NOWaste
- a media release was issued by TAMS on 23 September 2014 advising of the temporary use of West Belconnen Resource Management Centre
- the West Belconnen Resource Management Centre was activated on 13 October 2014, with approximately half of the ACT's waste being redirected to that site.

In addition, ACT NOWaste has taken steps for the completion of the A2AC cell to be brought forward and is investigating other options to increase available airspace within the current cells, including via reshaping the current landfill area.

4.5 Monitoring of clean fill tonnage

Scope item: The impact on the ACT's waste strategy, including meeting its waste targets.

Remondis has a contractual requirement to achieve a waste compaction rate of at least 850kg of waste per cubic metre of landfill airspace consumed (compaction ratio of 0.85). It has additional financial incentives to achieve a waste compaction rate of up to 950kg of waste per cubic metre (compaction ratio of up to 0.95). ACT NOWaste has monitored waste compaction rates to ensure these targets are achieved.

However, the level of clean fill used by Remondis to cover waste has been identified by Phil Grace Contracting Pty Ltd to be in excess of industry norms. We were advised by ACT NOWaste that Remondis contest this point and believe the level of clean fill they have used is not in excess of industry norms. Clarification of this point is necessary.

Analysis of weighbridge data since January 2012 shows that the level of clean fill used by Remondis since that point in time has potentially been above industry norms (subject to clarification of what standard industry practice is) and there was a further increase in clean fill use by Remondis during the 2013/14 financial year.

There is a need for increased monitoring by ACT NOWaste in relation to the level of clean fill used by Remondis to ensure unnecessary landfill space is not consumed.

It is important to note that the potentially excessive use of clean fill by Remondis does not appear to have resulted in landfill capacity being consumed in a shorter period of time than forecast. One of the key landfill capacity forecast assumptions is that 850 - 950 kg of waste is compacted into each cubic metre. This level of waste compaction is contractually incentivised and monitored by ACT NOWaste and records provided indicate that these waste compaction targets are being achieved. Provided compaction targets are met, the use of additional clean fill by Remondis does not result in landfill capacity being consumed in a shorter period of time than forecast. It means waste is being compacted to take up less space, but additional clean fill is being used to fill up that extra space created and overall the landfill site is being filled at the forecast rate.

Excessive use of clean fill by Remondis would, however, prevent landfill from being consumed at a slower rate than forecast. A fill rate that is slower than forecast would be a positive outcome in terms of prolonging the life of landfill cell. The report prepared by Phil Grace Contracting Pty Ltd highlights other potential issues created by excessive clean fill including leachate being unable to permeate through the waste to the base of the landfill and instead remaining at different levels within the landfill.

Appendix A – Methodology

The following work was undertaken as part of the review:

- Discussions were held with key NOWaste staff to gain an understanding of:
 - contract management practices undertaken in relation to the landfill contract between the Territory and Remondis, as applicable to the monitoring and forecasting of landfill capacity
 - roles and responsibilities of personnel from the NOWaste Procurement and Contract Management Section and NOWaste Asset and Capital Works Section, as applicable to the monitoring and forecasting of landfill capacity
 - the timeline of events leading up to the discovery that landfill capacity would be reached earlier than expected and shortly thereafter in response to the discovery.

A complete listing of people we consulted with during the engagement is provided at Appendix B.

- Key documentation was reviewed, including, but not limited to:
 - the landfill contract between the Territory and Remondis, including relevant contract variations and modifications
 - landfill survey reports prepared by PHL Surveyors on behalf of Remondis dating back to October 2012
 - Microsoft Excel spreadsheets and other manual calculations undertaken by ACT NOWaste to forecast remaining landfill capacity
 - various correspondence (e.g. e-mails, letters and Ministerial briefs) containing references to when the current landfill area was expected to reach capacity
 - various correspondence (e.g. e-mails, letters and Ministerial briefs) containing references to when the A2AC cell was expected to be operational, and
 - a report prepared by a landfill specialist, Phil Grace, Phil Grace Contracting Pty Ltd, for ACT NOWaste dated 10 November 2014 in relation to landfill capacity at Mugga Lane.
- Discussions were held with Phil Grace, Phil Grace Contracting Pty Ltd, to help inform our understanding of landfill capacity at Mugga Lane.
- Based on consultations undertaken and documentation analysed, a draft report was prepared and provided to ACT NOWaste for confirmation of factual accuracy.
- A debrief of the review and draft report was conducted with the TAMS Chief Audit Executive, Executive Director Directorate Services Division, Executive Director Business Enterprise Division and Director ACT NOWaste.
- The report was finalised incorporating relevant management feedback.

Appendix B – Consultation List

The following people were consulted with during the engagement:

<i>Name</i>	<i>Position</i>
Phillip Perram	Executive Director, Business Enterprises Division
Michael Trushell	Director, ACT NOWaste (21 July 2014 – present)
David Roberts	Former acting Director, ACT NOWaste (approximately May 2013 – 20 July 2014) Former Manager, Assets Section, ACT NOWaste (approximately November 2010 – May 2013)
Chris Ware	Former Director, ACT NOWaste (approximately October 2011 – May 2013) Former Senior Manager, ACT NOWaste (approximately March 2009 – October 2011)
Stuart Finch	Acting Manager, Assets and Capital Works Section, ACT NOWaste (19 September 2013 – present)
Kathiresu Nandapalan	Senior Project Officer, Assets and Capital Works Section, ACT NOWaste (approximately May 2013 – present)
Anthony Haroldson	Senior Contracts Officer, Contracts & Procurements Section, ACT NOWaste (27 March 2014 – present)
Deirdre Badcoe	Former contract officer, Contracts & Procurements Section, ACT NOWaste (approximately July 2013 – 26 March 2014)
Phil Grace	Phil Grace Contracting Pty Ltd

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