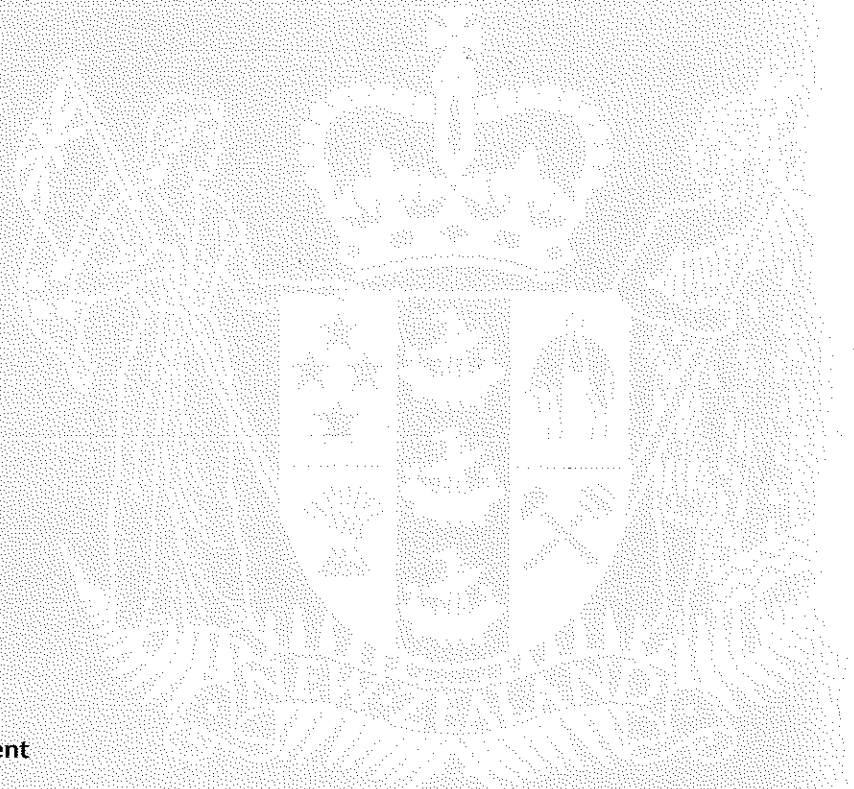


Levin landfill

Environmental management review

August 2008

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Parliamentary Commissioner for the Environment
Te Kaitiaki Taiao a Te Whare Pāremata
PO Box 10-241, Wellington, Aotearoa New Zealand
www.pce.govt.nz

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Investigation team

Yazmin Juned, Senior Researcher; Shaun Killerby, Researcher; Dana Moran, Researcher (to 6 February 2008) and those involved early in the investigation.

Internal Reviewer

Dr Simon Watts

External Reviewers:

Paul Beverley, Partner, Buddle Findlay; David Allen, Senior Associate, Buddle Findlay; Sarah Jenkin, Associate Environmental Planner, URS New Zealand

External Comments:

Horowhenua District Council; Horizons Regional Council

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Layout

Sharon Cuzens

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Preface

The Levin landfill is located in the Horowhenua District, four kilometres west of Levin. A landfill of some kind has existed on the site since the 1950s. For many years local residents have been concerned about the environmental effects of the landfill site, particularly given its proximity to the Hokio Stream. Some of those concerns were addressed through resource consent conditions in 2002. However, others have remained unresolved.

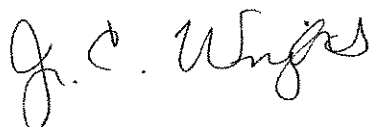
As a result of complaints made by concerned local citizens, my predecessor, Dr Morgan Williams, initiated an investigation in 2004. On taking office in 2007, I reviewed that investigation and, in light of ongoing concerns, decided to bring the investigation to a conclusion. This report contains findings from the investigation and recommendations for future landfill development and management.

The investigation has focused on the management of the site since resource consents were granted in 2002. It is not a review of historic issues raised before those consents were granted. The report aims to provide constructive guidance and advice to the two local councils about future management of the Levin landfill site, and to address local community concerns.

My recommendations to Horowhenua District Council, the consent holder for the site, and to Horizons Regional Council, the regulating authority, are contained in Section 11. Particular note has been made of a proposed notified consent review. This is an opportunity for the local community to participate in the decision-making process, and for the councils to address identified operational issues and community concerns via revised consent conditions. Recommendations have also been made regarding long-term planning for waste in the district; both through the need to plan for alternatives and the development of long-term policies that promote waste minimisation and alternative disposal methods.

More recently, I have become aware of local concerns about waste being imported to the site from outside the district. I have also received a complaint about piping leachate from the site. Both of these issues are outside the terms of reference for this report. However, there would be merit in the two local authorities considering these issues further when looking at the consent conditions for this site, as well as the long-term plans for waste in the district more generally.

The completion of this report has been helped greatly by the cooperation of both the local councils and the local community, and I would like to thank them for their assistance throughout the investigation.



Dr Jan Wright
Parliamentary Commissioner for the Environment

The Commissioner's decision to investigate

In 2004 the then Parliamentary Commissioner for the Environment, Dr Morgan Williams, received complaints from several members of the local community expressing concern about the management and environmental effects of the Levin landfill.

In September 2004, following preliminary analysis of background material, members of the Commissioner's office visited the landfill and met with tangata whenua, other representatives from the local community, and staff from Horowhenua District Council (HDC) and Horizons Regional Council (Horizons). On the basis of the visit and concerns about the management and effects of the landfill, the Commissioner decided to investigate further.

On 27 April 2005 the Commissioner wrote to Horizons (copied to HDC), recommending that Horizons, as the regional council, should carefully consider the merits of initiating a review of certain conditions of permits. Following the Commissioner's letter, Horizons initiated a non-notified review of consent conditions for the landfill in April 2005 and began negotiations with HDC.

The Commissioner had originally planned to wait until the consent review was completed before deciding whether to investigate this matter further. However, given the delay in progressing the consent review, in July 2007 the new Commissioner, Dr Jan Wright, decided to start an investigation. She prepared this report in accordance with the terms of reference set out in Section 4.

Horizons is likely to decide to publicly notify a new consent review that will supersede previous negotiations between Horizons and HDC. It is understood that a final decision on this will be made in August 2008, with hearings to be held in November 2008.

Notwithstanding the proposed review, the Commissioner considers that there is significant merit in releasing this report now, given the concerns of the local community and the importance of the outcome of the proposed review.

Remit and Terms of Reference

Pursuant to s 16(1)(b) of the Environment Act 1986, the Parliamentary Commissioner for the Environment (the Commissioner) has the function:

...where the Commissioner considers it necessary, to investigate the effectiveness of environmental planning and environmental management carried out by public authorities, and advise them on any remedial action the Commissioner considers desirable.

This report has been prepared in accordance with s 16(b) to provide information and guidance to HDC, Horizons, and members of the community. This information and advice relates to the following matters:

- assessing the performance of those responsible for the Levin landfill subsequent to the granting of resource consents for the site in 2002, in relation to:
 - concerns raised by tangata whenua
 - community consultation
 - compliance with resource consent conditions
 - monitoring and enforcement of consent conditions
 - compliance with the requirements of the Resource Management Act 1991 (RMA) and other relevant legislation
- assessing governance and operational changes which could improve the future performance of the landfill
- how these changes may be achieved, under the existing legislative framework and including the proposed consent review.

The purpose of this report is not to re-investigate the issues in the 1994–2002 application and appeal process. Nor does it intend to address the wider questions regarding waste importation, except to the extent that this could affect the service life of the current site. Rather, the intention is to consider the management of the site since the consents were granted, with a focus on matters relating to “avoiding, remedying or mitigating any adverse effects of activities on the environment” and community consultation. Consideration is also given to the need for appropriate future planning, preferably well before the operative landfill reaches design capacity.

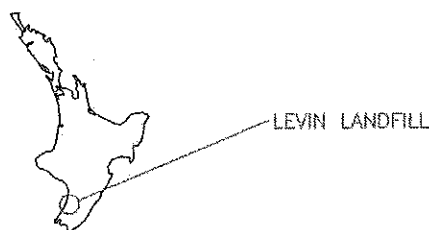
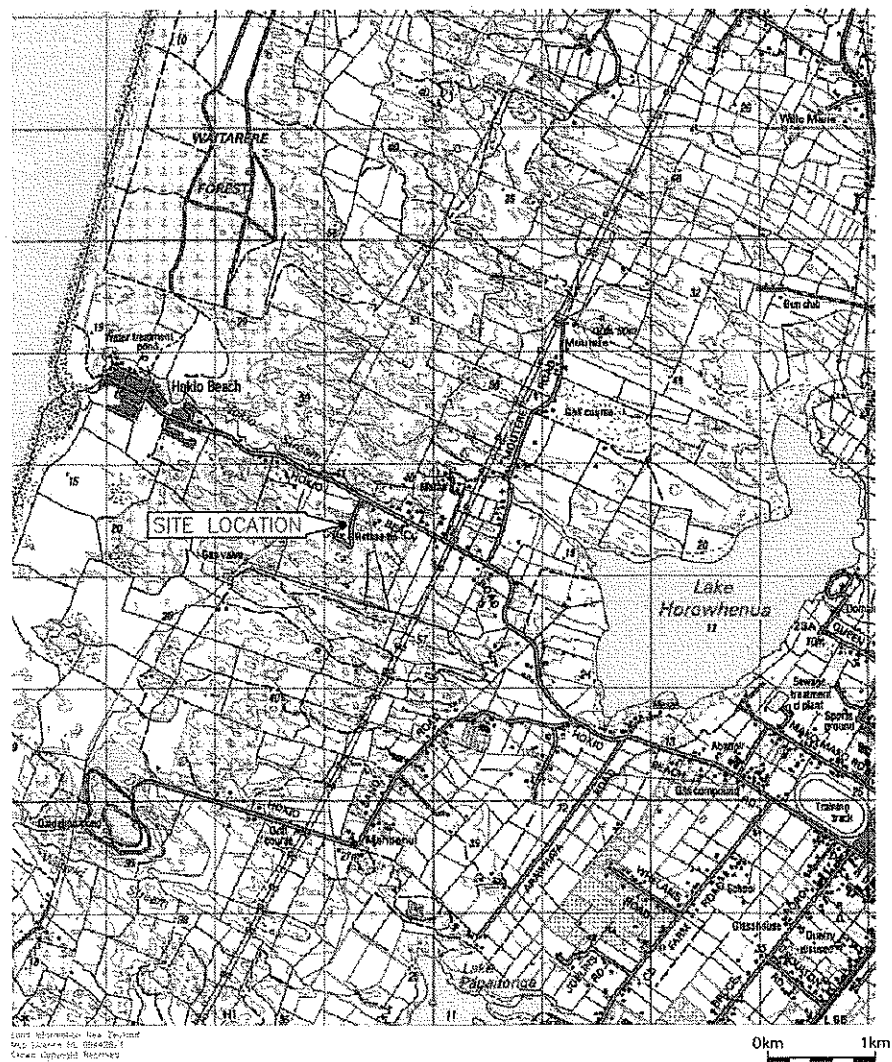
Apart from access to information, the Environment Act 1986 provides the Commissioner with advisory powers only. This report is therefore limited to making recommendations.

Background

Location of the Levin landfill

The Levin landfill is located on Hokio Beach Road in the Horowhenua District, 4 kilometres west of Levin. The landfill site is in undulating sand country surrounded by pastoral farming, with the Hokio Stream (the single outlet of Lake Horowhenua) close to the northern boundary. This stream flows west to the sea, 2.5 kilometres away.

Figure 1: Position of Levin landfill site



Local concerns

Of concern to local iwi is the potential effect of the landfill on Hokio Stream and waahi tapu in the area. The Ngaatokowaru marae (Ngaati Pareraukawa, Ngaati Raukawa) is located about 500 metres northeast of the landfill property, while the Kawiu marae (Muaupoko) is on the northern shore of Lake Horowhenua to the east. Tangata whenua have a special connection to both the groundwater and surface water. The Hokio Stream has traditionally been a source of food such as eels, drinking water, recreation, identity and cultural learning. Shellfish are gathered from the coast near the stream mouth. Archaeological sites in the area include shell middens and possible burial sites.

Site history

Pre-1994

In the 1950s a small rubbish dump was developed next to the area now occupied by the modern landfill. This was one of many dumps in the district, each servicing the town nearby. Upon reaching capacity in the mid-1970s, a second dump was opened on the site. By this stage there was local concern about degrading environmental quality in the area, as the sewage scheme for the growing town of Levin included discharged through Lake Horowhenua and Hokio Stream to the coast. This concern eventually led to the Lake Horowhenua and Hokio Stream Catchment Management Strategy in 1997, which aimed to improve in-stream water quality. Groundwater continues to be used, particularly as stock-water on farms in the area.

Before 1992, most New Zealand landfills were no more than local dumps that were often poorly sited, designed and managed. It is estimated that there were more than 1,000 such landfills.¹ With the introduction of the RMA, more stringent requirements began to be introduced. As a result, many small dumps were closed; nationally, the number of dumps decreased from 327 in 1995 to 115 in 2002.² Closing the old landfill at Levin, and constructing a new one, was part of this rapid adjustment.

A discussion paper for a draft Solid Waste Management Strategy for the Horowhenua District was developed in 1992. This paper, which discussed possible future options, was released for public comment with the 1992/93 Annual Plan. The Foxton, Foxton Beach, Tokomaru and Shannon landfills were then closed by 1996, with Levin retained as the one landfill for the district.

Post-1994: the consent process

As the old Levin landfill site was scheduled to reach capacity in the late 1990s, HDC lodged an application for resource consents for a new landfill site (adjacent to the old one) in September 1994. The district also needed an immediate replacement for the closed dumps.

As part of the consent application process, a hui was held at the Kawiu marae in February 1995. Members of the public, including tangata whenua, were invited to attend and to provide feedback on the Council's proposed landfill extension. The proposal was strongly opposed, with calls for alternative sites to be investigated. In response to various concerns expressed at the hui, several major changes were made to the consent application, including adding a synthetic liner. These changes were presented at a second hui at Kawiu marae in October 1995, but there was continuing opposition to the proposal from tangata whenua.

As HDC needed to develop a new landfill immediately, the revised applications were lodged with Horizons in October 1995. At this time there were disputes over the extent to which about whether:

- the two hui met legal requirements for consultation with tangata whenua
- appropriate steps were being taken to identify and protect potential waahi tapu
- alternative sites had been considered.

As a consequence, Horizons deferred hearing the resource consent applications until their Iwi Liaison Officer had prepared a report on the first two matters.

Horizons reached a decision in favour of all but one resource consent application for the new landfill in 1997. The decisions on all five consents were, however, appealed to the Environment Court. At this point the Parliamentary Commissioner for the Environment was called upon to investigate matters relating to consultation and protection of waahi tapu. Several Court mediation meetings were held in 2000, with the resource consents finally being approved in 2002 via an Environment Court consent order (Judge Allin).

The outcome of the application and appeal process involved three aspects:

1. protecting waahi tapu (discharge permit 6009, specific condition 30)
2. forming a Neighbourhood Liaison Group (discharge permit 6009, specific conditions 32, 33 and 34)
3. monitoring leachate into groundwater (various consent conditions).

The new landfill was completed and opened in 2004. At that time the old landfill, which had reached its original intended capacity around 1997, was closed and capped. The *1998/99 National Landfill Census Report*³ acknowledges, however, that landfills continue to affect the environment for 30–50 years after closure. As a consequence, the objectives of the National Landfill Census include:

- closed landfills to be monitored and managed effectively
- all operative landfills to be consented and compliant with conditions
- these conditions to reflect nationally consistent standards of environmental management.

Expert report

In November 2007, the Commissioner arranged for an independent landfill expert (Tonkin and Taylor) to conduct a technical and environmental impact review of the old and new Levin landfills. This review was intended to assist in completing the Commissioner's investigation of the landfill. The Tonkin and Taylor report is available on the PCE website and summarised below.

Tonkin and Taylor find that the old unlined landfill is not atypical of older landfills in New Zealand, and was "developed and operated to what were, by and large, the standards of the day". They conclude that current management of the old landfill site appears to conform with the consent conditions, although some of those conditions are ambiguous. Monitoring results show evidence of increasing impacts on groundwater quality, but that the information in the monitoring reports is insufficient to evaluate the significance of the impacts on the surrounding environment. Although levels of contaminants are generally low, the high level of ammonia is of concern. The authors note that some design and operational improvements and safeguards could be introduced to reduce the risk of effects.

The new landfill is considered to be an improvement on the older landfill in technical terms, and in most cases appears to be operated at a satisfactory level to manage environmental effects. However, the consent conditions are considered to fall short of current and best practice. Tonkin and Taylor note a number of alleged historic breaches of the consent conditions, but also regard the recent appointment of a Solid Waste Officer at HDC as a positive step. They conclude that some design, operational and management aspects of the new landfill could be improved to bring it in line with accepted norms and best practice elsewhere in New Zealand. They make five recommendations:

- confirmation of required structure, actions and timetable for compliance reporting and management including, if deemed appropriate by Horizons, incorporating a peer review process for ongoing design, operations and monitoring
- a review by HDC of the site operations contract for adequacy in relation to meeting the performance criteria set out in the conditions of the consent
- a review by HDC of recommendations made in the report relating to aspects of the detailed design of the new landfill site
- a comprehensive, independent review of the results of monitoring to date and of the implications of this review for the monitoring conditions for groundwater and surface water systems
- a review of other general conditions of consent where these depart from accepted norms, particularly those related to waste acceptance and hazardous waste disposal.

The Commissioner has considered these points in forming her own recommendations on this matter.

HDC: compliance

HDC is the consent holder for the Levin landfill. As such, it holds primary responsibility for ensuring compliance with the conditions of the resource consents for the site.

Resource consent conditions

Consent conditions will be most effective where the consent holder places sufficient importance on the need for compliance. Where conditions impose a regime of self-monitoring and reporting, the onus is increased on the consent holder to ensure that it has an adequate monitoring and reporting framework in place which is capable of both identifying and responding to potential breaches at an early stage.

Historic breaches of resource consent conditions are relevant to the long-term future management of a site. By identifying areas where non-compliance has occurred in the past, resources and consent review processes can be better targeted to improving future compliance. With this in mind, a sample of historic examples of non-compliance at the Levin landfill site, as recorded in the Horizons monitoring reports, is outlined in Appendix 1.

This report is not intended to provide a comprehensive compliance history. It is anticipated that such a report will be compiled by Horizons Horizons will compile in preparing for the proposed consent review (see Section 8). However, items of significance noted from the monitoring reports include:

- incomplete monitoring data (condition 3, consent 6010)
- leachate run-off other than to the irrigation areas (condition 19, consent 6010)
- Neighbourhood Liaison Group meetings not convened at regular intervals and members not supplied with required monitoring data (conditions 32–34, consent 6009)
- remediation of the old landfill (selection of vegetation cover and time taken to cap site) other than in accordance with the Landfill Management Plan (condition 14, consent 6009).

The recent appointment of a Solid Waste Officer at HDC is welcome and represents a positive step towards ensuring future compliance. It is important that any appointee in this role has both appropriate expertise and sufficient delegated responsibility to ensure compliance with consent conditions.

However, the consent conditions are considered to be of a standard that is less than current or best practice. This makes it likely that more stringent conditions will arise out of the consent review. It is therefore recommended that further consideration is given to the means by which compliance with any revised conditions will be assured following the outcome of that review.

How this may be achieved is for the two local authorities to determine, but could include a review of the site operations contract for its ability to meet the performance criteria set out in the conditions of consent. It is noted that effective changes are likely to require greater internal priority to be given to compliance issues. This, in turn, is likely to require the support of both the management team and councillors.

Specific amendments to the consent conditions recommended for further consideration during the review process are noted in Section 11 of this report.

Monitoring requirements

In 2005/06 HDC recognised that compliance with consent monitoring requirements had become problematic. As a result, the council opted to use external resources to carry out the monitoring requirements, engaging a contractor in January 2007. In relation to this contract, the following observations are noted.

- Some of the non-compliance with conditions reported by Horizons relates to insufficient or late monitoring data. For example, there was a delay in reporting October 2006 exceedences to either HDC or Horizons until May 2007.
- There appears to have been some initial lack of clarity regarding the allocation of responsibilities between HDC and its monitoring contractors. For example, correspondence from the Council's monitoring contractors in May 2007 indicates confusion as to where and when exceedences should be reported pursuant to conditions 11–13 of discharge 6010.
- It is unclear what management actions were taken by HDC in response to the monitoring results, particularly where exceedences were reported.

Given the enforcement and reputational risks associated with non-compliance, it is recommended that HDC take steps to ensure that future outsourcing of monitoring work is accompanied by clear instructions as to when, how and to whom monitoring results should be reported.

Monitoring environmental effects should not be confused with managing those effects – monitoring is the process by which information is obtained for the purposes of informed decision making on managing the effects. To ensure adequate management of the monitoring requirements within HDC, responsibility should be clearly assigned at officer level within the Council for:

- monitoring and enforcing the contract
- reviewing the monitoring data and responding as necessary.

Local Government Act

The previous two sections have considered HDC's responsibilities under the RMA. However, the special status of HDC as a local authority is noted. This includes, in particular, its purpose under s 10 of the Local Government Act 2002 (LGA) to promote the social, economic, cultural and environmental well-being of its communities, both now and in the future. This purpose places an additional onus on HDC to implement good environmental management practices, irrespective of the conditions of the resource consents; a breach of resource consent conditions is likely to be viewed as incompatible with these responsibilities.

Section 17 RMA and other legal obligations

The duty on HDC under s 17 of the RMA to "...avoid, remedy or mitigate adverse effects on the environment" is also noted, together with the wider expectation that activities will not give rise to a common law cause of action, such as an action in nuisance or under the rule in *Rylands v Fletcher*.⁴ For example, incidents such as windblown litter, stormwater contamination and leachate breakouts resulting in external land or water contamination could potentially amount to a breach of s 17 as well as, in some circumstances, an actionable nuisance.

These obligations exist independently of compliance with resource consent conditions, and may require additional compliance measures to be implemented over and above those set by the resource consent conditions.

Horizons: monitoring and enforcement

Primary responsibility for compliance rests with the consent holder, HDC.

As the regional council, however, Horizons is responsible under the RMA for monitoring compliance with the conditions of the landfill site resource consents by HDC. It also has the power to take enforcement action in the event of a breach.

Site inspections

Horizons is commended on the fact that site inspections have, on the whole, been carried out regularly. As a result, the council has the data available to prepare a detailed compliance history. It is recommended that this history is prepared for the proposed consent review to inform a decision about revising the current consent conditions.

Monitoring and enforcement action taken

Monitoring and enforcement of the consent conditions, however, has been unsatisfactory in a number of areas. Key examples, as recorded in the Horizons monitoring reports, are outlined in more detail at Appendix 2, but include:

- delays in approving the Landfill Management Plan for the new landfill and inadequate scrutiny of the same Landfill Management Plan's provisions, particularly in relation to the capping and aftercare of the site
- inadequate enforcement of the approved Landfill Management Plans, particularly in relation to the capping and planting of the old landfill
- delays in progressing a review of consent conditions
- monitoring delays and insufficient enforcement action in relation to investigating exceedences and leachate breakouts since October 2004
- inadequate consideration given to whether activities on site amounted to a breach of s 17 RMA and, if so, whether enforcement action was needed.

Of particular concern is the finding in the Tonkin and Taylor report that monitoring information available from the site is inadequate to make a full assessment of the environmental effects of the landfill site. The proposed review is welcomed as an opportunity to remedy this issue by the implementation of an appropriate monitoring framework in the future. It is recommended that the proposed review be undertaken as a priority.

To inform a decision on an appropriate monitoring framework, it is also recommended that an independent review of existing monitoring data and methods be undertaken in preparation for the consent review.

Irrespective of the outcome of the proposed consent review, Horizons will need to satisfy the local community that standards of monitoring and enforcement action will be improved in the future. The Neighbourhood Liaison Group (NLG) is one way that regular monitoring and enforcement information can be made available to the community in the future. Further consideration is given to the role of the NLG in Section 9 of this report.

Community liaison

Consent condition requirements

As early as February 1995, HDC recognised the need for community liaison as part of the resource consent conditions for the landfill. The consent process resulted in three specific conditions being attached to discharge permit 6009 (conditions 32, 33 and 34). HDC, as consent holder, was required to establish a Neighbourhood Liaison Group (NLG) including representatives of the Lake Horowhenua Trustees, the owners and occupiers of specified properties adjoining the landfill, a representative from each of the HDC and Horizons, and other parties invited by the consent holder. The conditions provide, among other things, that the NLG:

- meet at least once a year
- receive a copy of the annual report
- be allowed to inspect operations on the site
- be consulted as a group prior to any review of the consent conditions
- be provided with a copy of all monitoring reports and non-commercially sensitive documentation pertaining to the operation of the landfill
- be kept informed about whether progress is being made towards a regional landfill
- receive formal acknowledgement and consideration of members' written suggestions.

In April 2007 the Council was found to be non-complying with conditions 33–34, not having convened an NLG meeting since January 2005 and having failed to provide an annual report. The Council stated that the 2006 meeting was overlooked due to an organisational review and a misunderstanding as to which officer would initiate the meetings. As a consequence, an on-site meeting was convened in May 2007.

The future

To avoid a repetition of the events described above, HDC needs to develop and maintain clear responsibilities for providing information and invitations to the NLG. Furthermore, the NLG must be informed before any consent conditions are reviewed, as per condition 34(d)(iii) of discharge permit 6009.

It is imperative, given the level of public concern (particularly among tangata whenua) regarding this landfill, that effective neighbourhood liaison is maintained. Indeed, the Council is obliged to do so under the terms of the consents and such an approach is consistent with good practice under the LGA (particularly s 77 and s 82). Given the importance of the issues of water quality and waahi tapu to the Ngaati Raukawa and Muaupoko, it is recommended that representatives from each iwi are given the opportunity to be included in the NLG.

At the same time, it is important that such a forum is not perceived, by HDC or the NLG, as a means for the community to interfere with site operations undertaken in accordance with the conditions of resource consents, nor as a medium for enforcing consent conditions. Similarly, the NLG cannot require the consent holder to comply with recommendations arising from meetings. Rather, the purpose of such a group is to ensure that the consent holder provides the opportunity for site neighbours and interested groups to meet with them and discuss issues related to the site as they affect the local community. Such liaison is only likely to be effective, however, if supported by the consent holder – in this case HDC.⁵

Looking to the future

Alternatives

When HDC originally acknowledged the need for community liaison, the intent was to consider – well in advance – alternative options for landfill sites and disposal facilities. Indeed, the HDC Application for Resource Consents: Levin Landfill (March 1995) states:

During public consultation there was criticism that no alternative to the activity and/or site was being examined by the Council. The policy of continued use of the Levin landfill site had been public for several years and had never previously been questioned. In response to this recent expression of concern the District Council has decided that it will investigate alternative landfill sites/disposal facilities, with progress reviews at 5 yearly intervals... The District Council also decided to establish a working party to oversee and participate in the investigation and review of alternative sites consisting of representatives of the Council, the tangata whenua, the Department of Conservation and possibly others. It is anticipated that these would be conditions of the consent for "discharge to land".

The Operations Manager at HDC at the time later submitted evidence that an invitation was made to form such a working party, yet the only reply was from the Royal Forest and Bird Protection Society of New Zealand.

Following this, the draft HDC Waste Management Plan 1999 proposed "Research/ study of alternative disposal options including investigating a Regional Scheme". Given the lessons of the past few years, it is imperative to consider the issue of a future landfill well in advance of the operating landfill reaching capacity. Considerable time will be needed to:

- identify and evaluate any alternative sites
- develop baseline monitoring data
- consult effectively with interested parties
- obtain resource consents
- construct a new facility.

The resource consents granted in 2002 are for a period of 35 years (to 2037).

Assuming a worst case scenario of:

1. reaching design capacity as early as 2027 due to increasing waste streams
2. a period of 10 years to identify and evaluate sites, obtain resource consents and construct a new landfill...

...then such planning would need to start as early as 2017.

In other words, such planning needs to be instigated within the next 10 years if it is to reach recommendations on future waste provision early enough to contribute to the consenting process.

It may be that after evaluating alternative sites, the vicinity of the current site is found to be preferable. There cannot be informed consideration, however, without careful scientific investigation and community consultation.

Waste policy

The consideration of alternative sites, discussed at Section 10.1, should take place in the context of ongoing development of district-wide waste policy, in accordance with the principles set out in the New Zealand Waste Strategy.⁶

This will enable consideration of the future of the Levin landfill site to occur within a framework of planning for waste minimisation, developing alternative waste disposal methods, and setting district waste targets.

As the New Zealand Waste Strategy deals with the content of this policy framework, it is not considered necessary to detail it further here. However, the role of community consultation within the Strategy, for example in relation to setting local waste targets, is noted. A working party, as proposed in Section 10.1, may be one means of achieving this consultation:

Enforcement

Horizons does not currently have an RMA enforcement policy, although it is understood that one is being drafted. Given the history of breaches on the Levin landfill site, and the lack of enforcement action taken to date, it is recommended that Horizons gives careful consideration to the terms of its proposed enforcement policy, and to adopting it without delay. The policy should aim to provide support for enforcement action in the future, at all levels within the Council. It can also help enforcement officers and consent holders by providing clear guidance on the circumstances in which enforcement action will be taken and the type of action that may be expected.

Commissioner's recommendations

Horowhenua District Council

Governance

increased priority should be given at all levels within HDC to compliance with resource consent conditions and other legal obligations.

There has been a history of resource consent condition breaches on this site, some of which have been recurring. Consent conditions will be most effective where the consent holder places sufficient importance on the need for compliance. Where, as in this case, conditions impose a regime of self-monitoring and reporting, the onus is increased on the consent holder to ensure that it has an adequate monitoring and reporting framework in place, both internally and via external contracts. This framework must be supported by adequate importance being given to compliance with the consent conditions at all levels within HDC.

I recommend that:

- 1. a review is undertaken by HDC of the site operations contract for adequacy in relation to meeting the performance criteria set out in the conditions of the consent**

A review will help ensure that the increased emphasis placed on compliance by HDC is transferred through to the site contractor. The proposed consent condition review is also likely to give rise to the need for a contract review.

- 2. HDC develops and maintains clear responsibilities for providing information and invitations to the Neighbourhood Liaison Group**

There have historically been a number of breaches of the conditions requiring community liaison via the Neighbourhood Liaison Group. It is imperative, given the level of public concern (particularly among tangata whenua) regarding this landfill, that effective neighbourhood liaison is maintained.

- 3. HDC takes steps to ensure that contracted monitoring work is accompanied by clear instructions, and that responsibility for monitoring and enforcing such contracts is clearly assigned at officer level within the Council**

Historically, there appears to have been a lack of clarity regarding the allocation of responsibilities between HDC and its monitoring contractors. As a result, some monitoring data was either absent or reported late. It is also unclear whether adequate steps were taken within the Council in response to those instances where exceedences were reported.

Site design

- 4. a formal review of site design is undertaken by HDC with regard to the recommendations made in the Tonkin and Taylor report relating to aspects of the detailed design of the new landfill site**

Tonkin and Taylor found that the new landfill was an improvement on the older landfill in technical terms. However, they concluded that some design, operational and management aspects of the new landfill could be improved to bring it in line with accepted norms and best practice elsewhere in New Zealand.

Future planning

- 5. HDC undertakes long-term waste strategy planning, including developing waste minimisation policies and alternative disposal methods, together with identifying and evaluating alternative sites for future landfill requirements**

The HDC Application for Resource Consents: Levin Landfill of March 1995 stated an intention to investigate alternative landfill sites/disposal facilities, with progress reviews at 5-yearly intervals. Given community concerns about the current site, planning for the future of the area's waste needs remains an important requirement. Such planning should take place in accordance with the principles set out in the New Zealand Waste Strategy.⁷

- 6. a working party is established within the next 10 years to help identify and evaluate a future landfill site and to help develop a wider district waste strategy. The working party's remit should be to reach recommendations on future waste provision early enough to contribute to the consenting process. This working party should include, representatives of tangata whenua in addition to other significant interest groups in the district, representatives of tangata whenua**

The resource consents granted in 2002 are for a period of 35 years (to 2037). Assuming a worst case scenario of: a) reaching design capacity as early as 2027 due to increasing waste streams; and b) a period of 10 years to identify and evaluate sites, obtain resource consents and construct a new landfill, then such planning would need to start as early as 2017. In other words, such planning needs to be instigated within the next 10 years. The 1995 resource consent application also stated that it would establish a working party to oversee and participate in the investigation and review of alternative sites. This continues to be a relevant requirement for the future of waste planning in the area.

Horizons Regional Council

Consent review

7. the proposed consent review is undertaken by Horizons as a matter of priority and without further delay

Given the compliance history of the site, monitoring results and community concerns, the proposed consent review should not be further delayed. Recommendations 8a) to f) address the process and substance of that consent review.

- a. **The review process and timeframes are established by Horizons from the outset so that all parties are clear as to the likely timeframe for completion of the review, as well as opportunities for participation in the process.**
- b. **Horizons prepares a full compliance history review of the site before the proposed consent review.**
- c. **A comprehensive, independent review is commissioned of the results of monitoring to date and the adequacy of the monitoring programme. This review should be used to inform a decision on an appropriate future monitoring framework to be incorporated into the consent as revised conditions.**
- d. **A framework is established for consent compliance reporting and management including, if deemed appropriate by Horizons, incorporating a peer review process for ongoing design, operations and monitoring. These requirements should be incorporated into the consent as revised conditions.**
- e. **A review is undertaken of the other general conditions of the consents where these depart from accepted norms, particularly those related to waste acceptance and hazardous waste disposal.**
- f. **Specific conditions to which consideration should be given in the consent review include:**
 - **the changes proposed in the Tonkin and Taylor report, as per recommendation 5 above**
 - **in the event that the water quality standards specified in the consent conditions are breached, a requirement on HDC to investigate to determine if the breach is attributable to activities on site and, if so, to take remedial action**

- **where conditions currently require data to be made available on request by Horizons, to require that data be supplied automatically at appropriate intervals**
- **that representatives from each iwi are given the opportunity to be formally included in the Neighbourhood Liaison Group via the consent conditions.**

Governance

- 8. Horizons establishes clear responsibilities for the timely monitoring and enforcement of resource consent conditions, the performance of which is capable of being assessed at officer level**

Although regular site monitoring took place, there appears to have been inadequate consideration of how breaches of consent conditions and exceedences in the monitoring data should be handled. It is important that both the Council and community are able to monitor the Council's performance in these areas and address shortfalls.

- 9. consideration is given to adopting an enforcement policy, the terms of which should provide sufficient support, guidance and authority for future enforcement action**

The compliance history of the site indicates that, for a variety of reasons, enforcement action has been inadequate, despite an adequate monitoring programme. The absence of an enforcement policy may have led to a lack of clarity for both enforcement officers and consent holders. Consideration should be given to adopting an enforcement policy in future. The policy should aim to provide enforcement officers with sufficient support, guidance and authority to commence enforcement action where appropriate.

Appendix 1: Examples of historic non-compliance

- Various dates: the monitoring reports submitted by HDC indicate that the water standards set out in conditions 11–13 of consent 6010 were exceeded on a number of occasions. While these exceedences appear to have been communicated to Horizons, it is unclear what steps were taken by HDC “to determine if further investigation or remedial measures are required”, as required by the consent conditions.
- 31 August 2004: monitoring data incomplete (e.g. annual pesticide/semi-Volatile Organic Compound (VOC) screen tests were not carried out on bores B1, B2 and B3, monitoring at bores D4 and D5 not carried out).
- 8 October 2004: inadequate capping of the old landfill, with quantities of refuse remaining exposed, resulting in the forming of leachate. Leachate observed on the side of the old landfill, discharging to the stormwater drain, in breach of condition 19, consent 6010, and condition 5(b) of consent 6012.
- 10 and 16 December 2004: inadequate capping of old landfill non-compliant with conditions 14 and 15, consent 6010; poor management of windblown litter (consent 6009) with amounts of refuse being blown out of the landfill into surrounding vegetation; capping of old landfill also considered to be non-compliant with Landfill Management Plan in choice of capping materials and selection of vegetation cover. Detailed report requested as to how the closure of the old landfill would be remedied to meet the requirements of the consent conditions.
- 11 February 2005: leachate breakouts observed at two locations at the old landfill (conditions 19, 28, 29, consent 6010). Deadline set for reporting on permeability testing of old landfill cap of 1 April 2005.
- 1 April 2005: continued leachate seepage into stormwater drains observed (condition 19, consent 6010). Further capping advised.
- 10 June 2005: laboratory testing finds contaminated water in stormwater drain; source believed to be leachate run-off. Continued run-off of leachate beyond irrigation area (consent 6010, condition 19 and consent 102259, condition 11).
- 31 August 2005: annual report data insufficient due to “loss” of two bore holes (covered by leachate pond and sand hill) – advised to redrill bore holes; absence of data for second year regarding pesticides/semi-VOC screen samples.
- 16 September 2005: abatement notice served for failure to comply with condition 3 of consent 6010 (annual pesticide/VOC screen tests). Subsequently complied with.
- 19 July 2006: leachate observed to be seeping from the sides of the old landfill. Believed to be entering the stormwater collection and soakage areas before discharging to groundwater.

- 1 September 2006: insufficient monitoring data included in the annual report 2005/06, including leachate irrigation data as required by condition 23 of consent 6010 (inspection date 1 September 2006).
- October 2006–January 2007: discharge of leachate beyond the leachate irrigation area in October 2006, in breach of condition 19 of consent 6010 (inspection date 3 October 2006). The inspection report advised that the leachate seep be remedied immediately, yet at a visit on 12 January 2007 the leachate seep remained unresolved. The officer's report notes that "it was clear during the inspection... that little has been done since October 2006...to remedy the problem". Further action to repair the cell was again advised and this appears to have been complied with by the inspection on 27 March 2007.
- 19 April 2007: non-compliance with conditions 33 and 34 of consent 6009, by failing to convene a meeting of the Neighbourhood Liaison Group at least once per year and failing to provide members with a copy of the annual monitoring reports (report dated 19 April 2007). After the Group meeting on 31 January 2005, no further meetings appear to have been convened until a complaint was received by Horizons from a member of the Group in April 2007. Following consultation with HDC regarding this complaint, the Group was invited to a site meeting on 5 May 2007.

Appendix 2: Examples of historic monitoring and enforcement

Management Plan

In May 2004, HDC was notified in a letter from Horizons that condition 14 of consent 6009 had not been complied with, in that a Management Plan for operations on the existing landfill had not been prepared to the satisfaction of the Regional Council by 31 December 2002. Although HDC had previously submitted a Management Plan as part of the Environment Court process in early 2002, Horizons did not consider that this dealt fully with the requirements of condition 14. It is unclear from the correspondence why Horizons took approximately 18 months to notify HDC that the Management Plan was considered to be inadequate and to request additional information in respect of the draft Management Plans. Given that the original management plan document was submitted by HDC well in advance of the December 2002 deadline, Horizons' response time is regarded as unsatisfactory.

The Landfill Management Plan for the existing site, dated May 2004, appears to largely be a replica of the Plan for the new site, with a significant focus on the operation of the site, such as waste acceptance criteria. In contrast, proposals for capping and aftercare are dealt with in two paragraphs and do not comply with the Ministry for the Environment's *Guidelines of Management of Closing and Closed Landfills in New Zealand* (May 2001). Capping is proposed to occur with composted green waste and/or sand, followed by seeding for pasture. Aftercare is simply described as including "maintenance of the cap and continued monitoring". The Plan was submitted to Horizons for approval in accordance with condition 14 of consent 6009. However, little action, if any, appears to have been taken to require HDC to rectify the lack of information in the 2004 Plan regarding remediation.

Consent review

In April 2005 PCE recommended to Horizons that it take advantage of a clause in the consents to review and tighten some of the consent conditions for the landfill. Horizons agreed and initiated a review in May 2005, but since then the review has failed to progress and has now been outstanding for nearly three years. This 2005 review was undertaken on a non-notified basis with little information publicly available regarding key milestones or the timeframe for completion. The Commissioner regards the process and timeframe of that previous review as unsatisfactory.

Compliance monitoring

At an inspection on 3 October 2006, leachate discharge beyond the leachate irrigation area was noted for the second time (also in October 2004). Immediate remedial

work was advised, with a re-inspection to take place after two weeks to check what action had been taken. However, according to the Horizons monitoring reports, the next inspection did not take place until 12 January 2007, more than 14 weeks later. The January inspection report notes that little action had been taken to remedy the leachate seep in the intervening time. While compliance with consent conditions is the responsibility of the consent holder, the time between visits to the site is considered to be unsatisfactory, given the identified breach.

Enforcement action

In August 2005, HDC was advised by Horizons to redrill two destroyed bore holes. This does not appear to have been actioned by HDC. No enforcement action appears to have been taken to ensure that monitoring continued pursuant to the consent conditions.

Leachate seepages from the old landfill appear to have occurred on a regular basis. No enforcement action appears to have been taken to remedy this.

Horizons' monitoring reports note that the capping of the old landfill with sand and pine tree cover did not comply with the approved management plan, submitted pursuant to condition 14 of consent 6009 (which states that the surface of the landfill will be seeded for pasture). However, no enforcement action appears to have been taken.

Exceedence investigations

The monitoring reports submitted by HDC indicate that the standards set out in conditions 11–13 of consent 6010 were exceeded on a number of occasions. While these appear to have been communicated to Horizons, it is unclear what steps were taken by either authority "to determine if further investigation or remedial measures are required", as required by the consent conditions.

For example, on 15 June 2004 a Horizons monitoring report noted that bore 1 exceeded the lead limit of 0.1mg/l, and that bores E1s and E2s exceeded the Ministry of Health's *Drinking Water Standards for New Zealand*. According to the conditions, the Councils should have considered at this stage whether further investigations were required. However, the monitoring report "Suggested Actions" section is blank.

Similar examples can be noted in the monitoring reports dated 31 August 2004 and 31 August 2005.

While primary responsibility for compliance lies with HDC, it does not appear that Horizons has fully implemented its monitoring and enforcement role under conditions 11–13 in establishing whether HDC was taking steps "to determine if further investigation or remedial measures are required".

Endnotes

1. A guide to the management of closing and closed landfills in New Zealand, Ministry for the Environment, 2001.
2. The 2002 landfill review and audit, Ministry for the Environment, 2003.
3. Ministry for the Environment, 2000.
4. (1868) LR 3 HL 330.
5. A guide to landfill consent conditions, Ministry for the Environment, 2001:45.
6. New Zealand Waste Strategy, Ministry for the Environment, 2002.
7. New Zealand Waste Strategy, Ministry for the Environment, 2002.

- documentation, including written evidence, s92 information and the Environment Court decision related to the 1995 resource consent application (confirmed by the Environment Court in June 2002)
- the 6 December 2007 letter from HRC to PCE clarifying the proposed approach to consent matters, as now proposed.
- an inspection of the site on 17 December 2007 accompanied by Ms D. Moran and Mr Kerehi Wiwarena.

2 Background and Context

The Levin Landfill at Hokio Road has operated since the mid 1970s. The total amount of waste accepted at the site to date is unknown, with the historic disposal rate in Area A estimated at approximately 8,000 – 10,000 t/yr, based on available data. The total waste quantity on the site in Area A is therefore likely to be of the order of 250,000 tonnes, occupying a gross compacted and settled volume in Area A (including cover) of some 300,000m³. This equates to an average waste depth over the footprint of 7 to 10m. We understand that public access to the site ceased in around 2003, and the site is now open only to licensed operators using bulk haul vehicles. Area B has been open since 2005 and the total volume of waste and cover in place to date is estimated to be of the order of 35,000m³.

The total waste volume and annual tonnage would place the landfill into the category of a small site by NZ standards. The site is similar to a number of sites established and operated over the 1970s to 1990s, by other small local authorities around the country.

The site is effectively in two parts, all located within a sequence of coastal dune deposits with both shallow (unconfined) and deeper (partially confined) groundwater systems.

The original un-lined landfill cell Area A is located in the northern part of the site, and covers an area of some 4.25 ha. The new "lined" area of landfill is referred to as Area B. Stage 1 of Area B is currently being filled and is located in the central southern part of the site, bordering the adjacent property some 80 m to the south.

The two areas of the site (old and new) will be discussed separately in this report.

The old site appears to have been developed and operated to what were, by and large, the standards of the day – standards prevalent around the country at the time. For smaller, isolated sites, such as Levin (and there are many examples of similar sites around the country), this often meant:

- no principal environmental controls on discharges to surface and ground water (such as a landfill liner);
- poor operational practices (with little attention to applying cover, or controlling birds and vermin) and occasional landfill fires;
- relatively little regulatory control; and
- minimum capital and operating budget spending.

From the available records and complaints history, most of these general traits appear to have been evident in the operation at Hokio Road in the early years. Neighbours are, in general, reasonably distant from the site (buffer distance available to the north of Area A for example was generally > 400 m). However, the reportedly poor standard of the early

operation did lead to a history of complaints and concerns by neighbours in relation to potential groundwater contamination, surface water impacts, vermin, birds and other impacts such as traffic and litter.

These issues were traversed as part of the resource consent process for the site that began in 1994, following the introduction of the Resource Management Act in 1991. After what appears to have been a very protracted consent process for such a small landfill (at that stage the site should more properly be referred to as a controlled dumpsite), a suite of consents and related consent conditions was confirmed by the Environment Court in May 2002.

It is difficult to make anything other than comparative comment on the historical performance of a small waste disposal site such as this. This is because without Consents being in place the much needed controls that resource consent conditions are designed to provide, were simply not in effect.

Thus, to a large extent, what transpired up until at least 1994 is largely historic and while operations may have been of a low standard that would not have been atypical for a New Zealand landfill (tip) at the time. Historically, the standard of construction and operation of many of the smaller un-lined, uncontrolled tip sites around New Zealand was low, with this situation persisting well into the 1990s. For example, the closure of as many as fifty similar un-lined sites throughout the Canterbury region did not finally occur until around 2002 when the Kate Valley regional landfill was constructed.

This review takes into account that the design, operational and compliance record of the site was likely quite poor in the early days (up until the mid-1990s). The key questions this report addresses are:

1. Are the current structures and processes for managing the landfill adequate?
2. How has the site performed since consents were granted in 2002, and are the compliance record, related processes and compliance management now satisfactory?
3. Has the old area of the site been satisfactorily closed and are there any residual issues related to groundwater, site monitoring, or closure works that need to be addressed?
4. Does the design, operation, monitoring and related compliance reporting of the new site comply with the consent conditions, and does the overall operational standard align with current industry and regulatory expectations?
5. What are the key issues that need to be addressed in the review of Consent Conditions, recently initiated by HRC?

3 Are the current structures and processes for managing the landfill adequate?

This part of the review relates to the period after consents were granted in 2002 and hence, in the main, the current filling in Stage 1 of Area B.

Site development planning is managed by HDC professional engineering staff, with design carried out by HDC's consultants. We understand HDC has recently appointed a Solid Waste Officer to give the landfill operation more specific attention within the ambit of the HDC Community Assets Group. This is considered a positive step.

The day-to-day operation and management of the landfill are contracted to MidWest Disposals Ltd. Compliance monitoring and reporting is the responsibility of the Consent holder, HDC. Compliance monitoring is carried out by Council's main utilities contractor, Downer EDI Works Ltd. Test result interpretation and report compilation for HRC is carried out by Council's consultant, MWH NZ Ltd. Compliance assurance and enforcement is the responsibility of HRC.

Such a structure is usual throughout New Zealand, noting:

- subcontracting landfill operations can sometimes lead to performance issues if the operations contract is not tightly drafted, is poorly administered, or if insufficient financial resources are made available for the contractor to do an adequate job
- monitoring and related reporting requires careful management, which the Consent holder now appears to be managing with assistance from its consultants
- the effectiveness of inspections and compliance usually comes down to the level of experience, availability of and follow-up by Regional Council staff, together with the responsiveness of the consent holder and its staff. Historically, this function has been implemented with considerable variability in relation to landfills around the country.

In summary, the monitoring and reporting requirements that apply to the site are generally in line with requirements at other landfill sites around New Zealand. These will be adequate as long as they are effectively resourced and implemented by both the consent holder and the regulator. There is recent documentation on file suggesting that additional resourcing is to be applied by both parties to overcome a number of historic shortcomings evident from the file record over the period 2002 to 2007.

It is clear from what has transpired to date, that the process of resolving issues between HRC and HDC may have benefited from the input of an independent peer review panel. Such a procedure is routinely included in consent conditions for landfill sites where the Regional Council may not have staff with either specific landfill experience, or sufficient available resource, and therefore needs independent technical input in relation to design, operations and monitoring. For small landfill sites this is sometimes one independent expert, experienced in landfill design, construction and monitoring, that can assist both consent holder and regulator to achieve the outcomes targeted in the consent conditions.

In this case, the record of ongoing back and forth correspondence between the parties suggests the process of administering the consents has been problematic at times, and the input of an independent peer reviewer may have seen matters dealt with more effectively (noting that appointment of an independent Peer Review panel was not a consent requirement in this case). Requiring the input of a peer reviewer in the future would, we consider, be a positive step in relation to the HDC site.

Ultimately, it is the consent holder's responsibility to ensure compliance with consent conditions and the recent appointment of a council officer with full responsibility for the site's management will assist in this regard. The consent holder must ensure that any subcontracted processes are effective and are well resourced, and must have sufficient technical review and management controls in place to ensure consent conditions are met without instances of non-compliance.

HRC in turn needs to implement effective processes that ensure these outcomes are routinely achieved and that the requirements of the conditions are fairly assessed and problem areas are dealt with appropriately. In addition to any peer review processes undertaken by the

Consent Holder, this could include HRC implementing an internal peer review or overview process of its own to ensure compliance is being routinely achieved.

4 How has the site performed since consents were granted in 2002, and are the compliance record, related processes and compliance management now satisfactory?

The consent conditions contain a number of specific monitoring, reporting and information deadlines. As part of the review process recently initiated by HRC, we expect that HRC staff will be preparing a detailed report on the site's compliance history. HRC's records would need to be reviewed in detail to confirm the extent to which the requirements of the General and Special Conditions of consent have been met since being granted in June 2002.

However, it is clear from the file that there have been a number of non-compliances of varying sorts over the period since May 2002, in relation to the old landfill area. These relate to instances such as late delivery of reports, failure to manage leachate on site, slow implementation of requirements for site closure and capping and failure to monitor for VOCs. The file features a history of correspondence between the parties related to delays in implementation or failure to meet reporting deadlines, and failure by the Consent Holder to meet other aspects of the consent conditions.

The file information suggests that to date, the management processes adopted by HRC staff have taken some time to gain effect in enforcing the requirements of the conditions. An infringement notice was issued in September 2005 for failure to submit VOC samples for the second year in a row, and an abatement notice was issued in 2006 for failure to hold a required Neighbourhood liaison Group meeting.

We reiterate that it is the Consent Holder's responsibility to ensure consent conditions are met, irrespective of whether or not the outcome of non-compliance might be considered by the Consent Holder to be of minor significance. The consent conditions were set by the Environment Court to give all parties, including neighbours and the general public, confidence that standards and processes at the site are routinely of a good standard and that the risk of adverse effects is minimised.

5 Has the old area of the site been satisfactorily closed and are there any residual issues related to groundwater, site monitoring, or closure works that need to be addressed?

The old landfill area (Area A) was required under the consents to be finally closed and capping completed by 24 November 2004. We understand that placement of cap soil was completed to the required timeline, but that cap vegetation took some time to establish and was not fully completed until some time after February 2005. Inspection shows the capped area to be relatively tidy, with the cap surface in most places appearing relatively tight with a surfacing of competent material. It is understood that the cap thickness is typically of the order of 1m, as required by the consent conditions. Apart from some bare areas the cap is now covered in a mix of grass and weed species, and pines have been established in some areas.

The side slopes show evidence of bare areas where runoff is concentrated and also areas of settlement-induced cracking. There was no surface evidence of landfill gas emissions of significance on the day of the site visit.

The consent conditions in relation to the cap are loose and in part ambiguous (e.g., the slope requirement). The surface of the closed landfill is slightly sloped, but is essentially a "flat deck" landfill surface. While this is not inconsistent with the consent conditions, the outcome has been some low settled areas that appear to pond water during rain, with much of this ponded water likely to enter the landfill as seepage and form leachate. This and other issues relating to the capping of Area A were commented on in a review undertaken for HRC by Golder Associates in November 2007. As noted by Golder, the consent holder is monitoring and reporting on the ongoing effects of discharge from the closed landfill area. If trigger levels are exceeded in the early warning monitoring bores it is likely that remedial action will ensue. So far this has not been necessary.

Many old style disposal sites such as Area A at Hokio Rd were filled relatively slowly, under what were often semi-aerobic conditions (little cover placed) and with much of the waste being readily degradable organic material. As a result the common impacts on shallow groundwater at such sites are elevated levels of organic nitrogen (typically present in shallow groundwater as ammonia and nitrate/nitrite); together with increased levels of compounds such as chloride, sulphate, boron, and metal species such as iron and manganese. Depending on groundwater, soil and redox conditions below a site, often effects are relatively localised. When coupled with what is often poor quality shallow groundwater, the impacts of such historic sites, while evident, are often not significant enough to warrant major remedial actions following site closure.

Effects on surface water have not been recorded to date at the surface water monitoring sites. However, monitoring results show clear evidence of increasing impacts on groundwater quality at down gradient wells. Key leachate indicators show steady increases, in some cases to relatively high levels, in some down gradient wells (ammonia in B2, COD in B2 and B3, sodium and chloride in all wells except C1 and E2s). However, the information reviewed as presented in the monitoring reports and as able to be assessed from available file records, is insufficient to evaluate the significance of these impacts in terms of effects on the surrounding environment, including the potential for effects on surface water as a result of the high ammonia levels in particular, but also other contaminants recorded in the shallow groundwater monitoring wells. The locations of wells, surface water features and surface water monitoring sites, together with groundwater levels and flow direction could not be confirmed from the data provided for this review, and in some cases do not appear to have been measured. While levels of most toxicants appear to be relatively low, the high levels of ammonia in particular are of concern and could indicate some potential for future 'breakthrough' of other toxicants.

Overall we conclude that a thorough review of the significance of these monitoring results, and of the adequacy of the monitoring programme, would be appropriate. This comment was also made by Golder in its August 2005 report. The review would need to have available to it, more detailed information regarding the locations of wells, surface water features and surface sampling locations, and factual (rather than inferred) groundwater information. This exercise should clearly be a key consideration in the current review of consent conditions.

Following closure it is difficult to fully mitigate the effects on shallow groundwater of an unlined tip site located over a shallow unconfined groundwater system. There are many such historic sites around New Zealand and following the introduction of the RMA, the accepted practice has tended to be to grant discharge permits for these "attenuate and disperse" sites (as they were termed) to consent the ongoing discharges to groundwater and to allow the sites time to slowly stabilise. Consent conditions typically require regular

monitoring of groundwater impacts, and significant remedial action usually only takes place if there is evidence that groundwater aquifers, local users of groundwater, or surface water systems are being detrimentally impacted, or there is evidence of a significant risk of latent or potential effects.

In this particular case there is no current evidence that direct intervention or mitigation is necessary in relation to Area A, or the local shallow groundwater system. However, we agree with the Golder review comments that a precautionary approach should be taken to monitoring and aftercare at this site. One reason for this is that the historic controls on waste acceptance at the site, even as set out in the consents confirmed in 2002, are very loose by today's standards. It is known that the site accepted sewage sludges and it is quite likely that some hazardous wastes may have been co-disposed within the waste mass. No records of such disposals are likely to exist for Area A. Hence a prudent approach to site management would be based on:

- continuing with a comprehensive groundwater and surface water monitoring programme that will alert the need for more extensive environmental control measures or other discharge control steps, should evidence of more serious contamination occur in the future, with this monitoring programme to be improved as necessary
- ensuring the landfill cap is effective in preventing water ingress. We believe that some of the current practices are inappropriate and some relatively simple cap and drainage improvements would be of significant benefit in mitigating the potential for effects. These improvements include:
 - removing the pine trees (which are likely to be detrimental over the long term)
 - adding additional cover soil to mound the central cap area, eliminate surface depressions, ponding and infiltration, and promote runoff
 - implementing a programme of regular cap compaction to control cracking of the cap on the side slopes
 - improving the surface drainage system and constructing cap drains to avoid concentrated areas of runoff, with associated surface erosion and ingress of surface water into the waste mass.

It is our understanding that cap improvement options such as described above, together with the adequacy of the current monitoring regime will be discussed as part of the upcoming consent review. This will likely include review of "phytocap" cover discussions. While a phytocap approach is a technical possibility, it does not appear to us to be appropriate for this site. Further discussion on issues around phytocap covers is, however, beyond the terms of this current brief.

It remains to be seen whether monitoring ultimately indicates that remedial action is necessary in relation to groundwater. At this stage remedial action is not warranted in terms of the consent conditions. While impacts on local groundwater are very much evident, the resource is not utilised and is of poor quality. However, as noted above, the unknowns around what wastes have actually been disposed of at the site, mean that at the very least a comprehensive, technically robust programme of ongoing tiered monitoring, together with some limited improvements to the landfill cap, are warranted.

6 Does the design, operation, monitoring and related compliance reporting of the new site (Area B) comply with the consent conditions, and does the overall operational standard align with current industry and regulatory expectations?

A modern landfill operation has been the targeted objective for Area B, as described in the consent application and related Environment Court appeal documentation. Given the lack of locally available clay, a geocomposite liner has been adopted, using a GCL as the clay barrier component as required by Condition 27.

Other design and operational consent conditions for the Area B lined landfill development appear to be generally being met.

The design for Area B represents a major improvement over Area A. However, several aspects of the consents related to waste acceptance criteria, design and relate somewhat more "open" than conditions now generally being applied by the Court or recommended in the MfE publication "Guide to Landfill Consent C 2001". We suggest that HRC or the Consent Holder give consideration to the design and consent issues during the upcoming review of consent condition

- the appropriateness of the waste acceptance criteria: hazardous waste not permitted to be disposed (or co-disposed) at municipal solid waste Zealand, even the most secure sites (we understand from HDC that it hazardous waste at the site, albeit that the conditions permit it)
- the adequacy of a GCL alone without a further clayey bedding/attenu beneath it (a matter for consideration by HDC's designers)
- the performance of the GCL within the exposed, un-ballasted liner areas (for example Stage 2 as recently constructed) : this relates to the potential for both hydration and shrinkage/necking of the GCL panels given that the deployed liner is likely to remain exposed and the GCL un-ballasted for some time; and related issues of GCL performance on subsequent loading
- the lack of a consent condition limiting leachate head on the liner: typically the design requirement for leachate head is limited to <300 mm to minimise the risk of leakage even in the event of liner defects being present
- design review processes.

In relation to the operations in Area B, we made the following points and observations on the day of inspection:

- the amount of exposed refuse was excessive overall, not helped by the need to use sandy cover soil which tends to be lost into the voids in the waste. Options for improved cover to the waste do, however, exist and should be looked at. These include use of tarpaulins or sprayed synthetic daily cover materials, as well as topping up of sandy cover materials where used in intermediate cover areas
- bird numbers were excessive given the size of the site and the waste tonnage being received
- the amount of wind-blown litter was excessive: both operational practices and related consent conditions need to be improved in this regard

- the leachate pond and related piping should be regularly monitored for their adequacy as a containment system. This is because all leachate is now pumped to a storage lagoon for either removal offsite, or possible recirculation.

Based on the file information we consider that the leachate management approach now being proposed is appropriate. This approach no longer involves direct spray irrigation of leachate, and partial leachate recirculation is to be implemented, with offsite disposal to an approved wastewater treatment facility of the nett excess leachate generated by the facility.

The progressive nature of landfill development and the review processes built into the conditions mean that this and other aspects of the facility's development and operation can be reassessed periodically and amended as necessary. The operation of Area B represents a marked improvement over historic practices at the site, but there is still room for operational improvements to bring the design and operational standards fully into line with accepted practice at other New Zealand landfill sites.

7 What are the key issues that need to be addressed in the review of Consent Conditions, recently initiated by HRC?

There has been a significant improvement in design and operational standards at the site since the granting of consents in 2002. However, a number of aspects of non-compliance with consent conditions are evident from the file, as are failings in the process aspects of site management by both the consent holder and HRC. Ultimately it is the Consent Holder's obligation to meet the conditions of consent and we understand improved management processes are now being implemented by HDC to achieve this.

When HRC considers the review of consent conditions, it will no doubt take the performance of the site to date into account, together with the rather uncertain, but significant trends for ongoing effects shown by the results of monitoring of the impacts of the facility on surface and ground water over the intervening period.

HRC also has the ability under the conditions to, inter alia:

"add....new conditions as necessary"

to deal with issues that may have become evident only since consents were granted.

The extent to which changes to conditions, or the addition of new conditions are required, will depend on the full review of the landfill's compliance performance that HRC will be undertaking, its assessment of the significance of non-compliances to date, and its views on the processes to be undertaken in future should further non-compliances occur.

By and large the existing monitoring conditions appear to be appropriate but are, we consider, able to be refined. We consider that the waste acceptance criteria, particularly the ability to accept hazardous waste for co-disposal (Conditions 7, 8, 11) warrant review, as do aspects of the design and review provisions in the conditions necessary to ensure the design and performance monitoring of key aspects of the facility (e.g., leachate containment and pumping system, liner, cap etc) are adequate, and to bring the conditions into line with MfE recommendations and accepted practice elsewhere in New Zealand.

8 Summary

The HDC waste disposal site at Hokio Rd near Levin has operated for some 30 years, with a total waste input to date estimated at some 250,000 to 300,000 tonnes. Initial filling was in an un-lined sand dune area, with relatively few environmental controls and resulted in a

history of concerns and complaints by neighbours. However, despite episodes of poor performance, the isolated location and natural setting of the site with its limited local shallow aquifer system, has resulted in direct environmental effects appearing to be relatively localised.

The unlined area of the site (Area A) was eventually closed and capped in 2005 and groundwater and surface water are being routinely monitored under the conditions of consent set in May 2002. Overall, Area A is shown to be impacting on shallow groundwater quality in the area, and while the effects are locally quite marked, information to date indicates effects are likely to be localized and on a low quality groundwater resource that is not used for potable supply in the vicinity of the site. No effects on surface water are evident from the monitoring data presented to date.

The design and management of the new landfill area (Area B) as consented in 2002 are of a much higher standard, although there is still room for improvement in aspects of the operation, and possibly some aspects of the design detailing.

The legacy of Area A is typical of many older style "attenuate and disperse" dumpsites around New Zealand most of which are now closed, and some of which are in environmental settings significantly more sensitive than the Hokio Rd site. While not an ideal environmental outcome, the ongoing approach being taken to managing Area A, following its closure is what is envisaged by the consents and is an approach commonly adopted at similar sites. This approach involves capping and ongoing monitoring, with a view to implementing further remedial measures for groundwater or surface water if necessary at some future time. Such an approach is reliant on a robust monitoring network and monitoring programme, and on a good understanding of the local groundwater and surface water systems. Beyond this, there is potential for the Consent Holder to further reduce the risk associated with the site through some relatively minor cap improvement and related drainage works.

The upcoming review of consent conditions by HRC provides an opportunity to review some aspects of the conditions to bring them into line with accepted landfill practice in New Zealand. It also provides HRC and other interested parties with the opportunity to reflect on the compliance performance of the site, adjust aspects of the consent conditions as may be necessary, and clarify the future approach to be taken to compliance overview and response.

9 Recommended actions

As a result of this review we recommend the following actions for PCE to put forward for consideration, either as part of the current review of consent conditions being undertaken by HRC, or by HDC itself as the Consent Holder:

1. Confirmation of required structure, actions and timetable for compliance reporting and management including, if deemed appropriate by HRC, the incorporation of a peer review process for ongoing design, operations and monitoring
2. A review by HDC of the site operations contract for adequacy in relation to meeting the performance criteria set out in the conditions of consent
3. A review by HDC of recommendations made in this report relating to aspects of the detailed design of Area B

4. A comprehensive, independent review of the results of monitoring to date and of the implications of this review for the monitoring conditions for groundwater and surface water systems
5. A review of other general conditions of consent where these depart from accepted norms, particularly those related to waste acceptance and hazardous waste disposal.

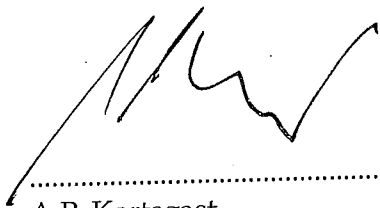
10 Applicability

This report has been prepared for the benefit of the Parliamentary Commissioner for the Environment with respect to the particular brief given to us and it may not be relied upon in other contexts or for any other purpose without our prior review and agreement.

TONKIN & TAYLOR LTD

Environmental and Engineering Consultants

Report prepared by:



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A.P. Kortegast
Director

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