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# **REMEDIATION OF THE FCC MAPUA SITE**

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Review of the Role and Actions of the  
Ministry for the Environment  
New Zealand

FINAL REPORT

C J BELL



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# 1

## EXECUTIVE SUMMARY

Like many other similar sites around the world, the Fruitgrowers Chemical Company Site at Mapua has a long and complex history of chemical manufacture and formulation. The New Zealand government and the Tasman District Council funded a remediation of the area, with the aim of cleaning up the site and its surrounds to allow commercial, residential and open space use of the site, and to minimise the continuing off-site effects of the residual contamination.

The site and its clean-up drew considerable public attention. The remediation strategy, the technology to be used and the potential for off-site effects all featured in the consent hearings and approvals processes.

The original clean-up contractor (Thiess Services Ltd) withdrew from its contract with TDC, and the Ministry for the Environment assumed the role of consent holder for the remediation. This conflated a number of potentially conflicting roles.

The remediation was always going to be a challenging one. As the first substantial clean-up of its type in New Zealand, and using developing technology on a closely settled site there were significant unknowns, requiring a close and adaptive management throughout the project. The consent conditions recognised this. Unsurprisingly, there were some challenges during the clean-up. Neither the control of air emissions, nor the reagent mix used in the MCD technology were finalised at the time of the consent hearings and became the subject of much scientific and technical debate. Noise and dust generated at the site created disturbance to neighbours.

In July 2008 the Parliamentary Commissioner for the Environment published a report of its investigation into the clean-up at Mapua.

This report was commissioned by the Chief Executive of the Ministry to gain an independent view of the performance of the Ministry during the clean-up.

This review found that the Ministry acted rapidly and with appropriate due diligence to arrange transfer the consents and establish a project management structure to deliver the project using the Thiess documentation as a project plan. It handled other aspects of the Ministry role using internal 'business as usual' processes. There were some gaps in project establishment that led to difficulties in the execution of the project.

Project structure and oversight in the Ministry seemed less stringent as the project progressed. The Ministry was slow to respond to a number of issues during the clean-up. This resulted from a range of factors - the complexity of the decisions to be made; uncertainties in the consent conditions, and the Ministry's judgment of the means to tackle the issue. The informal processes of project management contributed.

The Consents have now expired and the site has now been capped with clean soil and grassed. It would be premature to comment on the current state of the site before the formal audit and validation has been completed. Nevertheless, a substantial amount of residual toxic material has been removed from the site, and the site made available for the safe use of the land for defined purposes.

This report makes a number of recommendations for the Ministry to consider. These address both the Ministry's current obligations for the site, and the application of its learning from Mapua to provide guidance for the future.

## 2

# INTRODUCTION

The Fruitgrowers Chemical Company opened a pesticide formulation factory at Mapua in 1932. In 1945 the manufacture of organochlorine pesticides began, and in 1958, organophosphorus formulation was introduced. By the time the FCC operations closed down in 1988 over a hundred chemicals had been used and formulated on site. While this history resulted in a complex and heterogeneous site, it is not unusual for such sites remediated elsewhere in the world.

During this period, housing was developed on the peninsula south of the site, including on properties on the boundaries of the site. Commercial properties were developed to the north of the site.

The management of a site with these characteristics, whether by treatment and remediation, or by containment, is inevitably associated with significant, but manageable, risks.

Tasman District Council is the local authority within which the Mapua site is located and which has responsibilities under the Resource Management Act.

In the mid-90s site investigations were conducted, leading to the development of a resource consent application for a containment strategy. In 1997 a Resource Consent hearing granted a Consent for this purpose. The Royal Forest and Bird Society appealed this decision, in part on the grounds that containment was not the preferred response. The government also expressed its view that the preferred strategy was remediation, not containment. In 1999 the New Zealand Government decided to assist TDC with funding, research and advice, delivered in part by the Ministry for the Environment (the Ministry).

After a number of technology assessments, and field trials on the subject soil, TDC awarded the contract to Thiess, using the remediation technology of Environmental Decontamination Ltd (EDL), in 2001.

Thiess carried out further site characterisation and investigations, leading to a Resource Consent Application in 2003 for remedial works. Greenpeace and the Royal Forest and Bird Protection Society appealed the conditions, and the consent was granted with amendments in November 2003. The amendments included the establishment of a Peer Review Panel to oversee the 'Proof of Performance' of the selected remediation technology.

In August 2004 Thiess Services withdrew from the project and the Ministry for the Environment became the consent holder, assuming responsibility for the project.

The last batch of contaminated soil was treated in July 2007, and in November 2007 the resource consents expired and the site became the responsibility of the TDC.

In July 2008 the Parliamentary Commissioner for the Environment published a report resulting from an investigation under S16(1)(c) of the Environment Act, following allegations of poor environmental management of the remediation of the site.

In September 2008 the Chief Executive of the Ministry for the Environment, New Zealand, commissioned a review in order to assist the resolution of the Ministry's continuing responsibilities for the Mapua site.

This document presents that review, under the following terms of reference.

## **Terms of Reference**

1. To complete a detailed picture of the MfE involvement in the Mapua remediation process focusing on the Ministry's
  - a. Internal processes;
  - b. Governance; and
  - c. Management.
2. This investigation will include consideration of the Ministry's competency to undertake the roles it variously did and to manage the various contractual relationships it was party to.
3. To provide recommendations on
  - a. What further action the Ministry needs to take at Mapua (if anything)
  - b. A future protocol to guide MfE's involvement in any future contaminated site containment or remediation.
4. This is to enable the Chief Executive to reach an understanding of what the Ministry has done well. What it has done poorly as well as rebutting any accusations that are not appropriate.
5. The primary context for this review is provided by the report of the Parliamentary Commissioner for the Environment concerning the contaminated site at Mapua.



## **Conduct of the Review**

The review was carried out over a two-week in-country phase of collection of information, including a visit to the Mapua site, with reporting and further research carried out during report preparation. Full access to the records of the Ministry for the Environment, and research assistance, was provided.

The access provided to the Ministry's files and electronic records, and the availability of records of TDC provided every opportunity to examine original documentation. The short time available for the review precluded a close examination of every relevant original document, and so this review does not represent a formal 'audit' approach to the information.

Current and former staff of the Ministry, and other key players, were generous with their time, and readily participated in interviews to explore the issues.

Many complex and detailed scientific reports were generated over the long period of the preparation and conduct of the clean-up. In preparing this review all key reports were made available, and examined in detail for the relevant issues.

The review focused on the Ministry for the Environment. Where relevant to the Ministry's performance, the actions of other organisations were investigated.

A draft of the report was provided to the Ministry, for the correction of factual errors, and for additional information to be provided where the initial research was incomplete.



# 3

## MINISTRY'S ROLE AND HISTORY

It is not possible to review the role of the Ministry for Environment throughout the Mapua project without considering the context in which it operated. Many factors are important. The Ministry had a defined role under legislation. Many other agents had a role in developing and managing the project and in the development of, and compliance with, Resource Consent conditions. The unusual nature of the site (certainly for New Zealand) presented particular challenges and required an adaptive management approach. The nature of the contamination on the site is one that justifiably generates a great deal of community and public interest and attention. Finally, the Government (and more broadly the Parliament) had a continuing interest in the site, and in developing and promoting New Zealand technology.

In setting out the history of the site it is useful to examine several phases of the Ministry's role –

- initial site investigation and the development of the consents;
- the process of transition from the Thiess Services contract to the Ministry holding the consent;
- management of the operation of the remediation process; and
- current status of the project.

### Development of the Consent

Throughout the early phase of site characterisation and the development of the proposals the Ministry acted in its role as described in the *Environment Act* (1986)<sup>1</sup>, assisting and advising the Minister in the operation of the Resource Management Act. It provided funding, research and advice in the development of remediation options, convening a Technology Review Panel. It part-funded the demonstration and evaluation of several optional technologies for the remediation of the site, to help meet the Government's preference that the site should be remediated, rather than contained.

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<sup>1</sup> *Environment Act 1986*

S 31 The Ministry shall have the following functions:

(c) To provide the Government, its agencies, and other public authorities with advice on—

- (i) The application, operation, and effectiveness of the Acts specified in the Schedule to this Act in relation to the achievement of the objectives of this Act:
- (ii) Procedures for the assessment and monitoring of environmental impacts:
- (iii) Pollution control and the co-ordination of the management of pollutants in the environment:
- (iv) The identification and likelihood of natural hazards and the reduction of the effects of natural hazards:
- (v) The control of hazardous substances, including the management of the manufacture, storage, transport, and disposal of hazardous substances:
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In 2001 TDC awarded Thiess, offering the MCD technology operated by EDL, the contract to develop the Resource Consent and Environmental Permit applications and to carry out the remediation. The Resource Consent application was lodged in 2003, and after consideration by the council, appeals and a consent hearing, was granted with amendments in November 2003.

## **Proof of Performance**

As a condition of the consent, an expertise-based Peer Review Panel (PRP) was established.

“Peer Review Panel<sup>2</sup>

5. Prior to the commencement of any works the Consent Holder shall request the Council to appoint a Peer Review Panel, which shall include the nominated representative of the Environment and Planning Manager of the Council. The Peer Review Panel members shall be selected for their expertise in some or all of the following: Noise, air Quality, Vibration, Pesticide Contamination (including Persistent Organic Pollutants) Water Resources and Coastal Ecology.
6. The Role of the Peer Review Panel shall be to:
  - a. Meet during the Proof of Performance Period to review, comment and make recommendations on the management plans (including the Remedial Action Plan);
  - b. Meet after the Proof of Performance Period to review, comment and make recommendations on any changes to the management plans (including the Remedial Action Plan) and monitoring reports listed in condition 13
  - c. Meet at no less than three monthly intervals; and
  - d. Any recommendations of the Peer Review Panel shall be made to the Council's Environment and Planning Manager and the council's compliance coordinator. The Consent Holder will fund the operation of the Peer Review Panel.”

The PRP was intentionally established on the basis of specific technical expertise, although a representative of Thiess Services was included for information purposes<sup>3</sup>. The Site Auditor was also appointed to the panel.

The Ministry participated in this process. Council appointed a “MfE contaminated sites specialist, including experience with Persistent Organic contaminants, and advisor to MfE on the Mapua FCC project<sup>4</sup>” to the PRP.

At its first meeting the PRP received reports of progress and performance of the first week of the POP trials. There were issues of mechanical handling and the adjustment of reagent concentrations at this time. EDL flagged the potential use of other reagents<sup>5</sup>, although it is not clear from the report made to the PRP which other reagents might be used. The PRP expressed the clear view that the POP “needs to be (*demonstrated*)<sup>6</sup> for defined operating conditions<sup>7</sup>”. That is, for the expected normal operations of the plant.

In the POP trials during normal operating conditions the results of air discharge monitoring showed operations well within the resource consent conditions. However, higher results

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<sup>2</sup> Conditions 5, 6 of consent RM030521

<sup>3</sup> “...to ensure that everyone is as fully informed as possible, meetings of the Peer Review Panel should also be attended...by a local Thiess rep familiar with the management plans, and appropriate TDC and compliance rep(s)” Establishment of PRP – Email. Chair of PRP to Ministry. 2 Dec 2003.

<sup>4</sup> Establishment of PRP – Email. Chair of PRP to Ministry. 2 Dec 2003.

<sup>5</sup> PRP was told that Thiess would have to give approval if this were the case (and presumably would consider whether its Consent Conditions could still be met).

<sup>6</sup> Author's addition in italics

<sup>7</sup> Notes of First meeting of PRP 27 Feb 2004.

were observed for most pollutants measured “after the feed auger jammed several times and the Air Pollution Control System was shut down as a consequence, although the dryer was still operating, so that the soil was overheated.<sup>8</sup>”. This operational irregularity was thought not to represent normal operating conditions.

This is consistent with the observations of testing carried out on 28,29 January 2002 and 11,12,13 March 2002 and reported in the AEE<sup>9</sup> - “ The results show significantly higher organochlorine emissions from the dryer during the second round of monitoring compared to the first round. This is attributed to significantly higher temperatures of the drying air in the second set of tests as indicated by the baghouse exit temperatures”.

In combination, these reports suggest that certain plant operating conditions had consequences for organochlorine volatilisation and the emission of dioxin congeners. The key cause of such volatilisation and synthesis was attributed in the AEE to elevated dryer temperatures.

A second important implication of the results was to emphasise the importance of the Air Quality Management System as a key control, both in normal operating conditions (due to the potential volatilisation of contaminants) and during periods of process upset (where the carbon filters have the capacity to absorb organochlorines volatilized and dioxin potentially created in the compromised process.

The PRP provided comments on the Proof of Performance report, noting that Thiess had asked EDL to follow up the dioxin synthesis issue.

Thiess issued the Remediation Action Plan in July 2004.

## **Conclusion**

The actions of the Ministry during the development of the Consent appear consistent with its legislated functions and expertise. Management and governance issues are unremarkable as the Ministry was acting within its established role.

The POP trials showed that during normal operating conditions the MCD plant could be run in conformance with the consent conditions. It also highlighted the importance of an effective air management control system in capturing volatilized components discharged from the MCD plant.

## **Transition of Consents to The Ministry**

The withdrawal of Thiess Services from the project left TDC, the Ministry and the other project partners in a challenging position. The Ministry conducted significant investigations throughout July 2004 to determine the available options for the continued clean-up of the site. There were considerable disadvantages in leaving the site in its existing state. The Ministry had obligations to Government for the expenditure of the Contaminated Sites Remediation Fund, which had been the funding vehicle for the project. Further funding was vulnerable given that the Ministry had carried over appropriation for the site in previous years.

There was considerable ‘sunk’ effort and cost at this stage, all approvals had been prepared, and the treatment technology had been judged satisfactory. There had been an

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<sup>8</sup> Thiess Services. FCC Remediation, Mapua. Proof of Performance Report. June 2004.

<sup>9</sup> Tonkin and Taylor (2003) FCC Mapua Site Remediation. Assessment of Environmental Effects. Appendix 1: Assessment of the effects of discharges to Air from site remediation. Friuitgrowers Chemical Company Site, Mapua.

investment in community consultation, establishing community expectations. Detailed project planning had been completed and approved. Delays at this stage had the potential to cause a significant hiatus in the project.

In this period the Ministry considered options for contractors to continue site works, considering

- Securing another contractor to assume Thiess' role (judged too likely to result in delays); and
- Appointing a site engineer and an earthworks contractor, potentially on an interim basis, under contract to MfE or TDC

The Ministry considered 'Management Options', distinguishing between MfE "runs the show" and TDC "runs the show".

The Ministry also considered how it might manage the project internally should it adopt the role as consent holder and 'manager' of the remediation.

Ministry staff investigated to the extent possible the reasons for Thiess' withdrawal. Multiple potential reasons were identified, many financial (including matters outside the control of any party, such as exchange rate variations). The combination of reasons cannot be known with any certainty, but clearly the financial issues would have been sufficient to influence Thiess, bound as they were to a fixed price contract.

Within the Ministry a 'handover' project plan<sup>10</sup> was prepared by early August 2004, aimed at implementing a transition to the Ministry's project management role. The plan included the review of all consent and contract documents, signing of an exit deed with Thiess, establishment of an understanding with TDC on funding and compliance, transfer of the resource consents, establishment of a Ministry project team, urgent recruitment or reappointment of external personnel and contractors, and the development of a communications plan.

The Ministry and TDC negotiated heads of agreement on 4 August 2004. These provided for

"MfE to remediate the Mapua site to the agreed standards set out in the former contract between Thiess and TDC dated October 2001, and in the related resource consents.

Tasman District Council agree to:

- Contribute a maximum of \$2 million (plus GST) toward site remediation costs".
- Pay \$734, 000 (including GST) no sooner than 18 months (modified to 36 months) after completion of the remediation project as certified by the site auditor."<sup>11</sup>

The Ministry would be the Consent Holder; the remediation resource consents to be transferred from Thiess. All intellectual property relevant to the project was transferred to The Ministry. The heads of agreement also include a desire by TDC that the Ministry indemnify TDC in relation to the remediation project. This proved not to be acceptable to the Ministry.

## **Conclusion**

In this phase, the evidence shows that the Ministry carried out appropriate 'due diligence' with respect to its risks, project structure and resources in assessing whether to assume responsibilities for the project.

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<sup>10</sup> Mapua handover project design. (version 2). 2 August 2004

<sup>11</sup> Notes of a meeting held on 4 August 2004 between the Ministry and Tasman District Council

Some key issues were not resolved at that time. The financial arrangements were not resolved between the Ministry and TDC, and there was no documented agreement between the Ministry and TDC regarding the compliance and monitoring design. Both these issues later contributed to difficulties and misunderstandings in carrying out the project.

The project relied on the detailed Thiess project documentation and approvals to plan site activity. Other elements of the project that reflected the Ministry's broader responsibilities, such as governance, advice to the Minister, Mapua project funding and budgeting, project reporting and tracking, were dealt with using the Ministry's established procedures.

This decision is a matter of governance and strategic direction for the Ministry. A clear 'governance' separation of the Mapua remediation project would have helped resolve a number of apparent conflicts in the Mapua project, and certainly have made the process of review and evaluation more effective. However, the strategic intent was to build the Ministry as a more action-oriented and responsive agency<sup>12</sup>, and so integrating key projects into 'Business as Usual' management and governance is a key tool to achieve this new model.

## **The Ministry as a Consent Holder**

The Ministry formally took over the Consents on 2 September 2004. It acted rapidly to establish interim contracts for the key site functions and supervision, and a long-term contract with EDL for the remediation technology. These short-term contracts were later confirmed with long-term contracts. The Ministry reported to the PRP "The new contracts clarify the responsibility for the environmental controls lies with the individual contractors<sup>13</sup>". This is consistent with the Ministry project structure, which documents the interaction of the TDC (in its compliance function) with site management, not the Ministry itself.

The Ministry established a new reporting structure with EDL, requiring daily worksheets, work dockets, production details, and a formal monthly report.

It also established a health monitoring protocol for workers, having rewritten the Health and Safety documentation. This included lung and liver function tests, analysis of OCP in blood, personal air monitoring, and 'fit for work' assessments.

The Ministry was keen to keep the momentum of the project and carried out earthworks to provide sufficient soil for the MCD process to operate into January. The MCD operated using soil prepared for the Proof of Performance trials until mid October, before beginning to treat the soils more recently excavated from the site. These soils were wetter and less well mixed, and may have contributed to mechanical problems with the MCD process.

On 13 Jan 2005 there was a release of steam and soil from the MCD plant after maintenance operations. EDL did not notify TDC, the Ministry or the site manager EMS, but public complaints alerted TDC to the incident. The Ministry reported "EDL is not meeting its contract requirements for this"<sup>14</sup> (ie EDL not reporting "significant air discharges").

On 3 February 2005 stack emissions were tested. Results showed levels of OCP much higher than reported in the Proof of Performance Trial as representing normal operating

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<sup>12</sup> Former Chief Executive of the Ministry for the Environment. Interview 24 Sep 2008.

<sup>13</sup> PRP meeting #3. 14 Dec 2004.

<sup>14</sup> Ibid.

conditions. However, a calculation of the Total Hazard Index showed that this met the consent criterion for human health exposure.

On 15 March 2005 the carbon filter malfunctioned and visible signs of leaking carbon were obvious. A site instruction to stop work was issued by Ministry representatives on the same day requesting the plant to shut down until repairs could be made<sup>15</sup>.

These issues were discussed at the PRP meeting in April. The Ministry reported to the meeting that a closer oversight of the operations of the MCD plant would take place. In clarifying the implications of this, the Ministry advises that

"This reference is to both a more active formal and informal site management practice adopted on the site. The site management team became more actively involved in visiting the EDL plant and in being actively aware of any incidents and decisions that may have an effect on site management and/or resource consent compliance. The site team could also use the more formal site instructions and other mechanisms open to it as required. The key was being more fully informed in order to be able to respond. There is no formal reference to this however", and

"the site management team did become more actively involved in the maintenance of the Air Quality Control System, including ensuring the regular monthly changes of the carbon filter and documenting these in the site logs".

The carbon filter was changed monthly from March 2005<sup>16</sup>.

On 7 April 2005 TDC wrote to the MfE Project Manager regarding the 'failure to notify' of significant emissions from the site, and their concerns about the performance of the carbon filter<sup>17</sup>. Specifically, TDC wrote "...we discovered that the carbon filter was repaired at Christmas time with chicken wire, so presumably had been malfunctioning for several weeks before 5 March 2005". It also highlighted the exposure of the Ministry as the consent holder.

The Ministry responded to this letter, citing the 'stop-work' instruction on the day of the filter failure, providing air emissions data and a proposed methodology for further investigation to determine an appropriate maintenance period for the carbon filter.

On 4 May 2005 TDC raised the issue of the dryer temperature with the Ministry, referring to the consent condition and its rationale – to prevent the *de novo* formation of dioxins and to limit the volatilisation of OCP. Further letters from TDC followed, questioning the consistency of the filter design with the consent hearing, and requesting inlet and outlet OCP tests to confirm the efficiency of the filter.

In July the carbon filter again 'disintegrated' and required redesign to address corrosion of the supporting stainless steel basket.

At this time there was a change of personnel in the Ministry Project Team, following the loss of the Project Manager. The Project Manager position was not formally replaced. The Ministry advises "A project team approach was taken thereafter"<sup>18</sup>. I could not find documentation setting out the new arrangements for the project.

The meeting of the PRP on 2 August heard that OCP in the air discharge continued to be a compliance issue, and of the failures of the carbon filter. The PRP expressed concern about the repeated failure of the carbon filter, and explored the weight that could be given

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<sup>15</sup> Letter Ministry to TDC, 18 April 2005.

<sup>16</sup> Information provided to PCE. Email Ministry to PCE. 17 Jan 2007

<sup>17</sup> Letter 'Non-compliance with consent conditions' TDC to ministry Project Manager. 7 April 2005

<sup>18</sup> Notes in email. Ministry to author, 3 Nov 2008



to its recommendations. The Ministry representative advised that information was being collected and expert advice sought.

On 16 September 2005 the Ministry advised TDC that the MCD plant was shut down for modification of the air emissions control system, with the intent of addressing the air discharge issues.

The Ministry commissioned Kingett Mitchell Ltd to carry out an audit of the Air Emission Control System. This was carried out in September and reported to the Ministry in October<sup>19</sup>. The report noted that there had recently been work to reconfigure the air management system. Several recommendations were made. The report was sent to both TDC and EDL for their comment. EDL raised a number of issues regarding the 'best' configuration of the air management system, and the practical issues of reconfiguration.

On 25 November 2005 Dr Craig Stevenson joined the PRP, introducing much-needed advice to the group. He prepared a presentation on the air emission system for the meeting of 2 December 2005. The reconfiguration of the air management system appeared to have controlled the acidity in the discharge, and therefore the carbon filter was more secure. He suggested that volatile organic carbon compounds (VOCs) could be saturating the filters, even before the monthly change-out period. He recommended VOC sampling before and after the carbon filter, as had the Site Auditor in the April PRP meeting. The Ministry agreed to investigate a method to measure VOCs.

Dioxin generation was discussed. Dr Stevenson presented a plausible mechanism for dioxin generation, but concluded that dioxin generation under the present configuration was "not a high risk".

The PRP considered it needed to express its concerns about the air emission matters and there was some discussion at the meeting about the role of the PRP and the way its recommendations are dealt with. It formalised its views in a recommendation agreed at the meeting...

"The PRP is very concerned about the risks of discharges from the air emission system from OCPs and dioxins, the lack of supporting monitoring to assess the effectiveness of the carbon filter (given recent failures) and the lack of any redundancy in the air emission system. The monitoring of VOC and stack efficiency should take place before the next scheduled 3 monthly stack test."<sup>20</sup>

The carbon filter was sampled in January 2006 for OCP and VOC and estimates of the time taken to saturate the filter with VOC were discussed.

The problems of measuring the dryer temperature and the relevance of measurements at various points in the system were discussed at the PRP in February 2006. EMS checked the outlet temperature "3-4 times a day", and had found that outlet temperatures in the range 97-108°C. Temperatures in the chamber varied from 196-210°C. The PRP records show "...the PRP was not able yet to resolve how to achieve compliance with the condition of 120°C cutoff at the inlet of the dryer, and how to guarantee that dioxins are not being formed (which was one of the purposes of the consent condition)."<sup>21</sup> Key issues were the variability of temperature throughout the system, and the associated implications for OCP volatilisation and dioxin synthesis; and the energy required to dry the soil as stockpiled.

In May clear 'best practice' advice for filter management was summarized for the PRP - "...carbon...changed monthly, the used carbon analysed for OCPs, a running total of the OCP input calculated

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<sup>19</sup> Letter 'Review of Air Emission Controls – Mapua Site Remediation'. Consultant to Ministry. 17 October 2005

<sup>20</sup> PRP meeting #6, 2 Dec 2005.

<sup>21</sup> PRP meeting #7, 27 Feb 2006

with 240kg of OCPs being the theoretical limit, maintaining at least a 300kg charge of carbon, and keeping the dryer temperatures monitored and within current bounds to avoid risk of significant dioxin formation."<sup>22</sup>

The PRP also recommended at this meeting that dioxin was tested at the top and bottom of the filter charge, to determine its efficiency in removing dioxin.

The Ministry requested a consolidation of all TDC's requests for monitoring so that it was clear what additional monitoring was being requested. TDC sent a letter to the Ministry on 15 June 2006 outlining the outstanding issues and requests for further monitoring. In particular, it requested that "the carbon from the top and bottom of the filter is tested for dioxin, at the next carbon change (in June 2006)"<sup>23</sup>.

The Ministry responded formally on 7 July 2006. It analysed each request and prepared a detailed response. In summary, where the Ministry considered there was clear evidence for an issue, this was acted on whether or not it was strictly required by the consent (eg benzene sampling).

On the issue of dioxin sampling, the Ministry argued that expert evidence from the PRP suggested that dioxin formation would be low or negligible, and that it was therefore not necessary. Neither was it a consent condition. An additional reason is expressed in internal emails "continuing requests for investigations for dioxins implies that there is a problem. The requests and investigations can create concern when there are no grounds for concern. MfE will not assist with an approach which created unnecessary concerns over dioxins".<sup>24</sup>

A second key issue debated at this time was the consent condition 17, that "the consent shall be carried out in general accordance with the Consent Holders Assessment of Environmental Effects dated May 2003, supporting documentation lodged with the AEE and the evidence presented at the consent hearing." TDC argued that the current configuration of the air management system was not 'in general accordance' and did not reflect best practice. It provided Dr Craig Stevenson's recommendations on the carbon filter and its maintenance. The Ministry had previously commissioned a report<sup>25</sup> on the general configuration of the system to advise on best practice. While the system certainly differed from that proposed in the AEE and the hearing, it was not substantially different from that used in the Proof of Performance trials, which were accepted by TDC prior to the transfer of the permits to the Ministry.

TDC informed the Ministry on 26 July 2006 that it intended to sample the carbon filter for both dioxin and OCPs. The Ministry argued at the time that it was not related to a consent condition, and so TDC's "proposal to take carbon samples is unauthorised"<sup>26</sup>.

Ministry representatives and TDC met in August, and resolved that TDC did have the legal right to test. TDC was formally advised on 13 September<sup>27</sup> of the Ministry's willingness to allow TDC to take samples, while the letter expressed reservations held by EDL and the Ministry about the interpretation of results. TDC was to pay for this sampling.

The results of the sampling were analysed by Dr Craig Stevenson, who concluded "Overall, this testing of dioxins in activated carbon from the air pollution control filter provides a very good assurance of a clearly acceptable low level of dioxin formation in the drier, and very low levels of dioxins in the emissions from the carbon filter." He calculated that the average dioxin concentration in the gas discharged from the system was 0.0009 ng TEQ/m<sup>3</sup>, or about 1% of the European Commission limits for incineration. The efficiency of the filter was 95%. This result provided confirmation of

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<sup>22</sup> PRP Meeting #8. 30 May 2006.

<sup>23</sup> Letter "Outstanding issues and requests for further monitoring" TDC to Ministry. 15 June 2006

<sup>24</sup> Internal Ministry email: 3 July 2006.

<sup>25</sup> 'Review of Air Emission Controls – Mapua Site Remediation'. 17 October 2005

<sup>26</sup> email: Ministry to TDC Compliance officer. 26 July 2006.

<sup>27</sup> Letter; Ministry to TDC. 13 September 2006.

the conclusion of the POP report that dioxins would not be generated under normal operating conditions.

It has also been suggested that the Ministry ignored expert advice on potential groundwater contamination. In May 2006 the PRP discussed the possibility of a groundwater plume and included an action item “MfE to consider monitoring to track the contaminant plume...in a larger network of bores south of the site.” This was formalised in the “Outstanding issues and requests for further monitoring” letter from TDC on 15 June 2006. The Ministry sought clarification of what the precise requirements were. This was provided by TDC on 8 August 2006, expanding on the recommendations of the PRP. The identified plume of ammonia and nitrate was seen as a possible indication that contaminants were migrating off-site, and other contaminants of greater concern might follow.

The proposal for monitoring the plume was discussed at the PRP meeting in November 2006 leading to an action item: “MfE to discuss offsite groundwater contamination further with Peter Nadebaum, and consider implementing more fully Tasman District Council’s 8 June letter which suggested a monitoring process for tracking the groundwater plume.”

The change of reagents used in the MCD process (particularly the use of copper) was not anticipated in the resource consent process, but the use of copper sulfate as a reagent had the potential to introduce a new environmental concern. High copper levels have been recorded across the site, and the Site Auditor stressed the importance of reducing the rate of copper use to the contractor and the Ministry. Copper use in the process declined as the reagent mix and preparation was optimised. In assessing the significance of the copper found on the site is important to identify what chemical form of copper is present in the final soils. The ecotoxicity of copper and its leachability are strongly influenced by the chemical species present.

In June 2008 Dr Bill Glass completed his Final Report on Organochlorine Blood Monitoring, reporting this aspect of the health monitoring of site workers from the period 2005-2007. The key finding was that the levels of pp- DDT in blood tended to respond to on-site exposure in some staff. There was a high of variability in both the baseline conditions of staff, and their response over time. He indicated the importance of collecting baseline information for each individual, so that change can be measured from this baseline. It would be very difficult to interpret OCP results without baseline measurements.

During the project, there were calls for the Ministry to sample the blood levels of nearby residents for organochlorine pesticides. The Ministry did not agree to these calls. In the light of the highly uncertain and variable baselines in the New Zealand population, it is unlikely that such sampling, partway through the project, could be related usefully to the exposure of the people tested.

Dr Glass made some specific recommendations and some more general suggestions for the future. These include sampling of baseline conditions for the families of on-site workers. Despite the suggestions of areas of improvement, he concluded, “given that this was the first remediation project the Ministry has undertaken, all-in-all I believe it was successfully carried out”.

## **Conclusion**

The Ministry embarked on this phase of the project with most of the preparatory work effectively completed. In the conduct of the project, some key issues challenged the capacity of the Ministry. The lack of strong project management discipline led to a less formal project management structure later in the project. This may have led to more stretched resources for the project. The Project Leader was not replaced and a “team management” approach adopted.

The lack of a clear understanding of compliance and monitoring requirements, particularly in the context of the evolving nature of these requirements, led to some misunderstandings between partners in carrying out the project. Predictably, it was the unexpected that raised problems. For example, the change of MCD plant reagents, the debate about the effectiveness of the air management system, and the recommendations of the PRP all raised management challenges.

While the Ministry was seen to be obstructive in some areas, it went beyond the requirements of the consent in a number of areas. Some of these it initiated itself. It appeared to make its own judgments of the validity of the 'requests' by TDC, and the views of the PRP. In many cases these judgments were correct, but the approach used by the Ministry contributed to tensions in relationships with other participants.

While there were some weaknesses in project management, documentation and approach used by the Ministry, it remained focused on conducting an effective clean-up of the site, pursuing the project to completion.

The view by TDC as the regulator of the Ministry as consent holder was that it behaved 'like any other consent holder'<sup>28</sup>. The circumstances of the project – the site complexity, the controversial nature of the project, the adaptive management required by the refinement of the technology used – suggest that success in managing the emerging environmental risks depended on a consent holder that was responsive and flexible. It might be expected that the 'custodian' of the RMA should behave in an exemplary, rather than a typical way.

## **Current Status**

The Consents have now expired and the site has now been capped with clean soil and grassed.

There are some important actions that are required to finalise the project. The Site Validation Report is currently in draft form, and the Site Auditors Report, and Dilapidation Survey are required to be completed by the Ministry under the terms of the Financial Deed.

The Site auditor may

- Qualify its report and opinion
- Recommend restrictions upon the use of any part of the site; and
- Recommend further monitoring or work on the site.

It is premature to speculate on the results of these key reports, although it seems likely that the auditor will recommend further monitoring to assess the longer-term effects of the site. Restrictions on the use of parts of the site are acknowledged. TDC will apply limitations on land use via the planning process.

## **Conclusion**

The Ministry has a clear process for the formal completion of the project under the terms of the Deed. However, there are elements of Ministerial action and decision-making that will continue. Recommendations on further action for the Ministry follow.

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<sup>28</sup> TDC Environment and Planning Manager: Interview 19 Sep 2008.

## **Financial Agreements**

There has been some attention paid to the financial arrangements between TDC and the Ministry, and particularly the failure to sign the Mapua Financial Contribution Deed.

At the time that the Ministry assumed responsibility for the site, the Ministry and TDC had an existing Deed to pay for Stage 3 of the Thiess contract (the remediation). Thiess' contract was for a lump sum of \$NZ 4.6 million. The Deed agreed a 70:30 split, with TDC's contribution capped at \$NZ 2 million.

Notes of a meeting on 4 August 2004 to clarify heads of agreement document TDC's desire to cap its contribution at 2 million, and further to seek that the Crown indemnify TDC.

A draft was prepared and sent to TDC on 23 August 2004, and comments returned in late September. Discussion on the wording of the Deed, and particularly the issue of liability continued.

A further meeting of the parties did not occur until 27 May 2005, in part due to the Ministry's need to resolve the contracts for the delivery of the remediation. By this time the estimated cost of stage 3 was \$10 million, and it was running well behind schedule. In late 2006 TDC delivered an updated second draft. The issue of indemnity was still problematic. By 25 May 2007 project costs were estimated to reach as much as \$NZ13 million, and MfE proposed an amendment to increase TDC's share of the costs. This was not concluded. While the issue of indemnity had not been agreed, the delays meant that there was opportunity to renegotiate the arrangements as the identified costs rose.

On 1 May 2008 the Ministry sent a 'final version' of the Deed to TDC. However, TDC had identified additional contractors costs and proposed to alter the Deed to reflect these. The Ministry immediately sought advice from the Crown Law Office to determine its legal position. Crown Law's advice is summarised in the following statement "From the documents you have provided, the agreements between MfE and TDC in relation to the funding of, and responsibility for, the project appear to have proceeded on an informal basis"<sup>29</sup>.

The Deed was eventually signed on 8 September 2008.

## **Conclusion**

The expenditure of significant funds relied on an informal understanding between the key funding bodies. However, the Ministry was accountable throughout to the Minister(s) and to the Parliament for its appropriations, and the TDC was undoubtedly aware of its exposure.

The material effect of the informality of this 'partnership' approach is difficult to determine. Perhaps a more active management of the financial arrangements may have changed the distribution of the relative contributions, noting that TDC has consistently maintained that its contributions were capped at \$NZ 2 million.

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<sup>29</sup> Letter: "Recovery of money from Tasman District Council – Contributions to Mapua Project. Associate Crown Council to CE, Ministry. 3 July 2008.



## 4 DISCUSSION

This discussion presents some of the key subjects that emerged in the investigation. Many of these subjects are interactive. For example, the legislation rightly has an effect on the nature of consent conditions and the capacity for enforcement. It is difficult to consider one issue without considering its ramifications.

### Legislation

There is no New Zealand legislation specifically designed to deal with contaminated site management and remediation, and so the environmental effects of the Mapua clean-up were managed using the Resource Management Act. This is not necessarily 'best-fit' for the issues to be handled in a case like Mapua – The Act has a strong focus on the 'externalities' of site operations; does not support a statutory audit process; and does not provide key conceptual tools for the management of contamination – 'CUTEP' (clean up to the extent practicable), for example.

There are other issues that might be more effectively addressed with more specific legislation to deal with contaminated sites, but the value for effort should be evaluated. Contaminated sites legislation may be considered a low priority for New Zealand, given the limited number of seriously contaminated sites. Some attention to the legislation may address some of the key 'blind spots' in the process – eg the clean up criteria, ownership and responsibility for remediation, narrow attention to 'hazardous wastes' in the consent process documentation.

Commercial in Confidence arguments have provided a barrier to the efficient evaluation and effective monitoring of the process. As I understand it, an informal arrangement was made that the site auditor was able to access information on the reagents used in order to design effective monitoring requirements. In some other jurisdictions there are legal protections in environmental legislation that prevent officers communicating commercial-in-confidence information to outside parties. In some cases this involves jail terms as a maximum penalty. This provides the protection needed to manage a fully informed approval process.

Crown immunity provided additional difficulties in the Mapua process. While the RMA<sup>30</sup> binds the Crown in a formal sense, key elements of enforcement and compliance are not available to the enforcement body. This left the TDC with a more limited range of tools than normal to assure compliance.

### Potential Conflicts of Interest

There has been much attention to potential conflicts of interest that arise in the Mapua case.

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<sup>30</sup> Resource Management Act 1991 S4. **Act to bind the Crown**—(1) Except as provided in subsections (2) to (5), this Act shall bind the Crown. and 5) No enforcement order, abatement notice, excessive noise direction, or information shall be issued against the Crown.

In making observations arising from the review it is important to recognise that there is no intended implication that the potential conflicts of interest were material. It is important to recognise that the potential is difficult to avoid in complex orphan sites, and practices should be adopted to ensure that roles of the participants are clearly recognised, and potential conflict acknowledged.

Contaminated sites legislation and regulation in NSW and Victoria emphasise the importance of the independence of auditing and review processes, particularly when carrying out statutory functions and certification. In a more 'usual' clean-up the site owner might commission a clean-up of the site by a contractor. Government regulation acts to assure that the clean-up is to a 'fit-for-purpose' condition, so that the health and well being of future users or owners of the site are protected. Independent audit is a key tool to assure satisfactory completion of the remediation.

The Mapua FCC site has a long and complex history. As an 'orphan' contaminated site with a land value less than the cost of clean-up it predictably required significant intervention by government at both local and national level to rectify the legacy of years of contamination.

The TDC acted as both the landowner seeking site remediation, and as the enforcer of clean-up standards and practices. This might suggest that the owner's interest in minimising the cost of clean-up may conflict with the enforcer's interest in minimising risk. In this case however, the TDC had established a maximum contribution it was prepared to make (\$NZ 2m), and costs over this amount were essentially the responsibility of the Ministry for the Environment. There is no suggestion that TDC was less than diligent in pursuing its enforcement responsibilities.

The Ministry for the Environment also had some conflicts to deal with. As a Consent Holder its interest is in completing the clean-up rapidly while minimising costs, consistent also with its interest to manage appropriations on behalf of the government. However, the Ministry had to balance its financial interests with expectations of the community, and its responsibilities to provide advice to government on environmental matters and the application, operation and effectiveness of the Resource Management Act. As an agency with a largely policy role and history it had to create capacity to manage the remediation operation.

Many of the issues that arose during the Mapua clean-up would have been easier to manage had there been clearer separation of the respective roles and more explicit recognition of these potential conflicts of interest.

## **Initial consent conditions and application**

'Hazardous substances' dealt with in the AEE and in the consent appear to focus on those associated with normal site management (diesel, flocculants etc, and operating chemicals for the EDL process identified at the time). The production of hazardous 'treatment' waste does not seem to have been resolved early in the project. In particular, the disposal of the spent carbon filter and the baghouse dust are not addressed as hazardous waste in the documentation. Thiess work practices related to hazardous substances similarly deal with 'imported' substances<sup>31</sup>.

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<sup>31</sup> Thiess Management Plan – Work procedures. Hazardous substance management. TS-OPS-LR4042-WP11. 2004



The consent requires the “identification of potentially hazardous substances”, and that Management Plans should address “management of hazardous substances so as to ensure compliance with all statutory and regulatory requirements<sup>32</sup>”. While this clause is comprehensive, it lacks specificity and guidance for compliance and enforcement.

The Air section of the consent package requires the Environment Management Plan to include “Provision in the MCD Plant for appropriate filters<sup>33</sup>”, but does not specify the conformation for the air management system. The General section of the Resource Consent<sup>34</sup> requires “Unless otherwise specified by consent conditions, the consent shall be carried out in general accordance with the Consent Holders Assessment of Environmental Effects dated May 2003, supporting documentation lodged with the AEE and the evidence presented at the consent hearing.” Without examining the transcripts of the evidence presented at the hearing, reliance on this condition for the purposes of compliance would be fraught with difficulty. The evidence presented at hearings of appeals of this sort is rarely consistent, and there would be considerable interpretation of the intended conditions.

The consent conditions recognised the potential to form dioxins in the process, and applied conditions related to the dryer temperature to avoid *de novo* synthesis. In practice, these proved difficult to measure because of the configuration of the plant.

The consent also dealt with uncertainties in the technology to be applied by requiring the ‘Proof of Performance’ trial under the review of the Peer Review Panel.

The lack of specificity of the consent conditions had consequences for the management of the project and for the enforcement of conditions of the consent.

## **Role of the Peer Review Panel**

Shortly after the Consent was issued the Peer Review Panel was established. This provided a useful means of accessing the expertise needed to review and advise on a complex series of interacting environmental issues. Their role in the review of monitoring and environmental management plans and in the review of the Proof of Performance testing was essential to the quality and focus of the environmental monitoring. Importantly, it was also an essential underpinning to the adaptive management approach required in such a complex site. It allowed the project to be approved, while still providing for a refinement of the technology and monitoring design to the conditions of the site.

PRP’s role was to make recommendations to the TDC Environment and Planning Manager and Compliance Coordinator. The intent was that TDC would then give effect to the recommendations, if it accepted them. With the original project responsibilities, TDC would have used its enforcement powers in respect to a private business, and so ensure compliance with the consent. As the project was eventually carried out, TDC’s capacity to ensure compliance was more limited, both by the legislation and more subtly, by the close partnership between TDC and the Ministry. Although the Crown is subject to the Resource Management Act, many of the tools of enforcement are specifically excluded.

The PRP’s role was a difficult one. It had to provide advice and oversight using its expertise, without the capacity to put its recommendations into effect. In some cases its recommendations and conclusions could not be developed without preliminary work, which was debated.

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<sup>32</sup> eg RM030521 S10(m)(i)

<sup>33</sup> RM030523 Air 10(e)iii

<sup>34</sup> RM030521 General 17

## **Transfer of Consents**

In organizing the transfer of the consents from Thiess, the evidence shows that the Ministry carried out appropriate 'due diligence' in assessing whether to assume responsibilities for the project. It evaluated its risks, project structure and resources. It assessed the resources available both inside and outside the Ministry, and concluded that it could run the project "exactly as Thiess was planning to carry out the proposal"<sup>35</sup>.

It was acknowledged that the Ministry lacked widespread expertise in the practical aspects of contaminated site clean-up (although it had some), but had considerable skills in contract management, and well-defined project documentation and design inherited from Thiess. Contracts were let efficiently once the Ministry assumed responsibility and there appeared to be minimal delays in pursuing the project.

Importantly, the Ministry met with the TDC to resolve their respective roles, and in particular, the monitoring requirements and enforcement process<sup>36</sup>. I have been unable to locate any documented agreement setting out the joint understanding reached.

A key assumption seems to have been that the Thiess documentation would serve as an adequate project plan for the Ministry. However the Ministry is an entity with responsibilities different from Thiess, in its private capacity as a Consent Holder and manager of a remediation project. While the 'remediation project' had clear project management documentation, the 'Ministry project' appeared to be managed using the established structures within the Ministry. These included a clear project structure and responsibilities, redeployment of key staff resources, project tracking via monthly 'Group Managers Meetings'. However, there was no formal project plan apparently developed and adopted. Project tracking and oversight was weaker.

The threshold question to be asked in this 'due diligence' process is whether the Ministry should have considered it appropriate to take on this operational role. The need for some arrangement to pursue the remediation was considered compelling, and delays undesirable.

The Environment Act appears to provide little guidance for the Ministry acting in an operational capacity as a consent holder. The decision to assume this responsibility clearly had government sanction, as evidenced by continuing appropriation for this purpose. This appropriation was made in the clear knowledge of the extent of the contribution by TDC<sup>37</sup>.

## **Operational Management**

During the operational phase the site management appeared to function effectively, with good oversight of the works, responsive management and good communication with the local community. There has been some suggestion that the site manager was not sufficiently able to act on site, because of the need to confirm expenditure with the Ministry. It is difficult to establish whether this had material effect.

More difficulties arose in dealing with management decisions that were less clearly formalised. The relatively imprecise nature of the consent in describing the air management system, the need to prove the performance of the technology, and the need

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<sup>35</sup> Memo: Ministry Project Manager to Project Sponsor. 9 Sep 2004.

<sup>36</sup> Memo Ministry Project Manager to Project Sponsor. 9 Sep 2004.

<sup>37</sup> Former CE, Ministry, interview conducted 24 Sep 2008..

to consider the recommendations of the PRP, demanded a responsive and adaptive approach to the management of the project and the consent requirements.

It is clear that the Ministry resisted the TDC and PRP requests to sample the carbon filter for dioxins. The expense was clearly not the significant issue, since the Ministry did not initially accept that TDC could sample the filter itself. It appears that Ministry had genuine concerns about raising the dioxin issue when it was not a key factor in the current performance of the plant. It had expert advice to suggest significant dioxin release was “not a high risk”. However the focus of its arguments on close interpretation of the consent conditions and the right of TDC to take samples diminished its key argument. In retrospect, perception of the Ministry that was created appears to be one of obstruction, rather than of showing good judgment.

The Ministry at times was slow to respond to action items proposed by the PRP. This was due to a number of factors. In part, it reflected some lack of clarity in the PRP requests, which needed some considerable design and interpretation to implement. The process of PRP making recommendations to TDC, which evaluated them and sent requests to the Ministry, which then responded (often seeking further clarification) was relatively clumsy and contributed to delays.

The Ministry at times appeared to lack resources for the project. In part, this reflects the project management discipline applied. Much information was being presented to the Ministry by the PRP, and suggestions for action were frequent. At the same time the Ministry staff were managing contractors and preparing a substantial amendment to the RAP, which also had to be reviewed by the PRP prior to submission to the site Auditor and TDC’s Compliance Manager.

While the management of the original transfer of the consents was handled well by the Ministry, ongoing elements of project management seemed weaker. The lack of a project plan for the Ministry’s internal governance of the project contributed to this problem. The change of project management structure on the departure of the original Project Manager did not seem to be documented, and it seems that resources to interpret and manage technical information was not always readily available after this. The project was said to be reporting monthly to the Group Managers meetings. This may have been done informally, but a search of the Group Managers meetings by Ministry staff found few formal records or papers.

The issue of the expertise available to the Ministry has been raised. The lack of depth in specialized fields was recognised in project establishment, but it was judged that the Ministry’s expertise in contract management could access expertise as needed. The loss of the Project Manager reduced the practical site experience available to the Ministry, and it is not clear that the Ministry considered the expertise needed to pursue the project.

Public Consultation was a key feature of the project’s delivery. This seems to have lapsed somewhat as the project progressed. Nevertheless, the Ministry still has some outstanding commitments to public consultation, including the site “history”. The finalisation of the project provides a number of useful opportunities to re-engage with the community.

### **Current requirements of the Ministry.**

There are remaining clear requirements for the Ministry to close off the Mapua site clean-up. The Site Validation Report is currently in draft form, and the Site Auditors Report, and

Dilapidation Survey are required to be completed by the Ministry under the terms of the Financial Deed.

The Parliamentary Commissioner for the Environment<sup>38</sup> has recommended the inclusion of copper as an element of the review. I endorse this. In particular the copper analyses used should distinguish the chemical form of the copper, which will significantly affect its mobility and toxicity. I expect the auditor would require this.

Beyond these formal requirements the Ministry has a number of obligations it might choose to address. It has initiated a history of the site and its clean-up involving the local residents, creating some expectations in the community. It may consider contributing to some of the continuing monitoring to be a valuable exercise, and it may have some obligations arising out of the site audit and validation processes. There is an outstanding set of recommendations from Dr Bill Glass about follow-up blood tests of the employees found to have elevated blood levels of OCPs.

## **Role of the Ministry for Environment in Managing Contaminated sites**

Orphan contaminated sites are not uncommon, and governments around the world have wrestled with the problems of clean-up and ongoing use of the sites. It is common for governments to have to intervene to make sure the sites are cleaned up to reduce community health and environmental risk. In most cases, the site is 'orphan' because the cost of clean-up does not cover the likely financial benefit to the landowner.

New Zealand is fortunate in having identified only two sites that could be categorized as seriously contaminated, and which might be considered 'orphan'. One of these, Mapua, has been remediated. Arrangements seem well in hand for the other, Tui mine, without the Ministry having to adopt an operational role. This limited number of sites implies that New Zealand may not need a strictly defined structure to deal with these circumstances. Extensive legislative review or the creation of specific bodies to handle such a rare event appears inefficient.

However, the Ministry needs to be able to respond to future contingencies. It can learn a great deal from the experience of Mapua. There are several options that might be examined, each with its own management challenges.

### **OPTIONS**

#### **Limited policy and advisory role.**

If the Ministry acts in strict observance of functions of the Environment Act, and does not assume any similar operational role, it has the current structure of responsibilities to manage this process.

Limited in this way, the Ministry would be acting in the role it took prior to the transfer; a role it handled well. Despite taking a non-operational role, it could provide some useful additional guidance for the efficiency of the RMA.

The Mapua history shows the value of an effective shared understanding of enforcement and how it is to be implemented. A clearly defined agreement for enforcement and monitoring would usefully inform Consent Holders, Regional

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<sup>38</sup> Investigation into the remediation of the contaminated site at Mapua. July 2008. Parliamentary Commissioner for the Environment

Government and the public. The Ministry could lead a process to develop such agreements in conjunction with the Regional Councils.

The Ministry also has a role to define environmental standards and to prepare policy. It is currently developing a National Environmental Standard for Contaminated Land. This work might well be expanded to deal with some of the issues in contaminated land management that are currently unspecified in legislation. The PCE suggests that this might be used to define the requirements for environmental auditors.

There are other unspecified areas within the legislation. An example of comprehensive guidance can be seen in *Model Procedures for the Management of Land Contamination*. (2004) Department for Environment, Food Agriculture and Rural Affairs (DEFRA), UK. While this is a detailed guide suitable for large sites, this approach could be tailored to apply to a range of suitable applications in New Zealand.

### **Operational Contingencies**

The Ministry did not intend to act as an operational agency at Mapua, and yet it found itself in that position. Should the Ministry involve itself in a similar situation there are some important safeguards that could ensure best management.

To ensure an effective separation of roles there is the option under New Zealand law to create crown entities of various types. Non-Corporate Crown Entities seem to be a suitable class of body. Crown entities may be subject to normal legal instruments of enforcement. They have separate reporting requirement from normal departmental budget reporting. It has been argued that the financial responsibility for budget appropriations is at least as strict as normal corporate reporting. This may be true, but the assignment of staff to an independent entity sends some strong messages about clear separation of functions and responsibilities.

More subtly, staff allocated to such entities have defined and focused goals and roles that help manage conflict of interest. A model of this sort should limit the conflict of roles identified in the Mapua case. The creation of such an entity is not difficult, provided a clear rationale can be presented<sup>39</sup>.

A formal project management structure should be established and maintained. The key elements of effective project management were completed – risk analysis, financial planning, allocation of resources and responsibilities, key products, signoff etc, but overall project documentation and tracking did not appear to be strongly pursued. The project management structure for the Ministry's Mapua involvement relied heavily on the Thiess documentation. This of course focused on the operational role of the consent holder, not on the broader responsibilities of the Ministry. The key is to separate the operational project management from the other roles of the Ministry. Clear separation could be achieved using a crown entity.

The Peer Review Panel provided very useful and important access to expertise. However, the views of the PRP were not rapidly evaluated and acted on. In the case of Mapua a number of issues contrived to slow the response to the PRP and limit its effectiveness. There was considerable frustration in the PRP regarding how to express their views, and to have them acted on. In part, this related to a lack of resolution of the process of enforcement, and the focus on the specific

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<sup>39</sup> Executive director, Crown Corporation Monitoring Unit. Interview 16 Sept 2008

conditions of the consent by the holder. In part, it resulted from a lack of understanding of the mechanisms available (and not available) to the PRP. In Dec 2005 the PRP inquired about how its recommendations would be dealt with, and made its first formal recommendation. From this point it was much more precise in its recommendations.

Finally, the 'partnership' approach to the clean-up by TDC and the Ministry may have clouded their legal roles.

## **Enforcement and Compliance**

There is comprehensive guidance provided for "council practitioners and consultants, environmental managers and others involved in resource management practice under the RMA"<sup>40</sup>. This details the interpretation of the RMA and its powers, processes for enforcement and case history interpreting the Act and its implementation. The Quality Planning Website is a very useful resource for those immersed in the details of RMA implementation, and this appears its key audience. However, its detail and complexity may make it less useful to new consent applicants and consent holders.

Some enforcement and monitoring issues can only be resolved at a site and project level, particularly since "each local authority has different procedures and guidelines for staff, it is recommended that you (*the regional council*) insert your internal guidelines and procedures for enforcement in any hard copy of this section you print off for easy reference."<sup>41</sup>. It is apparent that there were misunderstandings during the project on the issues of enforcement and monitoring. Effective communication and understanding between the consent holder and the enforcement agency benefit both parties. In the case of Mapua, the Ministry (as the consent holder) and TDC (as the enforcer) met to discuss the monitoring and enforcement arrangements for the remediation. This agreement was not documented, although there was considerable correspondence and negotiation on the issue.

The model of enforcement intended by the Ministry is implied in the project establishment documentation. The PRP makes recommendation to the TDC Compliance Manager (as specified in the resource consent). If the TDC determines to take action it acts to control activities by the "Site Management Team" and the contractors on site. The Ministry is not seen to be the subject of enforcement action. During the remediation there appeared to be confusion by the Ministry and its contractors about the rights of access of the TDC compliance function, and the capacity of TDC to give directions. If this is a common problem in administering the Act, greater clarity about the rights and obligations of consent holders and the enforcement body would be valuable.

## **Land Value**

One of the issues raised during the investigation by the Parliamentary Commissioner for the Environment was the potential for TDC to benefit from the sale of land<sup>42</sup>. This is possible, depending on land prices and development in the area. However at the time of making this decision the TDC was using a valuation prepared in March 2001 by Telfer Young<sup>43</sup>. The total value of the site was assessed to be \$1,250,000 at that time, on the assumption that the site was fully remediated and with no memorials or encumbrances placed on the title.

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<sup>40</sup> Quality Planning website. [www.qualityplanning.org.nz](http://www.qualityplanning.org.nz)

<sup>41</sup> Quality Planning website. [www.qualityplanning.org.nz](http://www.qualityplanning.org.nz)

<sup>42</sup> Letter 22 Sep 2008. AG office to author.

<sup>43</sup> Letter Telfer Young (Nelson) Ltd to Manager EDL, 16 March 2001

TDC is likely to place such limitations on site use, including height limitations and restrictions on underground works, so the value estimate would be discounted for these restrictions on the use of the sites. Importantly, the TDC has committed to retaining at least 40% of the land in public ownership. The original valuation was for 100% of the site.

TDC limited its financial contribution to the project to \$2 million, conscious of its potential liability to service loans provide for this<sup>44</sup>. It clearly took that position in August 2004 during the negotiation of the transfer. TDC estimates<sup>45</sup> that, in addition to the \$NZ 2 million contribution agreed with MfE, TDC spent approximately 2.8 million on site investigations and preparation, prior to the clean-up, of which the Ministry contributed approximately \$800,000. There is a remaining component that will be returned to the Ministry in accordance with the Financial Deed. TDC estimates that its total expenditure is of the order of \$NZ 4.8 million. Even if the land has appreciated since the 2001 estimated value, it seems unlikely that the Council made its decision to remediate the site for the purposes of financial gain, nor that it will realise a substantial financial gain on the sale of land.

Whether in principle the Crown should have required a greater financial contribution by TDC is moot, but the government continued to provide appropriation for the clean-up aware the funding arrangements.

## **CONCLUSIONS**

### **Conduct of the Ministry**

The Ministry took on a range of roles in the development of the project.

In the early development it functioned well in its comfort zone, providing advice, commissioning investigations and participating in advisory forums.

It handled the transfer from Thiess remarkably quickly and effectively, using a good project planning process to carry out the transfer. The detailed site project plan inherited from Thiess became the primary project planning documentation. The broader governance and project responsibilities of the Ministry were handled by a 'Business As Usual' processes. Management challenges were always likely to lie in this latter area, which had to respond to the dynamic nature of the project, and the changes to monitoring requirements as the project evolved.

While the transfer process was handled well, there were gaps in project management in the establishment and execution. The details of enforcement and monitoring and the requirements of the consent holder were not resolved, and in particular the process to respond to contingencies. The process of concluding the Financial Deed with TDC seemed to be a low priority.

Project oversight within the Ministry seemed less stringent than expected. The regular Group Leaders Meetings did not provide a close formal monitoring of the project, and changes were not well documented. This may have contributed to the lack of rapid response in some circumstances. The lack of a formal replacement for the Project Manager was clearly a governance decision taken within the Ministry, but it seemed to confuse the management arrangements, certainly among the other participants.

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<sup>44</sup> Planning and Environment Manager, TDC: Interview 19 Sep 2008.

<sup>45</sup> Planning and Environment Manager, TDC. Pers comm.

The Ministry appeared obstructive in some cases, although its rationale was largely sound and considered. In a number of areas the Ministry went beyond the consent requirements.

The site is now restored and grassed, and awaiting formal audit processes. In recent times the Ministry has acted decisively and quickly to resolve its remaining obligations for the site, and for the issues surrounding the management of Mapua. The Financial Deed is now signed, and the remaining 'close out' obligations are being addressed by a ministry project team established for the purpose.

## **Issues**

Addressing the legacy of activities at Mapua was always going to require a significant contribution from the Government, and was likely to create potential conflicts of interest within spheres of government responsibilities. A clear separation of responsibilities and roles would have enabled more focused management, and more effective project tracking. In the records an often-used term to describe the relationships in the project was 'partnership'. While this is a commendable and inclusive approach, it reflected an informality in project arrangements that obscured the legal and contractual responsibility of the participants.

The extended process of negotiation of the Financial Deed also reflects the informality in some elements of project governance and execution. As the project developed the details of the Deed may have been uncertain, but it seems a long period of time to rely on an informal understanding. This may have been influenced by a determination that the site was to be remediated, and the expectation that the government would fund that remediation, but there was not an obvious exit strategy should costs escalate disproportionately.

The financial return to TDC on the sale of land does not seem likely to result in a substantial financial gain for the Council. In fact, it is not certain that there will be any positive financial return.

## **Contributing factors**

One of the factors that has not been closely considered in other reviews is the effect of the consent conditions. The PRP process of review and development of the details of the operation and the proving of equipment was extremely valuable as a means of permitting the remediation while adapting to the 'unknowns' in the project. Some other areas of the consent, particularly the "in general accordance" requirement did not provide sufficient certainty to rely on when managing the consent. This provided a focus for debate and uncertainty during the project. In some cases the PRP was called on to 'interpret' the consent conditions to provide a practical means of meeting the consent.

There was a certain informality in some aspects of the project. This was exemplified in the arrangements for the Financial Deed, but was also manifest in the 'partnerships' that the Ministry developed and described. Ministry representatives described its relationship with TDC (its consent regulator, co-funder, and owner of the land) and EML (its contractor) as partnerships. There was not a clear separation of these conflicting roles.



# 5

# RECOMMENDATIONS

## Legislation

Some of the issues that arose during the Mapua clean-up reflected a lack of understanding of the rights, obligations and powers exercised in the management of Resource Consents. Some of these might be clarified by legislative change.

### **Commercial-in-confidence information.**

It is important for businesses with proprietary processes to protect their intellectual property. At the same time it is essential that this information is available when assessing environmental risk and determining consent conditions. In the case of Mapua it appears that the use of reagents in the EDL was considered proprietary information. While a mechanism was established to make this information available for the project design and compliance monitoring processes, this arrangement seemed clumsy.

In some jurisdictions access to proprietary information cannot be denied to the regulating body. Legislation protects the security of this information by providing legal sanctions preventing the unauthorized release of information gained in the regulatory process. Significant fines and jail terms may be provided. MfE should explore means to address this issue that, if widespread, could have significant implications for the regulatory processes of the RMA.

### **Right of entry for enforcement purposes**

At stages in the Mapua remediation the right of entry of enforcement officers for the purpose of taking samples was debated. One issue appeared to be a conflict between the obligations of the occupier to insurance policy requirements, and the access for enforcement and monitoring purposes. There was legal debate during the clean-up about the application of S332 of the Resource Management Act and its interpretation.

These issues could be addressed by legislative change, or by the provision of guidance and information for practitioners.

***I recommend that the Ministry address the issues raised during the Mapua project to clarify these elements of the legislation, by providing clear guidance on the implementation of legislation.***

## Enforcement

The Mapua site remediation exposed a number of areas in which enforcement could be improved and better supported.

Some systemic solutions are available. The Ministry, in conjunction with Regional Councils, has published comprehensive guidance on various RMA processes for practitioners, consent holders and the public. Included in this package are descriptions of

the enforcement tools available, their use and rationale. This comprehensive package resulted from a review of the RMA in 2005, and so was not available at the inception of the project.

For complex consent cases, such as Mapua, a clear shared understanding of the enforcement and monitoring requirements is essential. These agreements may be difficult to reach, but are an important element of a 'no surprises' approach.

***I recommend the Ministry consider providing guidance to assist a consent holder and a regional council to negotiate and clarify key enforcement and monitoring requirements and the administration of the consent under the RMA.***

This approach would be particularly valuable in the case of complex sites such as Mapua where considerable adaptive management is needed and the consent conditions are not specific. It may be limited to site contamination issues, or generalized across the administration of the RMA.

## **Ministry Role in Contaminated Sites Management**

There are a number of areas of contaminated site governance that the Ministry uniquely can provide. A comprehensive process could include guidance to determine the relative benefits of containment vs remediation in dealing with contaminated sites.

The Ministry should prepare a contingency strategy for the unlikely event it has to assume an operational role. As a contingency, the strategy need only outline key options. Detailed planning is likely to be dependent on circumstance and individual sites, and should be carried out at the time.

The strategy should address

- the distinct operational and Ministry governance roles, preferably in a structural way. A crown entity should be further investigated as a model;
- the structural separation of the project team to ensure dedicated resources and focus;
- a formal project planning process, with appropriate accountability, clear sign-off and close-out processes.

***I recommend that the Ministry focus on the provision of key guidance, legislative support, regulatory tools, environmental standards, audit process and support for advice and research.*** It should generally avoid operational roles.

## **Expertise**

There is significant value in maintaining a pool of expertise available to the Ministry and more generally in New Zealand. Bodies such as the Peer Review Panel provide invaluable support to projects such as Mapua. There is considerable opportunity for the Ministry to maintain close contacts with external experts as it develop its guidance and regulatory projects.

***I recommend that the Ministry continue to develop its guidance and regulatory advice in close consultation with New Zealand experts to build and maintain effective relationships with these key individuals.***

## **Environmental audit**

Independent environmental audit is a robust and effective means of managing contaminated site risks. The credibility and effectiveness of environmental audit depend heavily on the expertise and independence of the auditors appointed. Assuring and administering the appointment of environmental auditors requires considerable 'in-house' resources and expertise.

Given the 'market' for contaminated site management in New Zealand is likely to be small, there may not be the demand for a stand-alone capacity to evaluate, appoint and review candidates. It is possible that the bulk of appointees are likely to be auditors appointed in other jurisdictions, who may seek recognition in New Zealand under mutual recognition arrangements.

***I recommend that the structure of any environmental audit system be designed first should a proposal to accredit or appoint 'experts' be pursued.***

## **Future Action at Mapua**

There are several 'close out' requirements for the Mapua site. Some are required under the conditions of the Consent. Many of these are already in hand within the Ministry.

**The Dilapidation survey needs to be completed.**

**The Site Validation report needs to be finalised.**

**A site auditor should be appointed to assess the site.**

**The outstanding financial issues need to be resolved.**

With the signing of the Financial Deed on 8 September 2008 the structure of the arrangements are set. There are some remaining financial transactions that are dependent on the Deed provisions. The means of resolving the outstanding transactions are set out in the Deed and should not be complex.

**An active relationship with the community of Mapua should be re-established**

The Ministry has previously been active in keeping the local community informed during the remediation, but is reported to be less visible now. The Ministry should review its community engagement strategy and reinvigorate its involvement with the community of Mapua. There are significant opportunities as the project is finalised. The Ministry has previously undertaken to commission a 'history' of the site and its remediation. While the project is not yet formally closed off, and a 'complete' history may be premature, the Ministry should to resolve its intentions for this project.

***I recommend that the Ministry's Mapua Project Team develops a clear and well-communicated plan to deliver the Ministry's remaining obligations with respect to the Mapua Site.***



# 6

# APPENDICES

## KEY INTERVIEWS CONDUCTED IN THE INVESTIGATION

A range of people was interviewed during the information collection phase. Some had been directly involved in various roles during the Mapua clean-up; some were interviewed to help provide advice and perspective on New Zealand governance and administration; and some to help build an understanding of the technical and scientific issues associated with the Mapua project.

### INTERVIEWEES

Planning and Environment Manager. Tasman District Council  
Former Chief Executive, Ministry for the Environment  
Senior Advisor – Contaminated Sites, Ministry for the Environment.  
Senior Advisor – Environmental Standards, Ministry for the Environment. PRP member.  
Landcare Research. Chair of PRP for Mapua  
Senior Solicitor, Office of the Auditor General  
Group Leader, Corporate and Community. Ministry for the Environment  
Senior Advisor – Mapua Project Team.  
Group Leader – Local Government - Ministry for the Environment  
Chief Executive Ministry for the Environment  
Assistant Auditor General – Local Government, OAG  
(MWH) Engineer to Mapua Contract  
Director, Air and Environmental Services Ltd. PRP Member.  
Research Manager, PCE  
Parliamentary Commissioner for the Environment  
Executive Director, Crown Corporations Monitoring Unit.

In addition to the specific interviews conducted I am indebted to staff of the Ministry and the other organisations involved for the open and cooperative way they assisted in the information collection. Numerous discussions and meetings helped develop a good understanding of the issues surrounding Mapua, while emphasising the complex and interactive nature of the issues involved.

## GLOSSARY

AEE	Assessment of Environmental Effects
C-I-C	Commercial-in-Confidence
CUTEP/CTEP	Clean-up to the Extent Practicable
DEFRA	Department for Environment, Food Agriculture and Rural Affairs, UK
EDL	Environmental Decontamination Ltd
FCC	Fruitgrowers Chemical Company
MCD	Mechano-Chemical Destruction
MfE	Ministry for the Environment, New Zealand.
OAG	Office of the Auditor General
OCF	Organochlorine Pesticides
PCE	Parliamentary Commissioner for the Environment
POP	Proof of Performance Trial
PRP	Peer Review Panel
RAP	Remedial Action Plan
RMA	Resource Management Act
TDC	Tasman District Council
TEQ	Toxic Equivalents
VOC	Volatile Organic Carbon