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A safer, cleaner environmental future

Peer Review
Management of Contaminated Soils in South Australia

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Peer Review

"Management of Contaminated Soils in South Australia"

BACKGROUND

Zero Waste SA have engaged CRC CARE to provide a peer review of the Report entitled "*Management of Contaminated Soils in South Australia*", prepared by Sinclair Knight Merz.

South Australia's Strategic Plan 2011 and *South Australia's Waste Strategy 2011 - 2015* establish targets for the reduction of waste disposed to landfill through the reuse and recycling of what would otherwise be waste materials. These targets have been set given a background of projected population increase and ongoing economic development in the Adelaide region both of which increase the potential for further generation of waste, but also for recycling and reuse (refer *South Australia's Strategic Plan* and the *30 Year Plan for Greater Adelaide*) .

The resource recovery objectives in *South Australia's Waste Strategy 2011 - 2015* are to maximise the useful life of materials through reuse and recycling, and to avoid and reduce waste, thereby reflecting the highest priority elements of the waste management hierarchy. These objectives are implemented through Zero Waste SA (ZWSA) and other Government agencies.

The diversionary approach in *South Australia's Strategic Plan 2011* and *South Australia's Waste Strategy 2011 - 2015* means that existing landfills will have longer operational lifespans, which in itself has important policy, financial and social implications regarding the establishment of new landfill sites (should they be required). Any new site(s) would likely be some distance from Adelaide, therefore requiring greater operational (transport) costs for waste management and higher greenhouse emissions.

ZWSA is concerned that the 'dig and dump' approach, in which contaminated soil is disposed of to landfill, and which is commonly used for the remediation of contaminated sites in Adelaide, compromises the strategic targets for the diversion of waste from landfill. ZWSA's goal is to "encourage reuse and treatment of contaminated soils, facilitate and foster local industry and R&D capabilities and investment, and to reduce the amount of contaminated soils being disposed to landfill."

According to the Strategy, the quantity of material going to landfill in 2008-09 was 1.07 million tonnes. It is understood that the quantity of waste going to landfill in 2011-12 was 1.22 million tonnes. The SKM Report states that for the period 2007-08 to 2011-12, the quantity of contaminated soil going to landfill was in the order of 87,000 tonnes per annum on average.

The redevelopment of part of the Adelaide railway station precinct for the new Royal Adelaide Hospital has the potential to have a major impact on landfill airspace in the Adelaide region. The SKM Report states that the amount of contaminated soil to be removed

from the site is in the order of 462,200 tonnes, which (if it all goes to landfill) would comprise a very significant proportion of total material going to landfill.

The management of contaminated soil therefore looms large in the implementation of the State waste management strategy.

As a result of these concerns, ZWSA commissioned Sinclair Knight Merz to prepare the Report entitled *"Management of Contaminated Soils in South Australia"*. The terms of reference/scope of work for the project undertaken by SKM were (as per page 3 of the SKM Report):

- *"assessment of the potential costs and benefits associated with sustainable soil contamination treatment and disposal, taking into account carbon pricing*

- *identification and assessment of current treatment technologies as well as local industry and R&D capabilities*

- *identification of drivers, opportunities and impediments for contaminated soils treatment and reuse in SA*

- *recommended strategies and actions for the SA Government to encourage treatment and reuse of contaminated soils and reduce the amount of contaminated soils being disposed to landfills."*

Objective and Scope of the Peer Review

As indicated above, ZWSA have engaged CRC CARE to carry out a peer review of the SKM report.

The objective of the peer review is to verify and where necessary enhance the quality and credibility of the SKM Report to ensure government policy development having a sound and credible basis. The report will be used to inform development of future policies or strategies for management of contaminated soil in the State.

The Scope of the peer review is to:

1. *"comment on the organisation and general presentation of the report*

2. *assess and comment on the validity of the information, the methodology, the results, the policy analysis and the conclusions and recommendations presented in the report*

3. *identify significant data/information/policy analysis gaps and provide suggestion on modifications to the report*

4. *identify opportunities for further analysis/research that would improve our understanding of issues of contaminated soils and its increased reuse in South Australia.*

5. *provide any other comment that the consultant might feel is relevant – based on the consultant's significant professional experience."*

ZWSA have also provided a detailed Statement of Requirements for the Peer Review (refer Appendix).

This peer review is structured according to the Scope (above), and may also be cross-referenced with the detailed criteria in the Statement of Requirements. [Please note that the correspondence between the Scope and the Statement of Requirements is not complete – the headings are based on those in the Scope, with sub-headings relevant to the Statement of Requirements.]

GENERAL CONCLUSIONS REGARDING THE REPORT

The SKM report has addressed the terms of reference, and the authors have clearly invested much effort in sourcing information and developing the report.

The readability of the report could be enhanced through improved sequencing of topics, and by the provision of more context for the information provided, particularly the information in the tables.

The drivers and impediments for policy development have been canvassed, although the policy analysis could be considerably enhanced by bringing these elements together via a restructuring of the document.

There is considerable information in the tables and diagrams in the report, and the policy analysis would have also been assisted by further development of conclusions from that information.

The concepts of transit oriented developments and soil treatment hubs bear further investigation.

The potential for the utilisation of waste derived fill sourced from (treated) contaminated soil, which meets the requirements of the SA EPA for waste derived fill, also bears further investigation, as this provides an environmentally sound route for the diversion of material from landfill.

With regard to the assessment of costs and benefits, while costs have been quantified in relation to carbon pricing, no (semi-) quantitative analysis of benefits was done - this may well be due to the difficulty of doing so. There is some difficulty in following the analysis of landfill levies.

An extensive survey of research capabilities and remediation technologies has been undertaken, and some technologies are fully described (eg in-situ biological treatment).

The recommendations could usefully be expanded to include the identification of key players in their implementation.

COMMENTS ON THE REPORT

1   Organisation and presentation

The SKM report has addressed the terms of reference provided by ZWSA. These terms of reference include both policy and technical matters relevant to the means by which contaminated soil may be diverted from landfill. SKM have clearly invested much effort in sourcing information and developing the report.

The report is structured as per the sequencing of the terms of reference (refer to table below), which means that there is some separation of matters which otherwise could usefully be considered together (particularly legislation, regulation, policy and guidance).

Table: Comparison of Terms of Reference with Section headings in the Report

Topics in the Terms of Reference	Report structure – section titles (in order)	
		Executive summary
	1	Introduction
Assessment of potential costs and benefits	2	Benefits of sustainable soil remediation
Treatment technologies; Local industry and R&D capabilities	3	Current remediation technologies in South Australia
	4	Remediation research & development capabilities in SA
Drivers, opportunities and impediments for contaminated soils treatment and reuse	5	Drivers for soil remediation in SA
	6	Impediments to soil remediation in SA
Recommended strategies and actions for the SA Government	7	Opportunities for soil remediation in SA
	8	Conclusions and recommendations

There is no single 'best' way of structuring a document such as this. One suggestion (of several possibilities) for structuring the document is:
- executive summary
- introduction
- drivers for soil remediation
- policy settings in SA, including strategic policy, legal framework and guidelines
- description of site contamination and contaminated soil management in SA
- potential means of addressing the issues (including the hub concept, financial instruments, reference to treatment technologies)
- impediments – policy impediments and cost impediments
- benefits and costs of strategies (eg hub concept and others) and technologies
- future policy and strategy developments (including landfill levies) to overcome impediments – in train and suggested

- conclusions and recommendations
- cost effective technologies available (or could be made available) in SA – appendix
- remediation research and development – appendix

There are a number of tabulations and diagrams throughout the report. As there is often a lack of interpretation of the information in those tabulations and diagrams, the flow of text is not ideal. Whilst the actual number of tables and figures is not inappropriate, the report 'feels' difficult to read. Some of the technical aspects could be relegated to appendices with the principal conclusions being brought into the text as appropriate (notwithstanding the fact that there are significant technical appendices present already).

The Executive Summary outlines the principal directions developed in the report, but it should include significant conclusions as well as the recommendations. In addition, there is some very useful analysis in the Conclusions section that could have been included with benefit in the Executive Summary.

There are several places in the report where the analyses could have been extended to develop conclusions, and others where additional conclusions could have been drawn from the analysis provided.

2   Information, methodology, analysis, and conclusions

As noted in the specific comments relating to the Conclusions section, it is one thing to make recommendations, but another entirely to implement them. It would therefore be useful to identify, for each recommendation, the principal players who need to be involved to achieve their implementation. This would provide an idea of the relative complexity (or otherwise) of implementation and the likelihood of achievement. The recommendation relating to taxation regimes would appear to the reviewers to be difficult to implement.

This peer review does not gainsay the technical information in the report. SKM have carried out an extensive survey of relevant players in SA as well as of technologies and research capabilities.

Some key points from the "detailed comments" section are:
- The drivers and impediments for policy development have been canvassed, although the policy analysis in the report could be considerably enhanced by restructuring the document
- The concepts of transit oriented developments and soil treatment hubs bear further investigation.
- The potential for the utilisation of waste derived fill sourced from (treated) contaminated soil, which meets the requirements of the SA EPA for waste derived fill, also bears further investigation, as this provides an environmentally sound route for the diversion of material from landfill
- With regard to the assessment of costs and benefits, while costs have been quantified in relation to carbon pricing, no (semi-) quantitative analysis of benefits was done
- It would be helpful to rationalise the analyses in the report of the impacts of landfill levies

- An extensive survey of research capabilities and remediation technologies has been undertaken, and some technologies are fully described (eg in-situ biological treatment)
- References to overseas developments are somewhat UK-centric, and the Report could have canvassed relevant developments in some other countries
- The readability of the report could be enhanced by improving the structure and sequence of information presented
- The recommendations could usefully be expanded to include the identification of key players in their implementation.

3   Data/information/policy analysis gaps

Utilisation of a broad 'mass flow' concept could have been useful in the development of the report - where will contaminated soil go, if it is not to go to landfill?

If contaminated soil can be treated and re-used on-site, and/or contained on-site (under appropriate conditions), then the former meets the higher level re-use concept in the waste management hierarchy, and both avoid disposal or re-use elsewhere. Otherwise, the material may be re-used elsewhere or be disposed of in landfill.

An analysis (to the extent feasible) of contaminated soil tonnages currently being moved off-site for treatment and re-use, and the markets in place for such materials (and the ability of such markets to absorb the quantity and quality of materials available), or for disposal in landfill (and which landfill sites), would have given a sharper edge to the policy analysis. The report usefully canvasses the criteria delineated in the SA EPA *"Standard for the production and use of Waste Derived Fill"* for the categorisation of (waste derived) fill and the uses to which it may be put. The utilisation of waste derived fill sourced from (treated) contaminated soil, which meets SA EPA requirements for waste derived fill would be an environmentally sound means for the diversion of material from landfill.

The metrics for sustainable remediation are dealt with in some detail, including emissions of CO_2. It is understood that the concept of "sustainable remediation" as developed by the Sustainable Remediation Forum (SuRF ANZ and similar groups internationally) has not been adopted by environmental protection agencies in Australia. It should be noted that the objects clauses in state legislation (such as the Environment Protection Act 1993 (SA) as amended (section 10)) do make reference to principles in the Intergovernmental Agreement on the Environment, including sustainability.

There are conclusions which could have been developed from the information included in the tabulations and diagrams, and which would have assisted in the policy analysis. Specific instances are adverted to below.

Policy analysis is spread over several sections, and the suggested structure (above) attempts to redress this.

Costings for landfill levies appear in three places in the report – they should be brought together (refer suggested structure for the report). This would also facilitate reconciliation of the seemingly disparate figures.

Remediation technologies

Most remediation technologies are included. The adoption of any technology must of course meet with the concurrence of the relevant regulatory agencies (eg SA EPA).

Some technologies are described sufficiently (eg in-situ biological treatment), but others less so – for some, the 'description' comprises an example rather than an actual description. For some technologies, case studies are provided and for others proprietary products are mentioned. ZWSA may wish to consider the extent to which they are comfortable with identification of specific case studies and proprietary products.

Industry and R&D capabilities

The Report includes much detail on relevant research carried out in SA.

Drivers and impediments

The report has covered drivers and impediments well, although an integrated approach as per the suggested report structure would be useful. As an example, it seems passing strange that the on-going development of a remediation framework is discussed in the section on impediments - an integrated approach would resolve this.

With regard to the hub concept, no mention is made of the likely environmental assessment and social issues that may arise with storage and treatment of contaminated soils, as well as potential amenity issues (eg noise, dust, truck traffic, road safety, aesthetics) that may arise in multiple locations. This could become a classic case of distributional impacts of environmental disbenefits associated with a strategy that may have significant environmental benefits in overall terms. These matters go well beyond the remit for this Report, however.

With a sufficient number of hubs, some could include treatment technology demonstration parks, and provide a knowledge transmission and educational function as well.

Any significant relevant information missing

The report is extensive, and a great deal of information has been sourced to produce the report. An attempt at determining the sources, quantities and destinations of contaminated soil and waste derived fill (recognising that this may well be easier said than done) would provide a useful platform for policy development re treatment hubs and the potential for diversion of (treated) contaminated soil.

The Report seems somewhat UK-centric, and could have also canvassed relevant developments in some other EU countries.

Reference should be made to specific comments on each section (below).

4   Opportunities for further analysis/research

From a policy perspective, more attention to the transit oriented development hub concept with treatment facilities may be warranted.

SA has significant research capabilities in research into the assessment and remediation of contaminated soil and groundwater. Much national research in this area is coordinated from Adelaide via CRC CARE, whose approach to research involves collaboration between industry, government and research institutions.

5   Any other comment

Nil

DETAILED COMMENTS ON THE REPORT

Executive summary

7th para: are 'regeneration' and 'remediation' the same?

1. Introduction

Section 1.1: *"Globally, the dig and dump approach has largely been cast aside as being un-sustainable, and economies have shifted to a more technological based approach to land clean up, where soils are treated and re-used on or off site."* This is a sweeping statement: whilst it may be true of the UK (refer Appendix F), no other (international) jurisdictions are canvassed.

Section 1.2:

Document structure: There is no single 'best' way of structuring a document such as this, but Sections 3 and 4 (treatment technologies) could have been placed immediately before the concluding section, for ease of reading.

last para: SKM clearly consider (not unreasonably) that this study is "stage 1" of a broader development process for contaminated soils policy in SA.

Section 1.3: whilst the range of stakeholders surveyed for the report was extensive, it is unclear as to whether they include those involved in markets for clean and derived waste fill. Whilst the TORs do not specifically advert to this, it is understood that there had been discussions between ZWSA and the consultant on this matter.

Section 1.4: Strategic policy context: The information presented in this section is highly relevant to the study objectives, and it would have been useful for this section to provide more context surrounding state government strategic policy. This would enable readers to better appreciate the overall direction established by the state government for the development of the state and of Adelaide, before launching into those elements directly relevant to this report. This section would have benefited from a generic 'mass flow' analysis (to the extent feasible) adverted to above.

Table 1: this is fine in so far as it goes, although it may be surmised that an appendix summarising all 14 redevelopment projects with the likely quantities of contaminated soil arising from each project would have provided a more comprehensive picture, thus providing a more concrete basis for policy development/action.

Section 1.5.1: The number of sites has been taken from the relevant SA state government source (SA EPA). It may be the case that the actual number of contaminated sites is much higher (eg Nastusch, J (1997) *Application and development of contaminated site remediation technologies in Australia. ANZAC Fellowship Report to Department of Internal Affairs, Wellington, New Zealand and Department of Foreign Affairs and Trade, Canberra, Australia*.)

Table 2: No conclusions are drawn from the information in this table.

Other relevant information pertaining to management, in addition to types of contaminants, would be geographical distribution and quantities (information that may not be readily available).

It would be useful to link the information in this section with that arising from the 14 development sites referred to in Section 1.4.

Sections 1.5.2.1 (legislation) *and 1.5.2.3:* (EPA guidelines) could be linked, as the matters considered form a continuum, including the linkages between the NEPM and SA requirements. The discussion in section 1.5.2.3 is particularly useful, especially that regarding waste derived fill.

Section 1.5.2.2: An explanation of how differing rates of landfill levies have impacted remediation practices (including any illegal dumping) to date in SA would be useful.

Section 1.6: Sustainable Remediation has not been adopted by environmental protection agencies in Australia, however the principle of ecologically sustainable development is referred to the Environment Protection Act (SA) (section 10).

This section and Appendix C present interesting information on the components of the SA waste industry and their (summary) views on sustainability, but there is a lack of context or comment. It is difficult to see where this information is used in the report.

It is unclear whether at least some of the people surveyed also are involved in the management of waste derived fill.

The information in this section could profitably be combined with that in the next Section.

2. Benefits of sustainable soil remediation

This section deals with 'sustainable remediation' with some context having been provided in Section 1.6.

Perhaps the key is reduction and management of the environmental footprint (both on-site and off-site), and how best to achieve this in a manner compatible with EPA and ZWSA objectives (as well as commercial objectives).

Section 2.1: It would have been helpful if some context had been provided for this element of sustainable remediation.

Section 2.2: This section provides very good generic information, but it is difficult to determine how this relates to (say) the management of waste derived fill or landfill. There are important social aspects of the waste related objectives (amongst others) of state government policy to be considered.

Section 2.3: Considers metrics and environmental footprint, and applies the concept using parameters relevant to SA in relation to CO_2 footprint, and comes to some useful conclusions – which could readily be extended to the hub concept and on-site treatment.

The proposed 'hub' concept (particularly in relation to the transit-oriented developments ('TODs')) could be developed further. The establishment of storage and treatment facilities

at the hubs carries its own set of issues to be thought through in terms of location, design and management – quite apart from the economics, the social and community aspects could very well be paramount (consideration of these matters is best left to a separate study). See also comments for section 7.7.

It is not readily apparent as to how the numbers in Table 5 were calculated. Reference(s) for conversion factors would have been useful.

The detail in this section could be included in Section 3.4.

3. Current remediation technologies in South Australia

Section 3.1: Suggest omit "theoretical" in relation to techniques.

Section 3.2: This section could usefully state that many contaminated sites in SA contain a mixture of contaminants, and no single technique can remediate such mixtures.

Most remediation technologies are included in Table 6 (and in Tables 7 – 10). Appendix D has a more detailed description of technologies.

Some techniques are described sufficiently (eg in-situ biological treatment), but others less so – for some, the 'description' comprises an example rather than an actual description. Again, Appendix D has more detailed descriptions. For some technologies, case studies are provided and for others proprietary products are mentioned. ZWSA may wish to consider to what extent they are comfortable with identification of specific case studies and proprietary products.

It should be noted that:
- in-situ treatment may not be feasible if the sub-surface is fine textured,
- the listing of oxidants for physical/chemical treatment should include persulfates and permanganates, and
- containment may be appropriate when it can be demonstrated that the approach does not pose an unacceptable risk to the environment and human health in both the short and long term.

The basis, or origin, of the criteria used for Table 7 is not given. Having done a significant amount of work to develop Table 7, it is not clear how the information contained therein may be used, particularly in assisting ZWSA in policy development. At the very least a segue into section 3.3 should be provided. The meaning of "operation and maintenance intensity" is not clear.

Section 3.3: A statement as to how the list of remediation techniques available in SA was derived would have been useful. Table 8 is headed "Summary of techniques relevant to SA/Australia", which is slightly at odds with the title of section 3.3.

The basis, or origin, of the criteria used for Table 8 is not given. Having done a significant amount of work to develop Table 8 (which contains much useful information), it is not clear what may be done with that information, particularly in assisting ZWSA in policy development.

As with Table 7, Table 8 includes some named case studies and proprietary products. For some techniques, case studies are not given.

Section 3.4: This seems to be an extension of the work presented in Section 2.3. It is not clear why the report jumps from an overall consideration of remediation technologies to carbon pricing.

Section 3.5: This section reverts to ranking remediation techniques. It provides a useful conclusion, which contains a reference to Table 2, requiring the reader to make the connections, rather than supplying (say) a further table linking (common) contaminants and relevant techniques.

4. Remediation research & development capabilities in SA

This section has covered SA research capabilities well. As with some previous sections, proprietary products are mentioned. In Table 10, there are gaps in the case studies, for example, on fracturing, land farming, pyrolysis and thermal desorption. The reference for soil vapour extraction should be: Johnston, CD 2010, *Selecting and assessing strategies for remediating LNAPL in soil and aquifers,* CRC CARE Technical Report no. 18). A reference for monitored natural attenuation (MNA) could also have been included (Beck, P 2011, *A technical guide for demonstrating monitored natural attenuation of petroleum hydrocarbons in groundwater,* CRC CARE Technical Report no. 15).

5. Drivers for soil remediation in SA

This section should be near the beginning of the report, to set the overall scene in terms of ZWSA objectives.

Introduction: The information on drivers in this introduction is fine – it would be useful to restructure this in terms of higher-level drivers (eg population growth, planning requirements) and the strategic plans which provide shape to these drivers, to more localised, specific issues. Also, the introduction should refer to the drivers discussed at greater length in sections 5.2 to 5.5.

Section 5.1: information is fine.

Sections 5.2 – 5.5: These sections read well, but reference to these drivers in the introduction would allow an integrated 'feel' for the whole of section 5.

6. Impediments to soil remediation in SA

Section 6.2: The cost figures quoted may well line up with those provided at section 1.5.2.2, but this is not at all apparent at a first reading. It is not clear how the information in Figure 5 relates to the dollar figures quoted in the text. It could be useful to also look at states which might be more comparable to South Australia – eg Western Australia and perhaps Queensland. Are their levies similar to those in SA, and if so are there similar difficulties with landfill disposal?

Have the higher levies in NSW and Victoria actually led to other treatment/disposal options, and if so what are they? Also, how do the NSW and Victorian outcomes compare with those for the UK?

Section 6.3: the point about auditor conservatism is an interesting one, and shows that (presumably because of liability and/or public safety issues), there may always be a conservative 'choke-point' in remediation management systems. The proposed way forward, in which remediation options appraisal would be required, is a useful suggestion.

Section 6.4: To include solutions to current impediments in this impediments section seems somewhat unusual – reference could be made to them, with further exposition on the way forward in another section. Alternatively an 'integrated' consideration of drivers, impediments and solutions could be utilised.

Section 6.5: The analysis in this section is very useful, and is heading towards a conclusion.

Section 6.6: suitable facilities for treatment – much of the text here belongs with a section dealing with the hub concept (eg section 7.7).

7. Opportunities for soil remediation in SA

Section 7.1: A useful discussion of opportunities including taxation treatments, although with regard to the latter there seems to be an underlying assumption that what worked in the UK will necessarily work here – the difficulty being that the Commonwealth controls company tax arrangements rather than the state government. Relief from state government land tax may or may not involve sufficient incentive. The issue deserves further investigation, and the recommendation as it stands needs to be teased out.

Figure 7 is a useful pictorial summary of approaches to reducing soils to landfill.

Section 7.2: This section raises some interesting issues and problems with regard to landfill levies. Again it is difficult to align the dollar figures with those quoted elsewhere in the report. Hypothecation of at least part of the landfill levy is a useful suggestion – whether it should go to Government (eg EPA or ZWSA) or to industry (as implied in the report) is not canvassed.

Section 7.3: The EPA Victoria HazWaste Fund has now closed (29 June 2012). It does provide a useful model.

The US Superfund model is most unlikely to be adopted outside the United States, although it has led to the development of very useful approaches to the management of waste materials, which bear further investigation in the SA context. The section then delves into green and sustainable remediation and LCA metrics.

It would be useful to examine approaches which fit the circumstances of SA, but such an exercise could go beyond the remit of this report.

Section 7.4: refer comments above at section 7.1.

Sections 7.5 and 7.6: There could be significant opportunities utilising waste derived fill. The development of flexible approaches will be pursued during development of the National Remediation Framework.

Section 7.7: Soil treatment centres aligned with the hub concept may well be worth further consideration - refer comments for section 2.3.

8. Conclusions and recommendations

Given that it is one thing to make recommendations, but another entirely to implement them, it would be useful to identify, for each recommendation, the principal players likely to be involved in achieving their implementation.

The recommendations relating to:
- *landfill levies and hypothecation:* involves broad state government policy which ZWSA may be able to influence
- *taxation:* as framed, this recommendation could involve both state government levies and Commonwealth taxation policy. In the current federal fiscal environment, this may well be a very hard sell. The recommendation needs further teasing out.
- *risk based approaches (soil classification and reuse as waste derived fill):* will largely be the province of the EPA and ZWSA
- *adoption of a new framework:* will largely be the province of the EPA and ZWSA
- *soil treatment centres:* will involve planning agencies and the EPA and ZWSA, as well as local governments

Appendix A: Lists stakeholders who were consulted.

Appendix B: Very useful information, which supplements Sections 1 and 5.

Appendix C: The graphical survey information links with Section 1.6, but as per the comments on that section, no conclusions are drawn.

Appendix D: An overview of technologies used in the United Kingdom.

Appendix E: It is not clear how the publication data in the table were identified, nor are any conclusions drawn.

Appendix F: Provides an overview of landfill tax in the United Kingdom.

Appendix G: Provides an overview of land remediation tax relief in the United Kingdom.

Appendix H: Provides an overview of a remediation framework in the United Kingdom.

Appendix I: Provides a listing of publications of CL:AIRE in the United Kingdom.

Appendix

The ZWSA Specification for the peer review

SCOPE

ZWSA is seeking a consultancy service to provide an independent peer review of the SKM Report with a view to verify the quality and credibility of the report (including all appendices).

Specifically, the consultant is required to:
- comment on the organisation and general presentation of the report
- assess and comment on the validity of the information, the methodology, the results, the policy analysis and the conclusions and recommendations presented in the report
- identify significant data/information/policy analysis gaps and provide suggestion on modifications to the report
- identify opportunities for further analysis/research that would improve our understanding of issues of contaminated soils and its increased reuse in South Australia.
- Provide any other comment that the consultant might feel is relevant – based on the consultant's significant professional experience.

Details on the requirements are given in […] "Statements of Requirements".

OBJECTIVE

The objective of this peer review is to verify and where necessary enhance the quality and credibility of the SKM Report to ensure government policy development having a sound and credible basis. The results from the peer review will be incorporated into a final public version of the report and the findings of the report will be used to inform development of future policies or strategies for management of contaminated soil in the State.

The goal is to encourage reuse and treatment of contaminated soils, facilitate and foster local industry and R&D capabilities and investment, and to reduce the amount of contaminated soils being disposed to landfill.

STATEMENT OF REQUIREMENTS

The consultant is required to assess the SKM Report (including all appendices) and prepare a peer review report in accordance with the following scope and requirements:

(1)   Assess the appropriateness of the organisation and presentation of the report and provide comment/response to the following questions:

    (a)   Does the report organise and present the material in a clear, concise manner and easy to follow?

    (b)   What modifications would you suggest be made to make the report more reader friendly?

(2)   Does the executive summary accurately and adequately reflect the information, methodology, the analysis and results/conclusions derived? What modifications would you suggest to improve this section?

(3)   Examine and comment on the validity and adequacy of the information, data, methodology used as well as the results/conclusions drawn in the report to identify and assess current remediation technologies in South Australia and the associated technological costs.

(4)   Assess and comment on the validity and adequacy of the information and results/conclusions drawn in the report on local industry and R & D capabilities in South Australia.

(5)   Review and comment on drivers and impediments for contaminated soils reuse and remediation in South Australia

    (a)   Does the report identify and cover all the relevant and important drivers and impediments for contaminated soils reuse and treatment in SA?

    (b)   Were any significant drivers and/or impediments missed in the report or required further discussion and why?

(6)   Review and comment on opportunities for contaminated soils reuse and remediation in SA and Section 8 "Conclusions and recommendations":

    (a)   Does the analysis in the report support opportunities identified for contaminated soil reuse and treatment in SA and conclusions/recommendations made in the report?

    (b)   What additional opportunities, conclusions and recommendations can be made to encourage reuse and treatment of contaminated soils or what modifications would you suggest be made to the report.

(7)   Identify if there is any other significant relevant information missing (including globally, nationally and locally) and should be included or discussed in the report. Please explain fully.

(8)   identify opportunities for further analysis/research that would improve our understanding of issues of contaminated soils and its increased reuse in South Australia.