



NEW ZEALAND FERTILISER MANUFACTURERS'  
RESEARCH ASSOCIATION INCORPORATED

**Submission to Ministry for the Environment**  
On

**Proposed National Environmental Standards For Assessing  
and Managing Contaminants in Soil**

Discussion Document

by

The New Zealand Fertiliser Manufacturers' Research Association

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## Introduction

Thank you for the opportunity to make a submission on the Proposed National Environmental Standard for Assessing and Managing Contaminants in Soil.

The New Zealand Fertiliser Manufacturers' Research Association Inc is a trade organisation representing the New Zealand manufacturers of superphosphate fertiliser. The Association also operates under the name Fert Research. The Association has two member companies – Ballance Agri-Nutrients Ltd and Ravensdown Fertiliser Co-operative Ltd. Both these companies are farmer co-operatives with some 45,000 farmer shareholders. Between them these companies supply approximately 95% of all fertiliser used in New Zealand.

Fertiliser companies assist shareholders to meet RMA requirements in relation to fertiliser use, and provide advice and support to ensure long term, safe sustainable use of their land based resources.

To comply with the guiding principles and to ensure delivery of industry good, 'Best Management Practices' requires investment into research, close collaboration and cross sector co-operation. This liaison occurs with high level engagement with Central Government, Regional Councils, environmental interest groups and agricultural sector groups.

The Industry has developed and promotes the Code of Practice for Nutrient Management. Fertiliser company advisors are fully trained in the use of Overseer and can provide nutrient budgets, nutrient management plans and emissions reports for farmers and growers, which are subject to independent audit. Training includes mandatory completion of the Massey University Sustainable Nutrient Management, Intermediate and Advanced Certificate courses, the development of which was initiated and funded by the Fertiliser Industry. These courses included sections specifically dealing with contaminants in soil.

The fertiliser industry has been actively engaged in the Cadmium Working Group led by MfE and MAF to establish soil guideline values and management practices in order to address the very gradual, diffuse, accumulation of cadmium in agricultural soil. More information on this activity can be found at the Ministry for Agriculture and Forestry web site.

The member companies of New Zealand Fertiliser Manufacturers Research Association employ a number of respected senior scientists with extensive research experience working in Crown Research Institutes such as AgResearch. The Chief Scientific Officer for one member company, Dr. Ants Roberts, while employed by AgResearch conducted field research on cadmium accumulation and uptake into plants, and is principle author or contributing author for many of the research publications on this topic applying to New Zealand agricultural soils.

The industry is grateful to have received the opportunity to comment on one very early draft of the NES Methodology document, and the Fertiliser Industry welcomes the opportunity to be engaged in the development of scientifically robust methodology for assessing and managing contaminants in soil.

This submission by The New Zealand Manufacturers' Research Association has been prepared in close consultation with our member companies and represents an agreed industry position.

## Submission Points:

### Executive Summary

1. The objective of this Policy is supported, specifically ;  
*“ To ensure that land affected by contaminants in soil is appropriately identified and assessed **at the time of being developed**, and if necessary remediated or the contaminants contained, to make the land safe for human use.”*
2. The approach to apply NES only to Human Health issues is supported, and this should be reflected in the title.
3. Terminology and emphasis for the document should be consistent with the title and objectives. i.e., “managing contaminants in land”, not managing and defining “contaminated sites”, which are defined under the RMA by adverse “effects”.
4. The document should be very clear that ;
  - NES represents values which are acceptable for the designated land use,
  - soil contaminants at levels above the NES require investigation
  - exceeding the NES does not necessarily represent adverse effects
5. An NES (Human Health) cannot be applied to determine RMA effect threshold, and there should be no attempt to do so.
6. Development of Soil Guideline Values (Environmental Health) remains outside the NES(Human Health) and should be developed through a separate process.
7. The development of appropriate Soil Guideline Values (Environmental Health) should be subject to public scrutiny such as a submission process and through engaging a sector based Working Group.
8. Land investigation reports supplied to council should be restricted to resource consent applications for land use change on land;
  - where there is a known history of land use and activities identified in the Ministry for Environment’s Hazardous Activities and Industries List ( HAIL) , or
  - that is indicated on the district or regional councils land use information register as being potentially affected or affected by contaminants in soil.
9. Land investigation, (e.g. sub-surface investigations) independent of a resource consent application for land use change should not be required to be supplied to council.

10. Support is given to ;

Permitted activities listed without conditions i.e.

1. *any ongoing activities or occupation of the land for the same activity of an existing use*
2. *subdivision which is not associated with a change in use or a disturbance of the ground*
3. *landscaping, fencing (but not retaining walls), and other minor actions which involves a minimum level of soil disturbance*
4. *internal and external additions and alterations to existing buildings that occur above ground level and do not disturb the ground*
5. *any activities on agricultural land used for the bulk production of food that are not associated with a change of use to residential, recreational, commercial or industrial land use.*

11. Specifically, it is supported that Agricultural land is excluded from the NES and that produce from agricultural land be managed subject to the joint New Zealand Australian Food Standards.

12. It is supported that investigation sampling, testing and reporting are conducted by appropriately experienced and qualified practitioners for the task involved.

13. The Glossary should include a definition for 'sub-surface sampling'.

14. Land use categories listed in Appendix 1 should be modified so that Rural Residential / lifestyle Block is deleted entirely.

15. Examples of site specific guideline values, such as 50 % produce consumption should be excluded entirely from the NES.

**16. The proposed Draft NES methodology supporting the cadmium NES values, is fundamentally and very seriously flawed and requires a complete revision.**

17. The potential for cost/risk to the economy through misapplication of NES does not appear to have been well considered in the discussion document and should be clearly identified and taken into account.

18. The NES document should state clear comparisons between New Zealand NES values and international soil guideline values (including differences in interpretation and application).

19. Figure 6 (page 58) should be edited. Environmental effects ( RMA effects) are very complex and not readily linked to the Human Health effects of soil contaminants, and there should be no attempt to do so (as currently occurs in Figure 6 , page 58)

## Introduction Chapter : Proposed NES for Assessing Contaminants in Soil

### Policy Objective:

1. The objective of this Policy is supported, specifically ;  
*“ To ensure that land affected by contaminants in soil is appropriately identified and assessed **at the time of being developed**, and if necessary remediated or the contaminants contained, to make the land safe for human use.”*
2. The approach to apply NES only to Human Health issues is supported.
3. Human Health should be included in the title : "*National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health*"
4. The document should be very clear that;
  - NES represents values which are acceptable for the designated land use
  - soil contaminants at levels above the NES require investigation
  - exceeding the NES does not necessarily represent adverse effects
5. It is noted the NES (Human Health) does not provide for the environmental requirements.
6. A NES( Environmental Health) to ensure a nationally consistent approach to management of contaminants in soil is desirable but requires more careful and more detailed consideration of the large number of variables relating to environmental receptors. NES (Environmental Health) should therefore be addressed as a second independent program.
7. In order to address “Environmental” Health there should be the formation of National Working Groups to oversee and consider the development of any Soil Guideline Values (Environmental Health) . The Cadmium Working Group for the agriculture and food sectors provides a clear example of a responsible collaborative process operating along these lines.
8. Ministry for Environment should provide for environmental health by making a clear directive alongside the NES (Human Health), ensuring that national Soil Guideline Values (Environmental Health) are developed along these Working Group lines, so as to avoid inconsistent and perverse outcomes from incorrectly applying the NES (Human Health) and to avoid inconsistent and perverse outcomes from the development of Soil Guideline Values (Environmental Health) using inappropriate methodology.

### Decision Sought

9. Human Health should be included in the title : "*National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health*"

10. Clearly state;

- NES represents values which are acceptable for the designated land use
- soil contaminants at levels above the NES require investigation
- exceeding the NES does not necessarily represent adverse effects

**Background:**

11. Support is given to the high priority given to ;
  - *developing a nationally consistent method for deriving and applying soil contaminant levels, protective of human health, that trigger a defined management action*
  - *developing nationally consistent land-use and subdivision rules*
12. The NES document should be clear that a *“defined management action”* includes investigation to determine if a risk exists.
13. It is recognised that the supporting documents are not contained within the NES Discussion Document, but are important in the derivation and application of NES values. These documents are :  
“Draft Toxicological Intake Values for Priority Contaminants in Soil (MfE,2010)” , and  
“Draft Methodology for Deriving Soil Guidelines Values Protective of Human Health (MfE, 2010)”,
14. These supporting documents recommend the Toxicological Intake Values and the Methods to be used to derive soil contaminant concentrations appropriate for generic and site specific NES values. These documents are therefore an integral part of the NES to be applied, and submission comments will address these documents also.

**Decision Sought**

15. Clearly state that *“defined management action”* includes investigation to determine if a risk exists.

## **PART 1 The Proposed NES for Assessing Contaminants in Soil**

### **Section 2.1.1 How much contaminated land is there in New Zealand ?**

16. The Ministry for Environment estimates that councils have identified 20,000 potentially affected sites.
17. This seems an inordinately high number, but there is no indication of the nature of the potentially affected sites identified by councils. Are they attributed mainly to legacy site of previous industrial activity, sheep-dip sites, or a wide range of land use categories on the HAIL list?

#### **Decision Sought**

18. The justification for this very large number of suspected legacy sites should be clarified and stated, or otherwise not reported.

### **Section 2.2.2 Inconsistent and inappropriate use of guideline values**

19. The fertiliser industry is very concerned about past examples of inconsistent and inappropriate application of various guideline values by regional councils.
20. An NES with clear and consistent requirements for the use and application of soil guideline values is supported.
21. The current soil guideline values appear to serve the purpose of both investigation value, and also threshold value for risk of adverse effects.
22. This will inevitably give rise to further inconsistent and inappropriate use of the guideline values.
23. Therefore a clear statement is required that : “investigation values” do not represent “threshold for unacceptable risk” for the application of the NES guideline.
24. Examples of a clear statement that “investigation /remediation values” do not represent “risk threshold” are provided with the UK and Dutch soil guideline values.
25. The potential for inconsistent and inappropriate use of the guideline values could impose serious economic costs at a national scale. (see Paragraphs 77-86)
26. It is noted: The draft Document is titled “assessment and management of contaminants in soil” while the language and definitions within the text consistently refer to “contaminated land”. (within this section alone, refer to pages 12 -18).

## Decisions Sought

27. Terminology and emphasis within the document which is consistent with the title and objectives i.e. “managing contaminants in soil” , not managing and defining “contaminated sites”, which are defined under the RMA by adverse “effects”.
28. Clear statement that investigation values do not represent threshold values for unacceptable risk.

## Section 3.2 Preferred Option

29. NES as a preferred option is supported however;
30. The meaning and application of the soil guideline value should be clear and unambiguous, however this is not the case with the current draft document.
31. The NES should be clearly defined as representing an “acceptable level for the designated land use”, and above which there should be “Investigation”.
32. It should be clear that exceeding the NES does not necessarily represent a significant risk of adverse effects.
33. In the draft proposal the NES is interpreted as both “threshold” defining unacceptable risk under the RMA definition (i.e. “contaminated sites”), and as an “acceptable” soil level, above which further “investigation” is required , and as a “remediation target”.
34. It remains very confused throughout the document as to whether the NES guideline represents a safe and acceptable level of contaminants in soil, or whether the NES represents a threshold defining a “contaminated site”.
35. The commercial and political ramifications of confusion over this designation is potentially very damaging and wide reaching.
36. The Fertiliser industry does not support the blurred amalgamation within the NES which represents, as this proposed value does, an NES which is an “investigation” level **and** a “threshold” level defining unacceptable risk that adverse effects will occur.
37. Preference is given to a NES which represents a level of soil contaminants which is safe for Human Health, requiring “investigation” of the risk if exceeded. This could then logically also apply as a remediation target.
38. An NES (Human Health)cannot be applied to determine RMA effects threshold, and there should be no attempt to do so.

39. Development of Soil Guideline Values (Environmental Health) remains outside the NES(Human Health) and should be developed through a separate process.
40. The development of appropriate Soil Guideline Values (Environmental Health) should be subject to public scrutiny such as a submission process and through engaging a sector based Working Group.
41. The fundamental errors and flaws identified in the cadmium methodology (as discussed in detail in our submission on the “Draft Methodology for Deriving Soil Guideline Values Protective of Human Health), provides a strong case for the requirement for engaging a submission process and Working Group collaboration in order to responsibly develop Soil Guideline Values (Environmental Health), outside the NES (Human Health).

#### **Decisions Sought**

42. The NES approach is supported as appropriate for the identification and assessment of contaminants in soil for the protection of human health and should be retained.
43. The NES for Human Health is not linked to generic Soil Guideline Values for Environmental Effects.
44. Development of Soil Guideline Values (SGV’s) for Environmental Health should be subject to public scrutiny, such as a submission process and through engaging a sector based Working Group.

#### **Section 4.1.3 Permitted Activity – Use ,development or sub-division**

45. Support is given to ;  
*“The permitted activity allows land –use change , development or subdivision of land where there is no evidence of soil contamination or the proven levels are acceptable for the intended land use as defined by the relevant soil guideline value.”*
46. Land investigation reports supplied to council should be restricted to resource consent applications for land use change on land;
  - where there is a known history of land use and activities identified in the Ministry for Environment’s Hazardous Activities and Industries List ( HAIL) , or
  - that is indicated on the district or regional councils land use information register as being potentially affected or affected by contaminants in soil.
47. Land investigation, (e.g. sub-surface investigations) independent of a resource consent application for land use change should not be required to be supplied to council.
48. Privacy issues, due diligence on purchase and sale agreements and potential effects on land values, and produce from the land may be adversely effected, if all land investigation reports must be supplied to Council even when values are determined to be acceptable and below NES values.

49. Support is given to ;

Permitted activities listed without conditions i.e.

1. *any ongoing activities or occupation of the land for the same activity of an existing use*
2. *subdivision which is not associated with a change in use or a disturbance of the ground*
3. *landscaping, fencing (but not retaining walls), and other minor actions which involves a minimum level of soil disturbance*
4. *internal and external additions and alterations to existing buildings that occur above ground level and do not disturb the ground*
5. *any activities on agricultural land used for the bulk production of food that are not associated with a change of use to residential, recreational, commercial or industrial land use.*

50. Specifically, it is supported that agricultural land is excluded from the NES and that produce from agricultural land be managed subject to the joint New Zealand Australian Food Standards.

51. It is supported that investigation sampling, testing and reporting are conducted by appropriately experienced and qualified practitioner for the task involved.

52. The Glossary should include a definition for 'sub-surface sampling'.

#### **Decisions Sought**

53. It is supported that agricultural land is excluded from the NES and that produce from agricultural land be managed subject to the joint New Zealand Australian Food Standards. This aspect of the NES should remain.

54. Land investigation, (e.g. sub-surface investigations) independent of a resource consent application for land use change is not required to be supplied to council.

55. Permitted activity listed without conditions should remain subject to changes shown above in point 5 in as shown paragraph 49 above.

56. Include a definition for 'sub-surface sampling' in the glossary.

#### **Section 4.2 Acceptable and unacceptable use**

57. Land use categories listed in Appendix 1 should be modified so that Rural Residential / lifestyle Block is deleted entirely. Page 68 of the discussion document clearly states this scenario is not for regulatory purposes and so it only adds confusion. The description clearly defines that the intention is to include the residential vicinity of the farm houses and this scenario and all exposure assumptions should be covered by the standard residential scenario.

58. 10 % produce consumption is accepted as a conservative scenario for home grown produce, because as documented in the Toxicology Report, it is unlikely that many typical New Zealand households will reach or exceed this level of produce consumption from home gardens.

59. It is noted that for the purpose of the discussion document examples of site specific guideline values are provided, such as 50 % produce consumption. These should be excluded entirely from the NES because citing values in addition to the NES values creates confusion, misapplication and unacceptable use of the NES values.
60. For site specific investigations ( 50 % produce consumption, for example) the Methodology should be logical, scientifically defensible and preferably consistent with international protocols. It should also be consistent with protocols and approaches which apply to commercial produce production, such as the 'Tiered Management Approach ' being developed through the National Cadmium Working Group.
61. **NOTE : The proposed Draft NES methodology supporting the cadmium NES values, is fundamentally and very seriously flawed and requires a complete revision.**  
(See additional submission on Draft Methodology for Deriving Soil Guideline Values Protective of Human Health [Publication no. ME979 ]).
62. It is noted that the current methodology gives rise to excessively conservative NES values for Cadmium and Arsenic, which will be lower than natural soil levels (undisturbed native forest) under some site specific circumstances, (e.g. cadmium NES under 50 % produce consumption, or if the World Health Organisation (WHO) accepts the current European Food Safety Authority (EFSA) recommendation for cadmium daily tolerably intake ). In the case of cadmium, this appears to be a manifestation of seriously flawed methodology for determining the New Zealand NES value, rather than a genuine risk to Human Health with soil cadmium levels at natural background levels.
63. No international soil guideline value for cadmium indicates any risk to human health at soil guideline values at soil cadmium concentrations equivalent to New Zealand's natural background levels. (0.2-0.77 mg Cd/kg soil)
64. There are very serious economic and social ramifications from the introduction of these types of errors and flaws. Misrepresentation of guideline values by local authorities in the past has been of grave concern to the fertiliser industry. The errors discussed in the submission on the Draft Methodology for NES (cadmium), provides a compelling argument for introducing a Working Group approach to addressing other guidelines which are not part of the NES and therefore have no formal submission process. e.g. Soil Guideline Values (Environmental Health).
65. Sector based Working Groups could address the suite of contaminants which might be relevant to that sector. For example, within the agriculture and food sector the Cadmium Working Group process of collaboratively developing appropriate protocols and management could be followed and expanded to address a range of elements.
66. Other sector groups might encompass timber treatment, petroleum industry etc.

### **Decisions Sought**

67. Delete the Rural Residential/ Lifestyle block category from the NES.

68. 10 % home produce consumption is accepted as a precautionary value, and should be retained as a standard reference value for the NES.
69. Delete reference to 50 % produce consumption as it has no regulatory application.
70. Revise the methodology for determining NES values and for site specific investigation for cadmium (and potentially arsenic) so that it is logical, scientifically defensible and consistent with international protocols.
71. Establish sector based working groups to address methodology for the contaminants which are relevant to each working group and include reference to the 'Tiered Management Approach' being developed through the National Cadmium Working Group.

#### **Section 4.4 How will the NES affect existing plans?**

72. By accepting the current NES (and the methodology supporting it), there is potential for serious anomalies arising where soil values were in the past acceptable, but are no longer (arsenic for example).
73. Note that rules and plans of Territorial Authorities will be overridden and the NES must be put into effect immediately.
74. Therefore, under these circumstances there must be a high level of confidence and certainty in the derivation and application of the NES values for soil contaminants.
75. Aspects of the methodology and derivation of arsenic and cadmium NES values have been considered and they do not support a high level of confidence in the derivation and application of the NES for these two elements. ( see additional submission on Draft Methodology for Deriving Soil Guideline Values Protective of Human Health [Publication no. ME979 ]).

#### **Decision Sought**

76. Review the methodology used to determine the NES values and used to provide site specific investigation for all contaminants.

#### **Section 5.0 Costs and Benefits of the Proposed NES**

77. There is no indication of risk to human health from productive agricultural land with soil cadmium at current levels. There is a very serious risk to New Zealand's national economy, if productive agricultural land is classified or perceived to be classified as contaminated land.

This is possible if the New Zealand NES for cadmium is set at, or close to natural background levels for a residential site including home grown produce consumption.

78. Commercial food production in New Zealand and around the world, is derived from soils at or slightly above background levels.
79. Excessively low NES values provide a large margin of safety for Human Health, however there are potential economic costs which must also be considered in terms of justifying the safety margin provided by conservative NES values.
80. Potentially, under the current Draft Methodology conservative (low) NES values for cadmium could be set at, near or below natural background levels.
81. The scenario of deriving NES (cadmium ) values at or close to natural background values is a manifestation of flawed methodology, rather than a genuine risk to human health at natural background levels in New Zealand.
82. The Soil Guideline Values ( Human Health) for cadmium derived by the United Kingdom Environment Agency, adopted the recent recommendations of the EFSA, and following a robust scientific review arrived a Soil Guideline Value for cadmium well above the natural background levels found in New Zealand.
83. The supporting documentation for the UK Soil Guideline Values also makes it very clear that this value is not a threshold for risk to human health, but an investigation value, and that the risk to human health is, in most cases, not likely to occur until many times the Soil Guideline Value.
84. In this respect the draft New Zealand soil guideline value (cadmium), as a manifestation of the methodology, is very conservative and very low. In addition, it serves as both an investigation(Human Health) and a threshold value(RMA Effects). Therefore the potential cost/risk to New Zealand economy through misinterpretation and misapplication of the NES (defining contaminated land) is very high.
85. The potential for cost/risk to the economy through misapplication of NES does not appear to have been well considered in the discussion document.
86. These costs/risks to the economy could be prevented through very clear differentiation between applying the NES as very conservative “investigation” values and by not applying them as generic “threshold” values for RMA Effects. (For example, a very clear distinction between ‘investigation’ values and ‘threshold for adverse effects’ applies to the Dutch, and UK Soil Guideline Values)

### **Decisions Sought**

87. Identify and take account of the potential cost to trade and New Zealand’s national economy from misapplication of conservative (low) NES values.

88. Clearly state the comparisons between New Zealand NES values and International Soil Guideline Values (including differences in interpretation and application).

## PART 2 Implementing the Proposed NES

### Section 8.0 Soil Guideline Values

89. This section of the NES Discussion Document provides clear examples of the ambiguous nature of the NES.

90. Section 8.1.1 determines that NES performs two functions ;

- 1) “Trigger” values which represent a threshold above which;
  - Effects on human health **may** be unacceptable over time
  - Further assessment if a site is required to be undertaken
- 2) Remediation Targets values at or below which land is considered safe for human use

91. Application of the NES value as an investigation value and a target value for remediation as described in the discussion document is appropriate and is supported.

92. Figure 6 (page 58 ) however, determines that the NES is a threshold value where adverse effects will occur and are **unacceptable**, with the ‘effects threshold’ defined as “RMA Effects thresholds’ .

93. Therefore Figure 6 of the NES Discussion Document leaves open for interpretation that the NES value represents:

- I. safe remediation target value
- II. trigger for investigation value
- III. threshold value defining unacceptable RMA effects

94. Unacceptable RMA effects could be used for a definition of contaminated land. This ambiguous representation is confusing and will likely lead to instances where the NES (human Health) is implemented incorrectly.

95. International examples for cadmium Soil Guideline Values are very clear with regard to the distinction between investigation values and unacceptable risk as follows;

**UK** **SGV** = Investigation values :

Allotments	<b>1.8 mg Cd/kg soil</b>
Residential	<b>10.0 mg Cd/kg soil</b>

#### **UK legal Guidance**

- I. For substances where there is an SGV, the more the SGV is exceeded, the more likely it is that an authority should consider the risks to be *significant possibility of significant harm*.

- II. Generally, the cautious nature of SGVs means that local authorities may conclude that *significant possibility of significant harm* is unlikely to exist at concentrations close to SGVs.
- III. In some cases, land with concentrations of contaminants which marginally exceed an SGV (say, up to a few times the SGV) might give rise to *significant possibility of significant harm* if, for example, the receptor is particularly sensitive; or if further assessment finds that exposure is higher than that estimated in the generic SGV; or if there is little uncertainty in the underlying toxicology and HCV [Health criteria values].
- IV. In other cases an SGV may be exceeded by tens of times and there might be no *significant possibility of significant harm* (e.g. if further assessment found that exposure was much lower than that estimated using the generic SGV).

**Dutch** : Remediation Target value = ( background ) = **0.8 mg Cd/kg soil**  
 (remediation is only required under specific situations , such as when the ‘Intervention’ value has been exceeded)

: Intervention Value = (risk to Human Health) = **12 mg Cd/kg soil**

**Canadian** : Soil Quality Criteria = (appropriate value for land use)  
 = (remediation target value )  
 Agricultural use = **1.4 mg Cd/kg soil**  
 Residential use = **10 mgCd/kg soil**  
 (These values represent ‘clean down’ to targets appropriate for continued land use for sites that have been remediated to these values.)

**Danish** : Soil Quality Criteria = ( background )  
 = (remediation target ) = **0.5 mgCd/kg soil**  
 (These values represent ‘clean down’ to targets appropriate for continued land use for sites that have been remediated to this value.)

(Remediation is required under specific situations, such as when the ‘Cut-off Criteria’ applies)

: Cut –Off Criteria = (requires remediation for very sensitive land use)  
 = **5.0 mgCd/kg soil**

**New Zealand** : **Draft NES** = safe remediation target value, and  
 = trigger value for investigation, and  
 = threshold value for unacceptable effects  
 ( RMA effects)

96. Figure 6 (page 58) should be edited to be consistent with documented processes where the NES defines an ‘investigation’ value to determine whether or not there are adverse Human Health effects, and does not represent a threshold for unacceptable RMA effects .

97. Environmental effects ( RMA effects) are very complex and not readily linked to the Human Health effects of soil contaminants, and there should be no attempt to do so (as currently occurs in Figure 6 , page 58)
98. Environmental effects of contaminants in soil should be addressed on a site specific basis as per the 'Tiered' approach developed by a working group as discussed in paragraph 7, and paragraph 60.
99. New Zealand National Environmental Standards (Human Health) could also provide for a clear legal description or clear designation to define the differences between criteria for ;
- I. investigation (or remediation ) values, and
  - II. values representing unacceptable risk.
100. The same value cannot, in practical terms, represent both criteria, unless there is a real and actual change from negligible risk to significant unacceptable risk at the threshold value.
101. Current science and international examples provide confidence that there is no quantum change in risk at the proposed NES value for the contaminants being addressed.
102. The increasing risk as the concentration of soil contaminants increases above the NES value is, in general, very gradual. This should be reflected clearly in the documentation for NES ( Human Health).

### **Decisions Sought**

103. Clearly state that investigation / remediation values do not represent adverse effects, and that exceeding these values do not necessarily represent adverse effects.
104. Introduce early in the NES document that risk of adverse effects gradually increases as soil concentrations increase above the NES value.
105. Clearly state that Environmental effects of contaminants in soil are not represented by the NES (Human Health), and are addressed on a site-specific basis.
106. Introduce the concept of a 'Tiered' approach similar to that being developed by the Cadmium Working Group for addressing environmental effects of contaminants in soil.

## Additional Comments

107. NES values for cadmium in the Discussion Document reflect numerous errors identified in the Methodology Document.
108. Correction of some arithmetic errors gives rise to a small increase in the Draft NES values for cadmium.
109. However page 86 of the NES Discussion Document identifies that for cadmium, there will be a review of the toxicological data by the Joint Expert Committee on Food Additives (JEFCA), in June 2010.
110. It is recommended that the current JEFCA values are used until the review.
111. Workshop discussions indicated that if the JEFCA review accepts lower toxicological intake values (as recommended by the European Food Safety Authority, EFSA), and if World Health Organisation accepts the JEFCA review, then New Zealand would also accept those revised Weekly Tolerable Intake values for determining NES values for soil cadmium .
112. The Draft NES Documentation and Draft Methodology Documentation describe intake criteria for both child and adult exposure pathways. It is not explained in these documents, but on investigation, it is apparent that the draft methodology calculates soil NES values using child exposure values only.
113. Note that on page 86, in reference to cadmium, the standard background intake of a child (2.87 mg Cd/kg BW/week) exceeds the recommended tolerable weekly intake by EFSA (2.5 mg Cd/kg BW/week). This is acceptable because the EFSA intake values are calculated for lifetime exposure and the typical child hood exposure criteria do not apply for a lifetime.
114. The draft New Zealand Methodology however is incorrect in that it only uses childhood exposure criteria to calculate NES based on lifetime assumptions for weekly tolerable intake values.
115. As a result of this and other serious, fundamental errors in the Methodology, NES values for cadmium will be “**negative**” values if JEFCA, WHO , and New Zealand accept the recommendation for reduced toxicological intake values.
116. That is, under the current flawed Methodology(cadmium ) , updating the toxicological data in-line with EFSA recommendations will give rise to the absurd conclusion that soil with **NIL** cadmium , will exceed a safe soil levels for cadmium.
117. This particular flaw in methodology is relatively easily corrected, but other more serious flaws in the Draft Cadmium Methodology present more difficult challenges.
118. These fundamental flaws in the Draft Methodology for cadmium are discussed in the attached paper- a submission on the “ Draft Methodology for Deriving Soil Guideline Values Protective of Human Health MfE, Feb 2010, [ME979].

### **Decisions Sought**

119. Review and revise the methodology for deriving NES values and for providing site specific investigation for cadmium.
120. Review and revise the methodology for the other contaminants (which have not been critically examined with regard to this submission).

End.