

# **Review of GE issues and options report for Whangarei District Council**

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Wellington  
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## **Biographical Note – Karen Cronin**

Karen Cronin is a Senior Lecturer (part time) in Environmental Studies at the School of Earth Sciences, Victoria University of Wellington and an independent consultant in science policy and communication. She is also completing her PhD at the Victoria Management School in the field of risk governance and risk communication, using biotechnology development in New Zealand as a case study.

Karen has a BA in Human Geography and an MSc in Resource Management. Her professional career has been in resource management, impact assessment, environmental policy, corporate communications and marketing.

She was Corporate Communications Manager for the Environmental Risk Management Authority from its establishment in 1997 to 2001. She has also held senior management positions in the Wellington City Council, the Ministry for the Environment and the World Wide Fund for Nature.

She was a member of New Zealand Environmental Council from 1985-1987. She has been a member of the international Commission on Environmental Education and Communication, IUCN (the World Conservation Union) since 1996; and was a member of an OECD international working party on risk communication 1998-2001.

Karen was also a founding member of the New Zealand Society for Risk Management in 2000 and a member of the Society's management committee.

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## **1. Background**

The Whangarei District Council has asked me to provide an independent evaluation of the report Community Management of GMOs II – risks and response options, prepared in May 2005 by Simon Terry and Associates and Mitchell Partnerships for the Whangarei District Council, in association with the Far North District Council, Kaipara District Council, Rodney District Council and Waitakere City Council.

The report presents options for the management of genetically modified organisms (GMOs) under the Resource Management Act (RMA), for the consideration of the Inter Council Working Party on GMO Risk Evaluation and Management Options whose membership represents the Northland Peninsula Councils noted above. The May 2005 report follows an earlier scoping report by Simon Terry and Associates in 2004, and draws on other key reports including Dr RJ Somerville QC (2004) Opinion on Land Use Controls and GMOs, a Crown Law Office opinion for the Ministry for the Environment (August 2003), and the report of the Royal Commission of Inquiry into Genetic Modification (RCGM) in 2001.

## **2. Terms of Reference for Review**

In undertaking this review, I have been asked to address the following questions:

1. Does the report address the terms of reference set out in the letter of engagement dated 14 September 2004?
2. Does the report analyse and evaluate the risks posed by GMO land uses in an objective manner?
3. Does the report analyse and evaluate the options available to territorial authorities to address those risks in an objective manner?
4. Does the report rely on accurate and up to date sources of information in its analyses and evaluations? Are they referenced adequately and are they verifiable?
5. Are the analyses and evaluations in the report robust and well supported?
6. Are there any significant flaws in the report that you would like to comment on?

## **3. My approach**

My comments have been written as an independent person reading through the report for the first time. I have tried to identify where the report may raise issues for other readers from a range of perspectives on the topic of GM.

This review reflects my policy background and direct experience of the HSNO process. I have also drawn on my own research on the perceptions of New Zealand scientists and the wider public, on GM risks and policy options. I am not however a legal expert or an economist. I have noted Dr. Somerville's opinion but have not read all of the primary documents cited by the authors. My comments, therefore, may in places reflect a limited understanding of what is proposed or of the issues involved.

Finally, in writing a page-by-page commentary [see Appendix] I may have raised questions in one section that the authors answer later on, or can readily clarify. I understand that there is still further research and investigation planned in the next stage, prior to a S.32 analysis.

#### 4. Evaluation questions

1. Does the report address the terms of reference set out in the letter of engagement dated 14 September 2004?

The Assignment was to “examine the options for TLAs to use RMA instruments to manage the risks arising from the outdoor use of GM organisms, while updating the previous comparison made with the broad alternative of amending the HSNO Act.”

The report refers to submissions made to the Long Term Council Community Plans as a platform, inter alia, for developing district plan provisions to manage GMOs. It proceeds in a logical way to examine the policy basis for such a strategy including what are seen as deficiencies in the central government regime for GMO management from the point of view of TLAs; the limits of scientific risk assessment and the use of the precautionary principle as a basis for responding to community preferences regarding GMOs; the requirements of a S.32 analysis leading to plan changes/new rules; the current planning approaches used by the various Northland councils in their plans; and in particular the use of a prohibition or discretionary provisions for considering applications for consent under a district plan. The report develops a policy proposal based on a ‘class by class’ classification of GMO types/uses – based on an overview of trends and risks, in the Appendix – and proposes 4 options for GMO management, in a sliding scale, for councils to consider. In so doing, the authors recognise that further policy work is required to develop this proposal at the next stage.

I understand that the proposition is to work under the RMA rather than relying on an amendment to the HSNO Act. The reasoning for this is presented in the earlier documents, and referenced in several places in the present report. But I think this strategic pathway needs to be made more explicit, certainly prior to any public consultation. The report might present this more clearly at the outset, perhaps using a flow chart or conceptual diagram.

The analysis was to include reference to the following points and has been generally achieved:

- a) Identification of existing council policies. **Done.**
- b) Description of outdoor uses of GMOs that could arise in the area, motivations for use and prospective benefits. **Done. But I think more might be said on benefits.**
- c) Risks, scope of effects, magnitude, uncertainties, categories of GMOs. **Done, but some aspects of risk were given more attention than others. See my detailed comments in the Appendix.**
- d) Response options for each category and controls. **Done.**
- e) Options for setting controls, including cost, administration and legal considerations. **Done. Some key policy and procedural issues around the interface with HSNO require further elaboration.**
- f) Do options meet the test under S.32 RMA. **Done but requires further discussion in next stage.**
- g) Steps to complete plan change. **Done.**

2. Does the report analyse and evaluate the risks posed by GMO land uses in an objective manner?

The report draws on a wide range of scientific studies, government reports, books, articles, and industry comments - and reflects considerable knowledge of the technical, scientific, policy and political developments around GMOs in NZ and internationally. In some places in my evaluation, I have suggested that a wider range of risks be examined e.g. greater emphasis on the risks to tourism; non- Maori cultural values; ethical and spiritual values; and issues around containment/controls.

I have also commented at various points on the need to reflect a wider literature on GM benefits, and to recognise the different perspectives on GM risks that may be held by some readers. Having said that, the authors have shown appropriate caution around the uncertainties of GMO impacts, especially in the absence of research and, more generically, given our inability to accurately predict changes in complex ecological and biological systems. Where risks are identified, these are related to reputable government or scientific inquiries and reports. The sources for some references might be made clearer e.g. the book on GM forestry. The structure of material in the appendix might be reviewed to ensure that each section is being considered under the same set of headings.

3. Does the report analyse and evaluate the options available to territorial authorities to address those risks in an objective manner?

The policy discussion includes a range of options from do nothing, to a total ban on GM activities and recommends a strategy with some elements of discretion based on the risk profile of different types of GMO. It is rightly cautious in respect to prohibited use status, given the philosophy of the RMA and the case law.

4. Does the report rely on accurate and up to date sources of information in its analyses and evaluations? Are they referenced adequately and are they verifiable?

The references appear to be comprehensive and up to date and reflect a substantial level of background research. They include key analyses from a range of international sources that are seen as reputable and relevant. In several places I have called for fuller discussion or documentation of the information cited. Some tidying up of the references would be useful if the report is to be read by a wider audience.

5. Are the analyses and evaluations in the report robust and well supported?

The report refers to important policy and legal precedents in Australia, Canada and the EU. It may be useful to source the policy material underpinning legal regimes for controlling GM land uses in other countries, to support the analysis in the next stage of the process.

In several places I have identified criticisms that may be raised by some readers of this report and which might be addressed at the next stage. There are a number of pointers to the underlying rationale for local government action, but I think these might be drawn together more forcibly - and there may be additional supporting arguments available. The report might make it clearer if it is relying on a 'community preferences' argument to justify local intervention under the RMA, or an argument based on effects assessment and the perceived deficiencies in HSNO risk assessments procedures – or a mix of the two?

Is the key objective to support a regional “GM Free” marketing campaign, or to invoke locally specific land use controls to manage environmental effects, or both? I have commented in several places about the value of precedents, in NZ and elsewhere, and think more might be made of these to support the basic proposal in the report. I have also suggested further elaboration is needed to explain the relationship between the RMA and HSNO (and potentially other legislation), and to identify an appropriate policy and procedural interface for decision-making by TLAs and ERMA. There is also a need to clarify the risk/impact assessment criteria and procedures that may be used, at the stage of plan development and when considering consent applications. There is also the issue of monitoring of both consent conditions and potential long-term effects. Finally, there are policy and procedural issues around the adoption of district plan rules in neighbouring TLAs and the interface with the regional plan – and the authors refer to this. The councils may wish to look at these issues in more detail to test their strategy. I understand that this is one of the next steps in the process, prior to formally embarking on a S.32 process.

6. Are there any significant flaws in the report that you would like to comment on?

The authors have responded comprehensively to the brief they were set by the Councils and have produced a valuable resource document.

## **5. Recommendations**

I appreciate that my review is one step in a longer process of analysis and decision-making. The report itself indicates a number of areas that need to be developed further. In that context, the Councils may wish to consider the following:

- a) drawing together and highlighting the relevant legal and policy precedents for this strategy, citing examples in New Zealand, Australia and elsewhere;
- b) clarifying the interface between the various Acts including the RMA, HSNO, BSA and LGA, including the policy and procedural issues that may arise from the operation of a district plan regime for GMO controls, as proposed;
- c) clarifying the proposed use of the Precautionary Principle under the RMA, particularly the extent to which the proposed strategy is reliant on community preferences and/or effects assessment/scientific evidence, respectively;
- d) further discussion, as identified in the report, on enforcement and financial damages; and planning issues (e.g. consent conditions/ monitoring/ performance measures/ regional plan interface); and
- e) developing a clearer presentation (e.g. through the use of a flow chart or case studies) of the fundamental strategy being proposed to justify district plan controls: joining the ‘links in the chain’ from a HSNO critique to an independent RMA initiative; identifying the marketing and/or land use control objectives for the proposal; and testing it for legal and policy coherence, prior to any S.32 analysis and public consultation.

## **Appendix- Detailed Comments on the report**

### Section 1

#### Page 1

- The limited scope of the report (i.e. only outdoor use of living GMOs in field trials or releases) is noted. However it may be necessary at some point to consider GM ‘development’ applications as well, which can raise issues of containment. The boundary line is not always clear and is open to challenge. In some cases GMO proponents have sought to have their applications to The Environmental Risk Management Authority (ERMA) classified as ‘developments’ rather than ‘field tests’ (the former usually do not require public notice/submissions). Submitters to ERMA have suggested that development projects are very similar to field trials in terms of the potential risk of releasing GM materials to the environment. Inadvertent escapes from such facilities (e.g. from glasshouses or fish breeding tanks) and breaches of containment conditions have already been documented in New Zealand and could raise local community concerns in Northland.
- The reference to the submissions of Local Government New Zealand (LGNZ) and Marlborough District Council is useful. This indicates wider expectations for a role for local government in considering GMO applications.

#### Page 2

- If not already done, it may be useful to cite a ‘cross check’ on the opinion of the Crown Law office and that of Dr Somerville, to illustrate where one supports the other in the key matters that the Councils’ Working Party may be relying on.
- The reference to Long Term Community Plans, under the Local Government Act (LGA) is important, as an indication of community concerns. The proposal is to draw on these objectives for GMO management and translate them into district plan changes under the RMA. This raises a wider question of scope: in following the recommendations of this report, Councils could be taking actions that potentially interface with 4 statutes i.e. the LGA, RMA, the Hazardous Substances and New Organisms Act (HSNO) and the Biosecurity Act (BSA). I understand that these points are discussed in Dr. Somerville’s report.

#### Page 4

- The reference in para 1. and para 6. to ‘deficiencies in the regulatory regime at the national level’ might be seen as rather a bald statement, at least on first reading. It requires justification, some of which comes later.
- The national regulatory regime for GMOs comprises several pieces of law and several agencies, including HSNO, the BSA, ERMA, The Ministry for the Environment (MFE), The Ministry of Agriculture and Forestry (MAF), The Australia New Zealand Food Authority (ANZFA), and institutional biological safety committees. In places, the report appears to refer just to ERMA as the ‘regulatory regime’.
- Para 4 raises a series of critical points. The report notes the value of a national centre for baseline analysis of GMO applications, given the complexity and cost of scientific analysis.
- Firstly, is there a presumption that scientific analysis is the key component of an evaluation of GMO risks? The report (correctly in my view) presents arguments against this, in later sections. However if an element of scientific analysis is required, do territorial local authorities (TLAs) have the capacity to do such an assessment? Could their ability to consider applications under a land use control regime be legally challenged if this scientific expertise is not available in TLAs?

Page. 4. cont.

- Alternatively, if TLAs had to rely on scientific assessments made at the national level, by ERMA, how might they use that information and what weight would it have in relation to other information? Would the TLA use a different analysis framework from that used by ERMA?
- It may be useful to have further policy discussion around managing the effects of a field test or release on the local community and its environment. The HSNO Act provides for approvals to be given to a 'new organism'. In the case of release, approvals are related to the specific organism rather than to the applicant or the project. Once it is deemed to be legally present in New Zealand under HSNO, the same organism can be released or used by any person, at any location, at any time in the future. This raises an issue about the extent to which ERMA will focus on the assessment of local effects, particularly for release applications.
- The assessment of environmental effects has been an important component in both GM and non- GM new organism applications under HSNO. But the critical point is that because the approval relates to the organism, not the site, it could be argued that there is an inherent limitation in the HSNO process in terms of investigating site specific environmental effects. This becomes particularly relevant in view of the limited powers open to ERMA to require long term site monitoring (except in the case of a conditional release).
- Furthermore, some commentators have argued that the assessment of social effects, including economic, ethical, cultural and community effects, has been given less attention by ERMA than other factors, see for example a critical report by Morgan and Archibald in 1999 (CIART, University of Otago). ERMA subsequently moved to address this issue to some extent, for example by adding new (but only discretionary) procedures to its corporate manual to provide notification to TLAs of local field trials; providing wider public notice to local communities about GMO applications; and starting to hold hearings for field trials in the local community. (See Report to Environmental Risk Management Authority on The Role of Public Notification for Applications and Decisions , February 2002, Delta Networks - Mary-Jane Rivers, Iona Pannett, Alison Broad ). ERMA has also recently established an Ethics Panel, but the way in which ethical assessment will operate in the context of wider risk assessment has not yet been established (see the consultation document, Consideration of Ethical Issues in HSNO Act processes, ERMA New Zealand, June 2005). There is of course no statutory connection between ethical assessments and inquiries conducted by the BioEthics Council and any application before ERMA.
- There may be some value in reviewing the assessment process used by ERMA in terms of its treatment of local and national costs and benefits. National level scientific and economic benefits have been prominent in the rationale for ERMA decisions. It might be worth investigating how public submissions, or ERMA staff evaluations, have dealt with the balance between local and national benefits, and the distribution of public and private costs. There is reference to this, in theory, in ERMA's own document on its approach to risk (cited later by the authors), but I don't know how widely this has been done in the context of actual applications – and such an analysis may enhance the policy argument in this report.
- In summary, if it could be demonstrated that the attention given by ERMA to local effects is inadequate from a local government point of view, this could provide a justification for local assessments to be made by TLAs - and potentially a stronger case for RMA interventions and approvals, independent of HSNO assessments. For the reasons above, I cannot fully agree with the statement on page 4, para 4. that the level at which analysis takes place "is more an efficiency argument".

Page 4. cont.

- More importantly, it is an argument about the type of effects that a proposal may cause, where they are likely to occur, and who is best placed to make the assessment. I would argue that, historically, ERMA has been constrained by both HSNO and its own operational practice from putting major emphasis on the assessment of local effects.
- The report suggests (page 4, para. 6) that the government has a conflict of interest in terms of being both the regulator and investor in GM developments in New Zealand. It is important to note the policy context and drivers under which ERMA must operate. HSNO was established as enabling legislation, to allow for GMO developments, field tests and releases in NZ. The presumption is that applications will be approved if benefits outweigh costs, taking into account the use of controls. Following the report of the Royal Commission of Inquiry on Genetic Modification (RCGM) the Government confirmed this strategic focus, opting to 'proceed with caution'; rejecting a 'class by class' ban (by lifting the moratorium); and re enforcing this policy in its Biotechnology Strategy (2003). Developers of GMOs, therefore, expect to be able to proceed under both national policy and law. If local communities want to achieve outcomes at variance with this national framework, can they do so? Dr Somerville's opinion [February 2004, pp.20-22] states that the RMA does provide a platform for securing alternative outcomes. It might strengthen the argument in this report, if the authors could demonstrate where else there are instances of regional or local policy operating independently of stated national policy, and the legal platform that make this possible.

Page 5

- On page 5, para. 2 the report refers again to the 'deficiencies' of the national government regime from 'a local government perspective'. The report might be enhanced at this point by summarising the key gaps in the central regime that leave local authorities and their communities at a disadvantage, under HSNO.
- We now come to the question of the interplay between ERMA/HSNO decision-making and a role for TLAs/RMA in GM decisions. This section of the report might be easier to follow if it noted the key points set out in the earlier reports to the Councils.
- For example para. 2 refers to the option of local authority policy statements on GM activities being accommodated by ERMA in its decisions. I agree that such statements by TLAs would probably only at best be seen as submissions, from one party, to be 'taken into account'; they would not act as a veto, regardless of the aspirations of local authorities and their communities. TLAs generally have no special status under HSNO. There are some requirements on ERMA to consult local authorities and the Department of Conservation for some applications (and the authors note this later), but in practice this has not seen a lot of local authority input. And more importantly, input at the notification or consultation phase is not the same as a requirement to consider, let alone 'accommodate', TLA policy in final decisions. Furthermore the Courts have supported ERMA's view that its role is effectively about 'balancing' a range of inputs, values and submissions and then making a final judgment on their relative significance. In the GM cattle appeal, even the critical issue of considering Maori values and the Treaty of Waitangi did not lead to an obligation on ERMA, according to the High Court, to require these matters to dominate over others (see the decision on the Bleakley appeal, May 2001).
- The authors then address the option of TLAs making decisions under the RMA "in tandem" with ERMA/HSNO decisions. I agree that this is problematic: the Government would be unlikely to make HSNO amendments to this end. The report notes the lack of willingness of the Minister to consider such changes. Furthermore,

applicants would need far greater certainty about the processes they had to follow. There is already a considerable body of opinion critical of the compliance costs of HSNO itself; and this is even without noting Biosecurity Act requirements.

- If the RMA is to be used, it has to operate in an appropriate way in relation to HSNO and the BSA. This requires a clear strategic rationale, to establish policy precedence and administrative efficiency. In terms of policy, it might be possible to argue for complementarities between HSNO and RMA, with the HSNO Act being seen as the national risk assessment mechanism, attaching approvals to GM organisms to be used anywhere; and the RMA operating as the mechanism for assessing and managing site specific, land use/amenity effects. Approved GMOs are legal 'products' in New Zealand. Perhaps the most useful policy parallel would be the law relating to alcohol or tobacco: both are legal products, allowed under national statute, but controlled and in some cases banned for use under other statutes or local by-laws (e.g. alcohol controls or bans in certain streets, locations, or times in cities and the ban on cigarette smoking in bars and restaurants etc). Another avenue might be to investigate any attempts that TLAs have already taken to control the local introduction of non -GM new organisms (e.g. biocontrol agents) and their effects, using the RMA. If this 'complementary' argument is valid, the practical outcome would see developers being required to first get approval for a new GMO under HSNO, but their ability to introduce or use them in certain locations could be constrained under the RMA.
- Para.8 on page 5 also introduces the concept of classes of GMOs, constructed according to their character and risk. I think this approach can be supported. It is reflected in a number of studies on the risk acceptance of GMOs among the public, and even within the science community. (See for example my report "Hands Across the Water – developing dialogue between stakeholders in the GM debate" for the Ministry of Research, Science and Technology (MORST), November 2004). HSNO is usually described as a 'case-by-case' system; but others argue that a 'class-by-class' approach might be more appropriate, allowing for a clearer delineation of the GMOs that society finds more acceptable/less acceptable, and avoiding the difficulties of pursuing generic issues about GM in the context of a single application. However the Government is likely to be concerned about such policy decisions being taken at the TLA level, especially by a single TLA, when they have not been taken at the national policy level. Again, it is important to argue why the RMA – as a land use control instrument, albeit one that includes the ability to implement social objectives – has a unique role to play; and to anchor the 'class-by-class' proposal in the wider RMA argument presented in this report. This section might be strengthened if it related back to the legal opinion.

## Section 2

### Page 7

- On page 7 there are 4 lines devoted to the environmental benefits of GM crops. There is some amplification in the appendix, but I think the report will be open to criticism for covering this so lightly. The report refers to the benefit of spray reduction being 'frequently cited' but there are no references. For the sake of completeness, it would be worth expanding the comment and sources for this part of the report; for example citing relevant sections of the RCGM report.

Page 8

- In para. 1 there is a comment about 'review studies'. I assume this refers to the study noted in footnote 22. This may also be an appropriate point to refer to the UK study on GM field trials (cited later) and to any relevant studies published by NZ Crown Research Institutes.

Page 9

- Para. 2 makes a rather broad statement that might be open to criticism: "...the types of benefits available from outdoor GMOs ... are almost invariably available by alternative mechanisms...". This may be valid, but it requires references to be justified.
- The report goes on to discuss the evaluation of projected benefits, the range of alternatives, and the consideration of net benefits. As proposed, TLAs would also need to consider the speculative nature of some of the risks of GMOs, in the design of control mechanisms. How much of this kind of risk assessment would have to be done by TLAs, after an ERMA assessment? A case study might be useful to show how these evaluation procedures would work in practice under the proposal.
- The report notes the predominant land uses in Northland but does not include tourism. (It is mentioned later in relation to a recent New Zealand study on the potential effects of GMOs on tourism). I understand the authors are referring here to the sectors where GMOs might be introduced in Northland. They are also the sectors where the effects of introduction may be felt, and in that sense tourism should be discussed.
- Para. 6 notes those uses of GMOs that are excluded from consideration. It might be worth explaining why non-viable GM products are excluded, particularly in the light of the 'perception' factor in consumer responses reported later. I have already noted there may be other definitional issues around contained GM developments (e.g. in glasshouses). The boundary line between medical and agricultural uses is also becoming blurred with the modification of animal or crop species to express pharmaceutical products.
- Para. 7 refers to approval by ERMA; approval might also be required from MAF and ANZFA.
- I agree with the statement, in para. 7, that most GMOs have been developed to target agronomic performance, both internationally and in New Zealand. Until the most recent application to ERMA, for GM onions, the primary aim has been to test viability in the field. This leaves open the question of who conducts research on immediate – and longer term – ecological effects. Crown Research Institutes, charged with operating as commercial entities, are not generally funded to do this within GM projects. And ERMA has had limited powers to require it. Furthermore, while acknowledging the recent impact studies funded by the Foundation for Research Science and Technology (FRST), it could be said that the monitoring of ambient/systemic ecological effects has had less attention under HSNO and the BSA than the monitoring of compliance with operational conditions (e.g. site access, tagging animals, disposal of animal or plant material after a field trial).
- This raises some questions about the role of TLAs in the managing GMOs: 1) on one hand, the lack of comprehensive ecological monitoring under the national regime might be seen to justify greater local precaution, including a prohibition on some classes of GM use, as discussed in this report; 2) on the other hand, would TLAs have the capacity to design, or undertake, commission, or audit, effective environmental (and social) impact assessments – especially, if this was required as part of the management controls attached to an approval, or to justify the proposed classifications under the district plan - and reviewing them in the light of future information?

[I see later in the report that the management controls would vary depending on how the district plan rules were set up. This is part of the discussion of the 4 options.]

Page 10

The report cites good references for the current use of GM in New Zealand. I think the RCGM report had a comprehensive overview, and it might be worth doing a cross check, along with checking the current FRST projects, to ensure that the topic is covered.

Page 11

Para. 6 : source of information on GM commercial forestry varieties?

Page 12

Para. 3 : source of information on biopharmaceutical corn?

Page 13

- Para. 1: a reference would be useful to support the statement about “a well documented ability to cause economic harm”.
- Para. 2 refers to the RCGM report on separation of GM and non GM crops. I think there was some subsequent work done by MFE/MAF on this and it should probably be cited. This might add some support to the statement that “methods for preventing GM crops from contaminating ... have yet to be demonstrated”.
- This section of the report makes good use of Australian and EU reports.

Page 14

- Para. 2. does refer to the FRST funded research on environmental effects, notably the Crop and Food project. But I think the authors might be open to a criticism of selective quoting here; there is a range of studies and while not all are completed, I understand the results are mixed.
- Para. 3. It might be useful to link this statement to the ‘pizza topping’ incident cited elsewhere.

Page 16

- Para. 2: the Starlink example might be amplified by reference to the risk of seed contamination in New Zealand, particularly in terms of the cost to industry of independent testing prior to shipment and in the case of actual or suspected incidents of illegal importation.
- Para. 4: The Australian Wheat Board example is useful. What is the source for the Barley Board comment?
- Footnote 55 : source?

Page 18

The reference in para. 8 to the BERL report is important. As noted above, I think the topic of tourism needs more attention in the report.

Page 19

Source for footnote 66?

Page 20

- The discussion on the South Australian situation appears to provide a substantial policy precedent for Northland and as such is critical to the central argument in this report. It might be worth citing this precedent in the Executive Summary.

Page 20 cont.

- The example cited in para. 5 raises the issue of amending national legislation to allow for distinctive 'GM free' local marketing. Is this an objective of the Northland strategy, or is the primary aim to use the RMA, relying on the purpose and instruments available under that statute, to achieve the Councils' land use objectives?

Page 21

- I am not an economist but is there a requirement to provide an overall risk analysis including:

- 1) the risks to tourism from the introduction of GMOs, in the region
- 2) the opportunity costs for conventional agriculture from the introduction of GMOs
- 3) the opportunity costs for non conventional agriculture, including organics and other forms of sustainable agriculture, from the introduction of GMOs
- 4) the opportunity costs of not introducing GMOs to the region, if for example GM pest or weed controls were found to be economically beneficial?

I assume this may be conducted as part of the process leading up to a S.32 initiative.

- Footnote 71 might benefit from a fuller reference?

Page 22

The references in this section seem to be well sourced and reputable. There is also a 2005 report from the Ecological Society of America (ESA) which provides a significant review of the effect of GMOs on the environment. (See *Ecological Applications* 1592, 2005, pp. 377-404]. It is the Society's position paper and may be worth citing. See also a forthcoming paper that includes a bibliography of publications on the risks of GM (Sean.A. Weaver and Michael. C. Morris. Risks Associated with Genetic Modification. Journal of Agricultural and Environmental Ethics. 2005. 00:1-33)

Page 23

The discussion on unintended and unpredictable effects is important and substantiates the later proposals around the Precautionary Principle. The inability to accurately predict ecological risks with scientific certainty, and therefore the limited role that science can ultimately play in risk judgments, are central arguments. In the absence of knowable risks and risk measures, social judgments become more relevant - and we move past the limits of 'rational risk assessment' and into the realm of 'post normal science' in public policy. The report might pull this together a bit more clearly here (and in the Executive Summary) to justify the use of the RMA to implement social preferences and outcomes.

Page 24

Para. 1 on non-target effects requires a reference.

Page 25

Para. 2 on soil micro organisms is important – it might be worth quoting the FRST research in this area; and the papers at an ERMA seminar on horizontal gene transfer (March 2002), particularly the comments of Dr. Orchard (ESR) and Dr. McGregor (Massey University); and the report of the RCGM.

Page 26

Footnote 68 – the source of the article needs to be a bit clearer.

Page 27

The discussion in para. 3 might be supported by reference to the recent work by Dr Connor at Crop and Food in achieving genetic modifications without techniques using other species, which I understand was aimed in part in responding to public concerns about transgenic GMOs.

Page 28

The consensus noted in para. 5 might be linked to some references?

Page 30

- The section on cultural effects in para 1. notes the views of Maori and non-Maori. I think by focusing exclusively on Maori concerns in the discussion that follows, the authors may leave themselves open to criticism. It might be worth highlighting the various submissions to the RCGM which were covered fully in their final report, rather than just summarising them in a footnote; and noting other publications around this topic (e.g. Hindmarsh, R and Lawrence, G. (eds.) Recoding Nature: Critical Perspectives on GM. University of New South Wales Press. Sydney. 2004); and the work of the Bioethics Council.

- I strongly support the discussion of Maori concerns and note the particular significance of these issues in the Northland community. The references cited include up to date work. There is now a growing body of literature in this field. See for example the overview by Dr Jessica Hutchings, of Te Putahi-a-Toi - Maori Studies at Massey University, at the Annual Whanganui-a -Tara Lecture "Māori and Nanotechnology", 01 June 2005. In terms of population, land ownership, economic participation in primary production and tourism, and community values, there is a strong case for highlighting Maori expectations in this region – from a both a 'sectoral' and Treaty position.

- Many of the issues raised by Maori are also supported by others, for example the need for alternative approaches to technical/scientific risk assessment when dealing with ethical and spiritual values.

Section 3

Page 33

- The opening sentence refers to "significant risks attendant to GMO release". It might be better to say 'potential' risks, especially given the discussion elsewhere around uncertainty. The report does recognise that in any risk assessment, the likelihood of events needs to be distinguished from the adverse consequences, which may be substantial.

- Para. 3 might be the place to summarise the matters of importance to local government regarding GMOs, and cite any references for these.

- Does the proposition in para. 4 allow for developments in neutraceuticals and biopharming?

Page 35

- The discussion in para. 2 on the Government as 'investor' might cite the current annual FRST funding for biotechnology development and the relative funding for biotechnology impact assessment

- Para. 3 refers to a Cabinet paper but there is no further source.

Page 39

Para. 4 discusses environmental clean-up under the RMA. It might be worth exploring at this point the powers under the Biosecurity Act, related to 'unwanted organisms', which can be used to manage HSNO breaches. This is picked up later on page 40. But MAF's powers also cover indoor containment facilities – in fact MAF has already investigated several incidents related to GM development work. (See ERMA monitoring reports, referenced in the Authority's annual reports).

Page 43

I find the points here are well argued, especially para. 4. The discussion on definitions and use of the Precautionary Principle in New Zealand law might be complemented by reference to the proceedings of an ERMA seminar on this topic (Precaution in Environmental Risk Management, Wellington, November 2001), which included a valuable paper by Hon. Geoffrey Palmer (see the ERMA website). The HSNO definition appears to be lighter than in other statutes – but some would still question the extent to which even this limited clause has been applied in HSNO decisions. The reference to Harte and Gough (footnote 175) is important here.

Page 45-46

- The discussion on ERMA accountability is useful. I would comment that there is precision in the HSNO Act, notably at S. 45 which requires a very distinct weighing up of 'costs and benefits' to approve an application. However, I have wondered if this narrow 'reckoning' is at odds with the wide-ranging purpose and principles at the head of the Act. It would be interesting to see a detailed analysis of the relationship between these sections – and the extent to which the general matters in S.4 - S.8, including the Precautionary Principle, are meant to prevail in deciding particular applications.
- Para 2. on page 46 refers to the limited scope for scrutiny of decisions. This is generally true, but it is worth noting that the Bleakley appeal did lead to greater requirements being placed on ERMA to follow its own Methodology and to document how it had done so, in its decisions.
- The final sentence in para. 3 (p.46) might be disputed. Some might argue that it is not the purpose of HSNO to 'deliver outcomes set by the community', let alone the outcomes sought by a particular local community. The CEO of ERMA has said that the Authority is not to be influenced by 'public opinion', and will base its decisions on 'scientific evidence'.
- There is a difference, however, between public opinion and social outcomes. It could be said that social outcomes have already been established in the provisions of the HSNO Act by virtue of its passage through Parliament into law; and in following the procedures for decision-making set down under the Act these have been met.
- A counter argument would be that inadequate attention is paid to the social outcomes expressed in the Act, as a result of either: a) the procedural pathway in S.45 which hinges on a narrow cost benefit calculation; or b) the focus in the Methodology on technical risk assessment, based on scientific evidence, which is necessarily inadequate given the wide ranging social, cultural and ethical concerns raised by GMOs; or c) the lack of fully developed social or ethical risk assessment procedures, at least to date. Some of these concerns were addressed in the Otago University report noted above and in the Nahkies Report on ERMA culture and operations (Review of the Environmental Risk Management Authority, July 2003).
- The absence of a right of appeal is an important point but this may be less germane to the goal of delivering social outcomes than the other factors noted above.

Page 46 cont.

The authors correctly point to the ability to appeal only on points of law, rather than on the substance of decisions, as under the RMA. Nevertheless, the courts have found that ERMA must follow the Methodology, and follow it consistently. And the Methodology itself refers to the primacy of the purpose and principles of the Act – and in fact in its final drafting was limited to avoid it being ultra vires the Act. I still think there may be room to argue for the wider application of the purpose and principles sections; and I am not sure that this has yet been fully explored in the [only 2] appeals taken to date.

Page 47

This section of the report discusses the ‘inability’ of ERMA to accommodate the outcomes of local communities. It is not clear if this is seen as a legal inability, owing to the provisions of HSNO, or disinclination by the Authority to ‘concur with local government’ based on its own level of risk aversion and its responses to current ‘policy settings’. It is important to make the distinction. In my view, the approach taken by ERMA is primarily driven by the Act. There appears to be a fundamental disjunction between the outcomes under HSNO – which is enabling of GMOs - and the outcomes that communities may wish to express via the LGA and the RMA. If the Government is unwilling to amend HSNO, then TLAs are inherently reliant on the RMA and LGA. But this needs a viable interface with HSNO. This, in turn, requires a clear enunciation of the policy objectives under each statute, to establish complementarity.

Section 4

Page 48-49

- The report now argues for the use of the RMA to achieve local community aims for managing GMOs. In para.3 on page 49 it notes that objectives and policies would address the “risk inherent in GMO release in the district” [my emphasis]. First, we need to be clear if the focus is primarily on release, as defined under HSNO, or if the district plan controls would also address conditional releases, field tests and potentially contained developments. For the reasons noted above, I think it might be possible to argue a distinct role for TLAs in the case of release because HSNO approvals focus on the organism rather than location. But would it have to be established that risks were relevant ‘to the district’? This in turn might require a micro level risk assessment, but I am not sure who would do this?
- I agree that there is value in pursuing a ‘class by class’ approach to GM risks, rather than ‘case by case’, based on the generally accepted risk profiles of different uses of the technology.
- The report proposes a management framework based on varying levels of risk for different classes of GMO. This requires a detailed and defensible risk assessment as part of the S.32 analysis: would this rely solely on this report or is further work required? And would the risk analysis be used jointly by a number of TLAs to design their district plan provisions? Does this require further work on the interface with the regional plan? Would a risk analysis also be required for a particular consent application to a TLA? The authors may deal with this question later in the report.
- The key requirement is to establish that there is “justification for District Plan control, based on economic risk, environmental risk, cultural risk and the issues surrounding liability and compensation”. Further to the analysis in this report, I think more might be said on economic risks (to cover tourism) and on cultural risks (to include non Maori concerns), and it may be useful to address ethical and spiritual as well as socio/cultural issues.

Page 50

- My policy experience does not extend to the matters of financial accountability covered in this section, so I will only pose a few questions. In terms of cleaning up “GM contamination”, discussed in para. 4, the authors might use a case study to illustrate those situations where a council would be uniquely exposed to costs, as opposed to other private firms who may be affected or central government, especially if these are costs experienced in the first instance by the council’s constituents and not itself.
- The reference in para. 1 to the general duty under the RMA raises the issue of a similar duty under HSNO in S.13. Has this been addressed/ does it need to be?

Page 52

- Para. 4 refers to enforcement orders under the RMA. Is it useful to note the compliance and enforcement provisions under the BSA at this point?
- The potential use of such orders to recover financial damages, relying on the RMA definition of ‘environment’, seems a little ambitious and may require further testing.

Page 54

The justification for provisions for financial accountability in para.5 follows the arguments made earlier, but my sense is that this will be seen as ambitious and it requires more policy and legal testing.

Page 55

- It might be worth describing the exact words for the ‘precautionary principle’ used under the RMA and comparing these to the HSNO definition. See the Palmer paper cited earlier. If the RMA definition is stronger, and more closely aligned for instance to the Rio Declaration definition, might this strengthen the argument in para.3? I understand this matter is dealt with in Dr. Somerville’s opinion.
- The discussion of case law in section 4.3.2 is useful.

Page 57

- I think the argument in para. 4 is well made, regarding the ability of risk bearers to define acceptable risk parameters. This parallels my argument earlier, that HSNO can be said to represent the expression of national public preferences because it was a result of parliamentary process. One of the guiding principles behind the RMA was that it should provide for local preferences and controls relevant to local conditions.
- Footnote 202 needs a reference.

Page 58

Para. 5 mentions that some district plans have been adapted to reflect the Precautionary Principle. This appears to be a very important precedent and I wonder if it should be noted earlier in the report.

Page 59

The report is rightly cautious about the viability of prohibited status for GMOs. Such an approach needs to fit with the ‘effects based’ philosophy of the RMA. This in turn requires an appropriate assessment of effects and I think it needs to be clarified where such assessments would be made under the strategy proposed in this report, particularly given the enormous issues of uncertainty surrounding GMOs (as noted in para. 8), including the limited scientific information available, and indeed the limits of scientific assessment per se to develop fully comprehensive risk scenarios.

Page 60

- Para. 3 discusses the rules for discretionary activities including a situation where GMO risk is “highest or unacceptable” and can be prohibited. This raises the question of whether the district plan rules can inherently be based on community acceptance alone, as the report argues in several places, or whether they would have to be based on a risk assessment to be valid; and therefore how that risk assessment might relate to any ERMA assessments for the same use?\* Would a developer be able to argue that the risk assessment parameters used under HSNO set a precedent for assessments under the RMA? This issue might be presented more clearly in the Executive Summary, perhaps with a flow chart to explain the rationale for the proposal.

Section 5

Page 61

- Para.3 correctly notes that our understanding of the effects of GMOs is far from complete. While accepting that the precautionary principle allows for action on the base of potential risks, I still think that a developer (and probably the Government) would be inclined to challenge the establishment of rules to limit or ban whole classes of GMOs in the absence of reasonable evidence of harm. I agree that ‘absence of evidence’ cannot always be construed as ‘evidence of the absence’ of a risk, particularly when one adopts an ecological systems framework. But I think this proposal requires legal and policy testing - and needs to make strong use of precedents, in New Zealand, Australia and elsewhere - if it is to be progressed.
- The grouping of GMOs into different classes is a valid exercise and the proposal could probably be defended on the basis of present knowledge. My own research, for example, on the risk acceptance by GM scientists of different forms of the technology, would tend to support these distinctions. However the technology is moving so fast (e.g. the convergence of biotech and nanotechnology), and the boundary lines between different uses are becoming increasingly blurred (e.g. medical and agricultural), that the groupings might be open to challenge and hard to maintain over time.

Page 64

The reference to the aims behind the 2003 HSNO Amendment might be supported by Hansard.

Page 65

I agree that robust stakeholder and community consultation will be required to inform the policy position for the Councils concerned. A further internal round of policy analysis and legal testing would be an important step before ideas were presented to the community.

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\* Interestingly, as far as I recall the HSNO Act does not discuss ‘risk assessment’ as such, although it does refer to ‘effects’. The concept of risk management was introduced by the Authority itself and later codified by way of the Methodology Order-in-Council).

Page 65 cont.

- The difficulty of predicting GMO industry sectors, GMO types and potential locations is noted in para.4. and may leave Councils open to challenge. Does this suggest that an approach based on predicting specific developments – as opposed to controlling for effects – is inherently problematic? This raises the issue of planning practice under the RMA: is this to be primarily a land use zoning or performance approach? The report usefully discusses the approaches used in each of the districts concerned. Does this create an issue if the generic risk assessment and classification is to be done at a pan-council level in the region? If one council took an approach that differed from its neighbours, would the overall objective be undermined? Would the regional plan have to be used at this point?

Page 66

- If a GMO activity is to be managed under the consent process, I assume it will be necessary first to establish what was meant by an 'activity' or 'use' in RMA terms; recalling that HSNO is primarily about approving 'organisms'.
- If discretionary GMO consent applications were to be publicly notified, would the council not find itself in the same position as ERMA in terms of considering an individual application, for a specific locality, but being open to submitters raising generic concerns about the technology and expectations for total bans?
- An application would have to be for a GMO that was already legally approved under HSNO and therefore the ERMA process would take precedence, at least in terms of sequencing. What criteria would Councils use to consider applications? How would these differ from HSNO and ERMA criteria? Would information from a HSNO decision be admissible at the local authority level? How would ERMA consent conditions, say on the operation of a field trial, inter relate with district plan conditions? There is potential for overlap at the site management level here.

Page 67

Does the reference to food plants and animals mean human food consumption or would it include GMOs developed for stock feed? Can the rationale for this classification be explained a little more? Some would argue that all GM plants pose ecological risks, given the potential for horizontal gene transfer and the spread of pollen etc.

Section 6

Page 70-71

The description of the options in terms of the degree of precaution appears to rely largely on public acceptance/opinion surveys/community concerns. (This is repeated on page 82, in terms of developing options based on community risk tolerance). Option B on page 71 refers to financial losses but this seems to be an exception to the basic concept. I am not clear that these options can simply be constructed this way, without reference to a systematic assessment of environmental/ social/ economic/cultural risks.

Page 71

- Para. 5 raises the rather interesting prospect of a Ministerial 'Call-In': is this under the RMA? In which case, on what basis would the Minister decide the application? Furthermore, how might this relate to a call in under HSNO?

Page 71 cont.

- Para. 6 might raise another scenario: if a GMO was approved by ERMA and its use had not been prohibited by a Council's district plan, and it was subsequently found to have caused damage in a neighbouring district that did have GMO provisions / or different provisions – how would financial accountability be addressed?\*
- Para. 8 states that the RMA provides for full accountability for ecological damage. It might be worth documenting this more fully. The potential to cover economic damage appears to be an important issue, which the authors flag for further investigation.
- Footnote 222 is a small sentence. But this is one of the central issues I have raised in this review: the interface with HSNO and ERMA requires a clear explanation. In effect the proposed rules need to be tested not just for precaution, financial accountability, administration costs and legal risks; but also for policy coherence and procedural efficiency. I assume this will be done in the next stage leading up to a S.32 analysis.

Page 72

Para. 7 correctly notes the administrative costs that a Council may encounter. The resourcing issues might not only include the extent to which a council has to measure 'community concern' around an application but, as I have said, the extent to which a council would have to do a comprehensive risk assessment\*\* - or require applicants to do assessments, with councils doing audits. Again this might be clarified with a case study showing how the proposed regime would operate under HSNO and RMA provisions.

Page 73

- Para. 1 refers to full cost recovery from applicants under the RMA. HSNO applicants have only ever faced partial cost recovery but even that has raised significant concerns about compliance costs.
- The discussion in para. 2 is valid: research locations are often assessed from a global perspective and the actual number of field test applications in a district or region could be quite low. It is not inconceivable that field test applications could be mounted to 'test out' new RMA provisions initiated by a TLA - and the authors note this under the legal risks. I agree that the risk would probably not vary between the options.
- The reference in para. 5 to further legal investigation into the platform for a S.32 analysis is very important. As I have indicated, the legal, procedural and policy precedents established under HSNO for GMO management may be evoked by those challenging management controls under the RMA.

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\* There was a similar issue at one stage around the extent to which the RMA or HSNO could cover the management of spray drift from hazardous substances like pesticides.

\*\*And if this is a 'risk' assessment – as done by ERMA under its Methodology – or an 'environmental /social impact assessment' in RMA terms. On page 74 example, the authors refer to "GMO risks". Might it be better to refer to 'effects'?

Page 74

Para. 6 notes the potential to change provisions in the face of new information.\* It refers to a GMO activity being shown to have a 'net benefit' to a district. This raises, again, the basis on which the rules for GMO management would be based. Will TLAs have to demonstrate that a cost benefit and/or risk assessment process was conducted prior to introduction? Interestingly, the authors use the term 'net benefit' which is a widely accepted economic approach but may not be comprehensive enough to deal with the full range of issues and risks raised by GMOs. I have questions about the 'net benefit' language in S.45 of HSNO, on which ERMA decisions appear to be hinged.

Page 75

- Para. 3 again refers to 'assessment' by Councils. This needs more clarification.
- Para. 4 cites valuable precedents for marketing individual districts as exclusion zones. Is this the strategic aim in the case of Northland?
- Para. 6 Option D refers to field trial conditions designed to prevent genes leaving the research area. Some scientists, and probably many Northland residents, would question the ability to fully control the movement of genetic material and may challenge the boundary line between field trials and releases.

Page 77

- The Northland councils may wish to discuss the statement in para. 4 that a sound plan would tend to see the threat of legal challenge evaporate. It may be useful to explore the Australian experience at the state and district level to provide assurance on this point.

Page 78

- The discussion in paras. 2 and 3. is important. While I am not in a position to comment, there does seem to be value in a joint policy/legal approach and in the proposed coordination role of LGNZ.
- Para. 4 makes slight reference to benefits but does not provide any references and will be open to challenge.
- The reference to incomplete research on benefits can also be applied to incomplete research, at least to date in NZ, on aspects of ecological and social risk. In either case, the rationale for the plan change needs to be made clearer: is it simply a matter of invoking public preferences or does it require detailed (scientific?) risk assessment – or some combination of the two? This fundamental strategic pathway needs to be made explicit, and then firmly anchored in the proposed RMA changes.
- Re para. 6: I am not familiar with the full range of arguments around liability. The authors make a definite statement that "councils are exposed to meeting the costs of clean up if the polluter does not pay". Does the situation in Gisborne, with the [inadvertent release of 'GM'] corn seeds, provide a precedent: what costs did the local council face there potentially/actually? And what role/costs did MAF have in 'clean up' - and further seed testing and site monitoring - under the BSA? These issues, including intentional/unintentional release, might be clarified with a case study.

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\* *There is a precedent for this, actually, under the HSNO re-assessment provisions.*

Page 78 cont.

- The situation quoted in para. 2, concerning financial losses to food producers, provides a useful real world example.
- The line of argument here is critical to the strategy proposed in this report and may benefit from further elaboration. The authors refer to it as a “chain of considerations” and there appear to be several links in the chain. Would a well- recognised ‘branding strategy’ for the area be a prerequisite to establishing the spillover effect from a private commercial loss to a public loss? Again, a case study might illustrate the argument.

Page 80

- Para. 3 talks about the ‘evidence to date’ about market resistance to GM contamination. It might be useful to reference the relevant studies. And it refers to markets serviced by Northland: which are these?
- Para. 4 discusses the contamination of non- GM plantings. Again this raises the issue of who would do such monitoring and whether councils could require it of applicants under consent conditions?
- Footnote 233 might be open to challenge from GM developers, in terms of public economic benefits. This has been a strong line of argument in ERMA applications, citing the benefits of field tests for health and medicine, the creation of new scientific expertise and knowledge (including new knowledge about GMO effects), and employment (of scientists) in the context of the Government’s objectives for growth and innovation. It would be interesting to see these arguments tested in the context of a local application. It illustrates my earlier point about the distinction between local and national costs and benefits.

Page 81

- Some critical issues are raised in para. 2 on the assessment processes of ERMA and a TLA. The authors correctly note the ERMA assessment would come first and would be based on different assumptions. The assessment under S.32 – to justify the new rules – is not the same as the assessment that may be required for a particular application. The latter is closer to the ERMA process, in terms of case-by-case administration. The authors mention in passing the possible use of the same base line data. This is one of the key HSNO/RMA interface issues that I was raising earlier. The different layers need to be clarified for the reader, say with a flow chart.
- I am not sure that the split between national economic benefits and district benefits would work as tidily as the authors suggest. ERMA also deals with field trials that are site specific. We can not entirely rule out possible arguments for site specific benefits. A developer could refer to the economic specialties in the area e.g. marine farming or forestry; there could be a research centre dependent on the funding of a new project for viability or a long term research programme in an area to which the new project is critically related; the GMO may need to be field tested in certain climatic or soil conditions etc.
- The conclusion at 6.2.3 is well made including the requirements for further information.

Page 82

- At para. 6 we seem to be at the nub of the strategy: if the risks of GMOs can not be fully predicted or determined with precision, we have to decide on the level of precaution required – and this is ultimately a matter of social discretion, to be established using appropriate social processes.

- The entire strategy of this proposal appears to rely on a successful link been made, under the RMA, between the precautionary principle and the rights of Councils to establish their own plans with their own objectives – a ‘devolution’ argument. The report needs to explain more clearly if the strategy rests solely on this line of argument to establish the new rules, or if it also relies on procedures for risk/impact assessment/ cost benefit analysis –or some mix of the two. The report (at page 83, para. 2) suggests a mix, by referring firstly to the importance of community preferences, with local communities as risk bearers and noting the limits of risk analysis; but then talking about ‘significant’ and ‘irreversible’ effects, which takes us more into the language of risk management.

Page 83

- I would comment (on para. 1) that the ‘indeterminacy of potential risks’ is argued by some GMO proponents the other way: as a rational basis for not banning GMOs. The action proposed here relies on a different statutory framing of the Precautionary Principle in the RMA than in HSNO. Perhaps there is case law, internationally, to illustrate how the Principle might work in practice here? It might be useful to cite the earlier legal opinion in this part of the report.

Section 7.

Page 84

The comments on consultation practice are well made.

Page 85

- I agree with the need to develop prior information and supplementary methods for public engagement. A clear working model of the options, citing precedents in other jurisdictions would give people a sound basis on which to respond. There is a valuable point made in para. 2 on robust consultation. There is a difference between giving everyone a chance to have their say, and making sure you have heard from a representative range of stakeholders. Some in-depth community surveys and workshops, using dialogue processes, may be helpful.
- The discussion in 7.2 is important and I imagine this would be analysed further prior to any s.32 process. The use of performance measures or generic risk categories at a district level, as opposed to zoning, is a substantial topic!

Page 89

- Para. 2 refers to the interface with regional councils. I expect the opinion for LGNZ (forthcoming) will be important in clarifying the boundary issues raised in this report – in terms of both the boundary ‘fences’ between TLAs that may adopt different rules for controlling GMOs, or for GMOs that ever cross fences; the potential for multi-district assessments, rules or monitoring etc; and the policy boundary between a district plan and the regional plan
- Re the next steps proposed, I would suggest further work on legal and policy precedents, in NZ and elsewhere; an analysis of the interface issues between the various Acts; some more work on the use of the Precautionary Principle under the RMA; and drawing together a clearer statement of the fundamental strategy being proposed – the links in the chain - and testing this for legal and policy coherence.

## Appendix 1

### Page 90

- I agree with the argument in para. 1 that even perceptions of inadvertent gene flow from GM food crops can have serious consequences; and this is particularly significant for Northland given the dominance of food production.
- Footnote 237. Which report is being cited here – the MfE (2003) study?
- The authors make good use of New Zealand and international research in this section and quotes from key industry and science sources.

### Page 92

- The reference to financial benefits in para. 3 relates back to Section 2.1. But I don't recall a lot of references earlier. It would be useful to quote directly from reputable studies on yields and use of pesticides/herbicides. Do the sources in Footnote 248 cover this adequately?
- Footnote 249 quoting NZ Federated Farmers needs to be sourced.

### Page 95

Para. 6 refers to risks from indoor biopharming in terms of perceived contamination. As I have indicated, there are also risks of escape from inadequate containment conditions or procedural breaches. In this sense, a lab standard is necessary but not always sufficient to completely manage containment.

### Page 96

Footnote 263 requires a reference.

### Page 97

Para. 3 discusses market issues around the use of GM carrots for controlling possum fertility. The report of the Parliamentary Commissioner for the Environment (cited later) did however show some community support for this form of possum control, in comparison to other methods. If the focus is on pest control outcomes, as opposed to market perceptions, the public risk aversion may vary. This reflects my own research, which suggests that 'end use' is an important factor in risk acceptance.

### Page 99

- Para.5 also focuses on market acceptance of GM forestry. It is interesting to observe that some private sector forestry companies appear to be moving away from GM production whereas the Forest Research Institute (FRI) is still committed to developing GM trees. Their focus seems to be driven, in part, by aims to reduce chemical use in forestry production i.e. to improve environmental outcomes (see comments in my study of scientists' views on GM in New Zealand, *ibid*)
- Footnote 273 : source? Is this person a scientist?

### Page 100

- Para. 4: the reference to Forest Stewardship Council certification in New Zealand is useful.
- The discussion in para. 6 about pollen clinging to food produce is interesting, and important given the Zespri comments quoted later. It needs to be said, however, that the FRI GM pine tree field trials were approved by ERMA only after requiring significant controls around preventing and managing pollen spread e.g. removing reproductive parts of the plant.

Page 101

- Para.5: I agree about the need to investigate precedents from Australia.
- Para 6. links the discussion in the appendix to the creation of the 4 options in the main body of the report. I am not sure that the rest of the appendix makes the connection in the same way.
- Para 6. discusses consent conditions on a potential application for a GM fibre plant as a discretionary use. This highlights the points I have raised earlier about the stages in the proposed RMA regime and at what level a risk assessment/impact assessment will be done. Can it be expected that an applicant to a local authority would be asked/able to produce “evidence” that food producers would not suffer from the perception that GM trees contaminate other plants. This is a high level of risk assessment, more likely to be seen at a national HSNO level for a release.
- It also raises procedural issues. Once the application was heard, and presuming it was approved with controls, how might the TLA controls relate to any imposed by ERMA under HSNO? Would the TLA be able to intervene with controls related to plant / animal husbandry, site management, as ERMA can?

Page 102

- Para. 2 refers to the use of GM trees to remediate contaminated soils. Perhaps more detail is required: do they work? Who is doing this research? It may be useful to expand this, given the level of public support documented in public opinion studies for the use of GM for pollution control/environmental clean up, at least in relation to other end uses.
- This para. also has me wondering about the structure of the Appendix. Is it meant to be:
  1. an overview of current GM applications and R+D trends
  2. a summary of risks (but it does not cover all categories of risk) and control options
  3. a market assessment or
  4. a rationale for the classifications and the 4 options proposed in the main body of the report?There appears to be some of everything, but not in each section.
- Para. 3: what is the source for the flower varieties cited in Australia? Also, I am not sure if the Crop and Food trial was for lisianthus. I recall field trials for petunias.
- Para. 5: where was the application for GM herbicide resistant grass – and to whom?

Page 103

The Tasmanian example is a valuable precedent, which could provide backing for the options proposed here, particularly the distinction between ornamentals and food production. It would be worth citing more detail from the Australian authorities, including the policy rationale. This is an important part of the policy discussion in the report.

Page 104

- Footnote 288. GM zebra fish have been developed in NZ research labs. (In fact, this is one of the instances of a containment breach investigated by ERMA).
- The reference to the ‘enviropig’ makes me wonder if someone will propose an ‘envirocow’ to genetically control the methane from cattle contributing to NZ’s greenhouse gas emissions.
- Para. 3. Would the work being done by Ag Research, which as I recall had outcomes related to lactose and casein modification in cows’ milk, not come into this category? There have also been recent news reports of ‘new’ milk products with health benefits but I am not sure if these are GM products.

Page 104 cont

- Para. 4 makes some important points and it may be worth referencing the research quoted.
- Footnote 289 needs a reference.

Page 106

This page, in fact the whole section, makes very good use of reports, research and articles, from reputable sources.

Page 107

The authors make statements about the market acceptance of GM fibre products, in terms of association with food products. Has this been researched?

Page 108

- Para. 4 raises the same issue around markets. It is an important plank in the overall argument. Does the BERL study support it? However, there are also significant non-market issues here including ethical and spiritual concerns around the development of GM animals for biopharming, especially the use of human genes. These should be noted.
- Para. 5 refers to the risk of generating a pathogenic virus. But submissions on the NZ field trials for GM cattle also raised issues around containment of animals and of GM material on the site e.g. the inadvertent entry to the food chain of animal products; the disposal of waste with viable GM materials; horizontal gene transfer; the escape of GM cattle and possible mixing with conventional cattle. While these matters were seen as manageable by ERMA, they are part of the potential risk profile of GM animals generally. The discussion later, on fish, does cover the topic of escape from containment in this way.

Page 109

Para. 1. Given the emphasis on market perceptions in this report, it might pay to quote some of the relevant opinion research here on support for medical applications v. food (see studies on MFE website, for example).

Page 113

Footnote 331 does refer to a waste disposal issue. What is the source?

Page 114

Again, I think the authors have worked from a strong base of literature for this appendix- e.g. the OECD report cited.

