



Is the Queensland Code For Biotechnology a Good Model for Canada? – A Preliminary Analysis

By Evlyn Fortier & Marc Saner

February 2004

The views expressed in this document are the views of the author and do not necessarily reflect those of the Institute On Governance or its Board of Directors.

The Institute On Governance (IOG) is a non-profit organization founded in 1990. Its mission is to explore, share and promote the concept of good governance in Canada and abroad, and to help governments, the voluntary sector, communities and the private sector put it into practice. Our current activities fall within the following broad themes: building policy capacity; Aboriginal governance; technology and governance; board governance; and values, ethics and risk.

In pursuing these themes, we work in Canada and internationally. We provide advice on governance matters to organizations in the public, private and non-profit sectors. We bring people together in a variety of settings, events and professional development activities to promote learning and dialogue on governance issues. We undertake policy-relevant research, and publish results in the form of policy briefs and research papers.

You will find additional information on the Institute and our current activities on our web site, at www.iog.ca.

© Her Majesty the Queen in Right of Canada (2004)

For further information, please contact:

Marc Saner
Institute On Governance
122 Clarence Street
Ottawa, ON
K1N 5P6 Canada
tel: (1-613) 562-0090
fax: (1-613) 562-0097
msaner@iog.ca
www.iog.ca

Executive Summary

Advances in biotechnology have presented Canada (and, indeed, most countries in the world) with a number of challenges. On one hand, the development of biotechnology has enormous potential to benefit mankind through an array of components of the economy. On the other hand there are definite risks and major social and ethical concerns. Recognizing that it has a responsibility to Canadians to manage this situation involving risks and benefits, the federal government has acknowledged the need to take the lead in the stewardship of biotechnology in Canada.

Health Canada is the federal lead for the stewardship file under the Canadian Biotech Strategy. In 2003 it organized a workshop to develop a Biotechnology Stewardship Framework. The participants in this workshop discussed the possibility of developing a code of practice for biotechnology in Canada. To investigate the possible development and implementation of such a code, the Office of Biotechnology and Science at Health Canada commissioned the Institute On Governance to conduct the research that is presented in this report.

Following the Introduction, Section 2 of this report briefly outlines the justification for such a project. Reasons why a code could be valuable include the fact that a code would provide an overarching framework, it would foster understanding and the sharing of values, it would extend the reach of stewardship beyond the federal government and it would demonstrate the government's commitment to an ethical framework. We can also note that other countries have codes, industry codes exist and there is some inter-departmental support for the idea of a code in the federal government.

Section 3 of the report is a suitability analysis of three existing codes as a model for a Canadian code of practice in biotechnology. The three codes that are examined for their suitability are the *Code of Ethical Practice for Biotechnology in Queensland, 2001*, the *BIOTECanada Statement of Ethical Principles* and the Biotechnology Industry Organization (BIO) *Bioethics Statement of Principles*. These codes are compared in general (an overall comparison of the model codes) and

then specific strengths and weaknesses of each code are presented. In the overall comparison, it is pointed out that the Queensland Code applies only to organizations in Queensland and does not have the international scope of the other two codes. The Queensland Code is also different in that there is mandatory application of the Code to organizations that receive government funding or who have a government body or officer as a participating member. All other organizations in Queensland are expected to adhere voluntarily. The other two codes (BIOTECanada's and BIO's) have no such commitment on the part of their members. Under the strengths and weaknesses discussion of this section, we show that the Queensland Code is highly detailed, is part of the development of a competitive industry strategy on the part of the Queensland Government and is applicable inside and outside government. The weakness of the Queensland Code is that it is specific to Queensland. BIOTECanada's code has been developed in a Canadian context but is not comprehensive and uses vague language that could be open to interpretation. BIO's code has been developed for an American and an international membership, but it is not comprehensive and uses vague language that could be open to interpretation.

Table 1 provides a listing of these results. The Queensland Code, the model of choice, is summarized in Table 2.

Section 4 of this report is a preliminary preference analysis based on interviews. This section presents the background, method, overview of responses and analysis of arguments that came out of interviews conducted with stakeholders over a two-month period in the fall of 2003. Under the guidance of the Office of Biotechnology and Science at Health Canada, the Institute On Governance contacted thirty-four people to ask them to take part in a telephone interview about the feasibility of developing a code for Canada and use of the Queensland Code as the model for such a code. Nineteen people were interviewed and asked a set of questions designed to find out if voluntary regulation was an option and whether the Queensland Code was desirable as a model for the Canadian context. In general, the interviewees showed support for the idea of a voluntary code and many thought the Queensland Code would be a good model for Canada. They thought it would be good because it would provide an acceptable "constitution" for stakeholders in the biotech community and would be preferable to regulation, which is slow, cumbersome and "top-

down.” In addition, a code could deal with things that could not be dealt with in a regulatory system. The Queensland Code was seen as preferable to other existing codes because it is more comprehensive and does not involve just vague principles. Furthermore, if a Canadian code was modeled on the Queensland Code, it would be a document that would make reference to all existing legislation and provide “one-stop-shopping” for biotechnology practice in Canada. The criticisms involved the claim that a voluntary code is not strong enough to deal with important issues raised by biotechnology. Other critics claimed that we don’t need another voluntary code because we already have lots of them, for example the *BIOTECanada Statement of Ethical Principles*. Critics of the Queensland model said that the state of Queensland is too different from Canada and their document could not be adapted for our purposes. Other critics were suspicious of the Queensland model because not enough is known about its implementation and subsequent effect.

Following the overview of responses, the arguments given by the interviewees were analyzed. Most of the responses involved certain patterns of reasoning that could be classified under fourteen argument types (there were six arguments regarding the development of a Canadian code in general and eight arguments regarding the Queensland model). A list of these arguments can be found in Table 3.

At the end of the report we offer a few points and observations to consider. Based on the responses in the interviews we conclude that there is support for a voluntary code for biotechnology in Canada. However, the results of our research involve certain limitations. First, the interviewees were predominantly federal civil servants and thus would not be representative of the views of a broad enough cross-section of stakeholders. Second, there is not enough known about the development and implementation of the Queensland Code, nor is there enough known about its efficacy in Queensland. There is a need for more interviews with stakeholders from other organizations and for more research on the Queensland Code. Requirements to carry out the project beyond these preliminary phases are outlined in some detail.

Table of Contents

Executive Summary	i
Table of Contents	iv
1. Introduction	1
2. The Case for a Code of Practice for Biotechnology in Canada	3
2.1 Do we need a code of practice?	3
2.2 Is it feasible to develop a code?	4
3. Suitability Analysis of Three Existing Codes as Model for a Canadian Code of Practice in Biotechnology	5
3.1 The Three Model Codes.....	5
3.2 Overall Comparison of Model Codes	6
3.3 Specific Strengths and Weaknesses of the Three Codes	7
Table 1. Comparison of Three Existing Codes of Practice for Biotechnology.....	9
Table 2. Summary of the Queensland Code.....	11
4. Preliminary Preference Analysis Based on Interviews.....	16
4.1 Method	16
4.2 Overview of Responses.....	19
4.3 The Arguments.....	22
Table 3. List of Arguments and their Proponents.....	34
5. Conclusions and Points to Consider	36
Appendix – Interview Summaries	40

1. Introduction

Advances in biotechnology have presented Canada (and, indeed, most countries in the world) with a number of challenges. On one hand, the development of biotechnology has enormous potential to benefit mankind through an array of practical, intellectual and economic components. On the other hand, there are definite risks and major social and ethical concerns. The Federal Government in Canada has recognized its responsibility to take a lead role in the stewardship of Biotechnology in Canada. As part of the development of a Stewardship Framework, the government is considering the development of a code of practice for Biotechnology in Canada. The impetus for development of such a code involves the idea that it could guide the approach and actions taken both by government and all other stakeholders as this transformative technology develops.

Health Canada is the federal lead for the stewardship file under the Canadian Biotech Strategy. In 2003 it organized a workshop to develop a Biotechnology Stewardship Framework. The participants in this workshop discussed the possibility of developing a code of practice for biotechnology in Canada. To investigate the possible development and implementation of such a code, the Office of Biotechnology and Science at Health Canada commissioned the Institute On Governance to conduct research that would provide the basis for a decision on whether to have a code and what model to use.

The Institute On Governance investigated the issue of a code for Canada with these two goals in mind. That is, we wanted to examine the benefits of a code in general, and we needed to look at a possible model for such a code. We researched these topics, first, by compiling reasons and comparing models, and then we interviewed stakeholders to collect their views and arguments about both aspects of the issue. The following report consists of three sections that comprise three aspects of the research. The first section of this report briefly outlines the justification for such a project. The second section of the report is a suitability analysis of three existing codes as model for a Canadian code. The three codes that are examined for their suitability are the *Code of Ethical Practice for Biotechnology in Queensland, 2001*, the *BIOTECanada Statement of Ethical Principles* and the Biotechnology Industry Organization (BIO) *Bioethics Statement of*

Principles. This suitability analysis is followed by a table (Table 1) that presents details of the suitability analysis. The Queensland Code – the model of choice – is summarized on Table 2.

Having examined the rationale for a code of practice and the merits and drawbacks of three model codes, we conducted a preliminary preference analysis through a series of interviews to gather information about the views of a cross-section of stakeholders regarding a code. The statements provided by the interviewees gives us a basis for drawing some conclusions about support for a code and the model that could be used. The views of the majority of stakeholders present general support for a code. However, the results of our research involve certain limitations. First, the interviewees were predominantly federal civil servants and thus would not be representative of the views of a broad enough cross-section of stakeholders. Second, there is not enough known about the development and implementation of the Queensland Code, nor is there enough known about its efficacy in Queensland. Based on the arguments made in the interviews we conducted, and taking into consideration the limitations of the research, we make a number of points that should be taken into consideration. We conclude that the development of a code is a path worth pursuing. However, there needs to be much more consultation and research in order to prepare a draft code. Advances in biotechnology have presented us with a situation that requires definite action on the part of the government in its rôle as steward of this transformative technology.

2. The Case for a Code of Practice for Biotechnology in Canada

In this section, we examine the rationale for developing a code of practice for biotechnology. The idea of a code has been proposed within the context of building a stewardship framework for biotechnology in Canada. While many elements of stewardship already exist, such as a regulatory system, regulatory transparency, mechanisms for public input and involvement, and mechanisms to discuss ethical and social considerations, these separate elements cannot, on their own, provide an overall framework for sound management of biotechnology. The question is whether a code can provide this management requirement. There are a number of reasons involved in the claim a code can do just that. We have listed these reasons for a code under the heading of two questions: first, do we need a code of practice and, second, is it feasible to develop a code.

2.1 Do we need a code of practice?

- Although there are many elements of good stewardship already in place, there is also something missing – a foundation that ties all the existing elements together. A comprehensive code would provide this encompassing, overarching framework for the existing components of stewardship.
- There would be great value in the process of developing a code because it would foster common understanding and shared values of the various stakeholders.
- The current discussion over stewardship involves only the federal government. A code would extend the reach of the stewardship beyond the federal government to include the provinces, the private sector and special interest groups.
- A code of practice for biotechnology would support the Government's commitment to a strong and transparent ethical framework for biotechnology.
- A code has the clear potential to benefit the development of the biotechnology industry. For example, the Code developed as part of Queensland's Bioindustries Strategy (discussed below) is considered an important part of the development of internationally competitive biotechnology industries in Queensland.

2.2 Is it feasible to develop a code?

- Other countries and groups have already adopted codes of the type being proposed here. The most promising model for a code is the *Code of Ethical Practice for Biotechnology in Queensland* published in 2001. Only a small modification would be required to adapt an existing code for use in Canada.
- Other relevant examples are *BIOTECanada Statement of Ethical Principles* (Canadian) and the Biotechnology Industry Organization (BIO) *Bioethics Statement of Principles* (American and international). These industry-developed codes are not nearly as comprehensive as the Queensland model and only cover a restricted set of stakeholders. However, they are relevant, as some Canadian companies have already committed to them.
- As mentioned above, there is cross-departmental support to explore the idea of a code and there were no concerns raised regarding the feasibility of the project.

Based on these observations, it seems meaningful to further inquire into the nature and potential utility of a Canadian code. With these additional data, it will then become possible to evaluate the costs, drawbacks and benefits of such a project.

3. Suitability Analysis of Three Existing Codes as Model for a Canadian Code of Practice in Biotechnology

If the choice is made to develop a code of practice for biotechnology in Canada, then the question that naturally arises is about the design of such a document. What should a Canadian code involve? What should be included in it and what should be left out? Is there an existing design that we could draw upon that would suit a Canadian document? There are a number of codes for biotechnology that can be examined. Some were designed by biotechnology industry representative organizations and some have been designed by governments. We selected three codes as possible models and analyzed them for their suitability for a Canadian code. In this section, we introduce the three codes, make an overall comparison of them, provide a more detailed analysis of their merits and possible drawbacks, then present this analysis in the form of a table. Following the suitability analysis table, we provide an abbreviated version of the most promising model for a Canadian code, namely, the *Code of Ethical Practice for Biotechnology in Queensland, 2001*.

3.1 The Three Model Codes

The three existing codes are examined for their suitability as possible candidates for the model on which to develop a Canadian code. These three models are worthy of consideration for the following reasons.

- The *Code of Ethical Practice for Biotechnology in Queensland*¹ is a promising model because it is comprehensive, it provides complete coverage of a wide range of relevant topics and it applies to biotechnology stakeholders both inside and outside of government.
- The *BIOTECanada Statement of Ethical Principles*² is a possible model that has been developed in Canada and adopted by a number of Canadian biotechnology organizations.

¹ The Queensland Code may be found at <http://www.iie.qld.gov.au/publications/biotechnology/coe.pdf>.

- The Biotechnology Industry Organization (BIO) *Bioethics Statement of Principles*³ is a possible model. Although the Statement was developed in the United States, the membership of BIO is very large, international in scope and includes Canadian organizations.

3.2 Overall Comparison of Model Codes

There are important differences that have been revealed in this comparison. Primarily, it can be seen that the *Queensland Code* is fundamentally different from the other two codes.

- Although all three codes have the same types of signatories or participants, the *Queensland Code* is applicable only to government organizations, universities, research institutes and industries in Queensland and does not have the international scope of the other two codes. Although the *BIOTECanada Statement of Ethical Principles* has been developed in the context of Canadian industries, many of the members are multinationals operating in Canada. Also, it is interesting to note that BIOTECanada is a member of BIO, and BIO is a member of BIOTECanada.
- The *Queensland Code* is applicable to participating organizations in two ways. The State Government of Queensland has directed that the code has mandatory application to all government agencies, all organizations that receive funding from the government, and all organizations that have a government body or officer as a participating member (see first footnote). All organizations not covered by these criteria are expected to subscribe to the code voluntarily. This is quite different from the *BIOTECanada Statement of Ethical Principles* and the *BIO Bioethics Statement of Principles*. The latter two codes require no commitment on the part of members of the two organizations. That is, it is not clear that becoming a member of BIO or BIOTECanada commits the participating organization to adhere to the Statement of Principles of either organization.

² The BIOTECanada Statement of Ethical Principles may be found at <http://www.biotech.ca/PDFs/BIOTECanada%20Statement%20of%20Principles.pdf>

³ BIO's Statement of Principles may be found at <http://www.bio.org/bioethics/principles.asp>

- There are more topics covered by the *Queensland Code* than the other two codes and these topics are covered in more detail.

Additional details regarding the comparison of these codes can be found in Table 1 (below).

3.3 Specific Strengths and Weaknesses of the Three Codes

An examination of Table 1 reveals the following key strengths and weaknesses of the three codes.

Code of Ethical Practice for Biotechnology in Queensland (see Table 2)

Pros:

- Highly detailed, comprehensive coverage of relevant topics
- The Code was developed as part of Queensland's Bioindustries Strategy and was considered an important part of the development of internationally competitive biotechnology industries in Queensland.
- Applies to stakeholders both inside and outside government
- The Code uses language that is very specific which would be difficult to interpret arbitrarily

Cons:

- The Code is specific to Queensland and would have to be adapted to apply to a Canadian context.
- The Code may be considered too detailed for voluntary acceptance.

BIOTECanada Statement of Ethical Principles

Pros:

- Developed in Canada within a Canadian context

- The Statement is brief and not highly detailed. It presents principles that could easily be adopted by various stakeholders.

Cons:

- Low detail, does not provide comprehensive coverage
- The Statement is presented in the context of an Industry Organization and applies primarily to stakeholders in that context
- The Statement uses language that is vague and could possibly be open to interpretation

Biotechnology Industry Organization (BIO) Bioethics Statement of Principles

Pros:

- Members of BIO are international in scope and the Statement has been developed for an American and international membership
- The Statement is brief and not highly detailed. It presents principles that could easily be adopted by various stakeholders.

Cons:

- Low detail, does not provide comprehensive coverage
- Applies primarily to stakeholders in industry
- Membership in Bio does not require adherence or adoption of code
- The Statement uses language that is vague and could possibly be open to interpretation

Table 1. Comparison of Three Existing Codes of Practice for Biotechnology

EVALUATION OF CODES	TYPE OF SIGNATORIES/ PARTICIPANTS	NUMBER OF SIGNATORIES/ PARTICIPANTS	IMPLEMENTED BY:	YEAR OF INCEPTION	LENGTH DETAILS	TOPICS COVERED/ SCOPE	IMPACT
Queensland Code	<ul style="list-style-type: none"> • Government • Industries • Universities • Medical • Agricultural • Other Research <p>- All signatories are exclusively Queensland organizations.</p>	Mandatory: 78 Voluntary: 24	The Code is mandatory for all organizations referred to as “Queensland Biotechnology Organizations” as defined in first footnote below ⁴	2001	Code pages: 13 ⁵ Detail: high	<ul style="list-style-type: none"> • Integrity of Research; • Access to Resources; • Care/Protection of Staff; • Care/Protection of Animals; • Transport of Materials; • Risk Assessment/Management; • Intellectual Property; Privacy; • Biological Weapons; • Import/Quarantine Controls; • Discussion of Ethical Issues; • Agriculture, Food & Environment; • Medical Research and Health Care 	Unknown ⁶
BIOTECCanada	<ul style="list-style-type: none"> • Government • Industries • Universities • Medical • Agricultural • Other Research • Legal firms <p>- Membership not restricted to Canada; - includes BIO and Canadian branches of multinationals.</p>	Members: 135	It is not specified if members are automatically required to adopt the Statement of Ethical Principles.	2002 ⁷	Code pages: 3 Detail: low	<ul style="list-style-type: none"> • Human benefit/rights; • Public discourse; • Education; • Priorities: health, safety, environment • Respect ethics boards; • Ethical & Social Issues; • Agriculture & Food; • Dealing with pollution; • Weapons; • Conservation of Biological Diversity. 	Unknown

⁴ Organizations for which the Code is mandatory are referred to as “Queensland Biotechnology Organizations”. They include all government organizations, organizations that receive financial assistance from the Queensland Government and organizations that have a Queensland Government body or officer as a participating member. Organizations that are voluntary are those that are not Queensland Biotechnology Organizations as defined above. They are referred to as “Subscribing Biotechnology Organizations.”

⁵ This number refers only to the Code and does not include the introduction, preamble and appendices of the complete document.

⁶ Research on the Internet has not supplied any information on the impact of any of the three codes.

⁷ This is the copyright date for the Statement of Ethical Principles which is found at the bottom of the final page of the document on BIOTECCanada’s Web Site and it is not certain that this is the actual year of inception.

<p>BIO (Biotechnology Industry Organization)</p>	<ul style="list-style-type: none"> • Government • Industries • Universities • Medical • Agricultural • Other Research • Legal firms <p>- membership is primarily American but also international;</p> <p>- includes Gov't of Ontario, Ministry of Enterprise, Opportunity and Innovation; National Research Council, Canada; Ottawa Life Sciences Council; Queensland Gov't Office, Americas; and BIOTECanada.</p>	<p>Members: 1063</p>	<p>It is not specified if members are automatically required to adopt the Statement of Principles.</p>	<p>Unknown</p>	<p>Code Pages: 3 Detail: low</p>	<ul style="list-style-type: none"> • Human benefits/rights; • Public discourse; • Education; • Priorities - health, safety & environment; • Confidentiality; • Humane treatment of research animals; • Ethical/social issues in genetic research; • Informed consent; • Standards of AMA; • Agriculture & Food; • Dealing with pollution; • Weapons; • Biological Diversity 	<p>Unknown</p>
---	---	----------------------	--	----------------	---	--	----------------

Table 2. Summary of the Queensland Code

Components of Queensland Code	Canadian Relevance and Comments
<p>General Principles</p> <p>Integrity ; Beneficence and non-maleficence; Respect for persons; Justice; Respect for the law and system of government.</p> <p>3. to improve human health, enhance quality of life, support the environment (by preserving ecosystem health and biodiversity), and promote sustainable agriculture and industry.</p> <p><u>Integrity of Research and Product Testing</u> 4. We will ensure that research and product testing are performed by qualified persons to optimal scientific standards... 5. We will maintain accurate and comprehensive records of research and product testing... 6. ...we will avoid conflicts of interest... 7. We will establish systems to ensure that conflicts or potential conflicts of interest are disclosed...</p> <p><u>Research into Genetically Modified Organisms (GMOs)</u> 8. We note that the Commonwealth and State Governments are establishing a stringent legislative scheme to regulate gene technology. This scheme will be applied in Queensland under the <i>Gene Technology Bill 2001</i>.... 9. We will ensure that research into GMOs meets all the requirements of the scheme... 10. We note that the Regulator must make public the location of all field trials of agricultural GMOs...</p> <p><u>Access to the State’s Biological Resources</u> 11. We note that the United Nations <i>Convention on Biological Diversity</i> (1993) affirms the rights of States to control access to their biological resources...etc... In this regard, the State Government is currently developing new policy and legislation to regulate access to biological resources on Crown lands....</p> <p><u>Care and Protection of Staff</u> 12. We will comply with all relevant requirements of the <i>Workplace Health and Safety Act 1995</i> (Qld) and will seek to comply with relevant Australian Standards governing laboratory safety.</p> <p><u>Care and Protection of Animals</u> 13. We will comply with the <i>Australian Code of Practice for the Care and Use of Animals for Scientific Purposes</i>....etc,</p> <p><u>Transport of Materials</u> 14. ...we will ensure that the transport arrangements and packaging are secure, provide adequate containment, and present minimal risk to humans and the environment.</p> <p><u>Risk Assessment and Risk Management</u> 15. We will work with relevant authorities to ensure that biotechnology activities are fully assessed for adverse impacts on human or animal safety or the environment. ... 16. We will not proceed with product development where assessed risks outweigh benefits.... 17. Particular caution will be exercised where data is lacking, where there is scientific uncertainty,... 18. ...risk management strategies will be established to ensure ... 19. We will report any risk or adverse...</p>	<p>Under “General Principles – Justice”, one of the items is “providing redress for the vulnerable”. Recommended: “providing protection for the vulnerable and redress for victims of injustice.”</p> <p>Need to substitute relevant Canadian policy or legislation on GMOs</p> <p>Need to substitute relevant Canadian policy on biological diversity.</p> <p>Need to substitute relevant Canadian policy on health and safety in the workplace.</p> <p>Need to substitute relevant Canadian code re; treatment of animals.</p> <p>Canadian guidelines governing safety in transport?</p>

Components of Queensland Code	Canadian Relevance and Comments
<p><u>Intellectual Property and Commercialization</u> 20. We will endeavour to ensure that new discoveries by Queensland researchers are developed in ways that provide appropriate return to the State and... retain control of the intellectual property within Queensland.... 21. ...we will support exchange of technology between countries, including developing countries, for the broader benefit of the world economy and social development. 22. ...We agree not to practice “biopiracy”. 23. We acknowledge that not all biotechnology research may attract significant commercial interest.</p> <p><u>Consumer and Patient Information</u> 24. We will provide clear, honest and verifiable information to consumers, patients, ...etc.....</p> <p><u>Biological Weapons</u> 25. Noting that Australia is a signatory to the <i>Biological and Toxin Weapons Convention</i> (1972)...we will not use biotechnology...to develop biological weapons for use in human warfare or terrorism... 26. We will aim to ensure that biological control agents directed at environmental protection and agriculture ... are ecologically sustainable....</p> <p><u>Import and Quarantine Controls</u> 27. ...we will comply with all national standards administered by the Australian Quarantine and Inspection Service (AQIS) and the Australian Customs Service (ACS).</p> <p><u>International Obligations</u> 28. We will avoid conduct which might violate Australia’s obligations as a good international citizen...</p> <p><u>Facilitation of Discussion about Ethical Issues</u> 29. ...we will encourage consideration and discussion of ethical issues associated with our work and individual research projects. 30. ...we will consider the involvement of qualified ethics advisers to help us address ethical issues and concerns. 31. We uphold the right of all persons to contribute to public debate and discussion about the ethical challenges created by biotechnology....</p> <p><u>Implementation of the Code</u> 32. We will ensure that our staff, and any other persons undertaking work on our behalf, are made aware of the Code and all other standards, guidelines and laws relevant to the safe and ethical conduct of biotechnology activities conducted by our organization. 33. We will establish internal procedures for reporting and rectifying breaches of the Code and other relevant standards, guidelines and laws relating to biotechnology. 34. We will also: <ul style="list-style-type: none"> • provide reasonable assistance to DIIE ... • make an annual report to DIIE... • promptly notify DIIE of any instance where our organization has been prosecuted, sanctioned or penalized for failure to comply with any law, regulation or legal code relating to biotechnology. </p> <p><u>Resourcing of Ethics Committees</u> 35. We will ensure that all ethics and biosafety committees established within our organisation under relevant laws and guidelines, or under the Code, are given the support necessary to fulfill their responsibilities....</p>	<p>Substitute “Canadian” for “Queensland”</p> <p>Substitute “Canada” for “Australia”</p> <p>Need names of relevant Canadian services for quarantine and customs.</p> <p>Substitute “Canada” for “Australia”</p> <p>30. The Code states that it will “consider” the involvement of qualified ethics advisors. Perhaps it would be better to say “seek dialogue with ethicists” as the BIOTECanada Code says</p> <p>“DIIE” = Department of Innovation and Information Economy (Queensland) Need to refer to equivalent Canadian Department</p> <p>Need to refer to relevant Canadian committees</p>

Components of Queensland Code	Canadian Relevance and Comments
<p>AGRICULTURE, FOOD AND THE ENVIRONMENT</p> <p>35. We will aim to produce animal strains, crop varieties and biotechnology solutions that benefit consumers, improve agricultural productivity and sustain the environment.</p> <p><u>Biodiversity and Sustainable Agriculture</u></p> <p>37. We will ensure that products of biotechnology do not adversely impact on the genetic diversity that underlies sustainable agriculture. Having regard to the uniqueness of the Australian environment, we will seek commercial release in Australia of ...etc.</p> <p>38. We will seek to ensure that plants, animals and other organisms produced through gene technology do not interact with natural ecosystems in ways that may diminish Australia's natural ecological capital...</p> <p>39. We will establish and maintain adequate buffer zones around genetically modified crops ...etc.</p> <p>40. We will comply with the <i>Good Agricultural Practices Guidelines for the Use of Genetically Modified Plants</i> developed by the Commonwealth-State Standing Committee on Agriculture and Resource Management (SCARM). ...</p> <p><u>Genetic Modification in Animals</u></p> <p>41. We will ensure that proposed work involving the introduction of foreign DNA into mammalian cells or whole animals is referred to the relevant Institutional Biosafety Committee, etc.</p> <p>42. We will ensure that the clinical status of animals in which the genetic material has been manipulated experimentally will be monitored for unusual or unexpected adverse effects.....</p> <p><u>Long Term Biological Monitoring</u></p> <p>43. ...we will co-operate with national and State authorities in monitoring the long term ecological impact of modern agricultural biotechnologies...</p> <p><u>Risk Assessment and Approval of Genetically Modified Foods</u></p> <p>44. We will ensure that food products meet the highest standards of safety, nutrition and benefit for consumers, and comply with relevant standards developed by the Australia New Zealand Food Authority (ANZFA) and approved by the Australia New Zealand Food Standards Council (ANZFSC).</p> <p>45. We note that from 13 May 1999 all foods produced using gene technology...cannot lawfully be sold in Australia unless they are considered safe after risk assessment by ANZFA and approved by ANZFSC.....</p> <p><u>Labelling of Genetically Modified Foods</u></p> <p>46. We acknowledge broad community expectation that GM foods should be labelled, noting that ANZFSC has determined that from November 2001, it will be mandatory for foods produced using gene technology and sold in Australia to be labelled where the food contains novel DNA or protein or has altered characteristics. We will comply with these requirements.....</p> <p><u>Agricultural and Veterinary Chemicals</u></p> <p>47. We will ensure that agricultural or veterinary chemicals produced through biotechnology are submitted to the National Registration Authority for Agricultural and Veterinary Chemicals (NRA) for pre-market safety assessment and registration, as required under the National Registration Scheme.</p>	<p>Need different statement relevant to Canadian environment.</p> <p>Substitute "Canada" for "Australia".</p> <p>Need equivalent guidelines developed in Canada</p> <p>Need names of equivalent/relevant Canadian committees for 41 and 42.</p> <p>Substitute "Federal and Provincial" for "national and State"</p> <p>Need to substitute equivalent Canadian food authorities/standards councils for ANZFA and ANZFSC.</p> <p>Need reference to Canadian regulations regarding labelling of genetically modified foods.</p> <p>Need to refer to Canadian equivalent to NRA</p>

Components of Queensland Code	Canadian Relevance and Comments
<p><u>Biotechnology and Reproduction</u></p> <p>57. In the application of assisted reproductive technology, we will pay the highest regard to the dignity, equality and rights of all persons.</p> <p>58. ...we will show the fullest respect and support for those with disabilities; those with disabilities who cannot be cured or remedied by biotechnology; and those who decline genetic treatment options for ethical reasons.</p> <p>59. While pre-natal diagnosis and genetic screening (including pre-implantation screening in the case of in vitro fertilization) offer expanding tools for assessing and addressing potential genetic disease and birth abnormalities, we will not employ such technologies for non-medical reasons. ...etc....</p> <p>60. We will not perform research into, or practice, “germ line gene therapy” by altering the genes of human sperm or eggs, or using other techniques, to pass on inheritable characteristics to future generations.</p> <p>61. We will take all necessary precautions to ensure that somatic cell therapy research and practices do not inadvertently result in secondary effects on the human germ line. We will not proceed with any somatic gene therapy applications where there is reasonable risk of modification to the germ line.</p> <p>62. We will not undertake any reproductive procedure that attempts to fuse human cells with those of animals or other species.</p> <p><u>Cloning and Related Technologies</u></p> <p>63. We will not conduct research into the cloning of entire human beings. However, we understand that research may continue into cloning of genes and cells for specific medical purposes, ...etc....</p> <p>64. We note that Queensland is in the process of drafting the <i>Cloning of Human Beings Bill 2001</i> to prohibit cloning of human beings...etc....</p> <p><u>Xenotransplantation</u></p> <p>65. Xenotransplantation (the transplantation of cells, tissues, or organs, generally from animals into humans) may have potential benefits in health care. However, we acknowledge that questions exist about the risks of animal retroviruses being transmitted to humans through xenotransplants. Accordingly:</p> <ul style="list-style-type: none"> • we will not conduct xenotransplantation on humans if to do so would carry unacceptable risks to the patient, etc. • we note that the NHMRC requires that all proposals for research into xenotransplantation must be referred to GTRAP for advice, and that no HREC should approve any research proposal involving xenotransplantation without first seeking this advice; and • animals will only be considered for transplant research if suitable alternative therapies are not available – ...etc.... 	<p>Substitute relevant Canadian policies on cloning..</p>

4. Preliminary Preference Analysis Based on Interviews

To investigate the possibility of developing a Canadian Code for Biotechnology, certain issues needed to be examined. These involve the general desirability of implementing a code and the question of the form and content of such a code. After examining the rationale for a code and looking at several existing codes for their suitability as a model for a Canadian code, we focussed attention on the prime candidate, the *Code of Ethical Practice for Biotechnology in Queensland (2001)*. The form of our research at this stage was dictated by the question of the feasibility of developing a code using the Queensland Code as a model. At this point in our research, it was considered important to consult with a cross-section of the biotechnology stakeholders in Canada.

The question of the feasibility of a code and the Queensland Code as a model were presented to a group of stakeholders in the biotechnology “community” in Canada. We interviewed a number of people, asking them questions on developing a code in general and the possibility of using the Queensland Code as a model. In the following section, the methodology, overview of responses to the questions and analysis of the arguments put forward by the interviewees are presented. We follow this with a table (Table 3) that lists the number of people who made each of the arguments described in the analysis and the background interests of these people.

4.1 Method

The interviews were conducted by a Programme Officer from the Institute On Governance under the auspices and with direction from Health Canada. A list of contacts for interviews was prepared by the Office of Biotechnology and Science, Health Canada. The list comprised thirty-four names of people from a cross-section of organizations with an interest in the issues concerning biotechnology. The list was subdivided into three groups: first, there were the contacts from federal government departments or agencies who were directly involved in the stewardship framework; second, there were contacts from federal government departments or agencies who were not involved in the stewardship framework; and third, there were contacts from non-federal organizations. (Examples of departments or agencies in the first group were Environment Canada, the National Research Council, and Health Canada. Examples of the

second group were Industry Canada, the Department of Justice and the Treasury Board Secretariat. Examples of the third group were Ontario Agri-food Technologies, the Catholic Health Association of Canada and the Office of Research at the University of Toronto.)

The Federal Government contacts were initially informed, in an e-mail sent by Health Canada, that they would be contacted later. This paved the way for the second stage, when they would be contacted for an interview by the programme officer of the Insititute On Governance.

For the second stage, all thirty-four potential interviewees (both federal government and non-federal government) were contacted by e-mail to inform them of the preference analysis, its purpose and goals, and the questions that would be asked in the interview. This e-mail also contained the URL of the Queensland Code for anyone who wanted to examine the complete version, and for those who wanted to look at a briefer version, the abbreviated Queensland Code (prepared for the suitability analysis) was attached.

The questions that were to be asked in the interviews were:

1. Do you think there should be a Canadian Code of Practice for Biotechnology in Canada?
Why or why not?
2. If yes, what type of results would you like the code to accomplish?
3. Do you have a fundamental disagreement with use of the Queensland Code as a model for a Canadian Code?
4. If you agree in principle with the Queensland Code as the model:
 - Can the Queensland model be adapted (“translated”) to the Canadian context?
 - Should there be deletions?
 - Should there be additions?
 - Should there be modifications?
 - Are there other topics that would not be suitable for the code?
5. Both the process of developing a code and the means of implementation are crucial. What development process and implementation procedure would you advise should be followed?
For example, who exactly should be included and how?

These questions were designed to elicit information regarding the preferences of the Canadian biotechnology community for a possible code. In general, the questions were designed to find out if voluntary regulation was an option, what would be the desired outcomes of having a code, what content a code should have, what issues it should address, how comprehensive it should be, whether the Queensland Code was desirable as a model, could it be adapted to a Canadian context, and the preference for how to get to the desired outcomes and who should be covered by the proposed code.

Shortly after the e-mail was sent by the Programme Officer of the Institute On Governance, she phoned the contacts to arrange a time for the interview. Of the thirty-four people on the list, eighteen were eventually interviewed. Of the sixteen who were not interviewed, nine never responded to repeated attempts to contact them. There were two contacts who agreed to be interviewed but missed the interview on the scheduled date and did not respond to attempts to re-schedule the interview. Finally, there were five people who were contacted but refused or declined to be interviewed. Of these, one person claimed that Canada already has a Code for Biotechnology and thus refused to take part in the preference analysis for a code. One person declined because of a possible conflict of interest with advisory work on biotechnology being done for the Auditor General. One person declined due to a lack of time. Two people declined because they considered their credentials or knowledge of the subject unsuitable for a preference analysis of biotechnology.

The contacts were considered to be individuals aware of the issues concerning biotechnology in Canada and thus able to offer informed views on these issues. They were not seen as representing the views of their organizations. In other words, although they represented their organizations, their views were not representative of the views of their organizations and their views were considered independently of the organizations to which they belonged.

Eighteen of the interviewees were from the following organizations:

- Environment Canada (2)
- National Research Council
- Canadian Food Inspection Agency
- Agriculture and Agri-food Canada

- Natural Resources Canada / CFS
- Health Canada
- Department of Fisheries and Oceans
- Industry Canada
- Department of Justice (2)
- Treasury Board Secretariat
- Canadian Biotech Secretariat
- Catholic Health Association of Canada
- Ontario Agri-food Technologies
- Canadian Agrifood Research Council
- Genome Canada
- University of Toronto - Research Services

There was also one interviewee who is an independent biotechnology consultant.

Altogether, there were nineteen interviews conducted. However, there was also the one person who declined to be interviewed whose response can be incorporated into the analysis. This contact claimed that Canada already has a Code for Biotechnology making a preference analysis unnecessary. This would constitute a negative response to the first question and should be considered in addition to the responses of those who were actually interviewed. Thus, there are **twenty** contacts whose views are represented in this analysis.

4.2 Overview of Responses

This section outlines general responses to each of the questions. For an overview of the responses of each of the interviewees, please see the Appendix – Interview Summaries.

The first question asked about the desirability of having a code of practice for biotechnology in Canada. In other words, should we even have a code? In general, the response to this question was overwhelmingly affirmative. Of the twenty contacts, (nineteen interviewees plus the one who declined), seventeen said “yes” and three said “no”. Of those who responded “yes” most made their affirmative response conditional, to some degree. These conditional responses

reflected their responses to the second question and the fifth question – that is, the desirability of the code was contingent on its results and how to achieve these results. The three negative responses were based on the idea that a code is unnecessary because there are other codes or regulations in place. One of the negative responses claimed that a code would be counterproductive because, if the code was to increase public confidence, that confidence would be misplaced.

The second question asked what the desired results would be. Of the seventeen interviewees who gave an affirmative response to the first question, the majority of responses indicated that a desirable result would be an increase in public confidence if there was a code. The second most common answer was that a code would establish transparency in the activities of those involved in biotechnology in Canada. There were a number of responses that were variations on these answers, and there were other outcomes that were considered. Individual views will be presented in the summary of each interviewee's responses, following.

The third question asked the interviewees if they had a fundamental disagreement with the use of the Queensland Code as a model for a Canadian code. This question asked for their general impressions of the Queensland Code. Fourteen of the interviewees said that they had no fundamental disagreement with the Queensland Code as a model for a Canadian code, three interviewees expressed doubts about the using the Queensland model and one interviewee had a fundamental objection to the Queensland Code

The fourth question asked for suggestions for the adaptation of the Queensland Code to the Canadian context. In general, the interviewees pointed out that there are some major differences between Canada and Queensland that would have to be considered in using the Queensland Code as a model. The first major difference is that Canada is a country and Queensland is a state. This creates a different context for Canada, especially with regards to federal-provincial relations and the relations Canada has to other countries (especially the United States). Many of the interviewees stated that Canada has a more developed biotechnology sector than Queensland. Some interviewees pointed out specific differences in the way Canada regulates biotechnology and what is regulated in Canada. In answer to this question, there also emerged a different view regarding the use of the Queensland Code as an exact model. Some interviewees stated that

Canada should “start from scratch” and use the Queensland Code only as a “check-list.” But the majority of interviewees thought that we should use it as an exact model because we do not need to “re-invent the wheel.” Many interviewees discussed specific numbered paragraphs in the Queensland Code that they thought would have to be changed to fit the Canadian context¹. To sum up, most of the interviewees who responded affirmatively to having a Canadian code stated that the Queensland Code would need changes if it was to be the model. They differed in the *degree* of change that would be needed, from saying that just a few changes should be made, to saying that the Queensland model would have to be completely re-written, to saying that the Queensland Code should not be used as a model but rather as a check-list and a Canadian code should be designed from scratch.

The fifth question asked about the development and implementation of a code. The majority of interviewees replied that there would need to be a great deal of consultation in the development of a code. Many of these interviewees thought it would be a good idea to know more about the process used in Queensland. One of the questions the interviewees frequently asked was “How did Queensland do it?” These interviewees thought that a useful part of the development of a Canadian code would be to do research on how Queensland designed and implemented their code. Another general response to this question involved the idea that a Canadian code would have to be developed in partnership with other stakeholders, and many interviewees insisted that a Canadian code would only work if it came out of a federal-provincial partnership. Specific answers to this question will be discussed below. Of the two interviewees who gave negative responses to the first question, one said that a Canadian code would have to be much simpler than the Queensland model and one did not advance suggestions for the development of a code.

4.3 The Arguments

The need for a voluntary code:

The first question that was considered by the contacts was whether or not Canada needs a code of practice for biotechnology. This resulted in some responses dealing with the usefulness and necessity of a voluntary code. The voluntary nature of a code was seen as both beneficial and as problematic. It was seen as beneficial because it would not be imposed the way legislation and regulation would and thus would be more acceptable to stakeholders. However, its voluntary nature would be problematic because there would be no assurance of compliance. These concerns led many contacts to question the nature, in general, of a voluntary code.

In parallel discussions with Dr. Kernaghan Webb, Chief of Research and Senior Legal Policy Advisor, Office of Consumer Affairs, Industry Canada, a number of these issues were examined. Dr. Webb has written extensively on voluntary codes and is author of *Voluntary Codes: A Guide to Their Development and Use* (Ottawa: Government of Canada, 1998). Dr. Webb pointed out that there are a number of issues that need to be considered in the development and implementation of a code. First, there is the vision that forms the context or reasons for a code. What “mischief” should be controlled and what are the benefits? Second, there is the issue of accountability. Who is responsible for the code, who takes the lead and who is committed? Finally, there is the decision-making process. What do we call “consensus” and how do we move forward towards a code?

The contacts for the preference analysis expressed views that addressed these issues:

- A code would increase public confidence, but only if it was seen as definitely enforceable and had some “bite.” This would address one of the “mischief” and benefits issues;
- A code would also make the activities of the biotechnology community more transparent, but again only if it was properly designed;
- There was concern about who was to be responsible. Would it be the federal government? If so, which department? Or would it be a federal-provincial partnership? How would all the stakeholders be included in the accountability aspect of the code? How could “buy-in” be assured? How could there be a balance between “buy-in” and “bite”?

- As far as consensus goes, many of the contacts were concerned about consulting with as many people as possible, in all levels of government, industry, NGO's and civil society, and the research organizations and academics. Some contacts claimed we needed to go beyond these groups and consult with women's groups, animal rights groups, youth groups and other public interest groups who are not necessarily consulted. Dr. Webb claimed that a code is about involving people who are "outside the tent."
- Another suggestion by Dr. Webb was to consult with people who could stand up and stop the process. People who, initially, have the most objections should be engaged early in the process of developing a code. There are good tactical reasons for this; if they are asked, they will be more agreeable.

What is most important is the identification of the problems (why do we need it) and an explanation of the process (how will it work) to make the case for a code.

Analysis of stakeholders' arguments:

There were a number of arguments made by contacts that followed certain patterns. Basically, these arguments centered on two questions: the need for a Canadian code and the Queensland Code as a model. For the first question, there were a number of arguments against having a Canadian code and there were some arguments that supported having a code. The arguments about the Queensland Code focussed on its usefulness in general and on its suitability for Canada in particular. These arguments are presented below, divided into two categories: first, arguments for or against having a Canadian code in principle; second, arguments for or against using the Queensland model.

Having a Canadian code in principle:

(a) The “Increased confidence” argument.

Details: This argument states that developing and implementing a Canadian code would increase public confidence. This would occur because the establishment of a code would make activities in the biotech sector more transparent, there would be a sharing of information, it would establish a ‘constitution’ for biotech and it would be a good means of communication of biotechnology practices. Confusion about regulation would be eliminated by having a code. It is argued that a Canadian code would become an important reference document because it would be a compendium of practices. One Canadian code would combine all the policies from different places, integrate other codes and policies, and have everything in one place. Then the public would understand biotechnology practices and policies. Since a Canadian code would make reference to regulations and legislation, people would know the rules by looking up the code. This would also help the general framework for business and create a level playing field for all participants. A code that includes principles on, for example, genetic testing, would reassure the public. Finally, through the process of implementing the code, issues would be publicized and the public would thereby be informed.

Conclusion: Therefore, there should be a code of practice for biotechnology in Canada.

Counterpoints: A code of practice might just be ‘window-dressing.’ Developing and implementing a code might result in ‘just another document.’ This would inspire false confidence in a public that believed the code would protect their interests when it actually had no ability to do so. If there is no buy-in by all sectors and no ‘bite’ involved in enforcement, then it would just be a document that didn’t do any good. Thus, it would mislead people.

(b) The “Gap-filler” argument.

Details: It is argued that there is a vacuum right now in biotech strategy in Canada. The stewardship framework is not adequate for dealing with the issues surrounding biotechnology. We need a code to state overall objectives and principles, something that we do not have at present. We need to develop a level playing field for biotech policies and we have to speak with one voice rather than having a number of separate codes and regulations.

A science-based regulatory system is not adequate for ethical issues and there is a growing need to look at the “should we,” not just the “can we.” Finally, we need a code to cover the convergence of biotech and nanotech because this will be the major problem of the near future.

Conclusion: We need a code of practice for biotechnology in Canada.

Counterpoints: There are already many codes and regulations in place that merely need to be further developed to meet new situations and enforced rather than subsumed into a new code. What good is a pan-Canadian code if present codes are not adequate as they are? Will a pan-Canadian code be any more enforceable and effective? There is no proof that it will. Many organizations that have their own codes might disagree with a pan-Canadian code and refuse to sign on. They say that we can't have a blanket statement for all organizations. If they do not sign on, a Canadian code will be useless. Also, many of the issues around biotechnology should be covered by regulation and legislation, not by an unenforceable voluntary code.

(c) The “Voluntary is better” argument.

Details: Having a voluntary code is better because some issues should not be covered by regulations and legislation. Regulations do not allow consumers a choice but make the choice for them. A code would be the responsibility of the stakeholders. A code could create an incentive for business to embrace ethical practice where regulation creates just compliance. A code can create ‘best practices’ whereas regulations can't. Also, regulations evolve too slowly and a voluntary code could be an advantage in a fast-moving area like biotech. The advantage of having a voluntary code is that it could achieve compliance because it would ‘start with a light touch.’ Then, if people did not comply, the government could get heavy (with regulations and legislation) if needed. Regulations would only be necessary if people did not adhere to the code. The ultimate value of a voluntary code is that it is developed by the stakeholders. Thus, the code could strike a balance between tyranny and anarchy. The law is mandatory, a code is not.

Conclusion: Therefore, we should have a voluntary code of practice for biotechnology in Canada.

Counterpoints: A voluntary code will not be adequate because, for many issues, there needs to be regulation or legislation. A voluntary code is not enforceable so we cannot guarantee ethical behaviour or compliance with a code. A voluntary code requires ‘buy-in’ and how do

we ensure that everyone complies? If it is made too easy for some stakeholders, then it might be too ‘wishy-washy’ – that is, it will not have enough ‘bite.’ Then a code becomes just window-dressing, just a document with no compliance.

(d) The “Canadian commitment” argument.

Details: A code would state our vision about biotechnology in Canada. It would force articulation about where we stand. It would state where our nation sees the rules about biotech and benefit the debate about biotech in Canada. Then other countries would see that we have a vision in Canada and the world would know that we are serious about biotechnology. This would have benefits for international trade. Increasingly, consumers will be buying products based on the values of the producers of those products. This is increasingly important to international clients. If Canada is seen as a country where there is good stewardship of biotechnology, then that could benefit our profile internationally and international customers will choose products from Canada. We have not been bold about biotechnology in Canada and a philosophical framing of issues in a code would show that we accept, as a society, that we have invested in biotech and are serious about stewardship issues.

Conclusion: Therefore, we should have a code of practice for biotechnology in Canada.

Counterpoints: Canada is already a leader in biotechnology and we don’t need a code to make us look serious about it. Also, having a code could be a disincentive to international development in Canada if the code is seen as too divisive or restrictive. It might also be looked at as a waste of time, as window-dressing or just another meaningless document.

(e) The “We’ve already got a code (or codes)” argument.

Details: There are already codes in Canada that make another code useless and meaningless and a waste of time. We have the Tri-Council Policy Statement. Every organization has its own code (e.g., BIOTECanada has its own code). Universities have their own codes and are governed by regulations. We can’t treat all organizations as identical under one code and it is better to let them maintain their own codes. There are differences in accountability between organizations. Different organizations have different needs, values and obligations. Thus different codes have been developed by these organizations so that they will buy in to them. Having the same code for everyone is undesirable; rather, there needs to be specific

codes for specific organizations. Furthermore, we already have laws in place to regulate biotechnology and yet there are still abuses. A code is not going to solve this situation. Just enforce the laws that are already there, don't bring in an unenforceable voluntary code.

Conclusion: We do not need to have a code of practice for biotechnology in Canada.

Counterpoints: The problem with existing codes is that they are too specific. They are only for industry, or only for the research community, or only for a specific federal department. We need a code that will be all-encompassing, that will cover government, industry, academics, research groups and other stakeholders. Having a multitude of specific codes will not satisfy sceptics and doubters about biotechnology practices in Canada. They see the lack of communication between the different groups and doubt the principles of biotechnology community in Canada. One code would solve this lack of confidence by working horizontally among all stakeholders.

(f) The “There are too many difficulties” argument.

Details: A voluntary code will not work because it will be unenforceable. If it cannot be enforced, it will look like an ethical document but it will not be one. If the code was for public confidence, it would be a misplaced confidence. Developing a code would just be for public consumption and would be mildly deceptive. There have already been some abuses in biotechnology and nothing in a voluntary code would stop these abuses. Also, some things should only be dealt with in regulations, for example, reproductive technologies. So a code will not work for important areas of biotechnology. Because of the scope of biotechnology, voluntary compliance will not be sufficient. A code would not acknowledge the conflict between the profit motive and public interest. We need a ‘lens’ for industry because they will ask, “What’s in it for them?” Voluntary codes can get bogged down in controversial stuff. Integrity would not be adequately covered in a code, especially if the language of the code was vague and ambiguous in order to achieve buy-in. Furthermore, where would the code reside? With Health Canada? With the federal government? If so, which department? Unfortunately, in Ottawa, everything done around biotech is done unilaterally. It would be difficult to include all stakeholders in the development and implementation.

Conclusion: Therefore, we should not have a code of practice for biotechnology in Canada.

Counterpoints: The fact that something is difficult does not make it any the less desirable. The process of developing and implementing a code would seek to address the difficulties.

Through consultation with many people representing as many stakeholders as possible, the difficulties and the objections could be examined and analyzed, and the code could be developed to solve the problems.

Using the Queensland Code as a model

(g) The “Queensland Code is better than others” argument:

Details: The Queensland model is very comprehensive, logical, and it goes through all the steps and addresses all concerns. It is inclusive enough that it could subsume all existing documents under one document. A code designed on the Queensland model could result in a ‘one-stop-shopping’ document. It is better than, for example, BIOTECanada’s code, which is a code from the industry point of view. A code designed along the Queensland model could achieve the desired effect of establishing an over-arching constitution document for biotech in Canada that would achieve the necessary horizontal agreement and satisfaction among all stakeholders.

Conclusion: Therefore, we should use the Queensland Code as our model.

Counterpoints: The Queensland Code was designed for Queensland, not Canada. To say that it is the best model is to ignore the differences. Also, the Queensland Code is very detailed and the more detail a code has, the harder it is to follow. It is better to have a simple document. There are a number of problems with the Queensland model that some stakeholders have found objectionable. Thus, it might be difficult to achieve buy-in if the Queensland Code is used as the model.

(h) The “Why re-invent the wheel?” argument:

Details: In developing and implementing a code for Canada, we can benefit from what was done in Queensland. The Queensland Code does a good job of covering the subject. At least 70% of the work has been done for us if we use the Queensland model. There are lots of parallels between Queensland and Canada, so we could apply what they’ve done. Also, the Queensland model is a good reminder that at least one other government has successfully developed and implemented a code.

Conclusion: Therefore, we should use the Queensland Code as the model for a Canadian code.

Counterpoints: Queensland is too dissimilar from Canada and the Queensland Code would not be easily adapted to the Canadian context. We need to design our own code from scratch. More stakeholders would buy in to a code if it was developed from the ground up, right here in Canada, consulting with as many of them as possible. Then they wouldn't feel that a code foreign to Canadian requirements was being imposed on them. The Queensland model could only be used as a 'check-list,' not as a template in which we just delete the word "Queensland" and plug in the word "Canada."

(i) The "Queensland Code was designed to attract investors" argument:

Details: The Queensland Code was developed as a part of the biotechnology strategy of Queensland. It was designed to attract investors. This was accomplished after a lot of consultation with as many stakeholders as possible in Queensland to find out how best to make the state attractive to international investment. Thus, if we use the Queensland Code as a model, we will be using a model that has a built-in design to attract investment. This would be good for investment in Canada.

Conclusion: Therefore, we should use the Queensland Code as our model.

Counterpoints: There was very little objection to implementing the Code in Queensland (from what we know). This is suspicious for some people who are concerned about the intentions of its designers. If it is too agreeable to investors and to the biotech industry, then it only exists to promote the profit motive and is not concerned with principles or best practices. Being designed to attract investment may make it weak on ethical concerns. Adopting this model may not satisfy those who are concerned about the morality of the code. Also, we don't know how successful the Queensland Code has been for Queensland in terms of its biotech strategy. Has the Code had any beneficial impact on investment in Queensland? We should not adopt the model if we cannot say that it has been successful.

(j) The "Too different from Canada" argument:

Details: Canada needs to develop its own code for its own circumstances. Queensland is a state whereas Canada is a country. We have to take into consideration federal-provincial relations, something Queensland did not need to worry about when it designed its code. We also have to look into territorial requirements and native rights. But primarily, we have to realize that a Canadian code could not be developed unilaterally by the federal government

because much that is covered in the code would fall under provincial jurisdiction (especially health). The only way we could develop a code in Canada is to do as a partnership between the provinces and the federal government. Then the federal/provincial partnership could consult with other stakeholders. Also, Canadian legislation is quite different from Queensland legislation. If legislation is stated in the code using the Queensland model, it would require so much re-writing we might as well start from scratch. We also have to consider the bilingual nature of Canada. Not only is Queensland different politically but it has a different environment and different physical makeup from Canada. Also, Queensland and Canada have different international relations. We have to take into consideration agreements like the OECD. We also have to take into account our links to the United States and cross-border ownership. Canada looks at innovation from a different angle. There are different players in the Canadian biotech community and there are many more of them. Finally, biotechnology has been a major priority in Queensland but it has not been in Canada.

Conclusion: We should not use the Queensland Code as a model for a Canadian code.

Counterpoints: Just because there are differences does not make the Queensland Code unusable. It would need to be adapted to the Canadian context but that is quite possible.

Why re-invent the wheel? The work has already been done in Queensland to develop a code so it would be unfortunate to throw it out and start from scratch. Furthermore, using the Queensland model would show that we are serious about biotechnology in Canada because we would be modeling our code on one designed by a state that considered biotechnology a major priority.

(k) The “Ideological bias in the Queensland Code” argument:

Details: The Queensland Code has a narrow intent according to some commentators. It was designed so that the biotech sector can grow in Queensland. If Canada used the Queensland model, then it would look as if the growth of the biotech sector was our only concern. This would give the signal that we are not interested in ethical issues. The Queensland code substitutes talk of ‘risk assessment’ and ‘risk management’ instead of public protection. This kind of talk is what leads the public to doubt the intention of such a code. On the other side, some commentators claim that the Queensland Code has a bias of control. It presents a whole series of dangers and ignores the benefits of biotechnology. This results in an

emphasis on fear and control rather than risk and reward. Talking about risk and reward should be at the heart of any framework for biotechnology. Therefore, some people see the Queensland Code as having an ideological bias for industry, whereas some people see it as having an ideological bias for too much control.

Conclusion: We should not use the Queensland model for a Canadian code.

Counterpoints: The fact that the Queensland Code seems to have an ideological bias on one side by one kind of stakeholder, and on the other side by another stakeholder, does not present a formidable obstacle to using it as a model. We would have to adapt the Queensland model to the Canadian context and this would require a great deal of consultation with all stakeholders. This is one of the requirements most commonly stated by all interviewees. In the process of consulting with as broad a range of stakeholders as possible, everyone who has objections to any ideological bias in the Queensland Code could request changes and modifications.

(l) The “There are too many specific problems” argument:

Details: There is a list of problems with the Queensland Code that various interviewees mentioned. Among these are:

- Only humans are mentioned under cloning
- The section on intellectual property would not work in Canada
- Aquaculture and fisheries is missing
- The Queensland model doesn't deal with stem-cell research
- Under the section on biological weapons, there is a reference to biological control agents (#26) that seems out of place
- There is nothing about sustainable development and this is needed
- There is too much vague language; for example, “public interest” needs to be defined
- There is nothing in the Queensland model about “the common good”
- There isn't a broad paragraph that states the value of the biosphere
- The principles of the Queensland Code are too categorical
- #39 about ‘buffer zones’ could never be acceptable in Canada
- the Queensland Code is too agriculturally oriented
- there is nothing about sustainability as a general principle
- the Queensland Code talks about respect for persons but not about respect for the planet

- the Queensland Code talks about the ethics of justice, which is a very male perspective; it ignores the ethics of care, which is a female perspective
- the Queensland Code is too anthropocentric and neglects being ‘earth-centric’

Conclusion: We should not use the Queensland Code as a model for a Canadian code

Counterpoints: As with the critique of #5 above, these specific problems do not make the Queensland Code completely unusable as a model for Canada. Through consultation with as many stakeholders as possible, these problems can be addressed and resolved. In adapting the Queensland Code, we can improve on it and have an even better code.

(m) The “Queensland Code is too thorough” argument:

Details: The Queensland Code is too detailed. This is okay at the state level and it could work for the federal government alone, but it would not work for all the stakeholders in Canada. The Queensland Code is too long. There should be fewer items in the Canadian code. Then it would be clearer. We should seek clarity rather than comprehensiveness. The Queensland Code is so comprehensive it delves into areas that it shouldn’t, for example, intellectual property. A code can’t treat all organizations the same, the way the Queensland model does. Then it becomes just another reporting document. The Queensland model covers too many subject areas. We need a good, gray Canadian document. The more subject areas there are, the more entangled it gets. Finally, why are there all the statements about obeying the law in the Queensland Code? How can it be a voluntary code if it requires people to obey the law? This makes no sense.

Conclusion: Therefore, we should not use the Queensland Code as a model for a Canadian code.

Counterpoints: A comprehensive code is better than a code that merely states vague principles. The Queensland Code was designed to attract investors and for the development of the biotech strategy in Queensland. If a detailed code was considered important there, shouldn’t Canada likewise adopt a detailed code? A comprehensive code that applies to all stakeholders would make us look serious about biotech in Canada.

(n) The “Queensland Code can’t be effective” argument:

Details: The Queensland Code is only enforceable on one category of organizations covered by the Code and so is not enforceable on everyone. To develop a code in Canada, we need

one with a ‘carrot or a stick.’ The Queensland Code is too weak and it does not have a lot of teeth. For example, it uses language like, “we will seek to ensure.” This does not sound forceful enough. In order to ensure buy-in for the Code in Queensland, it was designed without enough bite.

Conclusion: Therefore, we should not use the Queensland Code as a model for a Canadian code.

Counterpoints: The fact that the Queensland Code does not appear to have enough bite does not make it unusable as a model. We could modify it to serve our own needs. Through a process of consultation with as many stakeholders and public interest groups as possible, we could ensure that our code achieves ethical conduct. The Queensland Code will need to be modified to suit our requirements and if some groups want our code to have more force, it can be adapted to satisfy them. One suggestion is that we find ways to identify companies that comply, require that companies report annually, and so on. Many interviewees mentioned the success of *Responsible Care*, so a Canadian code could use the Queensland Code as a model and integrate aspects of codes like *Responsible Care* to make our code effective.

Table 3. List of Arguments and their Proponents

Argument Number	Name of Argument	Argued By - (Number)	Areas of interest of interviewees who made the argument
-----------------	------------------	----------------------	---

Having a Canadian Code in Principle:

Positive	1	The “Increased Confidence” Argument	11	Environment, Ethics, Health, Research, Law, Governance, Forests, Agriculture, Fisheries, Industry, Innovation
	2	The “Gap-filler” Argument	10	Environment, Health, Agriculture, Fisheries, Governance, Ethics, Industry
	3	The “Voluntary is better” Argument	5	Environment, Industry, Law, Fisheries
	4	The “Canadian Commitment” Argument	7	Governance, Health, Law, Agriculture, Forests, Innovation, Research
Negative	5	The “We’ve already got a code (or codes)” Argument	3	Law, Ethics, Research, Industry, Innovation
	6	The “There are too many difficulties” Argument	2	Ethics, Environment, Governance

Using the Queensland Code as a Model:

Argument Number	Name of Argument	Argued By - (Number)	Areas of interest of interviewees who made the argument
-----------------	------------------	----------------------	---

Positive	7	The “Queensland Code is better than others” Argument	4	Fisheries, Industry, Agriculture, Innovation, Governance, Law
	8	The “Why re-invent the wheel” Argument	4	Law, Governance, Agriculture, Industry
	9	The “Queensland Code was designed to attract investment” Argument	1	Innovation, Health
Negative	10	The “Too different from Canada” Argument (especially the need for Fed-Prov relations in Canada)	8	Governance, Health, Agriculture, Law, Environment, Forests, Industry, Research
	11	The “Ideological bias in the Queensland Code” Argument	3	Ethics, Research, Innovation, Governance
	12	The “There are too many specific problems” Argument	7	Agriculture, Fisheries, Innovation, Industry, Environment, Ethics, Forests
	13	The “Queensland Code is too thorough” Argument	6	Health, Environment, Agriculture, Research, Governance, Industry, Innovation
	14	The “Queensland Code can’t be effective” Argument	6	Environment, Forests, Ethics, Agriculture, Governance

5. Conclusions and Points to Consider

There are some valid reasons to pursue the development of a code of practice for Canada at this point. A code would provide an overarching framework, something that is missing in the stewardship of biotechnology in Canada at present. It would also foster a common understanding of the issues and the sharing of values, extend the reach of stewardship beyond the federal government and would demonstrate the government's commitment to an ethical framework. However, more information is needed before an informed evaluation of the merits of this project becomes possible. In this section, we present a summary of our conclusions based on the analyses in the preceding sections and provide some ideas for consideration to assist the further development of this project.

- The *Code of Ethical Practice for Biotechnology in Queensland, 2001* has advantages over other codes as a model for a code for Canada. Its advantages include that fact that it is more comprehensive, is part of the development of a competitive industry strategy on the part of the Queensland Government and is applicable inside and outside government. The other codes we examined presented an industry perspective only and comprised only general principles using vague language.
- Based on the interviews we conducted for a preliminary preference analysis, we conclude that there is general support for a Canadian Code of Practice for Biotechnology. The majority of interviewees answered affirmatively when asked if there should be a code.
- However, the results of the analysis involve certain limitations. The interviewees, as was explained in Section 4.1 on the method used for the research, were predominantly federal civil servants. Thus, the results of the interviews should not be considered representative of the views of a broad enough cross-section of stakeholders in the biotechnology community in Canada.
- Because of this identified limitation involved in our research, we conclude that there needs to be much more consultation in order to develop and implement such a code, especially of people from industry and NGOs. Considering the fact that the Queensland model covers not

only government but all stakeholders, it would be quite important to broaden the scope of the preliminary preference analyses presented here.

- The Queensland Code is only moderately acceptable as a model. Many interviewees pointed out that the implementation and use of a code is the hard part – it’s no use to have a nicely framed code on the wall that is not used or has no impact. Most interviewees were in favor of more research on the Queensland Code to find out how it was developed and implemented, and what effect it has had.
- Based on these conclusions, it seems meaningful to take this project to the next step, for example by designing an early draft Canadian code and by organizing additional preliminary consultations of cross-section of stakeholders in workshop settings. It will be important to bring in the people and groups who have expressed opposition to the process to engage them in the development at an early stage.
- If the broad approach used in the Queensland model is followed then it will be especially important to secure support from provinces and other jurisdictions. Therefore, representatives from provincial governments should be consulted early on.
- The Queensland Code should be used as a checklist rather than as a template for a Canadian code. The design of a Canadian code should be started “from scratch,” based on consultations and workshops involving the biotechnology community in Canada, and should only use the Queensland model as a reference document.
- In using the Queensland Code as a checklist, we should refer to it taking into consideration that a code will be designed for the Canadian context. That is, we must take into consideration our relations with the United States, Europe and other international states and organizations. Canada’s commitments to international agreements would have to be observed in a code.
- In the design of a Canadian code, care would have to be taken not to use vague language in order to avoid being seen as just developing a public relations document, or as merely

placating one side or other on the ideological divide in biotechnology. A code must become part of day-to-day activities and not be just a framed document on the wall.

- After the current impact of the Queensland approach has been better understood and after further consultation with a broader range of stakeholders have been carried out, it will become possible to more fully evaluate the merits and downsides of the Queensland approach in the Canadian context. A discussion paper that would outline this evaluation should be clear about the following:
 - What is the problem that should be addressed and what are the expected results for Canadians?
 - Who should take the lead and who should be responsible (clear hierarchies of responsibilities are desirable)?
 - Who will be included?
 - How will decisions be made during the development of the code - what will count as “consensus”?
 - Who should handle the process (it has been suggested that an independently moderated process may be advisable)?
 - How will we judge “success”?
- A more complete evaluation will make the choice among the following three options possible:
 - The project could be stopped
 - The code could be developed as a government-only document
 - The code could be developed as a pan-Canadian document
- If the second or third option is adopted, then the code project would need leadership from someone appropriate for that option who would be willing to be accountable and who would be senior enough to carry the project forward. The third option would ideally receive leadership from inside and outside of government and leadership should be secured early in the process. Central agencies of the Federal Government should be consulted at this point.

- It may be advisable to develop two documents – one on the code and one on the implementation of the code. There should be a built-in review plan for a code similar to the review plan of the Queensland Code. Progress should be monitored.

In summary, more consultation is needed with specific stakeholders outside of government and more research is needed on the Queensland Code before the project can be fully evaluated. The concerns expressed by interviewees should be taken into consideration, especially in the design and implementation of the code. A workshop setting may be useful to complete the early consultations or to evaluate the three options outlined above. If the project goes ahead, there should be leadership from someone who is willing to be accountable if it is decided to pursue the development of a code as a federal government document or if it decided to develop it as a pan-Canadian document. With more biotechnological methods and products arriving quickly, it seems advisable to strengthen the government's stewardship role rather sooner than later.

Appendix – Interview Summaries

First interviewee: The idea of the code is worth exploring but it depends on the degree of overall support. The process of development would be important because the ultimate value of the code would be that it was developed by the stakeholders. This interviewee also approved of the voluntary nature of a code. Voluntary codes have a value in that they supplement the law and establish desirable actions for situations that are not, and sometimes cannot be, covered under legislation. Regulations are “top down” in that, ultimately, government decides on them. A code is such that the decision-making has to be dispersed. In developing a code, the federal government should strike a balance between leadership and broad consultation.

Second interviewee: There should be a Canadian code of practice only if it is not just a process that leads to a document. A code should achieve a vision for a Canadian biotech strategy. A positive result of a code would be that we would look like we are making a bold step in Canada. If the government is going to make biotech important in Canada, a code might be part of strengthening our commitment to biotech. But if developing a code is just “business as usual”, then it will not be a benefit. A Canadian code should not involve absolute principles but rather be flexible to accommodate desirable consequences. A code should come about through 5% development and 95% implementation. To do this well, Canada will have to make it a “projet de pays.”

Third interviewee: This person was not sure about the need for a code because it is not clear what would be the “added value”. A code would be good only if it made practices more transparent. Also, a code would be good if it involved equal responsibilities and partnerships among the players in the biotechnology community. The Queensland Code could be used as a model but it would have to be adapted to the way we regulate biotechnology in Canada. In Canada, regulations are based on trade, not on the process of production as they are in Queensland. We could not have a “one-size-fits-all” code in Canada but would need to make it applicable across practices.

Fourth interviewee: A code could be good in that it would force articulation of where we stand. However, the challenge would be enormous because we might end up doing the same old things

that we have already done. This interviewee questioned the Queensland Code because so many of the numbered paragraphs refer to regulations and legislation. The interviewee claimed that it is odd to say. “We are going to uphold the law” in a voluntary code.

Fifth interviewee: A Canadian Code is a good idea to pursue because it would increase the sharing of information and identify gaps in the awareness different players have of different approaches. Even if the code were merely a compendium of practices, that alone would be of value. The code would then be a reference document. The Queensland Code is, perhaps, a bit too thorough for a model. A code developed on this model may be redundant because many big private-sector companies have adopted codes anyway. Thus, the Queensland Code may be a good checklist but we need to develop our own code in our own circumstances.

Sixth interviewee: The advantage of a code is as a catch-all for policies and regulations for biotechnology. A code would have everything in one place, it would integrate other codes and policies from different places. This would result in a good communications strategy. If the Queensland model was used, a Canadian code would make reference to existing regulations and legislation and provide guidelines. A code would be a first step to point to other things. We must evolve the code to cover the convergence of biotech and nanotech. This interviewee said we have to start doing something because, in the future, the concern is going to be about this convergence.

Seventh interviewee: This person agreed in principle with having a Canadian code and said it would be like a constitution. The question is how to enforce it. This interviewee also agreed with the use of the Queensland model but strongly objected to one item, namely mandatory labelling of food. The Queensland Code could be a template for a Canadian code but it is not acceptable in its present form.

Eighth interviewee: We need a Canadian Code to provide a concise document containing principles and practices. We don't need to have a document that just states organizations and so on, but rather one that builds public confidence in *how* we do things. The Queensland model is lacking because it is not enforceable on everybody. A code needs a carrot or a stick, otherwise the effectiveness might be impaired. Also, in the Queensland model, there is nothing about

sustainable development. A Canadian code would need a declaration of sustainable development principles, harmonization with international principles, and should be applicable using a life-cycle approach. To develop a code, we need to involve different levels of government and different sectors and the public at large to develop a document. Then we go back into government with the document to develop the code. We could use a “Canada Gazette approach.” That is, we could put it out for comment after consultation so that we involve all stakeholders in a process of continued participation. This would be the most effective way to get buy-in.

Ninth interviewee: This person was very concerned about the need for moral/ethical standards in the biotech industry. This interviewee felt that the Queensland model has a narrow intent, namely, that the biotech sector can grow. In the Canadian situation, the federal government has downplayed or ridiculed public concerns in its desire to promote the biotech industry. Thus, a Canadian code would need to acknowledge the conflict between the profit motive and the public interest. This interviewee stated that the main principle in a Canadian code should be the “common good.” An example of a statement along this line is from the Romanow Report. This interviewee said that when we develop a code, we should ask, “What kind of a society do we want?” and the code should reflect this. One of the problems with the Queensland model is its use of ambiguous language. If semantic ambiguity is used to ensure buy-in by industry, then that would be a problem for a Canadian code.

Tenth interviewee: A code would be a good thing because we can’t legislate everything and the federal government would be showing leadership in developing a code that reflects the interests and aspirations of Canadians. This interviewee had no objections to the Queensland Code as a model, but felt that there was one very crucial difference that needed consideration for a Canadian code. Much of what is covered in the Queensland Code is a matter of provincial legislation in Canada. So the development of a Canadian code would be impossible if it was not accomplished by a federal/provincial partnership. Also, there would need to be consultations with organizations that represent people with disabilities, animal rights groups, youth groups and others we don’t usually consult.

Eleventh interviewee: A Canadian code would provide an over-arching constitutional framework. There should not be ten provincial codes but rather a national code. The Queensland Code could provide a good reference point and we can benefit from what was done in Queensland. However, the Queensland Code has nothing about biosystems and we would need a broad paragraph to capture the value of the biosphere.

Twelfth interviewee: There should be a common Canadian code of practice, but is there a value to developing a code if we can't ensure that it works? In other words, we would need an accountability mechanism beyond the compliance of federal government departments and agencies. The code could be designed just for the federal government. Right now, there are all sorts of codes in departments, these codes have to be in sync, so we could have a code that was an inventory of all the codes and practices. Then we could build on this code and use it to leverage consumer confidence. However, if the code was applicable to all stakeholders, then we would need some mechanism of accountability, like logos on products or annual reports. The Queensland Code is categorical in some of its statements, which is problematic because some research is not yet complete. If we used the Queensland model and designed a code just for the federal government, then we wouldn't need it because we could just use the stewardship framework.

Thirteenth interviewee: There is no point to having a code. It would just be for public consumption (just "window dressing") and, if it was for the confidence of the public, then that would be a misplaced confidence. We need to enforce existing laws and regulations, not create a new document.

Fourteenth interviewee: Developing a code would be seen as a visible commitment to biotechnology in Canada and it would give us an international edge. We can adapt the Queensland model but there are many differences that we would have to take into consideration.

Fifteenth interviewee: We should have a Canadian code, but only with a number of conditions. This interviewee claimed that we could adapt the Queensland model if the federal government applied the code only to itself and partners who wanted to sign on. If the code was developed starting with the federal government and partners, and people could see the value in it, then it

would be easier to sell it. The Canadian code would be substantially different from the Queensland model, which is too detailed. This interviewee's conclusion was, start in areas where the federal government could put this into place for itself, then see.

Sixteenth interviewee: This person was concerned with the issue of where the code would reside. Would there be a partnership? Would it be the federal government only? Even if it was only the federal government it would still be problematic because which department or agency would be responsible for it?

Seventeenth interviewee: There should not be a Canadian code. There are a number of codes already in place, such as the Tri-Council Policy Statement, and there doesn't seem to be a need for another code. According to this interviewee, the Queensland Code has an ideological bias. It is trying to get everyone to buy into something they don't necessarily agree to and trying to manoeuvre people into taking a political stance on issues that are subject to political debate, e.g., GMO labelling. A Canadian code would have to be different from the Queensland model. It would have to be a "good gray Canadian document."

Eighteenth interviewee: A code would be good in an area like biotechnology which is new and where there are not regulations in the "gray areas." A code could be useful in that it would set the standard in place. Regulation would only be necessary if people did not adhere to the code. The Queensland model is not fundamentally objectionable but probably not necessary. There are other models that are simpler and thus easier to follow. If you stop with general principles then you haven't got anything, you need detail, but you have to point back to the principle to say why. Hence, a balance is needed between general principles and specific details.

Nineteenth interviewee: We need a code because a science-based regulatory system is not adequate for ethical issues. The Queensland Code is very agriculturally oriented. A Canadian code would have to be broader and include forestry and fishing. Also, a Canadian code would need to entrench more environmental principles that established not just respect for persons but respect for the planet. We could use the Queensland Code as a model, but we would need to Canadianize it by expanding or contracting certain discussions. It would be foolish to start from the beginning, and we could improve on the Queensland Code while adapting it.