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SCIENCE IN THE PUBLIC INTEREST: Values and Ethics in the Management, Use and Conduct of Science at Environment Canada

Working Paper No. 15

Science Policy Branch
Environment Canada

Document de travail n° 15

Direction de la politique scientifique
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SCIENCE IN THE PUBLIC INTEREST:
Values and Ethics in the Management, Use and
Conduct of Science at Environment Canada

Science Policy Branch Working Paper #15



March 2001

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Introduction

This report is based on the findings of a series of workshops which examined values and ethics in the management, use and conduct of science at Environment Canada.¹ In addition to a pilot workshop held in Ottawa, an additional six workshops were held in different cities during the winter of 2000-2001 (Edmonton, Saskatoon, Montreal, Sackville, Downsview, Ottawa). In total, over 100 EC personnel participated in the workshops, representing many job classifications - from technical, to scientific and managerial - and seniority levels.

The workshops were designed to fulfill several objectives. The first was to engage S&T staff in a dialogue on values and ethical decision-making, and provide EC with an indication about the types of ethical dilemmas which staff typically confronted in their work. A second objective was to understand any conflicts between (government-wide) public service and scientific values. The third objective was to provide staff with up-to-date information about values & ethics-related guidelines and resources

available from different federal government sources, as well as from EC itself. Finally, the project was intended to provide EC with a number of recommendations it could consider to advance the departmental values and ethics agenda.

Recent high-profile situations² have highlighted the challenges facing scientists³ working in a public service environment. While cases such as these are not common, they do serve to raise more general questions about the values and ethics involved in conducting science in government. To that end Environment Canada has established an internal value and ethics committee, and a number of employees monitor such issues through a web-based interest group.

Matters of ethics and values have long concerned governments. Within the federal government, there are guidelines for employees to follow that relate to typical situations

Project Objectives

- Engage EC staff in a dialogue on values and ethical decision-making
- Increase awareness about dilemmas faced by staff;
- Identify potential points of friction between public service and scientific values found in the work situations of S&T staff; and,
- Raise awareness of existing policies and best practices which are available to employees.

¹The workshops were conducted on behalf of the S&T Management Committee by The Impact Group and Interpraxis. They were developed in conjunction with the Science Policy Branch. Another report outlining the agenda, background material, evaluations and individual workshop reports is available from the Science Policy Branch.

²For example, scientists' concerns over drug approvals at Health Canada and fish quotas at DFO.

³This report will use the term scientists in a generic way, to include researchers, applied scientists, technicians, and other employees engaged in research and development or related scientific activities.

they might find themselves in.⁴ However, these guidelines tend to be general in nature⁵ and often do not address the special situation of the scientific community; for example special circumstances that might arise from a department's revenue generation, intellectual property, or enforcement practices or policies.

In 1997, five departments (Health, Agriculture & Agri-Food, Environment, Natural Resources, and Fisheries & Oceans) led by Health Canada, held a series of workshops to identify some of the key ethical principles related to S&T in the federal government. They were responding to an ongoing discussion and debate about the use of science in government, as well as a recognition that science was playing an increasingly important role in government policy and decision-making. The result of their work was the *Best Practices Initiative*. Its goal was to improve the way the federal science community operates and so to build public trust in federal science. The outcome was the identification of values, stakeholder traits, and principles for developing best practices particular to each department.

The Council of Science and Technology Advisors (CSTA) also addressed the question of ethics in its report and background study of science advice in government. The study reported the following:

*The public expects scientific advice to be predicated on research undertaken in compliance with scientific traditions (e.g., peer review, correction and verification through repetition, etc.) and codes of ethics. Governments are expected to employ open and transparent processes of decision-making that demonstrate which, and how, inputs are used in reaching a decision.*⁶

In the report, CSTA calls on SBDAs to "promote professional practices for those involved in the conduct, management and use of science". In so doing, it acknowledged that the interdepartmental Best Practices Initiative was a step forward.

The current assignment was one of EC's Learning Fund projects. The S&T values and ethics initiative used relevant case studies to involve employees in workshop settings to fully explore the underlying issues surrounding values and ethics in the Department. It also has a dissemination element, which is designed to bring the learning outcomes to a wider audience.

Workshop Format

Following is a sample agenda which the consulting team developed for the workshops, in conjunction with the Science Policy Branch. The agenda made use of a number of structured case studies to engage participants in discussion of what constituted an

⁴See, for example, Treasury Board Secretariat. *Guide on the Application of the Conflict of Interest and Post-employment Code for the Public Service*.

⁵For example, the Tait report is entirely silent about the special challenges of S&T within government.

⁶Industry Canada. *Scientific Advice In Government Decision-Making*. Ottawa. August 20, 1998. p. 4

ethical dilemma and how they might deal with them. The case studies were borrowed or adapted from a set of sample dilemmas that EC compiled in an earlier department-wide values and ethics consultation. In addition, the workshop format allowed for unstructured discussions, which were intended to allow participants to voice their own dilemmas.

Table 1. Workshop Agenda

Time	Activity
0:375	Introduction Introduction of Participants
9:10 (10 min)	Background to Project EC representative
9:10-9:20 (10 min)	Agenda and Goals for Day Review agenda Set out objectives Set out ground rules Review of participant expectations
9:20-10:00 (40 min)	Dialogue on Public Service Values and Ethics What are values, ethics, & dilemmas? What are some examples of ethical science dilemmas encountered at EC? Mini-Case #1 Review Tait Report Findings
10:00-10:45 (45 min)	Dialogue on Science Values and Ethics What are S&T values, ethics Mini-case #2 Difference of govt, academic and private sector S&T values Review Table <i>Glass Vault Exercise</i>
10:45-11:00	Health Break
11:00-12:15 (1hr 15 min)	[Breakout Group] Reality Check: Situation at EC Describe actual S&T dilemmas you have encountered What principles were at stake? How were these situations dealt with? What department-wide lessons can be drawn?
12:15-13:00 (45 min)	Lunch
13:00-14:15 (1hr 15 min)	Major Case Study Major Case Study Plenary Discussion
14:15- 14:45 (30 min)	Review of Tools and Existing Policies Refer to existing policies and tools available to employees
14:45-15:00	Health Break
15:00-16:00 (1 hr)	[Breakout Group] Responding to Dilemma at EC: Employee-Driven Solutions and Next Steps What tools/policies are needed? What should be done by EC?
16:00-16:30	Evaluation and Closing

At the conclusion of the day, employees were invited to evaluate the workshops. Workshop evaluations were collated, and the results were fed back to participants, along with a consultants' report on the findings of the individual sessions.⁷

Values & Ethics - Some Basics

What are values & ethics? For purposes of the workshops we used the following definitions (emphasis added), which were taken from the *A Strong Foundation* (the Tait report).⁸ This report has become the cornerstone of values and ethics discussions within the federal government.

Values: ... are enduring beliefs that influence attitudes, actions and the choices and decisions we make.

Ethics: ... are that dimension of human thought and behaviour which is guided by standards and principles of right conduct ... ethics involves a commitment to do the right thing.

Ethical Dilemma: ... is a situation in which:

- Two or more values may be in conflict.
- You are unsure of the right thing to do.
- Some harm may be caused, no matter what you do.

According to *A Strong Foundation*:

"The fundamental value of public service is loyalty to the public interest or public good ...

"Public servants hold a public trust; they are trustees for the interests of the citizens of Canada, as represented in their democratically elected government ...

"The structure of public service values should motivate public servants, above all, to give their primary loyalty to the public good and to put it ahead of any private or individual self-interest ...

"Anything that encourages public servants to do otherwise undermines the values which provide the foundation for public service"

Values and Ethics: Taking the Pulse of Environment Canada's S&T Community

⁷These are included in the S&T Values and Ethics Project Report available from the Science Policy Branch.

⁸*A Strong Foundation - Report of the Task Force on Public Values and Ethics* (January 2000 edition), p.22.

A primary objective of this project was to gather information about the kinds of ethical dilemmas which S&T staff face in their work. A number of themes emerged from the dialogue with staff. These are discussed below. We hasten to remind readers that only a small portion of EC's scientific staff participated in the values and ethics workshops. Thus, strictly speaking we cannot say that the views they expressed are completely representative of those held by the scientific workforce at large. However, the consistency of the themes and issues raised in different parts of the country leads us to conclude that the sentiments expressed in the workshops represent a broader sentiment within the department.

Strong Appetite for Genuine and Open Discussion

Staff who participated in the workshop expressed a strong desire for open discussion of ethical dilemmas. Far from being rare occurrences, ethical dilemmas are a normal aspect of life in the rough-and-tumble world of environmental science which is conducted in a public policy context. In the words of one participant, *"In science, we face values and ethics questions every day"*. In a similar vein, others said, *"This is an important issue – glad to see workshop being held – issue is often overlooked"*, and *"Want a frank/open discussion"*.

"In science, we face values and ethics questions every day"

It was clearly a source of frustration to many participants that they have no outlet for their desire for dialogue on such issues. As we heard, *"This is the first time in 20 years (working in government) we've formally discussed these issues"*, and *"We haven't received any guidance in the 6 to 7 years I've been with department; I don't have time to go to web sites"* (e.g., Environment Canada's values & ethics web site).

Along with a desire for dialogue on ethical issues, there is also an underlying concern that people who raise ethical issues with their managers might not be viewed as team players, as being trouble-makers, and so forth. People are seeking a "safe space" in which they can raise what they believe to be genuine ethical issues without being labeled as difficult employees, and possibly having their promotion prospects affected.

Desire to Share Experiences

Environment Canada is a large department that brings together diverse science functions. People working in different parts of the Department have a strong desire to share their own (values and ethics) experiences with colleagues in other sectors. They told us that they want to: *"explore ethical dilemmas with colleagues"*, *"learn from colleagues"*, and, *"... get a reality check outside of the lab"*.

(I want to) *"explore ethical dilemmas with colleagues"*

Employees want to know if their own experiences - the ethical dilemmas they face - are unique to them, or whether they are shared with others. In addition, they want to know how their colleagues have dealt with their dilemmas, and if they have ideas and suggestions they can utilize.

Concern Over the Science-Policy-Politics Interface

Many of the ethical issues which employees are concerned about relate to the science-policy-politics interface. In

"(I experience) conflict between official decisions and objective scientific truths"

other words, to the role of science in environmental policy formulation - how EC's research and assessment work is translated into policy. This is a complex issue which we will explore in detail later in this report (see page 15).

The following verbatim comments illustrate the range of concerns that employees brought to the workshops with respect to the role of science in policy. People expressed their concern over the science-policy-politics interface in the following ways:

- *"the tension between science and political issues"*
- *"the trade-off between scientific rigour and release of information to the general public"*
- *"government and departmental priorities"*
- *"the gap between decision-making and giving advice"*
- *"conflict between official decisions and objective scientific truths"*
- *"how the policy comes from the science"*

Coming to Grips With New Ways of Doing Business

The past few years have seen significant change in the ways in which science is undertaken in nearly all federal SBDA's (Science-Based Departments and Agencies). Cost recovery, cost-sharing, fee-for-service, partnerships, alliances, networking, intellectual property policy, knowledge management, technology commercialization, and special operating agencies, are all examples of the new vocabulary of science in government.

The comments received from workshop participants suggest that the changing "business" of government science is a source of dilemmas for many staff. Many staff are long-term government employees whose work experiences and expectations were formed in an era in which government science was a more or less self-contained activity. Certainly, for many, the idea that government science activity would be financially tied to outside interests, would have been alien to them. More than one individual referred to having to some extent to adopt financial partners' value systems (e.g., corporate values) as an outcome of dependence on external financial partnerships. Others expressed confusion over changing (or inadequate) departmental

policies regarding external scientific partnerships. People were concerned about such matters as:

- *“Exploring conflicts arising from commercialization”*
- *“How to handle partnerships”*
- *“Questions of intellectual property; sharing financial rewards from patents between the individual and the organization”*
- *“Dilemmas with respect to the release of data/information”*
- *“Ensuring quality science in a period of cutbacks”*
- *“Maintaining the credibility of federal S&T”*
- *“How to choose partners”*
- *“Partnering with other clients requires more guidance and new policies”*
- *“Cost recovery arrangements raise new dilemmas – help us”*
- *“Who owns data (in commercial arrangements etc.) (copyright?)”*

Confusion Over Departmental Values, Priorities, Practices

A group of concerns that staff expressed can be interpreted to result from confusion about EC's own departmental values, priorities or practices. Five of six workshops we conducted were held outside of the National Capital Region.⁹ In large organizations there is always an element of alienation between headquarters and regional operations. However, in this instance, NCR employees expressed similar concerns as their regional colleagues. This suggests that this theme tends to run throughout the organization. Employees expressed concern over such departmental value and ethics issues as:

- *“Erosion of scientific culture in the organization”*
- *“Lack of leadership and ad hoc decision-making”*
- *“Lack of planning leading to crisis management”*
- *“Staff at EC need to be clear and clean – bosses are not so! They need to be above suspicion and without bias”*
- *“How to prepare information for release - what is in and what is left out ... (i.e., muzzling)”*
- *“Lack of coordination between managers and researchers”*
- *“Application of promotion guidelines”*
- *“Filtering of science information/advice to politicians”*
- *“Frustrating feeling when department puts good news spin on a story – why don't we just be honest?”*
- *“Conflict between public good and good of the Department”*
- *“Conflict between scientific objectivity and the departmental position”*
- *“Censorship, within Department, of written research”*
- *“Levels of approval needed to be obtained in order to publish”*
- *“Get overview of government's sense of ethics”*
- *“Must address workload issues (more is added but nothing drops off)”*

⁹Excluding the pilot workshop

In different ways, staff are concerned that the Department's values and ethics are not aligned with their own. An underlying key theme is that senior managers makes compromises (with which staff disagree) in interpreting or acting upon the scientific advice that employees provide. A related theme is that the Department doesn't "walk the talk", when it comes to acting consistently on matters of values and ethics, such as the application of promotion guidelines.

Understanding the Personal and Professional Role of Government Scientists

Many Environment Canada employees are deeply committed to environmental protection and conservation, not only in their jobs but in their personal lives as well.

"Staff at EC need to be clear and clean – bosses are not so! They need to be above suspicion and without bias"

For many, working in Environment Canada is not "just another job". They hold themselves - and other custodians of the environment - to a very high standard. Moreover, they feel that citizens at large hold them - and the department - to a very high level of ethical behaviour, because they are seen to be the last line of defence on matters of environmental protection and conservation.

In regional operations, there is considerable frustration because in many - perhaps the majority - of instances, it is actually provincial governments who have primary responsibility for local environmental affairs, even though citizens are under the impression that EC is in control. Employees often feel conflict among their personal commitment to the environment, their professional standards¹⁰, their job responsibilities, and the constraints under which they operate as federal public servants.

Some scientists are frustrated that they have to take care not to publicly express opinions on scientific issues that can be interpreted to be at odds with departmental or government positions. Others are concerned that their ability to engage in what CSTA refers to as "early issue identification" is compromised in situations where an emerging issue would cast the government in an unfavourable light. Thus, they speak of such issues as:

- *"The social role of the scientist"*
- *"About my role as a citizen versus that as a scientist"*
- *"About the values conflicts at the personal and organizational levels"*
- *"Speaking truth to the public" (ability to defend personal reputation; need to make it understandable to the public)*
- *"Want more freedom to publish; should be able to submit paper to journal that conflicts with departmental policy. (EC can publish its own opinion on the matter)"*

¹⁰ For example, what constitutes good scientific data and advice

Desire to Understand “Public Service”

Environment Canada employees are deeply committed to public service. So much so that often, in our workshops, they would say that their primary allegiance is to “the public” or “the public good”, rather than to the department or the government. What they meant is that they put their commitment to public service - or at least their interpretation of the public good - ahead of their commitment to the department or to the government. In other words, they do not see their commitment to public service as being synonymous with their commitment to their employer, as illustrated below.

“I work for the public good”

- *“I work for the public good”*
- *“Understand our role as citizens vs. public servants”*
- *“Defining the public interest”*
- *“What exactly are the responsibilities of the scientist?”*
- *“Client” vs. “citizen”; “Public vs. private issues”*
- *“Resolution of science conflicts – ‘honest-broker’”*
- *“About the trade-off between scientific rigour and release of information to the general public”*

Many employees are conflicted over how to interpret the guidelines put forward by the Tait report, which states that *“The fundamental value of public service is loyalty to the public interest or public good ...”*, and which declares that *“Public servants hold a public trust; they are trustees for the interests of the citizens of Canada, as represented in their democratically elected government ...”*

Tait calls for *“The structure of public service values (to) motivate public servants, above all, to give their primary loyalty to the public good and to put it ahead of any private or individual self-interest ...”*. We found that many EC staff want guidance about how to apply these principles in their daily work.

The “Glass Vault” - Staff Perspectives on Ideal Values

During the workshops we invited workshop members to participate in a “glass vault” exercise. This activity encouraged staff to express the core values which they hold dear, and which they and the department currently live by or should strive to achieve. Below, we have grouped their responses into a number of different categories (Table 2).

Scientific Excellence	Scientific Credibility	Scientific Independence	Scientific Impact	Commitment and Advocacy	Organizational Culture
<ul style="list-style-type: none"> • Providing quality; • Having excellence; • Being rigorous; • Being relevant; • Being anchored in knowledge; • Known to collaborate with others; • Innovative/state-of-the-art • Professionalism • Known to collaborate with others 	<ul style="list-style-type: none"> • Having the confidence of the public; • Being a point of reference for the public; • Having credibility; • Impartiality; unbiased • Being equitable; • Transparency; • Accessibility, honesty, openness • Credibility; expertise; recognition as a respected authority • Brand recognition of name - Environment Canada • Internationally respected • Positive image among the public 	<ul style="list-style-type: none"> • Freedom to act and speak • Advocacy (on behalf of the environment) 	<ul style="list-style-type: none"> • Leadership; leaders for the environment • Protect environment • Public good • Concrete action • Responsiveness • Precautionary action • Enforcer of environmental regulations • Supporting sustainable development • Visibility (of impacts) 	<ul style="list-style-type: none"> • Commitment to the environment; • Conscience/ voice of the environment • Commitment to protection and conservation of the environment • Service to the public • Supporting sustainable development • Concrete action • Advocacy (on behalf of the environment) • A "white knight" 	<ul style="list-style-type: none"> • Science is valued • Having fun; • Being involved with an important domain; • Being proud of what we do; • Being passionate about what we do • Integrity, honesty • Dedication • Responsiveness • Teamwork and cooperation • Collegial • Solidarity • Tolerance and respect • Having a sense of belonging

Several things are striking about the results of the glass vault exercise. First, is that employees believe that Environment Canada currently expresses and lives by many of their ideal values - although they believe that some values are eroding and need to be reinforced.¹¹ Secondly, employees hold themselves and the department to a very high standard of values and ethics. When employees perceive that they, their superiors, the department, or the government, fail to reach these high standards, employees are distressed.

Thirdly, and most importantly, far from being an organization that lacks values and ethics, it seems to us that the department is replete with high standards of values and ethics which employees are doing their very best to fulfill. **It is precisely because employees have these high standards that they struggle when they perceive that their managers, the department, the government, the “system”, or they themselves are unable to achieve perfection in applying the values they cherish.**

Thus, in our opinion, science ethics dilemmas at Environment Canada (or elsewhere) arise *not* because employees lack values, but rather because their deeply-held values come into conflict with the values embodied in other value systems. Clearly, members of EC's science community are challenging themselves and the department to adopt and express a high standard of values and ethics. Employees emphasize a strong commitment to scientific excellence, credibility and impact. They want Environment Canada to be recognized as an organization which can be trusted to conduct high quality research, and render objective judgments on environmental matters. They also want their work to have a positive impact on environmental policy and stewardship. Staff want to retain a high degree of scientific independence, and to be able to act and speak in a straightforward way about the implications of their work.

Many staff see themselves and the department as standard-bearers for the environment. They are personally and professionally committed to the environment. They want Environment Canada to be a first and last line of defence in environmental matters.

The science community also wants to work in a setting where science is valued, and where colleagues and management are passionate about their work. Employees want their passion and commitment to be reflected in departmental science values and ethics.

Understanding Science Dilemmas

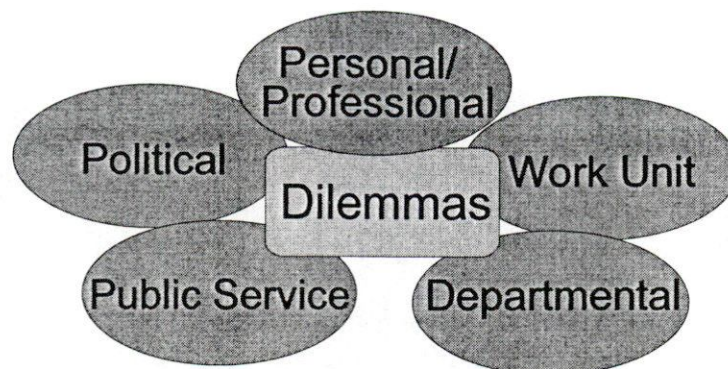
Why and how do ethical dilemmas arise in government science? Are dilemmas anomalous, or are they a normal product of the complex government science environment? These questions are explored in this section.

¹¹For example, what many would express as “doing quality science”. Budget and staff cuts have meant that staff feel they are unable to conduct as high quality science as in the past.

Multiple Value Systems and Their Implications

In any large science organization - whether government, industry or any other sector - one finds multiple value systems simultaneously interacting. The first is the **personal/professional** value system which each of us brings with us to the job. At its heart are our personal values and ethics; our individual sense of right and wrong, our personal standard of behaviour.

For scientists, there is an added dimension - a **professional value system** that has been taught (or absorbed) during years of formal academic or professional training and apprenticeship.¹² The professional value system of scientists (and technicians and engineers) carries with it implicit and explicit notions about: what constitutes scientific truth, proper research protocols, appropriate standards, limitations on the use of data, and so forth. Scientific value systems are international in character and apply to mainstream scientists working anywhere in the world. They are also self-policing, through such mechanisms as peer review, publication, replication, and sharing of specimens, materials, data and methodologies.



Once employees enter a work setting, they begin to encounter the first of a series of institutional value systems - the value system of their immediate **work unit**. This value system is set by managers and co-workers. Like all value systems, it has formal aspects (rules and regulations) and informal ones (practices). For most people, their primary mode of interacting with their employer occurs through their work unit. Not surprisingly, a number of the concerns that employees raised in our workshops related to their discomfort with work unit values and ethics. For example, whether technicians and applied scientists receive credit on publications. Based on what we heard in workshops, accreditation practices can vary from work unit to work unit. The work unit is where the values and ethics "rubber hits the road". No matter what the stated corporate values and ethics of an organization, these are actually interpreted and applied in the work unit.

¹² For example, engineers adhere to a code of conduct which is governed by a professional organization that has legislated authorities and responsibilities.

A third system of values and ethics which impinges on employees is the **departmental system** - Environment Canada's corporate values and ethics. The department establishes both formal and informal systems of standards to which all employees must adhere. In fact, in most large organizations (Environment Canada is no exception) there is at best a patchwork quilt of values and ethics, expressed variously as core values, mission statements and the like. Often, these were developed a long time ago and are not living documents, in the sense that they have truly been bought into by managers and employees. In many instances, personnel are not even aware that their department has a formal system of values and ethics. In all organizations there is a tendency for corporate values and ethics statements to become wall art - posted on an office wall, seldom discussed or applied, and otherwise largely ignored - unless they are continually refreshed and reinforced.

At the corporate level, there is often a feeling that once standards of values and ethics have been inscribed, printed and handed out, the job is over, and employees will automatically be aware of and will apply them. In fact, the work is just beginning. The challenge is to continuously engage employees in understanding and applying the organization's system of values and ethics in their day to day work.

Overlying the departmental system of values and ethics is a system of **public service** values and ethics. Such a system is represented by the Tait report, which is meant to apply to all public servants, whether file clerks or deputy ministers. Public service values and ethics typically deal with such issues as post-employment codes, honesty in submitting travel claims, access to information, and so forth. They apply a common set of standards to the work and behaviour of all public servants. Typically, it is up to departments to ensure that employees apply public service values and ethics.

Finally, there is the system of **political** values and ethics. The Tait report acknowledges the influence of this system when it refers to the fact that "Public servants hold a public trust; they are trustees for the interests of the citizens of Canada, as represented in their democratically elected government ..."

It should come as no surprise that Environment Canada employees - indeed public sector workers in any country or at any level of government - feel that the political establishment that they serve does not necessarily adhere to the same (high) standard of values and ethics as are applied to them. Suffice it to say that in our democracy we cherish the tradition of a neutral and independent public service. Mature observers acknowledge that from time to time tension arises between the values of public service and those of political service. For example, when politicians ask for actions to be taken that are not entirely supported by a rational policy analysis.

Due to their close interaction with the political sphere, public servants encounter such circumstances more regularly than ordinary citizens. Nevertheless, the reality of public administration is that its values are not synonymous with political values, and that dilemmas occasionally arise.

The essence of a dilemma is that there may be more than one correct course of action, and no course may be entirely satisfactory. It should therefore come as no surprise that dilemmas can arise when multiple value systems, which are not operating in unison, conflict. Similarly, dilemmas can also arise when there are conflicts within each of the different value systems.

Thus to our mind, ethical dilemmas are not aberrations - they are in fact a normal part of life - whether in our personal or professional spheres. It is important not to equate dilemmas with problems. There is little sense in trying to stifle or suppress dilemmas, because they are always with us. Instead, the best approach is to deal with dilemmas at an early stage, before they turn into problems.

Multiple Roles for Science and Scientists

Scientists working in government today are required to perform multiple roles - to wear multiple "hats". For example, Environment Canada scientific researchers are expected to perform as academics, conducting original research and publishing in refereed journals. In this role they draw on their years of formal academic training, and adhere to academic values and traditions. However, unlike their academic colleagues, they also work as public servants. This means they also need to adhere to public service values and traditions, which impose requirements that their academic colleagues do not have. In addition, since the mid-1990s Program Review, a significant number of Environment Canada scientists find themselves operating in a quasi-industrial setting which emphasizes different values and traditions; for example, cost sharing, cost recovery and service to external clients. Finally, all government science takes place in a political context, which indirectly at least requires science organizations and employees to be attentive to the political implications of their science, and adds a layer of complexity to their work.

It is apparent that scientists working in government have to balance the competing imperatives of many more value systems than their colleagues who work in academe or in industry. Industry and academic scientists need only adhere to a single value system, whereas government scientists need to be adept at juggling different, often incompatible value systems.

Furthermore, when they were originally hired, Environment Canada made an implicit "contract" with its researchers. The implicit contract for employees hired, say 20 years ago, contained a different set of expectations than the implicit contract given to employees hired today. Twenty years ago they were largely expected to wear one hat - to act primarily as academic researchers, albeit in a government setting. Today, they are expected to wear multiple hats. In effect, the terms of employment have changed over time. It is to be expected that some people hired under one set of assumptions (e.g., from the 1970s or 1980s) would have difficulty adapting to today's reality. And in fact, many scientists who participated in the values and ethics workshops expressed these kinds of sentiments.

Table 3 illustrates how different roles carry with them different values, which sometimes conflict with one another.

Table 3. A Comparison of Values in Different Venues

Academic values	Public service values	Industrial values	Political values
<ul style="list-style-type: none"> • Search for truth • Openness • Curiosity-oriented • Critical • Unbiased • Sharing of knowledge • Reluctant to forecast/project • Credit for work done 	<ul style="list-style-type: none"> • Service/loyalty to public • Focus on public good • Neutrality • Anonymity 	<ul style="list-style-type: none"> • Profit motivation • Restricted sharing of knowledge (cf. IP protection) • Confidentiality • Personal reward • External customer focussed 	<ul style="list-style-type: none"> • Avoidance of conflict • Search for compromise • Positive spin • Suppression of bad news • Appearance of certainty

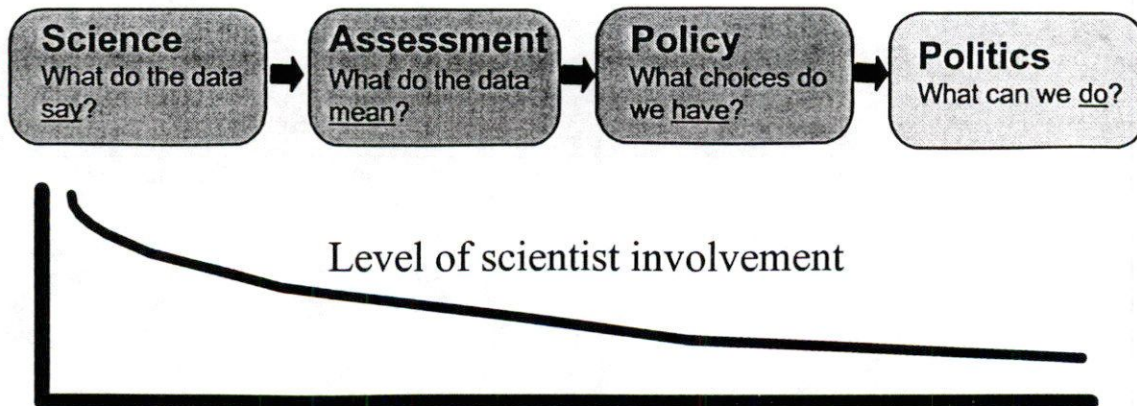
The Science-Assessment-Policy-Politics Process

What is the relationship between science and policy in government? How is science translated into policy? From the standpoint of understanding values and ethics, these are important questions. Many Environment Canada researchers indicated they are frustrated because they do not see their scientific views being expressed in policy, or occasionally see the policy running counter to scientific evidence.

For example, a researcher may be convinced that his or her research provides strong scientific evidence for global warming, but is frustrated that the government's position in international negotiations does not sufficiently reflect this fact. Or, a researcher may feel that their field work indicates that plant or animal species are disappearing at an alarming rate, and that the government should act in a more forceful way to protect habitat. The examples of such science dilemmas are many and varied. What is common to them is that such dilemmas engender a sense of disappointment on the part of many scientists. They feel that decision makers should be paying greater attention to science in formulating government policy. In our opinion, the fact that scientists feel this way in part reflects their lack of understanding of the science-policy process.

Scientific research of the sort typically undertaken at Environment Canada yields scientific data - carbon dioxide levels, habitat surveys, temperature fluctuations, and so forth. In the nature of science, data such as these are fragmentary - they provide small pieces of information in a larger puzzle: Is there global warming? What are the mechanisms? Is it natural or anthropogenic? What are the uncertainty parameters?

The Science-Policy Process



A separate process - assessment - is needed to make sense of the data, to understand what they mean. Science assessment frequently needs to draw data from many different sources, not just from Environment Canada research. Whereas scientific data tend to be un-ambiguous (after all they deal with scientific facts), the assessment of the science data can be far less certain and open to different interpretations. However, once the scientific community reaches a consensus over the assessment of data - e.g., whether or not global warming is occurring and why - there is still the question about the public policy choices or alternatives that a government will have to deal with a particular issue. Translating the data and assessment into policy introduces an entirely different set of considerations; not only scientific, but economic and social. These are even more open to interpretation and uncertainty than either the data or the assessment. Finally, the political process must review the policy alternatives and make a political assessment about what decisions are practical, and what is possible to do. In this they must balance another set of considerations: job gains or losses, fiscal policy, international relations, local politics, and so forth.

The further along the science-assessment-policy-politics continuum, the higher the degree of choice and interpretation that must be made, and the lesser the involvement of scientists. While scientists are almost solely responsible for data collection, and have a leading role in science assessment, the development of policy (options) typically rests with a different community in government. When hard choices need to be made by politicians, science is but one consideration in a complex mix of competing facts and interests. Whereas science has a low tolerance for ambiguity, politics is in many respects the art of managing ambiguity. The two co-exist uncomfortably.

These ideas are not especially original perceptions in the world of political science or public administration. However, what is clear from our dialogue with Environment Canada scientists, is that this process is not well understood by the scientific

community.¹³ And, because scientists don't fully understand the process by which their science is translated into policy - or if they do, they may disagree with the choices that are made - they become frustrated with their role. Many scientists would like the worlds of policy and politics to be as cut-and-dried as the world of science. Unfortunately, this cannot always be so.

Sample Science Dilemmas

EC employees described encountering many science dilemmas in their work. Following is a sampling:

Sample Dilemma #1 - Declining Standards?

Some employees are concerned over what they perceive as declining standards of in-house research and science, and their implications for quality and service to the public. They believe that in some instances they have had to lower their standards in the wake of declining resources (post Program Review). This has an impact on the quality and validity of their research and data. It also affects the quality of products and value-added services being sold to the public (through cost-recovery activities).

Another aspect is that some employees feel pressure to render judgments about particular environmental situations - e.g., environmental assessments - in the absence of complete information. As scientists, they are accustomed to making claims at the 0.95 degree of confidence. This comes in conflict with the need to make (policy) judgments based on "balance of proof", rather than degree of confidence. Some employees have found themselves in situations where they have been called as expert witnesses, but were uncomfortable in the role because they had not done the research needed to render an expert opinion in the particular circumstance.

Sample Dilemma #2 - Impact of Cost Recovery

A growing emphasis on cost-recovery - whether through the sale of information products, or through increased reliance on external partnerships with OGDs or other external groups (e.g., industry associations) - brings with it an inevitable pressure to adopt the values and ethics of the outside organizations. The perception is that the more reliant they are on outside groups for funding, the more EC employees have to play by the rules of the outside group. One employee described the situation thus, "Chasing the cash leads to bad decisions".

¹³ This may change in the near term as Environment Canada's S&T Management Committee is currently implementing the federal framework on S&T Advice.

Sample Dilemma #3 - Publish or Perish

Productivity, creativity, recognition and influence are meant to be the criteria for (RES) promotion. However, too often in the opinion of some researchers, only productivity is taken into account. This leads to a tendency to publish many low-quality papers, rather than a lesser number of high-quality ones. The over-emphasis on productivity also influences RES's choice of work - unless its likely to lead to a publication, there is a tendency to avoid otherwise important activities. In some instances, managers who have had no direct involvement with research seek credit for work done. In contrast, support staff who do contribute significantly to research are given no credit.

Another aspect is that as research resources and activities decline, some employees feel they are losing their credibility as scientific experts, because they are conducting less original research. "If I don't publish I become a bureaucrat", is how one RES explained their situation.

Sample Dilemma #4 - Artificial Boundaries

Some employees feel that their job descriptions (e.g., biologist) place artificial constraints on their everyday work. In many instances biologists carry out scientific research, but their job description technically restricts them from doing so.

Sample Dilemma #5 - Federal-Provincial Roles

EC S&T employees are dedicated public servants who view themselves as protectors of - or at least spokespersons for - the environment. From time to time they encounter situations where they feel that their provincial environment counterparts are either prevented from - or reluctant to - exercising their responsibilities in particular situations (e.g., environmental assessments). There is a degree of frustration that in situations where EC employees feel that provincial authorities are not properly carrying out their duties, they cannot interfere, unless explicit federal responsibilities are in question. EC employees find it difficult to explain to local environmental groups why they are not intervening in particular situations, due to the division of environmental responsibilities.

Sample Dilemma #6 - Over-Hyping of Benefits

Some employees expressed concern that the department had a tendency to over-hype benefits in certain circumstances, for example, to secure funding for a particular investment. For example, it was suggested that the benefits of Doppler radar were being over-sold to the public, when professionals were much more cognisant of its limitations for severe-weather prediction.

In a similar vein, some employees believe that the department sometimes makes decisions out of a desire to protect its turf, rather than do the right thing.

Sample Dilemma #7 - Shifting Priorities and Values

In the wake of the Walkerton water situation, some employees expressed the view that there will be an unwarranted push on water (chemistry) research, which will starve other priority areas of funding, because additional resources will not be provided. This they see as symptomatic of shifting EC departmental priorities and a disconnect between transient EC priorities and enduring (environmental) values. For example, some employees are embarrassed at the soft position they feel that Canada took at the Ottawa round of the Kyoto discussions. In the words of one employee, "The corporate culture changes every 3 years".

Sample Dilemma #8 - Informing the Public

A number of employees are concerned about actual or potential dilemmas related to their role in communicating with the public. The essence of these dilemmas is that employees may not agree with the government's position on a particular policy matter, but feel compelled to defend its position when interviewed by the media. For instance, they may be asked "Do you think that the government is doing enough to deal with (problem X)? Personally and professionally, they may not think the government is doing enough, but unlike their colleagues in academe, they cannot speak truthfully about their private concerns. Some employees refer to the discomfort they feel between: "what say publicly and what you know", "your credibility/knowledge vs. departmental spin". They acknowledge one of the (hidden) values of public service, which is that there is a strong barrier to making the Minister "look bad". "Are we being interviewed as individuals or as representatives of EC?"

Sample Dilemma #9 - Practising What We Preach

Many of the participants in one workshop identified the department's own seeming disregard for the environment as an important value and ethics issue. The fact that the government department, most closely identified with the protection of the environment, doesn't practice what it preaches is attracting increasing cynicism from its own employees. As one participant noted, "we don't take the environment seriously here". Other participants expressed disappointment that EC does not reflect their own personal values vis-à-vis the environment and indicated that this factor could result in them seeking employment elsewhere.

Other Sample Dilemmas

Following are abbreviated examples of other science dilemmas that staff encounter, as they were expressed during the values and ethics workshops. Some of these repeat earlier dilemmas.

Changing Roles

- Clients' values may be different than ours (EC's)
- Who are our clients at EC?
- Conflicts between – commercial interests, public service values and department
- Partnerships causes all sorts of problems
- How to operate in the situation of being a hybrid between university and industry;
- How to choose partners;
- What exactly are the responsibilities of the scientist?
- Having to wear too many hats;

Representing Government Policy

- Things that come out of EC go through a positive spin cycle
- Communications policy – needs clarification
- How to prepare information for release - what is in and what is left out? (i.e. - muzzling)
- Loyalty – to whom?

Ownership of Intellectual Property

- Scientists holding onto information for publishing at a later date and don't make it accessible quickly to public –or other scientists)

Promotion and Recognition

- Publish or perish
- How to deal with the distribution of financial rewards from patents between the individual and the organization

Leadership and Management

- The lack of leadership and ad hoc decision-making
- Erosion of scientific culture in the organization
- Lack of planning leading to crisis management
- Lack of coordination between managers and researchers
- Lack of understanding of the precautionary principle in an operational sense
- Eroding loyalty

Adequate Resources

- Having to cope with more and more international agreements but with diminished funding

- Increasing demands and fewer funds leading to pressures on values and ethics

Does the fact that so many employees raised so many science values and ethics dilemmas signal a values and ethics crisis at Environment Canada? In our opinion, just the opposite. We refer back to the words of one workshop participant who said "In science, we face values and ethics questions every day". (In our view, there is little doubt that if a similar exercise were conducted in any federal SBDA that the results would be the same.) The fact is, that conducting science in a public policy setting is a complex undertaking that continually challenges all concerned with values and ethics dilemmas. Whereas academic and industrial researchers need only juggle 2 roles at most (academic, industrial), government researchers need to balance up to 4 different roles (academic, public service, industrial, political). This could well explain why employees appear to encounter a high number of dilemmas.

What would be far more worrisome to us would be if employees said they experienced no dilemmas and were content with the status quo. This would reflect a group of individuals and an organization that truly lacked core values and ethical standards. We interpret the fact that Environment Canada employees were so willing to present and discuss the dilemmas they face, as a very positive sign that they are seeking to do the right thing. (Even though it is in the nature of values and ethics dilemmas that the right thing to do is not always apparent in a particular situation.) Ultimately, we believe that a high level of open discussion and dialogue is the sign of a healthy science-based organization; one that is prepared to challenge its own values and ethics, and how it tries to express them on a day to day basis.

Thus, the challenge for managers at Environment Canada is to stimulate and guide discussion and debate, and not to stifle it. Managers who view legitimate discussion of ethical dilemmas their employees encounter as being indicative of "problems" in the organization, and who try to suppress it, are being counter-productive. Values and ethics dilemmas are inherent to science and technology - especially in a public policy setting - and are best dealt with through open discussion, dialogue and debate. Suppressing debate will ultimately produce a values and ethics vacuum, which in the long term is far more damaging to an organization.

To its credit, Environment Canada has created a work environment in which employees feel comfortable discussing dilemmas with their supervisors. The 1999 Public Service Employee Survey showed that Environment Canada employees were very much in accord that "... I can disagree with my immediate supervisor on work-related issues without fear of reprisal."¹⁴ However, there was somewhat more concern among employees that "... senior management will try to resolve concerns raised (in this survey)."¹⁵

¹⁴Strongly agree = 26%; Mostly agree = 48%

¹⁵Strongly Agree = 7%; Mostly Agree = 30%

Conclusions

Following are the conclusions of our study, based on the workshops held with Environment Canada employees.

1 - Dilemmas Are a Normal Condition

Far from being rare anomalies, the large number and variety of values and ethics dilemmas that Environment Canada staff raised in our workshops indicates that such dilemmas are a normal condition of science, and especially of science conducted in a government setting. In our experience, the science enterprise inherently adds a significant potential for values and ethics dilemmas, to the already complex world of public administration. Scientists who work in government - a category we take to include all those who are engaged with R&D and related scientific activities - continually encounter ethical dilemmas. More so, likely, than their colleagues who work in an academic or industrial setting.

Dilemmas are produced by a wide variety of conditions. Sometimes, by the evolving capabilities of science and technology itself; for example, due to new techniques for creating genetically modified organisms (GMOs). Sometimes due to conflicts within value systems, and sometimes as a result of conflicts among the many different overlapping and non-aligned value systems that are in effect within a public service setting. If the experience of Environment Canada employees is indicative (and we think it is), the examples of values and ethics dilemmas which arise from working in government science can appear to be endless. This may be closer to the truth than we would like to acknowledge.

2 - EC Employees Have High Standards and Values

The reason that EC's science employees experience so many science-related dilemmas, is precisely because they have high personal and professional standards and values. This became very clear during our workshop consultations with employees from many different parts and at many different levels of the Department. In fact, if employees lacked these high standards they would experience far fewer dilemmas than they do; little would trouble them about their work. It was our overwhelming impression that EC employees are both trying to do the right thing, and to do things right.

We cannot over-emphasize this point, because it lies at the heart of how organizations need to treat their employees' concerns. The starting point for dialogue with employees about science values and ethics needs to acknowledge the validity of employees' concerns, which are based on strongly-held principles and high standards of behaviour. Time and again EC employees declared that their primary allegiance was to "the public good" and to "the environment" and to serving the people of Canada. This presents the clear picture of a motivated and well-intentioned workforce. "I work for the public" is a sentiment we heard regularly in the workshops. However, many employees are less

willing to acknowledge they also work for the Government of Canada and that they are bound by additional terms of employment. Overall, however, Environment Canada should be proud of its employees and their high standards.

Environment Canada employees also have a clear view of the (science) values and ethics that they would like themselves and the Department to strive for. They think that as a rule Environment Canada performs well on many of these, but that others need to be highlighted, reinforced or more consistently applied. While few employees would accuse the department of being “unethical” there still a great deal of confusion as to what exactly the values and ethics of the department are.

3 - Meeting Employees' Expectations

Many of the dilemmas which employees described during our workshops arose because they did not feel that “the system” was adhering to their own strongly-held personal and professional values. Many employees are unwilling to compromise on them. Sometimes, they blamed dilemmas on problems in the values and ethics system operating in their immediate work unit. For example, that managers were rewarding publishing quantity and not quality, and therefore not properly applying promotion guidelines. Sometimes, they felt that dilemmas arose because Environment Canada was not practising what it preached about putting the environment first. For example, the difficulty experienced in obtaining additional parking space for bicycles. Another set of dilemmas was attributed to a belief that the department no longer has the resources to conduct quality science. In this regard, more than one employee was uncomfortable having to distribute what they felt was “crappy data” to the public. Other dilemmas were attributed to political compromises and decisions with which they disagreed. For instance, what they saw as Canada’s weak position in international talks on global warming. From the perspective of many employees, the “system” is on trial for lacking strong and consistent values and ethics, or for failing to forcefully apply those it does have.

4 - The Role of Science in Government is Changing

Government science is growing more complex, and public sector scientists are taking on new and different roles than in the past. For instance, scientists hired many years ago were expected to perform mainly in an academic science capacity. Today, many are being expected to function in an industrial research mode. Implicitly, many established scientists feel that the government has broken the informal employment contract they originally entered into, and is thereby changing the original terms of their employment. One employee expressed this in saying “The corporate culture changes every 3 years”. In contrast, it appears to us that more recent hires are more comfortable with the new expectations and demands, because that is the world they have known all along.

Government science has changed significantly in the past few years - and is likely to do so in the future. However, many employees either do not understand or do not agree with the rationale for change. Many feel that changes were imposed on them without consultation and without their buy-in or agreement. Some would say that they are discouraged from openly debating these changes because to do so would make them appear to be troublemakers.

In our opinion, Environment Canada could do a better job in engaging its workforce in a dialogue on the changing role of government science. There has been a tendency to explain change simply as the result of reduced financial resources, rather than as a desirable response to the evolving nature of Canadian and international science. As with many dilemmas, there is no right or wrong approach to such questions. What is most important is to establish an open, ongoing dialogue with staff to discuss the issues arising from change.

5 - Guidelines Often Lag Behind Practices

One source of frustration for staff - and a potential source of dilemmas - is that the development of departmental guidelines often lags far behind change in actual on-the-ground practices. For example, changes in Environment Canada's cost recovery and partnership practices began to be implemented in the Meteorological Service (and elsewhere in EC) long before formal guidelines and principles could be established. This left staff operating in a policy vacuum, having to deal with specific circumstances on an ad hoc basis.

When there is no formal policy regime there is always the potential for dilemmas to arise. Each situation (and its accompanying potential to create dilemmas) must be dealt with on its own, rather than in the context of a coherent departmental policy. For example, deciding under what circumstances to charge or not charge for data, and how to price data sales to different customers: students; academic researchers; provincial governments; international collaborators; and so forth.

As a practical matter, organizations cannot always wait to develop comprehensive policies before they change their actual business practices. However, they should recognize that in these circumstances there is always the potential for dilemmas to arise.

6 - A Patchwork Quilt of Science Values and Ethics

Environment Canada is one of the first federal departments to deal with science values and ethics as a specific subset of government-wide values and ethics discussions. Formal federal work on public service values and ethics - those that apply to all public servants - have been ongoing since at least 1995. However, this work has not generally been extended to the special needs of the science community in government. If anything, our research indicates that science values and ethics are an important and

pervasive issue which requires special attention, and which is not well addressed by current federal values and ethics frameworks or programs.

The current situation is best described as a patchwork quilt of values and ethics frameworks, guidelines and principles, which do not apply directly to the role of science in government. Employees who participated in the workshops consistently called for the development of a specific framework for values and ethics in government science - or at least within Environment Canada. Such a framework should include:

- a vision/mission statement for EC S&T and,
- an updated EC code of conduct with increased emphasis on the department's S&T roles.

7 - Values, Ethics and Role Discussions Must Start Early

Our consultation with EC employees has led us to conclude that there is an important training deficiency at Environment Canada (and probably other SBDA's) - no orientation program for new employees. For the most part, new science hires are thrown into the job and provided with little or no background information about their Department and its values, the structure of government, the role of the public service, how decisions are made, the role of science in policy, their own role, standards of values and ethics, how to deal with dilemmas, etc. As matters stand today, new employees start their career in an ethical vacuum.

We strongly believe that discussions of science roles and values and ethics need to start as soon as employees are hired, not after they have been in the job - as one employee described - for 20 years. Employees are likely to begin encountering value, ethics, and role issues from their first day on the job, and they need a training and orientation program that will help them to understand and deal with what is going on. Yet at the present time they are expected to absorb critical information and knowledge they will carry with them their entire career, through an ill-defined type of informal apprenticeship system.

Not only do new employees not benefit from a basic orientation program at the start of their career, there are no formal opportunities - e.g., professional development courses - for them to learn about values, ethics and roles at critical points during their career: for example, when they transition into management roles. The current round of values and ethics workshops reached just over 100 of the Department's approximately 3,000 science workers, which is just the tip of the iceberg. In our opinion, serious consideration needs to be given to two initiatives:

- Establishing a comprehensive orientation program for new science employees - possibly in conjunction with other 5NR departments; and,
- Providing career-long professional development opportunities for employees to explore values, ethics, and role issues.

8 - Values and Ethics Requires a Neutral Ground

One useful approach that would support a climate of dialogue within Environment Canada would be to establish a “neutral ground” for discussion of values and ethics issues. Our workshops established that there is a strong appetite for dialogue within the department, but that many employees have a lingering concern that pursuing legitimate intellectual disagreements with even the best-intentioned managers, could label them as troublemakers. Employees would like to have a neutral route of appeal or dialogue through which they could express their concerns, especially when they are having problems communicating with their immediate manager. In a similar vein, one of the main reasons employees chose to attend the values and ethics workshops, was a desire to share their experiences with colleagues in different parts of the department. We will explore this issue further in the Recommendations section of this report.

9 - Managers Must Take the Lead

Many workshop participants talked about how values and ethics needs to “start at the top”. There is a feeling among many employees - unwarranted in our view - that the further removed managers are from day to day science, the more they are forced to compromise their values and ethics. Right or wrong as that view may be, at a minimum, everyone would agree that managers set the tone for values and ethics within any organization. As such, they bear a special responsibility. Yet managers look to their own managers to assess the priority which the organization is attaching to different issues. Is values and ethics just the flavour of the day? Is it an issue that will pass in six months? Is there a long-term commitment within the organization to deal with it? Will the organization provide me with tools I can use in my work?

Building an ethical and values-based orientation in any organization is both a bottom-up issue and a top-down one. However, it must begin at the top. By supporting the initial series of S&T values and ethics workshops, senior management at EC has demonstrated its commitment and interest in exploring these issues, and employees have responded in kind. Senior management ultimately must establish the tone within the organization, and employees will be closely scrutinizing Environment Canada’s management to see what priority and commitment they are attaching to the issue.

10 - Ongoing Communication and Dialogue are the Key

Values and ethics is more about process than product. Values and ethics dilemmas are a normal condition of science in government. But dilemmas are far more likely to turn into problems when communication and dialogue break down. Most employees in Environment Canada, or any large organization, are far removed from high level decision-making, which to many of them is an ill-understood process. Science and science advice are but one component in decision-making in government. Employees become frustrated when they do not understand how decisions were ultimately taken,

especially when they perceive that the decisions run counter to their own personal or professional views.

There is no substitute for ongoing dialogue between managers and employees, to understand the basis for key decisions in the department. That does not mean that managers need to act as apologists for all departmental or government decisions. It does mean that to the best of their ability, they need to explain to employees why decisions were taken, even if they themselves disagree with those decisions. The essence of many dilemmas is that there is no one correct answer, and that any answer may produce winners and losers. Dialogue not only means explaining how and why decisions were made, but seriously attending to employees' legitimate ethical dilemmas and concerns. Nothing is more sure to exacerbate dilemmas than an absence of dialogue - which is a two-way process.

Recommendations for Further Action

In launching this project Environment Canada has begun an important dialogue with its staff. Employees are now waiting on the department to respond concretely to the initial round of consultations. Following are a number of suggested initiatives for senior management to consider.

1 - Appoint Someone to be Responsible

In authorizing the recent workshop consultations, the Department sent a signal to employees that it wants to place priority on values and ethics. Environment Canada's science workforce is looking to senior management to act on the findings of the dialogue, and advance the science values and ethics agenda. Failure to do so will cast doubt on the Department's commitment to values and ethics.

In order for Environment Canada to maintain the momentum of the science values and ethics file, we suggest that one individual be given responsibility for operational values and ethics activities at Environment Canada. This individual should report directly to one or more senior management champions. He or she should develop an annual work plan with measurable objectives and outcomes, and should have an appropriate budget to implement the work plan. One possibility worth exploring is to ask a retired or emeritus science employee who is familiar with the Department and has personal credibility, to undertake the assignment. The responsible individual can give some thought to establishing a volunteer staff advisory committee or task force for the values and ethics activities.

2 - Develop an Employee-Centred S&T Ethics Framework

EC should establish a volunteer committee of interested employees (see previous section) to develop an EC S&T ethics framework. As discussed previously, the framework should include:

- a vision/mission statement for EC S&T; and,
- an updated EC code of conduct with increased emphasis on the Department's S&T roles.

In developing the framework the advisory committee should consult widely within EC, and possibly in other SBDAs, to look for best practices.

3 - Create a Neutral Space for Advice, Dialogue and Debate

One challenge for EC is to establish a neutral space within which employees can raise values and ethics challenges they are experiencing, without fear of retribution. This concept is easy to formulate and difficult to implement. There will always be a tendency among some employees to mistrust the neutrality and independence of values and ethics mechanisms established by senior management. Nevertheless, a number of possibilities seem worthwhile to us which may be considered individually or together.

- Value and ethics column in the Departmental newsletter

Much like the Globe & Mail's *Ethics 101* column, this would be a regular column in EC's newsletter (*Let's Talk Green*) to which employees could anonymously submit values and ethics dilemmas they are facing. Other EC employees would be invited to discuss the dilemmas and offer suggestions. An alternative would be an online version of the column on the Department's Intranet (*InfoLane*).

- Values and ethics advisory network

This advisory network would be made up of interested individuals, such as members of the Department's volunteer advisory committee (see recommendation 1), employees who had participated in a designated professional development workshop (see recommendation 5), or emeritus employee volunteers.¹⁶ The advisory network would be charged with organizing values and ethics discussions in the Department (e.g., brown bag lunch sessions) to explore various dilemmas using case studies. EC employees who felt their dilemmas were not being adequately addressed in their work unit, would be offered the chance to discuss their dilemmas with a local volunteer advisor. The advisor would make the employee aware of his or her options for having their concerns dealt with through channels. If the advisor felt the situation

¹⁶Emeriti could receive a small honorarium in return for their contributions.

warranted direct action, they would be empowered (with the agreement of the employee in question) to bring it to the attention of senior management.

- Departmental science values and ethics specialist advisor/ombudsman

A third possible route for EC to consider, is to appoint a neutral individual to act as the Department's specialist science values and ethics advisor. This individual would hear employees' concerns and advise the employee about his or her options. With the employee's agreement, the advisor would be empowered to take concerns to the attention of senior management. A refinement would permit the departmental advisor to issue written reports on his or her findings, which would be distributed within the Department. Ideally, the departmental advisor would complement the work of the values and ethics advisory network, and would deal with important issues which had department-wide implications, and which were referred to them by a volunteer network member. In effect, the volunteer network would be the local point of contact for values and ethics concerns, while the departmental advisor/ombudsman would handle more complex circumstances.

4 - Develop an Orientation Program and Employee Manual

We recommend that Environment Canada develop a comprehensive orientation program for new employees. The program could be offered - possibly in cooperation with other 5NR partners - three or four times per year. New employees would be required to participate during their initial term of employment. The orientation program should include a strong component covering science roles, values and ethics, the operation of government, the science-policy process, and other important matters which new employees should know about.

As part of the above employee orientation, a manual should also be developed which would cover many of the issues above and also serve as a reference for employees during their careers at EC.

5 - On-Line Values & Ethics Training / Resource

As part of the government on-line initiative, EC should consider offering science ethics and values training to all of its employees through an on-line training program, which would highlight all existing resources available. The training could include orientation modules in the following areas:

- Conflict of interest code;
- Public service values;
- Access to information;
- Workplace health and safety;
- Framework for S& T Advice ;

- CEPA;
- Internet use;
- Sexual harassment policy;
- Partnering & collaboration;
- Data and copyright ownership;
- Media relations; and
- Contracting with suppliers

The on-line program would also include a function which would allow employees to communicate with each other across the country on issues relating to ethics and values at EC. For example, case studies and various dilemmas, which EC employees might confront in their work, could be circulated to them asking for their response..

6 - Create Professional Development Opportunities

Values and ethics workshops should be offered regularly throughout the year to managers and employees, as part of their individual professional development plans. Individuals who participate in the workshops would be offered the opportunity to become volunteer advisors, and participate in other departmental values and ethics activities.

7 - Establish Clearly Defined Channels

We recommend that EC establish a clear set of procedures for handling employee grievances on science values and ethics related matters. Employees want to know what to do when they encounter dilemmas, witness ethical violations, etc. Throughout this assignment it became apparent that while employees recognized the importance of taking their grievances through the proper channels, on reflection they did not always know what these were. Presumably developing a set of procedures would involve a science values and ethics advisor or ombudsman.

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