# POLLUTION PREVENTION PLANNING

A VOLUNTARY INITIATIVE FOR MAJOR INDUSTRIAL SITES

IN BRITISH COLUMBIA

by

Catherine Ponsford

B.A.Sc. University of British Columbia 1992

## APPROVAL

## ABSTRACT

Both nationally and internationally, governments are considering alternatives to the traditional command

## ACKNOWLEDGEMENTS

In acknowledging those who have helped me complete this report, I must first recognize the study participants, without whose cooperation this study would not have been possible. Representatives from all three stakeholder groups – the Ministry of

## TABLE OF CONTENTS

# TABLES

## FIGURES

## ABBREVIATIONS

| | |
|---|---|
| ADt | Air dry tonne of pulp |
| AOX | Halogenated organic compounds |
| BC | British Columbia |
| BOD | Biochemical oxygen demand |
| CCPA | Canadian Chemical Producers' Association |
| EMS | Environmental management system |
| ISO | International Organization for Standardization |
| MELP | Ministry of Environment, Lands and Parks |
| mg/L | milligrams per Litre |
| MOU | Memorandum of understanding |
| P2 | Pollution prevention |
| VNRI | voluntary nonregulatory initiatives |

the Environmental Protection Agency (EPA) is estimated to have introduced more than 11,000 pages of regulations since its founding in 1970 (Higgins 1995, 65).

These regulations typically reflect a "command and control" management approach to environmental protection. Governments **command** industry through environmental laws, defining exactly what is required for environmental protection. Governments then **control** industry, ensuring that laws are adhered to by enforcing requirements through strict liability in criminal courts. These command and control regulations frequently define what performance standards must be met (quantity and quality of discharge at the end-of-pipe), what pollution control technologies must be used, and what design standards must be met. In Canada, governments have been more likely than their American counterparts to negotiate compliance agreements with offending companies rather than impose sanctions (Labatt and Maclaren 1998, 194). Nonetheless, the underlying approach to environmental protection has been the same.

This command and control management approach has been used to date in North America with limited success. Where pollution has been obvious, acute and widespread, command and control has provided a means of forcibly reacting to the most obvious and easily detected sources of pollution. It has provided "soot-free skies and phosphate-free lakes" (Wylynko 1999, 161). However, in addressing the more subtle, more complex and more poorly understood sources of pollution, this approach is proving to be increasingly unwieldy. Criticisms of command and control as it has been applied to major industrial operations have been voiced by government, industry, and other stakeholders.

A common criticism of the command and control approach is that it is not a practical nor cost effective means of addressing the growing myriad of environmental issues. Government's hands-on approach to date of defining allowable contaminant discharges, best management practices, and best available technologies is increasingly onerous as the range of industries and the number of contaminants of concern continues to rise. Furthermore, new environmental regulations are costly and time consuming to develop,

and subject to much debate and criticism because of the uncertainty of environmental science. As new scientific information comes to light, these regulations are not easily changed. The enforcement of regulations in criminal courts is often very costly and difficult as violations must be proven beyond a reasonable doubt. Sufficient evidence for such prosecutions is not easily nor cheaply collected. Critics argue that government resources are expended on paperwork and litigious debates while industry resources are spent on government requirements that are not cost effective. These resources could be spent to much greater environmental effect.

The command and control approach is also said to provide no incentives for industry to perform beyond compliance with existing environmental requirements. Companies that exceed compliance are not recognized, while those that risk trying new environmental technologies are threatened with prosecution should the experiments fail. Desirable innovation and business transformation are effectively discouraged by the inflexible nature of environmental regulations.

Furthermore, the command and control approach has been criticized for fostering an adversarial relationship between government and industry, that of polluter and police. This adversarial relationship discourages the exchange of information relevant for efficient and effective environmental protection. Innovation and business transformation are further discouraged by this adversarial relationship.

The publics[1] are also demanding a greater role in environmental management. Where environmental issues have traditionally been negotiated between government and industry behind closed doors, the publics are demanding greater transparency.

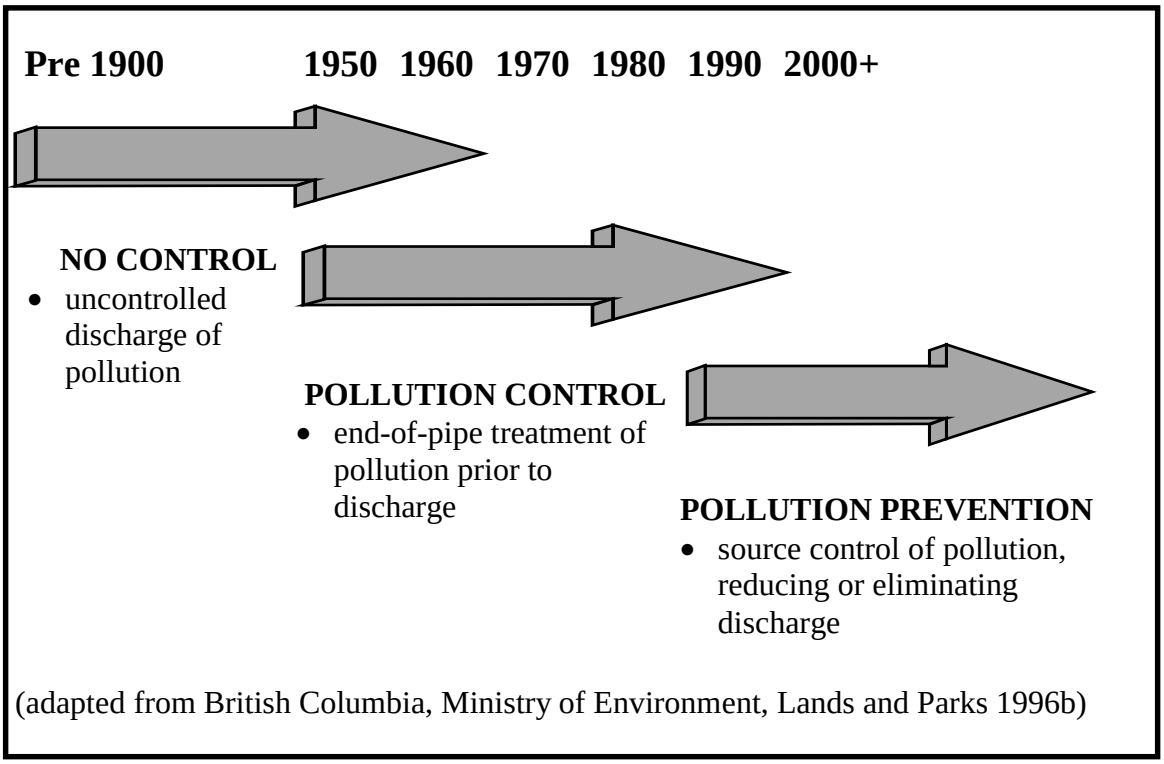
Given these criticisms of the command and control approach, government, industry, and the publics are interested in considering new management approaches for environmental

[1] The plural of public, that is publics, is intentionally used to reflect the wide range of interests and concerns found in the general population.

protection. Such approaches should not only address the shortcomings of the existing system, but also bring society closer to achieving the overarching goal of sustainability. Sustainability has been defined as meeting the needs of the present generation without compromising the ability of future generations to meet their own needs (World Commission on Environment and Development 1987, 43). In order to achieve sustainability, the current institutional, social and economic arrangements are subject to change.

Toward achieving this goal of sustainability, new approaches to environmental protection

**Figure 1 Approaches to pollution**




In moving toward sustainability, the roles and relationships between stakeholders can also be reconsidered. In the traditional approach, government unilaterally decides what measures should be taken for environmental protection, industry reluctantly complies with most requirements, and the publics observe through the media, commenting only outside of the process. Conversely, new approaches often try to integrate these different sectors of society in developing a shared responsibility for environmental protection (ten Brink 1998, 1). As illustrated in figure 2, the narrow view of government and industry interacting only through regulations could be replaced by a broader model including the publics and market as major players in environmental protection (Afsah, Laplante, and Wheeler 1996).

**Figure 2 Changing relationships between stakeholders**

**TRADITIONAL APPROACH**

In this new model, government and industry can work together toward achieving more effective and efficient means of environmental protection, including the publics as stakeholders in the development and implementation of these new means. Market forces can also be brought to bear on polluters to change their approach to environmental protection. With greater public involvement, greater market pressures, and the opportunity to contribute to the development of environmental management measures, industry has greater incentives to improve environmental performance.

These changes in thinking regarding how environmental issues should be managed is reflected in a variety of policy instruments, developed as alternatives or compliments to traditional command and control based regulations. Governments now employ a range of financial incentives, education and training measures, market instruments, and voluntary initiatives toward achieving the goal of sustainability. This paper considers the use of one such instrument, a voluntary initiative, in the context of British Columbia's historically command and control based approach to environmental protection. More specifically, this study considers the use of BC'y. iments to

study questions. Recommendations for the future of the P2 planning process are also made.

# Chapter 2 VOLUNTARY INITIATIVES

## *2.1 Introduction*

The term "voluntary initiatives" is used to refer to a wide range of measures to improve corporate environmental performance. By definition, such measures are not explicitly required by law. Instead they encourage companies to go beyond what is required to comply with existing environmental laws.

Voluntary initiatives can be developed exclusively by industry, by government, by public groups, or any combination thereof. Voluntary initiatives can be formal, documented programs with clearly defined starting points and participation requirements. Alternatively, they can be informal programs where companies are challenged to do what they can towards achieving a general goal without any specific requirements. Voluntary initiatives can include some mandatory elements for companies that voluntarily agree to participate, or be entirely voluntary in nature. The general term voluntary initiative is often used to refer to private codes, voluntary agreements, covenants, codes of conduct, challenges, and voluntary nonregulatory initiatives (VNRI).

## *2.2 Voluntary initiatives in Canada*

Although voluntary initiatives are a relatively new concept, there are many examples of this approach to environmental protection in practice. The Canadian Chemical Producers' Association (CCPA) was one of the first industry associations to develop a voluntary initiative in 1985. Its Responsible Care program requires that all participants adhere to six codes of practice and a set of guiding principles[2]. Compliance with the Responsible Care requirements is a condition of membership in CCPA. All member companies are evaluated every three years by industry and nonindustry representatives to ensure that they meet the standard (Overholt and Godsoe 1996, 1). In Canada and the

[2] These codes of practice and guiding principles address community awareness, emergency response, researcy ael8pee,

United States, where a similar Responsible Care program was adopted by the equivalent national association, the Chemical Manufacturers Association, over 90 percent of the basic chemical production is in facilities that meet the Responsible Care standard (Nash and Ehrenfeld 1996, 19). This is an example of a voluntary initiative developed independently by industry.

Governments also develop voluntary initiatives. For example, the Ontario Ministry of Environment and Energy recently introduced a Pollution Prevention Pledge Program. In this program, facilities that voluntarily commit to, plan for, and achieve pollution prevention measures greater than those required by law can be publicly recognized for their achievements and eligible for environmental awards. In order to encourage companies to reduce the release of chemicals into the environment, the use of toxic chemicals, and the generation or disposal of hazardous or liquid industrial wastes, the ministry proposes to reward companies that improve process design or operation and maintenance, eliminate or substitute polluting raw materials, or reformulate their products. In addition to this pledge program, the ministry also challenges industry to reduce the release of some of the most persistent, toxic, and bioaccumulative chemicals as listed on the Candidate Substances list for Bans and Phaseouts 50% by 1995 and 90% by 2000 (Ontario, Ministry of Environment and Energy undated). As of December 1996, 195 sites had enrolled in the early stages of the pledge program (Ontario, Ministry of Environment and Energy 1997). This is an example of a voluntary initiative developed independently by government.

Voluntary initiatives can also be developed by government and industry in conjunction. For example, the Ontario Ministry of Environment and Energy has signed memorandums of understanding (MOU's) with five business sectors for reduction in the production, use, release, and generation of 43 priority toxic substances and pollutants by the year 2000. The MOU's outline the goals and purpose of the agreement and the intent to meet these goals (Labatt and Maclaren 1998, 195). Since signing the MOU, the motor vehicles manufacturing sector, with 29 participating facilities, has achieved a cumulative

reduction of 332,870 tonnes of pollutants discharged (Ontario, Ministry of Environment 1999).

The three preceding examples illustrate the use of voluntary initiatives in Canada. There is an even greater use of voluntary initiatives internationally, for example in Europe, Australia, and the United States.

### *2.3 Voluntary initiatives internationally*

In Europe, over 300 environmental agreements between industry and national governments had voluntarily been signed as of 1996 (ten Brink 199??, 1). The

program is entirely voluntary, the terms of participation are mandatory once voluntarily agreed to (ICF Kaiser 1998, 16).

The Environmental Protection Agency (EPA) of the United States has introduced a number of voluntary initiatives in the last decade. One such initiative is Project XL (e**X**cellence and **L**eadership). It offers regulatory flexibility for companies willing to voluntarily achieve environmental protection superior to that required under the existing regulatory system, including stakeholders in the process. For example, at its facility in Arizona, the Intel Corporation offered to reduce air emissions to below current standards, to recycle 65% of freshwater used, and to reduce 60% of the solid waste generated and 70% of the non-hazardous chemical wastes generated by the year 2000. In return, EPA replaced Intel's multiple permits with a single permit which defined a facility-wide cap on air emissions. This gave Intel the flexibility to make operational changes without having to apply for permit amendments first. Furthermore, Intel's reporting requirements were simplified from multiple submissions for different agencies to a single report for a state agency (United States, Environmental Protection Agency 1997, 5). These simplified regulatory requirements and operational flexibility translated into operational cost savings for Intel.

Additional EPA voluntary initiatives include the 33/50 program, to reduce the generation of 17 chemicals by 33% and 50% by 1992 and 1995 respectively. Its Green Lights program encouraged the use of energy efficient lighting. Under the Water Alliances for Voluntary Efficiency (WAVE) program, hotels, commercial buildings, and institutions are encouraged to retrofit facilities with water-efficient fixtures (Higgins 1995, 24).

There are many more examples of voluntary initiatives being used in Canada, North America, and around the world. There is a wide variation within and between countries in the range of parties developing the initiatives, the companies participating in the initiatives, the involvement of stakeholder groups, and the conditions of participation.

However, the overall concept is essentially the same, that of corporate environmental performance voluntarily improved beyond what is required by law.

## *2.4 Incentives for industry to participate*

Why would industry voluntarily improve its environmental performance if it is not required by law? There are many incentives suggested in the literature. The most commonly cited incentives are:

- cost savings
- public image and market differentiation
- peer pressure
- due diligence concerns
- desire to avoid regulation

### 2.4.1 Cost savings

Cost savings can arise from improving process efficiencies while concurrently addressing environmental protection. When raw materials are used more efficiently, more product is made, and fewer waste products, often a source of pollution, are generated. For example, the 3M Company estimates that its "Pollution Prevention Pays" program has saved $750 million since 1975 in waste generation, eliminating 590,000 tons of pollutants (British Columbia, Ministry of Environment, Lands and Parks 1996b, 5).

### 2.4.2 **Public image and market differentiation**

By voluntarily improving their environmental performance through participation in a voluntary initiative, firms can differentiate themselves from their competitors and improve their public image, both locally and internationally. The importance of this incentive was recently illustrated in EPA's 33/50 program. Companies with higher advertising expenditures were significantly more likely to participate than those with lower advertising expenditures (Arora and Cason 1996, 431).

Even companies that meet all the required environmental standards may wish to improve their public relations by participating in a voluntary initiative. For example, Du Pont Corporation was listed as the largest polluter when the EPA released the first Toxic Release Inventory (TRI) information in 1988, even though all the discharges were permitted under existing regulations. This stain on Du Pont's public image stimulated a more proactive attitude within the company (Labatt and MacLaren 1998, 200).

### 2.4.3 **Peer pressure**

Industry sectors concerned with public image may apply significant pressure on individual companies to comply with a sector-wide code in order to improve the public image of the industry as a whole. For example, the Canadian Chemical Producers' Association's Responsible Care initiative was developed shortly after the Union Carbide accident in Bhopal, India, where 2,000 people were killed and thousands permanently injured from a toxic gas leak at a pesticide plant (Macdonald 1991, 116). Following this incident, public trust of the chemical producers' industry was extremely low. Now, all members of both the American and Canadian Chemical Producers' Associations must meet the Responsible Care standard (Nash and Ehrenfeld 1996, 19).

firmly support either viewpoint. However, the theory and limited experience to date do identify some of the important issues. These issues are:

- cost savings
- effectiveness
- cooperation
- innovation
- competition
- due diligence
- public involvement

### 2.5.1 Cost Savings

Voluntary initiatives could result in reduced government expenses for the costly development and approval of new regulations. In light of new information, standards set by the initiatives could be changed more quickly and cheaply than by altering existing regulation. Voluntary initiatives could have lower associated administration and implementation costs, with no enforcement costs (Labatt and MacLaren 1998, 202). Industry could have more flexibility to introduce more cost effective solutions to environmental problems. Both government and industry could save expensive litigation costs when further refining or enforcing existing environmental regulations (Arora and Cason 1996, 414).

Critics of voluntary initiatives argue that the negotiation and implementation of such initiatives could be very time consuming for government and industry, and not necessarily cheaper than developing new regulations. Once such initiatives are developed, they might only apply only to some sectors of industry, of which only some members participate. If not widely adopted, government may have to develop new regulation anyway to replace the voluntary initiative (Clark 1995, 19).[4] Furthermore, the flexibility of such initiatives introduces legal uncertainty which could lead to costly legal

[4] For example, Canada's previous Environment Minister, Christine Stewart recently added 18 chemicals to the Canadian Environmental Protection Act (CEPA) after voluntary measures failed to demonstrate

debates, offsetting any cost savings realized. In any case, cost savings alone are not always an adequate incentive to ensure industry adopts pollution control measures.[5] Even if a company decides to implement cost effective measures, voluntary initiatives may not provide adequate incentives for continual improvement (Labatt and MacLaren 1998, 203).

### 2.5.2 Effectiveness

Environmentally responsible companies could take the opportunity afforded by voluntary initiatives to make real changes in their own operations, freeing up government resources for more irresponsible companies, with the overall result of more effective environmental protection. Furthermore, as participating companies meet their voluntary goals, great environmental protection could be effected than might otherwise have been achieved[6].

### 2.5.3 Cooperation

Voluntary initiatives could develop a more cooperative approach to environmental protection than traditional adversarial approach of command and control. This could lead to better information exchange between government and industry, possibly resulting in more informed decisions. Industry could take on a greater leadership role in environmental protection, have some ownership of environmental successes. This leadership mindset would differ from the more traditional attitude where industry only did what was explicitly required.

However, in their efforts to negotiate these new standards, governments could be outnegotiated or captured by industry. When governments assist in developing or promoting voluntary initiatives, some would argue there are implication that industries involved will not be regulated further. If voluntary initiative proves to be unsuccessful, the cooperative goodwill established between government and industry could be lost when government resorts to introducing regulation. Some critics even argue that voluntary initiatives give industry the opportunity to write their own standards, become judges in their own cases (Overholt and Godsoe 1996, 5).

### 2.5.4 Innovation

Innovation and investment in new technologies could be stimulated by the flexibility of voluntary initiatives. The diffusion of such technologies and best management practices could be encouraged within industry by increased communication (Canada, Industry Canada, Office of Consumer Affairs and Treasury Board Secretariat, Regulatory Affairs Division 1998).

However, innovation may not necessarily be stimulated; in fact, voluntary initiatives may

### 2.5.5 Competition

Companies that participate in voluntary initiatives could have a competitive edge over other companies as a result of more efficient operations and better public image. Voluntary initiatives could lead to a more competitive economic climate, encouraging effective and efficient operations (International Institute for Sustainable Development and Canadian Environmental Technology Advancement Corporation - West 1998, xv).

However, there is a concern that some voluntary initiatives could be anti-competitive, in violation of the *Competition Act.* Such initiatives should not be used in a way "that substantially reduces competition, prevents non-participating firms from entering the market or negatively affects consumers by significantly raising prices, reducing service or limiting product choice" (Canada, Industry Canada, Office of Consumer Affairs and Treasury Board Secretariat, Regulatory Affairs Division 1998).

### 2.5.6 Due diligence

Voluntary initiatives could assist in developing the standard for due diligence (Canada, Industry Canada, Office of Consumer Affairs and Treasury Board Secretariat, Regulatory Affairs Division 1998). However, the level of due diligence provided by participation in a voluntary initiative may be misleading, giving industry a false sense of security, and possibly resulting to unexpected liabilities (Clark 1995, 21).

### 2.5.7 Public involvement

Voluntary initiatives provide an opportunity for greater public involvement, for improved communication between government, industry and the publics. Public involvement in the

However, not all voluntary initiatives include public involvement; of those that do, not all involvement is actually meaningful. Where the publics are not included in the initiative, the public credibility of that initiative can be called into question and an opportunity for public trust lost (Lukasik 1999, 145).

### *2.6 Elements of a successful voluntary initiative*

There is no clear consensus on whether voluntary initiatives are an improvement on, or an important addition to, more traditional command and control approaches. This is partially because voluntary initiatives are a new concept; there is not much evidence to support statements either for or against them. The current ambiguity can also be attributed to the fact that so many different kinds of voluntary initiatives have been introduced. Some well conceived and designed initiatives have been a success, attracting widespread participation and earning public credibility. An example of such an initiative is the CCPA's Responsible Care program (Moffet and Bregha 1999, 85). Others have failed to attract much participation or public credibility, leaving observers either nonplussed or critical of voluntary initiatives in general. The Canadian Industry Packaging Stewardship Initiative is such an initiative (Chang, Macdonald and Wolfson 1999, 125).

Nonetheless, there is much momentum behind this new approach to environmental protection. A number of parties from many stakeholder groups are taking an increasing interest in voluntary initiatives. Recognizing the growing role of voluntary initiatives, these stakeholders have presented arguments for and against their use, and proposed

and New Directions Group (an informal forum of business and environmental organizations), government offices such as Industry Canada and the Commission to the Council and the European Parliament on Environmental Agreements, as well as a number of independent authors, academic and otherwise. In reviewing this literature, it becomes apparent that a number of similar elements have been proposed by most interested stakeholders. As such, a sort of consensus seemed to emerge as to what are the most important elements of a voluntary initiative. These elements are summarized in the following table. A discussion of each element follows.

## Table 1. Elements of a successful voluntary initiative

**1. SUFFICIENT ADVANTAGES OF PARTICIPATION.**

- 

### 2.6.1 **Sufficient advantages of participation**

In order to attract companies to an initiative, encourage its adoption by those companies, and ensure long term participation and compliance with an initiative, there must be sufficient advantages of participation. These advantages can be inherent to the process, such as cost savings, improved process efficiencies, and better public relations. Advantages can also be external to an initiative. Such external incentives can be "carrots," such as subsidies, tax breaks, or some form of regulatory relief. External incentives can also be "sticks," such as the threat of tougher environmental regulation (ten Brink 1998). In many cases, the credible threat of regulation is said to drive voluntary action (Riordan 1997). The advantages of participation should encourage continual improvement not only at the beginning of an initiative, but in the long term as well (New Directions Group 1997).

Where voluntary initiatives apply specifically to a certain industry sector, free riders should be discouraged; there should be negative repercussions for failing to join or comply with an initiative (Canada, Industry Canada, Office of Consumer Affairs and Treasury Board Secretariat, Regulatory Affairs Division 1998). Free riders are companies that benefit from a voluntary initiative, such as enjoying overall improved industry sector public relations, without actually making any or much effort to contribute to the initiative.

### 2.6.2 **Participant commitment to process**

In order for a voluntary initiative to be effective, participants should commit to an initiative, should adv

Participants can demonstrate commitment through explicit statements and regular involvement of senior leaders (Resources Futures International 1996). The principles of an initiative should be disseminated internally throughout the organization staff as well as externally to suppliers and clients (ten Brink 1998). The objective of an initiative should be integrated into the policies and procedures of a company, as well as the choice of success indicators (ToBI 1999). Adequate resources, especially people, time, and money, should be allocated to an initiative (New Directions Group 1997).

### 2.6.3 **Ground rules**

In order for all stakeholders to have a common understanding of what a given voluntary initiative entails, ground rules for participation must be clearly defined. Easily measurable, clear goals, objectives, targets, and timeframes should be established prior to beginning an initiative (New Directions Group 1997). In this way, the expectations of participants are transparent. External stakeholders can check on the progress and performance of participants compared to the program objectives. The targets set should be update-able so that they represent more than just business as usual, that is, targets that would have been met even without the initiative (ten Brink 1998).

Similarly, the roles and responsibilities of all participants, be they government, industry or public representatives, should be clearly defined (New Directions Group 1997). In this manner, effective communication and common expectations can be more clearly established.

A clear understanding of the legal implications of participation should be established prior to beginning an initiative. Although an initiative may be entered into voluntarily, there may be legal implications arising from information disclosed, for example unknown spills, or legal responsibilities, such as previously unreported discharge sites. In order for industry participants to have a clear understanding of what participation entails, such

legal uncertainties should be addressed before beginning an initiative. This is also important for common expectations among other stakeholders.

A transparent and effective dispute resolution mechanism should be established prior to beginning an initiative (Canada, Industry Canada, Office of Consumer Affairs and Treasury Board Secretariat, Regulatory Affairs Division 1998). Should any disagreement arise regarding the expectations of participants, a dispute resolution mechanism, commonly agreed upon prior to beginning an initiative, could be critical in resolving the dispute. Such mechanisms could be not only for complaints related to industry's efforts in the voluntary initiative, but could also address concerns about the commitment of government and public stakeholders to the process.

Rewards and sanctions for a certain level of achievement should be specified prior to beginning an initiative (New Directions Group 1998). For example, rewards could include public recognition programs, reduced regulatory administrative requirements, or reduced regulatory fees. Where the rewards for participation are only those inherent to a program, such as better public relations or improved process efficiency, it is important there is a common understanding that no additional awards will be made.

Similarly, expectations regarding sanctions for not meeting a certain level of achievement should be clearly understood. Such sanctions could include fines, warnings, or a mandatory withdrawal from a program. Sanctions are important in defining what participation in a given program actually entails, gives meaning and credibility to participation; without sanctions, participation in a program could imply great commitment and effort or no effort at all. In some circumstances, program developers may determine that formal sanctions are not appropriate for a program's objectives. In this case, the absence of sanctions should be acknowledged, while any implied, informal sanctions understood.

### 2.6.4 Credibility

External stakeholders should be able to meaningfully participate in the development, implementation, and monitoring of an initiative. External stakeholders are persons affected in some manner by an initiative who are not industry or government representatives directly involved in developing a voluntary initiative. For example, external stakeholders could include any other levels of government not already involved, nongovernment organizations, and members of the public at large. Such stakeholders should be included to voice concerns, provide suggestions, and observe the process. Without such external stakeholder participation, voluntary initiatives devised between government and industry alone may have little credibility; external stakeholders might suspect that a government agency was "captured" by industry.

Not all external stakeholders will necessarily be interested or able to participate in the development, implementation, and monitoring of an initiative. Nonetheless, information about an initiative should be easily available for such stakeholders. The process should be transparent, that is, information necessarily to ensure the credibility of a program and its participants should be publicly available.

The adequate monitoring of appropriate performance indicators should be required. Appropriate performance indicators should be chosen as a means of measuring progress of program objectives and targets. Adequate monitoring of these indicators is necessary to clearly identify any progress or lack thereof in achieving program objectives and targets against their respective timelines. Where appropriate, there should be third party verification of these monitoring results, a party qualified to comment without bias on the monitoring procedures and results (Lynes and Gibson 1998, 19). This can be important to ensure credibility of results.

Regular, public reporting of results should be part of an initiative (ToBI 1999). What will be reported and how often should be determined prior to beginning an initiative and required as part of participation. Regular reporting of results, as opposed to intermittent

reporting, is important so that all participants have a common understanding and expectation as to what information will be made available and how often.

### 2.6.5 **Flexibility and innovation**

A key advantage of voluntary initiatives is the flexibility they can allow, a defining difference from the command and control approach. Flexibility enables participants, industry and government alike, to consider new alternatives and creative solutions. Programs should be designed with adequate flexibility to enable and encourage innovation. Such innovation could be in process, operations, management, or administration.

### 2.6.6 **Supportive policy framework**

A voluntary initiative does not exist in isolation. There are often many other government policy tools, such as regulations, as well as other incentive structures, such as those related to corporate public image, that influence the effectiveness of a voluntary initiative. The initiative should be designed in light of these other factors and positioned within a supportive policy framework (New Directions Group 1998). A voluntary initiative can be used as a substitute for or a compliment to other policy initiatives (ten Brink 1998). Other complimentary regulatory and civil mechanisms should be used to achieve the policy objectives where an initiative falls short (ToBI 1999).

## *2.7 Case study*

Voluntary initiatives are an interesting alternative to or compliment of more traditional command and control, regulatory approaches to environmental protection. These initiatives are increasingly attracting the attention of governments, industry, nongovernment organizations, and publics around the world.

Locally, the Ministry of Environment, Lands and Parks in British Columbia is considering alternatives to the existing command and control based regulatory structure.

Although the future of any such alternatives is as yet uncertain, voluntary initiatives may have an important role to play in such changes.

The following chapter considers the history of command and control in British Columbia and the proposed changes to this approach. A new process, recently tested with seven industrial companies, is also described. This process is significant at it may be introduced as a voluntary initiative for industrial companies throughout British Columbia.

# Chapter 3 BRITISH COLUMBIA

**Figure 3 Authorization to discharge waste**

restricted to waste management. Voluntary stewardship and partnerships with others should be included in this new approach, maintaining the ministry's authority to make regulations as necessary (British Columbia, Ministry of Environment, Lands and Parks 1992a, 19).

That same year, MELP's Environmental Protection Program announced a 5 year action plan (British Columbia, Ministry of Environment, Lands and Parks, 1992b). Two of the strategic actions for the private sector included the following:

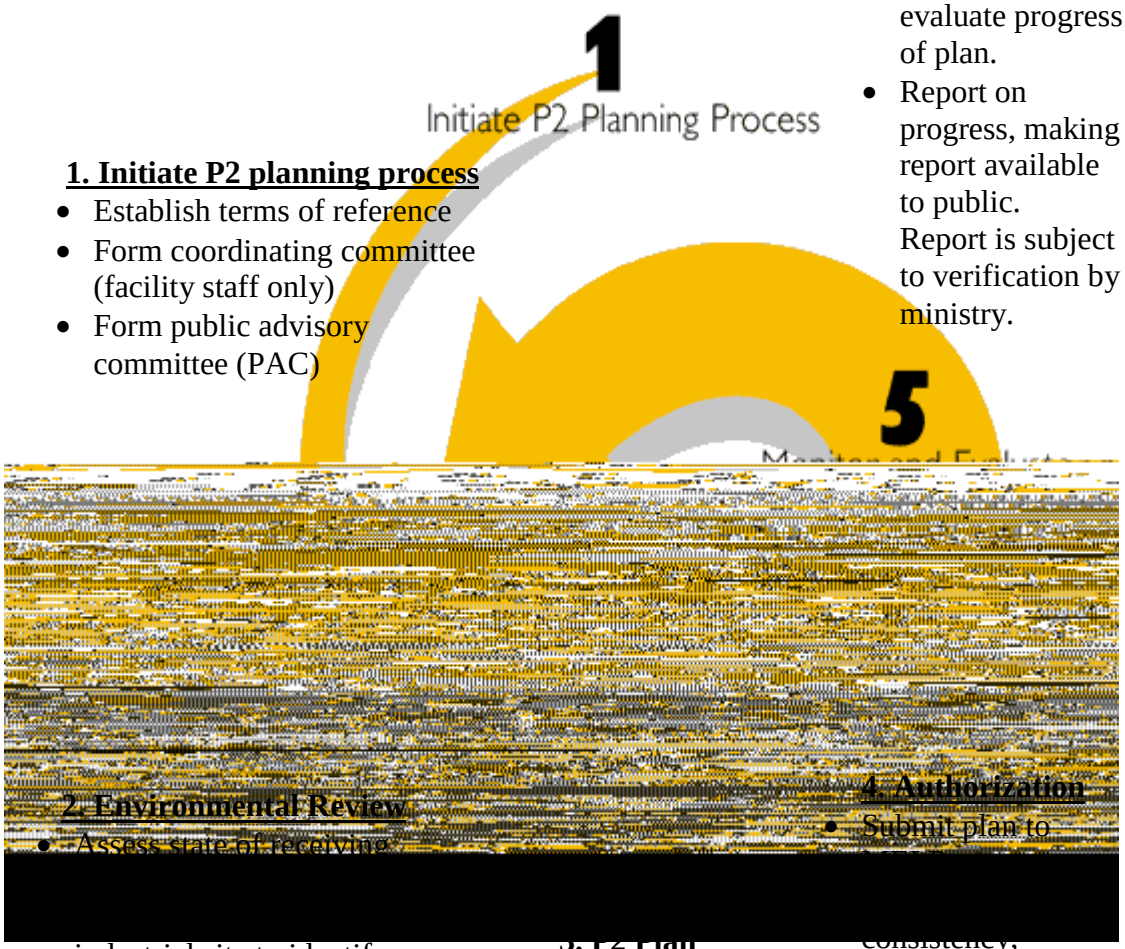
- "require individual companies and industry sectors to develop 5-year plans for

### 3.3 BC's pollution prevention planning initiative

The ministry set out to develop a new approach to environmental protection that incorporated the objectives identified in the five-year plan, addressed the identified shortcomings of the existing system, and took into consideration recommendations of the KPMG study. As a result of these efforts, MELP announced a new industrial pollution prevention (P2) program in March of 1996, developed in conjunction with several industry representatives (British Columbia, Ministry of Environment, Lands and Parks 1996a). The new program is described in MELP's *An Introduction to Pollution Prevention Planning for Major Industrial Operations in British Columbia* (British Columbia, Ministry of Environment, Lands and Parks 1996b). Pollution prevention is described in this document as "avoiding, eliminating and reducing pollution at source rather than treating or containing it after it has been created."

In this initiative, industry participants are to develop a plan for realizing pollution prevention at their specific facility according to a P2 planning process. The P2 planning process as initially defined consists of five components. These five components are described in figure 4. Input for each plan from the public is acquired through a public advisory committee (PAC).

**Figure 4 BC's P2 planning process**




**1. Initiate P2 planning process**

- Establish terms of reference
- Form coordinating committee (facility staff only)
- Form public advisory committee (PAC)

**2. Environmental Review**

- Assess state of receiving industrial site to identify opportunities to prevent pollution.
- Assess options for environmental, technical and financial merits.
- Prioritize options for future action.

**3. P2 Plan**

Develop and document a P2 plan identifying options to be implemented and corresponding timeframes.

**4. Authorization**

- Submit plan to [illegible] consistency, comprehensiveness and thoroughness of plan.
- One approved, authorization replaces previously granted permits and approvals.

**5. Monitor and Evaluate**

- Monitor and evaluate progress of plan.
- Report on progress, making report available to public. Report is subject to verification by ministry.

(adapted from British Columbia, Ministry of Environment, Lands and Parks 1996b, 1997)

More public involvement is also incorporated into the P2 planning process through public advisory committee's. This gives the publics an opportunity to participate in the development of environmental protection measures, not just react to measures once they have been implemented. Furthermore, a more open communication between the publics, government, and industry could lead to a better understanding of priorities, limitations, and possibilities.

### *3.4 The P2 planning demonstration project*

When introducing the P2 planning process in 1996, MELP concurrently launched a P2 planning demonstration project with five volunteer industry companies. These companies had been working with MELP since 1993, actively discussing such an initiative. Both industry and government agreed that "there could be mutual benefit in a system that would encourage the prevention of pollution, broaden the scope of environmental management, reduce the costs of, or offer alternatives to, the permitting process and be more sensitive to community interests" (British Columbia, Pollution Prevention Demonstration Project Steering Committee 1997, 1).

The purpose and objectives of the British Columbia P2 demonstration project were described in a memorandum of understanding (MOU). The main goal of the parties was "to determine whether P2 planning could contribute to achieving a better standard of environmental protection while accommodating social and economic concerns and priorities" (British Columbia, Pollution Prevention Demonstration Project Steering Committee 1999, 3). The original signatories of the MOU were MELP, Cominco Ltd., Fletcher Challenge Canada Ltd., Tilbury Cement Ltd., Westcoast Energy Inc., the Canadian Chemical Producers' Association (CCPA), and a CCPA member, FMC of Canada Ltd. Alcan Smelters and Chemicals Ltd. joined the MOU in 1996. Riverside forest products, although never formally becoming a signatory to the MOU, also participated in the demonstration project. In total, seven companies participated in this demonstration project.

As part of the demonstration project, each company agreed to conduct a pilot project at one or more test sites in BC. The test sites for the demonstration project are listed in table 2.

**Table 2. Test sites for P2 planning demonstration project**

| Company | Pilot project site |
|---|---|
| Alcan Smelters and Chemicals Ltd. | Kitimat<br>aluminum smelter (total site) |
| Canadian Chemical Producers Association (CCPA) with representative member, FMC of Canada Ltd. | Prince George<br>hydrogen peroxide manufacturing plant (total site) |
| Cominco Ltd. | Trail<br>fertilizer operation (part of Trail site) |
| Fletcher Challenge Canada Ltd. | Elk Falls<br>pulp and paper mill (total site) |
| Riverside Forest Products Ltd. | Lumby<br>mill (total site)<br>Armstrong<br>mill (total site)<br>Kelowna<br>mill (total site) |
| Tilbury Cement Ltd. | Delta<br>cement plant (total site) |
| Westcoast Energy Inc. | Fort Nelson<br>natural gas processing plant (total site) |

A steering committee consisting of MOU signatories from both government and industry was formed to guide the P2 pilot projects and provide a forum to exchange experiences. This group met periodically to discuss developments, occasionally inviting other stakeholders to contribute. This steering group reported on their experiences in an *Interim Report* and a *Final Report* (British Columbia, Pollution Prevention Demonstration Project Steering Committee 1997, 1999).

As of July 1999, four of the seven participating companies had completed P2 plans according to BC's P2 planning process (Alcan, FMC, Riverside Forest Products, and Westcoast Energy). One company was nearing completion (Tilbury Cement). The two remaining companies had started P2 planning, but determined during the process that a different approach was more suitable for their facilities (Cominco, Fletcher Challenge). Cominco decided that for the Trail fertilizer operation, "the ISO-EMS *(environmental management system)* approach is best suited to the Trail situation" (Cominco Ltd. 1999, 1). Fletcher Challenge, following a ten-month labor dispute and dramatic management restructuring, decided to implement a "Waste Reduction Initiative" instead of pursuing BC's P2 planning process (Easton 1999). Both companies are of the opinion that the process followed was not necessarily BC's P2 planning process, but the overall objective of pollution prevention was met nonetheless.

Although P2 planning was intended to eventually replace permits and regulations as a mandatory authorization for major industrial sites (step 4 of figure 4), entry into the demonstration project was voluntary. Parties were free to withdraw from the MOU and the project at any time. During the course of the demonstration project, the issue of whether P2 planning should be mandatory or voluntary was considered. In the final report, the steering committee concluded that "After much discussion, a general consensus was reached that entry into the process should be voluntary" (British Columbia, Pollution Prevention Demonstration Project Steering Committee 1999, 4). It was felt that little could be gained by forcing companies to develop P2 plans. A comprehensive P2 plan, the beneficial effects of long-term planning through a detailed

### *3.5 Future of P2 planning in BC*

Based on these developments over the last ten years, there is clearly an interest in changing MELP's traditional approach to environmental protection for major industrial operations. The P2 planning initiative is a manifestation of this interest. Following the

# Chapter 4 STUDY QUESTIONS AND METHODOLOGY

The future role of BC's P2 planning process is as yet unclear in the overall policy framework for environmental protection at major industrial sites. It seems possible that P2 planning could become a voluntary measure for companies interested in investigating the benefits of pollution prevention and improving their environmental performance beyond the minimum standard defined by regulations and permits. Although the process was originally intended to replace the existing permitting and regulatory system, P2 planning may instead become a compliance plus, voluntary option for companies. If this is indeed the case, P2 planning will essentially become a voluntary initiative.

This study considers the possibility of P2 planning as a voluntary initiative in BC, looking at two key issues: why companies would participate in such a voluntary initiative and whether the planning process as developed to date includes design elements considered important for a successful voluntary initiative. Many opinions are voiced in the literature regarding these aspects of voluntary initiatives. Furthermore, some direct experience in these areas has now been gained by the voluntary participants of the demonstration project. Using the following two questions, this study tries to better understand these two key issues in a BC context and provide some insights into the P2 planning process.

## *4.1 Study question #1*

process suggests that there at least are some perceived advantages of participation. This study question endeavors to find out what these advantages are.

### *4.2 Study question #2*

**Does the P2 planning process developed to date include design elements suggested in the literature for successful voluntary initiatives?**

As summarized in table 1, section 2.6, *Elements of a successful voluntary initiative*, there are six design elements commonly recommended in the literature for voluntary initiatives. If P2 planning is to become a successful voluntary initiative in BC, it could be useful to consider the experiences of the demonstration project participants in light of these elements.

This study evaluated the process in light of the first five elements: sufficient advantages of participation; participant commitment to initiative; ground rules; credibility; and

### 4.3.2 **Study question #2**

For question #2, inquiries were made of industry, government and public participants in the P2 planning demonstration project. The questionnaire used to answer study question #2, *Questionnaire B*, is attached in appendix C. This questionnaire inquired as to the participants' opinions regarding a number of aspects of the BC P2 planning process. Respondents were asked whether they agreed or disagreed that the first five design elements listed in table 1, section 2.6, were included in the P2 planning process. Respondents were also asked whether or not they thought those elements were important. This question regarding the importance of various elements was included to differentiate between what was commonly recommended in the literature and what participants thought was relevant. Respondents from all three stakeholder groups, industry, government, and the public, were asked to answer the same questionnaire.

Representatives of the seven industrial companies participating in the demonstration project answered the questions as industrial stakeholders. In most cases, the same individual answered both the questionnaire for question #1 and for question #2. However, in several cases, a different individual was recommended by the company to answer the second questionnaire. This second individual was typically someone who was more involved with workings of the P2 planning process than the more senior manager who had answered the first questionnaire. A representative from the CCPA was also asked to complete this second questionnaire as an industry spokesperson.

Government stakeholders were represented by MELP employees. Representatives of the MELP head office in Victoria, where the P2 planning process was initiated and promoted, as well as regional MELP office representatives who had been involved with individual P2 plans in their regions, were invited to answer the questionnaire. Government respondents were identified in discussion with several MELP employees from the head office.

Members of public advisory committees (PAC's) were asked to represent public stakeholders. In order to identify PAC members, the industrial company representatives were asked to provide a number of contact names of members of their PAC's[8]. A member of each PAC was randomly chosen from the names provided and contacted. These PAC members were asked if they had attended most of the PAC meetings and whether they felt they could comment in an informed manner on the PAC experience. In all cases, the respondents agreed that they met these criteria. These seven PAC members, one from each industry PAC, were also asked to complete the questionnaire.

The sample group did not include every industry, government, or PAC member involved in P2 planning. For each of these stakhecg 0 Tcı˝0 Twı˝[(one)]TJı˝0 -1.70 -1apatelveaPAC31.25B7dustrouC

public recognition programs. The inquiry was made in this manner in order to solicit strong opinions and ideas from all three stakeholder groups.

Based on conversations with many program participants and the literature regarding voluntary initiatives, a draft questionnaire for each of the two study questions was developed. This first questionnaire, designed for industry participants only, was pretested by an industry participant and a representative of CCPA. The second questionnaire,

replies to the questionnaires were collected during telephone interviews. These interviews were typically one half to an hour long, depending on the amount of discussion the respondent was interested in pursuing in addition to answering the questionnaire. Two government and two industry respondents preferred to respond to the questionnaires via fax or email instead of telephone. Additional comments from these respondents were included in their returned questionnaires.

The questionnaires were distributed at the beginning of June, 1999. Responses were collected during June and July of 1999. These responses were tabulated on a spreadsheet and summarized in table format. Additional comments made by respondents in answering the questionnaire were compiled. The results collected in this study, and a discussion of these results, follow.

# Chapter 5 RESULTS AND DISCUSSION

BC's P2 planning process was recently tried by seven industrial companies at a total of nine test facilities. This pilot was voluntarily entered into by the participating companies, in addition to their existing regulatory environmental requirements. Based on the results of this pilot, P2 planning is currently being considered as a voluntary initiative for industrial sites throughout British Columbia. In light of this potentially important role of P2 planning, this study investigated two key questions.

**1: Why would industry voluntarily participate in BC's P2 planning process?**

**2: Does the P2 planning process developed to date include design elements suggested in the literature for successful voluntary initiatives?**

This chapter discusses answers to these questions based on comments received from government, industry, and public participants in the P2 planning demonstration project. Questionnaires were the instrument used primarily to answer these questions. An introduction to the questionnaires given to all respondents is reproduced in appendix A.

The answers to the two study questions are considered separately. For each, the relevant questionnaire statements and responses are first reported in table format. These responses are then discussed in the following text. In these discussions, items quoted from the questionnaires are written in **boldface** print.

## *5.1 Why would industry voluntarily participate in BC's P2 planning process?*

**Table 3. Industry incentives, continued**

| INCENTIVE | IMPORTANCE[11] | | | | | Number of times ranked: | | |
|---|---|---|---|---|---|---|---|---|
| | VI | SI | N | SU | VU | 1st | 2nd | 3rd |
| k) other | see below | | | | | | | |
| Additional incentives:<br>• to be involved in planning proposed regulations (most important incentive once)<br>• to build trust and cooperation between all stakeholders (most important incentive once)<br>• to respond to community concerns (second most important incentive once)<br>• to improve environmental performance (second most important incentive once)<br>• to demonstrate industry leadership (third most important incentive once)<br>• to build consensus among all stakeholders on common priorities for environmental actions (third most important incentive once) | | | | | | | | |

When asked to identify their three most important incentives for participating, the volunteer companies most commonly cited **(c) better public relations with local community** (8, 100%) and **(b) better relations with BC Environment** (7, 88%).

The finding that **(c) better public relations with the local community** was an important incentive is supported by the fact that at least three of the seven participating companies already had some type of public consultation forum prior to joining the P2 planning project.

With regard to **(b) better relations with BC Environment** (MELP), the participating industries seemed to want MELP to understand their industrial processes better. Such understanding would hopefully better inform government permitting and regulatory activities. This could be realized through simply more effective permit writing and enforcement, or even through a fundamental change in government's management of environmental protection issues arising from industry. This interest is further evidenced

[11] VI: very important; SI: somewhat important; N; neither important nor unimportant; SU: somewhat unimportant; VU: very unimportant.

in that the **(j) desire to avoid the threat of further environmental regulation** and the opportunity **(k) to be involved in planning proposed regulations** were each identified once as one of the three most important incentives for participation. Responses of very or

this possibility of influencing future environmental policy would be significantly diminished. Nonetheless, participating industries would still benefit from a better relationship with BC Environment than is typically the case with basic permit enforcement because of greater communication and information exchange.

Several additional incentives were also identified as respondents' three most important incentives:

- 

### 5.1.2 **Disincentives**

The following table summarizes industries responses when asked about disincentives.

**Table 4. Industry disincentives for participating in P2 planning demonstration project**

2. When your company first committed to participation in BC's P2 planning process, how important was each of the following possible disincentives?

| DISINCENTIVE | IMPORTANCE[14] | | | | |
|---|---|---|---|---|---|
| | VI | SI | N | SU | VU |
| a) discovery of noncompliance | 1 | | 3 | 2 | 2 |
| b) enforcement action by government resulting from discovery of noncompliance | 2 | 1 | 3 | | 2 |
| c) voicing of local community concerns in public advisory committee that could not easily be addressed | | 4 | 1 | 1 | 2 |
| d) cost of participation | | 2 | 3 | 1 | 2 |
| e) uncertainty about legal implications of participation | 2 | 3 | 1 | | 2 |
| f) other<br>One respondent raised the concern that this demonstration project would result in a further layer of prescriptive regulation in the old command and control style instead of the desired cooperation. | | | | | |

Industry responses regarding disincentives prior to participation were varied with little clear consensus. The three more important disincentives seemed to be **(e) uncertainty regarding the legal implications of participation** (5, 63%), **(c) voicing of local community concerns in public advisory committee that could not easily be addressed** (4, 50%), and

valuable part of P2 planning. One participant commented that P2 planning had a lot to contribute even after meeting the Responsible Care standard.

### 5.1.4 Advantages and disadvantages

In addition to their incentives for participation prior to joining the demonstration project, companies were also asked about the advantages and disadvantages realized once they had actually participated in the project. The following table summarizes their responses.

**Table 5. Advantages and disadvantages of participation in P2 planning demonstration project**

4a. Your company now has several years of experience with P2 planning. Based on this

**Table 5. Advantages and disadvantages of participation in P2 planning demonstration project, continued**

r) other

- "the ability of both government and companies to think in terms of efficiency and effectiveness and adapt to business process change needs, i.e., change."
- as a result of P2 planning, the facility staff got to know each other much better, and collectively they got to know the MELP staff better as well. Prior to P2 planning, contact with MELP staff had only been brief and formal during periodic inspections.
- P2 planning had lead to a better understanding by government and the public of the industrial operations at the test facility.

**4c. Please rank the three most important disadvantages by selecting a letter from the list above (a, b, etc.) or by describing a result not listed.**

Respondents chose not to select or rank any disadvantages of P2 planning from the list above. Instead, they made general comments:

- Four respondents (50%) commented that the process was very time consuming and resource intensive. However, one of these respondents commented that "that's what it takes."
- Three respondents (38%) were concerned that voluntary measures would be made mandatory, that permits would be made more stringent as a result of P2 planning.

Individual respondents also identified the following disadvantages:

- The process entails significant short term costs with uncertain long term benefits.
- The environmental review involves an onerous level of detail.
- There is a persistent concern that regulations will be introduced ignoring P2 planning efforts.
- Issues raised by the PAC might not always be addressed by the company for any number of reasons. If the PAC was not satisfied with these reasons, how would such a situation be resolved?
- The local regional district might not recognize P2 planning efforts. Without approval from this second regulatory body, approval from MELP for P2 planning would result in little benefit for the participating facility in terms of simplifying regulatory efforts.

planning will be incorporated into MELP's existing environmental policy framework. As such, some future advantages of participation are still anticipated. However, one respondent commented that participating in P2 planning should not, necessarily, result in possible changes to regulatory requirements. P2 planning should be done for reasons other than regulatory change.

Several additional advantages were also identified by respondents as part of the three most important advantages. **Net cost savings (a)** was an advantage identified as applicable by many participants (6, 75%). One respondent commented that "the cost and efficiency savings alone make it a worth while effort for industry." However, as many respondents (6, 75%) agreed that there was a **(b) net cost in the short term (12-24 months)**, and two respondents (25%) agreed that there was a **(c) net cost in the long term (>12-24 months)**. Several respondents (2, 25%) commented that it was too early to say with any degree of certainty what the net costs or cost savings would be.

Most respondents (7, 88%) agreed that there had been **(g) useful input from public advisory committees (PAC's).** Their fresh perspective on some problems gave industry new insights. Several respondents (3, 38%) also commented that the **(j) improved communication within the company** resulted in a wealth of ideas. One respondent commented that "It has been our . . . experience that the people who operate and maintain the equipment will probably have the best ideas as to how to make it run better, discharge less, and use energy and chemicals in a more efficient manner. It is this resource that needs to be tapped." The **(k) valuable experience of comprehensive review and long-range planning that might otherwise not have been done** was recognized by six respondents (75%).

It is interesting to compare the incentives for industry's participation in P2 planning with the advantages realized. There seems to be a fairly good correlation between the two. The most important advantages were **better public relations with the local community**, **better relations with MELP**, and **possible changes to the existing regulations and**

would participate again, one did not complete the P2 planning process at the demonstration facility. The respondent was, nonetheless, satisfied with the benefits of having been involved in the process.

When asked if they would **voluntarily commit additional facilities to the P2 planning process**, four of the seven participating companies (57%) agreed that they would, one strongly and three mildly agreeing. The company that strongly agreed did not complete the P2 planning process at the test facility but was still very interested in future applications of P2 planning at other facilities. Of the remaining three companies, two indicated that they neither agreed nor disagreed, and one mildly disagreed that they would voluntarily commit additional facilities.

From these results, it would appear that industry is fairly satisfied with how the demonstration project developed. However, uncertainty regarding the long-term benefits of P2 planning, the government's long-term environmental policy for major industrial sites, and the anticipated revised structure of P2 planning temper industry's enthusiasm for further participation in the process.

### *5.2 Does the P2 planning process developed to date include design elements suggested in the literature for successful voluntary initiatives?*

P2 planning is being considered as a voluntary initiative, a compliance plus measure in addition to existing regulatory requirements. It has already been tried as such in the P2 planning demonstration project. This study question considers whether the process as developed to date includes design elements suggested in the literature for a successful voluntary initiative. The design elements considered are (see section 2.6, table 1):

- Sufficient advantages of participation
- Participant commitment to initiative
- Ground rules
- Credibility
- Flexibility and innovation

The sixth design element, a supportive policy framework, is not being considered in this study (see section 4.3.2).

*Questionnaire B,* reproduced in appendix C, was used to answer the second study question. Eight industry representatives responded, that is, representatives of the seven participating companies, as well as one CCPA representative. Nine government representatives responded, from both head office and involved regional offices. Two additional government representatives declined to respond to the questionnaire[18]. Seven

**Table 6. Element #1 -- Advantages of participation**

| Questionnaire statements. | Number of responses | | | | |
|---|---|---|---|---|---|
| | SA[19] | MA | N | MD | SD |
| A1. There are sufficient advantages of participation for companies with major industrial operations to voluntarily participate in BC's P2 planning process. | 11 | 8 | 2 | 2 | 1 |
| A2. The advantages of participation in BC's P2 planning process encourage long term | | | | | |

**Table 6. Element #1 -- Advantages of participation, continued**

Government suggestions (total of 9 respondents)

- public recognition, local and/or international (5, 56%)
- permit fees reduced or linked to performance. (4, 44%)
- greater understanding about the correlation between good economic and good environmental performance; these two goals are not diametrically opposed. Economic proof of process efficiency success stories needs to be developed and disseminated to "spread the word." (3, 33%)
- P2 planning should be promoted as a means of ensuring due diligence (2, 22%)
- Increased flexibility in meeting environmental objectives (1, 11%)
- Improved relations with government and the public (1, 11%)
- Increased pride in the workforce (1, 11%)

PAC member suggestions (total of 7 respondents)

- Participating companies should have greater flexibility and freedom in meeting environmental objectives (2, 28%)
- Public recognition (2, 28%)
- Permit fees linked to performance (1, 14%)
- Promote a business relationship between government and industry (1, 14%)
- Where companies are obviously trying to address and environmental problem, they should not be automatically prosecuted for permit violations. There should be some recognition for efforts being made (1, 14%).
- Promote the benefits of improved process efficiencies (1, 14%)
- Promote pride in workforce resulting from P2 planning (1, 14%)
- Increased certainty regarding future regulations so that companies can engage in long-term planning (1, 14%).

| | VI[20] | SI | N | SU | VU |
|---|---|---|---|---|---|
| A4. How important do you think it is to ensure sufficient advantages of voluntary participation in the P2 planning process? | 17 | 6 | | | 1 |

The majority of respondents (19, 79%) either strongly or mildly agreed that **there are sufficient advantages of participation in P2 planning for companies with major industrial operations**. Respondents who did not agree (3, 13%) were exclusively PAC

[20] VI: very important; SI: somewhat important; N; neither important nor unimportant; SU: somewhat unimportant; VU: very unimportant.

members. With regard to **long-term participation**, the majority of respondents (18, 75%) either strongly or mildly agreed that P2 planning encouraged such participation. Those who did not (4, 17%) were from all three stakeholder groups, i.e. industry, government and PAC's.

Suggested advantages as to what would be **most effective in encouraging participation in BC's P2 planning process** varied widely across all three stakeholder groups. No clear consensus supporting any one particular advantage emerged from either the individual stakeholders groups -- industry, government and PAC members -- or from the respondents as a whole. Each of the following advantages was suggested by at least two of the stakeholders groups:

- reduction of fees (either a percentage reduction or fees based on performance) (8, 33%) [21, 22]
- public recognition through awards and improved public relations (8, 33%)[22]
- increased certainty regarding future regulations (4, 17%)[22]
- increased flexibility in MELP's requirements of industry regarding environmental protection (5, 21%)
- promotion, education and documentation of the benefits of P2 planning such as cost savings (4, 17%), improved relations with public and government (4, 17%), and pride in the workforce (2, 8%)

---

[21] Permit fees are paid annually based on anticipated discharge levels for the following year. If a company discharges less than the permitted amount, there is no refund for excess fees paid. The company can apply for lower discharge levels in their permit for the following year in order to reduce permit fees. However, companies typically do not pursue this avenue as the reduction in permit fees is not worth risk of violating a more stringent permit requirement.

[22] The first three advantages shown here were listed on the questionnaire as examples of possible advantages that might promote participation. Respondents may have been more likely to select these three responses in answering the questionnaire rather than suggest different advantages. As such, the number of respondents identifying these advantages may be artificially high.

date, but that the P2 planning process itself is something the companies are still hesitant to commit to.

The issue of free riders was not considered in this study as the project participants represented a wide range of industries. Free riders more typically occur when an initiative is focused on a single industry sector. However, it is possible that P2 planning could attract free riders; if major industrial sites in BC were to avoid new strict environmental regulations because of the voluntary efforts of many, those few not making the voluntary effort would constitute free riders.

When asked how important it was to ensure sufficient advantages, all respondents except one (23, 96%) either strongly or mildly agreed that it was important. One government respondent indicated that it was very unimportant. He commented that industry must recognize the benefits of P2 planning for themselves; government does not have to ensure any additional advantages other than those inherent to the process.

### 5.2.2 **Participant commitment to initiative**

Respondents were also asked about the second design element, participant commitment to the initiative. The responses were as described in the following table.

**Table 7. Element #2 -- Participant commitment**

| Questionnaire statement | Number of responses | | | | |
|---|---|---|---|---|---|
| B1. To date, industry has demonstrated a high level of commitment to BC's P2 planning process as evidenced by: | SA[24] | MA | N | MD | SD |
| a) adequate allocation of recourses (people and money) | 15 | 7 | | 1 | 1 |
| b) explicit commitment of senior leaders | 15 | 6 | 2 | | |

**Table 7. Element #2 -- Participant commitment, continued**

| B3. To date, the regional office of the Ministry of Environment, Lands and Parks (locally) has demonstrated a high level of commitment to BC's P2 planning process as evidenced by: | SA | MA | N | MD | SD |
|---|---|---|---|---|---|
| a) adequate allocation of recourses (people and money) | 11 | 6 | | 4 | 3 |
| b) explicit commitment of senior leaders | 9 | 7 | 3 | 3 | 2 |
| c) regular involvement of senior leaders | 8 | 5 | 3 | 5 | 3 |
| d) training and involvement of government staff other than those immediately involved. | 3 | 3 | 10 | 3 | 5 |
| e) consistently making an effort throughout the process. | 10 | 7 | 3 | 2 | 2 |
| B4. To date, public advisory committee (PAC) members have demonstrated a high level of commitment to BC's P2 planning process by: | SA | MA | N | MD | SD |
| a) regular attendance at PAC meetings | 10 | 10 | 1 | 2 | 1 |
| b) voicing concerns to government and industry | 11 | 8 | 2 | 2 | 1 |
| c) offering constructive advice to industry and government | 13 | 5 | 3 | 2 | 1 |
| B5. How important do you think it is to ensure a high level of commitment from these participants for success of BC's P2 planning process? | VI[25] | SI | N | SU | VU |

generally supportive of the regional office's efforts. The indicators included adequate allocation of resources (17 agreeing, 71%), explicit commitment of senior leaders (16, 67%), regular involvement of senior leaders (13, 54%), and consistently making an effort throughout the process (17, 71%). However, respondents were divided as to whether the regional offices had demonstrated training and involvement of government staff other than those immediately involved, with six (25%) agreeing, eight (33%) disagreeing, and ten (42%) neither agreeing nor disagreeing.

One industry representative commented that "regional office permit writers seemed at times to be diametrically opposed to what Victoria was saying. The Ministry needs to speak with a common voice." Two of the seven PAC respondents (29%) commented that although the regional offices seemed to make an effort, they did not have enough resources or direction from head office.

In general, most respondents either strongly or mildly agreed that **PAC members** had demonstrated a high level of commitment to the process. Indicators included regular attendance at PAC meetings (20 agreeing, 83%), voicing concerns to government and industry (19, 79%), and offering constructive advice to industry and government (18, 75%). Interestingly enough, many of those that disagreed with these indicators were PAC respondents (5 of 9 disagreeing respondents, 56%).

Respondents often commented that there was a small core of committed people who always attended meetings, but aside from this group there was not much interest. Several respondents commented that the PAC members were very passive, listening to what was said and offering little comment or suggestion. Several PAC members commented that there was an overwhelming amount of material to absorb, a "terrible learning curve," that limited their ability to contribute and dampened their enthusiasm to commit to the process.

In general, many respondents (18, 75%) felt that a high level of commitment from all participants was very important. One PAC member commented that although it was important for industry and government to demonstrate commitment, it was somewhat unimportant for the public to do the same. One government respondent felt it was somewhat unimportant to have a high level of commitment to the process. His comment was that although individual people involved with P2 planning might change over time, the process itself would endure because of the inherent benefits.

### 5.2.3 Ground rules

In asking respondents about the third design element, ground rules, five areas were considered:

- goals, objectives, targets, and timeframes
- roles and responsibilities
- legal implications
- dispute resolution
- rewards and sanctions

#### 5.2.3.1 Goals, objectives, targets and timeframes

Respondents were asked to what extent they agreed or disagreed with the following statements regarding goals, objectives, targets and timeframes.

**Table 8. Element #3 -- Goals, objectives, targets, and timeframes**

| Questionnaire statement | Number of responses | | | | |
|---|---|---|---|---|---|
| | SA[27] | MA | N | MD | SD |
| C1. BC's P2 planning process in general has clear goals, objectives, and targets. | 6 | 10 | 2 | 3 | 3 |
| C2. Each individual P2 plan has clear goals, objectives, and targets. | 5 | 10 | 4 | 5 | |
| C3. Clear timeframes [*have*] been defined in which to meet any goals, objectives, and targets that have been set. | 3 | 12 | 4 | 4 | 1 |
| | VI[28] | SI | N | SU | VU |
| C4. How important do you think it is to set clear goals, objectives, targets, and timeframes? | 19 | 5 | | | |

Responses were mixed, although a majority (16, 67%) agreed to some extent that clear **goals, objectives, and targets** were present. Most of those who disagreed were representatives from either government or PAC's. Many respondents (9, 38%) commented that the demonstration project was a pilot, and as a result, these components were understandably somewhat uncertain and unclear. One respondent, when asked, did not necessarily feel that the goals, objective, targets and timeframes were any clearer at the conclusion of the demonstration project. Another respondent commented that although timeframes are important, they should be flexible in order to adapt to changing situations. One PAC respondent commented that timeframes had been identified and then abandoned without consequence. It seems that the P2 planning process itself has few specific goals, but that such specifics were determined for each individual P2 plan by the steering committee with input from the PAC.

All participants (24, 100%) agreed that it is either very or somewhat important to set clear goals, objectives, targets, and timeframes.

[27] SA: strongly agree; MA: mildly agree; N: neither agree nor disagree; MD: mildly disagree; SD: strongly disagree.

[28] VI: very important; SI: somewhat important; N; neither important nor unimportant; SU: somewhat unimportant; VU: very unimportant.

#### 5.2.3.2 Roles and responsibilities

Respondents were asked to what extent they agreed or disagreed with the following statements regarding roles and responsibilities.

**Table 9. Element #3 -- Roles and responsibilities of participants**

| Questionnaire statement | Number of responses | | | | |
|---|---|---|---|---|---|
| | SA[29] | MA | N | MD | SD |
| D1. Roles and responsibilities of industry participants during the P2 planning process were clear. | 10 | 10 | 3 | 1 | |
| D2. Roles and responsibilities of staff from the Ministry of Environment, Lands and Parks during the P2 planning process were clear. | 9 | 8 | 5 | 2 | |
| D3. Roles and responsibilities of the public participants on public advisory committees during the P2 planning process were clear. | 6 | 13 | 1 | 4 | |
| D4. How important do you think it is to have clear roles and responsibilities for each of the following? | VI[30] | SI | N | SU | VU |
| a) Ministry of Environment, Lands and Parks | 21 | 2 | 1 | | |
| b) industry participants | 22 | 1 | 1 | | |
| c) public participants on public advisory committees | 18 | 4 | 2 | | |

Most respondents agreed to some extent that the **roles and responsibilities** of industry (20, 83%), government (17, 71%), and PAC members (19, 79%) were clear. Those that disagreed were primarily PAC representatives. Several respondents commented that the roles of all stakeholders were not necessarily clear at the beginning of the pilot, but evolved into something more concrete during the process. Again, respondents emphasized that the process was a pilot, and as such, uncertainties were to be expected.

[29] SA: strongly agree; MA: mildly agree; N: neither agree nor disagree; MD: mildly disagree; SD: strongly disagree.

[30] VI: very important; SI: somewhat important; N; neither important nor unimportant; SU: somewhat unimportant; VU: very unimportant

One government respondent commented that roles and responsibilities, although not necessarily clearly defined for the process in general, were made clear in the terms of reference for each individual P2 plan. Several industry and government representatives commented that the distribution of government's roles and responsibilities between the head office and the regional offices was a source of confusion.

One industry respondent commented that the change from permits to P2 planning would require a change in the overall roles of government and industry. With the permit system, government representatives are usually technical people who administer permits from an office, while industry representatives communicate with MELP regarding permit issues through mail. "In the future the MOE Pollution Prevention officers will need to have less technical skill but will need to have good facilitation and people skills." As the

### 5.2.3.3 Legal implications

Respondents were asked to what extent they agreed with the following statement regarding legal implications:

**Table 10. Element #3 -- Legal implications**

| Questionnaire statement | Number of responses | | | | |
|---|---|---|---|---|---|
| | SA[31] | MA | N | MD | SD |
| H1. A clear understanding of the legal implications of participation in P2 planning was established prior to beginning the initiative. | 4 | 2 | 6 | 7 | 5 |
| | VI[32] | SI | N | SU | VU |
| H2. How important do you think it is to establish a clear understanding of the legal implications of participation prior to beginning the initiative? | 17 | 3 | 3 | 1 | |

Responses were mixed as to whether or not a clear understanding of the **legal implications** of participation in the P2 planning process had been established. Industry and government respondents tended to disagree, with seven of eight industry respondents (88%) and seven of nine government respondents (78%) disagreeing. Four of seven PAC members (57%) indicated that they neither agreed nor disagreed. The lack of consensus in responses would indicate that there was not a clear understanding of the legal implications.

The lack of clarity regarding legal implications was an issue several times during the demonstration project. In one instance, a regional office considered including a company's recently developed P2 plan in an existing permit during the process of renewing that permit. The company objected as this action would make the P2 plan

[31] SA: strongly agree; MA: mildly agree; N: neither agree nor disagree; MD: mildly disagree; SD: strongly disagree.

[32] VI: very important; SI: somewhat important; N; neither important nor unimportant; SU: somewhat unimportant; VU: very unimportant

legally enforceable; the company's participation in the demonstration project had been on a voluntary basis. The situation was resolved when the regional office decided against incorporating the P2 plan in the permit. In this case, there was no common, clear legal understanding of the role of the P2 plan.

Concerns were also raised as to how MELP would handle the discovery of a noncompliance with existing requirements discovered in the process of developing a P2 plan. Would MELP use the information discovered in developing the P2 plan to prosecute any of the demonstration project companies? A general understanding seems to

#### 5.2.3.4 Dispute resolution

Respondents were asked to what extent they agreed with the following statement regarding a dispute resolution mechanism.

mechanism might not be necessary where there is adequate transparency in the P2

**Table 12. Element #3 -- Rewards and sanctions**

| Questionnaire statement | Number of responses | | | | |
|---|---|---|---|---|---|
| | SA[35] | MA | N | MD | SD |
| G1. Rewards for a certain level of achievement in P2 planning were specified prior to companies committing to the process. | 2 | 5 | 3 | 5 | 8 |
| G2. Sanctions for failing to meet a certain level of achievement in P2 planning were specified prior to companies committing to the process. | | 1 | 4 | 4 | 14 |
| | VI[36] | SI | N | SU | VU |
| G3. How important do you think it is to specify rewards for a predefined level of achievement in BC's P2 planning process? | 5 | 10 | 4 | 3 | 2 |
| G4. How important do you think it is to specify sanctions failing to meet a certain level of achievement in BC's P2 planning process? | 4 | 3 | 4 | 6 | 7 |

Many respondents (13, 54%) disagreed to some extent that **rewards** had been specified prior to companies committing to the P2 planning process. Respondents who agreed to some extent (7, 29%) commented that the rewards referred to were inherent to the process, such as better relations with government and the local community, cost savings, and a more efficient process. One industry respondent commented that the real reward was "government backing off with the big stick." One PAC respondent commented that one of the companies may be have been granted more flexibility with other environmental regulations in recognition of its efforts in P2 planning. No respondents felt that additional, explicit rewards had been specified.

[35] SA: strongly agree; MA: mildly agree; N: neither agree nor disagree; MD: mildly disagree; SD: strongly disagree.

[36] VI: very important; SI: somewhat important; N; neither important nor unimportant; SU: somewhat unimportant; VU: very unimportant

industry's public relations, credibility, and government relations would tarnished should industry fail to make an adequate effort toward reaching set goals.

PAC respondents accounted for four of the seven responses indicating that it was very or slightly important to specify sanctions for failing to meet a certain level of achievement. Several commented that if an industry did not do what it said it was going to do, it would be wasting everyone's time. One government respondent commented that there should be some consequences for abandoning the P2 planning process.

Four respondents (17%) commented that the final role of P2 planning would determine

**Table 13. Element #4 -- External stakeholders**

| Questionnaire statement | Number of responses | | | | |
|---|---|---|---|---|---|
| | SA[37] | MA | N | MD | SD |
| J1. Members of public advisory committee's (PACs) were able to meaningfully participate in the development of individual P2 plans. | 9 | 8 | 2 | 3 | 2 |
| J2. External stakeholders, such as local interest groups and other interested organizations not necessarily based locally, were adequately represented in the development of the P2 planning process. | 3 | 8 | 5 | 7 | 1 |
| | VI[38] | SI | N | SU | VU |
| J3. How important do you think it is that PAC members can meaningfully participate in the development of individual P2 plans? | 13 | 9 | 2 | | |
| J4. How important do you think it is to enable the representation of external stakeholders, such as local interest groups and other interested organizations not necessarily based locally, in the development of the P2 planning process? | 5 | 14 | 3 | 2 | |

The first questionnaire statement addressed the participation of external stakeholders in the individual PAC's. Many respondents (17, 71%) agreed to some extent that **PAC members were able to meaningfully participate in the development of individual P2 plans**. Those that disagreed to some extent (5, 21%) were from all three stakeholder groups -- industry, government and PAC's.

Three of the seven PAC members (43%) commented that the learning curve and long-term time commitment required of PAC members were almost inhibitory, especially for those interested in joining after a process had already started. As a result, these PAC members

[37] SA: strongly agree; MA: mildly agree; N: neither agree nor disagree; MD: mildly disagree; SD: strongly disagree.

[38] VI: very important; SI: somewhat important; N; neither important nor unimportant; SU: somewhat unimportant; VU: very unimportant

felt they had not really been able to contribute to the process, only follow along as best they could. A further PAC member commented that informed nongovernment organizations could play an important role in bridging the information gap between industry and the public as a third party.

Three of the seven PAC members (43%) commented that although the PAC was meant to be a forum where public concerns and questions could be raised, this was not always realized. These members were not in any way critical of how industry had worked with the PAC; in fact, PAC members were generally very impressed with industry's efforts to include them and explain complicated processes so that they could meaningfully participate. However, the very nature of the social setting within which the PAC met, specifically in areas where the industry in question was the primary employer, was not always conducive to frank discussion. One PAC respondent commented that "In this town, you don't say anything bad about (*the company*). They're God." Another PAC respondent commented that it was very important for government to be present in PAC meetings as a third party, making industry accountable for what they tell the public.

Two respondents, one government and one industry, were surprised at the nature of the concerns raised by PAC members. These concerns were more about aesthetic issues and office recycling rather than the discharge of contaminant to the environment. These respondents commented that PAC members were typically more comfortable talking about things they understood and could relate to; the complex area of environmental pollution was rarely such a topic.

Nine respondents volunteered opinions regarding whether stakeholders from beyond the local community should be included in PAC's. Five of these (21%) felt that where the environmental effects reached further than the local community, then external stakeholders had a right to be included. The other four (17%) felt that such external stakeholders were adequately represented by government.

Even within the local community, volunteered opinions were divided as to who should be able to join a PAC. Three respondents (13%) commented that only those who represented a group, such as a local interest group, should be allowed to attend. Conversely, two respondents (8%) commented that any interested party should be allowed the opportunity to participate. All PAC's were concerned about avoiding individuals with private agendas who could derail the P2 plan discussions, a "lone wolf with an axe to grind." No respondents complained that this actually occurred. Nor did any respondent feel that anyone with a concern to voice had been refused entry to a PAC.

The second questionnaire statement addressed the inclusion of external stakeholders in the development of the P2 planning process, not just the individual P2 plans. Responses were mixed as to whether **external stakeholders, such as local interest groups and other interested organizations not necessarily based locally, were adequately represented in the development of the P2 planning process**, with eleven respondents agreeing (46%), eight respondents disagreeing (33%), and five respondents neither agreeing nor disagreeing (21%).

It seems that the P2 planning process had been developed primarily by government, with input from industry. The steering committee for the demonstration project consisted of industry and government representatives only. External stakeholders were able to attend some of the steering committee meetings, but none were part of the committee. One representative commented that the committee was intentionally designed this way so that industry and government could have frank communications. Such candid conversations would not have been possible during this pilot phase had additional external stakeholders been present. However, this same representative commented that it might now be appropriate to include external stakeholders in the further development of P2 planning in BC.

Almost all stakeholders agreed to some extent it was important that **PAC members meaningfully participate in the development of P2 plans** (22, 92%) and that **external**

**stakeholders be represented in the development of the P2 planning process** (19, 79%). Two respondents observed that "meaningful" could mean many things to different people.

#### 5.2.4.2 Transparency

Respondents were asked to what extent they agreed or disagreed with the following statements regarding the transparency of the P2 planning process.

**Table 14. Element #4 -- Transparency**

| Questionnaire statement | Number of responses | | | | |
|---|---|---|---|---|---|
| | SA[39] | MA | N | MD | SD |
| K1. The development, implementation and monitoring of BC's P2 planning process as a whole is adequately transparent, that is, information is readily available to all stakeholders and external parties. | 12 | 8 | 1 | 3 | |
| K2. The development, implementation and monitoring of the individual P2 plans is adequately transparent. | 11 | 9 | 1 | 3 | |
| | VI[40] | SI | N | SU | VU |
| K3. How important do you think it is to ensure that BC's P2 planning process as a whole is transparent? | 16 | 6 | 2 | | |
| K4. How important do you think it is that the development, implementation and monitoring of the individual P2 plans is transparent? | 14 | 8 | 2 | | |

[39] SA: strongly agree; MA: mildly agree; N: neither agree nor disagree; MD: mildly disagree; SD: strongly disagree.

[40] VI: very important; SI: somewhat important; N; neither important nor unimportant; SU: somewhat unimportant; VU: very unimportant

Most respondents agreed that the **P2 planning process as a whole** (20, 83%), and the **individual P2 plans** (20, 83%)**, were adequately transparent**. Respondents that disagreed with these statements (3, 13%) were government and PAC representatives only.

One government and one PAC representative both volunteered that there were practical limitations to the amount of information that should be made available to the public. The PAC respondent commented that "companies should provide the information we need to know, make available the information we would like to know, and keep a record of detailed technical information that only the experts would understand." Generally, PAC respondents seemed very satisfied with the amount of information made available to them by industry. One PAC respondent commented that any time information was requested, it was either made available immediately or at the next PAC meeting.

Two government respondents commented that more effort could have been expended to ensure that the information presented to PAC's was accessible to lay people's understanding. Transparency did not really exist if information was available but few people could decipher it.

#### 5.2.4.3 Monitoring and reporting measurable progress

Respondents were asked to what extent they agreed or disagreed with the following statements regarding monitoring and reporting.

**Table 15. Element #4 -- Monitoring and reporting**

| Questionnaire statement | Number of responses | | | | |
|---|---|---|---|---|---|
| | SA[41] | MA | N | MD | SD |
| E1. Appropriate performance indicators have been chosen to assess progress. | 5 | 10 | 6 | 2 | 1 |
| E2. Sufficient monitoring of performance indicators is part of the P2 planning process. | 12 | 8 | 3 | 1 | |
| E3. Independent third party verification of monitoring and reporting is part of the P2 planning process. | 3 | 3 | 8 | 4 | 6 |
| E4. Regular, public reporting of results is part of the P2 planning process | 8 | 9 | 4 | 2 | |
| E5. How important do you think it is to include each of the following in the P2 planning process? | VI[42] | SI | N | SU | VU |
| a) the use of appropriate performance indicators | 21 | 2 | 1 | | |
| b) sufficient monitoring | 18 | 5 | 1 | | |
| c) independent third-party verification of monitoring and reporting | 6 | 6 | 3 | 6 | 3 |
| d) regular, public reporting of results | 10 | 9 | 4 | 1 | |

Many respondents (15, 63%) agreed that **appropriate performance indicators had been chosen**. Similarly, most respondents (20, 83%) agreed that there was **sufficient monitoring** of these performance indicators. Almost all respondents found it important to some extent to **chose appropriate performance indicators** (23, 96%), and to ensure **sufficient monitoring** of those indicators (23, 96%).

[41] SA: strongly agree; MA: mildly agree; N: neither agree nor disagree; MD: mildly disagree; SD: strongly disagree.

[42] VI: very important; SI: somewhat important; N; neither important nor unimportant; SU: somewhat unimportant; VU: very unimportant

Responses were mixed as to whether there was **third-party verification** of monitoring and reporting. No industry representatives agreed that there was third-party monitoring. Several government and PAC respondents (6, 25%) were of the opinion that the PAC or a consulting engineering company working with the industry to develop a P2 plan constituted third-party monitoring.

Responses were mixed regarding the importance of third-party verification. For industry, three of eight respondents (38%) thought it was important to some extent, while five thought it unimportant to some extent (62%). Conversely, five of seven PAC respondents (71%) found it important to some extent, while only one found it unimportant (14%). Government responses were almost evenly distributed across the range of possible responses.

One PAC respondent commented that "they (*industry*) could cheat so easily." However,

Most respondents (19, 79%) indicated that **regular, public reporting of results** was important to some extent. Two PAC members commented that some reporting was important, but that the public was not terribly interested in environmental reports that were "overkill." Two PAC members also commented too much environmental reporting might not be a good thing for industry. "A little knowledge can be a dangerous thing" and "Companies should neither walk too tall nor talk too wise."

### 5.2.5 Flexibility and innovation

Respondents were asked to what extent they agreed or disagreed with the following statements regarding the fifth design elements, flexibility and innovation.

**Table 16. Element #5 -- Flexibility and innovation**

| Questionnaire statement | Number of responses | | | | |
|---|---|---|---|---|---|
| | SA[43] | MA | N | MD | SD |
| F1. P2 planning is flexible enough to enable innovation, such as technical, management, and process innovation. | 16 | 6 | 1 | 1 | |
| F2. P2 planning encourages innovation. | 13 | 10 | 1 | | |
| | VI[44] | SI | N | SU | VU |
| F3. How important do you think it is to enable and encourage innovation? | 19 | 5 | | | |

Almost all respondents either strongly or mildly agreed that **P2 planning was flexible enough to enable innovation** (22, 92%), while many agreed that it **encourages innovation** (13, 54%). Several respondents commented that P2 planning provided new forums for original thinking, "shaking up" the way people have been thinking for years.

[43] SA: strongly agree; MA: mildly agree; N: neither agree nor disagree; MD: mildly disagree; SD: strongly disagree.

[44] VI: very important; SI: somewhat important; N; neither important nor unimportant; SU: somewhat unimportant; VU: very unimportant

Many ideas not previously thought of were generated in the process. One PAC respondent commented that it was an "exciting change from the way permits have been managed."

One government respondent felt that the process was too bureaucratic to be adequately flexible. Conversely, another government respondent felt that the process was too flexible.

All respondents (24, 100%) thought flexibility and innovation were either very or somewhat important.

throughout the province either as a voluntary or mandatory measure, or some combination thereof.

In this study, the possibility of P2 planning as a voluntary initiative for major industrial operations in British Columbia is considered. It must be noted that P2 planning was not originally designed to be a voluntary initiative, but a replacement of existing permits and regulations. Based on the experience of the demonstration project, an alternative application of P2 planning is now being considered -- P2 plans as voluntary compliance plans in a context where historical permits are replaced by either multimedia, single-site permits or by multimedia, sector-based regulations (Driedger 1999). Furthermore, it should also be noted that the P2 planning process is still evolving and not necessarily complete. Nonetheless, a better understanding of the experiences of the seven major industrial companies who voluntarily participated in the demonstration project could be informative for the planned implementation committee when considering introducing P2 planning throughout BC.

## *6.1 Conclusions*

### 6.1.1 Study question #1

– Why would industry voluntarily participate in BC's P2 planning process?

In the first study question, reasons as to why industry would voluntarily participate in BC's P2 planning process were considered. To answer this question, inquiries were made as to the incentives and realized advantages of companies that had already voluntarily participated in the P2 planning demonstration project. For these seven companies, the three most important incentives prior to participation and advantages realized were **better public relations with the local community**, **better relations and communication with MELP**, and the **possibility of changes to existing regulatory requirements.** In contrast to what is suggested in the literature, pressure from financial

institutions, insurance companies, and peer pressure were not important incentives for participation.

The existence of incentives for companies to voluntarily exceed regulatory requirements is further supported by the fact that five of these seven companies are implementing, or have already implemented, environmental management measures such as ISO 14001 in addition to P2 planning.

A corollary of this first study question is why would industry not voluntarily participate

P2 planning process, four of seven participating companies agreed that they would, one strongly and three mildly. Of those companies that agreed, again one was a company that chose not to complete a P2 plan at its test facility. Of the remaining three companies, two indicated that they neither agreed nor disagreed, and on mildly disagreed that they would voluntarily commit additional facilities.

These results suggest that there are several reasons why industry might voluntarily participate in P2 planning, namely **better public relations with the local community** and **better relations and communication with MELP.** The incentive of possible **changes to existing regulatory requirements**

### 6.1.2 Study question #2

> – Does the P2 planning process developed to date include design elements suggested in the literature for successful voluntary initiatives?

The second study question considers the P2 planning process in light of design elements suggested in the literature for a successful voluntary initiative. The six design elements identified were: **sufficient advantages of participation; participant commitment to initiative; ground rules; credibility; flexibility and innovation;** and a **supportive policy framework**. Only the first five elements were used when considering the P2 planning process; considering the sixth element was not appropriate at the time of the study given the preliminary nature of the pilot project. Opinions about the P2 planning process with regard to the first five design elements were solicited from industry, government and public advisory committee (PAC) stakeholders. These design elements are considered separately.

According to questionnaire respondents, there are, for the most part, **sufficient advantages of participation** in the P2 planning process (19 of 24 respondents agreeing to some degree, 79%) and these advantages encourage **long-term participation** (18, 75%). However, these responses should be considered in conjunction with the commitment shown by companies to the demonstration project thus far, and their enthusiasm to repeat the process, as discussed in the previous section.

Respondents provided a multitude of suggestions as to what advantages or incentives would promote participation in P2 planning. Some of these advantages were inherent to the process, and should be promoted to encourage participation. Many of the suggested advantages were in addition to those inherent advantages, and could be implemented in the future. Suggested advantages seemed to revolve around three central themes:

- **business's bottom line** – reduced permit costs, process efficiencies, economic benefits of P2 planning

- **regulatory structure** – increased flexibility, certainty about future regulations, developing a due diligence defence, creating one regulatory window for industry where more than one government body has authority
- **relationships** – better relationships with government, with the local public, public recognition, and workers' pride in industry

Based on these results, the inherent benefits of P2 planning should be promoted, and further incentives and advantages seriously considered, in order to ensure sufficient advantages of participation.

than the *de facto* mechanism of the steering committee, a forum for discussion. Almost all respondents thought these four aspects were important to the P2 planning process.

A fifth aspect of ground rules is rewards and sanctions. No rewards or sanctions other than those inherent to the process were specified prior to the initiative. Many respondents (15, 63%) felt there should be some rewards but opinions were divided as to the need for sanctions, with thirteen respondents saying it was important (54%) and seven saying it was unimportant (25%). Respondents generally commented that if P2 planning is to be a purely voluntary initiative, sanctions are not as important. However, if it in any way replaces a form of authorization, sanctions would be very important.

The fourth design element is **credibility**. By including meaningful participation of external stakeholders in the individual P2 plans through PAC's, the plans seemed to have achieved a level of credibility. However, this was tempered by the level to which PAC members felt they were able to participate in the sometimes very technical and time-consuming process. External stakeholders were not included in the design of the overall process itself. Almost all respondents thought it was important to include external stakeholders in both the individual plans and the overall planning process design.

A further aspect of **credibility** is process transparency**.** Respondents thought for the most part that the process and individual plans were adequately transparent, although there were concerns about communicating complicated technical information to nontechnical PAC members. Almost all respondents thought it was important to ensure transparency.

The third aspect of **credibility** considered was monitoring and reporting measurable progress. Respondents thought that appropriate **performance indicators** had been chosen (15, 63%) and that these indicators were being sufficiently **monitored** (20, 83%). Opinions were mixed as to whether **third party verification** of monitoring was being done and how important this element was. Again, if P2 planning is to be a purely voluntary initiative, third party verification would not generally be considered important.

If P2 planning is to become some form of authorization, third party verification would be very important. Respondents were generally satisfied with the level of **public reporting** of results (17, 71%), although few companies formally published these results other than making them generally available to the PAC members. Most respondents thought that regular public reporting of general environmental performance information was important, but several commented that detailed reporting was not necessary.

The fifth design element is **flexibility and innovation**. Almost all respondents were satisfied that the P2 planning process enables (22, 92%) innovation, and some (13, 54%) that it encourages innovation. All respondents thought this design elements was important.

In summary, the P2 planning process as developed to date includes, at least to some extent, many of the design elements suggested in the literature for a successful voluntary initiative. However, a need for further clarification and development of most elements was identified. Respondents generally agreed that the design elements suggested were important with regard to P2 planning.

In many ways, the P2 planning demonstration project can be considered a success. MELP had an opportunity to learn more about the P2 planning process, how it could be applied, what issues and questions were raised in its application, and what kind of resources would be required to implement the process. MELP also developed a much better understanding of the demonstration project industries and the publics' concerns. Industry had a unique opportunity to communicate with MELP and the local communities regarding environmental management and protection issues, resulting in a more positive relationship between all these stakeholders. Industry also benefited from a much better understanding of their own processes, achieving improved process efficiencies and, in some cases, cost savings. The publics had an opportunity to participate in P2 planning, acquiring a greater understanding of MELP's and industry's issues, and voicing local community concerns about the environment.

## *6.2 Recommendations*

P2 planning is now slated to be further developed by an implementation committee. This committee will consider if P2 planning should be adopted province-wide, and if so, how. From this study, several recommendations regarding the further use of P2 planning in BC emerge.

**1. Carefully consider the supporting policy framework**.

A supporting policy framework was the sixth design element recommended for successful voluntary initiatives. Although this study did not directly consider the policy framework for P2 planning, this issue nevertheless impinged upon many aspects of the study. Participants opinions regarding many aspects of the process, such as the need for third party monitoring, sanctions, and public reporting, hinge upon this framework. Industry's present enthusiasm for P2 planning is also dependent on the future role of P2 planning in the overall environmental policy. The incentive structures for participation should be carefully considered in light of the overall policy. The possibility remains that P2 planning as a voluntary initiative is not the best policy tool to achieve overall environmental protection goals.

**2. Design for transparency.**

A second major theme to emerge from this study is the need for transparency. All three stakeholder groups agree that transparency is important; it lends the process credibility. The level of transparency affects the need for third party monitoring, rewards and sanctions, dispute resolution mechanisms, and makes the commitment of various participants evident to all stakeholders. Although most respondents in this study were fairly satisfied with the transparency of the individual P2 plans and the planning process as a whole, the implementation committee should ensure that the process is adequately transparent for all external stakeholders, including those other than in the local communities.

**3. Include external stakeholders in the implementation committee.**

The steering committee for the P2 planning demonstration project consisted of industry and government representatives only. Although additional stakeholders were occasionally invited to contribute to meetings, the steering committee was essentially closed. This was likely a necessary and important factor in building the improved communication channels between industry and government during this pilot project. Having established these improved communication channels, further development of the process should include external stakeholders to afford the P2 planning process credibility.

**4. Further develop the role of the public advisory committees in the overall process.**

Most respondents agreed that the public advisory committees (PAC's) were a positive and important part of the P2 planning process. However, the role of the PAC in the P2 planning process was not well enough defined and, as such, was a source of confusion for some participants. As a minimum, several issues need resolution:

•

**5. Further define the P2 planning process to fully incorporate suggested design elements.**

The P2 planning process included most of the recommended design elements discussed in table 1, Elements of a successful voluntary initiative, to some extent. However, further clarification of many aspects of the process could improve the stakeholders' understanding and communication as well as the overall process effectiveness and credibility. For the most part, respondents in this study agreed that these design elements are important.

**6. Ensure that the necessary resources are available and committed to P2 planning.**

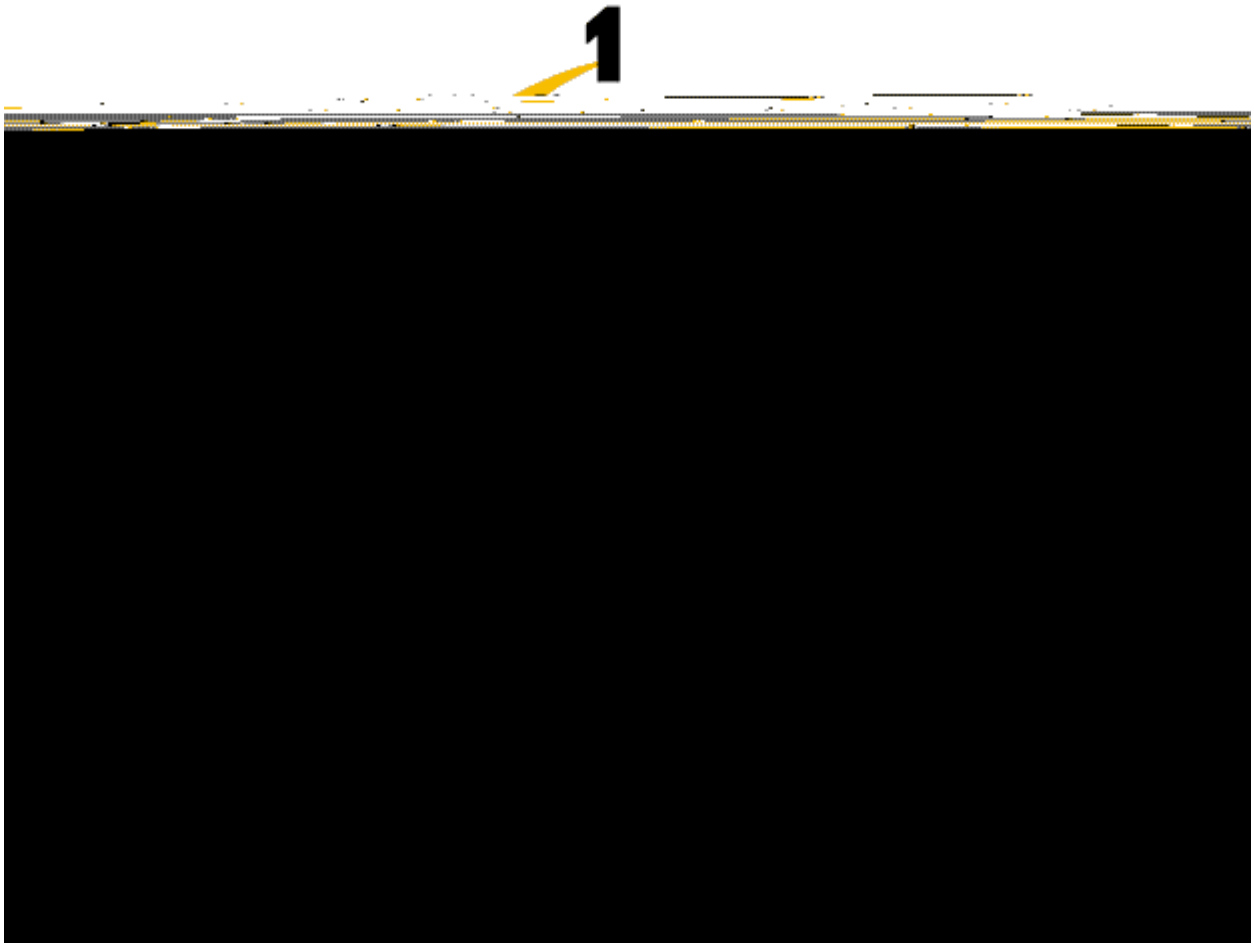
All project participants agreed that P2 planning was a resource intensive process, although most agreed that it was a worthwhile effort. If P2 planning is to be implemented throughout BC, it will require significant leadership and commitment from MELP, and coordination between the head and regional offices. In the long term, P2 planning may result in greater environmental protection and require fewer government resources. But in the short term, the process will likely require significant staff involvement and resources. The process should be carefully designed and defined with adequate resources committed to support the process before it is introduced throughout BC. Similarly, mechanisms should be implemented to ensure that industry participants are aware and willing to commit the resources necessary for P2 planning.

## *6.3 Closing comment*

BC's P2 planning process and recent demonstration project signify several new developments in BC's management approach to environmental protection with regard to major industrial operations. P2 planning shifts the focus from end-of-pipe thinking to source control, preventing pollution before it is even created. In this way, P2 planning is **proactive, not reactive**. P2 planning also reflects a potential change in institutional arrangements to include greater shared responsibility and accountability for environmental protection, including government, industry and the publics. In this

# Appendix A
# Introduction to questionnaire(s)

# POLLUTION PREVENTION PLANNING AS A VOLUNTARY INITIATIVE FOR MAJOR INDUSTRIAL OPERATIONS: A BC CASE STUDY



**Catherine Ponsford, Master's student,**
**School of Resource and Environmental Management,**

## Introduction

Having received this questionnaire, you have probably already invested many hours and much effort towards pollution prevention (P2) planning. Whether you are with government, with industry, or represent the public, you have gained a lot of experience with BC's P2 planning process. I am very interested in this new process, and hope you will take some time to share your learning by participating in this study.

Who am I? I am Catherine Ponsford, a Master's student in the School of Resource and Environmental Management at Simon Fraser University, Burnaby, BC. I am conducting this research in order to fulfil the research project requirements for a Masters in Resource Management (MRM).

## Project description

In this research, I am specifically interested in the **process** of P2 planning, that is, what it entails, who is involved, how it is carried out, and why people might participate. I understand that there is no one, specific and detailed P2 planning process for BC, that

you review this material and consider your answers, marking the form with questions or

## CONFIDENTIALITY AND CONSENT

(RESPONDENT'S COPY)

The university and those conducting this project subscribe to the ethical conduct of research and to the protection at all times of the interests, comfort, and safety of subjects. This form and the information it contains are given to you for your own protection and

NAME (please print legibly):

_____

Address:

_____

_____

email: _____ Phone: _____

fax: _____ Date: _____

Signature: _____ Witness: _____

---

Please return the RESEARCHERS COPY
of the **CONFIDENTIALITY AND CONSENT** form

to Catherine Ponsford

via mail or fax.

Mail: Catherine Ponsford
School of Resource and Environmental Management
Simon Fraser University
8888 University Drive
Burnaby, BC
V5A 1S6

Fax: (604) 291-4968
Tel: (604) 254-3032

# Appendix B
# Questionnaire A

# QUESTIONNAIRE A

# QUESTIONNAIRE A

**4a. Your company now has several years of experience with P2 planning. Based on this experience, please indicate the extent to which you agree or disagree with each of the following statements.**

SA strongly agree
MA mildly agree
N neither agree nor disagree
MD mildly disagree
SD strongly disagree

## P2 Planning has resulted . . . in:

| | | | | | |
|---|---|---|---|---|---|
| a) net cost savings | SA | MA | N | MD | SD |
| b) a net cost in the short term (<12-24 months) | SA | MA | N | MD | SD |
| c) a net cost in the long term (>12-24 months) | SA | MA | N | MD | SD |
| d) better relations with MELP | SA | MA | N | MD | SD |
| e) the possibility of changes to existing regulations and requirements (e.g., multi-media permit) | SA | MA | N | MD | SD |
| f) better public relations with local community | SA | MA | N | MD | SD |
| g) useful input from public advisory committees (PACs) | SA | MA | N | MD | SD |
| h) the raising of local community concerns in the PAC that could not be easily addressed | SA | MA | N | MD | SD |
| i) education of PAC members that was too time consuming for the benefits realized | SA | MA | N | MD | SD |
| j) improved communication within the company | SA | MA | N | MD | SD |
| k) the valuable experience of comprehensive review and long-range planning that might otherwise not have been done | SA | MA | N | MD | SD |
| l) improved market differentiation (i.e., favorably separate your company from the competitors) | SA | MA | N | MD | SD |
| m) better communication with other industry companies | SA | MA | N | MD | SD |
| n) the alleviation of financial institutions' concerns | SA | MA | N | MD | SD |
| o) the alleviation of legal due diligence concerns | SA | MA | N | MD | SD |
| p) greater legal certainty than before P2 planning | SA | MA | N | MD | SD |
| q) increased legal responsibility through disclosure of previously unknown sources of pollution to government | SA | MA | N | MD | SD |

# QUESTIONNAIRE A

# QUESTIONNAIRE A

**NOTES:**

**Please use this space to note any additional comments you may have about issues addressed in this questionnaire or other comments.**

---

**Thank you** for taking the time to consider this questionnaire.
I will contact you to record your responses to these questions.
You do **not** have to return this questionnaire to me.
If you have any questions, please contact me at:
tel: 604-254-3032 or chp@sfu.ca.

# Appendix C
# Questionnaire B

# QUESTIONNAIRE B

This questionnaire is for those involved with the P2 Planning demonstration project, namely industry participants, Ministry of Environment, Lands and Parks staff, and members of the public advisory committees.

This questionnaire asks about your experience with the P2 planning process, as well as

# QUESTIONNAIRE B

## A. Advantages of participation.

Please indicate the degree to which you agree or disagree with each of the following statements. Circle one response per statement.

*SA* *strongly agree*
*MA* *mildly agree*
*mi69Cc19.5ollowi3e indifo 0.cn 90moe71ch of the following*

# QUESTIONNAIRE B

## B. Participant commitment.

Please indicate the degree to which you agree or disagree with each of the following statements. Circle one response per statement.

*SA* *strongly agree*
*MA* *mildly agree*
*N* *neither agree nor disagree*
*MD* *mildly disagree*
*SD* *strongly disagree*

B1. To date, industry has demonstrated a high level of commitment to BC's P2 planning process as evidenced by:

a) adequate allocation of resources (people and/or money)

# QUESTIONNAIRE B

# QUESTIONNAIRE B

## C. Goals, objectives, targets and timeframes.

Please indicate the degree to which you agree or disagree with each of the following statements. Circle one response per statement.

| | |
|---|---|
| *SA* | *strongly agree* |
| *MA* | *mildly agree* |
| *N* | *neither agree nor disagree* |
| *MD* | *mildly disagree* |
| *SD* | *strongly disagree* |

C1. BC's P2 planning p96 0 0 15.96e Cl7 cı˝[Tfı˝-po2002 Tu6 0BC02(0s 0B)7(C02(M2re)4(e)]TJı˝TT30 s

# QUESTIONNAIRE B

# QUESTIONNAIRE B

## E. Monitoring of performance indicators, third party verification, and reporting of results.

Please indicate the degree to which you agree or disagree with each of the following statements. Circle one response per statement.

*SA* *strongly agree*
*MA* *mildly agree*
*N* *neither agree nor disagree*
*MD* *mildly disagree*
*SD* *strongly disagree*

E1. Appropriate performance indicators have been chosen to assess progress. **SA MA N MD SD**

E2. Sufficient monitoring of performance indicators is part of the P2 planning process. **SA MA N MD SD**

E3. Independent third party verification of monitoring and reporting is part of the P2 planning process. **SA MA N MD SD**

E4. Regular, public reporting of results is part of the P2 planning process. **SA MA N MD SD**

E5. How important do you think it is to include each of the following in the P2 planning process? Please circle one response for each.

*VI* *very important*
*SI* *somewhat important*
*N* *neither important nor unimportant*
*SU* *somewhat unimportant*
*VU* *very unimportant*

a) the use of appropriate performance indicators **VI SI N SU VU**
b) sufficient monitoring **VI SI N SU VU**
c) independent third-party verification of monitoring and reporting **VI SI N SU VU**
d) regular, public reporting of results **VI SI N SU VU**

# QUESTIONNAIRE B

# QUESTIONNAIRE B

## G. Rewards and sanctions.

Please indicate the degree to which you agree or disagree with each of the following statements. Circle one response per statement.

*SA* *strongly agree*
*MA* *mildly agree*
*N* *neither agree nor disagree*
*MD* *mildly disagree*
*SD* *strongly disagree*

G1. Rewards for a certain level of achievement in P2 planning were specified prior to companies committing to the process. **SA MA N MD SD**

G2. Sanctions for failing to meet a certain level of achievement in P2 planning were specified prior to companies committing to the process. **SA MA N MD SD**

Please circle one response for each of the following.

*VI* *very important*
*SI* *somewhat important*

# QUESTIONNAIRE B

## H. Legal implications.

Please indicate the degree to which you agree or disagree with each of the following statements. Circle one response per statement.

*SA* *strongly agree*

# QUESTIONNAIRE B

## I. Dispute resolution.

Please indicate the degree to which you agree or disagree with each of the following statements. Circle one response per statement.

*SA* *strongly agree*
*MA* *mildly agree*
*N* *neither agree nor disagree*
*MD* *mildly disagree*
*SD* *strongly disagree*

I1. A mechanism for dispute resolution was developed prior to beginning this initiative. **SA MA N MD SD**

I2. How important do you think it is to provide for transparent and effective dispute resolution prior to beginning this initiative? Please circle one of the following.

*VI* *very important*
*SI* *somewhat important*
*N* *neither important nor unimportant*
*SU* *somewhat unimportant*
*VU* *very unimportant*

**VI SI N SU VU**

# QUESTIONNAIRE B

## J. External stakeholders.

Please indicate the degree to which you agree or disagree with each of the following statements. Circle one response per statement.

*SA* *strongly agree*
*MA* *mildly agree*
*N* *neither agree nor disagree*
*MD* *mildly disagree*
*SD* *strongly disagree*

J1. Members of the public advisory committee's (PACs)

# QUESTIONNAIRE B

## K. Transparency.

Please indicate the degree to which you agree or disagree with each of the following statements. Circle one response per statement.

*SA* *strongly agree*
*MA* *mildly agree*
*N* *neither agree nor disagree*
*MD* *mildly disagree*
*SD* *strongly disagree*

K1. The development, implementation and monitoring of BC's P2 planning process as a whole is adequately transparent, that is, information is readily available to all stakeholders and external parties. **SA MA N MD SD**

K2. The development, implementation and monitoring of the individual P2 plans is adequately transparent. **SA MA N MD SD**

Please circle one response for each of the following.

*VI* *very important*
*SI* *somewhat important*
*N* *neither important nor unimportant*
*SU* *somewhat unimportant*
*VU* *very unimportant*

K3. How important do you think it is to ensure that BC's P2 planning process as a whole is transparent? **VI SI N SU VU**

K4. How important do you think it is that the development, implementation and monitoring of the individual P2 plans is transparent? **VI SI N SU VU**

# QUESTIONNAIRE B

## Appendix D
## Responses to questionnaires

**Appendix D**

| | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| J1 | | 4 | 2 | 1 | 1 | | | 3 | 2 | | | 2 | 9 | 8 | 2 | 3 | 2 | J1 |
| J2 | | 1 | 2 | 2 | 3 | | | 1 | 4 | | 1 | 1 | 3 | 8 | 5 | 7 | 1 | J2 |
| J3 | | 5 | 2 | 1 | | | | 2 | 5 | | | | 13 | 9 | 2 | | | J3 |
| J4 | | 2 | 4 | 1 | 1 | | | 2 | 4 | 1 | | | 5 | 14 | 3 | 2 | | J4 |
| K1 | | 6 | 2 | | | | | 3 | 2 | 1 | 1 | | 12 | 8 | 1 | 3 | | K1 |
| K2 | | 6 | 2 | | | | | 3 | 2 | 1 | 1 | | 11 | 9 | 1 | 3 | | K2 |
| K3 | | 6 | 2 | | | | | 5 | 1 | 1 | | | 16 | 6 | 2 | | | K3 |
| K4 | | 6 | 2 | | | | | 5 | 1 | 1 | | | 14 | 8 | 2 | | | K4 |

SA: strongly agree; MA: mildly agree; N: e; SD: strongly disagree
VI: very important; SI: somewhat importa omewhat unimportant; VU: very unimportant

## Reference list


Afsah, Shakeb, Benoit Laplante, and David Wheeler. 1996. *Controlling industrial pollution: a new paradigm.* World Bank, Policy Research Department, Environment, Infrastructure, and Agriculture Division. http://www.worldband.org/nipr/work_paper/1672/index.html (visited April 3, 1998).

Air and Waste Management Association (AWMA). Ontario Section. undated. *Approaches to environmental protection - reality and results.* http://www.ebtech.net/c2p2/awma.html (visited April 13, 1999).

Arora, Seema and Timothy C. Cason. 1996. Why do firms volunteer to exceed environmental regulations? Understanding participation in EPA's 33/50 program. *Land economics* 72 (4) : 413-432.

British Columbia. *Waste Management Act*, R.S.B.C. 1996, c.482.

British Columbia. Ministry of Environment, Lands and Parks. 1991. *Environment 2001, strategic directions for British Columbia.* Victoria: Ministry of Environment, Lands and Parks.

_____. 1992a. *New approaches to environmental protection in British Columbia: a legislation discussion paper.* Victoria: Ministry of Environment, Lands and Parks.

_____. 1992b. *New directions in environmental protection, 5 year action plan 1992-1997.* Victoria: Ministry of Environment, Lands and Parks.

_____. 1992c. *Revising British Columbia's waste discharge permit fee system: a discussion paper.* Victoria: Ministry of Environment, Lands and Parks.

_____. 1995. *Ministry mandate.* http://www.elp.gov.bc.ca:80/main/melp_overview/vision.html (visited March 1, 1999).

_____. 1996a. *Industry joins province to prevent pollution.* News release, March 27, Ministry of Environment, Lands and Parks. 330-20:ELP95/96-114.

_____. 1996b. *An introduction to pollution prevention planning for major industrial operations in British Columbia.* Victoria: Ministry of Environment, Lands and Parks.

_____. 1996c. *A policy and procedure for authorizing pollution prevention plans in British Columbia: compliance plus, background report.* Unpublished.

_____. 1997. *The pollution prevention planning guide for major industrial operation in British Columbia, Draft 3.* Unpublished.

British Columbia. Pollution Prevention Demonstration Project Steering Committee. 1997. *Interim report.*

_____. 1999. *Final report.*

Canada. Industry Canada. Office of Consumer Affairs and Treasury Board Secretariat. Regulatory Affairs Division. 1998. *Voluntary codes: a guide for their development and use.* http://strategis.ic.gc.ca/SSG/ca00963e.html (visited April 16, 1999).

Chang, Elfreda, Doug Macdonald, and Joanne Wolfson. 1998. Who killed the Canadian Industry Packaging Stewardship Initiative (CIPSI)? *Alternatives Journal* 24, no. 2: 21-25.

Clark, Karen. 1995. *The use of voluntary pollution prevention agreements in Canada: an analysis and commentary.* Canadian Institute for Environmental Law and Policy.

Cominco Ltd. n.d. *Environmental protection, balancing environmental, social and economic goals.*

_____. 1999. *Pollution prevention (P2) demonstration project at the Cominco Trail fertilizer operation: final report, conclusions and recommendations.* Trail, BC.

Cotton, Roger. 1996. Voluntary initiatives improve on use of compliance measures. *Environmental Policy & Law* 7, no. 3: 389.

Doern, Bruce G. 1990. *Getting it green: case studies in Canadian environmental regulation.* Ottawa: Renouf Publishing Company Ltd.

Dovetail Consulting Inc. 1997. *Summary report, pollution prevention demonstration project workshop.* Vancouver, BC.

Driedger, Ron, Director, Pollution Prevention and Remediation, Environment and Resource Management, British Columbia Ministry of Environment, Lands and Parks Headquarters Division. 1999. Correspondence with author, 25 November 1999.

Easton, Chuck, Environmental Supervisor, Elk Falls mill, Fletcher Challenge. 1999. Telephone interview by author, 10 June 1999.

Fast, Don, British Columbia's Assistant Deputy Minister of Environment, Lands and Parks Headquarters Division. 1999. Telephone interview by author, 23 June 1999.

Higgins, Thomas E., ed. 1995. *Pollution prevention handbook.* Boca Raton: CRC Press, Inc.

Hillyer, Ann. 1996. *Moving from permitting pollution to preventing pollution: What does the environment need from a permit? A public interest perspective.* West Coast Environmental Law Association. http://www.vcn.bc.ca/wcel/wcelpub/1996/11704.html (visited April 1, 1998).

ICF Kaiser Canada. 1998. *Pollution prevention planning in other jurisdictions.*

International Energy Agency. 1997. *Voluntary actions for energy-related $CO_2$ abatement.* Paris: Organisation for Economic and Co-operation and Development.

International Institute for Sustainable Development and Canadian Environmental Technology Advancement Corporation - West. 1998. *Beyond regulation: exporters and voluntary environmental measures.* Winnipeg, Manitoba.

New Directions Group. 1997. *Criteria and principles for the use of voluntary and non-regulatory policy objectives to achieve environmental policy objectives.* http://www.expertcanmore.net/Pgriss/English.html (visited April 16, 1999).

Ontario. Environmental Commissioner. 1996. *Round table: self regulation, voluntary compliance and environmental protection.* http://www.eos.uoguelph.ca/webfiles/awma/rtable.htm (visited June 21, 1999).

Ontario. Ministry of Environment and Energy. n.d. *Pollution prevention pledge program.*

_____. 1997. *Ontario's progress in pollution prevention.*

_____. 1999. *Pollution prevention in Ontario.*

Organisation for Economic and Co-operation and Development. 1998. *Voluntary agreements with industry.* OECD Working papers VI, no. 68.

Overholt D. H. and P. C. Godsoe. 1996. Voluntary environmental initiatives - are they here to stay? *Policy Perspectives* 3, no. 2: 1-6.

Parker, David R. 1996. Beyond command and control: do voluntary initiatives hold promise for enhanced environmental protection? M. L. thesis, University of British Columbia.

Parto, Saeed. 1999. Aiming Low. In *Voluntary initiatives: the new politics of corporate greening,* ed. Robert Gibson, 182-198. Peterborough: Broadview Press.

Porter, Michael E. 1991. America's green strategy. *Scientific American* (April 1991): 168.

Porter, Michael E. and Claas van der Linde. 1995. Green and competitive: ending the stalemate. *Harvard business review* (September/October 1995): 120-134.

Rabe, Barry G. 1997. The politics of sustainable development: impediments to pollution prevention and policy integration in Canada. *Canadian public administration* 40, no.3: 415-435.

Resource Futures International. 1996. *Voluntary environmental measures: What are they? What makes them work?* http://www.eos.uoguelph.ca/webfiles/awma/vem.htm (visited June 21, 1999).

Riordan, James. 1997. *Instruments for advancing pollution prevention and cleaner production: the Canadian experience.* http://c2p2.sarnia.com/hot/across-…ederal/leadership/instruments.html (visited April 3, 1998).

Salant, Priscilla and Don A. Dillman. 1994. *How to conduct your own survey.*

Segerson, Kathleen and Thomas J. Miceli. 1998. Voluntary environmental agreements: good or bad news for environmental protection? *Journal of environmental economics and management* 36: 109-130.

Sinding, Knud, Robert Anex, and Mark Sharfman. 1998. "Environmental uncertainty, corporate strategy and public policy." Paper presented at the Greening of Industry conference, Rome, Italy, November 15-18, 1998.

ten Brink, Patrick, Vicky Pollard and James Medhurst. 1998. "Environmental agreements: environmental effectiveness for potential future use." Paper presented at the Greening of Industry conference, Rome, Italy, November 15-18, 1998.

Thompson, Andrew R. 1980. *Environmental regulation in Canada.* Vancouver:

Wallace, David. 1995. *Environmental policy and industrial innovation*. London: Earthscan Publications Ltd.

Webb, Kernaghan. 1999. Voluntary initiatives and the law. In *Voluntary initiatives: the new politics of corporate greening*, ed. Robert Gibson, 32-50. Peterborough: Broadview Press.

World Commission on Environment and Development. 1987. *Our common future*. New York: Oxford University Press.

Wylynko, Bradley. 1999. Beyond command and control. In *Voluntary initiatives: the new politics of corporate greening*, ed. Robert Gibson, 161-175. Peterborough: Broadview Press.