



Guideline for Environmental Practice

V1.0
February 2004

The Association of Professional Engineers,
Geologists and Geophysicists of Alberta

FOREWORD

This guideline is a revision of the document entitled *Environmental Practice – A Guideline*, originally issued in 1994. This version recognizes the changes to environmental standards and practices in Alberta, including the concept of Sustainability.

An APEGGA guideline presents procedures and practices that are recommended by APEGGA. In general, an APEGGA member should conform to the recommendations in order to be practising in accordance with what is deemed to be acceptable practice and with regulatory requirements. Variations may be made to accommodate special circumstances if they do not detract from the intent of the guideline.

Guidelines use the word *should* to indicate that among several possibilities, one is recommended as particularly suitable without necessarily mentioning or excluding others; or that a certain course of action is preferred but not necessarily required; or that (in the negative form) a certain course of action is disapproved of but not prohibited (*should* equals *is recommended that*). The word *shall* is used to indicate requirements that must be followed (*shall* equals *is required to*). The word *may* is used to indicate a course of action permissible within the limits of the guideline (*may* equals *is permitted*).

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- They are encouraged to share their expertise and educate other members, governments and the public on environmental issues.
- They are encouraged to interact with other disciplines to bring theoretical and technological research into applied practice.

COMMENTARY

The practice of engineering, geology and geophysics continuously improves due to technological advances, innovation and design changes. Parallel to this, environmental consequences need to be addressed. This is central to the concept of Sustainability. Thus, continuous attention also needs to be given to environmental understanding and practices.

Members are encouraged to be actively involved with environmental issues. They should go beyond merely facilitating improvements. By being actively involved, they may anticipate and prevent, rather than react.

Members are uniquely poised between the two extremes of absolute preservation and unfettered development. Education is crucial: firstly, for members so that they will say "no" when "no" needs to be said; secondly, to be participants of bodies constituted to formulate environmental laws and their enforcement; and thirdly, for the public so that they see members as true stewards who have viable, knowledge-based solutions.

Members deal with environmental issues. Research is one means to improve designs, procedures and technologies. The solution to complex long-term problems requires the participation of industry, governments and academia. Members are encouraged to interact with others to translate from theoretical research into applied practice.

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1 OVERVIEW

APEGGA members have a wide diversity of occupations and responsibilities. Many are involved in different types of economic development, which should occur in a cost effective and environmentally responsible manner. Professional Members explore resources and design economic and sustainable methods of developing them. They develop new projects and public infrastructure and keep existing facilities operating effectively. Responsible environmental management is an inherent part of performing those duties for all Professional Members, regardless of their discipline.

Members work as employees, employers, researchers, academics, consultants, and in regulatory and managerial roles. They frequently work as a team where they are involved with other specialists. An individual member may or may not have control of, or be solely responsible, for a particular project. To the extent possible, they should understand and manage the environmental aspects of the project.

Members are expected to exercise Due Diligence in the execution of their work. That expectation includes practicing in accordance with the APEGGA Code of Ethics¹, provincial and federal law, restricting practice to areas of personal expertise, and practicing in accordance with established standards.

APEGGA professionals may or may not be directly managed by other members of APEGGA. Regardless, members will expect to be supported in environmentally responsible decisions by management and team members, as they too, have a societal responsibility for wise stewardship of the Environment. The primary duty of Professional Members is to hold paramount the protection of public safety and welfare, with due regard for the Environment.

A substantial body of legislation setting out environmental requirements has existed for some time, and much of this can be found in the *Canadian Environmental Protection Act*², the *Canadian Environmental Assessment Act*³, the *Alberta Environmental Protection and Enhancement Act*⁴, the *Alberta Water Act*⁵. Environmental regulations and standards are evolving. In some aspects, legislations from various jurisdictions overlap in a complex and sometimes contradictory manner. To cope with these complexities, APEGGA members will have to take extra measures to be regularly informed on local, provincial, and national trends in environmental legislations. As well, it will be useful for members to maintain awareness of emerging international protocols and agreements, even though these may not have legal status in Canada or Alberta.

1.1 SCOPE

This document, through amplification and commentary of each guideline, summarizes how an APEGGA member should strive to influence the practice of engineering and geoscience in an environmentally responsible direction.

¹ *Guideline for Ethical Practice*, APEGGA, 2003.

² S.C. 1999, c. 33.

³ S.C. 1992, c. 37.

⁴ R.S.A. 2000, c. E-12.

⁵ R.S.A. 2000, c. W-3.

- They shall maintain requirements of disclosure, accurate represent, and provide information concerning environmental effects to regulatory authorities.
- They shall make public regulatory authorities aware of all environmental effects of any assignment they are involved in, through the normal regulatory review and approval process.
- They shall maintain client and/or employer confidentiality unless otherwise required by relevant legislation, approvals or orders. Where any confidential information is disclosed to public authorities, the members shall ensure that their employers and clients are advised of such disclosure as soon as practicable.
- They shall ensure that appropriate action or notification of proper authorities occurs in any instance where they believe that public safety or the Environment is endangered, or where required by relevant legislation, approvals or orders.

COMMENTARY

Professionals are responsible for knowledge and awareness of environmental laws and regulations, either directly or through the retention of appropriate expertise. Due Diligence is required in the conduct of professional duties to ensure that everything reasonable is done to comply with environmental requirements. This implies an understanding of environmental policy and appropriate behaviour, including the obligation to establish and maintain clear lines of management responsibility, and the maintenance of technical excellence. Environmental Audits and the implementation of an EMS are effective means for accomplishing these objectives.

Members should know their obligations with respect to the role of the regulatory authorities relative to protection of the Environment. In dealing with employers, clients and public regulatory authorities, professionals shall not intentionally withhold information they have about environmental effects of any assignment they may be working on. Current legislation may hold them personally responsible or liable for any offenses, omissions, or acquiescence. Due Diligence is a moving standard which will be more clearly defined by the Courts with the passage of time. In this regard, professionals have an obligation to their colleagues, employers, client and regulatory authorities, for a well-documented and comprehensive approach to problem solving where environmental concerns are involved.

Professionals must conduct their work in a manner such that the confidentiality can be maintained to the maximum degree possible. In doing so, however, the professional must recognize that in some instances there may be regulatory requirements to release or report information relating to environmental effects.

3.9 GUIDELINE #9

Professional members should actively work with others to improve environmental understanding and practices.

AMPLIFICATION

- They should recognize the potential of their activities and membership to influence society.
- They should recognize the value of early involvement and action versus reaction.

- They shall recognize the importance of social and economic values in the environmental assessment process and the potential need for local, neighbourhood, traditional, and cultural criteria through Stakeholder involvement.
- They shall immediately advise their employer and/or client of any concern they may have about potentially Adverse Effects discovered in the course of any assignments they are involved in.

COMMENTARY

When members become aware of public concerns relative to an assignment they may be involved in, the nature of the concern should be investigated in a timely manner. Once they have determined the validity of the concern they should promptly communicate the information through the normal lines of responsibility. Members are encouraged to seek a second professional or specialist opinion as to the technical validity of their conclusions whenever possible, when there appears to be a difference of opinion with the other responsible parties regarding environmental effects.

In disclosing information about environmental effects, professionals should communicate the information through normal channels and lines of responsibility. Where, in the opinion of the professional, the withholding of confidential information poses a potential threat to the Environment, he or she should make reasonable effort to contact responsible parties before disclosure of the information to the proper regulatory authority. However, professionals must recognize their individual responsibilities for reporting releases and for environmental protection in accordance with legislated reporting requirements and Rule One of the Code of Ethics.

3.8 GUIDELINE #8

Professional Members shall comply with regulatory requirements and endeavor to exceed or better them by striving toward the application of best available, cost-effective technologies and procedures. They shall disclose information necessary to protect public safety to appropriate authorities.

AMPLIFICATION

- They shall develop and maintain current knowledge and understanding of legislation, regulations, approvals, codes and guidelines; their purposes and limitations, and shall ensure that these requirements are applied both on a procedural and substantive basis.
- They shall ensure that proper documentation of adherence to environmental procedures, protocols and regulations is maintained, and that relevant information be provided to regulatory agencies in a timely fashion.
- They shall have regard for both the reality and the trend of environmental legislation to assign personal responsibility for both action and omission. They shall reflect this reality in their professional duties accordingly as it relates to themselves, their employer, colleagues and clients.
- They should endeavor to go above and beyond standards and regulatory requirements to protect the health and well-being of the public. They are encouraged to take into account evidence of Cumulative, Persistent and synergistic Effects, where these may not be fully considered in standards or regulations.

1.2 PURPOSE

The purpose of this document is to inform, provide guidance, and to encourage members and permit-holders to be pro-active in the protection and stewardship of the Environment.

1.3 DEFINITIONS

For the purposes of this guideline, the following terms and definitions apply.

Act

The *Engineering, Geological and Geophysical Professions Act*, R.S.A. 2000, c. E-11.

Association

The Association of Professional Engineers, Geologists and Geophysicists of Alberta (APEGGA).

Acquiescence

To accept or comply passively, without question or objection.

Adverse Effect

Impairment of or damage to the Environment, human health or safety or property.

Conservation

The planning, management and implementation of an activity with the objective of protecting the essential physical, chemical and biological characteristics of the Environment against degradation.

Cost-Benefit Analysis

An economic analysis method that seeks to express the costs of an activity, in comparison to the benefits, using common units, to aid decision-making. The analysis would normally include capital, operating, maintenance, decommissioning, social and environmental costs.

Cumulative Effects

Individual effects that are incremental, additive, and synergistic such that they must be considered collectively and over time, in order for a true measure of the total effect and associated environmental costs of an activity to be assessed.

Due Diligence

The care that a reasonable person exercises under the circumstances to avoid harm to other persons, property, and the Environment.

Ecosystem

The interactive system involving all of the organisms in a specified area, their interactions with each other, energy and material flows and the components of air, land and water.

Environment

The components of the earth and includes:

- i) air, land and water
- ii) all layers of the atmosphere

- iii) all organic and inorganic matter and living organisms, and
- iv) the interacting natural systems that include components referred in subclauses (i), (ii) and (iii) above.

Environmental Audit

A systematic, documented, objective review of the manner in which environmental aspects of a program, project, facility or corporation are being managed.

Environmental Impairment

Damage, harm or loss to the Environment.

Environmental Management System (EMS)

A continual cycle of planning, implementing, reviewing and improving the processes and actions that an organization undertakes to meet its business and environmental goals. Most EMS's (i.e. ISO 14001) are built on the "Plan, Do, Check, Act" model. This model leads to continual improvement based upon:

- establishing policy or strategic direction;
- planning, including identifying environmental aspects and establishing goals [plan];
- implementing, including training and operational controls [do];
- checking, including monitoring and corrective action [check]; and
- reviewing, including progress reviews and acting to make needed changes to the EMS [act].

Environmental Specialist

An individual qualified with training, knowledge and experience in a field or discipline of science dealing with the Environment.

Hazardous Substance

A substance or mixture of substances, other than a pesticide, that exhibits characteristics of flammability, corrosivity, reactivity or toxicity, including, without limitation, any substance that is designated as a Hazardous Substance within the meaning of the regulations

Hazardous Waste

A category of Wastes requiring special handling, treatment or disposal as specified in currently applicable regulations.

Liability

Legal responsibility to another or to society, enforceable by civil remedy or criminal penalty.

Life-Cycle Assessment

Assessing the environmental effects of a chemical, product, development or activity from its inception, implementation, and operation through to termination or decommissioning.

Professional Member

A professional engineer, professional geologist, professional geophysicist, registered professional technologist (engineering), registered professional technologist (geological),

- They should make reasonable investigations as to the individual and Cumulative Effects on other micro Ecosystems in the vicinity of the work being completed as well as the social and economical implications.
- They should, where ever applicable, monitor the effect of changing climate on standard design practices and adapt their daily decisions and project designs to accommodate these changes as they evolve.
- They shall comply with all relevant legislation, approvals and orders relating to the sustainable treatment of resources and disposal of same resources and by products. In addition, even where not required by legislation, approvals or orders, they should arrange to increase the lifecycle of a resource as a means to increase Sustainability.

COMMENTARY

Sound engineering and geoscience, the application of modern technology, and innovative design approaches are important aspects in achieving Sustainability. All aspects of a project must be fully investigated and mitigated. Therefore, the Professional Member should endeavor to resolve all issues surrounding a project or product before proceeding.

Sustainability has, in the past, often focused on the development and use of natural resources. A change in this focus is required. Members must understand the effect of all projects on resources, both natural and manmade. Although Waste minimization is a key part of Sustainability so is the effect of a project on its surroundings. For example a new sky-rise building may effect nesting habits of falcons, and energy and water consumption; therefore energy efficient equipment and a roof top garden may be necessary to offset some of the effects of the new building. Similarly, automotive design incorporating alternative fuels should evaluate the Cumulative Effects of production, emissions and other byproducts to understand the full effect to Sustainability.

Climate change is a recognized phenomenon. Whether the observed changes in climate are caused by humankind or are due to natural causes these changes can have significant effects on engineered structures. Statistics governing the return frequencies of extreme weather events such as ice storms and floods may no longer be accurate or relevant. Structures designed based on historical information may not be robust enough to withstand weather events that are now much more common. In the best case this could result in higher repair costs. In the worst case, the inadequate design could present a significant risk to the safety of the public who depends on these structures and systems. The Professional Member should stay apprised of climate change developments and apply reasonable improvements to the systems and structures that they design in order to accommodate these changes.

3.7 GUIDELINE #7

Professional Members should engage and solicit input from stakeholders in an open manner, and shall respond to environmental concerns in a timely fashion.

AMPLIFICATION

- Members are encouraged to involve stakeholders during the design of a project that may have an Environmental effect. This would allow for Stakeholder concerns to be addressed up front.

identification protocols. These measures can be efficiently organized within an EMS that is formally implemented at the beginning of a project.

3.5 GUIDELINE #5

Professional Members should include the costs of environmental protection among the essential factors used for evaluating the economic viability of projects for which they are responsible.

AMPLIFICATION

- They should acknowledge the role of various decision-makers in determining technical feasibility for evaluating the economic viability of projects.
- They should acknowledge the importance of all relevant technical, economic, environmental, and social information to the ultimate decision-makers.
- They should recognize that environmental protection is an integral part of project development.
- They should include environmental protection in Life Cycle Assessment for comprehensive project costing.

COMMENTARY

Members usually must provide the technical detail that will form the basis for costing developments, even if the overall decisions about proceeding with a development are the responsibility of others. Project costing must now routinely consider the full, lifecycle costs, from project conception to final decommissioning. If the technical detail for the project lifecycle fails to consider the full scope of environmental costs, then project decision makers may reach an invalid decision about the true economic viability of a project. These environmental costs may include: prevention, Mitigation or compensation for Adverse Effects, operational and long term monitoring, inspection and maintenance and decommissioning and Reclamation costs. Although it was once common to externalize some or most of these costs, current awareness and resulting legislation are requiring that environmental costs be assigned to project proponents. Consequently, members need to advise responsible parties of these obligations.

3.6 GUIDELINE #6

Professional Members should recognize the value of environmental efficiency and Sustainability, consider full Life-Cycle Assessment to determine the benefits and costs of additional environmental stewardship, and endeavor to implement efficient, sustainable solutions.

AMPLIFICATION

They should consider the true cost of the use of a raw product including manufacturing, byproducts, and disposal.

- They should identify the sources, types and quantities of resources required to complete a project and undertake to find innovative ways to minimize the need for the resources, especially resources with scarcity issues.

registered professional technologist (geophysical) or licensee entitled to engage in the practice of engineering, geology and geophysics under the Act.

Mitigation

In respect of a project, the elimination, reduction or control of the adverse environmental effects of the project, and includes restitution for any damage to the environment caused by such effects through replacement, restoration, compensation or any other means.

Persistent Effect

A compound or substance that is resistant to degradation processes, and has the potential to accumulate in the environment and exert long term environmental effects.

Quality of Life

The factors related to the state of health and well-being of an individual or a community.

Reclamation

The removal of equipment or buildings or other structures or appurtenances; and the stabilization, contouring, maintenance, conditioning or reconstruction of the surface of land resulting in a biologically productive landscape equivalent to pre-disturbed state.

Recycle

To do anything that results in providing a use for a thing that otherwise would be disposed of or dealt with as Waste, including collecting, transporting, handling, storing, sorting, separating and processing the thing, but does not include the application of Waste to land or the use of a thermal destruction process.

Remediation

The process of correcting or counteracting the contamination of buildings or other structures or other appurtenances, or land or water to meet or exceed regulatory requirements.

Societal Values

The attitudes, beliefs, perceptions and expectations generally held in common in a society at a particular time.

Socioeconomic Effects

The effects of a development, product or activity on the economy and social structure of affected communities. Socio-economic effects may include issues such as: employment, housing and social needs, medical services, recreational facilities, transportation and municipal infrastructure and financial benefits, to local residents and businesses.

Stakeholder

A person or organization who is directly involved with or affected by a development, product, or activity and therefore has an interest in it.

Sustainability

Ability to meet the needs of the present without compromising the ability of future generations to meet their own needs, through the balanced application of integrated planning and the combination of environmental, social, and economic decision-making processes.

Visual Effects

Additions to or alterations of the existing landscape and horizons that are visible to, and create reaction, among the public.

Waste

A material or substance that is unwanted by its generator, and without proper management represents a risk to the environment.

2 ENVIRONMENTAL PRACTICE AND PROFESSIONAL MEMBERS

This APEGGA *Guideline for Environmental Practice* has been prepared to complement the existing Code of Ethics. The formulation of this guideline recognizes the prominent role of APEGGA, whose members are not only concerned with development projects and their maintenance, but also with a wide variety of environmental management responsibilities.

Environmental Impairment is recognized as a risk to public welfare, and in response members of society are being urged to protect, preserve and enhance the quality of the environment. The long term objectives are to sustain the viability of our Ecosystems, and to ensure that the well-being of future generations is not compromised by our activities today.

Members recognize that stewardship of the environment is a responsibility of all citizens, and the public expects and has a rightful role in setting goals for environmental management, even though public expectations are evolving and vary widely.

APEGGA recognizes the need for continuing development for the benefit of society. A balanced approach will most likely create development that will meet the needs of society. Integrating fundamental environmental sustainability with social and economic considerations will require members to be innovative and creative in their planning and design. In its broader context, this will require that members take a more holistic view of their role in shaping the future, by not only being innovative, but by showing to others how these innovations advance the interests of:

- public safety, health and welfare,
- the environment,
- risk minimization and management, and
- social and cultural values.

Environmental work is often best accomplished by a multi-disciplinary team. Due Diligence requires that all reasonable steps are taken to ensure that the team comprises the necessary expertise and that this expertise is appropriately applied. The Professional Member shall only apply his or her stamp to professional documents he or she has prepared or to professional documents that were prepared under his or her supervision and control. In the case of professional documents prepared by someone else, a Professional Member shall only apply his or her stamp to the documents after thoroughly reviewing the documents and accepting professional responsibility for them. The Professional Member must be aware that he or she is liable for all work that is presented

3.4 GUIDELINE #4

Professional Members should ensure that environmental planning and management is integrated into all their activities which are likely to have any Adverse Effects.

AMPLIFICATION

- They should recognize that projects undertaken by members are likely to have some effect on the environment.
- They should identify the possible environmental effects of all substantial aspects of a project (e.g. design, construction, operation and decommissioning), using the Life Cycle Assessment approach.
- Prevention of Adverse Effect is the preferred option, followed by Mitigation.
- They are encouraged, in assessing project alternatives, to seek opportunities not only to protect, but to enhance the environment.
- They should, where possible, work within an EMS that requires the identification and prioritization of environmental aspects and the organization of cost-effective programs to control and reduce the related effects for the ongoing operation.

COMMENTARY

Members must recognize that societal expectations and demands for environmental protection are such that if environmental effect prevention and Mitigation is not inherent in the initial project development, it will likely be required subsequently, probably at much higher cost and after public debate.

Almost every aspect of a project can have either direct or indirect environmental effects, both positive and negative. Project siting, design, construction, operations, maintenance, decommissioning and Reclamation all have environmental consequences which must be considered early in project evaluation. To effectively address such environmental issues requires a systematic evaluation procedure. Developing effective prevention or Mitigation strategies requires integrated project planning. Members are encouraged to see that such evaluation procedures are in place and are followed so that effective environmental protection strategies are an integral part of their activities. The Professional Member, as well as the project proponent, has a responsibility to consider environmental effect prevention and Mitigation as a part of doing business.

Many projects also present an opportunity to consider planning and design alternatives that may actually enhance the environment by having a positive effect. An example of such an opportunity would be during the planning of a bridge near a fish stream, where the natural stream could be improved for fish habitat by using selected excavated material such as large boulders to enhance hydraulic conditions, rather than simply discarding Waste materials at landfills or quarries.

Consideration of the full scope of environmental costs at the earliest possible stage of project development will often provide considerable cost savings, as compared with retrofitting or remedial actions. Consequently, the interests of the project proponent, as well as those of society, can best be served by recognition of the environmental effects of a project during the planning stages. Likewise, the risks posed by hazardous circumstances associated with a project may often be most cost-effectively remedied by early recognition of such circumstances, through the use of formalized hazard

COMMENTARY

As the practice of environmental science requires the integration of diverse disciplines and philosophies, many projects will require a team of appropriate specialists to address complex environmental issues. As Rule Two of the APEGGA Code of Ethics states, members shall undertake only that work that they are competent to perform by virtue of training and experience. Integrated decision-making by knowledgeable specialists is often required in environmental issues.

3.3 GUIDELINE #3

Professional Members shall apply professional and responsible judgment in their environmental considerations.

AMPLIFICATION

- They shall begin the environmental assessment process at the earliest planning stages of an initiative to provide the basis for project life-cycle environmental management.
- They shall develop a structured set of criteria which reflect standards relating to Sustainability or carrying capacity and in accordance with scientific research and experience, with respect to projects or initiatives which they are planning or designing.
- They shall recognize the value of multi-disciplinary involvement and Stakeholder consultation and participation in the decision making process for projects having environmental effects.
- They shall identify and promote cost-efficient solutions and approaches in integrating environmental, social, and economic considerations which reflect the concepts of Sustainability.

COMMENTARY

Members should bring the same structured problem solving approach to the environmental review process as they do in engineering and geoscience design, where known criteria, standards and procedures are applied in the planning, design development and Life-Cycle Assessment process.

The recognition of specialist responsibility in this area is paramount. The member must be vigilant in selecting a process or assembling a team to apply sufficient and appropriate knowledge to the proposed development.

Of similar concern is the need for members to recognize Societal Values applicable to the social and economic effects of developments. Local and neighbourhood concerns, Quality of Life, specific effect concerns (e.g. Visual, sound, odour), along with traditional and cultural values, have all gained acceptance as pertinent and definable criteria that many jurisdictions are now interpreting and applying.

Finally, there is a need to take initiative in the application of cost benefit and other analysis tools, and the evaluation of alternative designs for integrating the viability of projects with the concepts of sustainable development. Members are encouraged to bring expertise and a comprehensive approach to problem solving, in terms of optimizing the returns to society at large.

under his or her authority – Liability cannot be avoided simply by not stamping the document.

The philosophy of this guideline is to encourage sustainable environmental plans that are anticipatory and preventative, rather than reactive. It would be prudent for members to strive to inform, advise, and counsel the employer, client or owner as to the implications of possible changes in standards and expectations.

The provincial and federal governments have overlapping jurisdiction as it relates to the environment. Consequently, it is possible that municipal, provincial and federal laws may regulate the Environment concurrently.

Some examples of municipal, provincial and federal environmental laws that may apply to an activity undertaken by the Professional Member include:

1. Municipal - waste by-laws;
2. Provincial - the Alberta *Environmental Protection and Enhancement Act*, the Alberta Water Act, and associated regulations; and
3. Federal - the *Canadian Environmental Protection Act 1999*, the *Canadian Environmental Assessment Act*, and associated regulations.

This is not an exhaustive list. To ensure compliance with any applicable municipal, provincial and/or federal environmental laws, Professional Members shall determine what environmental laws, if any, apply to the activity they are undertaking as early in an activity's timeline as possible. To aid in this, Professional Members should consider consulting with municipal, provincial and federal authorities at the project scoping and planning stage of an activity. It is the Professional Member's responsibility to ensure compliance with all applicable environmental laws when undertaking any activity.

It is intended that this guideline will be universally applied, regardless of the scale of the undertaking. Certain projects will require a full environmental impact assessment; other projects will simply require thought and planning to minimize environmental disruption, even if that disruption appears to be very minor. Professional Members shall practice Due Diligence and the application of reasonable care.

2.1 GUIDELINE SUMMARY

Professional Members are committed to environmental protection and safeguarding the well-being of the public.

Professional Members:

1. should develop and maintain a reasonable level of understanding, awareness, and a system of monitoring environmental issues related to their field of expertise;
2. shall use appropriate expertise of specialists in areas where the Member's knowledge alone is not adequate to address environmental issues;
3. shall apply professional and responsible judgment in their environmental considerations;

4. should ensure that environmental planning and management is integrated into all their activities which are likely to have any Adverse Effects;
5. should include the costs of environmental protection among the essential factors used for evaluating the economic viability of projects for which they are responsible;
6. should recognize the value of environmental efficiency and Sustainability, consider full Life-Cycle Assessment to determine the benefits and costs of additional environmental stewardship, and endeavor to implement efficient, sustainable solutions;
7. should engage and solicit input from Stakeholders in an open manner, and strive to respond to environmental concerns in a timely fashion;
8. shall comply with regulatory requirements and endeavor to exceed or better them by striving toward the application of best available, cost-effective technologies and procedures; they shall disclose information necessary to protect public safety to appropriate authorities; and
9. should actively work with others to improve environmental understanding and practices.

3 GUIDELINES AND COMMENTARY

3.1 GUIDELINE #1

Professional Members should develop and maintain a reasonable level of understanding, awareness, and a system of monitoring environmental issues related to their field of expertise.

AMPLIFICATION

- They should recognize the general extent to which their professional activities can affect the environment. They should recognize the importance of Environmental Management Systems (EMS) to identify, control, and reduce these effects.
- They should stay informed of the major environmental issues facing society so that they may broadly judge the potential interaction of their professional activities with those issues.
- They shall practice Due Diligence and the application of reasonable care.

COMMENTARY

Sustaining the viability of our Environment is a broad responsibility of all citizens. Likewise, our society must seek to reconcile these environmental needs with our need for responsible development. Members should take an active and cooperative role to assist society to meet these challenges. This could apply even though the individual professional activities of some members may primarily involve expertise that is apparently unrelated to environmental matters. Members are responsible for maintaining their knowledge in areas that have a bearing on the quality and effect of their work. As society has developed an increased awareness of the degree to which development activities can affect the environment, so the members involved in designing and implementing developments must maintain a reasonable level of understanding of those

environmental concerns, and the possible significant effects of their professional activities on the Environment.

The foregoing responsibility does not imply that every individual member can or should be an Environmental Specialist. As with any other specialization, there will be degrees of environmental expertise that will be appropriate for specific circumstances. The general obligation is to possess sufficient knowledge of relevant environmental issues to be able to competently judge the degree of need for specialist assistance. Given the normal technical responsibilities of members, society may expect them to anticipate and understand environmental problems.

Environmental legislation can place responsibility for Environmental Impairment on any individual. In such cases, a defense for the individual may have to rely upon demonstrating Due Diligence, the premise that the individual took all reasonable measures to prevent the offence. The basis for judging these measures for a member should be determined by comparison with good current practice among peers and by compliance with the requirements of any legislation, approval or order relating to the project in which the member is involved.

If the accused individual was in a position where he or she should have been aware of environmental problems, or of the process and protocols by which environmental problems were to be detected, being unaware or taking no steps to ensure that the process and protocols were effective would not assist a Due Diligence defense. The individual can ensure a high level of Due Diligence by ensuring that activities take place within an adequate EMS which is either consistent with or formally certified to a recognized standard.

The steps or precautions that are likely to be judged reasonable care will vary from circumstance to circumstance. But, generally, the greater the likelihood and/or consequences of a negative occurrence, the greater the care that is expected. An important element of Due Diligence is being able to document that reasonable care has been exercised. Reasonable care may be assessed by comparing what was done to what could have been done, and determining if there were any practical alternatives that could have been used to avoid or to minimize problems. Furthermore, in recent Canadian environmental legislation, an individual can be deemed to be a party to an offence if the individual acquiesced in the commission of the offence.

3.2 GUIDELINE #2

Professional Members shall use appropriate expertise of specialists in areas where the member's knowledge alone is inadequate to address environmental issues.

AMPLIFICATION

- They shall recognize that environmental issues are interdisciplinary in nature, requiring the expertise of a range of disciplines.
- They shall undertake only that aspect of environmental work that they are competent to perform by virtue of training and experience.
- They shall seek out and use appropriate Environmental Specialists to provide expert advice on environmental issues.