

The logo for Professional Engineers & Geoscientists Newfoundland & Labrador (pegni). It features the lowercase letters "pegni" in a bold, black, sans-serif font. To the right of the text is a stylized graphic consisting of three overlapping, upward-pointing arrow shapes in shades of teal and blue.A decorative graphic in the top right corner consisting of several overlapping hexagons. One is a solid black hexagon, another is a solid gold hexagon, and others are outlined in light blue and white. They are arranged in a cluster, with some overlapping each other.

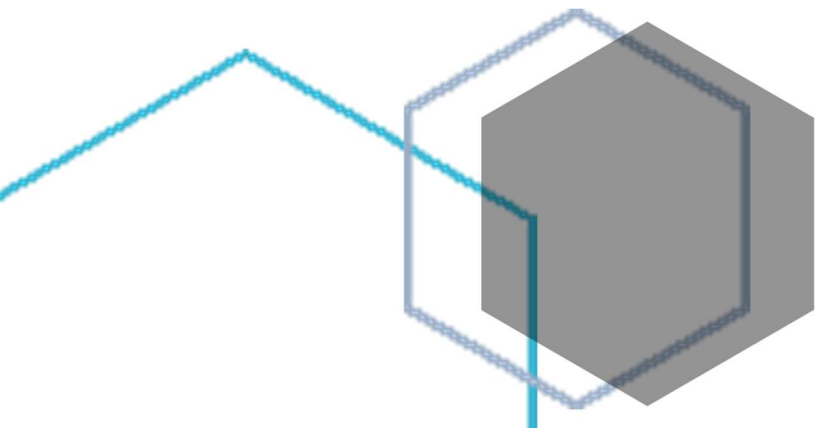
PROFESSIONAL ENGINEERS & GEOSCIENTISTS NEWFOUNDLAND & LABRADOR
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*Environmental Stewardship & Sustainable
Development Guideline for Professional Engineers and
Geoscientists*

Professional Engineers & Geoscientists

Newfoundland and Labrador

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for Professional Engineers and Geoscientists

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1. Introduction

1.1 PEGNL

Professional Engineers and Geoscientists Newfoundland & Labrador (PEGNL) is an organization with a mandate to regulate the practice of engineering and geoscience in the public interest. PEGNL exists so that there will be competent and ethical practice of engineering and geoscience in Newfoundland and Labrador, and to instill public confidence in the professions. To practice Engineering or Geoscience in Newfoundland and Labrador one is required to be registered, and in good standing, with PEGNL.

The Newfoundland and Labrador Engineers and Geoscientists Act, 2008 and the associated Engineers and Geoscientists Regulations, 2011 under that Act govern the practice of engineering and geoscience in the Province. PEGNL is the authority that licenses practitioners under the Act and administers all aspects of that legislation and strives to ensure the ethical conduct of all license-holders.

The purpose of PEGNL's Practice Guidelines is to inform and educate its license-holders, and the public, in matters of professional practice. In general, PEGNL produces these documents to:

- ensure PEGNL license-holders, understand their duties in performing specific components of their professional roles in accordance with the current Act, Regulations and By-Laws; and
- help the public understand the role of PEGNL license-holders and the responsibilities license-holders have when performing professional services.

License-holders adhering to these Guidelines will ensure themselves and the public that they are following best practices in conforming to the legislation and ethical practices applicable to this guideline.

These Guidelines seeks to advise what is normally expected of a reasonable and prudent Professional Engineer or Geoscientist. However, it is not a comprehensive list of what constitutes substantive engineering or geoscience practice. This is an area of responsibility which will remain fully incumbent on the Professional Engineer or Geoscientist.

The intention is not to supersede or replace contractual arrangements designed to satisfy specific situations where good engineering or geoscientific practice might, in certain circumstances, dictate departure from this Guideline.

In addition to items covered in these Guidelines, each project will have its own discipline-specific requirements for design and quality standards which the professional must respect. These Guidelines are intended to be read in conjunction with other applicable PEGNL Guidelines.

Questions or concerns relating to this document should be addressed to the Professional Standards Director at PEGNL.

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1.2 Environmental Guideline Purpose & Professional Member Responsibilities

The Environmental Stewardship and Sustainable Development Guideline has been prepared to elaborate on the basic principle of safeguarding “...human life and welfare and the environment...” as stated in PEGNL’s Code of Ethics. The guideline is intended to educate, provide guidance, and to encourage professional members and permit-holders to be proactive in the protection and stewardship of the environment.

Environmental degradation is recognized as a risk to public welfare. Accordingly, society is trending evermore towards protecting, preserving and enhancing the quality of the environment. In the long-term we must sustain the viability of our ecosystems to ensure the well-being of future generations. Professional members should consider cradle to grave impacts of projects including all related environmental management responsibilities.

This Guideline encourages planning that anticipates and avoids, rather than reacts to, adverse environmental effects. It is intended to be universally applied regardless of the scale of undertaking. Certain projects will require a full environmental impact assessment. Other projects will simply require thought and planning to avoid or minimize adverse environmental effects.

Environment stewardship is the responsibility of all citizens, including professional members and permit-holders, and the public expects, and has a rightful role in expecting, responsible environmental management.

PEGNL also recognizes the need for continued development for the benefit of society. A balanced, rather than one-sided, approach to development is one that will meet society’s needs in the future as well as today. Accordingly, balancing environmental, technical, and economic considerations requires PEGNL professional members to be creative in their work, and to adopt a holistic view of their role in shaping the future.

Permit-holders are required to apply the expertise of its professional members to key decisions. Professional members are encouraged to avail themselves of opportunities to participate in the decision-making process and to inform employers, clients and/or owners of potential changes in standards and societal expectations, and the implications of such changes on their projects.

Environmental stewardship and sustainable development work is often best accomplished by a multi-disciplinary team, some of whose members may not be professional members of PEGNL. Due diligence requires that all reasonable steps be taken to ensure the team has the necessary expertise and that it is appropriately applied.

A substantial body of legislation setting out environmental requirements has existed for some time, some of which can be found in the *Canadian Environmental Protection Act, 1999*, and Newfoundland and Labrador’s *Environmental Protection Act*. Environmental regulations and standards are evolving. In some aspects regulations from various jurisdictions overlap in a complex and sometimes contradictory manner. To cope with these complexities, PEGNL professional members shall keep informed of local, provincial and national regulatory trends

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in environmental stewardship and sustainable development. Furthermore, professional members should keep up to date with emerging international protocols and agreements, even though these may not have legal status in Canada or Newfoundland & Labrador.

1.3 Definitions**Act**

The Newfoundland and Labrador *Engineers and Geoscientists Act, 2008*

Adverse environmental effect

An effect that impairs the quality of the environment such that:

- existing ecosystems are substantially degraded or their ability to sustain themselves is substantially impaired.
- Human health or safety or property is compromised or impaired
- Future development possibilities are lost
- Access to, and enjoyment of, the environment is diminished or lost.

Authority Having Jurisdiction

The regulatory body with authority to administer and enforce the applicable laws or the local by-laws.

Client

The party who engages the professional member to provide services.

Conservation

The planned management of a natural resource to prevent harmful exploitation, destruction or neglect, with the object of preserving **or** maintaining the viability of the resource for future generations.

Cradle to Grave

The entire lifecycle of a chemical, product, development or activity that must be considered when estimating its true cost/benefit.

Discipline

A specific field of practice within the professions governed by the Act (e.g., civil engineering, electrical engineering, geology, environmental geoscience, etc.).

Due Diligence

The attention and care legally expected of a party to prevent or avoid a particular negative occurrence. The steps or precautions that are likely to be judged reasonable will vary from circumstances, but, generally, the greater the likelihood and/or consequences of a negative occurrence, the greater the care is expected. An important element of due diligence is being able to document that reasonable care has been exercised.

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. plant and animal life, including human life;
- iii. the social, economic, recreational, cultural and aesthetic conditions and factors that influence the life of humans or a community;
- iv. a building, structure, machine or other device or thing made by humans;

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- v. a solid, liquid, gas, odour, heat, sound, vibration or radiation resulting directly or indirectly from the activities of humans; or
- vi. a part or a combination of those things referred to in subparagraphs (i) to (v) and the interrelationships between 2 or more of them.

Environmental Stewardship

The wisest use of the finite resources in nature to produce the greatest benefit while maintaining a healthy environment for the foreseeable future.

Mitigation:

Measures or actions taken to reduce the adverse environmental effects of developments, products or activities on the environment.

Owner:

The person, company or other entity who controls the property under consideration and has the authority of ownership.

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Permit Holder

A corporation or association of persons that holds a permit to practice under the *Act*. A permit holder has a *permit number* issued by PEGNL allowing the permit holder to offer and provide engineering or geoscience services to the public.

Person

An individual, as well as a corporation, company, association, firm, partnership, society or other organization.

Positive Environmental Effect:

An effect that is a result of conservation of valued resources or ecosystems or a net reduction in the emission of harmful pollutants.

Precautionary Principle

If threats of serious or irreversible environmental damage exist, cost effective measures to prevent environmental degradation shall not be postponed due to lack of full scientific certainty.

Professional document

A document in any medium (e.g., paper, electronic or other) that contains or presents engineering or geoscience work as defined under the *Act*.

Professional Member

A professional engineer, professional geoscientist, limited licensee (engineering), or limited licensee (geoscience) entitled to engage in the practice of engineering or geoscience under the *Act*.

Regulations

The *Engineers and Geoscientists Regulations, 2011*

Sustainable development:

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

1.4 General Responsibilities of Professional Members and Permit Holders

Professional members and permit holders are responsible for practicing in accordance with the *Act*, Regulations and By-laws (which includes the Code of Ethics)

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A permit holder is corporately responsible for the integrity of its work. A permit holder is responsible to put in place a system enabling engineering or geoscience practice to be carried out competently and ethically by the professionals with education and experience in specific disciplines of practice, which includes facilitating compliance with this guideline.

1.5 Liability

Liability is defined as a legal responsibility for some harm or loss caused to another person. PEGNL has no authority to determine legal liability; jurisdiction to resolve disputes concerning liability rests with the courts. However, PEGNL does have jurisdiction and responsibility to administer the Act, Regulations and By-Laws. Not following this guideline without providing documented, sound professional judgement may contravene the requirements of the Act, Regulations and By-Laws and could lead to discipline proceedings.

1.6 Acknowledgement

Preparation of this guideline included a review of the Environmental Guidelines developed by the Association of Professional Engineers and Geoscientists of Alberta and the National Guideline on Sustainable Development and Environmental Stewardship for Professional Engineers developed by Engineers Canada.

2. Guidelines for Environmental Practice

The following Elements shall be considered by professional engineers and geoscientists as elements of good environmental stewardship and sustainable development practice. These Guidelines may help the professional member explain their services to an Employer, Client, Owner, and/or multi-disciplinary team member. These Guidelines deal in an advisory way with matters of practice and procedure rather than with matters of substantive engineering or geoscience practice.

2.1 Element #1 – Understanding of Environmental Issues

Professional Engineers and Geoscientists shall develop and maintain an understanding of environmental issues related to their field of expertise. To conform to this Element, Professional Members should:

- a) recognize the extent to which their professional activities can adversely affect the environment;
- b) recognize the importance of Environmental Management Systems (EMS) to identify, control, reduce, or avoid these adverse effects;
- c) stay informed of environmental issues facing society so that they may understand how the results of their work may affect or be affected by the environment;
- d) practice due diligence and apply reasonable care. They must not rely on ignorance of environmental issues to justify behavior that leads to adverse environmental effects; and
- e) in cases where the precautionary principle applies, it is important to exercise precaution by assuming that adverse effects are more rather than less likely.

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2.2 Element #2 – Environmental Compliance

Professional Engineers and Geoscientists shall comply with legal and other environmental requirements promulgated by authorities having jurisdiction, and when the benefits to society justify the costs, encourage additional environmental protection. To conform to this Element, Professional Members should:

- a) keep informed of and ensure compliance with environmental laws, regulations, orders, prohibitions, authorizations, approvals, conditions, codes, standards, guidelines, policies, etc.; and
- b) maintain documentation that demonstrates compliance with these requirements and provide such records to regulatory agencies in a timely fashion when required.
- c) monitor changing legislation/regulations and inform clients of pending changes that may impact design or development.

2.3 Element #3 – Climate Change

Professional Engineers and Geoscientists shall acknowledge the reality of climate change and adapt their professional activities to mitigate greenhouse gas emissions and develop projects that are resilient to the effects of climate change. To conform to this Element, Professional Members should:

- a) adapt their design practices to account for the projected effects of climate change on, and over the lifespan of, their projects;
- b) ensure design criteria include elements that make structures resilient to the projected effects of climate change at the construction stage, or during operations through cost-effective upgrades, operational modifications, or administrative controls. For example, where flood risk mapping has been prepared for a community in the province, new land development within the “climate change 1:100 flood zone” shall respect government policy concerning such developments; and
- c) seek to reduce greenhouse gas emissions for all phases of their projects to as low as technically and economically feasible

2.4 Element #4 – Engagement of Specialists

Professional Engineers and Geoscientists shall engage specialists in areas where the professional member’s knowledge alone is not adequate to address environmental issues. To conform to this Element, Professional Members should:

- a) recognize that environmental issues are interdisciplinary in nature requiring the expertise of a range of disciplines/fields, some of which may involve specialists that are not PEGNL professional members;
- b) undertake only that aspect of environmental work that they are competent to perform by virtue of education and experience; and
- c) seek out and use environmental specialists to provide expert advice on complex environmental issues.

2.5 Element #5 – Environmental Assessment

Professional Engineers and geoscientists shall apply professional judgment throughout the environmental assessment process. To conform to this Element, Professional Members should:

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- a) encourage federal and/or provincial environmental assessment processes to begin early during planning stages of a development to provide the basis for effective project life-cycle environmental management;
- b) recognize the value of multi-disciplinary involvement, and public/ indigenous consultation and participation in the decision-making process for projects requiring environmental assessment;
- c) identify and promote cost-effective solutions that reflect the concepts of sustainable development and conservation when integrating a project's environmental, technical, and economic considerations; and
- d) recognize the importance of socioeconomic effects throughout the environmental assessment process. This requires that gender- and workplace diversity-based criteria and indigenous, cultural, and local issues be thoroughly considered, evaluated, and addressed through a meaningful and respectful consultation process.

2.6 Element #6 – Environmental Management

Professional Engineers and Geoscientists shall ensure environmental management is integrated into all their activities that may result in adverse environmental effects. To conform to this Element, Professional Members should:

- a) prioritize environmental risk avoidance above mitigation;
- b) recognize that all projects expose the environment to some level of risk;
- c) consider all potential environmental effects (adverse and positive) during all stages of a project including design, construction, operation, decommissioning, and rehabilitation, using the cradle to grave approach;
- d) in assessing project alternatives, be encouraged to seek opportunities not only to protect, but to enhance the environment;
- e) start to integrate environmental considerations into a project during its earliest planning stages; and
- f) develop and implement effective environmental management systems to manage environmental risks and minimize costs.

2.7 Element #7 – Environmental Costs in Feasibility Studies

Professional Engineers and Geoscientists shall include environmental costs when evaluating the life-cycle feasibility of their projects. To conform to this Element, Professional Members should:

- a) acknowledge that feasibility studies are relied upon by ultimate decision-makers, and that economic viability is always critical in the decisions they make.;
- b) consider environmental protection as an integral part of project development; and
- c) recognize that, if full environmental costs are not considered, the feasibility studies they prepare risk misrepresenting the project's actual economic status.

2.8 Element #8 – Innovation in Waste Management

Professional Engineers and Geoscientists should research and use innovative methods that balance environmental, social and economic factors while contributing to healthy surroundings. To conform to this Element, Professional Members should:

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- a) engage in innovation as a key aspect in the development and application of sustainable solutions by applying innovative products and solutions that reduce environmental impact;
- b) consider waste avoidance when selecting processes and design options. Waste includes gaseous, liquid, and solid materials;
- c) use advanced and innovative manufacturing processes to produce products that result in less waste and require less energy;
- d) comply with all relevant legislation, approvals and orders relating to the treatment, storage, handling, transport, and disposal of wastes;
- e) ensure hazardous wastes are contained in a secure manner and monitored as long as necessary to minimize environmental risks until proper disposal; and
- f) ensure good, innovative solutions are widely used and publicized.

2.9 Element #9 – Environmental Notifications

Professional Engineers and Geoscientists shall cooperate with the public and regulatory authorities in an open manner, while safeguarding the confidentiality of their client's information, and strive to respond to environmental concerns in a timely fashion. To conform to this Element, Professional Members should:

- a) immediately advise their employer and/or client of any concern they have about potentially adverse environmental effects discovered in the course of any assignments they are involved on;
- b) not divulge any information of a confidential nature to the public unless required by relevant legislation, approvals or orders to do so, and then only to the extent required by such legislation, approvals or orders or pursuant to the Code of Ethics. When any confidential information must be disclosed to the public, professional members shall ensure their employers and clients are advised of such disclosure as soon as practicable;
- c) inform regulatory authorities of all adverse environmental effects through the normal regulatory review and approval process;
- d) not intentionally avoid disclosure or misrepresent the information when they are required to report adverse environmental effects to regulatory authorities; and
- e) ensure appropriate action is taken and appropriate authorities are notified when public safety or the environment is at imminent risk, or when required by relevant legislation, approvals or orders.

2.10 Element #10 – Environmental Leadership

Professional Engineers and Geoscientists are encouraged to work actively with others to improve environmental understanding and practices. To conform to this Element, Professional Members should:

- a) recognize the potential of their activities and their status as professional members of PEGNL to influence society;
- b) recognize the benefit of anticipating and avoiding environmental risks proactively as opposed to dealing with environmental problems after they have occurred;

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- c) be encouraged to share their knowledge and educate other professional members, government personnel and the public on environmental issues; and
- d) be encouraged to interact with other disciplines to bring theoretical and technological research into applied science.

2.11 Element #11 – Using Indicators to Evaluate Outcomes

Professional Engineers and Geoscientists Engineers should establish mutually agreed sustainability indicators and criteria for environmental stewardship at the earliest possible stage in projects, and evaluate these periodically against performance targets. To conform to this Element, Professional Members should:

- a) use project specific performance targets and involve key stakeholders to define key sustainability and environmental issues;
- b) employ appropriate standards, systems, tools, and data that provide objective evidence;
- c) consider an appropriate Environmental Management system based on the ISO 14000 standards that include performance indicators and methods to collect and analyze data;
- d) ensure that indicators are objective, measurable and comparable as well as comply with any statutory requirements and data should be collected over the life cycle of the project; and
- e) be aware of existing systems for measuring and rating sustainability indicators and outcomes for projects. Monitor new ones under development to maintain competence relative to best practices.