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June 24, 2016

The Honourable Catherine McKenna, P.C., M.P., Minister of Environment and Climate Change

Environment and Climate Change Canada
200 Boul. Sacré-Coeur, 12th floor
Gatineau, QC, K1A 0H3

Re: Response to *Planning for a Sustainable Future: A Federal Sustainable Development Strategy for Canada*

On behalf of Fertilizer Canada and our members, thank you for the opportunity to respond to the Government of Canada's *Planning for a Sustainable Future: A Federal Sustainable Development Strategy for Canada.*

Fertilizer Canada is an industry association which represents manufacturers, wholesale and retail distributors of nitrogen, phosphate, potash and sulphur fertilizers used in the production of agricultural crops, residential lawns and gardens and recreational parklands.

As the foundation of the agri-food sector, fertilizer positively impacts soil health, the economy, and the social fabrics of Canadian life. Fertilizer keeps soils productive, accounting for roughly 50 per cent of food production and improving both the quantity and quality of food, fuel and fibre crops for a growing global population.

Fertilizer is essential to intensifying crop production sustainably. Canada's fertilizer industry is utilizing its vast network of manufacturers and agri-retailers to ensure that Canada's farmers implement Climate-Smart practices. Additionally, our industry is committed to ensuring homeowners apply our product in a way which protects their local environment.

4R Nutrient Stewardship (Right Source @ Right Rate, Right Time, Right Place ®) is an innovative solution to meet the government's Sustainable Development Goals: increasing the efficiency of agricultural practices for enhanced food production, reducing greenhouse gas emissions, and improving the protection of Canada's freshwater. Through 4R Nutrient Stewardship, our industry can positively contribute to, and achieve tangible results for the government's sustainable development strategy.

The 4R Nutrient Stewardship framework is a science-based approach encompassing the four main principles of fertilizer application:

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- The **Right Source** means ensuring a balanced supply of essential plant nutrients including granular or liquid fertilizers or manures.

- The **Right Rate** is applying just enough fertilizer to meet the needs of the plant while accounting for nutrients already in the soil. Farmers and homeowners can use soil tests to identify nutrient shortfalls.

- The **Right Time** means applying fertilizer when the plant will get the most benefit and avoiding times when fertilizer can be lost to the environment.

- The **Right Place** is applying fertilizer where the plants can easily access the fertilizer and where it is less likely to be lost to the water or air.

The Government of Canada has a unique opportunity to take advantage of the advancements made by the fertilizer industry when developing goals and indicators as part of its sustainable development strategy. The government should support and promote this internationally-recognized and science-based initiative as part of the solution to achieving its goals.

Agriculture has a role to play in efforts to limit the negative impacts of climate change and the protection of our waterways. Innovative practices and technologies can help achieve that objective without compromising food security, making agriculture more sustainable, more productive, and more resilient.

Fertilizer Canada stands ready to work with the Government of Canada as the Sustainable Development Goals are developed and implemented. I look forward to discussing these opportunities with you at your convenience.

Sincerely,

Garth Whyte
President & CEO
Fertilizer Canada

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Fertilizer Canada's Vision for Meeting Canada's Sustainable Development Goals

Sustainable Agriculture (Clean Technology, Jobs and Innovation)

Climate-Smart Agriculture practices are not a new concept for the fertilizer industry, nor for our customers who have long embraced best management practices (BMPs) on their farms, yards, and in their business operations. We recognize that it is increasingly important to demonstrate our environmental sustainability and stewardship successes in a measurable way and also to identify areas of potential improvement.

Sustainable nutrient management is delivered through the incorporation of 4R Nutrient Stewardship (Right Source @ Right Rate, Right Time, Right Place®) for the farm, lawn or garden, which promotes the application of the scientific principles of crop nutrition in combination with best available regional evidence to improve the site-specific management of nutrients. The 4R Nutrient Stewardship program is evidence-based and seeks to balance nutrient management decisions within a framework of economic, social, and environmental goals.

Fertilizer Canada has worked with the Government of Canada as well as provincial governments - Ontario, Alberta, Manitoba, New Brunswick, and Prince Edward Island -, reaching agreements in partnership with other stakeholder groups to deliver regionalized 4R Nutrient Stewardship programming. To date, Fertilizer Canada has reached several significant milestones on each of these projects, including:

- Funding several research programs to quantify the environmental benefits of 4R Nutrient Stewardship. In March 2015, Agriculture and Agri-Food Canada announced $1.1 million in funding for Fertilizer Canada's project entitled "A Canadian Research Network to Improve 4R Nutrient Stewardship for Environmental Health and Crop Production." Fertilizer Canada and its

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members are providing an additional $1.1 million to the project over the next three years. Under this project, nine leading Canadian researchers will quantify economic, social and environmental benefits of 4R Nutrient Stewardship. Early results of this research indicate positive economic and environmental outcomes such as reductions in greenhouse gas (GHG) emissions, in nitrogen losses to the atmosphere and groundwater, in phosphorus losses to surface waters and improved productivity, efficiency and profitability of crop production.

- 38 4R Nutrient Stewardship Demonstration Farms in Alberta, Manitoba, Ontario, Prince Edward Island, and New Brunswick representing thousands of acres, which demonstrate the effectiveness of science-based BMPs. These projects aim to showcase not only increased crop yields but multiple sustainable benefits of 4R Nutrient Stewardship application to the farmer.

- The 4R Designation program, which encourages a voluntary approach to sustainable nutrient management across Canada. 4R Designation recognizes that Canadian agri-retailers are a key influencer to assist and guide growers in addressing environmental concerns while maintaining sustainable and productive systems. Once a grower has completed a 4R Nutrient Stewardship plan with their agri-retailer, the 4R Designation program allows Fertilizer Canada to count their acres and demonstrate the tangible commitment being made by the Canadian agricultural industry to the environment. Piloted in Manitoba, Fertilizer Canada is currently working on implementing this program across Canada.

The principles of 4R Nutrient Stewardship are also applied to lawns and gardens. Fertilizer Canada's Greener World program teaches homeowners how best to fertilize lawns and gardens using the 4R principles. Healthy grass makes several important contributions to our environment. It reduces pollution, absorbs GHGs and supplies

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oxygen. Lawns also clean water through filtration, reduce soil erosion and reduce water runoff.

Global food security through sustainable agriculture will never be realized without the use of commercial fertilizers. The industry's programs under the 4R Nutrient Stewardship initiative provide a proactive response to the need for responsible use of these essential plant nutrients. With use of this science-based framework, industry stakeholders, including farm groups, homeowners, researchers, conservationists, governments, landscapers, horticulturalists, industry members and communities can access strong environmental benefits.

Greenhouse Gas Emissions Reduction (Taking Action on Climate Change)

Nitrogen-based fertilizers are highly effective, but contribute to nitrous oxide (N_2O) emissions when applied on the farm.

For the nitrogen manufacturing sector, extensive government and third-party benchmarking, evaluating literature and on-site performance for new and existing facilities, has concluded that Canadian facilities perform in the top quartile globally for energy efficiency and GHG emissions. Research on nitrogen fertilizer manufacturing demonstrates that there is no commercial step-change technology in development that will replace the existing production systems based on the Haber-Bosch process.

Given the limited ability to reduce emissions at production, the sector has worked extensively to reduce on-farm emissions creating the world-leading Nitrous Oxide Emissions Reduction Protocol (NERP). This Canadian-made offset system is aimed at reducing regional, and ultimately global, N_2O emissions.

The NERP incorporates 4R Nutrient Stewardship (Right Source @ Right Rate, Right Time, Right Place®), providing a framework for farmers to reduce on-farm GHG

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emissions from nitrogen fertilizer in a quantifiable, credible, and verifiable way, and in return allowing farmers to produce saleable carbon credits.

Fertilizer Canada and Agriculture and Agri-Food Canada are jointly funding scientific field trials across Canada to quantify the nitrous oxide emission reductions from NERP and 4R Nutrient Stewardship practices. Current research shows how NERP can help to reduce on-farm GHG emissions from nitrogen by 15 to 25 per cent. The practices that reduce GHG emissions also tend to increase nitrogen use efficiency and the economic return on fertilizer dollars. It is estimated that increased profits per year range from $9 to $87 per acre.

The NERP protocol was originally developed for use within Alberta's *Specified Gas Emitters Regulations*, but is readily adaptable for other regions in Canada, and around the world. Since the protocol was approved for use in Alberta, at least one million acres of farmland in the province are now operating under 4R Nutrient Stewardship and incorporating NERP practices. These acres represent roughly four per cent of Alberta's 24 million acres of farmland, with extensive efforts to further expand adoption.

Maintaining Water Quality (Freshwater and Oceans)

Canada has many water bodies that are essential for Canada's economic prosperity and social well-being.

Lake Winnipeg is of ongoing interest and under federal/provincial commitment to reduce contributions of nutrient (i.e. nitrogen and phosphorus) loading, thereby reversing the frequency and severity of algae blooms and returning the lake to a pre-1990s state.

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Similarly, the Great Lakes—Superior, Huron, Michigan, Erie and Ontario—are a unique ecosystem that sustains a rich variety of plants and animals. They also supply drinking water to millions of Canadians and provide opportunities for agriculture, shipping, mining and manufacturing, which are all important to the success of the agriculture industry and Canada's economy. The water quality of the Great Lakes is a vital issue in Ontario, which also holds some of the country's most viable and productive farmland. Land use and water quality concerns are a shared priority in Ontario and the agriculture industry.

Fertilizer Canada promotes the adoption and implementation of 4R Nutrient Stewardship (Right Source @ Right Rate, Right Time, Right Place®) in Ontario, Manitoba and across Canada. This is demonstrating through industry-led research that by using the 4R Nutrient Stewardship approach, the impact on water quality and losses in drainage water can be reduced. Canada's fertilizer industry believes that the voluntary adoption of these principles is the best approach towards reducing the negative environmental impacts of unwanted nutrient loading into these important waterways.

While the primary nutrient found to cause the growth of algae and aquatic weeds in streams and lakes is phosphorus, it has many sources other than fertilizer. The environmental risk of applied phosphorus fertilizers stems from its ability to bind soils after application. The 4R Nutrient Stewardship approach provides practices that maximize nutrient uptake by the plant, manage phosphorus levels in soils and prevent it from being lost to surrounding water systems.

Canada's fertilizer industry is committed to working with governments, watershed groups, scientists, agri-retailers and farmers nationally and in the regions surrounding the Great Lakes to improve fertilizer application practices and reduce phosphorus losses to Lake Erie and other lakes and rivers.

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The fertilizer industry's work, which is focused on refining application practices and improving the health of the Canadian waters, is enhanced by the support of government and non-government stakeholders:

- 4R Nutrient Stewardship has been endorsed by the International Joint Commission who identifies Fertilizer Canada as a contributing partner to cross-border efforts. In the 2014 report on the Lake Erie ecosystem, *A Balanced Diet for Lake Erie: Reducing Phosphorus Loadings and Harmful Algal Blooms*, 4R Nutrient Stewardship was identified for accelerated implementation; and,

- The province of Ontario is a leader in encouraging farmers to use nutrient management plans in crop production. The province has embraced 4R Nutrient Stewardship as an important tool to meet the agricultural and environmental goals, referenced in government publications such as *A Phosphorus Primer* and *Soil Fertility Handbook (OMAFRA Publication 611)*.

- In Manitoba, Keystone Agricultural Producers and Fertilizer Canada have committed to a shared goal of improving water quality by reducing nutrients in Lake Winnipeg and rivers. The organizations intend to undertake signing the Lake Friendly Accord, of which the Government of Canada and Manitoba are among the primary signatories

- In Prince Edward Island, Fertilizer Canada has partnered with the PEI government, farmer groups, and watershed groups to promote sustainable nutrient use. In 2015, a three-year extension of the 4R Nutrient Stewardship MOU was signed among Fertilizer Canada; the PEI Department of Agriculture and Forestry; the PEI Department of Environment, Labour and Justice; the PEI Federation of Agriculture; the PEI Potato Board; and the Kensington North Watersheds Association.

This support is amplified by our partners, who have undertaken extensive efforts to adopt and promote 4R Nutrient Stewardship in Ontario, specifically:

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- The second joint action cited in the *Interim Joint Action Plan for Lake Erie* encourages adoption of the 4R Nutrient Stewardship Certification program or other comprehensive nutrient management programs. Fertilizer Canada is currently working with the Ontario Certified Crop Adviser Board on the development of a 4R Specialty Study Guide in Ontario, to complement the International Certified Crop Adviser Board's efforts via a pilot 4R Specialty accreditation.
- Fertilizer Canada, the Ontario Agri-Business Association and the Government of Ontario entered into a Memorandum of Cooperation partnership, recognizing that voluntary use of 4R Nutrient Stewardship, based on sound science and expert advice, is the best approach towards reducing the negative environmental impacts of unwanted nutrient loading in Lake Erie.

Additionally, Fertilizer Canada's Greener World program lends itself to mitigating runoff by teaching homeowners how best to fertilize lawns and gardens using 4R Nutrient Stewardship. Within Canada, Fertilizer Canada members have voluntarily eliminated phosphorus from mature lawn fertilizer products, since most lawns do not require annual applications, but have kept phosphorus in starter-fertilizer products for new lawns. Phosphorus specifically is important for establishing new lawns because it promotes the development of strong, healthy roots, vibrant flowers, seeds, early maturity, and a normal healthy green colour.

Fertilizer Canada supports the need to protect the ecological health of Canada's water bodies by continuing the industry's extensive research, programming and awareness-building efforts with our partners across Canada.

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Other Synergistic Benefits to Sustainability (Protected Areas and Ecosystems, Human Health, Well-being and Quality of Life)

While Fertilizer Canada has a less direct involvement to the other sustainability goals outlined in the draft strategy, 4R Nutrient Stewardship can have positive implications for other downstream indicators of a sustainable Canada. This is especially true in the context of agriculture and those farmers who work hard to feed Canadians and the world.

Global Applications of 4R Nutrient Stewardship

Fertilizer Canada is supportive of the outcomes of the United Nations Conference on Climate Change (COP21). Achieving these goals will require all to contribute towards both mitigation and adoption of new practices. Sustainable agriculture underpins development, health, and growth across economies. Agriculture needs to be included in efforts to limit and reduce the negative impacts of climate change. Innovations in practices and technologies can help achieve those objectives without compromising productivity and food security, making agriculture more sustainable, more productive, and more resilient.

The principles that underpin 4R Nutrient Stewardship can be applied in any geography and farming system. Cost-effective and environmentally responsible soil management and enhancement is key to increased food production and sustainability for small-holder farmers as well as larger farms. In each setting, the 'Right' actions might differ but the flexibility of the 4R Nutrient Stewardship system allows adaptation to local needs and conditions. While 4R Nutrient Stewardship can be optimized through the use of more complex measurements, essential information on soil and crops is either already in existence or can be found.

The Nitrous Oxide Emission Reduction Protocol (NERP) was developed initially for Canada. It uses a modification of Canada's internationally accepted and peer-

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reviewed Tier II inventory method to estimate nitrous oxide emissions at the farm level. The NERP can also easily be adapted to temperate region cropping systems outside Canada (for example the United States, Europe, and the Russian Federation) using Tier I or localized Tier II emission factors. In other regions, the protocol could be adapted to match the reporting systems and the crop systems of different countries.

Recommended Actions for the Federal Government's Sustainable Strategy:

Fertilizer Canada's efforts align with the Federal Government's proposed actions, and we recommend the following be adopted in the strategy:

- **Encourage the implementation of 4R Nutrient Stewardship (including the NERP) across Canada and around the world.**
  Meeting Sustainable Development Goals:
  - **Sustainable Agriculture, under the action of Clean Technology, Jobs and Innovation.**
  - **Maintaining water quality, under the action of Freshwater and Oceans.**

- **Recognize and acknowledge that voluntary actions have been undertaken by the fertilizer industry, farmers, and homeowners in adopting the principles of 4R Nutrient Stewardship.**
  Meeting Sustainable Development Goals:
  - **Agriculture, under the action of Clean Technology, Jobs and Innovation;**
  - **Maintaining water quality under the action of Freshwater and Oceans;**
  - **Protected Areas and Ecosystems, Human Health, Well-being and Quality of Life.**

- **Adopt and support science-based decisions on matters related to nutrient management by citing the results of Fertilizer Canada's 4R Research Network (also known as the Canadian 4R Research Network) to promote innovation in the agriculture sector and inform matters affecting Canada's waterways.**

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Meeting Sustainable Development Goals:

- **Sustainable Agriculture and Water Quality.**

- **Work with the provinces and members of the Canadian agriculture industry to ensure targets regarding climate change and water and soil conservation do not compromise farm productivity and food security.**
  Meeting Sustainable Development Goals:
  - **Sustainable Agriculture and Water Quality.**

- **Support and integrate the NERP into the Federal Government's climate change policies, strategies and planning to help reduce Canada's total GHG emissions.**
  Meeting Sustainable Development Goals:
  - **Greenhouse Gas Emissions Reduction, under Taking Action on Climate Change.**

- **Work collaboratively with the provincial Ministers of the Environment to ensure no duplication or overlap in GHG regulation of fertilizer manufacturers.**
  Meeting Sustainable Development Goals:
  - **Greenhouse Gas Emissions Reduction, under Taking Action on Climate Change.**