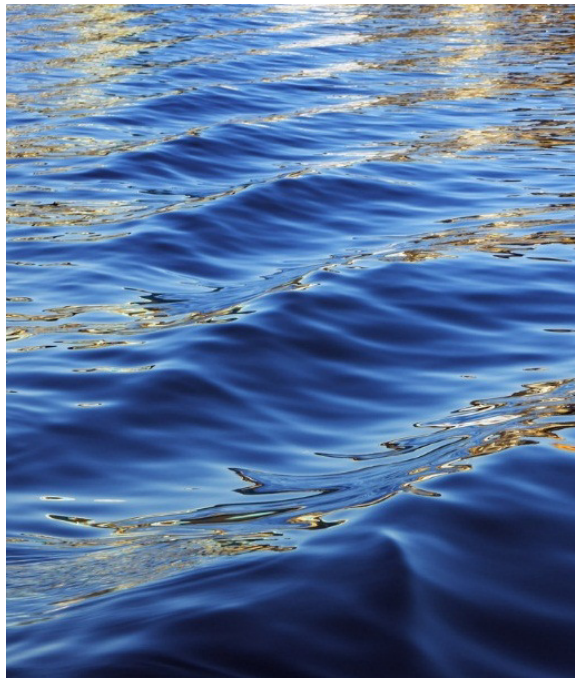
Phosphorous Innovation Challenge - Brief

STATE OF VERMONT

JANUARY 2018



Overview & Background

- Synopsis
  - In creating the Phosphorous Innovation Challenge, we are seeking entrepreneurial / innovative solution to the challenge of mitigating phosphorous that may simultaneously create a business opportunity.

- Phosphorus is essential for plant growth
  - Manure from livestock contains phosphorus
  - Applied at the right rate, at the right time and right location, manure is a valuable fertilizer
  - Careful use important to minimize impact to water and build soil to grow crops

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The Problem: Too much phosphorous?

Yes… when inputs overwhelm outputs

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The Problem: Too much phosphorous?

- The balance is off in Vermont
  - The State imports more phosphorus in fertilizer and animal feed than leaves the state in animal products (e.g., milk, meat) and crops
  - Excess phosphorus is applied to land and builds up over time in the soil

- Some of this excess is carried to Vermont's waterways in runoff during periods of rainfall and snowmelt

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Managing Phosphorus: The current approach

- Current strategies are focused on deploying conservation measures and best management practices to manage excess phosphorus in manure once it has been applied to the land
- Efforts to mitigate phosphorous losses from agricultural areas include:
  - Planting cover crops
  - Changing tillage practices
  - Rotating the crops grown on fields between corn and hay
- The total cost to farmers and taxpayers to implement these practices is more than $500 million over the next 20 years
- Unfortunately these practices do little to address the excess phosphorous, which will continue to accumulate in Vermont's soils

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Managing Phosphorus: New thinking

- Historically, government at all levels has been reactive in responding to water quality issues and challenges. In this case we look at ways to mitigate the impact of phosphorous once it is on the ground.
- We need to transition reactive response to proactive prevention – taking control and making things happen.
- What if, rather than waiting to manage the phosphorous until it was on the ground, we captured excess phosphorus from manure before application?

Managing Phosphorus: New thinking

- Incentivize creation of a at-scale commercial operation(s) that capture excess phosphorous (from manure) before it is applied to the land and convert it to a saleable product
- Determine a market for the extracted phosphorus
- Generate an economic value and grow jobs surrounding extracted phosphorus
- Share Vermont's experience with other states and countries that have similar phosphorus imbalance issues

Managing Phosphorus: What is needed

- Cost-effective technologies that extract manure's nutrients
- Create products that are:
  - Easily transported or sold to areas where nutrients are in demand, inside and outside the Lake Champlain watershed
  - Suitable for use by non-livestock farmers
- Technologies exist but are likely to require some amount of state investment in order to:
  - Be implemented at the scale need to have the desired impact water quality in Vermont
  - Make a sustainable business case for the technology(s)

Managing Phosphorus: The Reverse Pitch

- Invite entrepreneurs, scientists and inventors to propose the most efficient and commercially viable “P-Project” to capture, process, package and sell excess phosphorous
- Phase 1
  - Open the “Reverse Pitch” -- an invitation to submit written proposals/applications to the State for “proof of concept” seed money
- Phase 2
  - Select 3-5 P-Projects for proof of concept development grants; each winner would receive up to $50,000 in proof of concept funding
- Phase 3
  - Evaluate proof of concept prototypes and select the team(s) to invest in.
  - Investment would be scalable based on the benefits provided by the P-Project
- All project submissions will be reviewed by state and 3rd -party advisors interested in the success of the P-Project

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Discussion / Other Ideas ?

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