

Vermont Phosphorus Innovation Challenge – Frequently Asked Questions

This document attempts to address questions asked by interested parties involved with the Vermont Phosphorus Innovation Challenge (VPIC). This list is not exhaustive and will be updated as additional questions are received or answers are further developed by the VPIC Team.

Intellectual Property and Confidentiality

Question:

As Stage One responses are required to be sent by e-mail, and given that there is going to be sensitive proprietary information in that electronic correspondence, does the Department intend to shield these submissions from public viewing, and from public inquiry as would be found using Freedom of Information Act requests?

Answer:

We suggest using the direction provided in the initial RFP announcement and segregating any proprietary information on separate pages marked as such. All material not marked is considered a public record and would be released should a Public Records Request be submitted.

Question:

The Submissions will inevitably include new and novel invention ideas. Patent rights would typically accrue to the Inventor. Given that the Reviewers are technical people and will presumably have suggestions that would modify these Proposed Concepts, how are the future patent rights going to be treated? Will the Department be assigning the intellectual property rights to the Submitter?

Answer:

At this stage, Stage One, we have not developed direct guidance for any future patent rights. We believe it will depend on a variety of factors that evolve in any relationship that grows past Stage One.

Question:

Current patent law leaves a very tight window to file the Patent Application once the invention is "published." Will the reduction to writing, considering this will be done by e-mail and thus available to uncontrolled numbers of persons, be treated as a Public Publication? Or will the electronic submissions be held very tightly in-house, to avoid the "publication" trigger of the Patent Office, and then placing the invention into the public domain and unpatentable?



Answer:

Yes, the review committee will be a limited number of people. However, at Stage One, we suggest not submitting extensive technical detail and instead submitting a general description of what the technology is going to do only. Additionally, following the guidance in the initial RFP announcement regarding segregation of any proprietary information on separate pages marked as such, is recommended.

Question:

Some proposals may not be able to be completely evaluated without full disclosure of the unique physical system that is being developed.

Answer:

This is potentially true, but we can ask for that information at the appropriate time or have the review of the technology be completed in camera as opposed to direct submittal to the State. Two concerns exist, one is the potential for a Public Records Request, where we would not want to have to release any documents that might harm the respondent's business. The other is that we do not want to lose any information that has been submitted. An in camera meeting with the technical review committee may be the best choice for this first step of the VPIC to maintain confidentiality.

Formatting, Guidelines, and Dates**Question:**

Is there a special format for the intent for Stage One Proposals?

Answer:

There is not a prescribed format in which the Stage One response needs to be laid out, as long as it contains the required information that is described within the brief and does not exceed the established page limit.

Question:

Is there a sense of the dates yet for the advancement of Stage Two and Stage Three?

Answer:

Beyond the July 6, 2018 Stage One Proposal deadline, the timeline will depend largely on the number of proposals received and, in turn, the time the Evaluation Committee requires to complete their review. We expect to have awarded funding by the end of the calendar year to those projects that will be advanced to Stage Two. Beyond that, it is challenging to provide a timeline, in part because of the potential variety of Stage One Proposals. An **August**



22, 2018 meeting has been tentatively set for in-person presentations to the VPIC team, the Evaluation Committee, and additional expert reviewers from outside state government. For proposals that advance to Stage Two, prototypes and other pertinent details will be demonstrated to these reviewers in late-2018, allowing approximately 120 days for project development.

Question:

Is there a target for the August live presentation? What characteristics will require people to attend and what will be expected?

Answer:

As noted above, **August 22, 2018** has been tentatively scheduled for in-person presentations. We envision an opportunity that would be the reverse of the May 21, 2018 meeting – project developers will present ideas to the VPIC team, the Evaluation Committee, and additional expert reviewers from outside state government. This will allow the VPIC team and other reviewers to ask questions, to probe the ideas, to see how ready the projects are to move forward, and better understand any intellectual property concerns. This meeting will allow presenters a reasonable amount of time to walk through their proposals and have an interactive conversation with the VPIC team and other reviewers.

Question:

Would a site visit to an out of state facility where the technology is in use be workable?

Answer:

Yes, we certainly anticipate unique aspects as this is a developing market and we understand that project developers may have prototyping work underway in a different location. Any funding invested in later stages of the VPIC, however, will only be available to projects physically located in Vermont.

Question:

Those moving on to Stage Two will have 120 days to develop a prototype, please further describe or define what is meant by prototype, especially for capital projects?

Answer:

We do not have a specific standard for the prototypes, other than being able to sufficiently demonstrate that the project will function at scale. There is significant “bench-scale” work looking at phosphorus capture and reuse, and the prototype needs to demonstrate that the approach can be scaled to full-size application. For large scale projects where building a prototype is not a viable option, attendant scientific research and engineering design may be a potential substitute for a functioning prototype at the discretion of the VPIC Team.



Question:

What is the idea of the number, scale, scope, and duration of Stage Two projects?

Answer:

We anticipate five projects will advance to Stage Two, and approximately 120 days will be provided for completion of Stage Two prototyping work. Those projects that advance to Stage Three do not have an explicit timeline for projects, although we anticipate it is likely to be project specific.

Funding**Question:**

Instead of return on investment (ROI), if a proposal can show a large infrastructure savings through offsets or trading, is there funding available to supplement some of the bigger projects to address a ‘bigger bang for the buck’ in focusing on phosphorus?

Answer:

Opportunities for offsets or trading are not a central focus of the VPIC, in part because it will be important to have a robust understanding of the ability of individual processes or technologies to capture phosphorus and develop alternative end uses to land application, before making the jump to offsets and trading. If any viable technologies would further the offset or trading conversation, we would be interested in understanding how, but the primary focus is reducing Vermont’s phosphorus imbalance.

Question:

It is possible that effective solutions may not be money makers, a focus on ROI causes concern if the focus is on recapture of invested funds. It is good the State is getting involved, because there is most likely not a viable, profitable technological solution. Is State going to be offering capital investment and an operating stipend?

Answer:

Recapture of funds is a secondary goal, we’re focused on value proposition – we need to know what we’re buying with taxpayer dollars. There is full recognition that if an economically viable technology for phosphorus reuse existed, it would likely already be in place; the economics may also change in the future. In Stage One, our goal is to identify and evaluate the role different processes and technologies might play in correcting the phosphorus imbalance in our State and supporting the ultimate attainment of our water quality goals.



Question:

How many \$/ lb. of soluble reactive phosphorus (SRP)/year is the State allocating for each identified point source: Agricultural, Wastewater Treatment, Stormwater, Forestry, Other?

Answer:

While the Lake Champlain Total Maximum Daily Load (TMDL) establishes sector-specific targets for agriculture, wastewater, developed lands, forestlands, and streambanks, the VPIC will consider opportunities for phosphorus capture based on the total value proposition as opposed to reductions targeted at any particular sector or category of source.

Question:

Curious about Stage Two and demonstration of the technology's ability. What if it's a capital project and funding must be available to buy equipment before demonstration of the technology's ability?

Answer:

We recognize that technologies and approaches are in different stages of development. We will work with project developers to develop a mutually agreeable approach, that allows the VPIC team, the Evaluation Committee, and additional expert reviewers to understand exactly what is being proposed, the associated costs, as well as the anticipated benefits – understanding that the approach will need to match where the technology is in development and its anticipated life cycle.

Question:

As the guidelines and dates for Stage Two and Stage Three seem general and somewhat unknown, how is the funding for Stage Three going to be determined?

Answer:

Our approach will be to develop a funding framework that is based largely on the predicted cost-effectiveness of the proposed technology. The greater the impact on phosphorus pollution per dollar of State investment, the more funding that may be available. Because there will most likely be proprietary technology involved in all proposals, there will necessarily be additional conversations between Stages One and Two regarding intellectual property rights. Specifically, the State will need to evaluate what the opportunity and responsibility to Vermont taxpayers may be to recover some of the investment made over time. There are innumerable potential iterations of this, and we cannot say completely what these conversations will look like until we get through Stage One and begin that development process.

Question:

How influential will the ROI be in the selection of proposals? When will there be more insight on this topic?



Answer:

The primary goal of the VPIC is to develop and implement functional technology to mitigate the impacts of phosphorus pollution of Vermont's waterways; ROI is strictly a secondary goal. Proposals will not be penalized for not including ROI, but if ROI can help support or indicate strength of a proposal or organization, that may benefit the proposal.

Question:

How will public money be allocated for mitigating SRP for agricultural watersheds, i.e., how will State money be spent?

Answer:

In Stage One, the State is investing up to \$250,000 to support prototyping technologies and processes to mitigate phosphorus pollution. Decisions about further funding will be made as prototypes are reviewed and evaluated, and the level of phosphorus capture likely to be achieved can be quantified.

Phosphorus: Components, Chemical Makeup, and Technology**Question:**

Have there been any actions taken to address and extract legacy phosphorus from rivers and streams?

Answer:

Vermont has completed several demonstrations using alum to provide in-lake treatment to address legacy phosphorus issues. Aluminum sulfate, called alum, when added to lake water, removes phosphates through precipitation - forming a heavier than water particulate, known as a floc. This floc then settles to the lake bottom to create a barrier that retards sediment phosphorus release. Although not extraction, the use of an alum treatment in Lake Morey (Fairlee) and Ticklenaked Pond (Ryegate), in addition to a significant investment in BMPs and conservation practices in the surrounding watersheds, has decreased in-water phosphorus concentrations. Lake Morey is considered to be a successful long-standing treatment, as the treatment has kept down in-lake phosphorus concentrations for more than two decades. Ticklenaked Pond encountered some unknown changes to the watershed shortly after the waterbody underwent the alum treatment, which seem to be impact the performance of the treatment. In both waterbodies, although phosphorus concentrations were reduced in the water column, the phosphorus was not and is not available for beneficial reuse.

Question:

Would the extraction of legacy phosphorus from waters flowing into Lake Champlain be considered an acceptable technology for the VPIC?



Answer:

The VPIC certainly has not precluded the opportunity to look at in-stream or in-lake treatments, however because in-stream and in-lake these concentrations tend to be quite low (e.g., < 50ppb), treatments tend to be more complicated. Further, such approaches can impact natural resources and therefore require additional permits. We are interested in learning more about any viable approach.

Question:

Is there any appetite in government to consider the possibility that one or many of these solutions may be very difficult to permit in the current permit environment? Is there any appetite to consider solutions in this program to somehow have a different pathway, similar to renewable energy, for permitting?

Answer:

Yes, this concern has been discussed and there is interest in better understanding how current permitting requirements might impact a particular proposal. This will most likely need to be addressed proposal by proposal. If it is anticipated that a solution would require changes to the existing regulatory structure in order to be successfully implemented, it will be important to describe that in the Stage One proposal.

Question:

In terms of comparability of phosphorus capture, is the focus on elemental P or P₂O₅?

Answer:

While phosphorus in organic wastes is often present in both organic and dissolved forms, we are interested in the reduction in total phosphorus (TP) that the proposed technology will yield.

Question:

Is the State looking for investors for technology or for solutions only?

Answer:

The primary focus of the VPIC is on solutions. Specifically, the State is interested in how we can accelerate the creation, adoption, and implementation of the approaches that capture phosphorus from one or more waste streams. A secondary consideration is whether there is a market for the captured phosphorus that will generate revenue, and the opportunity that might be present for recapturing invested funds for taxpayers through ROI. The phosphorus ROI can be based upon lessened need in the future for phosphorus mitigation or an actual monetary return to taxpayers through a market solution.



Question:

Even if there are some great technologies that can pull phosphorus out of manure and sequester it, what if there isn't a market? How can that technology be viable?

Answer:

Market availability is anticipated to impact the level of State investment that will be required to make different projects economically viable, and will also depend on the finished product. We know there are products being made that reuse a significant amount of phosphorus that have a market. And also, as noted above, if an economically viable technology for phosphorus reuse existed, it would likely already be in place. We have also talked conceptually about the role a "renewable phosphorus standard" might play in helping to establish a market. We will continue to work on this in parallel to the VPIC, but also cannot and should not assume a future market condition in evaluating the value proposition offered by any proposed approach.

Question:

What testing protocol is being used to determine regulated field concentrations of SRP?

Answer:

Farm operations in the State that are required to have a United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) 590 Standard Nutrient Management Plan (NMP) use the Vermont Phosphorus Index, or P- Index to provide a relative rating of the risk of P runoff from individual fields. This method uses models to determine values of phosphorus loss from subsurface tile drainage, surface dissolved P loss, and surface particulate P loss. The results of these models allow the State to regulate farms to be sure they are applying nutrients at the rates determined in their NMP.

Question:

What thresholds of SRP in surface or drain water in parts per million (ppm) or lbs/ gal /average daily limits require mitigation?

Answer:

Vermont's Water Quality Standards contain average annual total phosphorus concentrations that vary by lake segment in Lake Champlain (http://dec.vermont.gov/sites/dec/files/documents/wsmd_water_quality_standards_2016.pdf). In addition, the Water Quality Standards have a tiered approach for evaluating phosphorus pollution in streams.



Question:

How is the State determining overall thresholds within a given area or watershed?

Answer:

Phosphorus loading has been allocated by sector (e.g. agriculture, wastewater, stormwater, etc.) and lake segment in the 2016 Lake Champlain TMDL

(https://ofmpub.epa.gov/waters10/attains_impaired_waters.show_tmdl_document?p_tmdl_doc_blobs_id=79000).

Question:

Does the Phosphorus Innovation Challenge consider innovative technology of SRP captured materials land applied in a targeted nutrient management setting viable for consideration?

Answer:

Yes, we are open to this. We are interested in learning more about any viable approach.

Disclosure of Parties and Collaboration**Question:**

At what point will there be a shared list of the different groups or projects that are being proposed? Will collaboration be encouraged between similar projects?

Answer:

The VPIC team is discussing the release of the list of interested parties and proposed projects – we have not made a decision on this topic yet.

As we move from Stage Two to Stage Three, the VPIC Team will be working with project developers to help ensure the end result meets the needs of the State; this may involve encouraging collaboration between similar projects.

