

**Request for Proposals: Technologies to Remove Phosphorus from Agricultural runoff**

**Release Date: July 20, 2018**

**Deadline to Submit: September 28, 2018 by 2 pm EDT (Toronto area)**

**Total Awards Available: 5**

**Available:**

1. **2-3 infield and/or edge of field systems**
2. **2-3 treatment systems for municipal drain**

**Awards $10,000-100,000 over three years**

**Submission Address**

**Ontario Federation of Agriculture**

**c/o Charles Lalonde**

**100 Stone Rd West, Suite 206**

**Guelph, Ontario, N1G 5L3**

**Electronic Submissions to**

[**Charles.lalonde73@gmail.com**](mailto:Charles.lalonde73@gmail.com)

**A confirmation will be returned**

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1. **Program Summary**

The Phosphorus Reduction Collaborative (PRC) seeks proposals for demonstrating technologies that intercept and remove phosphorus from agricultural run-off in the Thames River/Lake Erie Basin. These technologies will be positioned in-field, on outflows of field tile systems or in municipal drains, where diffuse non-point source runoff is channeled into mini-point source conditions, creating opportunities to capture phosphorus through passive systems using sorption materials or active treatment technology. The PRC will also consider a companion proposal from companies developing remote sensing opportunities for water flow and water quality parameters. In support of technology advancements that demonstrate an efficient and cost-effective way to intercept and remove phosphorus from agricultural runoff, PRC expects to make total awards worth between $10,000 and $100,000 over three years, from 2018 to 2020, depending on the cost and complexity of the systems.

Successful applicants will propose innovative and replicable technologies that can remove phosphorus from high volumes of agricultural runoff at low concentrations collected over large geographic areas, during different seasonal conditions. Preference will be given to systems that can remove soluble phosphorus (measured as ortho phosphorus), but systems that can remove phosphorus bound to particulate (measured as total phosphorus) will also be considered.

Additionally, applicants will be required to discuss how their proposed technology could be scaled up, either across larger geographic areas and/or to manage higher flows. The applicants may consider a multiple phased approach to adjust the technology’s performance to the water and site characterization, and to test its scalability (see project profile, below).

In response to this Request for Proposal (‘RFP’), the Applicant must submit a cover sheet, application form, project workplan, budget, and required documentation (‘The Application’) that meets the criteria outlined below. In the event the application is selected for further review, the Applicant will be contacted by the PRC with follow-up questions. PRC will make funding awards after follow-up conversations have been conducted. At such time, the successful applicant will be matched to a specific site determined by the PRC and will be supported by a local implementation team.

1. **About PRC**

The Phosphorus Reduction Collaborative is an alliance of farming organizations, municipalities, First Nations, drainage professionals, Conservation Authorities, NGOs and drainage suppliers in the Thames River basin area. The PRC is led by the Ontario Federation of Agriculture, Ontario’s largest agricultural organization representing 36,000 farming operations, and the Great Lakes and St. Lawrence Cities Initiative, a member-based organization of over 130 mayors from Ontario, Quebec and the eight US Great Lakes states. ([www.thamesriverprc.com](http://www.thamesriverprc.com))

The PRC has been established to demonstrate real, measurable progress on phosphorus loss recovery through in-field, edge-of-field, and municipal drainage systems that connect hydrologically to the Thames River basin in south-western Ontario.

The project receives funding from various sources and is currently operating through funds received from Environment and Climate Change Canada. As additional funding becomes available, additional awards will take place.

1. **Program Overview and Goals**

The PRC is designed to promote advancements in phosphorus loss reduction, interception and removal from agricultural run-off in the Thames River basin. As a leading agricultural region in North America that operates adjacent to the one of the largest sources of freshwater in the world, the Great Lakes, municipalities, the agricultural sector, and the drainage sector must show leadership in finding effective and affordable solutions to the challenge of phosphorus loss from agricultural lands that negatively impact freshwater. That is why the PRC is providing funding to demonstrate technologies that, once adopted broadly, can have a significant impact in reducing phosphorus entering our waterways from agricultural sources.

The primary goal of the PRC is to identify technologies that can intercept, capture and remove phosphorus from in-field surface water at collection points such as tile inlets, in tile drain outlets at edge-of-field, and in municipal drains in which agricultural runoff is collected. This program is meant to complement other essential initiatives to improve phosphorus application and retention in the soil. This program’s focus is on point at which the greatest amount of phosphorus is lost from fields, during heavy rains and sudden snow melts associated with climate change. In some cases where technologies address surface water runoff in fields, multiple intervention points may be required to service large acreages (up to 100 acres).

Successful applicants must demonstrate how their technology and/or product will measurably reduce phosphorus in agricultural runoff at low concentrations, variable temperatures and flows. Over the course of the technology demonstration, the applicants will be required to report on the stated metrics indicating the level of phosphorus capture.

1. **Program Highlights**

|  |  |
| --- | --- |
| Technology Demonstration Duration | Up to 3 phases, over 36 months (see Project profile) |
| Maximum Grant | 1. Up to 100-acre infield and edge of field tile system: $25,000CDN 2. Municipal drain technology: $100,000 CDN |
| Required Cost Share | The PRC will pay up to 100% of equipment costs, monitoring and analytical costs and installation costs, depending on the complexity and total costs applicant assumes cost of operations, Inc. staff costs. |
| Anticipated Total Awards | Upwards of five awards based on available funds |

1. **Profile of Projects**
   1. **Types of Technologies**

Applicants can apply to one of two award categories to implement and pilot their technologies or to qualify their product towards a field trial. The PRC accepts the responsibility to find appropriate sites for the successful applicants. The farm conditions will vary to represent a variety of farm commodities, soil types, topography and soil nutrient levels. In the site selection, there will be fields with very low P readings of less than 10 ppm to close to 100 ppm. Farms selected will have records on their agronomic practices to relate to the water being treated. All farms will have tilled fields that are located adjacent to municipal drains. The area covered for a field trial will vary from 25 acres to over 100 acres. Smaller field sizes will be used only to test unique conditions.

* + 1. *Intercepting and Capturing Phosphorus from 25 to100-acre agricultural fields*

The first category includes systems with the ability to intercept and capture phosphorus in surface and in-tile run-off from up to 100-acre field. The minimum field size will be 25 acres. This may consist of a combination of multiple infield and edge of field passive filtration beds using a variety of sorbtive materials and/or biological treatments and/or other innovative approaches. Field tile systems run mostly in the November to May period and can be dry in the summer. Sandy soil sites could have tiles running after each significant rain event.

In-field Tile Drain Inlet

Agricultural lands are generally equipped with drainage systems that consist of underground drainage pipes (tile drains) and drain inlets on the surface of the land that lead to the tile drain, for rapid drainage during a heavy rain event. These drain inlets may be flat on the land or perforated vertical pipes (e.g. Hicken Bottom). For more information on drainage systems, please refer to a Best Management Practices Book published by the Ontario Ministry of Agriculture, Food and Rural Affairs. A typical field tile installation diagram is provided on the website [www.thamesriverprc.com](http://www.thamesriverprc.com) for illustrative purposes.

It is envisaged that passive filtration beds using a variety of sorbtive materials/biological materials may be installed surrounding these micro-point sources for runoff in field.

Edge of Field Tile Drain Outlet

Agricultural tile drainage systems lead to an outlet at the edge of field that generally drains into a stream or municipally-maintained drain. Again, it is envisaged that a passive filtration system using sorbtive material would be installed at this micro-point source. The system should not interfere with agricultural activity, so may be located on unproductive land, or underground. The system should be designed to handle flow from a typical 12-inch or greater drain pipe outlet. Innovative technologies will be considered; however, sites could have constraints such as limited or no access to broadband and electricity.

*5.1.2 Treatment on Site Adjacent to Municipal Drain.*

Surface and tile drained runoff are collected in open or closed drains that are administered and maintained by municipalities. These serve as linear storm water ponds during rain or snow melt events, and often run dry during some of the summer and Fall. Municipal drains may be many kilometers long, up to 6 meters wide and 4-5 meters deep depending on the severity of the weather event. Where these drains are not gravity fed, pumping stations pump the water into receiving waters. It is these pumping stations, or other points such as dams, that may serve as point sources for the installation of active treatment technology.

These sites will need to be enclosed in an area no bigger than a shipping container. They will have road access and access to electricity.

Technologies envisaged at these points could include filtration, electrolysis, membrane technology, biofiltration and chemical removal or any combination. Given the level of turbidity in the water, it is anticipated that some form of pre-filtration or sedimentation system will also be needed.

Technology companies are encouraged to consider provision of technology, delivery, implementation and maintenance.

Notwithstanding these suggested types of systems, new innovative solutions will also be considered.

**5.2 Water Profile**

Agricultural runoff water and tile water will have different P profiles. Surface runoff will have higher particulate P bound to soil particles while tile water benefiting from infiltration through a soil layer will have more dissolved P and much less turbidity. The following insert has been prepared to provide readers with as much understanding as possible of water found on agricultural lands.

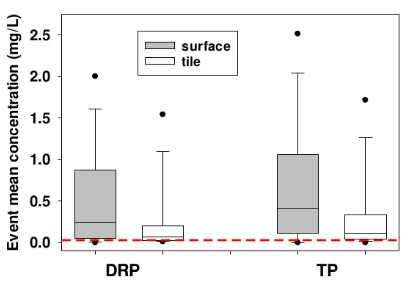
**Summary of Observed Total-P and Ortho-P Concentrations Exiting Subsurface Tile Drains at Field Edge**

**Ohio summary**

This is a summary of over 20 edge-of-field sites in Ohio portion of Lake Erie Basin. Includes all forms of management, (manure, no manure etc.) but mainly corn-bean rotations with not a lot of sites receiving manure.

Note: “surface” refers to overland surface water leaving the field edge. Tile refers to subsurface tile water with tiles that have no surface inlet connection. If tiles have a surface inlet connection, then they could see concentrations matching those of the surface runoff. Can also expect higher levels of sediment (TSS) in surface waters.

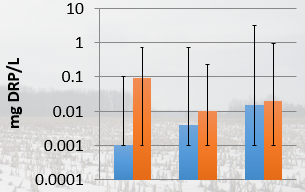
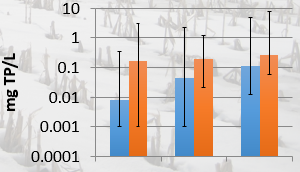
Source: Kevin King (2015) presented at the Nutrient Management and Edge-of-Field Monitoring Conference, Memphis TN (SWCS Specialty Conference)

1. 

**Ontario Edge-of-Field Studies Summary (**Note MDL = minimum detection limit)

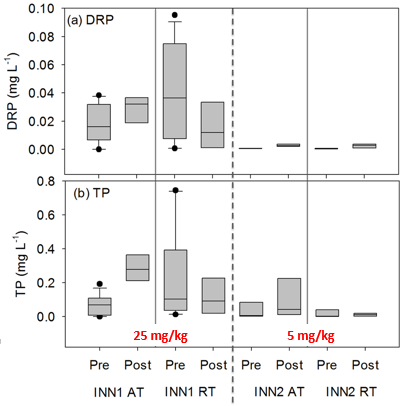
|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Location** | **Monitored Period** | **Range of Observed Concentrations (mg/L)** | | | | **Comments** |
| **Surface** | | **Tile** | |
| **Ortho-P** | **Total-P** | **Ortho-P** | **Total-P** |
| Huron\* | 6 yrs. | MDL – 0.8 | MDL – 1.0 | MDL – 0.3 | MDL – 0.5 | No manure, well managed |
| Middlesex\* | 6 yrs. | MDL – 1.0 | MDL – 1.4 | MDL – 0.6 | MDL – 1.2 | Some manure, well managed |
| Simcoe\*\* | 6+ yrs. | -- | -- | MDL – 0.8 | MDL – 0.8 | Tile only, different tillage and P levels (see graph below (Lam et al, 2016)) |
| Eastern ON | 2 yrs. (mean) | 0.006 | 0.06 | 0.1 | 0.23 | Means only, |
| Chatham-Kent | <1 yr. | -- | -- | MDL - 0.4 | MDL - 0.6 | Some manure, common mgmt. |
| Chatham-Kent | 1 yr. | -- | -- | MDL – 0.4 | MDL – 0.6 | No manure, Hort crop rotation |
| Essex\* | 3 yrs | MDL - 1.0 | MDL – 8 | MDL - 2.5 | MDL – 6 | No manure, common mgmt. |
| Huron | 3 runoff events over 1 yr. | -- | 0.4 – 7 | -- | -- | Monitored at a WASCOB inlet |
| Chatham- Kent | 1.5 yrs. | -- | -- | MDL- 0.05 | -- | No manure, some cover cropping |

Below are graphs showing the means, and ranges of all samples for the sites identified in the table by an \* to give an idea of where most of the samples fall. Blue is tile concentrations, orange is surface concentrations

Huron Middlesex Essex Huron Middlesex Essex

\*\* Details for Simcoe monitoring site (tile only monitored) (Source: Lam et al, 2016 Journal of Great Lakes Research) Note different soil test levels made a difference. Therefore, sites that have received high levels of P applications historically (e.g. through manure applications) may be more susceptible to higher P losses.



In addition to P concentrations, the turbidity level can vary from very low readings to 150 mg/l. Tile water is very clean while surface water would be higher.

**5.3 Multi-Phased Approach**

It is proposed that projects move forward in a phased approach, to allow for initial site characterization and corresponding adjustments to technology performance, through to scaling up.

The PRC recognizes that some companies with products that may be used in a P removal system may not wish to be involved in the installation of the system itself. These companies are encouraged to apply by providing technical information about their product and how it could be deployed. The submission will be evaluated and if of interest, a suitable installer such as a local drainage company will be contacted to further develop a proposal. In some instances, a farmer could decide to install the system using the company’s product.

*25 to 100-acre infield and edge of field projects*

The 1st phase for in-field and edge- of-field systems will consist of a desktop exercise. The successful company will be provided support from a drainage engineer, and a technician where necessary, to characterize water flow from the site and calculate anticipated water flow, water profile and suitable system design for flows for up to a 50-year storm. At a field site, technology designs should be able to handle a on inch rainfall per 24 hours. The PRC project team will provide water sample laboratory information to inform this exercise.

The second phase will be the demonstration of the system over a two-year period, running 24/7 through all seasons. The system will service from 25 to 100-acre plot of land. During peak flows, it is anticipated that a percentage of the runoff will bypass the system. The ability of the system to handle a larger percentage of the peak flow, e.g. due to short contact time, will be a factor in evaluating proposals. During this phase, the successful company, with the assistance of the PRC project team, will monitor and analyze the effectiveness of the system’s phosphorus interception and removal.

The third phase will consist of recommendations, design and costing for scaling up the system to service either a larger flow of runoff and/or a larger geographic area.

For technology companies interested in developing remote sensors, a test site will be assigned where water parameters are already measured and supported by laboratory testing.

*Treatment adjacent to municipal drains*

The first phase will begin with a testing period to allow for initial site and water characterization and corresponding calibration to the technology for optimal performance, at an initial capacity of 10,000 liters per day. During this first phase, the PRC project team will interface with the successful company to calculate precisely the hydrological conditions under which the test would be evaluated.

The second phase will consist of a demonstration at 35-40,000 litres per day, running 24/7 through all seasons. This may require remote monitoring and remote shutoff capabilities. All systems will have a bypass option for peak flows. The technology’s ability to treat a larger percentage of the peak flow, e.g. with short contact time, will be a factor in the evaluation of the proposal.

During this two-year phase, the successful company and the PRC project team will monitor and analyze the technology’s effectiveness to intercept and remove phosphorus and monitor and document maintenance requirements and power requirements.

The third phase will consist of recommendations, design and costing to further scale up to 100,000 litres per day.

**5.4 Sites**

Sites will be selected in the Upper Thames region, the Lower Thames region, and at least one site on the Chippewas of the Thames First Nations reserve.

For a municipal drain system, the technology should not occupy a space larger than a shipping container. Each site will be provided with a power supply, and road access, as well as a sanitary and water line.

An installation at an in-field inlet should anticipate an available area of 1 meter in circumference (or 3 metres squared) to the infield inlet,

An installation at edge-of-field has no specific space limit, however it must not interfere with normal farm production activities, so may be located on unproductive land or underground.

Where space permits, some sites may allow for hydraulic storage combined with treatment to allow for controlled flow treatment.

**5.5 Weather Conditions**

Projects will be expected to run through all seasons

During the winter months, anticipate ambient air and water temperatures to dip below zero degrees Celsius.

Active systems in municipal drains will have to be enclosed to control temperature and avoid freezing.

In field and on edge of field systems that are not contained will not operate when water on fields is frozen. However, they will have to be designed in a way that they can withstand repeated freezing and thawing cycles.

During summer months, dry periods with no flow for prolonged periods of time should be anticipated. Systems will have to be designed in a way that they can withstand these no flow periods, which may cause air locks in pipes.

**5.6 Monitoring and Analysis**

For municipal drain technologies, continuous monitoring will be required. It is anticipated that this could be performed through remote monitoring where there are broadband services.

Companies interested in providing remote sensing can apply for funding. Our sites will be monitored and as result it can provide useful benchmark data.

1. **Eligibility**

Applicants may be from the private sector, the academic/NGO sector, or a collaboration amongst two or more parties. The applicants should have a track record (references) to demonstrate their experience in technology development and demonstration. Technologies should be in advanced development or be commercially available.

There is no limitation on the country of origin of the applicant.

Applications must be submitted by the lead applicant and clearly identify the relevant applicant team members and the technology vendors’ roles and responsibilities.

Where there is intellectual property (IP), the Applicant may request a non-disclosure agreement.

1. **Estimated Timeline of RFP Process\***

\*All dates are subject to change

|  |  |
| --- | --- |
| Release of RFP | July 23, 2018 |
| Final Date for written questions | August 1st, 2018 |
| Final Date for submission of applications | September 28, 2018 |
| Projects Selected | October 19, 2018 |
| Projects begin by | No later than 1 month after contract is signed |
| Phase 1 completed | No later than March 29, 2019 |
| Phase 2 completed | No later than September 27, 2019 |
| Projects Completed by | No later than March 31, 2021 |

1. **Budget and Cost sharing requirements**

Applicants must provide an estimated budget using the budget template below (see section 13.3, below). The budget evaluation will be a factor in the selection criteria. Selected applicant teams will be paid based on agreed upon milestones achieved and outcomes delivered.

There is no cash cost share requirement. The PRC assumes up to 100% of costs for equipment rental/purchase, installation and monitoring costs. The applicant is responsible for operational costs, including staff time. The grant must be used within the time stipulated in the grant contract.

Ineligible costs

Ineligible costs will follow grant agreement conditions. These will include salaries

And travel costs at a minimum.

1. **Term of Contract and Requirements**

A final contract is subject to successful negotiation of a final budget and scope of services.

Notwithstanding conditions laid out in this RFP, contracts signed between the PRC and successful applicants will be consistent with funding agency requirements, including, but not limited to

* Eligibility of costs
* Confidentiality requirements
* Intellectual privacy rights

These conditions will be agreed to at the time of contract negotiation.

1. **Technical Selection Criteria**

The criteria below will be used to identify promising proposals and to measure performance during testing of selected technologies. Therefore, it is important that each criterion be addressed in your proposal

**10.1 Temperature**

For municipal drain technologies, the Applicant must demonstrate that treatment will function during the non-growing season, at water temperatures ranging from 0-40 degrees Celsius. Air temperature can be below freezing. Any equipment that operates under a narrower temperature range must be supplied with a temperature-controlled enclosure provided by the applicant.

While in-field and edge of field systems will not be able to operate in conditions where water is frozen (i.e. below zero Celsius), the Applicant must demonstrate that the system is able to withstand below freezing temperatures, including internal and external ice formation, without being damage.

**10.2 Hydraulic velocity/flow**

For municipal drain technologies, technologies must treat

* 10,000 litres of water per day, in the first phase,
* 35-40,000 litres per day in the second phase, and
* 100,000 litres of water per day in the 3rd phase (or provide recommendations on cost, design for scaling up to 100,000 litres).

For 25 to 100-acre systems, technologies must treat either

* Infield systems - Up to 100 litres per minute
* Tile outlet systems- outflow from a 12-inch pipe

**10.3 Water profile and removal reaction performance**

Total phosphorus removal performance will be measured as a percentage of removal compared to phosphorus concentrations in pre-treatment flow. This can be conveyed through research reports.

The desired removal rate of the treated flow is 40% or higher for each storm/flow event. This is based on the commitment by the Governments of Canada and the US, as well as the Governments of Ontario, Ohio and Michigan, to remove 40% phosphorous from runoff entering Central Western Lake Erie. Performance will not be linked to a regulatory or voluntary threshold.

While performance will be evaluated based on total phosphorus removal, removal of soluble phosphorus, measured as either total P or ortho phosphorus, will also be considered.

The percentage of total phosphorus removed will be measured only from the flow that is treated and will not include the bypassed flow. However, the ability of the technology to treat a significant percentage of the total flow from the designated site will also be considered.

Performance will also be evaluated based on the ability of the technology to treat water with high turbidity. When this is relevant, the technology company will need to describe this step at the front of their technology. However, actual removal of suspended solids will not be a performance measure.

Performance will also be evaluated based on no impairment to background water quality, such as chemical usage, dissolved oxygen, total suspended solids, conductivity, temperature, and pH.

Performance will be evaluated on the additional consideration of a company’s demonstrated ability to innovate and adjust based on changing conditions, e.g. weather, site conditions, etc.

**10.4 Footprint / Energy Consumption**

Available footprint and power supply will vary depending on site. Systems with a small footprint and low energy requirement may be given preference. Companies will need to specify electrical requirements including pumps to draw water from municipal drain.

Maintenance cycles and need for staff oversight must be described.

**10.5 Costs per kilogram of phosphorus removed and Lifecycle costs**

An important consideration in evaluating applications is the anticipated cost per kilogram of phosphorus removed.

These costs must include anticipated maintenance and operation costs that will need to be assessed during the demonstration stage. Full lifecycle costing, including energy costs, will be carried out after testing is complete.

**10.6 Environmental Impact and Approvals**

Applicants will be required to disclose the Material Safety Data Sheet (MSDS) for any chemical used and a health and safety assessment. Toxicology information on potential impact on the ecosystem is beneficial and may be considered.

Characterization of chemicals and byproducts and their storage and disposal methods must also be provided if required at any site.

Where an environmental approval is required from relevant regulatory bodies, the PRC will work with the applicant and the regulatory body to secure approval. Companies with existing approvals may wish to provide additional information.

Where electrical equipment is being used, such equipment will have been approved by the CSA.

The PRC will share successful project applications with appropriate regulatory agencies to ensure appropriate authorization are in place.

**10.7 Ability to recover phosphorus**

While not a requirement, the Applicant should explain its technology’s potential to recover phosphorus for reuse.

1. **Application Review Process**

Upon receipt of applications, PRC will undertake an initial threshold review to determine whether applications are complete and meet basic eligibility requirements.

Eligible proposals will undergo a merit review process by a technical review committee including members from academic and research centres and innovation agencies. This review will be based on the general request for proposal conditions, technical selection criteria and project profile outlined in this RFP. From this process, eight ranked candidate projects will be identified, with recommendations on the top 5 to be selected.

The eight shortlisted candidate projects, with recommendations, will be forwarded to the PRC Steering Committee Review Sub Committee, which will include members of the

steering committee (agricultural, drainage, municipal and conservation representatives) and select external experts.

Shortlisted applicants may be contacted with follow-up questions. After the successful companies have been notified that they will receive an award, the OFA, on behalf of the PRC, will move forward with executing a grant agreement with the selected Applicant.

Potential applicants are encouraged to submit questions during the written question period as outlined in the timeline above. Questions may be submitted to Charlie Lalonde, project manager, at [charles.lalonde73@gmail.com](mailto:charles.lalonde73@gmail.com) .

1. **General request for proposals conditions**

All applicants must be responsive to the requirements outlined above and meet the criteria outlined in the table below.

|  |  |
| --- | --- |
| **Selection Criteria** | **Sub criteria** |
| Minimum Threshold | PRC reserves the right to only consider those applications that meet the following minimum threshold criteria: |
| Potential of Proposed Technology | Demonstration of understanding of barriers/risks to project success and proposed methods to address these barriers/risks.  Proposed solution is innovative and uses sound engineering and scientific principles and approaches.  Demonstration of understanding of market potential for the technology in Ontario/wider Great Lakes region. Demand for byproducts |
| Qualifications | Application team has relevant skills, qualifications and experience to undertake the project;  Strong track record of conducting previous demonstration projects; identification of who will be involved. |
| Project Workplan | Clear project workplan including plan to clearly assess progress and measure results, including how necessary resources will be mobilized and how the project will meet the projected timeline.  Highlight key project milestones  Description of metrics to measure progress during demonstration, and success upon completion, including.  flow measurement, either by the applicant or in collaboration with the PRC team. |
| Project Budget | Ability to carry out project within budget and on time. |
| Liability Insurance | Attach a copy of Certificate |

1. **How to apply**

The full application should be no longer than 15 pages, including

1. A project proposal cover sheet
2. A project proposal application form
3. A project workplan and budget with sufficient detail to support an award
4. A signed authorized applicant team signature and acceptance form
5. Resumes from each of the members of the applicant team
6. References

**13.1 Project Proposal Cover Sheet**

The Applicant shall use any cover page with company logo and address. On each page of the proposal, the company name shall appear as a header.

**13.2 Project Proposal Application Form**

The proposal can be formatted using Word, the font can be Segoe UI 12 or of equivalent size. No italicized text.

The sequence shall be as follows:

* Applicant Background of Company
* Project Proposal Summary
* Technical Details of the System (How it works)
* Implementation Details including Drawing
* Technical Results on Operating Costs and Efficacy
* Project Timeline
* Team Qualifications and Time Estimate
* List of Equipment
* Cost
* Signature and Date

**13.3 Project Workplan and Budget Template**

The workplan will be provided in a Word format and sequential. GANTT chart is also acceptable. A typical plan could look as follows:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Activity Number | Description | Lead | Timeline | Duration |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

The Budget will be presented as follows using Excel:

|  |  |  |  |
| --- | --- | --- | --- |
|  | Year 1 to March 31st 2019 | Year 2 Aril 1 2019 to March 31 2020 | Year 3 April 1, 2020 to March 31 2021 |
| Contractor cost |  |  |  |
| Materials & Supplies |  |  |  |
| Capital for equipment |  |  |  |
| Equipment rental |  |  |  |
| Other (specify) |  |  |  |
| Total |  |  |  |
| Estimate of in-kind support |  |  |  |

**13.4 Authorized Applicant Team Signature and Acceptance Form**

The applicant shall complete the application with a letter stating that he /she has the authority to bind the company and that all technology IP rests with the said company. In cases where the IP is unclear, the Applicant shall provide additional information. Any need for Non-Disclosure Agreements shall be declared at this time. The letter shall also summarize the financial request to the PRC.

**13.5 Insurance Certificate**

The insurance certificate shall cover the company while working on third party sites.