



**SPF Application Form**  
**Section A - Cover Page**

Fill out this Cover Page and save it to your files for future reference before uploading it on the SPF website.

**Project Title** Sustainable Rain and Flood Water Management on the McGill Campus

**In one to three sentence(s), explain what your project is about:**

Develop a sustainable rainwater management plan for McGill's downtown campus to be implemented in 2017 (initially by the project team and then the FMAS department). This will involve the analysis of sustainable rainwater management alternatives as well as the feasibility of harvesting rainwater for potential reuse on-campus.

**Indicate the McGill campus(es) where your project will be implemented:**

Macdonald  Downtown  Gault Reserve  Bellairs Research Institute  Other (Specify): \_\_\_\_\_

**Approximate Budget Requested to the SPF (\$):** 71,732

**Approximate Total Project Budget (incl. other sources of funding if applicable) (\$):** 153,960

**List 1 to 3 main item(s)/expense(s) for your project that SPF money will be used for (incl. approx. % of total budget):**

Personnel payments (41%); field activities (59%)

**Indicate which of the following team members...**

**... will be in charge of monitoring the project's budget (maximum 1 person):** Prof. Jan Adamowski

**... will be the Project Lead (Project Lead will be the contact person for the SPF Staff):** Prof. Jan Adamowski

**The Project Lead stays for the entire duration of the project:**  Y  N

**If no, explain in a few sentences your leadership transition plan for one or both of the Project Lead for sustainable continuation of the project:**

**PROJECT TEAM MEMBERS**

*The SPF encourages your team to be inclusive of individuals who voluntarily self-identify as members of marginalized communities (e.g. women, Indigenous people, people of colour, LGBTTQI, student parents, members of ethnic minorities, immigrants, people with disabilities).*

**1. Student Team Member (read details about [SPF Evaluation Criteria #5](#) for more information)**

**First Name & Last Name** John Quilty **Affiliation (select one)** Post-graduate (PG)  
**Phone (daytime; only put #)** +1 (514) 398-7786 **Specify if Other** PhD student  
**Email** john.quilty@mail.mcgill.ca **Faculty/Unit/Organization** Bioresource Engineering

**2. Staff Team Member (academic or administrative staff) (read details about [SPF Evaluation Criteria #5](#) for more information)**

**First Name & Last Name** Philippe St-Jean **Affiliation (select one)** Administrative Staff (ST)  
**Phone (daytime; only put #s)** +1 (514) 398-7196 **Specify if Other** Sustainable Construction Officer  
**Email** philippe.st-jean@mcgill.ca **Faculty/Unit/Organization** McGill

**3. Additional Project Team Member**

**First Name & Last Name** Jan Adamowski **Affiliation (select one)** Academic Staff (AC)  
**Phone (daytime; only put #s)** +1 (514) 398-7686 **Specify if Other** Professor  
**Email** jan.adamowski@mcgill.ca **Faculty/Unit/Organization** Bioresource Engineering

**4. Additional Project Team Member**

**First Name & Last Name** Postdoctoral Fellow **Affiliation (select one)** Post-graduate (PG)  
**Phone (daytime; only put #s)** \_\_\_\_\_ **Specify if Other** \_\_\_\_\_  
**Email** \_\_\_\_\_ **Faculty/Unit/Organization** Bioresource Engineering

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### PROJECT TEAM MEMBERS (CONT'D)

#### 5. Additional Project Team Member

First Name & Last Name Postdoctoral Fellow Affiliation (select one) Post-graduate (PG)  
Phone (daytime; only put #s) \_\_\_\_\_ Specify if Other \_\_\_\_\_  
Email \_\_\_\_\_ Faculty/Unit/Organization Bioresource Engineering

#### 6. Additional Project Team Member

First Name & Last Name MSc student Affiliation (select one) Post-graduate (PG)  
Phone (daytime; only put #s) \_\_\_\_\_ Specify if Other \_\_\_\_\_  
Email \_\_\_\_\_ Faculty/Unit/Organization Bioresource Engineering

#### 7. Additional Project Team Member

First Name & Last Name BEng student Affiliation (select one) Undergraduate (UG)  
Phone (daytime; only put #s) \_\_\_\_\_ Specify if Other \_\_\_\_\_  
Email \_\_\_\_\_ Faculty/Unit/Organization Bioresource Engineering

#### 8. Additional Project Team Member

First Name & Last Name BEng student Affiliation (select one) Undergraduate (UG)  
Phone (daytime; only put #s) \_\_\_\_\_ Specify if Other \_\_\_\_\_  
Email \_\_\_\_\_ Faculty/Unit/Organization Bioresource Engineering

To list more members, fill a 2nd Cover Page form and save it separately. Then merge with your 1st Cover Page before uploading to the SPF website.

#### OPTIONAL:

If applicable, total number of team members voluntarily self-identifying as members of marginalized communities: 0

Represented marginalized communities: Other (specify) \_\_\_\_\_ Other (specify) \_\_\_\_\_

Specify if Other(s) and/or add more: None \_\_\_\_\_

Relevant link(s): (to website(s) or social media re: project and/or team members)

How did you learn about the SPF? (select one) SPF Staff \_\_\_\_\_ Specify if Other \_\_\_\_\_

#### Please check the boxes to confirm that you have read and agree to the following information:

- All our project team members understand that the SPF is publicly funded and therefore, by default SPF projects are not confidential. We agree that if needed, the SPF Steward, the SPF Administrator and/or the SPF Working Group members read and/or share the application and/or communicate part of its content in the cases where they would need to (e.g. to receive professional advice, connect our team to stakeholders, etc.).
- If our project is approved, all our project team members agree that their name, email, and phone number as well as their participation to the project be disclosed (e.g. for contact information or through our application and progress/final reports published on the SPF website).  
**If you do not check this box, the SPF staff will communicate with you to know who's information to remove before sharing your project online.**
- All our project team members have read and understood the [SPF Terms & Conditions](#), and we confirm that we agree to respect them.  
**If any aspects of the [SPF Terms & Conditions](#) are unclear to you, contact the [SPF Staff](#) before you submit your application so that you can check this box in all confidence. Also note that, if your project is approved, the Project Leads and the person monitoring the project's budget will have to confirm in writing (through email or document's signing) that they agree to the [SPF Terms & Conditions](#) before officially starting the project.**



## SPF Application Form

### Section B - Project Overview

Answer the following questions and save this form to your files for future reference before uploading it on the SPF website with Section A - Cover Page.

**Project Title** Sustainable Rain and Flood Water Management on the McGill Campus

**Project Lead** Jan Franklin Adamowski **Phone** +1 (514) 398-7786 **Email** jan.adamowski@mcgill.ca  
**First & Last Name** Jan Franklin Adamowski **(daytime)**

*Before you fill out this Project Overview, make sure you have consulted all related application documents online, including the [SPF Evaluation Criteria](#), the [SPF Glossary](#), the [SPF Project Flow Diagram](#), and the [SPF Sustainability Brief](#). Read all questions first before starting answering them. Answer **exactly** what is being asked: go straight to the point and stay clear and succinct. If need be, you will have a chance to include additional information in appendices at a later stage of the application process. The characters' limit (including spaces) is indicated for each question so that you can draft your answers in Word first if you want to (you will have to remove all formatting in Word before pasting here). Note that any skipped line will make you lose the line's characters (approx. 140 characters). Once you successfully pass this first stage of the application process, the SPF Staff will ask you to fill a Project Plan, in which you will specify your expected impacts, S.M.A.R.T. objectives and main activities, outputs, success indicators, stakeholders, main risks and mitigation measures, preliminary timeline, and costs. Although it is OK for you not to have all these details ready at this stage, having thought about them in advance will help you succeed in responding to the following questions.*

**Project Vision** Towards integrated and sustainable rain and flood management on the McGill campus

*A vision depicts the ideal future that someone is hoping for. Thus, a vision is a dreamed aspiration that someone intends to lead or contribute to, and it does not necessarily need to currently seem realistic. As such, tell us how you see McGill campuses in an ideal world once your project is completed successfully. The vision does not need to be completed within the timeline of the SPF funding.*

**Project Goal** To supplant traditional and archaic forms of rainwater management by developing and implementing a comprehensive and low cost campus rainwater management plan to sustainably capture rainwater on site and address flooding

*A goal is the overarching desired tangible realization (and thus change) to be achieved within the project's lifespan. The goal contributes to the project's vision in a palpable and realistic manner. The project's goal may last longer than the SPF funding lifespan. In line with the SPF mandate, when achieved, your project's goal should result in a culture shift (e.g. change in ideas, habits, behavior).*

**1. What is the specific sustainability-related issue/challenge that you see on McGill campus(es) that you want to address?**  
(530 char. max. ~80 words)

Eliminate the use of artificial and costly concrete and plastic rainwater retention and transmission systems (i.e. 'traditional stormwater engineering' approaches) on campus by developing and evaluating a rainwater master plan centered on the use of natural and plant-based hydrological systems which are inherently sustainable and low-cost alternatives that will enhance McGill's current rainwater management practices. After careful evaluation via modeling some alternatives will be implemented for testing and demonstration.

**2. What is your project idea and how will it help address the above issue/challenge?** (2000 char. max. ~300 words)

Montreal does not have independent rainwater and sewage water drainage systems and as such, during heavy rainfall, the City's water treatment plants cannot handle the excess volume. The overflow of sewage and rainwater is thus dumped directly into the St-Lawrence river without treatment. To address this issue, the City now requires that all new exterior construction projects capture rainwater on site during a storm, and slowly release the water to the municipal system to avoid overwhelming it. The simplest and most commonly used approach to do this is to store the water in underground plastic/concrete basins and slowly release it into the municipal sewage system. This project will develop a much more sustainable approach for McGill by developing and testing a rainwater management master plan which will involve evaluating different low cost sustainable rainwater and flood management options for McGill's downtown campus using state-of-the art hydraulic models and by studying the flood consequences considering McGill's infrastructure and the stormwater system. As part of this, we will explore an integrated strategy for rain and flood water harvesting to provide water for campus irrigation, urinals, etc. The introduction of these ecosystem based approaches can both increase biodiversity and restore natural hydrological cycles on campus. They also reduce the wasted resources that go towards treating rainwater when it is combined with sewage, and they present an opportunity to reuse rainwater on site to reduce potable water consumption in a significant way. The sustainable rainwater management alternatives that will be evaluated (of which some will be implemented for testing and demonstration purposes) may include infiltration trenches, land hilling, stream creation and/or channelization, leveling, small diversion earth dikes, vegetation planting, small detention ponds, etc.

**3. What impacts do you want your project to have on McGill structures, processes and/or systems? Also specify how this should positively transform peoples' behaviors/perspectives/habits on McGill campus(es).** (935 char. max. ~135 words)

Without this project, McGill will have no choice but to hire an external civil engineering firm to develop the rainwater management master plan required by the City. Given the very limited knowledge and experience of these firms with respect to ecosystem based design, they will very likely implement traditional concrete/plastic rainwater systems with which they are familiar. By developing the master plan with key stakeholders and educating them in the process, we can ensure a consistent application of much more sustainable strategies across all future projects. The implemented strategies can then also be used as 'showcase', hands-on, teaching tools for students, staff, and the broader public to learn about water conservation, rainwater re-use, etc. This project will also contribute to LEED certification on all projects across campus.



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**4. What arrangements will make these impacts continue after the SPF funds have been spent?** (530 char. max. ~80 words)

The development and implementation of a 5-year rainwater management master plan is a requirement of the City of Montreal for the issuance of any construction permit as of January 1, 2017. Adherence to the plan will be a legal requirement of McGill. As such, the development of a comprehensive master plan, centered on sustainable practices, will ensure the consistent and continuous application of these practices on all construction projects until 2022, when the master plan will be updated to cover the subsequent 5 years.

#### - ABOUT SUSTAINABILITY -

**5. How do you intend to address social, environmental, and/or economic dimensions of sustainability in your project's objectives?** (1350 char. max. ~200 words)

Key stakeholders will be identified and involved using the Participatory Model Building Framework developed by Prof. Jan Adamowski (which has been very successfully used for diverse applications). This will ensure that the perspectives of stakeholders are included throughout all phases of the project (regarding the problem, causes, consequences, and strategies to address the problem). The different low cost and sustainable rainwater management alternatives will be selected based on how well they address all aspects of sustainability and they will then be evaluated (using the hydraulic models in conjunction with stakeholder input) based on (i) their effectiveness in addressing campus flooding events (ii) their ability to enhance/benefit the surrounding ecosystem, (iii) their social acceptance by key stakeholders on campus, and (iv) their costs. For each alternative an estimate of its costs will be included to evaluate its effectiveness in flood-protection per dollar invested. Furthermore, parts of the rain and flood management system will be implemented as part of the SPF and showcased to the McGill community and general public and serve as an educational tool for students, staff, and the general public.

**6. In addition to having sustainability-related objectives (Q5), how will you ensure that your project is also planned and managed sustainably (e.g. material local sourcing; accessibility - see the [SPF Sustainability Brief](#))?** (530 char. max. ~80 words)

Jan Adamowski has significant expertise in the area of engineering for sustainability, sustainable rain and flood management, stakeholder engagement, etc. As such, he is very familiar with the latest ideas and methods in ensuring that engineering projects are planned and managed sustainably, and will ensure that this is done. Some examples of frameworks that will be used to ensure this include the FIDIC Project Sustainability Management System, the Participatory Model Building Framework (that he developed), etc.

Beside appear the five categories in which the McGill students, faculty, and staff think the University can make a positive difference within society. The [McGill Sustainability Strategy. Vision 2020](#), describes a specific vision and goals for each of these categories, as they were defined by the McGill direct stakeholders through a comprehensive consultation process.

**7a. In the figure, check all the categories under which your project falls** (you can select only one if no others apply to your project).

**7b. Among the categories that you checked, select the one that you think is most relevant to your project:**

**Dominant Category:** Operations

**7c. How does your project concretely contribute to advancing the vision and goals described under the [Vision 2020](#) category that is most relevant to your project?** (800 char. max. ~115 words)

The main results of the implementation of ecosystem based rainwater management practices are: reduction in construction material use; reduction in GHG emissions; reduction in waste water creation; more sustainable land use; reduction in potable water use; reduction in energy use; creation of a living lab for experiential learning; developing staff, student and sub-contractors' knowledge and skills related to sustainable water management; increasing biodiversity and human-health related impacts; increasing the visibility of McGill's sustainable practices; exposing students to a pressing operational need and solution; and reducing the cost and increasing the sustainability of rain and flood management on campus.

#### Vision 2020 Categories

- Finance & Investment
- Diversity & Equity
- Transparency
- Inclusiveness
- Accessibility
- Experimentation
- Accountability
- Leadership
- Human Resources

- Materials
- Energy
- Food
- Water
- Transportation
- Land
- Living Lab



- Exploring Sustainability
- Collaborative
- Community-Engaged
- Social-Ecological Footprint
- Interdisciplinary
- Applied Student Research

- Citizenship
- Leadership
- Lifelong Learning
- Experiential Learning
- Sustainability Knowledge & Skills

- Wellness & Health
- Community Engagement
- Sense of Belonging
- Accessibility
- Community Spaces
- Knowledge Sharing

## SPF Application Form

### Section B - Project Overview

**8. How does your project relate to any current/past initiative(s) on McGill campus(es) (e.g. other SPF projects)? If applicable, also indicate: 1) how your project complements the initiative(s), and 2) how you will partner with them in implementing your project (e.g. working together on some activities, sharing material/resources/costs). (2000 char. max. ~300 words)**

Professor Adamowski had two very successful SPF projects in the past: i) the construction of a small demonstration rainwater harvesting system for the Horticulture Center on the Mac campus, and ii) the construction of a dew water collection system for small scale irrigation on both the downtown and Mac campuses. Both systems are currently working very well and each year a set of ~10 students are involved in the operation, management, and maintenance of both systems. In addition, hundreds of students and the general public have seen and studied the two systems as they are very good hands-on demonstration tools of simple and sustainable water systems and management. This project builds on the knowledge that was gained from the small SPF rainwater harvesting system that was developed.

The implementation of the proposed project will help in the development of the McGill rainwater management plan and will consequently contribute to LEED certification and therefore tie in to the SPF project SP0146 LEEDing Change. As such, the Sustainable Construction Officer, hired under SP0146, will be directly involved in all aspects of the development and implementation of the project. It should be noted that the McGill Facilities Management and Ancillary Services (FMAS) has agreed to hire an external civil engineering firm to collect the preliminary data we need for our model (approximately \$60,000+tax). We believe this demonstrates how committed FMAS is to our project.

**9. List the other stakeholders on/off of McGill campus(es) that you will partner with for your project. (530 char. max. ~80 words)**

*Note: Under Stage 2 of the SPF application process, in the Detailed Project Plan, you will be asked to select your key stakeholders and specify how they will participate in your project. You will also be able to submit any documents that you want in appendices to demonstrate your communications and agreements with the key partners of your project (e.g. support letters, emails).*

We will use the Participatory Model Building Framework developed by Jan Adamowski to identify and then meaningfully engage all key stakeholders identified. This will include but not be limited to: students, staff, operations personnel (including the new Sustainable Construction Officer who is part of our proposal), engineers, and any other interested stakeholders. Once we complete our stakeholder analysis, we will have a much more comprehensive group of stakeholders that we will engage.

**10. What key recommendations and/or lessons learned from current or past initiative(s) do you plan to build your project upon? (800 char. max. ~115 words)**

I have led over 30 successful research/engineering projects in the last 6 years. I have learned many valuable lessons during this time that I will build upon for the proposed SPF project. To give an example, in my many projects with diverse stakeholders, I have seen how important it is to ensure that key stakeholders are appropriately identified and engaged throughout the process (planning, implementation, follow up, etc.).

#### - ABOUT SPF FUNDING -

**11. Why do you think that your project should be funded by the SPF rather than by, or in addition to, another source of funding (i.e. what aspects of your project make it specifically relate to the SPF mandate)? (530 char. max. ~80 words)**

The proposed project is a much more elaborate approach to an operational issue than would normally be taken by the McGill FMAS department. It is directly focused on the sustainability of an issue that has not been explored at all to date. The research required to develop this progressive master plan would also be significantly more expensive than a traditional plan. These three points make it almost impossible to push this initiative through the regular operational process, which is exactly why the SPF was created.

**12. What other sources of funding have you approached for your project? If applicable, also provide the relevant details on these sources (e.g. responses given, amounts already committed, what these amounts will pay). (530 char. max. ~80 words)**

Professor Adamowski will provide some funding from his budget to help pay for the students that will form part of the project. Ultimately, funding to build all the components of the rain and flood management system will come from the FMAS department as part of the city's requirement for them to manage the rainwater related to the Leacock terraces, McTavish Gates, and Roddick Gates renovations (among others). They have already committed 60 000+tax to collect the data we need.

*Thank you! After you save it to your files, you can now upload this form and Section A - Cover Page on the SPF website to complete this first stage of the application process. The SPF staff will contact your team within two weeks to provide feedback and accompany you towards next stage - Project Plan. Congratulations for applying to the SPF!*



## SPF Application Form Section C - Project Plan

Answer the following questions and save this form to your files for future reference before uploading it on the SPF website.

**Project Title** Sustainable Rain and Flood Water Management on the McGill Campus

**Project Lead** Jan Adamowski **Phone** +1 (514) 398-7786 **Email** jan.adamowski@mcgill.ca  
**First & Last Name** Jan Adamowski **(daytime)**

*Before you fill out this Project Plan, make sure you have consulted all related application documents online, including the [SPF Evaluation Criteria](#) and the [Project Plan Flowchart](#). Also make sure to consult the [SPF Glossary](#), as it clearly defines each term underlined in this form, as well as the [Sample Project Plan](#), which gives some concrete examples for each term. Last, also do not forget to refer back to your 'Section B - Project Overview' to make sure that all the details you specify here align with it. For more support, consult the SPF website and the SPF staff.*

**Project Vision** Towards integrated and sustainable rain and flood management on the McGill campus

*As indicated in your Section B - Project Overview.*

**Project Goal** To supplant traditional and archaic forms of rainwater management by developing and implementing a comprehensive and low cost campus rainwater management plan to sustainably capture rainwater on site and address flooding

*As indicated in your Section B - Project Overview.*

**1. List 1 to 3 main impacts you expect/wish to have with your project - these must relate to the above Vision and Goal:**

*As per question #3 of your Project Overview. If you think of more than 3 impacts, only indicate the ones you think are the most relevant to sustainability at McGill.*

Expected/Desired Impact (200 char. max. ~30 words)	
A	Natural plant-based hydrological rainwater management measures will be the main source of rainwater treatment on campus moving forward.
B	The master plan will ensure the implementation of a holistic rain and flood water management approach centered on sustainability for the entire campus.
C	The measures built as a result of the master plan will act as a showcase for students, staff, and the general public to learn about sustainable rain and flood water management.

**2. List 4 to 7 of your objectives to reach the above impacts with your project. Make your objectives as S.M.A.R.T. as possible.**

**For each objective, indicate one key Success Indicator.** (see [SPF Glossary](#), [Sample Project Plan](#), and [Sample Indicators](#))

*Of your 4-7 objectives, you should have a minimum of one "monitoring" objective, one "outreach" objective, and two "other" objectives. A monitoring objective ensures or verifies the progress and effectiveness of your project, thus allowing you to learn from it. An outreach objective ensures that your project is adequately communicated to the McGill community to increase stakeholders' awareness of and/or participation in your initiative. These two types of objectives might lead to project monitoring and outreach activities (next question). The nature of the 2-5 other objectives is for you to decide and tailor to your project. If you have more than 7 objectives, only indicate the ones that relate best to the above impacts and thus to sustainability at McGill. For each objective, specify the key success indicator(s) that you think should be used to assess the objective's degree of achievement/completion. Your indicators can be qualitative or quantitative (e.g. number of participants, participant testimonials, website analytics, quantity of energy saved, etc.). See the document [Sample Indicators](#) for inspiration.*

#	Type of Objective	S.M.A.R.T. Objectives (125 char. max. ~20 words)	Related Impact(s) (A, B, C)	Related Key Success Indicator(s) - also indicate targeted numbers for each (85 char. max. ~15 words) (ignore the circles for now)
1	Other	By the end of the second month, the rainfall frequency analysis (FA) and PCSWMM setup will be executed.	A, B, C	Initial report by the rainfall FA and PCSWMM setup <input type="radio"/>
2	Other	By the end of the third month, calibration and validation of the PCSWMM professional model will be executed.	A, B, C	PCSWM report (Calibration & Validation) <input type="radio"/>
3	Other	By the end of the fourth month, a sustainable measures master plan of the campus will be developed.	A, B, C	Master-Plan with all possible sustainable measures for rain and flood management <input type="radio"/>
4	Other	During the following 4 months the necessary tests on site and modifications/adjustments will be carried out.	A, B	The project team will support FMAS department in building at least 1 measure <input type="radio"/>
5	Outreach	Throughout the project, we will engage with 6 different types of stakeholders to ensure their ideas are incorporated.	A, B, C	Students/Staff/FMAS/ SPF/ Landscaping arch./ Civil Engineers <input type="radio"/>
6	Outreach	Throughout the project, we will ensure that numerous students are involved in the project (around 5).	A, C	2-3 students volunteering for the project each semester. <input type="radio"/>
7	Monitoring	Throughout the project, we will ensure the project stays within budget and activities are completed on time.	A, B, C	90% of activities completed on time; Progress/Financial report (2x/month) <input type="radio"/>



**3. List the 4 to 7 most important activities that you need to conduct to reach the objectives you listed before. Make these as S.M.A.R.T. as possible. Also indicate at least one output and a key success indicator per activity. (Sample Project Plan)**

Your main activities should relate to the objectives you listed. As such, if you consider this crucial to your project, you may end up having an activity that relates to your monitoring objective(s) (e.g. developing a survey, any other activity that will help you and other stakeholders learn through your project) or to your outreach objective(s) (e.g. producing and promoting a video about the project). For each activity, indicate the output(s) that will be created as a result, such as a deliverable (e.g. video, report), training, website, network, design plan, or any other output adding value to the project and helping reach objectives/impacts.

S.M.A.R.T. Main Activities (125 char. max. ~20 words)	Related Objective #(s)	Resulting Output(s)	Related Key Success Indicator(s) - also indicate targeted numbers for each (85 char. max. ~15 words) (ignore the circles for now)	
Collect essential information/data for the PCSWMM setup including rainfall historical data for downtown campus	1, 2, 3, 4, 6	Data analysis report	All data and information collected for the PCSWMM	<input type="radio"/>
Stakeholder meetings/analysis to discuss model calibration and validation as well as proposed measures	2,3,4	PCSWMM report	Meetings every two weeks with all stakeholders	<input checked="" type="radio"/>
Calibration and validation of the PCSWMM model	2,3,4,5,6	PCSWMM report	Performance indices (R2, RMSE, NSC) demonstrate excellent model (eg R2>0.8)	<input type="radio"/>
Evaluation of different sustainable measures (with stakeholders)	3,4,5,6	PCSWMM report	All developed measures (>5) evaluated using the model and with stakeholders	<input type="radio"/>
Development of the McGill sustainable rain and flood water master-plan, and implementation and testing of some measures	3,4,5,6	Master-Plan	Plan is accepted by all stakeholders, and some measures implemented and assessed	<input checked="" type="radio"/>
Preparation of notes, delivery of presentations, and tours regarding plan and implemented measures.	5,6	Notes/ presentations	5-6 presentations given, and 15 tours given (students, staff, public, etc.)	<input checked="" type="radio"/>
Project team regular meetings (once every two weeks)	7	Final report	All team members attend, as well as students involved	<input type="radio"/>

**Provide any additional qualitative details that you would like to share with the SPF about your activities. (800 char.max.~115 w.)**

We will ensure that all relevant key stakeholders are involved in all phases of the project, from initial idea generation all the way through to implementation and assessment of the measures. A framework developed by Prof. Adamowski (the Participatory Model Building Framework) will be used to do this. We will also prepare a master plan, test and implement some of the proposed measures, and then help McGill's Facilities Management and Ancillary Services department (FMAS) implement the entire plan (which is a major project that goes far beyond our SPF project). We will also prepare and give talks, presentations, and tours of the 'showcase' measures that we will have implemented as part of the SPF (which will be continued by the FMAS after the completion of the SPF project). See Appendix.

**4. Now, about the circles...: Select a total of 3 success indicators that you wish to track more seriously and report on during your project out of all those you indicated for your objectives and activities. These 3 indicators should be the most relevant to your goal and to creating a culture of sustainability at McGill and they should be relatively easy to monitor.**

When selecting your indicators, make sure that you will have/plan the time and resources you will need to allocate to monitor them throughout the course of your project. Before you start your project, the SPF may ask you to change a chosen indicator for another that seems more pertinent to the SPF or to the University sustainability reporting. Note that, in addition to these three indicators, you will be asked to track four other generic ones that will be specified in the Award Letter. You will be required to indicate progress towards your final 7 indicators in your progress and final reports to the SPF. Because the SPF values the experiences and learning that occurs during your project (not only results), these reports will also gather related information through open-ended questions.

We have selected the 3 Success Indicators that we wish to monitor during the project:

**5. For all projects, there exist various risks, i.e. factors or preconditions whose probable presence or absence could negatively influence the successful achievement of the project's objectives. Please indicate 2 to 4 main risks for your project and the mitigation measures you intend to use/implement to reduce their likelihood. (advise if you have more to list)**

It is particularly important that you list all risks to health and safety of the project's team members, direct and indirect stakeholders, and/or the environment.

Main Risks (65 charac. max. ~9 words)	Preventative Measures (65 char. max. ~9 words)
Poor meteorological data availability for the downtown campus	Use Environment Canada data base instead
McGill storm system information (material type, diameter, etc.)	Do field measurements (2 months)
Lack of space to implement most sustainable measures	Include hybrid measures in evaluation
Lack of buy-in from upper management	Keep directors informed of project's evolution & request feedback

If needed, list additional Main Risks in a separate appendix.

- 6. List the 3 to 10 stakeholders/partners on/off McGill campus(es) that will be involved with and/or impacted by your project, and indicate their respective role in your project.** *If your project team (as presented on Section A - Cover Page) does not include a student member or a faculty or administrative staff member, please make sure to have this group represented as part of your stakeholders/partners to better align with [SPF Evaluation Criterion #5](#).*

Stakeholder's Name(s)	Affiliation	Role in the project	Confirmed support/participation
Design department	McGill University	Work on the aesthetics of proposed measures	Yes
Utilities and Energy Mgmt. Dept.	McGill University	Develop infrastructure for proposed measures	Yes
Project Mgmt. Dept. FMAS	McGill	Manage the construction of measures	Yes
Grounds Dept.	McGill	Develop maintenance plan for measures	Yes
Planning Dept.	McGill	Help dictate the locations of measures	Yes
Operations Dept.	McGill	Help develop water reuse strategies	Yes
Civil engineer consultants		Provide infrastructure info and 'stamp' plans	Yes
The City of Montreal		Must approve the master plan	Yes
Staff, students, etc.	McGill	Stakeholders	Yes
Grad students - Bioresource Eng.	McGill	Team members/Stakeholders	Yes

**- PRELIMINARY TIMELINE ASSUMING THAT PROJECT STARTS IN 3 MONTHS -**

**Note:** *If your project is approved, you will be asked by the SPF staff to fill out a more detailed timeline before any funding can be allocated.*

Key Tasks and/or sub-tasks	Related Output(s)	Responsible Team Member(s) and Time <i>(initials + if paid, estimated # of hours to do task)</i>	Start Date	End Date
Data collection + stakeholder identification	See above for all	PA / 1GS/ 2UG/ Philippe /Jan	Sep 1, 2016	Oct 31, 2016
Model setup + stakeholder engagement		2 PA/ 2GS/ Philippe/ Jan	Oct 1, 2016	Oct 31, 2016
Rainfall frequency analysis		PA/ GS/ Philippe /Jan	Oct 1, 2016	Oct 17, 2016
Model calibration and validation		2PA/ GS/ Philippe /Jan	Nov 1, 2016	Nov 30, 2016
Model evaluation of different measures		2PA/ 2GS/ Philippe /Jan	Dec 1, 2016	Dec 31, 2016
Identify the best combination of measures		2PA/ Philippe /Jan	Dec 1, 2016	Dec 31, 2016
Develop master-plan		2PA/ Philippe /Jan	Nov 1, 2016	Dec 31, 2016
Implement/assess some measrs/alternatives		2PA/ 2GS/ 2 UG/ Philippe/ Jan	Apr 3, 2017	Jun 30, 2017
Talks, tours, etc.		2PA/ 2GS/ Philippe /Jan	Apr 17, 2017	Jun 30, 2017

**Provide any additional details that you would like to share with the SPF about your timeline.** *(530 charac. max. ~80 words)*

Given that the project team has completed a very large number of engineering projects, we are very confident we will deliver as promised.

**- ADDITIONAL INFORMATION -**

**Qualifications:** Where relevant, the profiles/CVs of the people to be directly involved in the project are attached:

**List of appendices, if any** *(max. 7 pages of appendices, excluding profiles/CVs):*

*If a McGill department/unit is to contribute financially to your project, make sure to include a support letter from its Financial/Budget Officer confirming contribution. Note that the SPF Working Group will evaluate your project based on your main application forms (i.e. Sections A, B, and C), not on appendices.*

Appendix #	Title/Topic of Appendix	Total Qty of Pages
1	Tasks and Team Description	3
2		
3		
4		
5		
6		
7		



**- BUDGET -**

When completing this form, please refer to the [SPF Guide to Budgeting](#) for additional information and explanations. If you would like to submit a more elaborated Financial Model/Business Case in addition to this SPF project budget (for instance, because of the nature of your project; e.g. you plan to generate some revenues through selling some items, revenues that will then allow your project to become financially self-viable), please develop it separately and join it as an appendix to this application. If you need guidance on how to elaborate a Financial Model/Business Case, see [suggested resources on the SPF website](#).

**REVENUES**

Please indicate any funding you will receive or anticipate receiving to complete your project, including funds from McGill Departments and Units. Reminder: For McGill department/unit's financial contributions, make sure to include a letter from its Financial/Budget Officer confirming contribution in appendix. Note that this contribution will also need to be confirmed at the end of the project.

(A) Funding Source(s)	(B) Amount (\$)	(C) Status
1. Sustainability Projects Fund (SPF)	\$71,732.00	Unconfirmed
2. Jan Adamowski	\$13,230.00	Confirmed
3. McGill Facilities Management and Ancillary Services	\$68,998.00	Confirmed
4.		Confirmed
<b>REVENUES GRAND TOTAL - add all (B)</b>	<b>\$153,960.00</b>	

**EXPENSES**

**1. Salaries & Wages** (only if applicable)

If applicable, indicate the job position(s) under your project and the associated costs. See the [SPF Guide to Budgeting](#) for further instructions.

(A) Position Title	(B) ~# of Hours per Week	(C) ~# of Weeks	(D) Hourly Wage* (\$)	(E) Subtotal (\$) (B x C x D)	(F) 20% Benefits	(G) Total Cost (\$) (E x F)	(H) Funding Source(s)**
Project Associate 1	35	36	\$23.00	\$28,980.00	1.2	\$34,776.00	SPF
Project Associate 2	17.5	32	\$23.00	\$12,880.00	1.2	\$15,456.00	SPF
Graduate Student 1 - John Quilty	21	15	\$17.50	\$5,512.50	1.2	\$6,615.00	JA
Graduate Student 2	21	15	\$17.50	\$5,512.50	1.2	\$6,615.00	JA
<b>Expenses Subtotal 1 - add all (G)</b>						<b>\$63,462.00</b>	

Do you already have a specific person in mind for filling the above position(s)?

Y  N

Do you have a personal and/or professional affiliation with the above position(s)?

Y  N

If you answered 'Y' to one or both of the above questions, please disclose:

I will hire my current PhD student (Mr. John Quilty) since he is an expert on the topic.

**2. Other Expenses**

Indicate all of the expenses associated with your project; think back to all of your project's activities and all of the items that you need to complete them. It may be beneficial to group by category (not required); if you do so, please use the following categories: Materials-Supplies, Equipment, Printing, Events, Transportation, One-time Profess. Fees, and Miscellaneous.

(A) Item Description (inputs)	(B) # of Units	(C) Unit Cost (\$)	(D) Total Cost (\$) (B x C)	(E) Funding Sources**
GPS	2	\$750.00	\$1,500.00	SPF
PCSWMM	1	\$2,500.00	\$2,500.00	SPF
Field measures/transp	30	\$50.00	\$1,500.00	SPF
Mapping/printing	10	\$100.00	\$1,000.00	SPF
Implementation of at least one measure	1	\$15,000.00	\$15,000.00	SPF
Data inputs for model	1	\$68,998.00	\$68,998.00	FMAS
<b>Expenses Subtotal 2 - add all (D)</b>			<b>\$90,498.00</b>	

(A) Item Description (inputs)	(B) # of Units	(C) Unit Cost (\$)	(D) Total Cost (\$) (B x C)	(E) Funding Sources**
<b>Expenses Subtotal 3 - add all (D)</b>				

**EXPENSES GRAND TOTAL (Subtotals 1 + 2 + 3) \$153,960.00**

\* See the [SPF Guide to Budgeting](#) for the conditions and Hourly Wages applicable to hiring under the SPF.

\*\* To indicate the one or many Funding Source(s) that will pay for the expenses, use their respective number as you listed under Revenues (SPF or other).

Thank you! After you save it to your files, you can now upload this form and any appendices on the SPF website to complete the application process. The SPF staff will contact your team within two weeks to provide feedback. Congratulations for applying to the SPF!

## Appendix

The first associate who will be funded by the SPF will be involved in all of the phases of the project. This person will not only oversee the entire project (along with the Jan Adamowski and Philippe St-Jean), but will also be involved in all the detailed aspects of the project (e.g. setting up stakeholder meetings, checking measurements, and overseeing the modeling, plan preparation, and implementation). This will necessitate a significant amount of work; hence a 'full time' associate is required for this. The second associate who will be funded by the SPF will work part time on specific aspects of the project (as outlined in the proposal).

The two GS (graduate students) will work part time on the project. However, both will be involved in all phases of the project to ensure everything proceeds smoothly (as outlined in the proposal). The two GS will be funding by me. Various undergraduate students will also work on various aspects of this project as part of BREE 497 and 608 research project courses (so funding is not required).

The teams that will be part of this project are described below:

### **Stakeholder Team**

Using the Participatory Model Building Framework developed by Prof. Adamowski, key stakeholders will be selected and engaged in a meaningful manner from the initial stages through to monitoring and updating of the measures. The stakeholder team will be involved in all aspects of the project, from initial brainstorming of ideas through to plan development, testing, implementation, and monitoring and updating.

The team will consist of the full time associate and one GS and one undergraduate student.

### **Field Measurements Team**

The Field Measurements team will have different predefined tasks based on the output of the Engineering group activities. Activities will include: (i) review and measure diameters and levels of the storm pipe system within the campus; (ii) try to identify pipe material if not identified by the Engineering documents available on the campus; and (iii) review all the areas that would accommodate possible measures.

The team will consist of the part time associate and one GS, along with two undergraduate students.

### **Modeling Team**

The Modeling team will first review precipitation data within Montreal (The Environment Canada Station that is the closest to the down-town campus) and carry out precipitation frequency analysis to identify the maximum precipitation event that may occur once every 25 years for design purposes as

recommended by the city of Montreal. They will also carry out statistical analysis to identify and evaluate trends in precipitation.

Subsequent to this, the Modeling team will have two main tasks. The first task will be to review all available sustainable measures that can be used for rainwater management and identify suitable measures that could be applied on the downtown campus. The second task will be the calibration and validation of the PCSWMM model recommended by the City of Montreal. The modeling task will be carried out in three stages. The first stage will be to prepare and set up the PCSWMM model using information collected by the Engineering group as well as the Field measurements team. The second stage will be to calibrate the model to known events, and ensure that the model simulates rain events accurately and precisely. The third stage will be to choose, with the Stakeholder team, different measures and simulate each of them to evaluate their rainwater management capabilities for various locations on campus.

The Modeling team will consist of the full time associate, part time associate, and two graduate students.

### **Master Plan**

The final step will bring together the Campus & Space Planning, Buildings & Grounds, Design, Project Management, and Utilities & Energy Management departments to analyze the outputs of the Field measurements team, Statistical Hydrology team and Modelling team to develop a rainwater management master plan for the downtown campus. The Stakeholder team will be involved as well. The plan will cover implementation of each of the recommended strategies to meet the requirements of the city of Montreal for the next 5 years.

As part of the Master plan, a detailed plan will be prepared to ensure 5-6 presentations are given, and 15 tours are given (to students, staff, public, etc.) regarding the measures (both the implemented measures and the recommended future measures). We will follow the same format Prof. Adamowski has used in many of his outreach projects around the world (e.g. Guatemala, Cyprus, etc.), as well as his past SPF projects. Presentations will be prepared/tailored to different audiences (e.g. school children, CEGEP students / university students / staff, and the general public). These presentations will be given by the team members (especially the students involved in the project). Tours will be planned carefully for different audiences (as described for the presentations), and will be given by the team members (especially the students involved in the project).

The Modeling team will consist of the full time associate, part time associate, and graduate students.

### **Implementation team**

The implementation team will choose one or more of the recommended rainwater management strategies outlined in the master plan and have them built as part of a pilot project to refine the design and implementation of these technologies moving forward.

The Implementation team will consist of members from the Campus & Space Planning, Buildings & Grounds, Design, Project Management, and Utilities & Energy Management departments, as well as the core group (Adamowski, St-Jean, associates, graduate students, and Stakeholder team).