COLORADO
Colorado Water Conservation Board
Department of Natural Resources

Last Updated: June 2020

Colorado Water Conservation Board

Water Plan Grant Application

Instructions

To receive funding for a Water Plan Grant, applicant must demonstrate how the project, activity, or process (collectively referred to as "project") funded by the CWCB will help meet the measurable objectives and critical actions in the Water Plan. Grant guidelines are available on the CWCB website.

If you have questions, please contact CWCB at (303) 866-3441 or email the following staff to assist you with applications in the following areas:

Water Storage Projects	Matthew.Stearns@state.co.us
Conservation, Land Use Planning	Kevin.Reidy@state.co.us
Engagement & Innovation Activities	Ben.Wade@state.co.us
Agricultural Projects	Alexander.Funk@state.co.us
Environmental & Recreation Projects	Chris.Sturm@state.co.us

FINAL SUBMISSION: Submit all application materials in one email to *waterplan.grants@state.co.us* in the original file formats [Application (word); Statement of Work (word); Budget/Schedule (excel)]. Please do not combine documents. In the subject line, please include the funding category and name of the project.

Water Project Summary

Name of Applicant	The Water Connection an initiative of The Greenway Foundation
Name of Water Project	Clean River Design Challenge
CWP Grant Request Amount	$ 45,655
Other Funding Sources WSRF Statewide Account	$ 10,000 (requested)
Other Funding Sources Metro Basin Roundtable	$ 6,500 (approved)
Other Funding Sources _____	$
Applicant Funding Contribution	$ 39,225
Total Project Cost	$ 101,380

Last Updated: June 2020

Applicant & Grantee Information
Name of Grantee(s) The Greenway Foundation
Mailing Address 1800 Platte St, Denver, CO 80202
FEIN 51-0193575
Organization Contact: Devon Buckels
Position/Title Director, The Water Connection
Email devon@thewaterconnection.org
Phone (720) 837-3289
Grant Management Contact Lauren Berent
Position/Title Associate Director, The Water Connection
Email lauren@thegreenwayfoundation.org
Phone (303) 743-9720 x 850
Name of Applicant (if different than grantee)
Mailing Address
Position/Title
Email
Phone

Description of Grantee/Applicant
Provide a brief description of the grantee's organization (100 words or less).
Since 1974, The Greenway Foundation (TGF) has been dedicated to revitalizing the South Platte River corridor, creating a thriving ecological and recreational resource. TGF has helped create 20 riverside parks, numerous whitewater boat chutes, and a nationally recognized urban trail system, collectively known as the South Platte River Greenway. Partnering with local agencies, TGF has facilitated over $500 million in investments in Denver's waterways. The Water Connection (TWC), TGF's newest initiative, focuses on civic action and technological innovation for resilient Colorado watersheds. TWC promotes and facilitates regenerative water systems, improved water quality, and sustainable water infrastructure.

Last Updated: June 2020

Type of Eligible Entity (check one)	
	Public (Government): Municipalities, enterprises, counties, and State of Colorado agencies. Federal agencies are encouraged to work with local entities. Federal agencies are eligible, but only if they can make a compelling case for why a local partner cannot be the grant recipient.
	Public (Districts): Authorities, Title 32/special districts (conservancy, conservation, and irrigation districts), and water activity enterprises.
	Private Incorporated: Mutual ditch companies, homeowners associations, corporations.
	Private Individuals, Partnerships, and Sole Proprietors: Private parties may be eligible for funding.
X	**Non-governmental organizations (NGO):** Organization that is not part of the government and is non-profit in nature.
	Covered Entity: As defined in Section 37-60-126 Colorado Revised Statutes.

Type of Water Project (check all that apply)	
	Study
	Construction
	Identified Projects and Processes (IPP)
X	Other

Category of Water Project (check the primary category that applies and include relevant tasks)	
	Water Storage - Projects that facilitate the development of additional storage, artificial aquifer recharge, and dredging existing reservoirs to restore the reservoirs' full decreed capacity and Multi-beneficial projects and those projects identified in basin implementation plans to address the water supply and demand gap.. *Applicable Exhibit A Task(s):*
	Conservation and Land Use Planning - Activities and projects that implement long-term strategies for conservation, land use, and drought planning. *Applicable Exhibit A Task(s):*
X	Engagement & Innovation - Activities and projects that support water education, outreach, and innovation efforts. Please fill out the Supplemental Application on the website. *Applicable Exhibit A Task(s): Competition Planning, Preparation and Promotion; CRDC Fall 2021 – Spring 2022; Wrap up and Facilitation of Winning Design Promotion; Competition Planning, Preparation and Promotion; CRDC Fall 2022 – Spring 2023; Wrap up and Facilitation of Winning Design Promotion*
	Agricultural - Projects that provide technical assistance and improve agricultural efficiency. *Applicable Exhibit A Task(s):*
	Environmental & Recreation - Projects that promote watershed health, environmental health, and recreation. *Applicable Exhibit A Task(s):*

Last Updated: June 2020

	Other	Explain:

Location of Water Project	
Please provide the general county and coordinates of the proposed project below in **decimal degrees**. The Applicant shall also provide, in Exhibit C, a site map if applicable.	
County/Counties	Front Range, Colorado
Latitude	N/A
Longitude	N/A

Water Project Overview
Please provide a summary of the proposed water project (200 words or less). Include a description of the project and what the CWP Grant funding will be used for specifically (e.g., studies, permitting process, construction). Provide a description of the water supply source to be utilized or the water body affected by the project, where applicable. Include details such as acres under irrigation, types of crops irrigated, number of residential and commercial taps, length of ditch improvements, length of pipe installed, and area of habitat improvements, where applicable. If this project addresses multiple purposes or spans multiple basins, please explain. The Applicant shall also provide, in Exhibit A, a detailed Statement of Work, Budget, Other Funding Sources/Amounts and Schedule.

Last Updated: June 2020

Two Clean River Design Challenges (CRDCs), competitions for innovative solutions to urban waterway pollution. These two-semester long competitions are open to undergraduate and graduate students attending Colorado universities and colleges. The first semester is dedicated to researching the designated issue, *E. coli* and excess nutrients. Teams will generate solution concepts, and obtain feedback from a multi-disciplinary panel of volunteer professionals. The second semester focuses on final design and documenting each solution's effectiveness and feasibility in a business plan. At the end of semester 2, teams present their solution in the form of a proposal for a product or service accompanied by a succinct business plan for implementation. A panel of expert judges will select the top three teams that will each receive a modest cash prize. First place teams from each year will be invited to participate in Trout Tank H2O, a business accelerator co-hosted by the Denver Metro Chamber of Commerce and TAP-IN.

CWP funding will be used to develop and host two successful design challenges, producing viable design concepts (including a designed prototype if applicable) from an interdisciplinary technology-driven set of solutions that could be used to reduce urban waterway pollution.

Measurable Results

To catalog measurable results achieved with the CWP Grant funds, please provide any of the following values as applicable:

	New Storage Created (acre-feet)	
	New Annual Water Supplies Developed or Conserved (acre-feet), Consumptive or Nonconsumptive	
	Existing Storage Preserved or Enhanced (acre-feet)	
	Length of Stream Restored or Protected (linear feet)	
	Efficiency Savings (indicate acre-feet/year OR dollars/year)	
	Area of Restored or Preserved Habitat (acres)	
	Quantity of Water Shared through Alternative Transfer Mechanisms	
	Number of Coloradans Impacted by Incorporating Water-Saving Actions into Land Use Planning	
11,000+	Number of Coloradans Impacted by Engagement Activity	
	Other	Explain: • Undergraduate and graduate students will be exposed to local, real-world water issues. Anticipated student participation: 4-8 teams of 3-6 people: total 12 – 48 students

		• 100+ Denver community business leaders and entrepreneurs educated and engaged in water pollution issues and solutions • Engage TAP-IN network to further the creation of high-impact water innovation with a group that possess the resources and expertise needed to address challenges and "mitigate barriers and limitations to innovation, entrepreneurship, and breakthrough technology deployment" • Thousands of community members educated through awareness building by CRDC display at 4 Denver-based river cleanup days. • 11,000+ people learn about innovation in water quality through TWC/TGF social media and email newsletters. • The entire metro region would benefit from the development and implementation of new water quality solutions. • Thousands introduced to the need for intervention and innovation in water quality through media coverage of the competition and results. • Hundreds of 1st – 5th grade students learn about issues and explore solutions through grade appropriate field trips.

Water Project Justification

Provide a description of how this water project supports the goals of Colorado's Water Plan, the most recent Statewide Water Supply Initiative, and the applicable Roundtable Basin Implementation Plan and Education Action Plan. The Applicant is required to reference specific needs, goals, themes, or Identified Projects and Processes (IPPs), including citations (e.g. document, chapters, sections, or page numbers).

The proposed water project shall be evaluated based upon how well the proposal conforms to Colorado's Water Plan Framework for State of Colorado Support for a Water Project (CWP, Section 9.4, pp. 9-43 to 9-44;)

CRDC is a collaborative project that addresses key themes in the Colorado Water Plan and South Platte / Metro Basin Implementation Plans: maximization of water resources, protection of watersheds, enhancement of water quality, protection of recreational and environmental assets, and promotion of education and innovation. Both plans acknowledge the connection between water supply and water quality. The CRDC supports the State in developing innovative strategies to protect the urban water supply from high impact pollutants, enhancing water quality and protection of important recreational and environmental assets, while promoting education and innovation.

The Colorado Water Plan addresses the State's supply and demand challenges while protecting the health of rivers, streams and watersheds. This project supports achieving this goal by facilitating the removal of high impact but invisible pollution, and excess nutrients, from the watershed's urban waterways. Watershed health affects water supply – the gap will only grow if our available water is degraded with pollutants.

CRDC has two keys goals: 1) Facilitating innovation and creating potential solutions to complex, pervasive water quality problems, and 2) raising the level of public awareness and engagement around the extent and impact of urban waterways pollution and the importance of protecting our valuable water resources.

By engaging students from a variety of backgrounds and disciplines from multiple universities, TWC is reaching budding professionals who may pursue careers in the water field. In addition, the water sector

innovation ecosystem will benefit from a strengthen link between local universities and the business sector.

The community will also be impacted though marketing and PR around the competition, engaging elementary through high school students in the results and process of the design challenge, and reaching 11,000+ people through TWC/TGF's social media and email newsletter distribution. Furthermore, the public will be engaged through the CRDC display at four river cleanup days, and educated through media coverage of the competitions, including final presentations and results.

CWP Executive Summary, p. 15:
Education, Outreach and Innovation
Colorado's Water Plan sets a measurable objective to significantly improve the level of public awareness and engagement regarding water issues statewide by 2020. This work is intended to be collaborative and include local partners. As one component of this overall strategy, the CWCB seeks to work with Colorado's innovation community, education and outreach experts, and research institutions to address Colorado's water challenges with innovation and "outside-the-box" creativity.

- The CRDC reaches thousands of people through TGF's social media, email newsletter distribution, and education programs; all of whom will be informed of the issues addressed in the competition. TWC will also reach out to news outlets to obtain media coverage of the competition and final presentations. In addition to reaching the public, by engaging university and college students from a variety of backgrounds and disciplines, CRDC reaches budding professionals who may not have been exposed to water resources as a discipline, and who may not be aware of career opportunities in the water field.

CWP Executive Summary, p. 16:
Watershed Health, Environment and Recreation
The environment and recreation are too critical to Colorado's brand not to have robust objectives; a strong Colorado environment is critical to the economy and way of life.

- Through CRDC, multiple key elements of creating a robust Colorado environment will be addressed: maximizing water resources, protecting watersheds, enhancing water quality, protecting recreational and environmental assets, and promoting education and innovation.

The connection between water quality and water quantity is specifically mentioned numerous times through the Colorado Water Plan (CWP):
CWP, p. 3-1
"Water quality management" is listed as one of the 16 Water Challenge in the South Platte Basin.

CWP; Goal 1.9.5 on p. 1-27 states:
Goal: Maintain, enhance and proactively manage water quality for all use classifications.

CWP Executive Summary, p. S-1
As part of Governor Hickenlooper's Executive Order on May 14, 2013, he acknowledged the many water challenges facing the state including "Recognizing that water quantity and quality issues in the state are integrally linked."

- The South Platte Basin has virtually no additional water sources to develop, so it is critical to maximize the resources that are already available to the region. CRDC will tackle critical urban water pollution issues and the resulting designs will be for use in an urban environment. By focusing on improving water quality, this competition works towards cleaner water for the aquatic ecosystem, recreation and downstream users.

SPBIP Executive Summary, p.8, S.3.7 Water Quality Issues, p.2
A major challenge in the South Platte Basin relates to adequacy of the water quality for domestic and municipal water uses. Major technological innovations are needed for delivery, treatment, and disposal of the waste streams from currently available complex water treatment systems, which results in

significant cost to customers, impacts to the environment, and uncertain regulatory permitting processes. Relying exclusively on South Platte River supplies in the face of decreasing water quality will be a major challenge in the South Platte Basin."

- The CRDC addresses the challenges highlighted in this section by providing a relatively low-cost method for idea generation and innovative solution development to reduce *E. coli* and excess nutrients before they reach water treatment facilities along the South Platte River.

State Water Supply Initiative Executive Summary, p.41
#5. Support meeting Colorado's non-consumptive water needs by working with Colorado's water stakeholders to help protect or enhance environmental and recreational values that benefit local and statewide economies.

- CRDC brings together stakeholders from business, academia, water management, environmental health, and recreation fields to address the challenges created by urban waterway pollution that can impede aquatic recreation and affect habit quality. Stakeholders from a variety of disciplines participate as advisors and judges of student designs. Furthermore, the top-rated design is shared with stakeholders through the Denver Metro Chamber of Commerce and TAP-IN's business accelerator program, Trout Tank H2O.

Related Studies

Please provide a list of any related studies, including if the water project is complementary to or assists in the implementation of other CWCB programs.

The Greenway Foundation partnered with Market Perceptions to conduct a survey of Metro Denver residents in 2012, and found that 71% of respondents perceived water pollution as a problem in the area. The survey highlights disconnections between the concern for water quality and common sources of water pollution. This is likely a reason that pollution issues continue to persist in Denver's waterways. Increasing Metro Denver resident's understanding of sources, behaviors and activities that contribute to these problems is a critical next step.

The South Platte River and the Cherry Creek are tested monthly for water quality. "Recreation" is listed as an allowable use for both streams, however neither stream is deemed safe for recreation due to elevated levels of *E. coli* (Water Quality in Denver's Streams: A Story Through Maps, 2020).

According to water samples taken in 2019, nitrogen + phosphorus concentrations increase in the South Platte River moving downstream (Water Quality in Denver's Streams: A Story Through Maps, 2020). These excess nutrients, in combination with raising temperatures and slow moving water, can cause algae to bloom out of control. Large blue green or Harmful Algal Blooms (HABs) can produce extremely dangerous toxins that can sicken or kill people and animals. Even smaller, less toxic blooms can create harmful imbalances in an aquatic ecosystem.

TWC recently assumed the role of program lead for TAP-IN, a CWCB-initiated project intended to engage businesses and entrepreneurs in solving Colorado's water challenges. TWC intends to create synergy between CRDC and TAP-IN, leveraging CWCB and matching funding for each. The key link is the opportunity provided CRDC first-place winners to participate in the Trout Tank H20 business accelerator program co-led by the Denver Metro Chamber of Commerce Small Business Development Center and TAP-IN. Trout Tank H20 is a 2-month program to create solutions to local water problems, and in turn potentially create jobs and boost the economy.

Previous CWCB Grants, Loans or Other Funding

Last Updated: June 2020

List all previous or current CWCB grants (including WSRF) awarded to both the Applicant and Grantee. Include: 1) Applicant name; 2) Water activity name; 3) Approving RT(s); 4) CWCB board meeting date; 5) Contract number or purchase order; 6) Percentage of other CWCB funding for your overall project.
The following is a list of previous CWCB funding awarded to TGF and/or TWC: - South Platte River Recreation and Habitat Feasibility Study; Metro Basin RT and Statewide funds; Approved 9/17/2008, Contract # C150442 - South Platte River Recreation and Habitat Improvement Preliminary Design; Metro Basin RT and Statewide funds; Approved 9/13/2011; Contract # C150493 - Denver South Platte River Implementation Project; South Platte Basin & Metro RT; approved 9/28/2012; Contract # CTGG1 2015-392 - Grant-Frontier Park West Bank Riparian Floodplain Design and Construction Project; Metro Basin RT; approved 9/24/2013; Contract # CTGG1 2015-1721 - 8th Ave. to 20th St. In-River Recreation and Environmental Improvements and Floodplain Mitigation; Metro Basin RT and Statewide funds; Approved at 9/12/2014 meeting; Contract # CTGG1 2015 - Clean River Design Challenge; Approved 7/30/2018; Order Number: POGG1; PDAA; 201900002072 - Denver One Water Plan. Approved June 29, 2019. Contract #CTGG1 2020-056 - TAP-IN. Education and Innovation statewide funds. Approved 3/10/2020, Order Number: POGG1, PDAA, 202000002926 <u>PENDING</u> - Nautilus 2; Metro and South Platte Basin RT; Pending Statewide funds on December 1, 2020; total program budget $91,900; 65% of other CWCB funding (WSRF) for project. - CRDCs; Metro Basin Roundtable, Statewide funds, and Colorado Water Plan Grant; Approved 11/12/2020 for Metro Basin, others pending; total program budget $101,380, WSRF requests 16% overall project budget.

Taxpayer Bill of Rights

The Taxpayer Bill of Rights (TABOR) may limit the amount of grant money an entity can receive. Please describe any relevant TABOR issues that may affect your application.
There are no known TABOR issues that would affect this application.

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Last Updated: June 2020

Submittal Checklist	
	I acknowledge the Grantee will be able to contract with CWCB using the Standard Contract.
Exhibit A	
X	Statement of Work(1)
X	Budget & Schedule(1)
	Engineer's statement of probable cost (projects over $100,000)
X	Letters of Matching and/or Pending 3rd Party Commitments(1)
Exhibit C	
	Map (if applicable)(1)
	Photos/Drawings/Reports
	Letters of Support (Optional)
	Certificate of Insurance (General, Auto, & Workers' Comp.) (2)
	Certificate of Good Standing with Colorado Secretary of State(2)
	W-9(2)
	Independent Contractor Form(2) (If applicant is individual, not company/organization)
Engagement & Innovation Grant Applicants ONLY	
X	Engagement & Innovation Supplemental Application(1)

(1) Required with application.
(2) Required for contracting. While optional at the time of this application, submission can expedite contracting upon CWCB Board approval.

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ENGAGEMENT & INNOVATION GRANT FUND SUPPLEMENTAL APPLICATION

Introduction & Purpose

Colorado's Water Plan calls for an outreach, education, public engagement, and innovation grant fund in Chapter 9.5.

The overall goal of the Engagement & Innovation Grant Fund is to enhance Colorado's water communication, outreach, education, and public engagement efforts; advance Colorado's water supply planning process; and support a statewide water innovation ecosystem.

The grant fund aims to engage the public to promote well-informed community discourse regarding balanced water solutions statewide. The grant fund aims to support water innovation in Colorado. The grant fund prioritizes measuring and evaluating the success of programs, projects, and initiatives. The grant fund prioritizes efforts designed using research, data, and best practices. The grant fund prioritizes a commitment to collaboration and community engagement. The grant fund will support local and statewide efforts.

The grant fund is divided into two tracks: engagement and innovation. The Engagement Track supports education, outreach, communication, and public participation efforts related to water. The Innovation Track supports efforts that advance the water innovation ecosystem in Colorado.

Application Questions

*The grant fund request is referred to as "project" in this application.

Overview (answer for both tracks)
In a few sentences, what is the overall goal of this project? How does it achieve the stated purpose of this grant fund (above)?
The overall goal of CRDC is to solve water quality problems, using interdisciplinary College and University teams to bring different design ideas, innovations and publicity to a variety of water pollution issues facing Denver's urban waterways. CRDC will follow best practice in design competitions and be evaluated against a clear set of objectives. CRDC prioritizes collaboration and cross-disciplinary teams to expand thinking and innovation. By engaging a variety of approaches, CRDC encourages the exploration of out-of-the box thinking. Each CRDC problem statement will be designed to address current, real-world issues. Throughout the competition, students will encounter real life obstacles, and will need to tap into their creativity to solve them. The solutions devised, which may take the form of a product or a service, will also be accompanied by a business plan, making the final products of this competition financially feasible and ready to be implemented to improve our urban waterways. In addition to supporting innovative solutions, CRDC will provide an important opportunity to promote well-informed community discourse regarding local water issues and solutions at multiple levels. By engaging professional volunteers as advisors and on judging panels, and presenting the winning designs to business leaders and entrepreneurs during Trout Tank H2O and TAP-IN, TWC will engage decision makers who have the skills and resources to impact the possibility of implementing a solution. Through CRDC, TWC will raise awareness among residents and engage community members in the Denver metro area regarding water pollution issues facing our community.
Who is/are the target audience(s)? How will you reach them? How will you involve the community?

Last Updated: June 2020

Overview (answer for both tracks)
The target audience for participation in CRDC is local university students, at both the undergraduate and graduate levels. TWC has support from several professors at Metropolitan State University of Denver, Colorado School of Mines, University of Colorado Denver, and Denver University who have recruited student teams for previous iterations of the competition, and who have expressed interest in continuing the partnership. Other local colleges and universities, such as University of Colorado Boulder, and Colorado State University (home to the newly developed Colorado Water Center) have also expressed interest in participating. Another important target audience is the professionals TWC will engage from a variety of fields to assist with the design process and judging. Previous competitions have involved professionals from businesses, government and academia, including the Denver Department of Environmental Health, Mile High Flood District, South Platte Renewal Partners, Roxborough Water and Sanitation District, ECI Construction, Wright Water Engineers, CDM Smith, DHM Design, Merrick Engineering, Otak, Confluence Kayaks, as well as participating schools. All of these agencies have long-standing relationships with TGF developed over time through various projects along the South Platte River. It is TWC's goal that as professionals assist teams and are exposed to students' fresh take on solution development, they will expand their thinking about perceived limitations and restrictions to new innovations. And finally, TWC will reach the general Metro Denver community, including additional professional networks and committed individuals and businesses, through marketing and publicity. In addition to utilizing TGF's database of 11,000+ that receive weekly TWC/TGF email newsletters, TWC will establish a marketing/publicity schedule to maximize exposure of the competition and its results. Information on CRDC and the issue(s) it addresses will be included in articles and email communications several times over the course of the year. Progress of the student teams throughout the course of the competition and the resulting solutions will be widely publicized to showcase both the competition itself and the innovation that local university students are capable of creating.
Describe how the project is collaborative or engages a diverse group of stakeholders. Who are the partners in the project? Do you have other funding partners or sources?
As described above, CRDC involves stakeholders from engineering, design and construction firms, academic institutions, water management and environmental health agencies, and the recreation industry. These valuable stakeholders will be involved in the competition, offering feedback and direction to student teams and serving on judging panels. This diverse set of participants/volunteers will ensure that the products/solutions created in the competition are holistic and realistic in approach. Key partners are the universities who engage in this competition, the numerous professionals who give their time to provide feedback to student teams, and professionals who judge the competition. Given that CRDC will start in August of 2021, specific organizations cannot be named at this time. Additional partnerships that will be developed include key publications, periodicals and websites to provide a broad audience for articles on the process, winners, and results of CRDC. Participating engineering and construction firms have contributed funds to CRDC in previous years and TWC anticipates that this support will continue. TWC/TGF has committed to provide $55,725 in matching funds for this project, which will be provided through a variety of funding mechanisms including special events, individual donors, and fee for service work. Foundation support for CRDC will also be pursued, along with support from WSRF statewide and basin funds.
Describe how you plan to measure and evaluate the success and impact of the project?

Last Updated: June 2020

Overview (answer for both tracks)
TWC will evaluate the success of CRDC based on the number of participants, increase in awareness amongst participants of water related issues, connections between student teams and professional consultants, and the functionality of the proposed solution(s). Outcomes and potential improvements to CRDC will be assessed through conversations with participants, judges and faculty. TWC will also evaluate the success of the marketing/publicity generated by CRDC through tracking both the number of press contacts targeted and number of articles published. By maximizing the amount of media attention/interest generated by the pollution issue and competition, TWC will expand the audience for these issues and conversations beyond our current network. A related metric of success will be the student team participation in Trout Tank H2O, a business accelerator hosted by the Denver Chamber of Commerce and TAP-IN. The first-place team will be invited to pitch their idea and potentially find resources to turn their solutions into a business that improves urban water quality.
What research, evidence, and data support your project?

Last Updated: June 2020

In Colorado, demand for water will soon outstrip supply and many businesses could struggle to find, or afford, the water they need to run their businesses. A growing population and economy are placing bigger demands on already-stretched water supplies. Agricultural runoff and other forms of pollution are exacerbating the scarcity of water that is clean enough for human, recreational, and industrial use. Closing the gap between supply and demand by increasing water quality and productivity is a must. Water quality issues are not easily solved. Some of the primary environmental issues that are affecting communities and businesses today include pollution, waste disposal, water quality, and water supply issues. It is clear that solving as many of these complex issues as we can will require the cooperation of all sectors.

Given the complexity of these issues and the silos within the communities involved, solutions will require an interdisciplinary approach. The transformation of thinking may be of particular importance, so mindset shifting could become a critical aspect to solving the problem. Research has shown on numerous occasions the success of an interdisciplinary team approach to problem solving. Design thinking is a solution-based approach to solving problems. It describes an iterative process in which one seeks to understand the needs of the user, challenge common assumptions about the problem or potential solutions, and redefine the problem to identify alternative strategies or solutions that might not be immediately apparent. It is a productive process that has been embraced by many successful companies and the academic community is employing aspects of this approach as well.

Competitions that challenge students to create design/build solutions to real-world problems are a proven method for engaging youth in technical disciplines. CRDC is committed to giving university students opportunities to solve some of the biggest technical challenges facing our water resources today. Through sponsored challenges and competitions such as CRDC, students representing multiple disciplines can put their skills to work by designing and building real-world solutions. Furthermore, design challenges provide students and professionals with an opportunity to be creative and innovative, often demonstrating there can be more than one solution to a problem.

The South Platte River and Cherry Creek are tested monthly for water quality. “Recreation” is listed as an allowable use for both streams, however neither stream is deemed safe for recreation when elevated levels of *E. coli* are found in the water (Water Quality in Denver’s Streams: A Story Through Maps, 2020). The primary measure for determining if a water body is suitable for swimming is whether *E. coli* levels meet health-based standards for recreation. Most of the streams in Denver do not meet those standards. Evaluation of data from DDPHE’s sampling efforts indicates that progress toward meeting the 2020 Sustainability Goal of making all streams in Denver safe for swimming has been negligible. Statistical analysis of *E. coli* data from the South Platte River, Bear Creek, and Cherry Creek reveals that there is too much variation in the data to draw any conclusions about changes in *E. coli* levels. This lack of progress, even though several new water quality facilities have been installed and thousands of feet of riparian habitat along the South Platte River have been improved, serves as a reminder of how difficult it is to address *E. coli* in City streams.

According to water samples taken in 2019, nitrogen + phosphorus concentrations increase in the South Platte River moving downstream (Water Quality in Denver’s Streams: A Story Through Maps, 2020). These excess nutrients, in combination with raising temperatures and slow moving water, can cause algae to bloom out of control. Large blue green or Harmful Algal Blooms (HABs), can produce extremely dangerous toxins that can sicken or kill people and animals. Even smaller, less toxic blooms can create harmful imbalances in an aquatic ecosystem.

CRDC helps to bridge these ideas and change perceptions by providing an opportunity for multi-disciplinary research at the university level, raising the public profile of the work done, and connecting solutions with opportunities for potential implementation. More efforts to raise awareness of these connections, like CRDC, are clearly needed in the Metro area. CRDC has already produced one trash awareness device, the Nautilus. This half-scale prototype is currently installed in Cherry Creek with

Overview (answer for both tracks)
education signage about the issues of trash pollution in our waterways for a 10-month pilot which just ended in November 2020.
Describe potential short- and long-term challenges with this project.
A potential short-term challenge to CRDC is lack of participation and/or engagement from student teams. Marketing the benefits and learning available to potential participants is critical in motivating student engagement. Best practice specifies that it is important to clearly articulate objectives, explicitly define the task at hand, clarify expectations, and communicate performance criteria. Well run programs attract top talent, and will engage the level of students CRDC needs to be successful. To accomplish this, TWC will create a robust online program that, in addition to clearly stating the goals and entry requirements, also sets the tone and background for the competition. The full competition program will include: eligibility guidelines, regulations, format, deadlines, overall competition schedule, and resources that entrants will be able to utilize. In this way, when marketed extensively to colleges and universities, students and faculty alike will understand and appreciate the benefits of participation. TWC is dedicating the first half of 2021 to developing this robust website and online resource. However, ultimately, the level of participation will largely be dependent on the individual students and the teams. There are also inherent risks in any project involving innovation. New approaches and techniques will be designed and tested, each one with a risk of failure, but all ultimately contributing new knowledge and ideas which has a benefit all its own. Possibly the largest short- and long-term challenges to this competition will be the COVID-19 pandemic. Health experts are not certain of the course the pandemic will take, and CRDC will have to be flexible and forward thinking to accommodate any potential limiting factors, such as in-person meetings and events. TWC is aware of the possibility that lower student enrollment at universities may impact the level of participation in the competition. However, this competition could be conducted online and still achieve great success. Although TWC would like to host as many elements of CRDC in person as possible, contingency plans will be put into place for elements of the competition to be virtual as needed. With a start date of fall of 2021, the current plan is to host this two-semester competition with in-person meetings and events.

Please fill out the applicable questions for either the Engagement Track or Innovation Track, unless your project contains elements in both tracks. If a question does not relate to your project, just leave it blank. Please answer each question that relates to your project. Please reference the relevant documents and use chapters and page numbers (Colorado's Water Plan, Basin Implementation Plan, PEPO Education Action Plan, etc.).

Engagement Track
Describe how the project achieves the education, outreach, and public engagement measurable objective set forth in Colorado's Water Plan to "significantly improve the level of public awareness and engagement regarding water issues statewide by 2020, as determined by water awareness surveys."

A primary goal of CRDC is to raise awareness of the importance of protecting Colorado's valuable water resources, and awareness of the urban waterway pollution problem in particular, through education and outreach. In addition to reaching participating students, CRDC aims to engage and educate the public on current water issues. CRDC is a fiscally effective way of enacting PEPO Education Action Plans for the Metro Basin Roundtable among others. Furthermore, it supports efforts to improve coordination between state agencies on water outreach and education activities.

Through promotion of the competition, underlying issues facing Denver's urban waterways will be pitched to media for coverage, in addition to the competition's final pitch and judging day. In the past, Channel 9, Channel 4, and the Denver Business Journal have published articles and news stories about CRDC as well as the resulting prototype installed in Cherry Creek, the Nautilus. In addition, the first year of the competition, Colorado Public Radio interviewed the winning students. Campus-specific newsletters have also run stories about this competition, reaching an audience of faculty members, fellow students and alumni. In the coming months, additional media outlets, including traditional press, websites, periodicals, and social media, will be identified to further amplify knowledge and awareness.

By engaging students from multiple universities from a variety of backgrounds and disciplines, TWC is reaching budding professionals who may not be aware of the various and compounding water pollution issues facing the Denver Metro area, and may not have been exposed to water resources as a discipline. This may be a smaller audience, but the quality of the outreach activity is robust. Through participation in CRDC, students will study Denver waterways and their associated water quality issues and develop solutions to these issues. An 8-month competition allows a significant amount of time for a deep dive into the issue of urban water pollution. In this way, all CRDC participants gain important and impactful knowledge around water issues that they take with them into their future. During this process, students will also have opportunities to explore career pathways in related fields as they conduct their research and reach out for help from local professionals.

Furthermore, by offering the winning team the opportunity to participate in the Denver Metro Chamber's business accelerator program, a platform for conversation about water quality challenges is created in a way that could elevate engagement among entrepreneurs, small businesses and investors. The final pitch event of the Trout Tank H20 program has had excellent participation, with over 100 people in attendance, and has attracted media attention.

Describe how the project achieves the other measurable objectives and critical goals and actions laid out in Colorado's Water Plan around the supply and demand gap; conservation; land use; agriculture; storage; watershed health, environment, and recreation; funding; and additional.

This project addresses key themes in the Colorado Water Plan and South Platte / Metro Basin Implementation Plans, including maximizing the use of water resources, protecting watershed health, enhancing water quality, protecting recreational and environmental assets, and promoting education and innovation. Both these plans acknowledge the connection between water supply and water quality. CRDC supports the State in developing innovative strategies to protect the urban water supply from critical unseen pollutants.

The Colorado Water Plan and the South Platte / Metro BIP speak to the importance of protecting our recreational water resources. Urban waterway pollution is a deterrent to recreation and the enjoyment of metro area waterways. Recreational resources can be severely impacted by unseen pollutants, such as *E. coli* and excess nutrients that can degrade the health and function of watersheds and aquatic environments.

A primary goal of the Colorado Water Plan is to address the State's supply and demand challenges while protecting the health of rivers, streams and watersheds. By creating solutions to reduce pollution and keeping watersheds healthy, this project seeks to support the State in achieving this goal. If the available water is polluted, it will only widen the supply and demand gap.

Watershed health affects water supply, so by reducing levels of *E. coli* and nutrients this project could increase the quality of water in the Metro Denver Region.

This project enhances the water innovation ecosystem and engages with TAP-IN and the entrepreneurial/business/innovation community to help solve Colorado water challenges.

Describe how the project achieves the education, outreach, and public engagement goals set forth in the applicable Basin Implementation Plan(s).

CRDC supports the Metro Basin Roundtable's Education Action Plan goal of "outreach to metropolitan area institutions of higher education to develop programming specifically targeted to young professionals." CRDC engages young professionals from metro area universities/colleges in improving Colorado's water future. This goal will be further bolstered by the opportunity for winning teams to be involved in Trout Tank H2O, a business accelerator co-hosted by the Denver Chamber of Commerce and TAP-IN.

CRDC also aligns with the Education Action Plan's strategy of expanding on "previous efforts to identify and partner with other groups and/or entities, which are doing water related public education and outreach." TWC/TGF has a long history of conducting public education and outreach related to Denver's urban waterways and has a database of 11,000+ area residents that regularly receive its communications.

TGF's award-winning South Platte River Environmental Education (SPREE) also has a direct link to CRDC. Models of previous design challenge solutions, specifically in-stream trash removal devices, were presented to elementary-aged SPREE Summer Campers where they were encouraged to invent their own miniature devices. This type of education and experience enhances existing SPREE program content and inspires young minds to solve real problems in their neighborhoods. SPREE Staff also attend CRDC presentations to learn more about current thinking concerning these critical water issues and solutions. That knowledge is then incorporated into new environmental education program content.

Describe how the project achieves the basin roundtable's PEPO Education Action Plans.

TGF is specifically mentioned in the PEPO Education Action Pans as a key outreach and engagement partner. Metropolitan State University of Denver, a previous and returning participant in CRDC, is also specifically mentioned. This project is a perfect example of how the Basin's priorities can be implemented through the engagement of partner organizations with extensive outreach potential to the local community.

Innovation Track

Describe how the project enhances water innovation efforts and supports a water innovation ecosystem in Colorado.

The purpose of CRDC is to spark innovation and support the development of practical creative solutions addressing the ongoing challenges of pollution entering Metro waterways. By connecting multiple stakeholders together, each bringing their own set of skills and resources, innovative ideas can become real-world solutions. Through the competition, students are challenged to consider each water pollution problem holistically and comprehensively, evaluating cause, effect, opportunities for intervention, market factors, and financial considerations for implementation.

Last Updated: June 2020

Innovation Track
The winning team from each CRDC will be invited to present their idea and business plan at Trout Tank H2O, a business accelerator co-hosted by the Denver Chamber of Commerce and TAP-IN. If accepted into the cohort, this 5-week program will teach participants how to appropriately present their business ideas and be able to address concerns from funders. While participating in this program, other innovators and entrepreneurs will be made aware of the water pollution issues that are present in Denver, and the proposed solution. There is potential for further collaboration and innovation between the students and stakeholders who may have the resources to move their ideas forward. Today's university students are developing solutions to vexing environmental challenges on a regular basis, and with supporting guidance and resources, in some cases are able to move solutions to the market. The State's water innovation ecosystem will benefit from additional opportunities for university and small business connections. Given the significance and critically valuable nature of water in our semi-arid state, TWC believes strengthening ties between universities and business development opportunities could support the expansion of water innovation business cluster activity in Colorado. These types of economic development clusters are frequently formed through alliances between business and universities and produce significant returns on both technological innovation and economic fronts. Though a relatively small step in this direction, CRDC can build on previous success and continue to call attention to the need for innovation and business development in the area of water quality, in addition to the more prevalent water quantity and conservation efforts.
Describe how the project engages/leverages Colorado's innovation community to help solve our state's water challenges.
Universities are incubators for innovative thought and design. By engaging university students in CRDC, TWC is tapping into the next generation of thought leaders with new perspectives on current issues and traditional methods. CRDC connects these young adults with professionals in the design, construction, and environmental fields that are eager to advance new concepts and have the resources to do so. TWC recently assumed the role of program lead for TAP-IN and intends to create synergy between CRDC winners and the entrepreneurs/funders that participate in TAP-IN programs, such as the business accelerator Trout Tank H2O. This collaborative program co-led by the Denver Metro Chamber of Commerce is a 2-month program to create solutions to local water problems, and in turn potentially create jobs and boost the economy.
Describe how the project helps advance or develop a solution to a water need identified through TAP-IN and other water innovation challenges. What is the problem/need/challenge?
In the 2017 TAP-IN Opportunities Report, four areas of concern were identified that will be positively impacted by both CRDCs: • Finding ways to support smaller water providers in implementing projects to reduce hazards in their water supply watersheds was identified as an issue. A successful CRDC develops possible cost effective mechanisms to reduce the in stream water hazards of *E. coli* and excess nutrients. • Tackling the issue of dumping trash and hazardous waste along riverbanks was addressed through the first CRDC with the development of the Nautilus, an in-stream trash removal device. The next step is to tackle invisible pollution, and the next two CRDCs will focus on mechanisms to reduce these issues. • Concern about filamentous algae growth impacting ditch owners, fishery advocates, and municipal water interests. Filamentous algae are one of the most common aquatic plant problems and arise when there is an excess of nutrients in the water.

Last Updated: June 2020

Innovation Track
• Finding ways to communicate our collective challenges, work, and successes in a way that engages all members of the community, building understanding and partnership in how Colorado tackles water-related issues. This crosscutting issue affects all aspects of the work being done to address Colorado's water challenges. CRDC engages the public and works to increase understanding of the causes, impacts and potential solutions to important water issues facing Colorado. Working with the media and highlighting the competitions engages the public in understanding the issues at hand. Sharing the results of CRDC with participants in river-focused community events and through educational programming targeting pre-K – high school students, TWC/TGF works to develop an educated citizenry with the skills and knowledge needed to address environmental challenges. Although the State of Colorado has determined the South Platte River, Cherry Creek, and Bear Creek are appropriate for recreation, water quality monitoring indicates that *E. coli* levels reduce the capacity for recreation (Denver Environmental Health, 2014 Water Quality Update). Without intervention, we will not reach the level of accessible recreation desired by our community. Water-related outdoor recreation is essential to the livelihood of Colorado; this industry supports over 131,000 jobs, provided $6.3 billion in household incomes, and brings in approximating $2.7 billion in tax revenue (Economic Contributions of Water-related Outdoor Recreation in Colorado, Business for Water Stewardship, 2020) Nitrogen and phosphorus levels have been reduced in recent years due to education efforts from wastewater treatment facilities. However, stretches of our waterways still experience increased levels of both nutrients (Denver Environmental Health, 2014 Water Quality Update). Excess nutrients (in combination with raising temperatures) can causes algae to bloom out of control. Large blooms of algae can create imbalance in an aquatic ecosystem, but a large blue green algae bloom, or Harmful Algal Blooms (HABs), can be harmful to people, wildlife and pets. Cherry Creek State Park had to temporarily shut the swim area on July 11th because of a large bloom of blue green algae ('Don't Get in The Water': Blue Green Algae Closes Swim Area at Cherry Creek State Park, Michael Abeyta, July 11, 2020). Swimming, wading and boating were prohibited until further notice in Boulder County on June 11th, 2020, also due to HABs (Be cautious of potentially harmful blue-green algae this summer, Bobbi Sheldon, June 11, 2020).
Describe how this project impacts current or emerging trends; technologies; clusters, sectors, or groups in water innovation.
There is a need for cost-effective innovation solutions to urban waterway pollution. Urban areas in particular are realizing the importance of clean waterways and are pursuing new methods and technologies for addressing each of the topic areas that will be a focus of CRDC, (*E. coli* and excess nutrients). Utilities are working hard to stay abreast of new technologies that help them continue to remain in compliance with standards. Yet in spite of good efforts many waterways are burdened by continued contamination. There are limited technologies to remove *E. coli* and excess nutrients once they are in the watershed ecosystem, and there are perhaps even more critical challenges in preventing or reducing their introduction in the first place. CRDC could be at the leading edge of innovation and create a complimentary product or service that fits into Metro Denver's robust system for keeping our water clean and safe. Continued reduction and removal of these pollutants is vital because their presence costs communities and the State of Colorado money- either through the cost of removing these pollutants or lost income due to reduced water recreation opportunities. TWC focuses on highlighting new technologies and practices being developed for cleaner water. By working at the university level and the professional level through TAP-IN and other events, our work connects resources and efforts for the development of new technologies and practices, advances existing technologies and practices, and connects products with end users, or those seeking solutions.

Last Updated: June 2020

Innovation Track
Given what we know about the limited number and types of known solutions to the problem of waterway pollution currently on the market, TWC believes there is significant opportunity for solutions developed during CRDC to increase the number of viable options.

Last Updated: June 2020

Colorado Water Conservation Board
Water Plan Grant - Exhibit A

Statement Of Work	
Date:	**November 15, 2020**
Name of Grantee:	**The Water Connection of The Greenway Foundation**
Name of Water Project:	**Clean River Design Challenge (CRDC)**
Funding Source:	**Colorado Water Plan Grant**

Water Project Overview:

The funding requested is to develop and host two Clean River Design Challenges, providing innovative solutions to urban waterway pollution. These two-semester long competitions are open to undergraduate and graduate students attending Colorado universities/colleges. Each competition is focused on reduction of *E. coli* and excess nutrients. One semester is dedicated to research and idea generation, with opportunities for feedback from experts in the field. One on solution design, proof of effectiveness, evaluation of environmental economic considerations, and a conceptual business plan. Teams then present their solution in the form of a proposal for a product or service. Expert judges select the top three teams to receive a modest cash prize. The first place team is invited to participate in Trout Tank H2O, a business accelerator co-hosted by the Denver Metro Chamber of Commerce and TAP-IN.

Project Objectives:

The Water Connection (TWC) works across academic, industrial, environmental and governmental sectors to facilitate and implement tangible, visible projects improving waterways and watershed resiliency. TWC provides resources for demonstration of new products and practices and is a catalyst for innovative and collaborative work. Through collaborative efforts and unique approaches, TWC drives innovative solutions addressing current and future water challenges.

The Objectives:

The overall objective of Clean River Design Challenge (CRDC) is to solve water quality problems through innovation and awareness, using interdisciplinary college and university teams to bring new ideas, solutions and publicity to a variety of water pollution challenges. CRDC prioritizes collaboration and cross-disciplinary teams to expand thinking and innovation. By engaging a variety of approaches, CRDC encourages the exploration of out-of-the box thinking. Throughout the competition, students will encounter real life obstacles, and will need to tap into their creativity to solve them.

CRDC follows best practice in design competitions and will be evaluated against a clear set of criteria. Over the next two years, CRDC will focus on two pollution issues: *E. coli* and excess nutrients. These two

types of pollutants were chosen because they enter waterways via similar routes, create poor water quality, and inhibit recreational uses. The solutions devised, which may take the form of a product or service, will be accompanied by a business plan, requiring integration of environmental economic analysis and business strategy, and making the solutions ready to be implemented.

In addition to supporting innovative solutions, CRDC provides an opportunity to promote well-informed community discourse regarding local water issues and solutions at multiple levels. By engaging professional volunteers on judging panels, and presenting the winning design to business leaders and entrepreneurs during Trout Tank H2O and TAP-IN, TWC will engage decision makers who have the skills and resources to increase the potential for solution implementation. Furthermore, through CRDC, TWC will raise awareness among the public and engage community members regarding water pollution issues facing our State.

Tasks

Task 1 – Competition Planning, Preparation and Promotion

Description of Task:

Sub-task: Recruitment of Key Experts

Recruit multiple experts in topic area of *E. coli and nutrients*. Partnership and collaboration with industry and academic professionals is an essential component of the educational experience for students and greatly increases the viability of the solutions created.

CRDC tasks students with tackling real-world water pollution issues. For the greatest innovation, these issues and solutions benefit from buy-in and input from multiple perspectives and disciplines. TWC will need to build on our current network of professional experts to incorporate our new topic area of *E. coli* and nutrients as well as recruit leaders in the business/entrepreneurial space to coach our teams when creating a conceptual business plan for their solution.

Sub-task: Development of Competition Guidelines and Program

Competition materials will need to be created including:

- Competition handbook
- Judging rubric
- Links to resources on *E. coli* and nutrients, sources, implications, and access to local waterways
- Directory of expert volunteers available for questions

A comprehensive CRDC website will be created to house all materials and resources. Ideally the website will provide a question and answer feature to facilitate inquiry and problem solving both about the timing and format of the competition. Additional resources may also be needed during the course of CRDC and if so, will be added. The website will provide all resources and tools developed and collected to support the competition.

A robust online presence is critical for a program's success, not only in light of the COVID-19 pandemic, but also to allow the competition to be opened to colleges and universities on the western slope and other parts of the state.

Sub-task: Competition Promotion and Recruitment of Teams

Last Updated: June 2020

Tasks
Market to colleges and universities; recruiting 4-8 teams of 3-6 students.
Method/Procedure:
TWC staff will reach out to current professional and academic contacts to determine interest in participating in one or both of the upcoming competitions. In addition, TWC staff will tap into The Greenway Foundation's (TGF's) networks, built over several decades of work, for additional contacts. Since TWC is expanding the scope of the competition (both in terms of water pollutants and adding the business plan element) staff will reach out to entities and disciplines previously not worked with. This is a key component of the success of the CRDCs and will take significant due diligence. Utilizing experience gained in the first CRDC, best practice in design competitions, and with the aide of recruited experts, TWC staff will develop the competition handbook and judging rubric. TWC will also explore website hosting services that are easy to access and maintain, and are reasonably priced. Promotional materials will be created and circulated to colleges and universities, seeking participation. Networking with professors who have participated in previous CRDC will occur to recruit return participation and outreach to potential new teams.
Deliverable:
• Comprehensive outreach list of professionals in key fields. • List of specialists and experts recruited to mentor and judge the competitions. • Fully functional website available to professors and student teams by the start of the competition, Fall 2021. • Roster of participating teams.

Last Updated: June 2020

Tasks
Task 2 – Clean River Design Challenge, Fall 2021 – Spring 2022
Description of Task:
Sub-task: Competition Kick-off Media outreach will occur for a kick-off event for CRDC. If in-person is not possible, a virtual kick-off will be the default. **Sub-task:** Team Support, Concept presentations, and Final Design Presentations TWC will host a two-semester challenge where student teams research, create a solution concept, present their idea to a team of experts and get feedback. Then in the second semester, student teams develop their solution complete with a conceptual business plan, and then pitch their solution and plan to a panel of interdisciplinary judges. Judges select 1st – 3rd place winners for cash prizes. A conceptual business plan is a short overview of a new business venture. It is used to expand on an initial business idea; guide more detailed planning, and communicates essential information.
Method/Procedure:
August 2021- December 2021: Student teams research the water pollutant topic. Teams begin designing a solution with feedback and guidance from volunteer professionals. December 2021, teams present their final solution concept to a panel of judges for review and final guidance. January 2022- April 2022: Teams fine-tune their solution ideas and create a conceptual business plan for their solution. April 2022: teams pitch their solution and business plan to a panel of interdisciplinary judges. The panel selects the top three teams and awards cash prizes. Fall 2022: First place team is invited to participate in Trout Tank H2O.
Deliverable:
• Media releases and photos of kick-off • Photographs and/or video of the final pitch day, April 2022 • High-level summary of the concepts put forth during the pitch day • Photos of 1st – 3rd place winners

Last Updated: June 2020

Tasks
Task 3 – Wrap up and Facilitation of Winning Design Promotion
Description of Task:
Outreach to Media for PR around the final presentations of CRDC. Outreach to community stakeholders on the need, goals and purpose of CRDC with highlights of the winning solution. The first-place team will be invited to pitch their idea and potentially find resources to turn their solutions into a business that improves urban water quality at Trout Tank H2O, a business accelerator hosted by the Denver Metro Chamber of Commerce and TAP-IN. Although it is not a requirement for the winning team to participate in Trout Tank H2O, it is considered an important aspect to the learning and innovation of CRDC. The winning team will be strongly encouraged to participate and supported throughout the October event.
Method/Procedure:
Outreach to media, particularly local news media (TV, radio and newspapers) will be done through press releases to encourage and invite coverage of the final CRDC presentations. Media packets will include information of the issues, the original and purpose of CRDC, and the cooperation between Basin Roundtable, Statewide WSRF, and State Water Plan Grants to develop cost effective, efficient solutions to in-stream pollution. Also covered will be the consequences of not removing pollution, and the importance of increasing the public's engagement in keeping pollutants from streets, parks, and waterways. TGF and TWC will share blogs, emails and newsletter articles with over 11,000 constituents. The top three winners will be highlighted at two annual Stewardship Events organized by TGF. TWC will highlight the winning solution during Reception on the River, an event celebrating the past, present and future of our urban waterways. South Platte River Environmental Education (SPREE) educates thousands of metro Denver students each year, aiming to develop a positive relationship between the South Platte River and Denver area youth through school excursions, day camps, weekend events, internships, and summer employment. The issue of urban waterway pollution and programs aimed to address this issue, such as CRDC, its funding partners, purpose and outcomes, will be a topic at some point in each of these activities, educating children, youth and their parents about the pollution issues affecting our waterways and the work being done to address it. Trout Tank H2O encourages entrepreneurs from early-stage start-ups to more established companies to pitch their concept. The winning team will be encouraged to participate. Participation includes: • 5 sessions including pitch practice, expert panels, and interactive group work • Introduction to business mentors • Completing a pitch deck • Opportunities to pitch in a supportive environment • Instant feedback and coaching • Face-to-face meetings with lenders and investors • Trout Tank H2O Pitch event

Last Updated: June 2020

Tasks
Deliverable:
• Press release(s) and press coverage • Blog(s) • Photo(s) of winning team presentations • Photos of pitch event

Tasks
Task 4 – Competition Planning, Preparation and Promotion
Description of Task:
Sub-task: Recruitment of Key Experts Recruit multiple experts in topic areas of excess nutrients. Partnership and collaboration with industry and academic professionals is an essential component of the educational experience for students and greatly increases the viability of the solutions created. CRDC tasks students with tackling real-world water pollution issues. For the greatest innovation, these issues and solutions benefit from buy-in and input from multiple perspectives and disciplines. TWC will need to build on our current network of professional experts to incorporate our new topic area of excess nutrients, as well as recruit leaders in the business/entrepreneurial space to coach our teams when creating a conceptual business plan for their solution. **Sub-task:** Development of Competition Guidelines and Program Competition materials will need to be created including: • Competition handbook • Judging rubric • Links to resources on *E.coli* and excess nutrients, their sources, implications, and access to local waterways • Directory of expert volunteers available for questions A comprehensive CRDC website will be created to house all materials and resources. Ideally the website will provide a question and answer feature to facilitate inquiry and problem solving about the timing and format of the competition. Additional resources may also be needed during the course of CRDC and if so, will be added. The website will provide all resources and tools developed and collected to support the competition.

Last Updated: June 2020

Tasks
A robust online presence is critical for a program's success, not only in light of the COVID-19 pandemic, but also to allow the competition to be opened to colleges and universities on the western slope and other parts of the state. **Sub-task:** Competition Promotion and Recruitment of Teams Market to colleges and universities; recruiting 4-8 teams of 3-6 students.
Method/Procedure:
TWC staff will reach out to current professional and academic contacts to determine interest in participating in one or both of the upcoming competitions. In addition, TWC staff will tap into The Greenway Foundation's (TGF's) networks, built over several decades of work, for additional contacts. Since TWC is expanding the scope of the competition (both in terms of water pollutants and adding the business plan element) staff will reach out to entities and disciplines previously not worked with. This is a key component of the success of the CRDCs and will take significant due diligence. Utilizing experience gained in the first CRDC, best practice in design competitions, and with the aide of recruited experts, TWC staff will develop the competition handbook and judging rubric. TWC will also explore website hosting services that are easy to access and maintain, and are reasonably priced. Promotional materials will be created and circulated to colleges and universities, seeking participation. Networking with professors who have participated in previous CRDC will occur to recruit return participation and outreach to potential new teams.
Deliverable:
• Comprehensive outreach list of professionals in key fields. • List of specialists and experts recruited to mentor and judge the competitions. • Fully functional website available to professors and student teams by the start of the competition, Fall 2021. • Roster of participating teams

Last Updated: June 2020

Tasks
Task 5 – Clean River Design Challenge, Fall 2022 – Spring 2023
Description of Task:
Sub-task: Competition Kick-off Media outreach will occur for a kick-off event for CRDC. **Sub-task:** Team Support, Concept presentations, and Final Design Presentations TWC will host a two-semester challenge where student teams research, create a solution concept, present their idea to a team of experts and get feedback. Then in the second semester, student teams develop their solution complete with a conceptual business plan, and then pitch their solution and plan to a panel of interdisciplinary judges. Judges select 1st – 3rd place winners for cash prizes.
Method/Procedure:
August 2022- December 2022: Student teams research the water pollutant topic. Teams begin designing a solution with feedback and guidance from volunteer professionals. December 2022: teams present their final solution concept to a panel of judges for review and final guidance. January 2023- April 2023: Teams fine-tune their solution ideas and create a conceptual business plan for their solution. April 2023: teams pitch their solution and business plan to a panel of interdisciplinary judges. The panel selects the top three teams and awards cash prizes. Fall 2023: First place team is invited to participate in Trout Tank H2O.
Deliverable:
• Photographs and/or video of the final pitch day, April 2023 • High-level summary of the concepts put forth during the pitch day • Photos of 1st – 3rd place winners

Tasks
Task 6 – Wrap up and Facilitation of Winning Design Promotion
Description of Task:

Last Updated: June 2020

Tasks
Outreach to Media for PR around CRDC final presentations. Outreach to community stakeholders on the need, goals and purpose of CRDC with highlights of the winning solution. The first-place team will be invited to pitch their idea and potentially find resources to turn their solutions into a business that improves urban water quality at Trout Tank H2O, a business accelerator hosted by the Denver Chamber of Commerce and TAP-IN. Although it is not a requirement for the winning team to participate in Trout Tank H2O, it is considered an important aspect to the learning and innovation of CRDC. The winning team will be strongly encouraged to participate and supported throughout the October event.
Method/Procedure:
Outreach to media, particularly local news media (TV, radio and newspapers) will be done through press releases to encourage and invite coverage of the final CRDC presentations. Media packets will include information of the issues, the original and purpose of CRDC, and the cooperation between Basin Roundtable, Statewide WSRF, and State Water Plan Grants to develop cost effective, efficient solutions to in-stream pollution. Also covered will be the consequences of not removing pollution, and the importance of increasing the public's engagement in keeping pollutants from streets, parks, and waterways. TGF and TWC will share blogs, emails and newsletter articles with over 11,000 constituents. The top three winners will be highlighted at two annual Stewardship Events organized by TGF. TWC will highlight the winning solution during Reception on the River, an event celebrating the past, present and future of our urban waterways. South Platte River Environmental Education (SPREE) educates thousands of metro Denver students each year, aiming to develop a positive relationship between the South Platte River and Denver area youth through school excursions, day camps, weekend events, internships, and summer employment. The issue of water pollution and programs aimed to address this issue, such as CRDC, its funding partners, purpose and outcomes, will be a topic at some point in each of these activities, educating children, youth and their parents about the pollution issues affecting our waterways and the work being done to address it. The winning team will be encouraged to participate in Trout Tank H2O. Participation includes: • 5 sessions including pitch practice, expert panels, and interactive group work • Introduction to business mentors • Completing a pitch deck • Opportunities to pitch in a supportive environment • Instant feedback and coaching • Face-to-face meetings with lenders and investors • Trout Tank H2O Pitch event
Deliverable:

Last Updated: June 2020

Tasks

- Press release(s) and press coverage
- Blog(s)
- Photo(s) of winning team presentations
- Photos of pitch event

Budget and Schedule

This Statement of Work shall be accompanied by a combined Budget and Schedule that reflects the Tasks identified in the Statement of Work and shall be submitted to CWCB in excel format.

Reporting Requirements

Progress Reports: The applicant shall provide the CWCB a progress report every 6 months, beginning from the date of issuance of a purchase order, or the execution of a contract. The progress report shall describe the status of the tasks identified in the statement of work, including a description of any major issues that have occurred and any corrective action taken to address these issues.

Final Report: At completion of the project, the applicant shall provide the CWCB a Final Report on the applicant's letterhead that:

- Summarizes the project and how the project was completed.
- Describes any obstacles encountered, and how these obstacles were overcome.
- Confirms that all matching commitments have been fulfilled.
- Includes photographs, summaries of meetings and engineering reports/designs.

The CWCB will pay out the last 10% of the budget when the Final Report is completed to the satisfaction of CWCB staff. Once the Final Report has been accepted, and final payment has been issued, the purchase order or grant will be closed without any further payment.

Last Updated: June 2020

Payment

Payment will be made based on actual expenditures and must include invoices for all work completed. The request for payment must include a description of the work accomplished by task, an estimate of the percent completion for individual tasks and the entire Project in relation to the percentage of budget spent, identification of any major issues, and proposed or implemented corrective actions.

Costs incurred prior to the effective date of this contract are not reimbursable. The last 10% of the entire grant will be paid out when the final deliverable has been received. All products, data and information developed as a result of this contract must be provided to CWCB in hard copy and electronic format as part of the project documentation.

Performance Measures

Performance measures for this contract shall include the following:
(a) Performance standards and evaluation: Grantee will produce detailed deliverables for each task as specified. Grantee shall maintain receipts for all project expenses and documentation of the minimum in-kind contributions (if applicable) per the budget in Exhibit B. Per Water Plan Grant Guidelines, the CWCB will pay out the last 10% of the budget when the Final Report is completed to the satisfaction of CWCB staff. Once the Final Report has been accepted, and final payment has been issued, the purchase order or grant will be closed without any further payment.
(b) Accountability: Per Water Plan Grant Guidelines full documentation of project progress must be submitted with each invoice for reimbursement. Grantee must confirm that all grant conditions have been complied with on each invoice. In addition, per Water Plan Grant Guidelines, Progress Reports must be submitted at least once every 6 months. A Final Report must be submitted and approved before final project payment.
(c) Monitoring Requirements: Grantee is responsible for ongoing monitoring of project progress per Exhibit A. Progress shall be detailed in each invoice and in each Progress Report, as detailed above. Additional inspections or field consultations will be arranged as may be necessary.
(d) Noncompliance Resolution: Payment will be withheld if grantee is not current on all grant conditions. Flagrant disregard for grant conditions will result in a stop work order and cancellation of the Grant Agreement.

COLORADO
Colorado Water Conservation Board
Department of Natural Resources

Colorado Water Conservation Board

Water Plan Grant - Exhibit B
Budget and Schedule

Prepared Date: November 15, 2020

Name of Applicant:The Water Connection of The Greenway Foundation

Name of Water Project:Clean River Design Challenge

Project Start Date: April 1, 2021

Project End Date: October 31, 2023

Task No.	Task Description	Task Start Date	Task End Date	Grant Funding Request	Match Funding	Total
1	Competition #1 Planning, Preparation and Promotion	1-Apr-21	31-Jul-21	$ 4,850.00	$ 8,040.00	$12,890
2	2021/2022 Design Competition	August 1, 2021	May 31, 2022	$17,200	$17,700	$34,900
3	Competition Wrap Up and Work with Winning Team	May 1, 2022	October 31, 2022	$1,000	$2,500	$3,500
4	Competition #2 Planning, Preparation and Promotion	April 1, 2022	July 31, 2022	$4,900	$7,990	$12,890
5	2022/2023 Design Competition	August 1, 2022	May 31, 2023	$16,700	$17,000	$33,700
6	Competition Wrap Up and Work with Winning Team	May 1, 2023	Octobre 31, 2023	$1,005	$2,495	$3,500
						$0
						$0
						$0
						$0
						$0
						$0
						$0
			Total	$45,655	$55,725	$101,380

July 15, 2020

Colorado Water Conservation Board
Attn: Ben Wade
1313 Sherman Street, Room 721
Denver, CO. 80203

Re: Clean River Design Challenge

Dear Evaluation Team:

On behalf of the Metro Basin Roundtable (MRT), I am writing in support of The Water Connection / The Greenway Foundation's request for grant funding to pursue the Clean River Design Challenge. The MRT voted unanimously to support this effort to engage Colorado's university students in developing innovative solutions to the state's water resource challenges. We're also supportive of the role this competition plays in engaging local professionals and raising the community's awareness of pervasive water quality challenges in our region.

The Clean River Design Challenge will advance numerous goals of the State Water Plan as well as the South Platte Basin Implementation Plan and PEPO Plan including but not limited to:

- CWP Executive Summary, p. 15; Education, Outreach and Innovation: Colorado's Water Plan sets a measurable objective to significantly improve the level of public awareness and engagement regarding water issues statewide by 2020, as determined by water awareness surveys…This work will be collaborative and include state, local, and federal partners. As one component of this overall strategy, the CWCB will work with Colorado's innovation community, education and outreach experts, research institutions… to address Colorado's water challenges with innovation and outside-the-box" creativity
- CWP Executive Summary, p. 16; Watershed Health, Environment and Recreation: The environment and recreation are too critical to Colorado's brand not to have robust objectives; a strong Colorado environment is critical to the economy and way of life.
- Colorado Water Plan, p. 3-1 "Water quality management" is listed as one of the 16 Water Challenges in the South Platte Basin.
- Goal 1.9.5 on p. 1-27 of the CWP states; Goal: Maintain, enhance and proactively manage water quality for all use classifications.
- CWP Executive Summary, p. S-1; As part of Governor's Hickenlooper's Executive Order on May 14, 2013, he acknowledged the many water challenges facing the state included: Recognizing that water quantity and quality issues in the state are integrally linked
- SPBIP Executive Summary, p.8, S.3.7 Water Quality Issues, p.2: A major challenge in the South Platte Basin relates to adequacy of the water quality for domestic and municipal water uses. … Major technological innovations are needed for delivery, treatment, and

disposal of the waste streams from currently available complex water treatment systems, which results in significant cost to customers, impacts to the environment, and uncertain regulatory permitting processes. Relying exclusively on South Platte River supplies in the face of decreasing water quality will be a major challenge in the South Platte Basin."

- State Water Supply Initiative Executive Summary, p.41: #5. Support meeting Colorado's non-consumptive water needs by working with Colorado's water stakeholders to help protect or enhance environmental and recreational values that benefit local and statewide economies.

The Metro Basin Roundtable is pleased to share our support for this project. Thank you for your consideration of this proposal.

Yours truly,

Barbara Biggs
Metro Roundtable Chairperson

6795 S. Elati St.
Littleton, CO 80120
T 303-795-5925
www.barr-milton.org

BARR MILTON
Watershed Association

November 24, 2020

Colorado Water Conservation Board
1313 Sherman St., Room 721
Denver, CO 80203

Re: Barr Milton Watershed Association Support for WSRF State Request and Colorado Water Plan Grant Request for The Water Connection/The Greenway Foundation's Clean River Design Challenge

Dear Evaluation Team,

On behalf of the Barr Milton Watershed Association, I am writing this letter in support of the application by The Water Connection/The Greenway Foundation for grant funding for their Clean River Design Challenge.

Barr Milton Watershed Association had a meeting with TWC/TGF on September 29th, 2020 to discuss the new direction of their Clean River Design Challenge for the next two years. Together we discussed potential water pollutant issues for the students to focus on, and nutrients and *E. coli* were some of the top potential targets.

The Clean River Design Challenge (CRDC) is a two-semester competition that will engage university students to create innovative solutions to various water pollution issues. In previous competitions, teams were tasked with removing trash from urban streams. Moving forward, the focus will be shifted toward other types of pollutants such as excess nutrients (phosphorus and nitrogen) and *E. coli*. Along with creating solutions, teams will also be responsible for creating a business plan for their product or service. The winning team will have the opportunity to participate in Trout Tank H2O, a business pitch accelerator that is hosted by the Denver Metro Chamber of Commerce and TAP-IN Colorado. TWC/TGF will run the CRDC for two years: the first in Fall 2021/Spring 2022, and the second in Fall 2022/Spring 2023.

The CRDC is expected to provide numerous community and environmental benefits:

- Improve water quality in local streams
- Expose the next generation of professionals to a local, real-world environmental issue
- Create a space where innovative ideas and/or businesses can be developed
- Raise awareness about water pollution issues facing rivers and streams in Colorado

Barr Milton supports this competition, and is excited to see what the student teams come up with!

Sincerely,

Dan DeLaughter

Dan DeLaughter, P.E.
BMW Chairperson

CC: Steve Lundt, BMW, Vice Chairperson
James Boswell, BMW, Secretary
Chris Douglass, BMW, Treasurer
Amy Conklin, BMW, Coordinator

BARR MILTON
Watershed Association

ENVIRONMENTAL QUALITY
DENVER PUBLIC HEALTH & ENVIRONMENT

November 30, 2020

Colorado Water Conservation Board
1313 Sherman St., Room 721
Denver, CO 80203

Re: Letter of support for WSRF and Colorado Water Plan Grant Request for The Water Connection / The Greenway Foundation's Clean River Design Challenge

Dear Evaluation Team,

The Denver Department of Public Health & Environment (DDPHE) supports the application by The Water Connection / The Greenway Foundation (TWC/TGF) for funding for the Clean River Design Challenge.

The Clean River Design Challenge (CRDC) is a two-semester competition that seeks to engage university students to create innovative solutions to water pollution issues. In previous competitions, teams were tasked with removing trash from urban streams. Future challenges will address other types of pollutants such as nutrients and *E. coli*. In addition to developing innovative solutions, teams will create a business plan for their product or service. The winning team will have the opportunity to participate in Trout Tank H2O, a business pitch accelerator that is hosted by the Denver Metro Chamber of Commerce and TAP-IN Colorado. TWC/TGF will run the CRDC for two years: the first in Fall 2021/Spring 2022, and the second in Fall 2022/Spring 2023.

The CRDC is expected to provide numerous community and environmental benefits:

- Improve water quality in local streams;
- Expose the next generation of professionals to a local, real-world environmental issues;
- Create a space where innovative ideas and/or businesses can be developed, and;
- Raise awareness about water pollution issues facing rivers and streams in Colorado,

DDPHE supports the CRDC because it has shown itself to be an effective incubator for creative solutions to urban water quality issues. We look forward to working with TWC/TGF staff on development of future challenges and to the exciting solutions that the student teams come up with!

Sincerely,

Jon Novick
Water Quality Program Administrator

Environmental Quality Division
Denver's Department of Public Health & Environment
200 W 14th Ave, Suite 310 | Denver, CO 80204
www.denvergov.org/EnvironmentalQuality
p. 720-913-1311 | f. 720-865-5534 | www.Facebook.com/DenverEnvironmentalQuality

METRO WASTEWATER RECLAMATION DISTRICT

William J. "Mickey" Conway, District Manager

November 30, 2020
Colorado Water Conservation Board
1313 Sherman St., Room 721
Denver, CO 80203

Re: Metro Wastewater Reclamation District for WSRF State Request and Colorado Water Plan Grant Request for The Water Connection/The Greenway Foundation's Clean River Design Challenge

Dear Evaluation Team,

On behalf of the Metro Wastewater Reclamation District, I am writing this letter in support of the application by The Water Connection/The Greenway Foundation for grant funding for their Clean River Design Challenge.

Metro Wastewater Reclamation District has provided volunteer professional support for this competition in the past, and is excited for the focus to shift to *E. coli* wand nutrients for the next CRDC.

The Clean River Design Challenge (CRDC) is a two-semester competition that will engage university students to create innovative solutions to various water pollution issues. In previous competitions, teams were tasked with removing trash from urban streams. Moving forward, the focus will be shifted toward other types of pollutants such as excess nutrients (phosphorus and nitrogen) and *E. coli*. Along with creating solutions, teams will also be responsible for creating a business plan for their product or service. The winning team will have the opportunity to participate in Trout Tank H2O, a business pitch accelerator that is hosted by the Denver Metro Chamber of Commerce and TAP-IN Colorado. TWC/TGF will run the CRDC for two years: the first in Fall 2021/Spring 2022, and the second in Fall 2022/Spring 2023.

The CRDC is expected to provide numerous community and environmental benefits:

- Improve water quality in local streams
- Expose the next generation of professionals to a local, real-world environmental issue
- Create a space where innovative ideas and/or businesses can be developed
- Raise awareness about water pollution issues facing rivers and streams in Colorado
-

Metro Wastewater Reclamation District supports this competition, and is excited to see what the student teams come up with!

Sincerely,

Jordan Parman

Jordan Parman
Water Quality Scientist

6450 York Street - Denver, Colorado 80229-7499 (303) 286-3000 Telefax (303) 286-3030 www.metrowastewater.com

SOUTH PLATTE RENEW
OWNED BY LITTLETON/ENGLEWOOD

November 25, 2020

Colorado Water Conservation Board
1313 Sherman St., Room 721
Denver, CO 80203

RE: SOUTH PLATTE RENEW SUPPORT FOR WSRF STATE REQUEST AND COLORADO WATER PLAN GRANT REQUEST FOR THE WATER CONNECTION/THE GREENWAY FOUNDATION'S CLEAN RIVER DESIGN CHALLENGE

Dear Evaluation Team,

On behalf of the South Platte Renew, I am writing this letter in support of the application by The Water Connection/The Greenway Foundation (TWC/TGF) for grant funding for their Clean River Design Challenge.

The Clean River Design Challenge (CRDC) is a two-semester competition that will engage university students to create innovative solutions to various water pollution issues. In previous competitions, teams were tasked with removing trash from urban streams. Moving forward, the focus will be shifted toward other types of pollutants such as excess nutrients (phosphorus and nitrogen) and *E. coli.* Along with creating solutions, teams will also be responsible for creating a business plan for their product or service. The winning team will have the opportunity to participate in Trout Tank H2O, a business pitch accelerator that is hosted by the Denver Metro Chamber of Commerce and TAP-IN Colorado. TWC/TGF will run the CRDC for two years: the first in the Fall 2021/Spring 2022, and the second in Fall 2022/Spring 2023.

The CRDC is expected to provide numerous community and environmental benefits, including:

- Improve water quality in local streams
- Expose the next generation of professionals to a local, real-world environmental issue
- Create a space where innovative ideas and/or businesses can be developed
- Raise awareness about water pollution issues facing rivers and streams in Colorado

South Platte Renew supports this competition, and is excited to see what the student teams come up with!

Sincerely,

Pieter Van Ry
Director, South Platte Renew

South Platte Renew
2900 S. Platte River Dr., Englewood, CO 80110
P (303) 762-2600 F (303) 762-2620
southplatterenewCO.gov

OWNED BY LITTLETON/ENGLEWOOD