Brandywine-Christina Healthy Water Fund

Coordination and Policy Report
June 2017

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WILLIAM PENN FOUNDATION

UNIVERSITY OF DELAWARE

Brandywine-Christina Healthy Water Fund Collaboration and Policy Report

June 2017

prepared for the

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Section 1: Collaboration

Collaboration with key stakeholders, Brandywine-Christina cluster members and the William Penn Foundation are critical components of the Brandywine-Christina Healthy Water Fund (the Water Fund) project. The project team coordinated with multiple groups and organizations using a variety of methods to engage these groups and to ensure feedback and expertise regarding the Water Fund. Collaboration included team and cluster coordination, regional advisory panel meetings, project website, written communication, stakeholder interviews, presentations, and one-on-one meetings and discussions. Detailed information about the collaboration strategies employed are outlined below.

Team and Cluster Coordination

In years two and three of the Brandywine-Christina Healthy Water Fund project the project team participated in two focused planning sessions. The intent of the first session, held in April 2016, was to determine the project management structure, identify key deliverables and assign project team leads. The second of the two planning sessions, Highly Effective Teams Training, was led by The Nature Conservancy (TNC) Organizational Strategies staff and included Brandywine-Christina cluster members. Table 1.1 provides detailed information about the two sessions.

Table 1.1. Team and cluster coordination

Date	Place	Attendees	Intent
April 16, 2015	Hagley Museum and Library, Wilmington, DE	Project Team	Determine project management structure, deliverables and responsibilities.
November 2-3, 2016	Stroud Water Research Center, Avondale, PA	Project Team and Cluster Partners	Fostering teamwork and improving the performance of teams. Develop a work plan that will identify strategies and metrics.

Regional Advisory and Steering Committee Meetings

Over the course of this project, the project team has conducted seven Regional Advisory Panel and Steering Committee meetings, three spanning the first phase and four spanning the remainder of the project timeframe (Table 1.2). Each meeting served as a forum for the project team to present and discuss the project's findings, analysis, and conclusions. The meetings were central to creating dialogue among the Regional Advisory Panel, Steering Committee members and the project team and obtaining valuable feedback. Members of the Brandywine-Christina cluster for the William Penn Foundation's Delaware River Watershed Initiative (DRWI) and William Penn Foundation staff were also invited to these meetings. The meetings provided the project team with critical input for consideration in the establishment of a water fund in the Brandywine-Christina watershed.

Table 1.2. Regional Advisory Panel and Steering Committee meetings

Date	Place	Attendance (approximate)	Materials Developed
Year 1			
May 30, 2014	Longwood Gardens, Kennett Square, PA	40	Meeting booklet, presentation boards (see website)
September 18, 2014	Mount Cuba Center, Hockessin, DE	30	Meeting booklet, PowerPoint presentations (see website)
January 14, 2015	Stroud Water Research Center, Avondale, PA	60	Final report (draft) (see website)
April 30, 2015	Lenfest Center at the ChesLen Preserve, Coatesville, PA	30	Review of year 1 activities and overview of years 2 and 3
Years 2-3			
September 22, 2015	Lenfest Center at the ChesLen Preserve, Coatesville, PA	30	Water purveyor feedback, technical and economic analysis
March 3, 2016	Lenfest Center at the ChesLen Preserve, Coatesville, PA	35	Municipal and township feedback, communications update, modeling work and governance structure
November 30, 2017	Mount Cuba Center, Hockessin, DE	30	Business plan outline and communications research
February 3, 2017	William Penn Foundation and Webinar/Online	3 (in-person at William Penn Foundation), numerous online	Business plan draft
May 4, 2017	Mount Cuba Center, Hockessin, DE	30	Business plan draft

Presentations and Written Communication

In May 2014, a project website was developed to house all project information and meeting materials and to serve as a communication hub for the project. The website contains project overview and information, Regional Advisory Panel meeting materials and presentations, and project team contact information. The website has been updated throughout the project to include publications, presentations and project-related information. The website can be accessed at: http://www.wrc.udel.edu/research/brandywine-christina-healthy-water-fund-2/ .

Presentations and written communication were utilized to engage stakeholders, the public and the William Penn Foundation. Project team members presented detailed information about this project to local, regional, and national groups (Table 1.3). Written communication was used to publicize the project and provide materials to stakeholders and those interested in the project. This communication was shared through the project website, press releases, newsletters, and academic publications (Table 1.4).

Table 1.3. Presentations for the Brandywine-Christina Water Fund

Date	Host Organization	Location	Presenter	Presentation Title
Year 1				
June 6, 2014	Christina Basin Task Force	Mount Cuba Center, Hockessin, DE	Jerry Kauffman and Ellen Kohler	Brandywine-Christina Healthy Water Fund Overview
November 6, 2014	American Water Resources Association 2014 Annual Conference	Tysons Corner, VA	Jerry Kauffman and Richie Jones	The Brandywine-Christina Healthy Watershed Fund: Clean Water is Good Business
November 18, 2014	Arden Guild	Arden, DE	Jerry Kauffman	Economics and Water in Delaware
Years 2-3				
June 16, 2016	Delaware MS4 Stormwater Consortium	Dover, DE	Martha Narvaez	Overview of the Brandywine-Christina Healthy Water Fund
January 24, 2017	Partnership for the Delaware Estuary	Cape May, NJ	Andrew Homsey	Brandywine-Christina Healthy Water Fund Model-based Prioritization
January 24, 2017	Partnership for the Delaware Estuary	Cape May, NJ	Martha Narvaez	Brandywine-Christina Healthy Water Fund

Table 1.4. Written communication for the Brandywine-Christina Water Fund

Date	Type	Title	Source and Author
Year 1			
April 1, 2014	Press Release	Water quality program seeks to protect Brandywine, Christina Rivers	NPR Delaware (Authored by Jon Hurdle
April 8, 2014	Press Release	Watershed Investment: The Nature Conservancy and the University of Delaware Partner on an Innovative Market-based Funding Mechanism for Brandywine-Christina	UDaily (Authored by Richie Jones, State Director, The Nature Conservancy in Delaware and Jerry Kauffman, Director, Water Resources Agency, Institute for Public Administration, University of Delaware)
Spring/Summer 2014	Newsletter	A Watershed Moment: Partners turn collective focus to Delaware's freshwater resources	Delaware, Acorns – Delaware Waters: We are making a splash around the First State.[1] (Authored by Staff of The Nature Conservancy in Delaware)
May 30, 2014	Booklet	Regional Advisory Panel Meeting: Brandywine-Christina Healthy Water Fund	Project Website (Developed by Project Team)
September 18, 2014	Booklet	Regional Advisory Panel Meeting: Brandywine-Christina Healthy Water Fund	Project Website (Developed by Project Team)
January 14, 2015	Booklet	Regional Advisory Panel Meeting: Brandywine-Christina Healthy Water Fund	Project Website (Developed by Project Team)
2014	Academic Magazine	University of Delaware, School of Public Policy and Administration (SPPA) Publication	Jerry Kauffman
N/A	Web Feature	Learn how working in the Brandywine-Christina watershed advances the Conservancy's mission in Delaware	The Nature Conservancy in Delaware's Website
N/A	Project Communication	Brandywine-Christina Healthy Water Fund	Maria Dziembowska, The Nature Conservancy in Delaware and Martha Narvaez, Water Resources Agency, Institute for Public Administration, University of Delaware
Years 2-3			
February 2, 2015	Article	Brandywine-Christina Healthy Water Fund	The Nature Conservancy website (Authored by TNC)
May 2016	Article	Brandywine-Christina Healthy Water Fund	Water Funds Network Olympics (Authored by Ellen Kohler, Brian Boutin and Richard Jones)

[1]Approximately 3,000 people receive the Acorns newsletter.

Water Purveyor and Municipal Interviews and Meetings

Multiple interviews were conducted with Pennsylvania and Delaware stormwater managers and private and municipal water purveyors. The team interviewed representatives from Pennsylvania municipalities due to their stormwater management (both municipal separate storm sewer system (MS4) and Total Maximum Daily Load (TMDL)) obligations in the watershed (Table 1.4). The team interviewed 13 Pennsylvania townships and municipalities throughout the entire project period and include:

- Parkesburg
- Valley
- West Whiteland
- Wallace
- Honey Brook
- West Chester
- Pocopson
- East Bradford
- Kennett Borough
- Kennett Township
- London Grove
- New Garden
- New London

Delaware municipalities including the City of Wilmington and City of Newark represent both stormwater managers (MS4 and TMDL) as well as public water purveyors. Both municipalities were interviewed during the project period. New Castle County and Delaware Department of Transportation (DelDOT) jointly hold a Phase 1 National Pollutant Discharge Elimination System (NPDES) MS4 permit and were interviewed during the project period. Private water purveyors in both Delaware and Pennsylvania were also interviewed, including: Pennsylvania American Water (PA), Aqua (PA) and Suez (formerly United Water Delaware) (DE). The following public water purveyors were interviewed: City of Newark (DE), City of Wilmington (DE), Honey Brook Municipal Water Authority (PA) and Downingtown Municipal Water Authority (PA). Table 1.5 provides a detailed list of the interviews and meetings conducted. The project team's approach to addressing the MS4 communities and regulated entities is discussed in more detail in Section 2 of this report.

Table 1.5. Stakeholder interviews and meetings

Date	Organization	Stakeholder	Project Team
Year 1			
August 27, 2014	City of Newark	Tom Coleman, Director of Public Works and Water Resources Tim Filasky, Assistant Director of Public Works	Martha Narvaez and Ellen Kohler
August 28, 2014	City of Wilmington	Jeffrey J. Starkey, Public Works Commissioner Sean Duffy, Water Division Director Matt Miller, Assistant Water Division Director Christiana Oh, Water Quality Manager Kelly Williams, Special Assistant to the Commissioner	Martha Narvaez and Ellen Kohler
September 24, 2014	PA American	James Gable, Operations Superintendent, Coatesville District	Martha Narvaez and Ellen Kohler
October 9, 2014	Honey Brook Municipal Water Authority	Mike Shuler, Manager Dennis Patterson, Chief Operator	Andrew Homsey and Ellen Kohler
October 16, 2014	Downingtown Municipal Water Authority	Fred Bopp, Executive Director	Jerry Kauffman and Ellen Kohler
October 20, 2014	Aqua Pennsylvania	Colleen Arnold, Manager of Water Quality and Environmental Compliance Tony Fernandes, Manager of Water Resources Engineering	Jerry Kauffman and Ellen Kohler
October 23, 2104	New Castle County and DelDOT	Michael Harris, Environmental Compliance Manager, Special Services, New Castle County Ellie Mortazavi, Stormwater Program Coordinator, Special Services, New Castle County Marianne Walch, Environmental Scientist, DelDOT	Martha Narvaez and Ellen Kohler
October 27, 2014	Christina Basin TMDL and Implementation Plan (CTIP)	Jan Bowers, Executive Director, Chester County Water Resources Authority Bob Struble, Watershed Conservation Director, Brandywine Valley Association Chris Strohmaier, District Manager, Chester County Conservation District	Martha Narvaez and Ellen Kohler
December 3, 2014	United Water Delaware	Larry Finnicum, Operations Manager Tom Hubbard, Public Relations Manager	Martha Narvaez and Ellen Kohler

Table 1.5. Stakeholder interviews and meetings (cont.)

Date	Organization	Stakeholder	Project Team
Year 2-3			
September 22, 2015	Cedarville Engineering Group (providing expertise from working with PA townships)	April Barkasi, CEO Steve Dadio, Environmental Manager	Martha Narvaez and Ellen Kohler
September 22, 2015	New London/London Grove Townships	Ron Reagan, Engineering Consultant Steve Brown, London Grove, Township Manager	Martha Narvaez and Ellen Kohler
September 23, 2015	New Garden Township	Tony Scheivert, Township Manager	Martha Narvaez and Ellen Kohler
October 19, 2015	Valley Township	Bob Glisson, Valley Township Manager	Martha Narvaez and Ellen Kohler
October 28, 2015	Kennett Township	Lisa Moore, Township Manager	Martha Narvaez and Ellen Kohler
January 13, 2016	Kennett Square Borough	Joseph Scalise, Borough Manager	Martha Narvaez and Ellen Kohler
February 25, 2016	PA American Rock Run Water Treatment	Pennsylvania American Water Staff: Jen Milakeve, James Kelly, Nicole Bell, Brian Hassinger	Martha Narvaez and Ellen Kohler
May 24, 2016	Delaware Water Purveyors	Tom Coleman, City of Newark Tom Hubbard, Suez Mary Neutz, Suez Chris Oh, City of Wilmington	Water Fund Team
July 14, 2016	Pennsylvania Purveyors	Tony Fernandes, Aqua	Water Fund Team

Business Plan Meetings

Project team members attended one-on-one meetings with the Brandywine-Christina cluster partners and stakeholders in the watershed to gather additional information for the project and to present the draft Brandywine-Christina Healthy Water Fund Business Plan. These meetings provided a forum to hear feedback and discuss challenges and opportunities related to the Water Fund and the information contained in the business plan. From February 2017-April 2017, five meetings were held with the following organizations: Chester County Conservation District, Stroud Water Research Center, Brandywine Conservancy, White Clay Wild and Scenic and Suez (Table 1.6). At these meetings several questions were raised and clarification was requested on specific details of the Water Fund, such as: contracting, farmer outreach, capacity funds, municipal funding, existing and future federal funding, governance structure, fund constraints, working with partners and rate recovery. Future meetings to further refine the business plan and discuss concerns with the stakeholders, cluster partners and investors will be held in May and June 2017 with groups including:

- Chester County Conservation District
- Dansko
- DuPont
- Mount Cuba Center
- National Fish and Wildlife Foundation
- NatureVest
- Open Space Institute
- Suez (Delaware)

Table 1.6. Cluster Partner and Stakeholder Meetings for Draft Business Plan

Date	Organization	Attendees
February 13, 2017	Chester County Conservation District	Christian Strohmaier, Dan Miloser, Zack Stepan, Jennifer Egan
February 28, 2017	Stroud Water Research Center	David Arscott, John Jackson, Matt Ehrhart, Richie Jones, Jennifer Egan
March 2, 2017	Brandywine Conservancy	David Shields, Bob Struble, Grant DeCosta, SeungAh Byun, Richie Jones, Jennifer Egan
March 10, 2017	White Clay Wild and Scenic	Shane Morgan, Ellen Kohler, Naomi Young, Jennifer Egan
April 12, 2017	Suez (Delaware)	Phone call with Tom Hubbard and Jennifer Egan

Information Sharing and Funding Requests

In addition to collaboration with Brandywine-Christina cluster partners and stakeholders, Water Fund team members have reached out to national-level audiences and applied for grant funds to capitalize years one through six of the Water Fund.

The national-level meetings have been conducted with the Water Fund team representatives and organizations that the team has deemed appropriate for discussions related to the project partnerships and potential investments into the fund in the future. These meetings included:

- USDA/NRCS on November 26, 2016 in Washington, D.C.
- Suez Water, North America (NA) on April 14, 2017 in Paramus, NJ.
- NatureVest on May 22, 2017, WebEx

The grant funds requested include:

- NatureVest Accelerator, grant requested $225,000 to incentivize beneficiaries to increase their investments and help provide staff capacity and early-stage project implementation. Final decision and notification are pending.
- USDA Conservation Innovation (CIG), the Brandywine-Christina Water Fund is the focus of the approximately $820,000 application (with team members/partners committing an equal amount of in-kind match). Award recipient, announced June 8, 2017.

Section 2: Policy Dialogue

Overview

The initial stages of the Water Fund will focus on two main beneficiaries. First, water providers have an economic incentive to reduce pollution levels in the streams that flow to their surface water intakes, as cleaner water costs less to treat. Additionally, reducing potential for risk associated with service disruptions (e.g., algal blooms affecting service provision) can help induce their participation in the Water Fund. Second, jurisdictions regulated for stormwater (entities that administer MS4s) are the other main potential beneficiary of the Water Fund.

In Delaware this latter group includes towns, New Castle County, DelDOT, and other organizations responsible for stormwater that drains through infrastructure to a stream. In Pennsylvania each municipality—townships and boroughs—is responsible for creating a plan to meet regulatory pollution reduction requirements as specified in the 2006 Christina Basin TMDLs implemented through USEPA's NPDES program requiring communities discharging stormwater to waters of the U.S.

In Delaware the stormwater regulations are promulgated by the Delaware Department of Natural Resources and Environmental Control (DNREC), and in Pennsylvania by the Department of Environmental Protection (PADEP). The USEPA requires that permitees develop a Storm Water Management Plan (SWMP), which inventories infrastructure, identifies stormwater outfalls, and determines how the pollution reduction requirements are to be addressed through Best Management Practices (BMPs). New Castle County, Delaware permittees include the county itself, which has a co-permit with DelDOT and several towns. In Chester County, Pennsylvania, where the majority of the Brandywine-Christina Basin lies, each borough or township is required to develop their own plan. Currently some municipalities are not required to reduce stream impairments and therefore are not required to develop a plan for all or part of their jurisdiction. The PADEP is going to require that those areas be addressed by Pollution Reduction Plans (PRPs), similar to the SWMP (or "TMDL" plans).

The Brandywine-Christina Healthy Water Fund project team engaged the Pennsylvania and Delaware regulatory agencies and key stakeholders identified during the Phase I feasibility study to identify a preferred regulatory structure for the Water Fund. Several key groups in Pennsylvania and Delaware are critical to engage in the regulatory discussion regarding MS4 communities and the MS4 regulatory process and structure. The Water Fund team has engaged the following key groups throughout the Water Fund project:

- DelDOT
- DNREC
- Christina Watershed Municipal Partnership (formerly CTIP) (CWMP)
- City of Newark, DE
- City of Wilmington, DE

- New Castle County
- PADEP
- Pennsylvania Township and Boroughs
- USEPA

Discussions with these groups focused on a preferred approach to achieving regulatory compliance with stormwater permits using strategic conservation investments, such as the Water Fund. At these meetings the Water Fund team presented a detailed discussion on the Water Fund and provided feedback to regulators and stormwater managers on different approaches to achieve regulatory compliance and to incentivize participation in strategic conservation investments such as the Water Fund. The Water Fund team also assisted the regulated community in determining the willingness of regulatory agencies to consider alternative approaches to compliance with stormwater permits. Meeting dates and intent are included in Table 2.1.

In accordance with the grant, the project team documented outcomes of discussions with the regulatory community, stormwater managers, PADEP, DNREC and USEPA representatives. The policy dialogue reports were submitted to the William Penn Foundation for distribution to the William Penn Foundation, Innovative Finance Panel, Regional Advisory Panel and the Brandywine-Christina cluster partners. The following reports were submitted to the William Penn Foundation:

- September 2015
- December 2015
- March 2016
- July 2016

Legislation

To create incentives among the stakeholder community represented by the private water purveyors, the Water Fund necessarily addressed their concerns regarding the ability to recover potential investments in clean water infrastructure (i.e., green BMPs that are upstream of surface drinking water intakes). By ensuring that purveyors could pass any costs undertaken through investment in the Water Fund to final rate payers (i.e., consumers), the economic incentive for innovative approaches to clean water is enhanced.

The Water Fund has therefore been exploring the potential to amend the language in the enabling legislation of the Delaware Public Service Commission (PSC), which is responsible for setting the rates that private water suppliers can charge, and what costs can be recovered through rate increases. The proposed changes are very straightforward, consisting of additional language in the legislation to allow the utilities to recover costs of green-infrastructure projects.

Currently, new legislation has been drafted in collaboration with stakeholders to work toward a finalized bill that would be agreeable to all parties. The ultimate goal is to incentivize private utility investment in cost-effective strategies to achieve clean water in the Brandywine-Christina Basin.

Table 2.1. Policy Meetings

Date	Meeting Intent	Discussion
Year 1		
December 3, 2014	Project overview meeting with PADEP	Briefing on the Brandywine-Christina Water Fund feasibility study and feedback from PADEP on the project, how it may play a role in their MS4 program, and other ideas on the implementation of a water fund in the Pennsylvania portion of the Brandywine-Christina watershed.
December 10, 2015	Project meeting with USEPA Region 3 representatives. -	Discussion of watershed-based solutions for stormwater management specifically addressing the following objectives: - Share specific tools/approaches for meeting stormwater management needs on a watershed basis (Pennsylvania and Delaware). - Address the interface with the regulatory requirements for MS4s. - Identify the best tools for analyzing least-cost solutions on a watershed basis. - Inform the ongoing Healthy Water Fund options.
Year 2-3		
May 24, 2016*	Project meeting with Delaware water purveyors	Discussed technical analysis and potential funding from the Delaware water purveyors. Discussed challenges and opportunities as it relates to private and public utilities in Delaware.
July 14, 2016*	Project meeting with Pennsylvania purveyors, Aqua	Discussed technical analysis and potential funding from Pennsylvania water purveyors. Discussed challenges and opportunities as it relates to private and public utilities in Pennsylvania.
October 3, 2016	Discussion with DNREC/MS4 credit/offset potential with Water Fund	Meeting with DNREC to present Water Fund and identify specific regulatory challenges and areas for coordination. Identified specific areas for further analysis in order to obtain regulatory compliance as it relates to the Water Fund. DNREC requested a presentation on the technical analysis conducted for the Water Fund.
December 6, 2016	Presented Water Fund technical analysis to DNREC	Provided DNREC with a detailed presentation on the technical analysis and modeling conducted for the Water Fund and the resulting conclusions drawn from the analysis.
January 30, 2017*	Convened DNREC and PADEP to discuss regulatory challenges to Water Fund implementation.	A pilot project is essential to identify specific challenges and ways to address regulatory concerns such as double counting, compliance, and regulatory credit. Follow-up meetings as pilot project is selected and fund progresses.

*Meeting summaries are provided in Appendices A and B.

Christina Watersheds Municipal Partnership

Development of SWMP/TMDL plans or PRPs, as well as their subsequent implementation is not currently funded (permitees must define funding mechanisms themselves) through any existing source. To aid this effort to meet regulatory requirements, several public and private watershed partners in 2010 organized the Christina Basin TMDL Implementation Partnership (CTIP) a multi-municipality group to lend expertise and in some cases material support to those efforts. The CTIP produced a strategic plan to help coordinate and implement projects throughout the watershed, and has been a forum for information and communication between the regulators and the regulated community. The Water Fund has been actively involved in this process over the course of the past year, to establish a channel through which capital can be matched with the need to produce cleaner water and healthy watersheds.

Collaboration between the Water Fund and regulated entities (and potential beneficiaries of the Water Fund) is further being effected through participation in the Christina Watersheds Municipal Partnership, a collaboration among many of the municipalities in Chester County, Pennsylvania currently required to develop stormwater plans.

The CTIP group began in 2010 primarily under the aegis of the Brandywine Red Clay Alliance (BRC, formerly the Brandywine Valley Association, or BVA) and the Chester County Water Resources Authority (CCWRA). The group invited the municipalities of the Christina Basin portion of Chester County to participate in a series of meetings and information sessions to promulgate information about the TMDL plans and stormwater requirements, and to assist in communication with the PADEP about related issues and concerns.

In 2016 the CTIP was reformulated to reflect a broader scope and more directed approach to meeting the needs of Brandywine-Christina municipalities in Chester County. The new name, Christina Watersheds Municipal Partnership (CWMP), emphasizes the broader context of water quality and watershed health beyond the TMDL context. Members previously associated with the CTIP were informed of the change in the fall of 2016. Appendix D presents the organizational chart of the CWMP.

A significant step forward for the CWMP (previously CTIP) was the awarding of a grant from the National Fish and Wildlife Foundation (NFWF) to implement a pilot program to develop a multi-municipality TMDL stormwater plan as part of the new permitting cycle. This effort involved a collaboration of many watershed partners, including the Water Fund, toward collaborative development of plans to address regulatory requirements. Traditionally PADEP had been reluctant to allow municipalities to work together to develop combined plans and implement shared BMPs. Even where money could be best spent across jurisdictional boundaries to provide a much better reduction potential for a lower cost, regulatory barriers rendered this approach infeasible.

The CWMP is focused on breaking down these regulatory barriers by providing technical expertise to work through the obstacles to collaborative stormwater and water quality

improvement approaches, and to develop dialogs with the PADEP and municipal officials (both paid staff, consulting engineers, and elected officials). The CWMP hopes to pilot such a collaborative approach to allow resources to be spent where they can best serve the needs of the watershed as a whole, and assist local governments that are under financial, political, and regulatory pressure. The grant award allowed the group to move forward with implementing their broad vision. Recent meetings of the CWMP and its predecessors toward this effort are presented in Appendix E.

Pilot Projects

The CWMP invited the municipalities who have participated in CTIP to become part of a pilot project to explore the feasibility of planning stormwater improvements under the MS4 permitting process on a multi-municipal basis (see invitation letter, Appendix F). In consideration for being part of the pilot, municipalities would pay $1000 annually (on top of the existing $1000 fee to be part of CTIP/CWMP). In return municipalities are being provided with technical and legal expertise to help develop plans for the current round of MS4 permitting. CWMP members coordinate efforts at communicating with the PADEP and other regulators, conduct meetings to develop methodologies to inventory infrastructure, define planning areas (i.e., regulated land), and calculate pollutant loads and reductions required by the TMDLs or Pollution Reduction Plan framework. The template agreement of municipalities to participate in the CWMP is presented in Appendix G.

Instead of trying to develop a single plan for all Chester County municipalities in the Brandywine-Christina Basin, three pilot areas were identified, representing agricultural areas (Honey Brook Borough and Honey Brook Township), urbanized areas (the City of Coatesville, South Coatesville and Modena Boroughs, and Caln, and Valley Townships), and suburban areas (New Garden, London Grove, Franklin Townships, and Avondale and West Grove Boroughs).

Each jurisdiction in the county will still be required to receive a separate MS4 permit, but those in the CWMP pilot program will develop a combined plan (or component of their plans) which specifies where and how they can collaborate on shared projects to more efficiently and a more cost-effective manner meet the regulatory requirements.

The draft plans for pilot areas (and other municipalities in Chester County) are due in June, 2017, followed by a 45-day comment period. The final plans will be due in September, 2017. Significant assistance from the CWMP include technical assistance in identifying planning areas (regulated areas), MS4 infrastructure (pipes, inlets, outfalls, stormwater catchments), GIS mapping and data management, coordination with PADEP to clarify questions regarding the regulations and the viability of proposed approaches to permit satisfaction. A series of meetings were held during this process, including planning meetings for the CWMP partners, CWMP member meetings, and CWMP pilot meetings for the agricultural, urban, and suburban pilots.

The Role of the Water Fund

Fund personnel have been actively involved in the CWMP since the grant was awarded and the pilot projects were conceptualized. Activities include:

- Development of recommended data structures and elements of stormwater infrastructure (pipes).
- Development of catchment delineation processes (presented to CWMP pilot partners and other municipalities).
- Mapping, GIS, and data analysis support for the suburban pilot area (in the White Clay Creek watershed).
- Attendance at suburban (White Clay) pilot meetings with stakeholders.
- Attendance at CWMP partner meetings (see Appendix E).
- Assistance on development of calculations to determine pollution loads and BMP efficiencies for use by municipalities (and/or their consultants) in determining regulated loads and required reductions.

Appendix A – Delaware Water Purveyors Meeting Summary

Brandywine-Christina Healthy Water Fund
Delaware Water Purveyor Meeting
May 24, 2016
10 am – 12 pm

MEETING ATTENDEES

Tom Coleman (City of Newark)
Tom Hubbard (Suez)
Chris Oh (City of Wilmington)
Mary Neutz (Suez)

Project Team
Jerry Kauffman
Richie Jones
Andrew Homsey
Brian Boutin
Martha Narvaez

MEETING AGENDA

Technical Analysis (Andrew Homsey/Brian Boutin)

Andrew Homsey provided an overview of the technical analysis that has been conducted in the Brandywine, Red Clay and White Clay Creek watersheds. This technical analysis identifies pollutant loads in the watershed based on subsheds as well as cost estimates to achieve the TMDLs and estimates for dollars spent for water quality improvement.

- Tom Hubbard will provide Andrew with data from Chris Crockett's analysis for mushroom farms in the Red and White Clay Creeks.
- Tom Coleman noted it is important to identify and locate mushroom compost facilities in the watershed (such as Nutri Soils) as well as mushroom farms.
- It would be helpful to identify what type of farming each farm is (for example row vs. pasture vs. mushroom). Different concerns are related to different types of framing, for example sediment with cropping systems and bacteria with animal (note: cow significantly higher crypto source than horse).
- Conservation easements may help to identify which farms are horse farms. Partners like the Brandywine Conservancy may be able to help with this type of clarification based on their land conservation and easement program.

- A map of how much money is going to ag BMPs, the total annual investment as of 2012, was provided.
- An analysis of the cost to achieve the TMDL target, set on a 15-year time horizon, by subshed was provided.
- Overall in the Red and White Clay Creeks it is >$2 million, closer to $1 million in the Brandywine, for 10-15 years to achieve the target for N, P and sediment. **Determining which subsheds have the highest loads as well as the most favorable return on reduction dollars helps to target projects in areas where BMPs can be most cost effective.**
- The unit reduction cost maps show where reductions are more or less expensive.
- The suite of BMPs chosen typically addresses all 3 parameters. There is N, P, and sediment overlap when installing BMPs, this is not accounted for so there could be a cost-reduction because one BMP may benefit all three parameters.
- Nitrogen is the most costly to reduce.
- Total cost estimates to meet the TMDLS in a 15-year time-frame:
    - Red Clay - $2.4M
    - White Clay - $2.3M
    - BC - $1.1M
- Tom Coleman noted these costs do not address flashiness/storm events.
- The source of loads – ag vs. all other sources – was provided for comparison. It was clear that the pollutant load coming from "all other sources" was significantly less than the ag load.
- Note: mushroom farms have a NMP in PA, other farms in PA do not.

Brian Boutin provided an overview of the InVEST/RIOS analysis conducted.

- Brian showed the cost and return on investment (ROI) for 6 conservation practices implemented across 218 hectares each (i.e. equal weighted distribution of each conservation practice across the watershed).
- RIOS/InVEST takes a different approach from MapShed where the user defines a specific annual investment level for implementation and creates an optimized conservation portfolio from that yearly investment – each year has a conservation portfolio created for it that builds upon the last.
- Note: wetland creation and restoration is the most expensive BMP and the majority of the cost. Stream fencing is the next highest cost.
- The ROI does not consider the location of the intakes. In future scenarios it was suggested to remove the subsheds beneath the intakes to get a better idea of the areas that purveyors are interested in.
- In years 10-20 the ROI starts to plateau.

- The model shows sediment and N can meet the TMDL in 30 years. The model shows P can't but this may be due to the current trends and the low levels of P.
- Year 10 there is the highest percent change in reductions.

Business Plan (Richie Jones)

Richie provided an overview of the water fund and the goal of the water fund.

- In general, a water fund is, the downstream water users fund projects upstream that will ultimately provide watershed services to the downstream users.
- The draft business plan for the water fund is due in October. The final business plan will be presented in March 2017.
- Stormwater managers, water purveyors and public/private investment will all be a piece of this investment strategy.
- Richie provided a brief discussion on capital stacking which, over time, may include sources such as startup capital, water fund funds (from municipal stormwater and water purveyors), corporate contributions, fines and fee-in-lieu, etc.

Discussion (All)

Richie provided the following question prompts for the meeting discussion:

- Do you see value in consolidation and expansion of capital?
- What does industry need to make shift from philanthropy to infrastructure investment?
- How can we move legal process forward – LOI to Term Sheet to Operating Entity?
- How can you support business plan and application to William Penn?
- How important is tax-deductibility of investment?
- What is your reaction to cost estimates from modeling?
- Other concerns?

Discussion:

- Tom Hubbard noted for the public and investor-owned purveyors it is very different. For the investor-owned it's dependent on recovering the capital – the PSC and PUC have a regulatory structure, rate-recovery that governs this. A public-utility can put this in their capital plan.
- It would be helpful to determine the impact of these investments on base flow. Does it help with drought resiliency? This would be helpful for Newark to know. For example, forest restoration as a BMP could negatively impact stream flows yet improve water quality.

- Suez is currently applying to the PSC for rate-recovery for the crypto work they are doing. Support for this effort could be helpful.
- Wilmington has not had any crypto hits to date.
- For municipalities this is a pricing issue for investor-owned this is a used-and-useful.
- Suez commented there is a lot of competition for capital investment.
- Is there a need for the amount contributed to be tax deductible? How important is that? There was discussion surrounding the issue if you get something in return it cannot be considered tax deductible. Different initiatives Suez contributes to, some are tax deductible, like work with PDE, and others like White Clay work are not.
- Newark suggested that it would be helpful for someone from the Water Fund team to present to the Conservation Advisory Committee. The meetings are held the second Tuesday of each month, 7-9 pm.
- In July 2017 the team will present the proposal to start the Water Fund.
- Newark is budgeting for 2017 now. Newark would need a place holder amount. Newark is also currently working on a rate-study so this may be a good time to get this in the budget. Budgeting in the "out years" was also discussed.
- Suez was asked who at United would benefit from a presentation on the water fund. Tom mentioned John and mentioned he would think about it and get back to the group.
- Newark mentioned working through the MS4 process is important too. Newark has $40,000 budgeted for MS4 work. It was suggested that the water fund team meet with DNREC to continue this discussion.
- Wilmington mentioned their source water fund. Currently about $40,000 is going to the Brandywine Conservancy for source water protection. Chris Oh is going to talk to Allison regarding stormwater funds. The Brandywine Conservancy is going to put together a presentation for Chris to talk about the successes and the projects that Wilmington has contributed to upstream. It was suggested that the water fund team present to the City Public Works staff and City Council as well.
- Newark has the potential to contribute $40,000 for the first few years then see how it's going in 5 years.
- Currently Suez sends about $64,000/year to DRBC. This is something Tom suggested the water fund team look into regarding recovering these funds for their benefit. Newark sends about $12,000/year.

Communications Survey and Focus Group Summary (Martha Narvaez)

OpinionWorks recently conducted a phone survey (approximately 300 respondents) and two focus groups (suburban and ag populations) in southeast PA. The survey work included questions related to the population's attitudes about water (for example, knowledge of local waterways,

level of pollution in local streams and their connection to drinking water). Their willingness-to-pay as well as their level of acceptance for a water fund were also assessed.

This data will be paired up with the data collected in New Castle County for the state-wide clean water fee and the Partnership for the Delaware Estuary's Delaware Basin-wide analysis. Compiling all three sources of data, all of which were conducted by OpinionWorks, will provide a more complete analysis of the entire Brandywine-Christina watershed.

Next Steps (Jerry Kauffman)

Jerry provided a brief summary of an analysis of the dollars spent on improving water quality in the watershed. This exemplified that the water fund will not need to cover the entire cost of meeting the water quality goals.

The next meeting will be the Steering Committee meeting which will be held on June 14 at Mount Cuba in Hockessin, DE.

Appendix B – Pennsylvania Purveyor Meeting Summary

Meeting with Tony Fernandes, AQUA America
Brandywine Christina Healthy Water Fund
2 pm on July 14, 2016
University of Delaware - Water Resources Center
Newark, Del.
w/ Kash Srinivasan, Martha Narvaez, Andrew Homsey, and Jerry Kauffman

1. As investor to water fund, AQUA would scrutinize the watershed models/technical analysis.

2. The subwatershed scale is sufficient for the watershed models and the technical analysis.

3. Issue with cost recovery according to director of water rates at AQUA formerly head of PA PUC. Water treatment is measureable and within geography of the service area therefore able to recover costs. Upstream source water investment difficult to recover since BMPs are less measureable and outside of service area geography.

4. Remedy to recover costs via water rates is to classify source water investment as a category similar to the distribution improvement charge where AQUA can recover 1% to 5% of the water rate to replace pipes, etc. AQUA could then claim source water investment in water fund as capital asset with BMPs installed close as possible to the service area and water intake.

5. Don't want to hinder AQUA Tree Revitalize investments, AQUA received an award for this program.

6. AQUA has option to invest in source water quality directly in lieu of a pooled water fund.

7. Need to meet with DE PSC and PA PUC to obtain regulation change so purveyors can recover water fund costs through water rate revenues.

8. Get the BCHWF going in Delaware with the PSC and Delaware water purveyors and seed money from WPF and others, prove the concept, and then phase into the PA water purveyors.

Appendix C – DNREC and PADEP Meeting Summary

Brandywine-Christina Healthy Water Fund, January 30, 2017

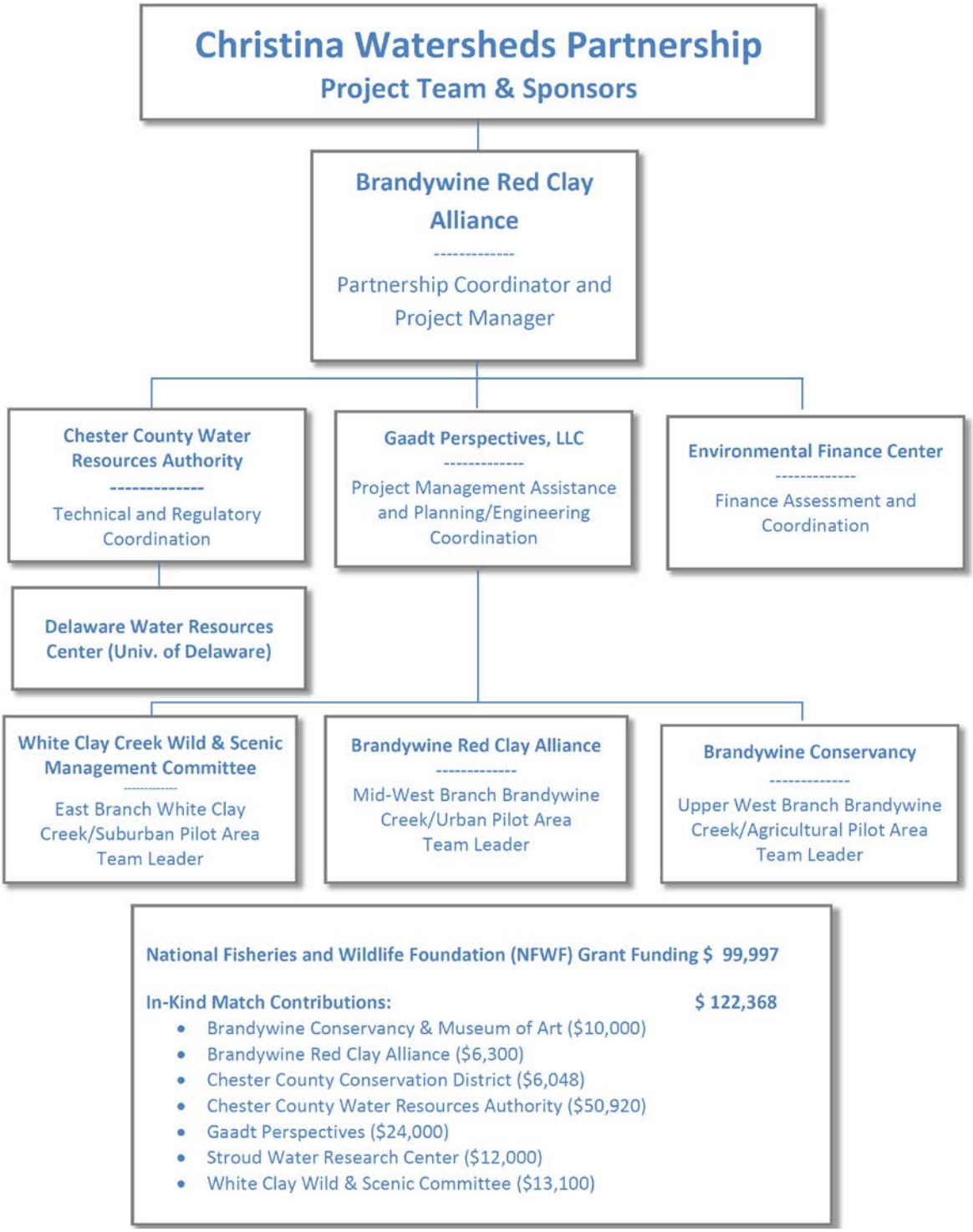
Meeting topic: Funding projects across state lines

- Both DNREC and DEP expressed interest in cooperation.
- PADEP supported using a pilot project to work through the challenges and opportunities for future project implementation and regulatory framework.
- Discussion around tracking, verification and compliance.
- DNREC will need to work through the specifics with DNREC's Divisions of Water and Watershed Stewardship.
- Significant discussion related to requirements to achieve baseline before any "credits" can be received for work.
- It was suggested that if PA is not taking credit for the BMPs, there needs to be PA coordination but don't need to apply PA methods.
- The Chesapeake Bay and Wissahickon models were briefly discussed.
- It was suggested that the Water Fund team come up with a framework for verification, counting, maintenance, etc.
- The group will engage with EPA at a later date once there are more details for the pilot project.
- DNREC would like to review the Water Fund's business plan when it is available.

Meeting Attendees

Name	Affiliation
Jan Bowers	Chester County Water Resources Authority
Martha Narvaez	University of Delaware (Water Fund Team)
Jennifer Fields	PA DEP
Lee Murphy	PA DEP
Tom Coleman	City of Newark
Naomi Young	University of Maryland - Environmental
Jenn Roushey	DNREC- Division of Water
John Rebar Jr	DNREC- Surface Water Discharge Section
Judy Jordan	DNREC- Surface Water Discharge Section
Jennifer Egan	The Nature Conservancy (Water Fund Team)
Jennifer Pyle	University of Delaware, Stormwater
Kelley Dinsmore	City of Newark
Sara Wozniak	DNREC- Watershed Stewardship
Shane Morgan	White Clay Watershed Assoc.
Bob Struble	Brandywine Red Clay Alliance
Jerry Kauffman	University of Delaware (Water Fund Team)
Kash Srinivasan	Water Fund Team
Andrew Homsey	University of Delaware (Water Fund Team)

Appendix D – CWMP Organizational Chart



Appendix E – CWMP Meetings

Meetings of the CWMP (and predecessors)

Entire Group Meetings: July 22, 2015, November 4, 2015, March 6, 2016,

July 19, 2016, August 16, 2016, October 26, 2016, January 25, 2017, April 12, 2017, May 1, 2017

Group Workshops: November 14, 2016, Jan 13, 2017,

Planning Group Meetings:

May 2,10, and 16, 2016, June 3, 2016, June 17, 2016, July 6, 2016, August 15, 2016, Sept. 23, 2016, October 19, 2016, October 26, 2016, December 13, 2016, January 10, 2017, February 1, 2017, March 8, 2017, April 5, 2017,

Pilot Meetings:[1]

Urban: February 13, 2017, March 16, 2017, May 1, 2017

Ag Pilot: February 21, 2017, March 29, 2017

Suburban Pilot: February 14, 2017.

[1] The pilot groups met on a more frequent basis. This list is not complete.

Appendix F – Invitation Letter to Municipalities to Join CWMP/CTIP Pilot Project

Christina Watersheds Partnership[2]
Invitation to Participate - Pilot Collaboration Project

Brandywine Red Clay Alliance invites your municipality to participate in a collaboration and pilot project to restore our community's waterways by bringing impaired streams to unimpaired status in a cost-effective manner consistent with federal and state laws and regulations. Named the *Christina Watersheds Partnership*, this collaboration is a continuation of your municipality's previous work with over 30 other municipalities in Christina Basin watersheds to proactively address the regulatory requirements to protect and restore water quality. The new name signals the Partnership's shift in focus from just TMDL compliance to watershed-based implementation planning and protection that has the ultimate aim of bringing impaired streams to unimpaired status in less time and using limited resources more effectively while meeting regulators' expectations.

Existing regulations, which have been effective in reducing water pollution from industrial and municipal wastewater treatment point sources, are now focusing on non-point discharges, in particular stormwater runoff from developed and agricultural lands, including runoff from municipal stormwater systems. Complying with the new regulations will likely impose high costs when applied individually to the small municipalities that characterize Pennsylvania. This collaboration in the Christina Basin watersheds (Brandywine, Red Clay and White Clay Creeks) provides an avenue for municipalities to share knowledge and information about the design and implementation of strategies to address impaired streams and protect the unimpaired ones. It provides access to technical experts and direct engagement with PADEP and other regulators that should facilitate your municipality's timely and effective response to water quality protection requirements.

In addition to continuing the multi-municipal work of the past, the Christina Watersheds Partnership is also piloting approaches to explore the feasibility and practicality of small-scale, multi-municipality watershed-based collaboration to comply with pollution reduction targets. PA regulations are written to achieve pollution reduction targets on a municipality-by-municipality basis. However, PADEP has recently expressed greater flexibility to allow – and is now promoting – watershed-based collaborations of municipalities and stakeholders to achieve pollution reduction. Over the next two years, the Partnership intends to facilitate multi-municipal, watershed-based "water quality improvement plans" for three pilot areas. In principal, developing watershed-level plans involving multiple Pennsylvania municipalities should lead to more efficient and effective implementation of stormwater pollution reduction.

[2] [Editor's note] This is was provisional name for the Christina Watersheds Municipal Partnership, now superseded.

Your municipality is invited to participate in one of the three pilot areas (see attached map) comprising contiguous landscapes of suburban (East Branch White Clay Creek watershed), urban (mid-West Branch Brandywine Creek watershed), and rural-agricultural (upper-West Branch Brandywine Creek watershed) communities. Each area forms a natural stream restoration planning region for achieving and maintaining state water quality standards by meeting Total Maximum Daily Load (TMDL) and Pollution Reduction Plan (PRP) targets, which can help turn the "red" (impaired) streams (displayed on the map) to "blue" (unimpaired) streams.

To participate in this collaboration, the Christina Watersheds Partnership seeks a two-year commitment. As a pilot partner, the commitment involves: adoption of a resolution formally indicating your municipality's commitment to participate; committed municipal staff and engineering time to work on a multi-municipal pilot area planning team (including monthly meetings), and financial support of $2,000 ($1,000 per year). Your municipality will receive specialized assistance from technical experts in planning, permitting, restoration and finance to: produce individual municipal MS4 application materials that include legally enforceable BMP commitments across contiguous municipalities; demonstrate pollution reduction within each municipality over the permit term; and a strategy to work toward eliminating stream impairments within a 15-20 year planning horizon.

On behalf of the Christina Watershed Partnership, we request that your board of elected officials consider adopting the enclosed resolution of commitment and, if approved, please return a signed copy to Mr. Robert Struble, Jr., at Brandywine Red Clay Alliance. Please feel free to contact him to arrange for a meeting or for any questions or further information you may need (601-793-1090; *rstruble@brandywineredclay.org*).

Appendix G – CWMP Municipal Collaboration Agreement Template

TOWNSHIP/BOROUGH NAME _____

RESOLUTION 2016 - ___

PARTICIPATION IN CHRISTINA WATERSHEDS PARTNERSHIP PILOT Collaboration Project

WHEREAS, the [_____Township] [Borough of _____] lies within the [East Branch White Clay Creek watershed] [West Branch Brandywine Creek watershed] and within the Christina Basin, and discharges to streams or tributaries therein that have been designated as "non-attaining" of their water quality standards ("impaired") in the Pennsylvania Integrated Water Quality Monitoring and Assessment Report (2014) , pursuant to the federal Clean Water Act, some portions of which have a Total Maximum Daily Load (TMDL) established for sediments and/or nutrients ; and

WHEREAS, the [municipal name] is required under the Clean Water Act and Pennsylvania NPDES municipal separate stormsewer system (MS4) regulations to submit to the Pennsylvania Department of Environmental Protection (PADEP) by September 2017 plans to improve water quality of these "impaired" streams and to achieve specific stormwater pollutant load reduction goals established by PADEP and U.S. Environmental Protection Agency and, thereafter, to implement those plans until the stream water quality is fully restored to the state standards; and

WHEREAS, other adjacent municipalities also discharge stormwater to these "impaired" streams and are under the same regulatory obligations; and

WHEREAS, the [municipal name] has been a participant for __ years in the Christina Basin TMDL Implementation Partnership (CTIP), and wishes to continue its participation in this partnership, which is now the Christina Watersheds Partnership, to continue working with 32 other municipalities within the Christina Watersheds to exchange information, collaborate and coordinate on water quality improvements and related activities to address these regulatory obligations; and

WHEREAS, the Brandywine Red Clay Alliance, as the convener and lead coordinator of the Christina TMDL Implementation Partnership and now the Christina Watersheds Partnership, has received a two year grant from the National Fish and Wildlife Foundation to provide the [municipal name] specialized assistance from technical experts in planning, permitting, restoration and finance to: produce individual municipal MS4 permit application materials that include legally enforceable best management practice (BMP) implementation commitments across contiguous municipalities; demonstrate pollution reduction within each municipality over the permit term; and provide a strategy to work toward eliminating stream impairments within a 15-20 year planning horizon; and

WHEREAS, the townships and boroughs in the Christina Watersheds recognize that working together to meet these regulatory requirements by developing watershed-level plans involving multiple Pennsylvania municipalities will, in principal, identify where collaboration among the municipalities could result in cost savings and better water quality outcomes, and result in more efficient and effective stormwater pollution reduction measures; and

WHEREAS, the other adjacent townships and boroughs in the [East Branch White Clay Creek watershed] [West Branch of the Brandywine Creek watershed] have also been invited and are considering participation in this pilot collaboration project;

NOW, THEREFORE, IT IS HEREBY RESOLVED by the [Board of Supervisors] [Borough Council] of the [municipal name] that:

1. The [municipal name] commits to participate in the Christina Watersheds Partnership Pilot Collaboration Program for the next two years.
2. The commitment to participate includes:
    a. Involvement by municipal staff and engineer to work on a multi-municipal pilot area planning team, including monthly meetings, attendance at other project meetings, and related supportive work, as deemed appropriate by the municipality;
    b. Sharing of non-proprietary, non-confidential data as deemed appropriate by the municipality; and
    c. Financial support of $2,000 ($1,000 per year) to the Christina Watersheds Partnership, payable to the Brandywine Red Clay Alliance as the project manager.

3. As and when required by the Pennsylvania Intergovernmental Cooperation Act (Act of July 12, 1972, P.L. 762, 53 P.S. Section 481, *et seq*., as amended), the [municipal name] will adopt an appropriate ordinance to authorize entering into an intergovernmental cooperation agreement for the furtherance of its participation in the Christina Watersheds Partnership Pilot Collaboration Program.