

REPORT

KENT COUNTY SURFACE WATER MANAGEMENT LEVEL OF SERVICE ANALYSIS



Prepared for
DNREC Division of Soil and Water Conservation
Kent Conservation District
Kent County

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EXECUTIVE SUMMARY

This analysis began in May of 2008 and was funded equally by the Delaware Department of Natural Resources and Environmental Control (DNREC) Division of Soil and Water Conservation, the Kent Conservation District, and Kent County. Representatives from these agencies oversaw its preparation as the Joint Coordinating Committee (JCC). The purposes of the project were to determine the current level and costs of surface water management offered in Kent County and to identify the levels and costs needed to adequately meet the needs of current residents and the expanding population.

This project built upon previous efforts such as Governor Minner's Task Force on Surface Water Management (2005) and the Delaware Public Policy Institute Dialogue on Financing Wastewater and Stormwater Infrastructure (2006). In addition to the sponsoring agencies, meetings were also held with numerous other government entities and stakeholders including DeIDOT, tax ditch managers, municipal representatives, the Home Builders Association of Delaware, and the Kent County Conservancy.

Information obtained through interviews and document research was used to categorize program areas and responsibilities, determine current expenditures, identify issues of concern, project future funding needs, and develop alternative governance structures to provide services.

Twelve program areas were developed as follows:

- Stormwater Program
- General Drainage
- Tax Ditch Assistance
- Tax Ditch Management
- Watershed Modeling for Quantity and Quality Management
- Maintenance of and Improvements to Public Infrastructure
- Maintenance of and Improvements to Private Infrastructure
- Water Quality Strategies
- Flood Plain Protection and Improvement
- Dam Safety
- Public Outreach and Public Involvement
- Planning and Regulatory Aspects

Responsible parties were identified for each and three levels of service developed: Current Level, Minimum Additional, and Optimum Program. Program aspects and funding needs for each element and service level were developed and have been summarized on pages iii - vi of this Executive Summary. It was found that current expenditures in a typical year total \$9,400,000. The additional annual funds to meet the Minimum Additional Program are \$8,250,000 for total expenditures of \$17,650,000. An additional \$16,100,000 is needed for the Optimum Program for total expenditures of \$25,500,000. One time costs were found to be \$2,750,000 and \$3,400,000 for the Minimum Additional and Optimum Program, respectively.

Nearly half of the current annual expenditures are spent on public infrastructure. General tax appropriations are the primary source. This estimate is a reflection of more day-to-day costs and does not include isolated major expenditures. A majority of the Minimum Additional needs is comprised of 21st Century Fund shortfalls but recognizes additional expenditures on tax ditch assistance, preparation of inventories, and maintenance of stormwater management basins. The Optimum Program enables greater allowance for private parties such as Tax Ditch Organizations and homeowner associations (HOAs) and also includes additional personnel and equipment for government agencies.

The most notable prior effort to quantify these costs was the Governor's Task Force, though it offered Statewide projections. This Level of Service analysis made certain assumptions regarding the Task Force's annualized needs and determined that approximately \$7,000,000 of the over \$40,000,000 Statewide would be

realized in Kent County. The \$8,250,000 Minimum Additional Program needs identified are principally comprised of project expenses. Though some needs were quantified in one document but not the other, the projections developed independently are similar and would seem to validate the estimates.

The recommendations offered focus more on broader themes as opposed to specific program changes and are presented in three contexts.

Programmatic Recommendations which will require a high degree of planning and resources and, if implemented, would result in new or substantial changes to existing programs. These include:

- Create a Stormwater Management District
- Develop Mechanisms Governing the Maintenance of Privately-owned Stormwater Management Structures

Administrative Recommendations which can be accomplished more quickly than those related to program changes and with minimal additional resources. These include:

- Develop Report Dissemination Strategy
- Prepare a More Comprehensive Organizational Analysis and Detailed Cost Model
- Reassess Program Funding Sources and Personnel Allocation for the Kent Conservation District
- Better Clarify Maintenance Responsibilities
- Evaluate Policies and Update or Prepare Regulations and Codes
- Improve Education and Outreach

Policy Recommendations that necessitate approaches or tactics on an entirely new level. These include:

- Provide Better Funding for Tax Ditch Organizations
- Address Aging Public Infrastructure and Flooding
- Evaluate Reliance on Tax Ditch Organizations

This report completes this Level of Service Analysis. It is intended to provide a framework for budgetary conversations and guidance for moving forward. It is not an end point but rather a blueprint for future action.

PROGRAM SUMMARY

Program Area	Current Level	Minimum Additional	Optimum Program
A. Stormwater Program	<ul style="list-style-type: none"> \$220,000 in DNREC salaries to oversee administration of State's Sediment and Stormwater Regulations 	<ul style="list-style-type: none"> No additional resources needed 	<ul style="list-style-type: none"> No additional resources needed
	<ul style="list-style-type: none"> \$500,000 in KCD salaries for plan reviews, inspections, and program management 	<ul style="list-style-type: none"> No additional resources are needed but reevaluating revenue sources and reallocating those currently existing should be considered 	<ul style="list-style-type: none"> \$175,000 for two additional District employees to perform more vigorous inspections and assure upkeep of stormwater management structures which will almost certainly increase in number
	<ul style="list-style-type: none"> \$150,000 in DelDOT salaries for plan reviews, inspections, and program management 		
B. General Drainage	<ul style="list-style-type: none"> \$410,000 in DNREC salaries for technical assistance, complaint response, surveying, and project management \$200,000 for DNREC projects utilizing 21st Century funds \$230,000 in DNREC contractual (also supports Stormwater program) 	<ul style="list-style-type: none"> \$1.5 million for 21st Century Fund projects \$75,000 for additional DNREC engineer or planner to manage additional 21st Century Fund projects 	<ul style="list-style-type: none"> \$3.0 million for 21st Century Fund projects \$75,000 for additional DNREC engineer or planner to manage additional 21st Century Fund projects
	<ul style="list-style-type: none"> \$25,000 in KCD salaries (from Kent County) for general drainage and ditch work 		
	<ul style="list-style-type: none"> \$50,000 in Kent County salaries for drainage work related to construction projects 		

Legend						
DNREC	KCD	Kent County	DelDOT	Municipalities	Tax Ditch Orgs	Private Entities

Program Area	Current Level	Minimum Additional	Optimum Program
C. Tax Ditch Assistance	<ul style="list-style-type: none"> • \$205,000 in DNREC salaries 	<ul style="list-style-type: none"> • \$50,000 for additional DNREC Tax Ditch Coordinator to provide inspections and technical assistance (Statewide) • \$100,000 for DNREC computer system upgrades and associated costs (one time cost for Statewide coverage) 	<ul style="list-style-type: none"> • \$100,000 for two additional DNREC tax ditch coordinators to provide inspections and technical assistance (Statewide) • \$100,000 for DNREC computer system upgrades and associated costs (one time cost for Statewide coverage)
	<ul style="list-style-type: none"> • \$60,000 in KCD salaries for technical assistance to Tax Ditch organizations 		<ul style="list-style-type: none"> • \$50,000 for Tax Ditch Technician to coordinate and administer various tasks
D. Tax Ditch Management	<ul style="list-style-type: none"> • \$310,000 for Cost Share projects to address maintenance activities (funds provided by State and County) 	<ul style="list-style-type: none"> • \$300,000 for Cost Share projects to address major maintenance activities 	<ul style="list-style-type: none"> • \$600,000 for Cost Share projects to address major maintenance activities
	<ul style="list-style-type: none"> • \$165,000 for Cost Share projects to address maintenance activities 		
E. Watershed Modeling	<ul style="list-style-type: none"> • \$250,000 for the Murderkill Watershed Stormwater Management Plan 	<ul style="list-style-type: none"> • \$125,000 to complete remaining major watersheds in ten years • \$20,000 to complete remaining tributary watershed plans in ten years 	<ul style="list-style-type: none"> • \$125,000 to complete remaining major watersheds in ten years • \$20,000 to complete remaining tributary watershed plans in ten years • \$100,000 for GIS computer system upgrades (one time costs)
		<ul style="list-style-type: none"> • No additional personnel are needed but developing mechanism for other program staff to work on watershed issues is advised 	<ul style="list-style-type: none"> • \$75,000 for additional KCD employee to coordinate watershed activities
		<ul style="list-style-type: none"> • \$20,000 to complete all municipal plans in ten years 	<ul style="list-style-type: none"> • \$20,000 to complete all municipal plans in ten years

Legend						
DNREC	KCD	Kent County	DelDOT	Municipalities	Tax Ditch Orgs	Private Entities

Program Area	Current Level	Minimum Additional	Optimum Program
F. Maintenance of and Improvements to Public Infrastructure	<ul style="list-style-type: none"> • \$1,400,000 in DelDOT salaries to manage 2,650 lane miles of roads • \$1,800,000 in DelDOT projects 	<ul style="list-style-type: none"> • \$2,000,000 for complete drainage inventory (one time cost) • \$700,000 in DelDOT salaries for increased maintenance capabilities • \$900,000 for DelDOT projects 	<ul style="list-style-type: none"> • \$2,000,000 for complete drainage inventory (one time cost) • \$1,400,000 in DelDOT salaries for increased maintenance capabilities • \$1,800,000 for DelDOT projects
	<ul style="list-style-type: none"> • \$200,000 in municipal projects such as inlet repairs, pipe replacements, etc. 	<ul style="list-style-type: none"> • \$100,000 for municipal projects such as inlet repairs, pipe replacements, etc. 	<ul style="list-style-type: none"> • \$200,000 for municipal projects such as inlet repairs, pipe replacements, etc.
G. Maintenance of and Improvements to Private Infrastructure	<ul style="list-style-type: none"> • \$1,800,000 for minor maintenance such as grass cutting by homeowner associations 	<ul style="list-style-type: none"> • \$1,800,000 for minor maintenance such as control of invasive plants, erosion repair, etc. • \$1,250,000 for major renovations and retrofits 	<ul style="list-style-type: none"> • \$3,600,000 for minor maintenance such as control of invasive plants, erosion repair, etc. • \$2,500,000 for major renovations and retrofits
H. Water Quality Strategies	<ul style="list-style-type: none"> • \$50,000 in KCD costs related to NPDES compliance 	<ul style="list-style-type: none"> • \$25,000 for KCD for increased efforts related to NPDES compliance • \$100,000 for small grants program for improvement projects • \$25,000 for part-time grant administrator 	<ul style="list-style-type: none"> • \$25,000 for KCD for increased efforts related to NPDES compliance • \$200,000 for small grants program for improvement projects • \$50,000 for full-time grant administrator
	<ul style="list-style-type: none"> • \$175,000 in City of Dover costs related to NPDES compliance 	<ul style="list-style-type: none"> • \$90,000 for City of Dover for increased efforts related to NPDES compliance 	<ul style="list-style-type: none"> • \$90,000 for City of Dover for increased efforts related to NPDES compliance
	<ul style="list-style-type: none"> • \$700,000 in DelDOT costs related to NPDES compliance 	<ul style="list-style-type: none"> • \$350,000 in DelDOT costs for increased efforts related to NPDES compliance 	<ul style="list-style-type: none"> • \$350,000 in DelDOT costs for increased efforts related to NPDES compliance
I. Flood Plain Protection and Improvement	<ul style="list-style-type: none"> • \$150,000 for flood plain mapping in the Murderkill watershed 	<ul style="list-style-type: none"> • \$500,000 for completing mapping of lower estimate of remaining major streams in County (one time cost) • \$50,000 for map maintenance (updates) 	<ul style="list-style-type: none"> • \$1,000,000 for completing mapping of upper estimate of remaining major streams in County (one time cost) • \$100,000 for map maintenance (updates)

Legend						
DNREC	KCD	Kent County	DelDOT	Municipalities	Tax Ditch Orgs	Private Entities

Program Area	Current Level	Minimum Additional	Optimum Program
J. Dam Safety	<ul style="list-style-type: none"> • \$40,000 in DNREC salaries to oversee dam safety program • \$200,000 for the preparation of Emergency Action Plans 	<ul style="list-style-type: none"> • \$200,000 for the preparation of Emergency Action Plans for 20 dams over a five year time frame • \$500,000 for structural modifications to one dam every two years 	<ul style="list-style-type: none"> • \$400,000 for the preparation of Emergency Action Plans for 20 dams over a two and a half year time frame • \$1,000,000 for structural modifications to one dam every year
K. Public Outreach and Public Involvement	Current expenditures are negligible	<ul style="list-style-type: none"> • \$50,000 for assorted programs such as literature, advertisements, and volunteer programs • \$25,000 for part-time additional KCD employee to coordinate programs 	<ul style="list-style-type: none"> • \$75,000 for assorted programs such as literature, advertisements, and volunteer programs • \$50,000 for full-time additional KCD employee to coordinate programs
L. Planning and Regulatory Aspects	Current expenditures are negligible	<ul style="list-style-type: none"> • \$50,000 to Kent County to prepare Lines and Grades and/or other ordinance (one time cost) • \$100,000 to municipalities for various code writing tasks (one time cost) 	<ul style="list-style-type: none"> • \$100,000 to Kent County to prepare Lines and Grades and/or other ordinance (one time cost) • \$100,000 to municipalities for various code writing tasks (one time cost)

Legend						
DNREC	KCD	Kent County	DelDOT	Municipalities	Tax Ditch Orgs	Private Entities

I. INTRODUCTION

This Level of Service Analysis of Surface Water Management Needs in Kent County was initiated in January 2008 with the retaining of URS Corporation. The project was funded equally by the Delaware Department of Natural Resources and Environmental Control (DNREC) Division of Soil and Water Conservation, the Kent Conservation District, and Kent County and representatives from these agencies oversaw the preparation of the analysis.

The purpose of this project was to determine the current level and extent of public services offered in Kent County related to surface water management, and to identify both the cost and the degree to which they may be initiated or increased to adequately meet the needs of the expanding population within the County. Analyses built upon previous efforts such as Governor Minner's Task Force on Surface Water Management (2005) and the Delaware Public Policy Institute Dialogue on Financing Wastewater and Stormwater Infrastructure (2006).

A kick-off meeting for the project was held on May 28, 2008 and was attended by representatives from the three funding agencies. The issues were framed, approaches developed, and potential outcomes discussed. Additional meetings of the oversight committee were held on September 30, October 28, November 25, 2008, and January 13, April 2, and August 18, 2009. Minutes of each meeting are included in Appendix B. Multiple meetings and separate interviews were held with each funding agency as well as DelDOT. The assessment and preliminary recommendations were presented to a meeting of the Kent Conservation District Board of Supervisors on May 18, 2009. Two members of the Kent County Levy Court were also in attendance.

Interview meetings were also held with six municipalities (Camden, Clayton, Dover, Harrington, Milford, and Smyrna). Notifications about the project were sent to the remaining 14 cities and towns. Surveys were prepared and mailed to each of the 86 tax ditch organizations in the County. Thirty-three were returned or just under 40 percent. Interviews were also held with interested stakeholders including the Kent County Conservancy and the Delaware Association of Homebuilders.

These surveys and interviews formed the basis for this analysis. Areas of responsibility, surface water management functions, concerns and unmet needs, and budgets and expenditures were identified. Databases were developed to more easily analyze municipal operations and tax ditch organization efforts.

Utilizing information obtained through interviews and document research, 12 program areas were identified, costs were estimated, and recommendations developed.

II. BACKGROUND

A. Kent County Characteristics and Trends

Kent County comprises approximately 800 square miles which places it in the middle of Delaware's three counties. Its population was listed as 126,697 in the 2000 U.S. Census which represented a 13.5 percent increase over the 1990 population. The Delaware Population Consortium estimated the County population at 143,458 in 2005, which would be a 12.8 percent increase over the 2000 population, and 157,404 in 2010 or a 22.5 percent increase. It is anticipated that the population will continue to grow but at a less dramatic rate with a projection of 189,000 residents in 2030. According to the Kent County Comprehensive Plan, 20,411 building lots were approved between 2000 through 2007 with 14,858 having been recorded. An estimated 12,000 vacant lots exist within recorded subdivisions. A Growth Zone Overlay was created in 1996, and since then 69 percent of approved development has occurred in this zone.

The County offers a mix of land uses and customs. Dover, the State capitol, lies in its center and in addition to its many government functions hosts diverse events ranging from cultural activities to NASCAR races. C-5 Galaxy military cargo planes are a common site. Other parts of the County range from suburban to agricultural and include miles of shoreline along the Delaware Bay. There are 20 incorporated cities and towns in the County.

Two prior efforts are notable in providing context for this Level of Service Analysis. The first is the work and subsequent report by Governor Minner's Task Force on Surface Water Management, completed in 2005. The second is the Delaware Public Policy Institute's Dialogue on Financing Wastewater and Stormwater Infrastructure undertaken in 2006. Each is described below.

B. Governor Minner's Task Force on Surface Water Management - 2005

The Task Force was created in 2005 by the Governor's Executive Order Sixty-two and tasked with, among other charges, developing strategies for integrating drainage, flood control, and stormwater management and exploring potential costs and funding sources for implementing a strategy. It was comprised of a broad representation of government employees as well as representatives from the private and nonprofit sectors. In order to accomplish the work mandated by and within the time frame stated in the Executive Order, the Task Force created four subcommittees: Governance, Finance, Land Use and Regulation, and Maintenance and Restoration with membership in each broadened to include other interested stakeholders. A total of 30 recommendations were made. Only those relevant to this Level of Service Analysis are shown in Table I below along with their applicability.

Table I – Governor's Task Force Recommendations	
<u>Recommendation</u>	<u>Applicability</u>
Recommendation #2. A central response unit coordinated by DNREC in conjunction with county or municipal utilities should be created for handling public calls related to drainage, stormwater, and flood control. A new process and response procedure for addressing citizen complaints related to stormwater facilities and flooding needs to be established. Citizens should be provided with a single point of contact.	Already done

<u>Recommendation</u>	<u>Applicability</u>
Recommendation #3. The State Department of Safety and Homeland Security and local emergency response agencies should review flooding emergencies and determine that adequate protocols exist to ensure seamless and effective communication, coordination, and response to endangered citizens and property, and that their respective responsibilities be clearly delineated.	Yes
Recommendation #5A. Stormwater utilities operating at the county or local level should be formed as a funding vehicle for the purpose of providing a simplified and comprehensive approach to drainage and flooding problems throughout each county. The utility would be a mechanism to provide necessary funding for implementing improved surface water management.	Yes
Recommendation #5B. A proposed stormwater utility fee should be utilized for the purpose of planning, maintenance, capital construction and administration. To minimize additional administrative costs associated with the utility, the fee should be set and collected at the county or municipal level, possibly utilizing the existing real estate tax or sewer billing process. The individual counties or municipalities should receive compensation for billing and collection costs. Funds and funding decisions should be kept at county or municipal level but associated annual work plans should be presented to the Surface Water Advisory Council (SWAC). Municipalities may elect not to join a county level utility but must establish their own utilities or other funding sources that meet the established Statewide standards.	Not yet
Recommendation #5C. The fees would be established at a level appropriate to fund the needs identified without the use of general obligation or other special or exceptional (e.g., 21 st Century) funding. The utility operating units should have the latitude to make modifications to its fee for credits and enhancements as appropriate subject to the approval of the SWAC. The county level units would establish cooperative agreements with municipal level units or local governments. Financial audits to be provided to the SWAC on an annual basis.	Not yet
Recommendation #5D. The Stormwater Utility fee should be levied on all property in the State recommended for inclusion by the SWAC. The fee should be assessed on residential customers using a flat rate fee structure for all residential properties of a specific nature (e.g., residential properties with similar zoning would be assessed identical rates). The fee will be levied on all developed nonresidential properties using equivalent residential runoff units which are essentially a measure of impervious surface. A credit system should be established for developed non-residential utility customers that recognizes existing and/or planned on-site stormwater quantity/quality management practices. A Board of Appeals at the utility level or similar board should handle appeals.	Not yet
Recommendation #6. Stormwater utilities should have the ability to sell revenue bonds to leverage the collected fee to the extent practicable.	Not yet
Recommendation #7. Urban, suburban, and defunct tax ditch organizations may be considered for inclusion into the county or municipal stormwater utility.	Yes
Recommendation #12. The stormwater utilities, DNREC, designated agencies, and delegated agents should have authority to enter onto private lands or waters for the purpose of surveys, assessments, and emergency repairs. However, entry except for emergency repairs will require a 48 hour notice and said agency would at all times be responsible for any and all damages which shall be done to the property of any such person or persons.	Partially
Recommendation #13. The stormwater utilities should be authorized and empowered to acquire by gift, devise, purchase, exchange, or any other method of acquiring real property or any estate, interest, or right therein, provided that such acquisition shall not be made through the exercise of the power of eminent domain.	Not yet

<u>Recommendation</u>	<u>Applicability</u>
Recommendation #14. Right of entry for essential maintenance and repairs, in the form of recorded easements, should be a condition of approval if public funds are used or if the maintenance is to be assumed by a public entity (such as stormwater utilities). A 48 hour notice would be required.	Yes
Recommendation #17. State funding for property buyouts on a reactive basis (after damage) should be legislated at the State level for consistency. The possession of flood insurance should be a prerequisite for buyouts which should also consider FEMA funding and processes. No stormwater utility fees should be used for buyouts.	Partially
Recommendation #21. The development and utilization of “shared” stormwater facilities should be strongly encouraged to minimize costs, encourage environmental protection, and support ecosystems. Decisions should be made by teams of competent and qualified engineering, scientific, technical, and regulatory personnel (interdisciplinary teams).	Yes

C. Delaware Public Policy Institute Dialogue on Financing Wastewater and Stormwater Infrastructure - 2006

At the request of Governor Minner, the Delaware Public Policy Institute (DPPI) convened a policy dialogue on financing wastewater and stormwater infrastructure for the 21st Century in the winter of 2006. The dialogue was organized around three questions: what are the current and future Statewide challenges facing wastewater and stormwater infrastructure, is a dedicated, longer-term funding source for wastewater and stormwater infrastructure needed, and if such a funding source were established, what mechanism(s) might be used to provide those funds?

The dialogue offered numerous recommendations to the State, the Clean Water Advisory Council (CWAC) and DNREC, and municipalities and utilities. Table II provides a listing of the recommendations applicable to this assessment:

Table II – Delaware Public Policy Institute Recommendations	
<u>Recommendation</u>	<u>Applicability</u>
Recommendation B1. The Clean Water Advisory Council shall provide for and DNREC should develop detailed watershed plans for all of Delaware’s waters.	Yes
Recommendation B2. The Clean Water Advisory Council shall encourage and provide for increased education on stormwater management.	Partially
Recommendation B3. The Clean Water Advisory Council should review and refine projected stormwater infrastructure capital and operations and maintenance funding gaps.	Partially
Recommendation B4. The Clean Water Advisory Council should detail the public benefit provided by its funding assistance to counties and municipalities.	Partially
Recommendation C1. Counties and municipalities should review their current impact fees related to development of growth-related wastewater and stormwater infrastructure.	Yes
Recommendation C2. Stormwater utilities should be created and implemented, when possible, to provide for a consistent, coordinated, clear, comprehensive and funded approach to stormwater management.	Yes

III. AGENCY ACTIVITIES

A. Overview

There are numerous entities responsible for performing surface water management work in Kent County. Government agencies include the Delaware Department of Natural Resources and Environmental Control (DNREC), the Delaware Department of Transportation (DelDOT), the Kent Conservation District, Kent County, and the 20 incorporated municipalities in the County. On the quasi-government level are the approximately 86 tax ditch organizations. Private organizations include numerous homeowner associations and nonprofit groups. These are described below.

B. Delaware Department of Natural Resources and Environmental Control (DNREC)

Division of Soil and Water Conservation

The Division's surface water management functions are complex. Work is performed in two programs, Stormwater which is regulatory and Drainage which is non-regulatory. Positions are funded through General Fund (GF) appropriations, fees collected through activities such as Notice of Intent applications, contractual appropriations (also through the GF), and payroll savings from unexpended personnel funds due to vacancies. Projects are typically funded through the 21st Century Fund and not the General Fund and require matching funds. Most DNREC employees have responsibilities in all three counties which complicates precise calculations of personnel dollars spent. Table III summarizes DNREC personnel and the number of full time equivalent (FTE) positions in various programs based on the percentage of individual employee time on Kent County projects.

Table III – DNREC Division of Soil and Water Conservation Personnel Costs		
Program	Typical Duties	FTEs
State of DE General Funded		\$411,000
Drainage	Channel Restoration/Wetland Enhancement/Tax Ditch Projects/Permitting	3
Stormwater	Sediment and Stormwater Program/Stormwater Projects/Watershed Planning	2
State of DE GF Contractual		\$15,500
Stormwater	Inspections	2/3
State of DE ASF/NSF		\$58,000
Stormwater	Stormwater Program/Erosion and Sediment Control Program/Program Training/Outreach/Research	1
KCD District Contractual (Paid for with appropriations from Bond Bill Appropriation TD/PD)		\$420,000
Drainage	Surveying/ Project Planning/Inspections/Land Use Reviews/Project Design/Tax Ditch Right of Way and Restoration/Research/Drainage Database/GIS/IT Support	7
KCD District Contractual Seasonal (Paid for with appropriations from Bond Bill Appropriation TD/PD)		\$26,000
Drainage	Tax Ditch GIS	1
Total		930,000

The Stormwater Program (more formally known as Delaware's Sediment and Stormwater Management Program), employs a comprehensive approach to sediment control (both during and after construction) and stormwater management that includes monitoring of stormwater quantity and water quality control. Specifically, the program includes:

- Stormwater management engineering plan approval
- Sediment control and inspection during construction
- Post-construction inspection of permanent stormwater facilities
- Stormwater quantity and water quality control
- Education and training relating to stormwater

Whereas the Stormwater Program focuses more on current construction projects and "big picture" perspectives of surface water management, the Drainage Program is responsible for addressing more isolated drainage problems, often involving private properties, such as those projects typically funded by 21st Century and other legislative funds. The Drainage Program provides technical assistance to landowners, tax ditch organizations, Conservation Districts, federal, state and local agencies in the areas of drainage, water management and restoration.

Division of Water Resources

The Division's responsibilities are limited to overseeing the National Pollutant Discharge Elimination System (NPDES) program which has two components, municipal separate storm sewer systems (MS4's) and industrial. There are two NPDES MS4 permits in Kent County, one held by DeIDOT and the other by the City of Dover. Each has a five year time period. Workload and staff limitations at DNREC have resulted in each permit being expired (DeIDOT's in June 2008 and Dover's in August 2008). DNREC anticipates each will be reissued on or about their sixth anniversary in the summer of 2009. Each permit requires compliance with the Six Minimum Controls as developed by the U.S. Environmental Protection Agency (EPA). These controls are:

- Public education and outreach
- Public participation and involvement
- Illicit discharge detection and elimination
- Construction site runoff control
- Post construction runoff control
- Pollution prevention and good housekeeping

It is planned that the next permits will better communicate Department expectations and encourage attracting more resources. Currently there are no plans to include TMDL reductions into these permits as their basis is a presumptive approach in that compliance with the permit is presumed to result in water quality improvements. However, new administrations in Dover or Washington could change this approach. Similarly, there are no plans to broaden the geographic area of coverage.

There are also 47 industrial facilities with NPDES stormwater permits in Kent County. Many of these are transportation-related including four DeIDOT maintenance areas, Delaware Transit Corporation's yard, and private bus service locations as well as construction materials and food processing facilities. The need for permits is determined by Standard Industrial Classification (SIC) codes. Each facility is covered by a general permit (as opposed to individual permits) and required to conduct monitoring and sampling although the requirements vary by SIC code. These general permits will expire in 2011.

C. Kent Conservation District

KCD operates two programs related to surface water management. The first, Sediment and Stormwater Program, is administered by the District as a DNREC delegated agency and responsibilities include tracking projects through the NPDES Notice of Intent (NOI) process, reviewing plans, and inspecting construction of stormwater management facilities throughout Kent County. The District also performs annual maintenance inspections on the approximately 850 basins and best management practices (BMPs) that exist in the County. An inventory of these facilities exists. It is thought that about 20 of these are publicly-owned with the vast majority being privately-owned. This program has nine full-time employees and an annual budget of \$550,000 which includes salaries, rent, vehicles, etc. Review and inspection fees are the source of these expenditures.

Position	Duties
Program Manager	Management of Program
Engineer (Part-time)	Review of Construction plans and calculations
Plan Reviewer	Review of Construction plans and calculations
Senior Inspector	Construction inspection
Inspector	Construction inspection
Inspector	Construction inspection
Inspector	Construction inspection
Urban Conservationist	Inspection of completed SWM facilities and Public outreach
Administrative Assistant	Program support and administration
Total	\$550,000

Multiple employees participate in the second program, Tax Ditch and Drainage Program, and all told one full-time equivalent position is utilized for duties such as providing technical assistance, answering questions, surveying, and attending annual meetings of tax ditch organizations. The program’s budget is \$350,000 of which \$175,000 is provided each by the State and Kent County. In addition to personnel costs, these funds are utilized mostly for major and not minor maintenance of tax ditches.

One of the biggest concerns that the District has is in regard to the maintenance of privately-owned stormwater management basins. It is noted that many older developments do not have homeowner associations (HOAs) and even newer developments with HOAs often are not collecting enough money to perform adequate maintenance on their facilities. Kent County’s revisions to Section 187 of the County Code – Subdivision and Land Development in 2003, clarified the responsibility of HOAs and have helped the situation. There is still lack of clarity regarding when associations will be set up and when they begin to accept maintenance responsibility. While the District has enforcement authority over projects under construction, it does not have any regulatory power to address post development problems such as basins falling into disrepair. It was noted that it is easier to identify basins on commercial properties and hold owners accountable.

Over time, the District has assumed partial responsibility for site grading on individual lots. Their inspectors look at general drainage patterns and whether or not grades are positive and unobstructed. They do not check exact grades or elevations of homes or other structures. There are no as-built requirements except for stormwater management basins. If these plans indicate a basin was not built reasonably close to the approved plans, the District recommends to the County that they withhold certificates of occupancy.

By and large the District has no major pressing issues to contend with. Due to the slow down in the housing market, staffing appears to be adequate though could become an issue once the market turns around. Future concerns include the maintenance of basins as it is not known how much technical assistance will be needed as those existing basins age and new basins come on line. It is thought that basin maintenance may one day be addressed by some sort of cost share program as tax ditches are today. Regarding tax ditches, it is believed that changes to the tax ditch law recently enacted by the State will minimize right-of-way issues and therefore staffing of the Tax Ditch and Drainage Program is adequate.

The District reports that relationships with other entities are generally good. The turn over at municipalities is usually higher than at the County so those relationships need to periodically be reestablished as new contacts are made. It was noted that DeDOT does not utilize DNREC's database of drainage problems.

D. Kent County

Since the Kent Conservation District has purview over most surface water management functions, Kent County's responsibilities are comparatively small. The County does regulate development through its Subdivision Section in the County Code. A Lines and Grades Ordinance does not exist and therefore there are no specific guidelines regarding lot grading but the Subdivision Section does include provisions such as buffer requirements. Though attributed somewhat to chance, most growth has occurred in areas near public drainage conveyances and away from tax ditches. Also, the County's Land Development Ordinance prohibits construction within the 100-year flood plain.

The requirements for forming and managing homeowner associations (HOAs) in residential subdivisions was significantly clarified and strengthened in October of 2003. From this date forward, provisions for establishment and recognition for maintenance responsibilities for stormwater infrastructure and open space have been needed prior to project approvals. However, once approved, there is no follow up effort to assure that the associations continue to operate as planned or are performing the functions for which they are responsible. Furthermore, the degree of success of these requirements will not become known for many more years as the drainage and stormwater management systems in these developments age and require maintenance. The 2003 revisions to the Subdivision and Land Development Ordinance have been fairly successful in guiding development.

The deferred maintenance of privately-owned stormwater management basins now, or soon coming of age, is a major concern. It is believed that many HOAs, even those formed after 2003, are unaware of their responsibilities or are not taking adequate steps to assure basin functionality. If inadequately funded HOAs were to seek County assistance, there currently are no funds or legislative authority to undertake these tasks. Even if the basins remain privately maintained, there are no reporting or documentation provisions to assure proper maintenance is being performed. Sixty three HOAs have been formed since October of 2003 and another 66 were previously formed although it is likely there are subdivisions in existence with no HOAs.

The County owns and maintains six stormwater management basins, three on County property and another three in private subdivisions on deeded open space through agreements put into place many years ago. The County also performs plan reviews in conjunction with the Conservation District on sewer projects outside of designated growth zones for public/private partnerships. In these cases, stormwater BMPs above and beyond those required are often utilized as one of six allowed incentives.

Yard flooding complaints are somewhat common. This could be the result of the lack of a Lines and Grades Ordinance which could set floor elevations with respect to surrounding grounds. On the other hand, these may be a perception issue as residents may not understand that drainage conveyances are not always in rights-of-way. There is also concern that if the County had a more comprehensive Lines and Grades Ordinance, the County's responsibilities could increase and overwhelm existing resources such as inspectors.

The County previously developed standards for source water protection including excellent recharge areas and wellhead protection areas but these were repealed because of the lack of enabling legislation to permit overlay zoning. Numerous other initiatives are underway in an effort to otherwise assure an on-going adequate supply of drinking water including reducing impervious cover allowances in some districts or increasing buffer requirements particularly for waterways covered by TMDL regulations. Specific efforts noted in the Comprehensive Plan include the following:

- Coordinate with DNREC to review development and permitting standards including infiltration practices and impervious cover limitations to prevent the depletion of groundwater resources.
- Continue to coordinate efforts with KCD and DNREC to limit and manage stormwater runoff in the most efficient and effective manner while respecting natural features and constraints.
- Continue participation in the Stormwater Regulatory Advisory Committee and Clean Water Council to develop a watershed approach to stormwater.
- Develop a stormwater facility maintenance program where the County fulfills the administrative role and KCD and DelDOT continue in their technical roles of plan review and site inspection.
- Encourage stormwater management practices designed to meet the objectives of a regional stormwater model intended to address stormwater runoff impacts within a watershed.
- Encourage the use of Low Impact Design particularly for projects within the more rural areas within and outside the Growth Zone Overlay.
- Establish a permitting process for land grading to enable efficient and effective inspection and enforcement action.

The Kent County Planning Department is currently implementing these and other recommendations according to the schedule included in Chapter 12 of the Comprehensive Plan.

Regarding TMDLs, the County could become more proactive in enticing property owners to comply with the Murderkill Pollution Control Strategies (PCSs). For example, the County could seek to take over the approval process for septic systems from DNREC and develop a program more specifically tailored for the Murderkill conditions.

There is a high level of cooperation among the various groups performing surface water management in Kent County. Any sort of regional entity such as a stormwater utility would necessitate a cooperative agreement between the County and the Conservation District.

The County's annual expenditures are not as substantial as DNREC or KCD. As with the other two counties, Kent County gives the Conservation District \$175,000 each year as part of its Cost Share Program as well as another \$100,000 annually for special projects. The maintenance of the County's stormwater management basins necessitates a part-time position estimated at \$25,000. The County also provides an additional \$25,000 in recognition of the District's role in responding to miscellaneous drainage complaints.

E. Delaware Department of Transportation (DelDOT)

Central District

Central District reviews development plans for constructability but assessment regarding drainage is deferred to DelDOT's Stormwater Engineer. They inspect new construction as well as bridges (defined as openings greater than 20 square feet) either annually or bi-annually and perform maintenance as needed. There is some inventory information available for bridges and culverts but little for inlet, pipes, and swales although DelDOT's NPDES program employees are gathering data. All told, the District is responsible for nearly 2,650 lane miles of roads, most of which have roadside channels. It is estimated that another 50 lane miles of roads are privately maintained though the exact number is unknown.

The District spends about \$3.2 million each year (based on 2007 records) on maintenance which includes personnel salaries as well as contracted costs. The vast majority of these expenditures are for projects within the right-of-way. Approximately 20 full-time equivalent employees are devoted to drainage-related tasks. Materials and Minor Contracts fund between \$300,000 and \$500,000 in capital projects each year. There is also an on-going three year contract with a private firm for \$400,000 for on-call services to replace cross road pipes and make various other drainage improvements. There is no five year capital budget as capital and maintenance work is done on more of a reactive than proactive basis.

By and large Central District does not receive many drainage complaints. However, a major concern is maintaining conveyance downstream where roadway drainage outfalls onto private property and easements do not exist. Permissions are needed to access properties (often with DNREC assistance) but land owners may seek to deny this. Problems can also be created when parcels are sold particularly if then developed as the new owner can seek to change the drainage pattern. Discharges into tax ditches though are mostly beneficial to the Department as these permission issues do not exist.

New points of connection for drainage within the rights-of-way are "frowned" upon by DelDOT. While calculations may indicate adequate system capacities, past experience often indicates ensuing problems. DelDOT does not consider ponding in roadside channels an issue unless it results in inundation of the road itself. Kent County code enforcement officials can assist if an obstacle to conveyance is placed in a drainage channel.

Projects related to public safety receive the highest priority followed by those that affect traffic. Drainage issues sometimes fall under the first category. Legislators can also influence prioritization by granting specific funds for projects through the Community Transportation Funds program.

In subdivisions, drainage between the curb and right-of-way line is the Department's responsibility whether the conveyance is open or closed. As more subdivisions are built, DelDOT's workload will certainly increase as well which could affect future budgets. Drainage in and adjacent to non-subdivisions roads is always DelDOT's responsibility.

Agreements with municipalities vary from city to city and town to town and often are different within a single jurisdiction. DelDOT believes the coordination and cooperation with local governments is generally good. While drainage complaints may be a comparatively small component of their workload, the District would like to adopt a more proactive role in drainage. This would necessitate hiring more people and buying additional equipment.

NPDES Program and Stormwater

The NPDES program spends about \$700,000 each year and the Stormwater program another \$150,000 in Kent County. These two divisions' primary concern is the BMPs constructed since 1991. While up to now the maintenance of these has been fairly inexpensive, many of these will soon need major maintenance such as structural modifications which will be much more expensive. As more and more BMPs come on line, this situation will be exacerbated.

As previously noted, DelDOT's NPDES permit for Kent County expired in June 2008, but has been extended. The Department does not anticipate major changes when it is ultimately renewed. DNREC had sought to mandate DelDOT entering into an agreement with EPA regarding its voluntary Green Highways Partnership but the Department is already addressing most partnership objectives. Regarding TMDLs, since the pollution control strategies have not yet been promulgated for Kent County watersheds, there are no major concerns at this time but once the strategies are implemented, project costs will likely increase in order to be compliant. Retrofit costs could also be substantial.

On-going development is also a concern. The Department has little control over stormwater management and conveyance except when discharges are into the right-of-way. However, without proper upstream controls, downstream road crossings that the Department is responsible for can become inadequate. They do seek partnerships with developers regarding shared facilities. The Department believes that the responsibility for maintenance of private facilities should be assigned to the land and not the owner so subsequent property sales would not confuse responsibilities.

Coordination and cooperation among agencies is good due somewhat to the Conservation District having near total control over stormwater. The Department believes that drainage patterns sometimes change as a result of development and downstream conveyances need to be assured. The narrowing of tax ditch rights-of-way can become an issue as there may no longer be room to repair or replace culverts which cross under roads.

With sufficient additional resources, the Department would like to better address the maintenance backlog by either hiring additional staff or having more money for contractors.

Planning

The Planning Division, also located in Dover, is responsible for long-range planning of Department needs and for the review of development plans. As a policy, the Division is not supporting developments in Level IV areas and is seeking to eliminate or at least minimize additional discharges into State rights-of-way. In addition, the Division is providing comment on the need for BMPs when reviewing development plans. Getting the Department involved in the drainage aspects of projects earlier would result in fewer discharges to rights-of-way. The need for watershed plans was cited as a strategy that could result in projects evaluated on a larger scale, increasing the likelihood of effective drainage solutions. Finally, it was noted that the Department's Rules for Subdivision Streets are being revised but these will not be applicable to private roads.

F. Municipalities

There are 20 incorporated cities and towns in Kent County. A two pronged approach was used to gather information from these municipalities for this analysis. First, interviews were held with representatives from six cities or towns and these are summarized below. A copy of the questionnaire which was the basis for the interviews is included in Appendix C. Second, a letter describing the

study was sent to the remaining cities and towns and they were each invited to attend the presentation with the Kent Conservation District Board of Supervisors on May 18, 2009.

The Kent County Comprehensive Plan noted that there are agreements in place with jurisdictions to administer building permitting and inspection functions and the County has also assumed the responsibility for enforcement of floodplain ordinances for a number of towns. In Viola and Little Creek, the County has agreed to administer the towns' zoning and land development ordinances in addition to the Building Code. These agreements are particularly important because the majority of municipalities within the County are not able to employ professional planners or building inspectors whereas the County has already made the investment in staff and equipment to serve such functions. The Comprehensive Plan suggested that the County should consider entering into additional agreements for administration as well as drafting or review of ordinances as the smaller municipalities experience increased development pressure. Memoranda of Understanding (MOUs) exist with some smaller towns as part of the County's efforts to steer development towards already developed areas.

The Kent Conservation District reviews plans and performs inspections on stormwater management facilities within municipalities. Therefore cities and towns by and large defer to the District for these types of activities although support or assistance is provided in some instances.

Camden

The Town takes a proactive approach to drainage by sweeping streets twice weekly and inspecting and cleaning inlets annually. These activities are estimated to cost about \$19,000 and funds are derived from the general budget and supplemented by Municipal Street Aid and Community Transportation Funds. The Town has applied for a \$3 million Federal grant for sidewalk, streets, and drainage projects in low income areas. It is estimated that one full-time equivalent position is dedicated to drainage. In addition to the street sweeper, the Town also shares a vacuum truck with the Camden Wyoming Sewer and Water Authority that is used to clean out inlets.

An inventory of drainage structures does not exist but there are five stormwater management basins in the Town, four privately-owned and one publicly-owned. The biggest on-going project is the Gibbs Ditch clearing and sediment removal project being funded by the Town, Kent Conservation District, and DNREC through 21st Century Funds.

Relationships with other entities are good but the Town believes they periodically perform work that DeIDOT should be doing.

Clayton

The Town's efforts are fairly limited as less than five percent of the public works budget is used for drainage. Smaller maintenance projects are performed by Town employees but contractors are used for larger projects. Clayton is in the process of purchasing a flusher truck that will be used for sanitary and storm sewers. While this will certainly reduce obstructions in pipes, provisions are often needed to capture dislodged sediments or they will otherwise flow to a downstream water body.

HOAs are responsible for the maintenance of basins once completed and the Town is responsible for inlets, pipes, and open channels in the right-of-way. The Town believes that even though HOAs may be aware of their maintenance responsibilities they are probably not dedicating sufficient resources to adequately perform the job. The maintenance of inlets, pipes, and open channels is more reactive

when there are problems than proactive. There are no inventories of any components of the drainage infrastructure.

The biggest concern is the maintenance of privately-owned basins. Coordination with the Conservation District is reported by the Town as good. They do not have any worries regarding NPDES or TMDLs. If sufficient resources were available, Clayton would like an inventory of the drainage infrastructure along with a maintenance schedule.

Dover

Being the holder of a NPDES permit, an inventory of drainage structures in Dover is nearing completion. It is believed that between 5,200 and 6,000 inlets will be identified in the City when the inventory is complete but this includes inlets maintained by DeIDOT and private entities too. There are also about 60 stormwater management basins of which as many as 20 are maintained by the City with the responsibility of HOAs or other private organizations. The City has investigated the feasibility of assuming ownership of private basins in the future but has no immediate plans to do so. The City is also the manager for two tax ditches. Dover's contribution to the McKee Run ditch is only \$700 a year but when added to the contributions of others, minor maintenance is performed each year. However, there are no funds being set aside for any major maintenance that may be needed in the future. Activities regarding the White Oak tax ditch are more or less dormant as funds are not being collected nor are maintenance activities performed.

Dover has clarified maintenance responsibilities at privately-owned basins as the City maintains pipes and open conveyances to basins as well as pipes from basins and HOAs maintain the basins themselves. For developments built in the last 20 years or so, these open conveyances and pipes are typically in easements but in older developments more often than not easements are not in place.

The City's priorities are set mostly by complaints but other factors influence decisions including permit compliance, downtown redevelopment, and infrastructure replacement.

Dover has initiated numerous programs as part of the NPDES permit compliance for its stormwater discharges. Street sweeping is routinely performed with expenditures estimated at \$150,000 annually with another \$25,000 spent on landfill charges. An extensive mapping and database is being developed of the entire storm drainage system which has cost about \$50,000 over the last five years or \$10,000 annually. Completing system connectivity is planned for the next phase of work. Other efforts include good housekeeping programs, identifying and correcting cross connections between sanitary and storm sewers, and providing or increasing riparian buffers along the St. Jones River. All told, approximately \$175,000 is spent annually on NPDES compliance. Issues regarding TMDLs are not a concern at the present though may be in the future.

Notions of the creation of stormwater utility and potentially becoming a DNREC delegated agency have periodically been discussed in the past. These steps could allow for other programmatic components such as utilizing regional basins to manage stormwater from multiple sites and using revenues for improvements to the parks system.

One of the bigger issues for Dover is continuing to encourage downtown redevelopment while also promoting green technologies as it can sometimes be difficult to do both simultaneously.

Harrington

Unlike many municipalities, Harrington has an inventory of its drainage system. It is hand drawn but is being converted to GIS format. There are approximately 500 storm drain inlets in the Town, 360 publically maintained and another 140 by the State. The City is also the manager of two tax ditches although no funds are specifically allocated for their maintenance. However, the City and the Conservation District do periodically maintain the height of grass. Funds are not being collected for major maintenance.

It is estimated that about 15% of the public works budget is spent on drainage derived from general funds. There is no capital budget for drainage projects.

The main driver of the program is citizen complaints. These have been reduced due to the proactive cleaning of pipes which occurs annually and identified decaying system components before members of the general public detect problems. Safety issues are typically the highest priorities.

A major issue in future years will be managing growth as the number of dwelling units is expected to double in the next 20 years. The additional associated maintenance would seriously burden existing staffing. With sufficient additional resources, Harrington would like to make system wide improvements to correct sizing deficiencies, replace aging system components, and add drainage structures when needed where none exist.

Milford

The Kent County/Sussex County line bisects Milford and therefore new development plan reviews are performed by the Kent Conservation District and the Sussex Conservation District depending on the project's location. The City oversees new construction and performs maintenance on five stormwater management basins it is responsible for. The maintenance of most of the basins in Milford is the responsibility of HOAs as is the maintenance of the few best management practices that exist. The City does not have an inventory of drainage structures so does not know the number of inlets or linear footage of pipes it is responsible for. The linear footage of open swales is also unknown but is very small.

Expenditures are comparatively small and are derived from general revenues. The Public Works Director spends less than five percent of his time on drainage issues with an inspector spending 10 percent of his time. The only equipment consistently used for drainage is a Vacuum truck but it is used much more often for sanitary sewer maintenance.

The biggest concern for Milford is the maintenance of privately-owned basins. Regulations may be sought to clarify the fiduciary responsibility of HOAs. Subdivision agreements do specify developer responsibilities during construction such that the City is never responsible for basins.

Coordination with both Conservation Districts is described by staff as good.

Milford does not have any concerns regarding NPDES or TMDLs. They do note that the older parts of the City discharge directly to the Mispillion River but due to the density of development, there are few opportunities for providing treatment. The proximity of inlets to the river periodically results in street flooding when high tides inhibit conveyance.

With sufficient additional resources, Milford would want a GIS system but the costs to scan or digitize existing data as well as hire staff to maintain the system have up to now been greater than current resources allow.

Smyrna

The Town does not have an inventory of drainage structures but it is known that there are 27 miles of streets with mostly enclosed drainage systems. The Town does maintain the basin at Gardenside through an informal arrangement with neighbors but otherwise basins are privately maintained. Those located on commercial properties are mostly maintained adequately but those owned by private HOAs less so. It is estimated that there are between 20 and 25 basins in Smyrna so lack of maintenance could become a big issue in five to ten years.

Annual expenditures for drainage work is not known but it is estimated that \$250,000 is spent each year on streets which includes drainage. These funds are derived mostly from the State's municipal street aid. Drainage issues are typically addressed more reactively than proactively. The Town has a flusher truck which is used for both sanitary and storm sewer cleaning. It is estimated that one full-time equivalent position is dedicated to drainage. Drainage work is performed by both Town employees and contractors.

The biggest concern in the future is in regard to privately owned basins and BMPs and the funds that will be needed to assure their functionality. The proliferation of BMPs which can be difficult to maintain will exacerbate the problem. It is noted that subdivision agreements include provisions that allow the Town to perform maintenance and then seek reimbursement should an HOA fail to perform maintenance.

In one instance, a tax ditch was declassified as the enclosed drainage system associated with a new development essentially eliminated it. The Town's relationship with the Kent Conservation District is reported as good but occasionally their workload results in minor scheduling lapses. With sufficient additional resources, Smyrna would like an inventory of its drainage infrastructure.

G. Tax Ditch Organizations

A questionnaire was distributed to the managers for each of the 86 tax ditch organizations in the County. Thirty-three questionnaires were returned equating to a response rate of just under 40 percent. The purpose of the survey was to solicit input to better understand the organizations' issues and needs.

Functions

Respondents were asked to indicate what operations including mowing, weed wiper, herbicides application, dip outs, erosion, beaver dam removal and pipe replacements were performed in the year 2007, by whom and how often. Approximately 67 percent of the tax ditch organizations responding to the survey stated that they perform mowing. In general, the tax ditch organization or a private contractor mows once every other year and some once every year. In some cases, the KCD assists organizations in carrying out the function of performing weed wiping dip-outs, erosion control, and pipe replacement. The number and percentage of functions that are performed by tax ditch organizations, including the assistance of the KCD, are shown in the tables included in Appendix D.

Activities

The majority of survey respondents indicated that an annual meeting, an audit of financial records, and an inspection of their tax ditch was performed in the year 2007. Only two of the 33 respondents stated that they did not have an annual meeting. Six stated that they did not have an audit. Eight stated that a ditch inspection did not occur in the past year. The number and percentage of each activity carried-out by the tax ditch organizations are shown in the tables included in Appendix D.

Operations

All of survey respondents stated that they are familiar with the KCD's cost share program. The majority stated that they receive financial and technical assistance from the District. The majority further stated that the responsibilities of their organization are clearly known and understood. Only 27 percent of respondents replied that they were aware of any work that is not being performed due to lack of funds. Nevertheless, 91 percent of the organizations appear willing to attend a workshop to learn how to better manage their organizations. Twelve percent stated that their tax ditch organization is bonded. The number and percentage regarding the operations of the tax ditch organizations are shown in the tables included in Appendix D.

Budget

According to the survey responses, the expense for tax ditch functions, activities and operations in the year 2007 ranged from \$0 to \$13,978. The total annual expenditure of the 21 organizations that responded to this question was \$79,250. When this sum is extrapolated to all 86 organizations, the estimated annual expenditures are found to be about \$325,000. The mean average annual expense was \$2,401. Nearly all (31 of 33) of the respondents to this question indicated that they fund their general operations through tax revenue. Twenty-seven of the respondents stated they receive additional funding from the cost share program. Only five respondents stated that they have a long-term budget. The number and percentage of the tax ditch organizations within budget range categories are shown in the tables included in Appendix D. This table also shows actual spending, funding source per organization and whether each has a long-term budget and adequate funding.

Needs/Issues

Respondents were asked what the primary current needs of their tax ditch are, and if these needs are being met. Of the 33 respondents, the common responses were general maintenance needs, such as dip-outs and mowing. Seven respondents indicated that these needs are being met. When asked what they believe their needs will be in five years, the responses were similar to current needs. About 63 percent of respondents to the survey indicated that they have adequate funding to meet their tax ditch needs. Refer to the tables included in Appendix D for detailed information per tax ditch organization.

Respondents were further asked what the current issues of their tax ditch are. Of the 33, common responses were general maintenance issues such as having adequate access to mow, keeping the ditch free of obstructions and general clean-out, among others. Forty-five percent of respondents indicated that they currently have problems with obstructions and invasive species, trees, overgrowth and phragmites, among others. Five respondents stated encroachment in rights-of way is an issue.

Nine of the 33 respondents answered what they believe will be important issues in the next five years. These responses were similar to those provided in current issues.

Refer to the tables included in Appendix D for detailed information per tax ditch organization.

Desires

Respondents were asked if budget was not a limitation, what they would do to improve their tax ditch program and services. Of the 18 responses, there appears to be a general desire to better maintain their tax ditches by doing more preventive work, keeping the rights-of-way clear of obstructions and increasing the number of clean-outs, dip-outs and tree removal, among others. Two respondents indicated that they desire the education of land development stakeholders and the public on the importance of tax ditches. A few responses indicated that they have no desires otherwise constrained by finances.

IV. STAKEHOLDER OBSERVATIONS

A. Homebuilders Association of Delaware

Jennifer Casey, Executive Director of the Home Builders Association of Delaware (HBADE) along with DNREC Committee members Jim McCulley, Bob Thornton, Garth Jones, and Doug Seavey were interviewed on April 9, 2009.

The Home Builders Association believes there are significant overlaps in agency responsibilities related to surface water management. For example, the Federal government is responsible for setting TMDL limits and the State dictates policy through its Sediment and Stormwater Regulations yet local governments are often left with implementing the regulations necessary to meet program goals. Furthermore, representatives from these various levels of government do not always agree. This can limit the use of innovative practices as one agency may allow or recognize a new process or product but another may not. An example was cited where a developer wanted to place rain gardens on individual lots but no one was willing to grant the approvals needed. It is believed that better clarity of roles would reduce these instances. Also, in order to advance innovative practices, developers could offer bonds for a certain period of time that could be used for maintenance or even replacement of failed controls.

The most pressing surface water management issue is the need to resolve how privately owned facilities will be maintained. There are two categories to consider; stormwater management basins owned and maintained by HOAs and rain gardens or other BMPs on individual lots. It is the sense of HBADE that lack of political will is partly responsible as elected officials have in the past dictated through financing or policy that their government body will assist or assume maintenance responsibility even though there may be an agreement that indicates otherwise. In other words, there is no incentive for a private entity to devote resources to maintenance knowing they can appeal to government officials instead.

Regarding priorities, efforts should be made to minimize administrative hurdles that hinder the use of innovative practices. DNREC is encouraging the use of green technology BMPs but the agencies responsible for plan approvals do not always agree with the approaches or are leery to approve a control lacking historical data. Also, HBADE agrees that education of homeowners is needed if the private maintenance issue is to be resolved. Maintenance agreements must be adhered to and need to go with the land so future owners know what to expect. Increased outreach on the benefits of conservation would be beneficial. Finally, there is a significant amount of information available about the front end of the process, design, but much less regarding the back end, maintenance. More frequent inspections would help identify small problems early before they become big problems later.

B. Kent County Conservancy

Nicholas DiPasquale, President of Kent County Conservancy Board of Directors, was interviewed on February 3, 2009. The Conservancy is still a nascent organization that holds no land or easements. The Board has not weighed in on surface water management issues but since there really is no other nonprofit environmental organization operating in Kent County, it was determined that they are an appropriate organization to offer observations and comments.

The Conservancy believes the two most significant issues regarding surface water management in Kent County is the lack of adequate and significant funds and the division of responsibilities among agencies.

Regarding funding, it is thought that the 21st Century Fund process is dysfunctional in that insufficient funds are made available and projects that are performed tend to be more reactive as opposed to proactive. Also, there is too much political influence into funding and therefore prioritization. Projects should be prioritized first by public safety and second by property protection. Projects should also take into account environmental considerations, such as source water protection, water quality and habitat conservation. The Clean Water Advisory Council could play a strong role in providing recommendations for funding and priority setting. Unless the process is modified, it is likely the situation will become worse in coming years. However, a stormwater utility at the county and municipal level or even on a watershed basis could provide a more unified and appropriate approach.

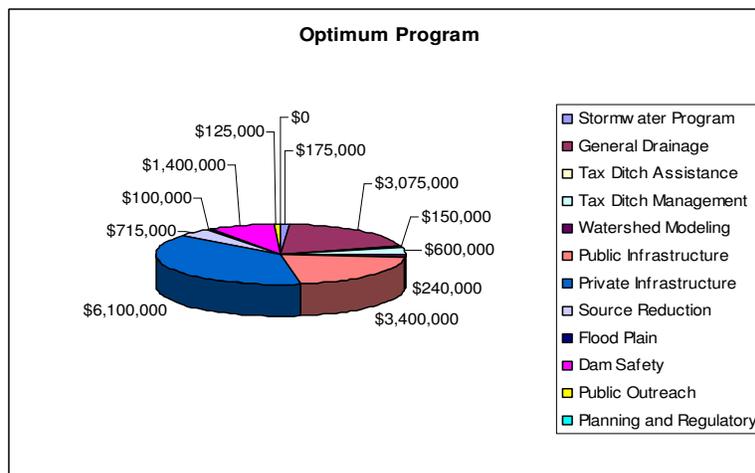
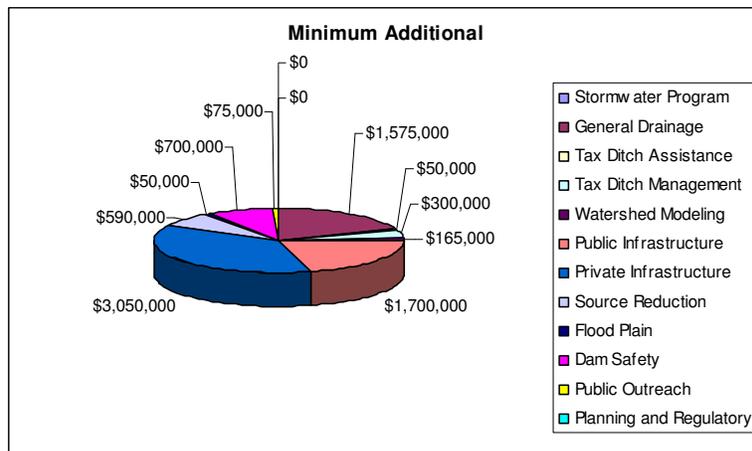
Responsibilities among agencies are not always well defined. For example, whereas the Conservation District is typically responsible for identifying violators of erosion and sediment control regulations, DNREC is the agency which enforces the regulations and levies fines. A more consolidated and streamlined approach might be more effective. Furthermore, it can be easy for one agency to “pass the buck” to another for certain tasks particularly in a climate of limited staff and decreasing revenues.

On-going and future growth in the County could increase nutrient loadings into receiving waterways and make it more difficult to provide source water protection and meet water quality objectives. A process to “harmonize” the programs or address the overlap between water management quantity and quality issues for example would be the best way to approach development of solutions. This could necessitate working across department organizational lines as was previously done with DNREC Whole Basin Management approach.

V. PROGRAM AREAS

Twelve surface water management program elements were identified through the analytical process. An overview of each is provided in this section along with current service levels and projected expenditures to address identified issues. Expenditures are projected at two levels: “Minimum Additional” and “Optimum Program”.

As detailed in the following sections and also tabularized in Appendix A, it was found that current expenditures in a typical year total \$9.4 million. The additional annual funds to meet the Minimum Additional Program are \$8.25 million for total expenditures of \$17.65 million with an additional \$16.1 million needed for the Optimum Program for total expenditures of \$25.5 million. One time costs were found to be \$2.75 million and \$3.4 million for the Minimum Additional and Optimum Program, respectively.



The rationale for these increases over current levels is offered below. Assumptions and methodologies to reach the totals are included in the program descriptions. Note that these projections are intended to offer a general understanding of the costs and do not include debt service or inflation. All estimates are annual expenditures unless noted as one-time costs. The estimates for Minimum Additional and the Optimum Programs reflect new expenditures and do not include existing resources. Expenditures under the

Optimum Program scenario include those identified under the Minimum Additional Program. Both programs use the Current Level of funding as their benchmarks.

The most notable prior effort to date to quantify these costs was the Governor’s Task Force which made the following projections in 2005 (with assumptions applicable for Kent County noted):

Table V – Kent County Estimated Expenses by Governor’s Task Force	
FY 2006 21 st Century Fund Requests (1/3 of total assumed)	\$2,500,000
Future 21 st Century Fund Requests	\$3,700,000
Watershed Planning (five assumed)	\$3,750,000
Watershed Capital Implementation (two assumed)	\$20,000,000
Tax Ditches	\$2,400,000
Other Identified Needs	<u>\$2,250,000</u>
Total Five Year Projected Capital Needs	\$34,600,000
Approximate Projected Annualized Needs	\$7,000,000

The \$8.25 million Minimum Additional Program needs identified in this assessment is comprised of approximately \$7.3 million in project needs with the remaining allotted to additional staffing and related expenses. Though this study included some programs that were not included in the Task Force assessment such as dam safety, the nearly identical projections developed independently would seem to validate the estimates.

While a substantial percentage of these additional funds are for project-related costs, some are for personnel salaries. In order to keep from increasing the overall payroll or to balance the workload during exceptionally busy or less busy times, agencies could retain the services of consultants or contractors instead. This could potentially reduce the total costs since these contracts would be on a part-time or as-needed basis. However, the higher hourly rate of consultants may offset salary savings. Regardless, the estimates in this section are based on full-time positions with salaries commensurate with anticipated employee classifications.

A. Stormwater Program

Overview of Current Service Level

As a State agency, DNREC is tasked with the overall responsibility for assuring compliance with the Delaware Sediment and Stormwater Regulations. This is accomplished in Kent County by delegating program management to the Kent Conservation District. DelDOT is also a delegated agency for its own projects and DNREC maintains responsibility for all other State projects. Program costs for DNREC include general oversight as well as plan reviews and construction inspection. For the Conservation District and DelDOT, program costs are mostly reviews and inspections along with some administrative support. Total current expenditures including salaries and overhead costs are approximately \$220,000, \$500,000, and \$150,000 for DNREC, the Conservation District, and DelDOT, respectively.

Stormwater Program
<p>Current Level</p> <ul style="list-style-type: none"> • \$220,000 in DNREC salaries • \$500,000 in Kent Conservation District salaries • \$150,000 in DelDOT salaries
<p>Minimum Additional</p> <ul style="list-style-type: none"> • No additional resources are needed but reevaluating revenue sources and reallocating those currently existing should be considered
<p>Optimal Program</p> <ul style="list-style-type: none"> • \$175,000 for two additional District employees

Historically, staffing has been able to keep up with most urgent needs but many long-term aspects of surface water management have not been adequately addressed. The housing crisis of 2008 and 2009 has resulted in a reduction in the number of plans submitted and projects under construction in Kent County. The associated review and inspection fees paid to the District have subsequently been reduced as well. This presents both a challenge in adapting to declining revenues but also an opportunity for the District to consider alternate program funding sources and personnel allocation.

Minimum Additional

No additional resources are needed for the Minimum Additional program but reevaluation of the sources of revenues and reallocating the resources that currently exist should be considered. For example, the District performs maintenance inspections of each of the approximately 620 basins and 230 BMPs each year but these inspections are funded through sediment and stormwater review and inspection fees. Assuming an average time of two hours for basins and one hour for BMPs are needed, nearly 1,500 hours can be attributed to this task or the equivalent of about \$75,000. A mechanism for collecting revenues from the owners of those facilities being inspected should be developed.

Also, other staff is assigned mostly to plan reviews and similar urgent tasks. Since workloads in situations like this can fluctuate, the District should develop a mechanism by which employees can work on longer-term projects such as watershed-level assessments.

No additional resources are identified for DNREC or DeIDOT in the Minimum Additional program.



Optimum Program

As development continues, more basins and particularly more BMPs will be added to the inventory of stormwater structures and a second employee will likely be needed at some point in the future. Assuming the number of basins and BMPs increases by 10 and 50 percent respectively in the next five years, 680 basins and 350 BMPs will exist. It is also likely that Pollution Control Strategies will necessitate increased vigilance and, therefore, inspections will take four hours for basins and two hours for BMPs for a total of nearly 3,500 hours or the equivalent of \$175,000. This is an additional \$100,000 or one full-time employee equivalent over current levels. Once this level of effort is reached, the level of service creates impacts for providing legal assistance with enforcement actions and administrative support resulting in increased personnel needs. An additional full-time employee is estimated to cost \$75,000.

As with the Minimum Additional program, the District should develop a mechanism by which employees can work on longer-term projects such as watershed-level assessments.

No adjustments are suggested for DNREC or DeIDOT to meet the Optimal Program.

B. General Drainage

Overview

General drainage work is performed by DNREC, KCD, Kent County, and DeIDOT. For simplicity, DeIDOT expenditures for general drainage are accounted for under Public Infrastructure. The other agency's projects typically include isolated drainage problems often involving private properties. Many projects are funded through the 21st Century fund. DNREC currently spends approximately \$410,000, \$200,000, and \$230,000 on salaries, projects, and its contractual employees, respectively. The District has one full time employee whose time is split between general drainage and tax ditch work or about \$25,000 for each with the funds derived from a County contribution. Kent County has five employees who each spend about 20 percent of their time on drainage work mostly related to construction projects such as new sewers or an equivalent of one full-time employee at \$50,000.

General Drainage	
Current Level	<ul style="list-style-type: none"> • \$410,000 in DNREC salaries • \$200,000 for DNREC projects • \$230,000 in DNREC contractual (also supports Stormwater program) • \$25,000 in KCD salaries (from Kent County) • \$50,000 in Kent County salaries
Minimum Additional	<ul style="list-style-type: none"> • \$1.5 million for 21st Century Fund projects • \$75,000 for additional DNREC or KCD employee
Optimal Program	<ul style="list-style-type: none"> • \$3.0 million for 21st Century Fund projects • \$75,000 for additional DNREC or KCD employee

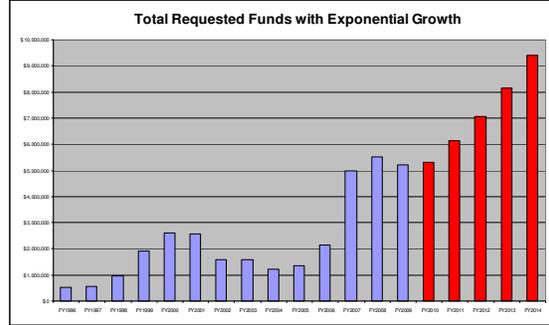
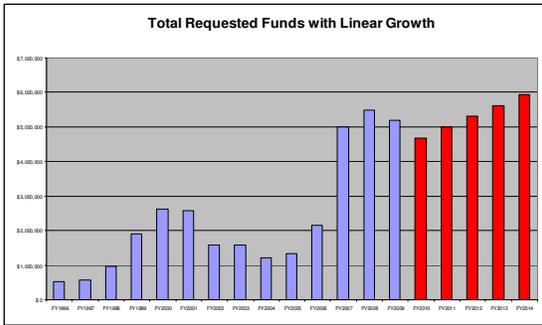
At current levels, most critical needs are met but backlog is increasing. Dwindling funds such as 21st Century Fund and a growing population will result in an increasing demand for service with a growing funding gap for new capital projects. As watershed studies identified in Section E are completed, new projects will be identified as well.

As was found in Sussex County, there is common agreement in Kent County that even though precise areas of responsibility for miscellaneous drainage problems are not always known, critical problems seem to be resolved due mostly to the level of cooperation among the various agencies.

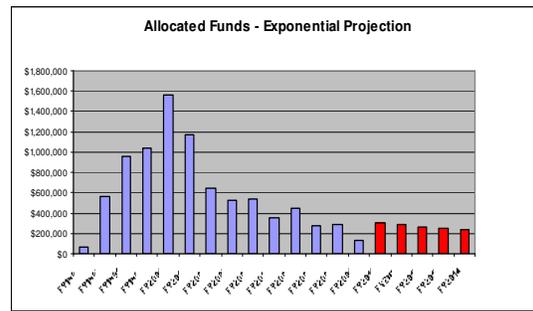
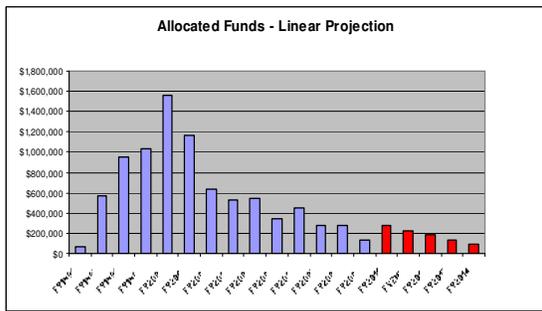
Minimum Additional



A significant shortfall exists in project funding due to reductions in available 21st Century funds. Prior to and including fiscal year 2000, there were no under-funded balances. Starting in fiscal year 2001, the under-funded balance for Kent County projects was just under \$1.3 million. It has been steadily increasing and is \$5.1 million for fiscal year 2009. Five year projections based on past years' trends were made using either an exponential or a linear fit and are graphically shown below:



The total funds allocated have fluctuated over the years but have shown a slight downward trend. Five year projects were made for these as well and are shown below:



Since neither projection can be solely relied upon, an average between the exponential projections and linear projections was made. These are shown in Table VI below:

Table VI – Average 21st Century Fund Requests

	<u>Linear</u>	<u>Exponential</u>	<u>Average</u>
FY2010	\$4,685,090	\$5,316,789	\$5,000,939
FY2011	\$4,998,308	\$6,130,869	\$5,564,588
FY2012	\$5,311,527	\$7,069,596	\$6,190,561
FY2013	\$5,624,745	\$8,152,056	\$6,888,401
FY2014	\$5,937,964	\$9,400,256	\$7,669,110

Average Total Allocated Funds

	<u>Linear</u>	<u>Exponential</u>	<u>Average</u>
FY2010	\$272,018	\$301,119	\$286,568
FY2011	\$226,837	\$284,291	\$255,564
FY2012	\$181,657	\$268,403	\$225,030
FY2013	\$136,476	\$253,403	\$194,940
FY2014	\$91,296	\$239,242	\$165,269

Projected Funding Gaps

	<u>Total Requested</u>	<u>Allocated</u>	<u>Funding Gap</u>
FY2010	\$5,000,939	\$286,568	\$4,714,371
FY2011	\$5,564,588	\$255,564	\$5,309,024
FY2012	\$6,190,561	\$225,030	\$5,965,531
FY2013	\$6,888,401	\$194,940	\$6,693,461
FY2014	\$7,669,110	\$165,269	\$7,503,841

The Minimum Additional program assumes that this potential \$7.5 million funding gap be eliminated within five years. Funding in the amount of \$1.5 million would be needed to accomplish this.

Most 21st Century Fund projects are funded incrementally. Limited dollars are distributed among competing projects each year and as individual projects reach fully funded status, they become active in design and/or construction. However, as the number of projects increase and available funds decrease, it can take as many as 10 or even 20 years for a project to be completed. A process that does not rely on incremental funding is needed to reduce the timeline for project completion.

Assuming additional funding does become available, additional personnel will be needed to administer the resulting project workload. A single employee at DNREC or KCD at about \$75,000 is assumed to be adequate to address this projected new workload.

Optimum Program

The Optimum Program assumes that the 21st Century Fund funding gap is closed within two and a half years and not five. The premise for this approach is that initial watershed plans described in Section E are begun in that same time period and these plans then result in more projects. Assuming funding needs are the same, the Optimum Program doubles the expenditures from the Minimum Additional. The additional DNREC or KCD employee is assumed to be adequate for the Optimum Program.

C. Tax Ditch Assistance

Overview

Both DNREC and the Conservation District provide technical assistance to the 86 tax ditch organizations in the County. Each provides funds for projects as well.

The Kent Conservation District provides financial and technical assistance to Kent County's tax ditch organizations. Financial assistance includes cost-share funds for clean out, spreading spoil, mowing, emergency repairs, and weed wiper bar. A District conservationist is the contact person for the District with the tax ditch officers. She attends annual meetings when requested and provides guidance with financial assistance programs. The district also holds a Tax Ditch Officers' Breakfast every other year to convey important information to the managers. DNREC assists with many of these programs as well.

Minimum Additional

Statewide, DNREC is the agency primarily responsible for the assistance given to tax ditch organizations. Considering the public's reliance on tax ditches and trends that will increase that reliance as a critical part of the drainage infrastructure, it is anticipated that a new Tax Ditch Coordinator will be needed by DNREC and this non-technical position would cost about \$50,000. DNREC also maintains a database of tax ditch organizations but it has not been updated in many years. DNREC has estimated that \$100,000 is

Tax Ditch Assistance
<p>Current Level</p> <ul style="list-style-type: none"> • \$205,000 in DNREC salaries • \$60,000 in Kent Conservation District salaries
<p>Minimum Additional</p> <ul style="list-style-type: none"> • \$50,000 for DNREC Tax Ditch Coordinator (Statewide responsibilities) • \$100,000 for DNREC computer system upgrades and associated costs (one time cost with Statewide coverage)
<p>Optimal Program</p> <ul style="list-style-type: none"> • \$50,000 for KCD District Tax Ditch Technician • \$100,000 for two DNREC Tax Ditch Coordinators (Statewide responsibilities) • \$100,000 for DNREC computer system upgrades and associated costs (one time cost with Statewide coverage)

needed to upgrade its GIS system, obtain ARC View licenses, and further develop the database. This cost estimate also includes legal fees associated with recordation and tax ditch rights-of-way issues.



Optimum Program

The 40 percent of tax ditch managers who responded to the survey are likely representative of some of the better managed organizations and even those appear to need help periodically. A Tax Ditch Technician position should be created at the District to help coordinate and administer various tasks. These tasks include: conducting inspections, organizing and facilitating annual meetings, and serving as the point of contact for managers and landowners. The technician could coordinate with the County staff and officials, consult individual tax ditch organizational managers on best management practices, and identify funding mechanisms. Tax ditch organizations could continue to function without a technician but some administrative functions may be done only sporadically if at all, resulting in less than an optimum level of service. This position is estimated to cost \$50,000.

Many tax ditch managers have been in office for decades and it is uncertain how active new residents will be in managing these crucial organizations. It is likely that DNREC will play an increasing role in coming years and that two Tax Ditch Coordinators will ultimately be needed. Two positions would cost \$100,000. The computer upgrades at \$100,000 are deemed sufficient for the Optimum Program for a one-time cost with routine upgrades as appropriate.

D. Tax Ditch Management

Overview

Approximately 14,650 tax parcels in Kent County are drained by the 745 miles of tax ditches. These comprise about 195 square miles or about a quarter of the County’s land. Statewide, tax ditches provide benefits to almost half of the roads maintained by the State. Most of the growth planned in the County is outside of tax ditch watersheds but some development will occur within these areas.

Tax Ditch Management	
Current Level	<ul style="list-style-type: none"> • \$475,000 for projects (\$310,000 from KCD and \$165,000 from Tax Ditch Organizations)
Minimum Additional	<ul style="list-style-type: none"> • \$300,000 for KCD projects
Optimal Program	<ul style="list-style-type: none"> • \$600,000 for KCD projects

Two types of maintenance are common with tax ditches. First is minor maintenance which is essentially the control of woody vegetation by mowing or applying herbicides. Major maintenance is activities related to the dip-out and spreading of accumulated sediments. Minor maintenance is often performed at least annually while major maintenance may occur only once every 10 or 20 years. In the survey, 31 of 33 tax ditch managers reported that they fund general operations through tax revenues but 27 also stated that they receive additional funding from the cost share program. Only five of the 33 reported that they have a long-term budget. Therefore, it appears that tax assessments provide adequate funding for minor maintenance but major maintenance necessitates additional funding assistance. The Cost Share results in approximately \$475,000 in projects each year. Without the Cost Share Program, the managers would not be able to adequately maintain the ditches without significantly raising taxes.

Minimum Additional

Tax ditches appear able to be relatively self sufficient for minor maintenance. For major maintenance, it is assumed that each tax ditch will require a dip out every 20 years. For the 86 tax ditch organizations in Kent County, this would equate to about four dip outs each year. This can be better quantified by assuming that all 745 miles of ditches will need to be cleaned every 20 years or about 40 miles a year. At an average price of \$2.00 per linear foot or about \$10,000 a mile, this results in a major maintenance need of \$400,000 annually.



Dip outs typically represent only about one half of expenditures with court order changes of existing ditches, emergency repairs, technical assistance, etc., comprising the remaining two thirds. Assuming this ratio remains constant, total annual needs would be more on the order of \$800,000 or a little over \$300,000 above current funding.

Optimum Program

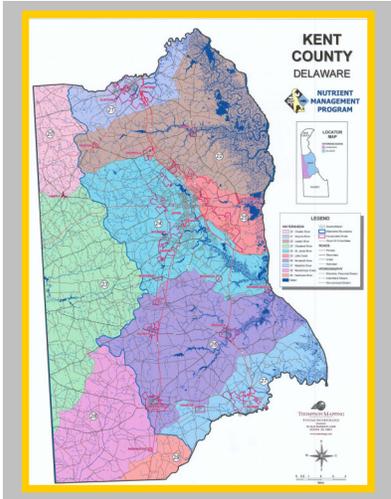
Since 25 percent of County land drains into a tax ditch, there is concern about the affects of new and future developments. Tax ditch managers believe that as development increases, so does the cost to maintain ditches as the costs for clean-up including disposal of trash and debris (tires, leaves, etc.) typically rises. Furthermore, watershed master plans may indicate other needed investments. For purposes of projecting a potential program impact, a doubling of the Minimum Additional program is offered as a place-holder for the Optimal service level and would result in \$600,000 each year.

E. Watershed Modeling for Quantity and Quality Management

Overview

Watersheds know no political boundaries but planning and project assessment on this scale is needed. Every agency involved in the Level of Service analysis stated that problems need to be analyzed in the context of the larger watershed and downstream impacts of development need to be better addressed. Currently developers’ engineers address drainage on a site-by-site basis. Furthermore, resolution of a problem in one jurisdiction sometimes necessitates work in another but these situations cannot be easily identified without a more comprehensive approach. The DPPI Dialogue recommended that the Clean Water Advisory Council provide for and DNREC develop detailed watershed plans for all of Delaware’s waters.

Watershed Modeling
<p>Current Level</p> <ul style="list-style-type: none"> • \$250,000 for the Murderkill Watershed Stormwater Management Plan
<p>Minimum Additional</p> <ul style="list-style-type: none"> • \$125,000 for major plans • \$20,000 for tributary plans • \$20,000 for municipal plans • No additional personnel are needed but developing mechanism for other program staff to work on watershed issues is advised
<p>Optimum Program</p> <ul style="list-style-type: none"> • \$125,000 for major plans • \$20,000 for tributary plans • \$20,000 for municipal plans • \$75,000 for additional employee at either DNREC or KCD • \$100,000 for DNREC GIS computer system upgrades and associated costs (one time cost)



Watershed models are often viewed on three levels:

- Major streams – these watersheds are usually measured at the square mile scale and models are used to develop policies to manage resources.
- Tributaries – these watersheds are usually measured more on an acreage scale and used to identify specific projects to protect or restore resources.
- Municipalities – DNREC has developed an outline for municipal drainage plans that describes activities in a number of categories associated with three programmatic levels that were more or less patterned after the requirements of the National Pollutant Discharge Elimination System (NPDES) stormwater permitting program.

Watersheds in Kent County have already been recognized by DNREC as follows:

Delaware Bay Drainage

- Smyrna River
- Leipsic River
- Little Creek
- St. Jones River
- Murderkill River
- Mispillion River

Chesapeake Bay Drainage

- Chester River
- Choptank River
- Marshyhope Creek
- Nanticoke River

Of these, six are considered major streams (Smyrna, Leipsic, St. Jones, Murderkill, Mispillion, and Choptank). The remaining four (Little Creek, Chester, Marshyhope, and Nanticoke) have drainage areas within the County small enough to be considered Tributary sized.

Minimum Additional

There have been few if any watershed models prepared in Kent County. This will be changing in the coming year as DNREC has contracted for the creation of the Murderkill Watershed Stormwater Management Plan in the southern part of the County. DNREC is currently funding this study for \$250,000 which is a good estimate for studies of major streams. Therefore, \$1.25 million would be needed for the five remaining major watersheds. If these studies are completed over a 10-year time period, \$125,000 would be needed each year. Outcomes for projects such as this vary depending on the circumstances of individual watersheds but typically include improvements to the existing drainage infrastructure and management strategies for currently undeveloped areas.

Similar studies for tributaries are assumed to cost \$50,000 each or \$200,000 for the four listed above. At the same 10-year period, this would necessitate \$20,000 annually. Municipal plans at a baseline level are assumed to cost \$10,000 each or \$200,000 for all 20 municipalities or again \$20,000 annually.

As noted in the Stormwater Program section, due to fluctuating workloads, Conservation District staff assigned mostly to plan reviews and similar urgent tasks periodically have excess capacity. A mechanism is needed that would allow employees to work on longer-term projects such as watershed-level assessments as one cost-management approach to study development and oversight.

Optimum Program

Watersheds are not static and change over time particularly as development occurs. Provision would be needed to manage the technical data developed as well as track projects resulting from the studies. GIS costs would be on the same scale as that needed for tax ditch assistance and \$100,000 has been estimated to support data management needs. An additional employee at either DNREC or KCD is also included to coordinate activities in watersheds at \$75,000 annually. Such coordination would include integration of each plan into a prioritization process for addressing issues. It would be critical that the impacted agencies establish a methodology to determine critical, intermediate, and long-term projects so that effective resource management can be established to meet expectations.

F. Maintenance of and Improvements to Public Infrastructure

Overview

A cornerstone of infrastructure maintenance is an inventory of assets. DeIDOT has a partial inventory of its storm drainage systems in the more urbanized areas of the County and some municipalities report having similar information of their systems. The Conservation District’s inventory of stormwater management basins includes both publicly and privately owned. Many municipal interviewees stated that the restoration of their aging infrastructure is one of the major concerns.

DeIDOT reported that they expend about \$3,200,000 annually on drainage projects related to the 2,650 lane miles of roads they maintain in Kent County. Municipalities are expending significant resources on other infrastructure improvements. For example, Camden has been seeking a multi-hundred thousand dollar improvement of Gibbs Ditch for years and recently applied for a \$3 million Federal grant that is partially intended to address drainage problems. Similarly, a multi-million dollar improvement of the Tar Ditch drainage system is being planned in Dover but funding sources are still being sought. Since these projects are isolated and not routinely performed, they have been excluded from the Expenditures and Funding Sources spreadsheet in Appendix A and from the summary herein, which are intended to capture routine, on-going levels of service. Other municipalities reported varying levels of annual expenditures for more routine maintenance and the total was estimated to be \$200,000.

Maintenance of and Improvements to Public Infrastructure
<p>Current Level</p> <ul style="list-style-type: none"> • \$1,400,000 in DeIDOT salaries • \$1,800,000 in DeIDOT projects • \$200,000 in municipal projects
<p>Minimum Additional</p> <ul style="list-style-type: none"> • \$2 million for complete inventory of State and municipal drainage infrastructure (one time cost) • \$700,000 in DeIDOT salaries • \$900,000 for DeIDOT projects • \$100,000 for municipal projects
<p>Optimum Program</p> <ul style="list-style-type: none"> • \$2 million for complete inventory of State and municipal drainage infrastructure (one time cost) • \$1.4 million in DeIDOT salaries • \$1.8 million DeIDOT projects • \$200,000 for municipal projects

The DPPI Dialogue stated that the Clean Water Advisory Council should review and refine projected stormwater infrastructure capital as well as operations and maintenance funding gaps.

Minimum Additional

A complete inventory of the public drainage infrastructure would build the foundation for future maintenance work as well as support the watershed master planning discussed previously. DeIDOT spent approximately \$5 million developing a detailed database and assessing the condition of its



stormwater conveyance components. Since a partial inventory exists in Kent County, it is estimated that \$1 million would be needed to complete this. Expanding the inventory to include municipalities that currently do not have an inventory would likely double the expenditures to \$2 million.

A 50 percent increase to DelDOT's drainage expenditures would be \$1.6 million comprised of salary increases of \$700,000 and project expenditures of \$900,000. A similar

increase for municipalities would be \$100,000. However, final recommendations on funding for maintenance should be completed once an inventory and system assessment is completed.

Optimum Program

The inventory described above is necessitated regardless of whether a Minimum or Optimum Program is implemented. A doubling of current expenditures would be \$3.2 million for DelDOT comprised of salary increases of \$1.4 million and project expenditures of \$1.8 million. A similar increase for municipalities would be \$200,000. However, it is noted that this change in level of service should be driven by the inventory and system assessment and likely would be phased in over a period of years to achieve an optimal service level.

G. Maintenance of and Improvements to Private Infrastructure

Overview

The maintenance of privately-owned stormwater management basins was cited as a major concern by each agency performing drainage work in Kent County including the municipalities. This issue was also noted in the Sussex County Surface Water Management Level of Service Analysis and is recognized throughout the Country as a growing problem.

While tax ditches are also privately maintained, their managers appear to generally be aware of their responsibilities and, by and large, perform their duties well, within the resources.

Maintenance of and Improvements to Private Infrastructure
Current Level <ul style="list-style-type: none"> \$1.8 million for minor maintenance by home owner associations
Minimum Additional <ul style="list-style-type: none"> \$1.8 million for minor maintenance \$1.25 million for major retrofits
Optimum Program <ul style="list-style-type: none"> \$3.6 million for minor maintenances \$2.5 million for major retrofits

There is growing concern that HOAs often are uninformed about their responsibilities. Many also question if the HOAs have the financial resources or technical wherewithal to properly perform the tasks.

It is very difficult to estimate current expenditures. Some communities spend a considerable amount of money on the upkeep of amenities such as fountains and aerators whereas others simply cut the grass several times a year. The Kent Conservation District has already accomplished the first important step by completing an inventory of publicly and privately owned basins within the County as well as municipalities. The inventory is geo-referenced and the associated database includes relevant information including drainage area and year the facility was built. Each of these is inspected annually. For the purposes of this assessment, it was assumed that each HOA spends \$2,500 and \$1,000 for each of the 620 basins and 230 BMPs respectively for a total of \$1.8 million. Many

communities also are responsible for open channels but these costs are even harder to quantify so for simplicity these have been assumed to be incidental to the upkeep of the basins.

Establishment of standards for maintenance of private facilities within the County, for consistency in long-term management and to ensure that these perform appropriately to protect property, should be considered. Should public resources be expended on privately owned facilities, standards are important to establish expectations for each party's role in maintenance.

Minimum Additional



Maintenance of basins falls into two general categories, minor and major. Minor maintenance operations like grass cutting are usually addressed by current owners. However, other frequent tasks such as the control of invasive plants, repair of eroded banks, or removal of obstructions from outlets are often not. The doubling of the average cost or \$5,000 each for the 620 basins and \$2,000 for each of the 230 BMPs would necessitate an additional \$1.8 million each year to provide a level of service that would address routine, on-going maintenance.

Major maintenance usually involves the rehabilitation or retrofit of an existing basin. Depending on the design, construction, and maintenance activities, this often significant amount of work may be needed every 25 years. Though few retrofits have been done in Kent County, experience in New Castle County indicates these projects can cost at least \$50,000 and sometimes several hundred thousand dollars, depending on size and location of the facility. It is assumed that annual maintenance of BMPs would enable these types of facilities to continue to operate effectively without major maintenance; however, as BMPs are relatively new in the industry, their maintenance should be evaluated on a routine basis to determine if major rehabilitation will be necessary and on what schedule. Tracking national data on BMPs is being done by several organizations such as EPA and this data will be valuable to the agencies within the County. If each of the 620 basins has a life span of about 25 years, 25 would require a retrofit each year. Using the lower cost of \$50,000 for the Minimum Additional program, this would necessitate \$1.25 million each year.

Optimum Program

A more aggressive program would assume that minor maintenance of privately owned facilities could be more comprehensively handled and doubles the Minimum Additional estimate to \$3.6 million for minor maintenance and \$2.5 million for major maintenance each year.

H. Water Quality Strategies

Overview

There are two regulatory programs associated with water quality emanating from nonpoint sources: the National Pollutant Discharge Elimination System (NPDES) stormwater permitting program and the Pollution Control Strategies (PCSs) being developed to address Total Maximum Daily Loads (TMDLs) in select watersheds in Kent County.

The NPDES program has two components. DeIDOT and the City of Dover have the only two municipal separate storm sewer system (MS4's) permits in Kent County. Though not a direct permit holder, several of the Conservation District's programs such as plan reviews, site inspections, and education and outreach are due to the requirements of these two permits. There are also 47 industrial facilities with NPDES stormwater permits in the County. Further details about these programs can be found in Section III.B. of this report.

It has been reported that DeIDOT spends approximately \$700,000 each year on NPDES activities in Kent County complying with the six minimum controls: public education and outreach, public participation and involvement, illicit discharge detection and elimination, construction site runoff control, post construction runoff control, and pollution prevention and good housekeeping. The City of Dover spends about \$175,000 on similar activities. Approximately \$50,000 of the Conservation District's expenditures are related to the NPDES program.

A listing of TMDL watersheds and their impairments are shown in Table VII below. With the exception of the Murderkill River which has been finalized, each of these has been approved by the U.S. EPA but not yet promulgated. Several have Tributary Action Teams developing Pollution Control Strategies in order to comply with the TMDLs.

Water Quality Strategies	
Current Level	<ul style="list-style-type: none"> • \$700,000 in DeIDOT costs • \$175,000 in Dover costs • \$50,000 in KCD costs
Minimum Additional	<ul style="list-style-type: none"> • \$350,000 in DeIDOT costs • \$90,000 in Dover costs • \$25,000 in KCD costs • \$100,000 for small grants program at Conservation District • \$25,000 for half time employee at the Conservation District
Optimum Program	<ul style="list-style-type: none"> • \$350,000 in DeIDOT costs • \$90,000 in Dover costs • \$25,000 in KCD costs • \$200,000 for small grants program at Conservation District • \$50,000 for full time employee at the Conservation District

Table VII – TMDL Watersheds in Kent County

<u>Watershed</u>	<u>Impairment</u>
Chester River	Bacteria, Nutrients
Choptank River	Bacteria, Nutrients
Marshyhope Creek	Bacteria, Nutrients, Dissolved Oxygen
Nanticoke River	Bacteria, Nutrients
Smyrna River	Bacteria, Nutrients
Leipsic River	Bacteria, Nutrients
Little Creek	Bacteria, Nutrients
St. Jones River	Bacteria, Nutrients
Murderkill River	Nutrients
Mispyllion River	Bacteria, Nutrients, Dissolved Oxygen

Though some expenditures have been reported, it is difficult to quantify the current level of effort. The prevalent nonpoint source impairments of bacteria and nutrients are often traced to two land uses, agricultural and urban. Adding stormwater quality best management practices in these areas could be one of the more strategic investments that can be made to improve or restore water quality. Similarly, retrofitting existing facilities in developed areas that may not have been designed or constructed with water quality considerations or may have fallen into a state of disrepair could have a similar positive return on the investment.

The most comprehensive Pollution Control Strategies developed to date for TMDL watersheds in Delaware are those still in draft form dated April 2007 related to the Inland Bays watershed. That draft document noted that approximately \$700,000 has already been spent on BMPs in the watershed.

Minimum Additional

While each NPDES permitted agency is in compliance with their permit, it is recognized that additional activities could be performed. It is assumed a 50 percent increase in expenditures would result in more comprehensive approaches. This increase results in \$350,000 for DelDOT, \$90,000 for Dover, and \$25,000 for the Kent Conservation District.



Appendix F of the draft Inland Bays Pollution Control Strategies provided cost bases for numerous BMPs. Agricultural BMPs included natural features such as grassed waterways and filter strips as well as structural measures like basins and compost sheds. Urban BMPs were focused on constructed facilities such as basins, infiltration structures, sand filters, and biofilters. The natural agricultural BMPs averaged over \$200/acre/year and the urban BMP’s averaged about \$1,500/acre/year. Based on the acreage of the County within impaired watersheds, implementation costs would easily be in the millions of dollars. Since these estimates are largely approximate and Pollution Control Strategies are still being developed, they are being omitted from the quantitative aspects of this report.

A good first step towards much larger scale BMP implementation would be to create a small grants program where municipalities, communities, or watershed associations could apply for and obtain funds on a cost share basis. Potential projects could range from watershed assessments to new BMP installations to retrofit of existing facilities. This program would be best managed by the Conservation and \$100,000 has been estimated as a reasonable funding level. This would also necessitate a part-time employee at the District estimated to cost \$25,000.

Optimum Program

It is assumed the Minimum Additional Program effort is adequate for the Optimum Program as well. A more robust small grants program would double the Minimum Additional program and provide \$200,000 in grant funds. A full-time employee at \$50,000 would be needed.

I. Flood Plain Protection and Improvement

Overview

Flood plains in Kent County fall into two general categories: tidal and non-tidal of which tidal make up the majority. As in other counties and states, these two types of flood plains are addressed differently. Development, including fill, in tidal flood plains is usually allowed since for all intents and purposes, the extent of the flood plain is so vast that fill in any one location would not appreciably raise elevations in other locations. Non-tidal or riverine flood plains are different as development resulting in fill could

Flood Plain Protection and Improvement
<p>Current Level</p> <ul style="list-style-type: none"> • \$150,000 for flood plain mapping in the Murderkill watershed
<p>Minimum Additional</p> <ul style="list-style-type: none"> • \$500,000 for flood plain mapping (one time cost) • \$50,000 for map maintenance
<p>Optimum Program</p> <ul style="list-style-type: none"> • \$1 million for flood plain mapping (one time cost) • \$100,000 for map maintenance

theoretically raise elevations elsewhere as well as place structures at risk. In these cases, unless the County mandates that the developer perform the necessary studies to calculate offsite impacts and the appropriate on site elevations, adjacent properties may be affected and individual homeowners left to determine adequate building heights.

In those streams where detailed studies have been performed, the floodway (the channel and adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than one foot) is known and is often very close to the flood plain itself. However, many parts of the County have not had detailed flood studies performed and, therefore, floodways have not been determined. FEMA floodplain maps have been developed for those that meet the criteria for draining at least a one square mile or greater watershed. As development continues to occur which rely on tax ditches for downstream conveyance, more frequent updates to these maps may become necessary. These maintenance updates are also needed as new data becomes available.

Kent County's Land Development Ordinance prohibits construction within the 100-year flood plain. Its inspection and permitting program assures compliance with the Ordinance and also regulates construction issues such as building and foundation types when building is still allowed due to grandfathered plans. The regulations are more difficult to enforce in unmapped areas. For municipalities, Dover has similar prohibitions to the County but most other cities and towns do not have the same level of statutes. The lack of training in the understanding of flood plain issues may be an issue. DNREC's flood plain management group within the Division of Soil and Water Conservation provides periodic assistance.

Minimum Additional

DNREC is currently overseeing a flood plain mapping project for approximately 30 stream miles in the Murderkill watershed for \$150,000 or \$5,000 a stream mile. It is estimated that between 100 and 200 stream miles need to be mapped elsewhere in the County. Using the lesser estimate of 100 miles at the same rate, \$500,000 would be needed for this mapping. It is assumed that an additional one tenth of this sum would be needed for on-going map maintenance.



Optimal Program

Using the upper estimate of 200 unmapped stream miles at \$5,000 a stream mile, \$1 million would be needed with an additional \$100,000 for maintenance.

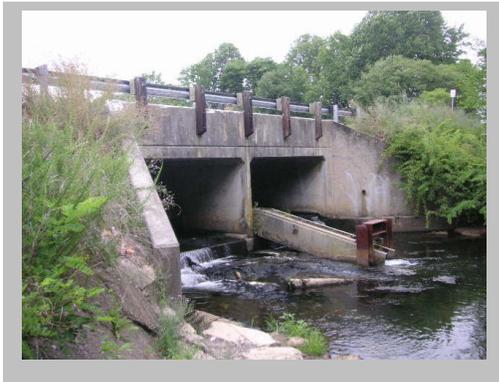
J. Dam Safety

Overview

Delaware's Dam Safety Law was passed by the General Assembly and signed by Governor Minner in 2004. It requires DNREC to establish a dam safety program for the State and to promulgate regulations. Part of this work includes determining the hazard classification of dams which forms the basis for their regulation.

DNREC's current efforts are focused on the preparation of Emergency Action Plans (EAPs) which identify potential emergency conditions at a dam and specifies pre-planned actions to be followed to minimize property damage and loss of life. An EAP specifies actions to moderate or alleviate problems at a dam and contains procedures and information to assist the owner in issuing early warning and notification messages to responsible authorities of an emergency situation. The Plan also contains inundation maps to show the critical areas for action in case of an emergency. Currently, \$200,000 is being spent annually in Kent County. DNREC staff is overseeing the preparation of these plans by consultants and \$40,000 is estimated for this task.

Minimum Additional



EAPs cost about \$50,000 each and there are 20 dams in Kent County which DNREC's consultant has classified as high hazard and in need of an EAP. Therefore a total of \$1 million is needed. Preparing these plans over a five year time frame would necessitate \$200,000 a year.

Numerous dams in Kent County were identified as having potential risks such as under-designed spillways. Costs to provide structural modifications are often on the order of \$1 million. Structurally modifying one dam every two years would require \$500,000 a year.

Optimum Program

A more aggressive program would double the Minimum Additional expenditures and prepare EAPs over two and half years and fund a structurally modified a dam every year. The resulting costs would be \$400,000 and \$1 million, respectively.

K. Public Outreach And Public Involvement

Overview

Public outreach and involvement efforts in Kent County are performed almost exclusively by the Conservation District.

The District's most notable work involves working with HOAs as part of their annual inspections by providing technical assistance and educating these owners about how to properly maintain their basins. The brochure on basin maintenance previously developed by DNREC is often distributed and references are made to DNREC's website. District personnel also have a display at the

Dam Safety
<p>Current Level</p> <ul style="list-style-type: none"> • \$40,000 in DNREC salaries and overhead • \$200,000 for Emergency Action Plans
<p>Minimum Additional</p> <ul style="list-style-type: none"> • \$200,000 for Emergency Action Plans • \$500,000 for structural modifications
<p>Optimum Program</p> <ul style="list-style-type: none"> • \$400,000 for Emergency Action Plans • \$1 million for structural modifications

Public Outreach and Public Involvement
<p>Current Level</p> <ul style="list-style-type: none"> • Existing expenditures are nominal
<p>Minimum Additional</p> <ul style="list-style-type: none"> • \$50,000 for assorted programs • \$25,000 for part-time additional KCD employee
<p>Optimum Program</p> <ul style="list-style-type: none"> • \$75,000 for assorted programs • \$50,000 for full time additional KCD employee

State Fair in Harrington each July and work with school-aged children at water festivals throughout the year. These activities seek to educate residents about the ramifications of their actions such as salting streets during winter and washing cars on pavement in the summer. Programs planned for the future include more formal seminars for HOAs on basin and BMP maintenance.

As previously noted, two of the six program components of the NPDES program are Public Education and Outreach and Public Involvement and Participation. These are intended for citizens to gain greater understanding of the reasons why stormwater-related programs are necessary and important and to become aware of the personal responsibilities expected of them and others in the community, including the individual actions they can take to protect or improve the quality of area waters. Examples include the preparation of documents such as the following:

- Brochures or fact sheets for general public and specific audiences;
- Recreational guides to educate groups such as golfers, hikers, paddlers, climbers, fishermen, and campers;
- Alternative information sources, such as web sites, bumper stickers, refrigerator magnets, posters for bus and subway stops, and restaurant placemats;
- A library of educational materials for community and school groups;
- Volunteer citizen educators to staff a public education task force;
- Event participation with educational displays at home shows and community festivals;
- Educational programs for school-age children;
- Storm drain stenciling of storm drains with messages such as “Do Not Dump - Drains Directly to Lake”
- Stormwater hotlines for information and for citizen reporting of polluters;
- Economic incentives to citizens and businesses (e.g., rebates to homeowners purchasing mulching lawnmowers or biodegradable lawn products); and
- Tributary signage to increase public awareness of local water resources.

A Public Participation and Involvement program would work in concert with the education and outreach efforts and include activities that engage the public directly. For example:

- Public meetings/citizen panels allow citizens to discuss various viewpoints and provide input concerning appropriate stormwater management policies and BMPs;
- Volunteer water quality monitoring gives citizens first-hand knowledge of the quality of local water bodies and provides a cost-effective means of collecting water quality data;
- Volunteer educators/speakers are utilized who can conduct workshops, encourage public participation, and staff special events;
- Storm drain stenciling is an important and simple activity that concerned citizens, especially students, can do;
- Community clean-ups that organize volunteers who work along local waterways, beaches, and around storm drains have a positive impact on stream health;
- Citizen watch groups can aid local enforcement authorities in identification of polluters; and
- “Adopt a Storm Drain” programs encourage individuals or groups to keep storm drains free of debris and to monitor what is entering local waterways through storm drains.

While these types of projects could and should be performed by multiple organizations, both public and non-profit, it would be best if one agency leads the effort, if for no other reason than to keep track of projects and quantify expenditures by all. Considering the Conservation District is already engaged in many such activities, they would likely be the best organization for this role.

The DPPI Dialogue recommended that the Clean Water Advisory Council encourage and provide for increased education on stormwater management.

Minimum Additional

Costs on a per capita basis for these sorts of education programs vary significantly across the country and range from between \$0.20 on the low end to about \$0.50 per capita on the high end. Using a mid point average of \$0.35 and a population of 150,000 residents, \$52,500 would be needed annually. This has been rounded down to \$50,000. This increased level of expenditure would also necessitate additional staff time and a part-time person at \$25,000 has been allotted.



Optimum Program

A more aggressive program would be equated with the high end average of \$0.50 per capita or \$75,000 for the County. These funds could be directed to a more proactive outreach, rather than rely significantly on volunteer efforts. The part-time position has been upgraded to a part-time position for \$50,000. Coordination with similar efforts in Sussex and New Castle Counties could leverage other funds and reduce overall per capita costs.

L. Planning And Regulatory Aspects

Overview

Several of the organizations interviewed for this analysis noted that Kent County as well as many of the cities and towns in the County do not have a Lines and Grades Ordinance. Interviewees expressed concern that grading changes can be made on lots without any approval process or tracking mechanism which can cause effects on adjoining properties. As-built plans prepared after construction are needed.

Kent County Comprehensive Plan

Kent County recently completed its 2007 Comprehensive Plan. It offers a thorough evaluation and clear goals on stormwater management countywide. The Plan provides a description of the existing conditions related to stormwater management, identifies the major issues and challenges, and sets forth strategies and specific recommendations to tackle the issues.

The existing conditions section describes the watershed and drainage patterns in the County. A description and mapping is provided for FEMA classified floodplains and other significant environmental resources, such as wetlands and woodlands. A narrative of tax ditches in the County is also presented. The County recognizes that well-organized and maintained tax ditches provide the

Planning and Regulatory Aspects
<p>Current Level</p> <ul style="list-style-type: none"> • Current expenditures are negligible
<p>Minimum Additional</p> <ul style="list-style-type: none"> • \$50,000 to Kent County (one time cost) • \$100,000 to municipalities (one time cost)
<p>Optimum Program</p> <ul style="list-style-type: none"> • \$100,000 to Kent County (one time cost) • \$100,000 to municipalities (one time cost)

drainage conveyance framework that enables the area to have productive farmland and adequate drainage countywide.

A brief discussion with complete mapping is provided on excellent recharge areas and wellhead protection areas. The County acknowledges that Delaware Code requires measures to protect the quality and quantity of public water supplies within these source water areas.

As identified in the Comprehensive Plan, most of the statewide and local stormwater management regulations to date have focused on regulating new development. However, many stormwater runoff problems within Kent County are associated with existing developments that were built prior to the adoption of stormwater management regulations. In addition, land use activities such as row crop agriculture can contribute to both water quality degradation and increased flooding. The County Plan recognizes that traditional stormwater management technologies significantly alter the natural hydrology of a site, which has regional impacts.

Awareness of these issues and requirements of the Clean Water Act, particularly Total Maximum Daily Loads (TMDL), have prompted the exploration of methods for addressing stormwater quality and quantity controls in all areas of Kent County. The County recognizes that Low Impact Development (LID) minimizes site alterations as much as possible by incorporating natural landscaping design techniques to control runoff both during and after development. The natural landscape is used to reduce runoff from the site, and to treat and filter the runoff that is discharged from the site.

The Plan notes that historically there has not been dedicated funding for this maintenance, with adequate funds available on a year-to-year basis for the clean out of streams, basins and other conveyance systems. It further states that a stormwater utility would provide a dedicated source of revenue to address flooding and drainage, improve water quality and minimize future problems. A stormwater utility would also facilitate the maintenance process on stormwater management systems including collection, conveyance, detention facilities and retention facilities and coordinate response to identified needs.

The Plan offered numerous recommendations related to surface water management:

- Develop standards for source water protection including excellent recharge areas and wellhead protection areas to ensure an ongoing adequate supply of drinking water.
- Coordinate with DNREC to review development and permitting standards including infiltration practices and impervious cover limitations to prevent the depletion of groundwater resources.
- Continue to coordinate efforts with KCD and DNREC to limit and manage stormwater runoff in the most efficient and effective manner while respecting natural features and constraints.
- Continue participation in the Stormwater Regulatory Advisory Committee and Clean Water Council to develop a watershed approach to stormwater.
- Develop a stormwater facility maintenance program where the County fulfills the administrative role and KCD and DelDOT continue in their technical roles of plan review and site inspection.
- Encourage stormwater management practices designed to meet the objectives of a regional stormwater model, intended to address stormwater runoff impacts within a watershed.
- Encourage the use of Low Impact Design particularly for projects within the more rural areas within and outside the Growth Zone Overlay.

- Establish a permitting process for land grading to enable efficient and effective inspection and enforcement action.

Municipal Comprehensive Plans

The comprehensive plan is the rational basis for all local land use policy making in Delaware. Per the Delaware Code, Title 22, Section 702, municipalities are required to draft comprehensive plans meeting the requirements of the law and review the plan every five years to determine if its provisions are still relevant given changing conditions in the municipality or in the surrounding areas. The adopted comprehensive plan shall be revised, updated and amended as necessary, and re-adopted at least every 10 years.

Of the municipal comprehensive plans, all have some information provided pertaining to the stormwater management. The information ranges from a generalized overview of stormwater issues to a detailed inventory and analysis with specific recommendations to address problem areas. None of the Plans have a section devoted to stormwater management as all have sections integrated with the infrastructure and utilities chapter and/or an environmental chapter. It is noted that the Office of State Planning Coordination (OSPC) does not require a stormwater management element in the Comprehensive Plan for certification. Indeed, water resource protection and pollution control strategies are commonly recognized and recommended by OSPC and the Department of Natural Resources and Environmental Control (DNREC) through the Preliminary Land Use Service (PLUS) review process which is required for certification of a municipal Comprehensive Plan.

It is typical for a Comprehensive Plan to provide a description of the existing conditions related to stormwater management issues. In general, an overview is provided that describes the watershed, the topographical relief of the region and surrounding rivers, streams and water bodies. Only a few Plans in the County provide an inventory of stormwater management facilities in the municipality, including distribution facilities, conditions and specific flooding issues.

Most of the Plans were drafted prior to or during the establishment of Total Maximum Daily Loads (TMDL) standards or during the development of Tributary Action Teams. With the exception of Houston, Frederica and Milford, none of the Plans provide quantitative loads or targets and merely reference that the DNREC studies and goals are underway.

Similarly, the deadline to adopt the State mandated source water protection ordinance was December 2007, which was after the certification of all the plans. Therefore, the majority of municipalities simply reference the requirement as a recommended implementation item. Due to this recent state mandate, it is noted that identifying appropriate land uses for wellhead areas will be a top priority for municipalities with public water systems in their next Comprehensive Plan Update.

With the assistance of DNREC, the majority of municipalities have identified and mapped their wellhead protection area and excellent recharge areas. In general, the Comprehensive Plans recognize specific initiatives and objectives of the Clean Water Act and the TMDL and source water protection programs. Moreover, some of the Plans make recommendations to adopt regulations to protect environmentally sensitive areas related to stormwater management such as wetlands, flood prone areas, recharge areas and riparian corridors. Such Plan recommendations make the connection between land use and stormwater management issues by recommending preservation provisions in zoning and subdivision ordinances including permitted land uses in an identified overlay zones, riparian buffer setback requirements, BMPs, and cluster developments, among other regulatory techniques. About half of the municipalities with certified Comprehensive Plans provide recommendations for Best Management Practices (BMPs) to treat stormwater runoff.

Since the Kent Conservation District is the delegated authority of stormwater management in the County for plan review, inspection, construction oversight and maintenance, the majority of the municipal Comprehensive Plans recommend to either initiate or to continue to coordinate with the KCD. In addition, some plans recommend coordination with DNREC, the OSPC and/or the KCD in preparing regulations and ordinances, such as the mandated source water protection ordinance.

Minimum Additional

It is important to have a comprehensive approach when setting forth strategies and implementation recommendations to resolve drainage issues in areas targeted for growth and development in the future land use and annexation plan. The County and municipalities should consider drainage and stormwater management in updates and amendments to their comprehensive plans to set the framework for other regulatory actions if needed.

Current personnel at the County level could provide updates to existing codes or author new regulations such as Lines and Grades requirements as part of their regular duties. It is however assumed that a professional code writer could assist on a contract basis for \$50,000. Some municipalities, particularly those smaller in size, could benefit from the guidance of a professional code writer as well. It is assumed that \$100,000 spread out to multiple cities and towns would be adequate to meet the minimum needs. A county-wide standard for design and maintenance strategies may be appropriate, following similar approaches in other states. A state-wide design and maintenance standards manual may be an alternative as well. This is another approach unfolding across the nation. This set of standards would be incorporated into local ordinance by reference and could be prepared with location specific conditions to address the variability in drainage and stormwater challenges throughout the state.

Optimum Program

The services of a professional code writer for Kent County could be more fully engaged for \$100,000. Assuming individual municipal needs could be fulfilled for \$25,000 for each of the 20 cities and towns in the County, \$500,000 or \$100,000 a year for five years would be needed.

VI. RECOMMENDATIONS

The purpose of this project was to determine the current level and extent of public services offered in Kent County related to surface water management, and to identify both the cost and the degree to which they may be initiated or increased to adequately meet the needs of the expanding population within the County. Analyses built upon previous efforts such as Governor Minner's Task Force on Surface Water Management (2005) and the Delaware Public Policy Institute (DPPI) Dialogue on Financing Wastewater and Stormwater Infrastructure (2006).

Potential program enhancements were described for each of the 12 service areas specified in Section V. Since some themes transcend multiple service areas, the recommendations that follow focus more on broader themes. They acknowledge the previous assessments as appropriate.

A. Programmatic Recommendations

The following recommendations will require a high degree of planning and resources and, if implemented, would result in new or substantial changes to existing programs.

Create a Stormwater Management District

This Level of Service study found that the additional annual funds to meet the Minimum Additional Program is \$8,250,000 for total expenditures of \$17,650,000 with an additional \$16,100,000 needed for the Optimum Program for total expenditures of \$25,500,000. One time costs were found to add \$2,750,000 and \$3,400,000 to these sums for the Minimum Additional and Optimum Program, respectively. A little under 20 percent of the Minimum Additional and Optimum Program shortfalls is the projected gap in funding for the 21st Century Fund. At the current level, projects added today may not have full funding for 20 years. Other approaches to funding are needed.

The Governor's Task Force was specific in stating that "stormwater utilities operating at the county or local level should be formed as a funding vehicle for the purpose of providing a simplified and comprehensive approach to drainage and flooding problems throughout each county". This recommendation was reinforced by the DPPI Dialogue which declared "stormwater utilities should be created and implemented, when possible, to provide for a consistent, coordinated, clear, comprehensive and funded approach to stormwater management". Communities of all sizes have undertaken the challenge to ensure that their stormwater management strategies are funding in a manner that meets community expectations and addresses both water quantity and water quality management issues. Just as water and sewer agencies struggled with the demands of the Clean Water Act in the early 70's, drainage infrastructure managers are now challenged to find stable and sufficient financial resources to provide effective stormwater services.

Creating a comprehensive stormwater utility could be challenging since so few exist in the mid-Atlantic region. A better approach may be to set up an organizational structure with a specific program focus and expand it over time to other responsibilities. The issues related to privately maintained stormwater management structures would be an ideal place to start since most of the basins and BMPs in the County are the responsibility of private entities. A mechanism is envisioned such that new residential developments that have stormwater management facilities would be required to join a non-contiguous but County-wide Stormwater Management District. Existing developments would also be required to join as they seek public funds to pay for major

restoration. Commercial basins and those that are the responsibility of public agencies such as DeDOT would continue to be maintained as they are today.

A Kent County Stormwater Management District would be advantageous for a number of reasons. HOA officers, who are often lay people, would be relieved from the burden of maintaining their community's basins and best management practices (BMPs) better assuring the public at-large that this critical aspect of the overall drainage system is functioning properly. Total expenditures would be reduced if a single agency performed the maintenance work and / or oversaw contractors due to economies of scale. Most importantly, water quality in the County would be improved through enhanced maintenance.

The proposed Stormwater Management District would be a step towards the type of utilities envisioned by the Task Force but would differ in two ways. First, its breadth would be initially limited to stormwater management basins and BMPs and not a more comprehensive program including other aspects of drainage infrastructure. Second, the fee structure would be based on a per-lot assessment and not more complex impervious coverage calculations.

The District proposed would initially solve the problem of maintenance of stormwater management facilities in new developments. The underlying intent would be for existing HOAs to realize the benefits of inclusion in the District and seek to join thus expanding the District's boundaries and closing geographic gaps over time. This would result in the hundreds of basins and BMPs maintained by private HOAs to be brought into public responsibility over time. Ideally, at some point in the future, all basins and BMPs in Kent County would be subject to District maintenance.

Once the framework for the District is in place, over time it could also take over some or all of these other drainage-related functions such as conveyance system maintenance and projects typically funded by the 21st Century Fund. Fees would of course need to account for this broadening of responsibility and ideally be based on impervious cover. This approach would shift funding away from general funds and result in an equitable, stable, and dedicated source.

Develop Mechanisms Governing the Maintenance of Privately-owned Stormwater Management Structures

This is a major issue throughout Delaware and in other parts of the Country. The concern with this approach is twofold. First, HOAs are often uninformed about their responsibilities and second, even if aware, financial resources and technical wherewithal may not be sufficiently provided. Similar issues exist for smaller facilities such as rain gardens on individual private lots. Many of the agencies and municipalities interviewed for this study identified this as a concern. Stakeholders at opposite ends of the spectrum agreed from the Kent County Conservancy to the Home Builders Association of Delaware. DeDOT representatives opined that responsibility for maintenance of private facilities should be assigned to the land and not the owner so the responsibility is always clear. Others noted the precedents that are set when elected officials acquiesce and agree to pay for maintenance or rehabilitation when there is no mandate to do so.

Creation of a Stormwater Management District described above would reduce the likelihood of these problems and one day eliminate them if fully implemented. However, even in a best case scenario, this would take years. Therefore, other program enhancements should be considered.

For example, a mechanism for collecting revenues from the owners of facilities should be developed to offset the Conservation District's personnel costs associated with inspections. Currently these activities are funded through the Sediment and Stormwater Program fees. This creates an inequity as developers are essentially paying a portion of the upkeep costs for existing stormwater management facilities for which they are not responsible. Principles of government finance, when using specific fees or revenues, indicate that the property or individual who receives benefits directly should pay their fair share of the cost of that service. This is an important principle in creating equity between who pays and receives services in return.

Also, there are certain similarities between tax ditch organizations and HOAs as both are private and overseen by an elected board. In recognition of the importance of tax ditches, the cost share program through the Conservation District was developed years ago. A similar program would lessen the burden on HOAs and potentially provide funds for major maintenance. A source of matching funds would be needed.

As stormwater management practices continue to evolve and dispersed green technology best management practices (BMPs) become more prevalent, the maintenance provisions will become increasingly important. Furthermore, there are multiple efforts underway to place BMPs in already developed areas where there currently are no treatment provisions or retrofit stormwater structures that already exist. Indeed, work in the St. Jones Watershed in 2008 identified almost 150 potential sites within that watershed, nearly all on private property. It is important as these practices are targeted for site by site solutions and that the cost allocation for maintenance services be thoroughly examined and allocated to the end user as appropriate.

B. Administrative Recommendations

The following recommendations can be accomplished more quickly than those related to program changes and can be accomplished with minimal additional resources.

Develop Report Dissemination Strategy

A strategy should be developed for distribution of the report and its findings. At a minimum, the report findings should be presented to every organization interviewed or represented at the public meeting. Members of the General Assembly representing Kent County should be made aware of the current and future funding gaps as should the Clean Water Advisory Council. While some members of the Kent County Levy Court and various municipal representatives were involved in the process to date, a concerted effort to reach others in similar roles should be undertaken so a more widespread audience of decision-makers understand the long-term implications of current policies.

Prepare a More Comprehensive Organizational Analysis and Detailed Cost Model

This Level of Service Analysis is intended to be the starting point in the development of a more comprehensive surface water management program in Kent County. The next step would be to complete a more comprehensive organizational analysis in concert with a detailed cost model. While some programmatic changes were recommended herein, the organizational analysis would take these initial observations and identify restructuring and aligning responsibilities and provide a map for roles that help drive the funding strategies. A detailed cost model for future program growth extended over a five year time frame would result in the development of an "optimal" and "acceptable" approach to balancing demand for services and appropriate funding methods

based on this Level of Service Analysis. The results of the study would provide greater insight into issues of who pays and how funding mechanisms should be managed.

Reassess Program Funding Sources and Personnel Allocation for the Kent Conservation District

Personnel costs for staff from the District's Sediment and Stormwater Program are derived from program fees. These can fluctuate which provides an opportunity for staff to be utilized during slower development periods in other tasks such as watershed assessments. These reassignments would necessitate an internal employee transfer mechanism. Regardless, the Conservation District should seek new or additional funding sources. Other conservation districts facing similar issues have created task forces to evaluate alternative approaches. Similarly, the Sediment and Stormwater Program needs to be able to quickly increase staff to provide services when development activity is heightened.

A related issue is the encumbering of funds. The Kent Conservation District operates in a different manner from the New Castle Conservation District. In New Castle County, funds are encumbered for a project sometimes over many years and administrative costs for District employees are included in project budgets. In Kent County, funds can get reapportioned if not spent and administrative costs are not included in budgets. Therefore, alternate funding processes are needed in support of a goal to ensure that projects are implemented in a timely manner.

Better Clarify Maintenance Responsibilities

Any change considered for stormwater program financing must address the issue of maintenance responsibility. For many in the County, drainage system maintenance is the most highly visible service they experience when considering all the various stormwater-related activities undertaken. Getting this service "right" in the eyes of the community is critical for implementation of an effective funding and program implementation strategy.

There is uncertainty regarding maintenance responsibilities for some portions of the drainage infrastructure. In a general sense, DeIDOT typically maintains enclosed pipes within their rights-of-way but once these pipes daylight, particularly in unincorporated areas, clear responsibility often ends. The Conservation District or an HOA may maintain open channels outside of rights-of-way but often neither has been formally tasked. Even in cities and towns, this responsibility is often undefined and is exacerbated by the disparate roadway agreements that exist. More formal arrangements between agencies could result in greater efficiencies with shared resources or in addressing multi-jurisdictional projects. Similar arrangements between public and private organizations may also be a necessity in resolving the issues inherent to maintenance of private facilities.

While an inventory of stormwater management basins and BMPs exists, this should be expanding to include other surface water management structures such as inlets, pipes, and roadside channels. This would necessitate cooperative arrangements among multiple parties as maintenance responsibilities vary by drainage components. DeIDOT currently does not utilize DNREC's database of drainage problems and a common inventory would facilitate database applications.

Evaluate Policies and Update or Prepare Regulations and Codes

While DNREC clearly intends to further the use of green technology BMPs in coming years, those representing private interests believe that administrative hurdles exist to their implementation. Since DNREC has delegated the Sediment and Stormwater Program to the Conservation District, the process for reviewing and approving or denying the use of innovative practices should be periodically evaluated. Similarly, DeIDOT may want to reconsider its policy of disallowing new drainage points of entry into its rights-of-way. There may be instances when a new outfall may make the most sense from an engineering viewpoint.

Kent County should enact a Lines and Grades ordinance and also require as-built plans for developed lots to demonstrate that adequate grading exists for drainage. Currently only stormwater management basins have this requirement. Also, the County should require the name of the entity responsible for maintenance for all drainage easements shown on record plans.

The Kent County Comprehensive Plan includes multiple aspects of stormwater management but the plans prepared by some municipalities do not. It was noted that the Office of State Planning does not require a stormwater management element for certification of comprehensive plans. Creation of stormwater design and development standards at the statewide level is becoming more widely acceptable today. These approaches acknowledge the reality that stormwater runoff impacts are created watershed-wide and are not limited to the geo-political boundaries of local, regional, or state stormwater management programs.

Improve Education and Outreach

Public education on environmental issues is recognized as a key component for success. As a comparison, the raising of public awareness for the need to conserve resources through recycling of consumer materials such as paper, bottles, cans and other previously discarded “wastes” has lead to reduced environmental impacts of landfills. Transferring that approach to stormwater is recognized as an important step in addressing local drainage issues.

Several interviewees opined that greater stormwater knowledge by not only responsible parties such as HOAs, but the public at-large, would result in increased awareness of the issues and understanding of the circumstances moving forward. Tax ditch organizations specifically noted the lack of awareness regarding their role and rights-of-way. While only a small geographic area of the County is covered by the Federal NPDES stormwater permitting program, two of the six program components that permitted jurisdictions must address are Public Education and Outreach and Public Involvement and Participation. The DPPI Dialogue recognized the important role of education in stormwater management. Modest investments in literature, advertisements, and volunteer programs could yield significant returns particularly in the area of pollution prevention, the major focus of Pollution Control Strategies.

C. Policy Recommendations

The following recommendations necessitate approaches or tactics on an entirely new level.

Provide Better Funding for Tax Ditch Organizations

Tax ditches have their historical roots in old English ditch law which was brought to the eastern United States hundreds of years ago. All across the eastern seaboard, ditches were created to drain agricultural lands and were maintained by the abutting property owners through a tax levy.

As urbanization has occurred, the role of these important drainage components has shifted from agricultural to suburban uses with little or no change in the financing structure. Policies are needed which recognize this shift.

The Conservation District's Cost Share program is relied upon by tax ditch organizations for minor and major maintenance items. While almost all of those responding to the survey conducted for this study indicated they fund their operations through tax revenue, 27 of 33 responders indicated they receive additional funding through the cost share program. Since funds available from this program are somewhat limited, tax ditches should consider other possibilities.

There are State Revolving Loan Funds that have not been used to date as a resource for tax ditch organizations. For example, the Clean Water Advisory Council typically awards approximately \$1.5 million annually to nonpoint source reduction projects which could potentially also be used for tax ditch projects. This could necessitate the raising of warrants to pay back the loans. Warrants could otherwise be raised in general as few tax ditch organizations have long-term budgets and are therefore not saving for major maintenance such as dip outs.

Address Aging Public Infrastructure and Flooding

Though a significant amount of development has occurred in recent years, there are parts of the County, particularly in or near cities and towns with public infrastructure such as inlets and pipes, which have or are nearing the end of their life span. This can result in several issues including safety considerations to the public should grates collapse or sink holes form over deteriorated pipes. In addition, isolated flooding may occur should capacities be exceeded due to growth of development in the watershed. Policies in the form of funding levels from the State for DelDOT responsibilities and municipalities for local needs should be increased as described herein.

This is a critical driver in instances when financing of stormwater is shifted to a dedicated resource such as fees. In Fairfax, Virginia, for example, it was a backlog of hundreds of millions of dollars of unfunded projects that led to the dedication of one-penny of the County's tax levy which has now resulted in the creation of a special taxing district. Capital needs typically far exceed the capability of general fund tax revenues to provide a stable resource. Though the change in funding for stormwater may often be driven by water quality issues, in fact, it is typically the demand for infrastructure remedial and rehabilitation repairs that leads to a change in strategy.

Evaluate Reliance on Tax Ditch Organizations

Though not as urgent as addressing the maintenance of stormwater management facilities by HOAs, the appropriateness of tax ditch organizations each privately managed and which drain about 25 percent of the County should be considered. One of the Governor's Task Force recommendations was that urban, suburban, or defunct tax ditches may be considered for inclusion into a stormwater utility to provide adequate funding and allow the organizations to better address development pressures and environmental concerns. While the development of a utility does not appear to be on the immediate horizon, the policy aspect of privately-owned components of the overall drainage infrastructure should be discussed.

D. Conclusion

These tasks are complex and will require the support of all the agencies and stakeholders that are engaged in or impacted by stormwater management practices in Kent County. The end result of this next phase of work should be a platform for change in financial policy and potentially in roles and responsibilities for current participants in the provision of services. Political and community support are critical and educating policy makers along with the general public is a key to moving forward on the recommendations within this report. Such an undertaking must be built on trust and a commitment to a shared outcome and goal.

APPENDIX A

EXPENDITURES AND FUNDING SOURCES SUMMARY

KENT COUNTY SURFACE WATER MANAGEMENT LEVEL OF SERVICE ANALYSIS

EXPENDITURES AND FUNDING SOURCES SUMMARY

Function	General Fund	Other Legislative Funds	DNREC Fees	KCD Fees	Kent County	DeIDOT	Tax Ditch Organizations	Municipalities	Other (21st Century, 3921 funds, CTF's, private sources, etc.)	Total
Stormwater Program										
DNREC salaries and overhead	\$160,000		\$60,000							\$220,000
KCD salaries and overhead				\$500,000						\$500,000
DeIDOT salaries and overhead						\$150,000				\$150,000
General Drainage										
DNREC salaries and overhead	\$120,000	\$290,000								\$410,000
DNREC projects								\$200,000		\$200,000
KCD projects					\$75,000					\$75,000
Kent County salaries					\$50,000					\$50,000
DeIDOT salaries and overhead						\$1,400,000				\$1,400,000
DeIDOT projects						\$1,800,000				\$1,800,000
DNREC contractual & supplies*		\$230,000								\$230,000
Municipal projects								\$200,000		\$200,000
Stormwater basin maintenance								\$1,800,000		\$1,800,000
Tax Ditches										
DNREC salaries and overhead	\$115,000	\$90,000								\$205,000
KCD salaries and overhead	\$30,000				\$30,000					\$60,000
Tax Ditch projects	\$45,000	\$100,000			\$95,000		\$165,000	\$70,000		\$475,000
Public Ditch projects					\$50,000					\$50,000
Dam Safety										
DNREC salaries and overhead	\$40,000									\$40,000
EAP's	\$200,000									\$200,000
Miscellaneous										
NPDES Compliance				\$50,000		\$700,000		\$175,000		\$925,000
Watershed modeling	\$250,000									\$250,000
Flood plain mapping	\$150,000									\$150,000
Total	\$1,110,000	\$710,000	\$60,000	\$550,000	\$300,000	\$4,050,000	\$165,000	\$375,000	\$2,070,000	\$9,390,000
									Say	\$9,400,000

* Supports Stormwater and Drainage Program

APPENDIX B

MEETING MINUTES

KENT COUNTY LEVEL OF SERVICE ANALYSIS
SURFACE WATER MANAGEMENT PROGRAM NEEDS

MEETING MINUTES

May 28, 2008

Present:

Tim Riley	Kent Conservation District
Jared Adkins	Kent Conservation District
Mike Petit de Mange	Kent County
Hans Medlarz	Kent County
Frank Piorko	DNREC
Jennifer Campagnini	DNREC
Bob Enright	DNREC
Scott Koenig	City of Dover
Don Mulrine	Town of Camden
Elizabeth Treadway	AMEC
David Athey	URS (recording)

The group present at this meeting will comprise the Joint Coordinating Committee (JCC).

The general time frame for interviews and preparation of documents as presented by URS was agreed upon. A project end date in December is anticipated.

Interviews will occur through the summer with the Existing Program document planned for completion in September. Particular emphasis will be placed on those with NPDES responsibilities including the Surface Waters Discharge Section of DNREC, DeIDOT, City of Dover, and the Kent Conservation District.

Interviews with DeIDOT Central District will be coordinated with Bob Enright and those with other DeIDOT sections with Jen Campagnini.

Representatives from six municipalities will be interviewed: Dover, Camden, Smyrna, Harrington, Milford, and Clayton. A notification letter will be developed by URS for the remaining municipalities in the County. This will be distributed at the next JCC meeting.

The tax ditch survey used for the Sussex County Level of Service Study will be modified and then sent to the tax ditch organizations in Kent County. It was agreed that this activity should not occur until after the General Assembly completes its session on June 30 so changes to legislation will be known. URS will provide surveys and the Conservation District will furnish labels and mail the surveys.

Other stakeholders to be interviewed will include the Home Builders Association of Delaware and/or the Delaware Association of Realtors and the Kent County Conservancy.

Discussion was held about trying to interview home owners associations. It was decided to invite association representatives to the public meeting tentatively scheduled for November in lieu of seeking individual interviews. Kent County will be receiving yard waste pick up requests from HOAs in the Fall and these contacts will be used for invitations. It was noted that the establishment of HOAs was not a requirement prior to the 2003 Land Development Code updates and therefore the maintenance responsibilities in subdivisions built before then are often not defined.

To date there have been no major renovations needed to stormwater management facilities in the County.

In Dover, the City owns the pipes into and out of basins but HOAs own the basins. Either may own the outlet structure.

There are few new subdivisions being built with open drainage systems.

There are approximately 650 basins and BMPs in the County on residential as well as commercial properties. Bioretention is fairly common on commercial sites but rare on residential.

Miscellaneous items that will need to be addressed by the study include the maintenance of privately-owned stormwater management facilities, private property rights and access by public agencies onto private lands, the administrative burden in costs and time due to Federal permitting requirements, and DelDOT's legal responsibilities regarding road drainage.

The 12 program areas used for the Sussex County Level of Service study were reviewed. There was disagreement regarding whether or not the dam safety and source reduction areas should be included as program areas in Kent County. These will be further discussed at a future date. If costs for nonpoint source reduction strategies are included, it was questioned if point source costs should be included as well since both are components of TMDLs. It was also questioned if the "High Hazard" dam classification recognized discharges into tidal reaches.

The County's Comprehensive Plan is being revised but these revisions will not affect the Community Facilities section. URS will find out the status of municipal comprehensive plans.

The next meeting of the JCC was not scheduled but will tentatively be held in mid August.

KENT COUNTY LEVEL OF SERVICE ANALYSIS

SURFACE WATER MANAGEMENT PROGRAM NEEDS

MEETING MINUTES

September 30, 2008

Present:

Tim Riley	Kent Conservation District
Jared Adkins	Kent Conservation District
Mike Petit de Mange	Kent County
Hans Medlarz	Kent County
Frank Piorko	DNREC
Jennifer Campagnini	DNREC
Bob Enright	DNREC
Scott Koenig	City of Dover
Don Mulrine	Town of Camden
David Athey	URS (recording)

The minutes from the May 28, 2008 meeting were approved without comment or revision.

Initial conversations revolved around the current economic slump and more specifically the slow down in development plan submittals and construction. Contrast was drawn with the recommendations offered in the recently completed Sussex County Surface Water Management Level of Service Analysis which focused mostly on the need for additional resources to keep up with development. The Kent County Study will need to consider fluctuating fees and workloads. For example, the Conservation District's Sediment and Stormwater Program is funded solely by review and inspection fees so reductions in development projects also reduces the Program's revenues. Ideally staff could be re-assigned to other tasks such as watershed modeling but funding sources would be needed.

It was also noted that economic conditions are also resulting in a delay in public projects as well. Camden noted that some projects in that town have been approved but are not moving forward since associated road improvements by DeIDOT have not begun.

The draft Expenditures and Funding Sources Summary spreadsheet was reviewed. Questions were raised about the basis for DeIDOT's \$3.2 million in expenditures for maintenance projects and it was also observed that the Department's \$700,000 for NPDES related tasks had been omitted. The estimate for maintenance expenditures was given by their NPDES program as requests for the same from Central District had not been answered. URS will seek verification from Central District as well as again request other information such as public and private lane miles in the County. It was also noted that a portion of the Conservation District's Sediment and Stormwater Program should be attributed to NPDES mandated tasks and that a percentage of the District's tax ditch expenditures is used for general drainage projects.

The draft program document was also reviewed. Kent County stated that they do not have a Lines and Grades Ordinance as was erroneously written. The Conservation District looks at general drainage patterns as part of its site inspections but not specific grades. They “eye ball” house elevations and mostly assure that drainage is positive and unobstructed. All agreed that a Lines and Grades Ordinance is needed. New Castle County has such an ordinance but portions of it may not be appropriate for Kent County. There was discussion without resolution of whether as-built inspections would best be handled by County or District employees or developer’s representatives.

It was agreed that the 12 program areas developed for the Sussex County study would be used for Kent County too. Various differences and similarities between the two were discussed.

Public works agreements could be structured such that centrally located stormwater management facilities could serve multiple developments. Precedent exists for privately funded traffic impact studies which analyze impacts from multiple developments within a certain region. This would necessitate all included developments having similar time lines which would probably be a rare occurrence.

There are drainage ditches in the County which are not tax ditches and therefore a database of their number or locations does not exist.

It may be possible to create drainage districts in the County to address stormwater needs on a scale between an individual lot and an entire watershed. Existing districts related to street lights, trash, and sewers could serve as a model.

The next meeting of the JCC was scheduled for October 28, 2008 at 9:00 at the offices of the Kent Conservation District.

KENT COUNTY LEVEL OF SERVICE ANALYSIS

SURFACE WATER MANAGEMENT PROGRAM NEEDS

MEETING MINUTES

October 28 and November 25, 2008

Present:

Tim Riley	Kent Conservation District
Jared Adkins	Kent Conservation District
Hans Medlarz	Kent County
Frank Piorko	DNREC
Jennifer Campagnini	DNREC (October 28 only)
Bob Enright	DNREC
Don Mulrine	Town of Camden
David Athey	URS (recording)

The minutes from the September 30, 2008 meeting were approved without comment or revision.

The latest draft of the report including 12 program areas and summary tables was reviewed between the two meetings. Details regarding each program area will be provided and future needs will be addressed at two levels, Minimum Additional and Optimum Program.

Stormwater Program – Current staffing is considered acceptable but bigger picture needs such as maintenance and outreach are not being met. The Minimum Additional program will discuss different ways of allotting revenues and expenditures. Funds needed to perform facility inspections will be estimated for the Optimum Program.

General Drainage – Both the Minimum Additional and Optimum Program will consider an additional engineer or planner for the KCD to better coordinate current projects. Discussions were held about past 21st Century Funds requests and disbursements and the difficulty projecting these for the next five years due to outlying data points. This will be discussed again at the next meeting.

Tax Ditch Assistance – The current level of program assistance was considered acceptable and therefore the Minimum Additional will be to continue current efforts. The Optimum Program will include another employee at the KCD to handle technical as well as administrative functions.

Tax Ditch Management – Conversations on this program area were somewhat deferred until URS can assess the results of the survey of tax ditch managers. Estimates of needs will likely follow the procedure used in Sussex County where a linear footage cost estimate will be applied to the total length of tax ditches in Kent County over a lengthy, probably 20 year, time frame.

Watershed Modeling for Quantity and Quality Management – The procedure used in Sussex County will be used in this case also with three levels of studies (major streams, tributaries, and municipalities)

performed at an assumed frequency over a given time period. New employees are not anticipated to be needed but using existing employees potentially underutilized in other programs will be investigated.

Maintenance of and Improvements to Public Infrastructure – Since this program element is essentially an assessment of DeIDOT's activities, it was decided that further discussions with the agency were needed. Frank stated he would try to set this up with the intent of better defining areas of responsibility as well as their program expenses.

Maintenance of and Improvements to Private Infrastructure – Costs for this program element are difficult to quantify since there is ambiguity between the responsibilities of public and private entities. URS will seek to estimate the maintenance expenditures of the basins and BMPs in Kent County based on the inventory prepared by the KCD.

Source Reduction Strategies – Financial needs for this program area were recognized as the most difficult to estimate since TMDLs have been finalized for only one watershed (Murderkill). Furthermore, data is sparse for expenditures for Pollution Control Strategies. URS will provide a very approximate estimate for expenditures but all recognized that this will be somewhat a placeholder only and caveats provided as appropriate.

Flood Plain Protection and Improvement – URS will confer with Mike Powell at DNREC regarding flood plain issues in Kent County.

Dam Safety – These needs will be estimated as they were in Kent County but handled somewhat as Public Infrastructure in that the dollar estimates will be categorized separately.

Public Outreach and Public Involvement – URS will confer with DNREC and the KCD on this program element.

Planning and Regulatory Aspects – Significant effort has already been expended summarizing water resources components of the County as well as municipal comprehensive plans. URS will discuss separately with the Kent County Planning Department.

The expenditures and funding sources summary spreadsheet was also reviewed. The numbers will continue to be refined as the costs associated with each program area are further developed.

The next meeting of the JCC was scheduled for January 13, 2009 at 9:00 at the offices of the Kent Conservation District.

KENT COUNTY LEVEL OF SERVICE ANALYSIS

SURFACE WATER MANAGEMENT PROGRAM NEEDS

MEETING MINUTES

January 13, 2009

Present:

Tim Riley	Kent Conservation District
Jared Adkins	Kent Conservation District
Hans Medlarz	Kent County
Frank Piorko	DNREC
Bob Enright	DNREC
Don Mulrine	Town of Camden
David Athey	URS (recording)

The meeting started with a summary of the meeting held last week with DeIDOT. Attendees were Frank Piorko and Bob Enright from DNREC, Tom Greve and Tom Langford from DeIDOT, and David Athey from URS. DeIDOT stated that they have maintenance agreements that cover their responsibilities with both municipalities and home owner associations (HOAs). Those with HOAs are now specifically including enclosed pipes even if not located within the right-of-way as DeIDOT responsibility but this is not being applied retroactively. DeIDOT typically does not maintain open channels outside the right-of-way even if accepting discharge from an enclosed system.

The number of agreements the Department has with HOAs was questioned as the County does not have a record of them. It was noted that while DeIDOT has the authority to acquire or require right-of-way for roadway improvements, it does not use this ability for drainage improvements. It was also noted that pipes or open channels between roadway drainage systems and stormwater management basins would best be in dedicated open space as the party responsible for maintenance would then be clearly known.

The latest draft of the report including 12 program areas and summary tables was reviewed. Staffing needs for basin and BMP inspections form the basis for the Stormwater Program needs. Clarity regarding Kent County's efforts under General Drainage was provided and URS will be projecting future 21st Century Fund requests and allocations. DNREC and Conservation District personnel needs for Tax Ditch Assistance were discussed as were financial needs for minor and major maintenance under Tax Ditch Management.

It will be stated in the report that the cost estimates for Watershed Modeling will not be recurring as there are a limited number of watersheds in the County. On-going upkeep and maintenance costs for the models will be included though. Programs for Maintenance of and Improvements to Public Infrastructure will be refined after receipt of additional information from DeIDOT. Programs for Maintenance of and Improvements to Private Infrastructure will continue to be based on rough estimates for HOA expenditures to perform annual maintenance as well as the less frequent rehabilitations or retrofits.

It was agreed that there are too many variables to reasonably prepare cost estimates for Pollution Control Strategies to meet TMDL requirements. Instead, a small grants program will be offered as a suggestion. Flood Plain Protection and Improvement and Dam Safety programs were based on input from Mike Powell and Frank Piorko from DNREC respectively. Public Outreach and Public Involvement programs were based on input from Kelly Wilson and Paula Kohout from the Conservation District. Planning and Regulatory Aspects will be refined after URS discusses with Kent County Planning.

Recommendations as an outcome of the report were also discussed. The draft document proposed the potential creation of stormwater management districts modeled more or less on existing other districts in Kent County for services such as sewers, street lights, and refuse removal. Another approach to reach a similar result would be to use the existing tax ditch framework as a model. Regardless of the programs initiated or expanded, it was generally agreed that the Conservation District is the agency best suited to build up service deliveries.

The expenditures and funding sources summary spreadsheet was reviewed as the above was discussed. DNREC will provide a breakdown of their expenditures but otherwise the remaining estimates are substantially complete.

Now that the program areas and potential changes or increases are fairly clear, URS will seek interviews with stakeholders such as The Home Builders Association of Delaware and the Kent County Conservancy.

A follow up meeting was not set but is tentatively scheduled for mid to late February.

KENT COUNTY LEVEL OF SERVICE ANALYSIS

SURFACE WATER MANAGEMENT PROGRAM NEEDS

MEETING MINUTES

April 2, 2009

Present:

Tim Riley	Kent Conservation District
Jared Adkins	Kent Conservation District
Hans Medlarz	Kent County
Frank Piorko	DNREC Soil and Water Conservation
Bob Enright	DNREC Soil and Water Conservation
Lyle Jones	DNREC Water Resources
David Athey	URS (recording)

The upcoming changes to DNREC's Sediment and Stormwater Regulations were discussed including what measures or criteria should be set at the State level versus the local level. The difficulties of relying too heavily on local implementation such as inconsistencies that would be created and the difficulty the Conservation District would have keeping track of numerous regulations were recognized. The question of whether or not Kent County could draft an ordinance better defining the District's roles was debated without resolution.

URS summarized progress since the last meeting. Representatives from the Kent County Planning Department and the Kent County Conservancy were interviewed. A meeting with representatives from the Home Builders Association of Delaware will be held on April 9th. This will complete the interviews.

DNREC reiterated its desire to build better capacity regarding surface water management functions at the District and acknowledged this would likely necessitate shifting of the funds.

The draft report and supporting spreadsheets were reviewed. The table summarizing DNREC's Division of Soil and Water Conservation Personnel Costs, previously condensed, will be expanded to differentiate employees working on the Drainage and Stormwater Programs and better describe the percentage of employee time working on projects in Kent County.

Recommendations were also discussed. The process by which KCD encumbers funds and how this process is different from the New Castle Conservation District will be better described. DNREC Division of Water Resources will furnish information regarding privately-owned stormwater facilities within the St. Jones watershed. The issue of funding for tax ditch work will include the option of raising warrants and better state the need for these organizations to save for major maintenance such as dip outs. Finally, the section detailing maintenance responsibilities will include the disparate maintenance agreements regarding roadways between DeIDOT and both municipalities and HOAs as well as the lack of responsibility for public ditches. Issues regarding DeIDOT (see below) will be added to the recommendations.

Steps needed to bring the Level of Service Study to completion were discussed. It was decided to present the findings and recommendations at the May meeting of the Conservation District Board of Directors. Members of the Kent County Levy Court will be invited as will other stakeholders such as the towns that were not already interviewed for the Study. URS furnished a draft letter that the District will send to the municipal representatives and will begin work on a presentation.

A somewhat parallel effort will be to engage DelDOT in further dialogue regarding surface water management. Issues include redundancy in plan reviews as both the Department and KCD review the drainage components of subdivision and land development plans. DelDOT is typically concerned about work in rights-of-way whereas the District looks at projects more in their entirety. However, the two overlap and if the District, for example, were to assume greater review responsibilities, more consistency could be an outcome. There is also lack of clarity regarding maintenance responsibilities with the biggest issue being the need to define the responsible party for non tax ditch open drainage ways. URS will develop an agenda for a meeting with DelDOT at a day and time to be determined later.

DRAFT

APPENDIX C

SERVICE PROVIDERS, MUNICIPAL, AND ORGANIZATIONAL QUESTIONNAIRES

KENT COUNTY LEVEL OF SERVICE ANALYSIS

STATE AND COUNTY SERVICE PROVIDERS QUESTIONNAIRE

1. What stormwater functions do you perform (development plan reviews, inspections, maintenance, new construction, etc.)? What exactly are you responsible for maintaining (number of SWM basins, linear footage of open water courses, number of inlets, linear footage of pipes, etc.)? What databases or other information is available?
2. What do you spend annually for drainage and stormwater maintenance and what is the source(s) of that funding? Is this work performed by employees, contractors, or both? If both, what is the approximate percentage performed by each? Do you have a five year capital improvements plan for drainage and stormwater construction and if so, what is that budget amount?
3. How many people or full-time equivalent (FTE's) positions do you have working on stormwater? What equipment (vehicles and others) are dedicated to work related to drainage?
4. What are the most pressing stormwater related problems, needs, and issues you see in Kent County? What are the "drivers" for your stormwater program (e.g. flooding, infrastructure decay, mandates)? What issues do you think will be important in five years? Are there any safety issues that you are concerned about?
5. How are your priorities established and who are the decision makers? What program or permitting issues such as NPDES or TMDL's do you have?
6. How will on-going and future development in Kent County affect your ability to manage stormwater? Are there measures that should be taken now to account for this growth? How well are you able to balance the needs for new infrastructure while maintaining that which already exists?
7. What are the written or understood (unwritten) policies, laws or criteria that govern, guide, or control your activities?
8. Stormwater-related services in Kent County are provided by many diverse agencies and organizations including Kent County, Kent Conservation District, DNREC, DeIDOT, municipalities, tax ditch organizations, and nonprofit and private entities. Can you describe your current working relationships with these groups and identify coordination or communication issues that could improved upon?
9. If budget were not a limitation what would you want to do to really improve your program and services?

**KENT COUNTY SURFACE WATER MANAGEMENT LEVEL OF SERVICE STUDY
MUNICIPAL QUESTIONNAIRE**

Municipality:

**Point of Contact
(Municipality)**

**Secondary Point of Contact
(Engineer/Public Works)**

Name:

Name:

Position:

Position:

Phone:

Phone:

E-Mail:

E-Mail:

Date:

1. STORM WATER FUNCTIONS: For each of the following stormwater functions, please indicate if they are performed in your municipality. If yes, please indicate who performs the function (town employees, contractor, engineer, other agency, etc). If a function is not performed, please state why.

Stormwater Function	Performed	By who? / Why not performed
New Development Plan Review	YES / NO	
Stormwater Facility Inspection	YES / NO	
Stormwater Facility Maintenance	YES / NO	
New Construction and Oversight	YES / NO	

2. MAINTENANCE: Please indicate how many of the following you are responsible for.

Number of basins or ponds: _____

Linear footage of open water courses: _____

Linear footage of drainage pipe: _____

Number of inlets (catch basins): _____

Number of BMP's and other: _____

3. BUDGET:

- a. What do you spend annually (capital expenses as well as operations and maintenance):

- b. What is (are) the source(s) of that funding:

- c. Is stormwater work performed by: Percent of budget:

Town / City	YES / NO
Employees	
Contractors	YES / NO

- d. Do you have a five year capital improvements plan for drainage and stormwater construction and if so, what is that budget amount?

4. RESOURCES:

- a. How many people/full time equivalent (FTE's) positions do you have working on stormwater?

- b. What equipment (vehicles and others) are dedicated to work related to drainage?

5. DRIVERS:

- a. What are the “drivers” for your stormwater program (e.g. flooding, infrastructure decay, mandates)? What do you think will be important in five years?

- b. Which of these are you able to adequately address? Which remain unresolved?

- c. How are your priorities set?

- d. How are development patterns affecting surface water management in your municipality? What measures are you taking now to account for growth?

6. EXTERNAL ISSUES AND ORGAZNIATIONS:

- a. How is your working relationship with the Kent Conservation District? Kent County? DNREC? Other municipalities? What could improve coordination?

- b. Do you have permitting issues such as TMDL's or NPDES that you need to address and/or are concerned about?

7. DESIRES:

- a. If budget was not a limitation, what would you want to do to really improve your program and services?

8. DOCUMENTATION:

- a. Can we obtain copies of your budget and any other guiding documents?

KENT COUNTY LEVEL OF SERVICE ANALYSIS

ORGANIZATIONS QUESTIONNAIRE

1. What are the most significant issues related to stormwater and drainage in Sussex County? How should they be solved?
2. What are the most pressing needs? What do you think the needs will be in five years? How should they be financed?
3. How are priorities established regarding expenditures?
4. What functions does your organization perform? How many people does this involve?
5. How much do you spend in a typical year and what are the sources of the funds?
6. How will on-going and future growth in the County affect water resources?
7. How well do the various players in the County coordinate and communicate regarding the issues?
8. If costs were not an issue, what would you really want to do to improve the situation?

APPENDIX D

TAX DITCH ORGANIZATION QUESTIONNAIRE AND SUMMARY TABLES

**KENT COUNTY SURFACE WATER MANAGEMENT LEVEL OF SERVICE STUDY
TAX DITCH ORGANIZATION QUESTIONNAIRE**

Tax Ditch Organization: _____

Your Name: _____ **Phone:** _____

Title: _____ **E-Mail:** _____

Today's Date: _____ **Fax:** _____

1. FUNCTIONS: Please indicate if the following operations were performed between January 1 and December 31, 2007. If yes, indicate if the function was performed by the Kent Conservation District or private contractor and how often it is typically performed. If the function was not performed, please state why.

Function	Performed	By who? / How often / Why not performed
Mowing	YES / NO	_____
Weed Wiper Bar	YES / NO	_____
Herbicides Application	YES / NO	_____
Dip outs	YES / NO	_____
Erosion control	YES / NO	_____
Beaver dam removal	YES / NO	_____
Pipe replacements	YES / NO	_____
Other _____	YES / NO	_____
Other _____	YES / NO	_____
Other _____	YES / NO	_____

2. **ACTIVITIES:** Please indicate if the following activities were performed between January 1 and December 31, 2007. Provide additional detail if appropriate, particularly if the activity was not performed.

Activity	Performed	Additional Detail
Annual meeting	YES / NO	_____
Audit of financial records	YES / NO	_____
Inspection of ditch	YES / NO	_____

3. **OPERATIONS:** Please answer as appropriate regarding the following operational questions.

Question	Answer
Do you receive financial assistance from the Kent Conservation District?	YES / NO
Are you familiar with the District's cost share program?	YES / NO
Do you receive technical assistance from the Kent Conservation District?	YES / NO
Are your organization's responsibilities clearly known and understood?	YES / NO
Is your tax ditch organization bonded?	YES / NO
Are you aware of any work that is not being performed due to lack of funds?	YES / NO
Would you attend a workshop to learn how to better manage your organization?	YES / NO

4. **BUDGET:**

- a. What did you spend between January 1 and December 31, 2007? Is this amount typical for most years?

b. What is (are) the source(s) of that funding?

c. Do you have a long term (such as five years) budget? If yes, how much?

5. ISSUES:

a. What are the primary needs of your tax ditch? Are these needs currently being met? What will be your needs in five years?

b. Do you have adequate funding?

c. What issues are important to you now? What issues do you think will be important in five years?

d. Do you have problems with obstructions or invasive species?

6. DESIRES:

a. If budget was not a limitation, what would you want to do to really improve your tax ditch program and services?

Kent County Tax Ditch Organizations (Respondees)

<i>Tax Ditch Organization</i>	<i>Contact</i>	<i>Title</i>	<i>Phone</i>	<i>Email</i>	<i>Fax</i>
Andrewville Tax Ditch	Roger Butler	Secretary Treasurer	302-398-8663		302-398-8663
Beach-Neidig	Connie Sinclair	Secretary	302-492-1578		302-492-1578
Beaver Dam Tax Ditch	Truman Schrock	Manager/ Chairman	302-349-4155	trmnel@aol.com	302-349-5750
Blackarm and Horsepen	Cahty Vogl	Secretary. Treasurer	302-398-4530		
Cattail Tax Ditch	William R. Parker		410-430-6111		
Crout Tax Ditch	Gary A. French	Secretary Treasurer	302-492-3526		
Culbreth Tax Ditch	Harvey Thomas	Chairperson	302-492-3171		
Ditch Road Tax Ditch	David Peterman	Secretary Treasurer	302-492-8042		
Golden	Eugene Ore	Chairman	302-492-3709		
Goose Pond	Charles W. Short	Secretary-Treasurer	302-398-4696		
Grambull	Ginger Hendricks	Secretary Treasurer	302-398-8262		
Grey Tax Ditch	Terry Higgins	Treasurer	302-492-3354	higginte@dmv.com	302-492-1205
Grey Tax Ditch	Matthew Thomas	Manager (one of them)	302-270-8502		302-492-3788
Guytown	Carlton C. Fifer	Manager	302-697-2141	carlton@fiferorchards.com	302-697-7240
Harrington-Beaverdam	Steve Szelestei	Chairman	302-492-3441	sselesteijr@aol.com	302-492-1233
Hazelwood tax Ditch	Ed Clarke	Treasurer	302-674-0726	edandlotte@comcast.net	
Hughes Crossroads Tax Ditch	Richard Dye	Chairman	302-284-0264	rdwork111@aol.com	302-284-4607
Jacksons	Howard Brown	Manager	302-398-3079		
Jordan Branch Tax Ditch	William C. Webber	Manager	302-653-9101	jwchix1@aol.com	
Luther- Marvel	Eugene Ore	Secretary/ Treasurer	302-492-3709		

<i>Tax Ditch Organization</i>	<i>Contact</i>	<i>Title</i>	<i>Phone</i>	<i>Email</i>	<i>Fax</i>
Marskyhope Tax Ditch	Ronnie Hanson	Manager	302-398-3553		
Melton Ditch	Harvey Thomas	Chairperson	302-492-3171		
Meredith Tax Ditch	William A. Chandler Jr.	manager	302-284-4160	chandlerwa@hotmail.com	302-284-4160
N/A	Don Chalmers	Secretary- Treasurer	302-398-8628		
Prospect Tax Ditch	Franklin Hanson	Manager	302-398-3553		
Quarter Branch Tax Ditch	Ronald Webb	Secretary and Treasurer	302 349 4551		302 349 4788
Short & Hall Tax Ditch	Charlotted Tarr	Chairman	302-349-4948		
South Mill Creek Tax Ditch	Mary Ann Varanko	Secretary/ Treasurer	302-653-5730	varanko@msn.com	
Tomahawk Tax Ditch	Roger Butler	Secretary/ Treasurer	302-398-8663		302-398-8663
Vernon Tax Ditch	Tim Welch	Secretary/ Treasurer	302-398-0383		302-398-0383
Webb Tax Ditch	William T. Webb		302-492-3394		
White Marsh	Keith Carlisle	Manager	302-349-5692	carlislefarms@comcast.net	302-349-9451
Wildcast tax Ditch	Evelyn Hackman	Manager	302-284-9141		
Yarema	C. Nunan	Manager	610-268-2124		610-268-8629

TAX DITCH ASSESSMENT

Total Respondants: 33

FUNCTIONS

Mowing Performed:	22	(66.7%)
Weed Wiper Bar Used:	13	(39.4%)
Herbicide Application:	5	(15.2%)
Dip Outs Performed:	13	(39.4%)
Erosion Control:	7	(21.2%)
Beaver Dam Removal:	10	(30.3%)
Pipe Replacements:	10	(30.3%)

ACTIVITIES

Annual Meeting:	31	(96.9%)
Financial Audit:	27	(84.4%)
Inspection Of Ditches:	26	(81.3%)

OPERATIONS

Financial Assistance from the Kent Conservation District?	31	(93.9%)
Familiar with the District's cost share program?	33	(100.0%)
Is technical assistance received from the KCD?	30	(90.9%)
Are the organization's responsibilities clearly known and understood?	31	(93.9%)
Is the tax ditch organization bonded?	4	(12.1%)
Is there work not being performed due to lack of funds?	9	(27.3%)
Interest in attending a workshop to learn to better manage the organization?	30	(90.9%)

BUDGET

2007 Tax Ditch Spending		
\$0.00	11	(34.4%)
\$0.00 - \$500.00	0	(0.0%)
\$500.00 - \$1000.00	5	(15.6%)
\$1000.00 - \$5000.00	10	(31.3%)
\$> \$5000.00	6	(18.8%)

ISSUES

Current Needs Met?	7	(21.2%)
Adequate Funding?	20	(60.6%)
Obstructions or Invasive species Present in Tax Ditches	15	(45.5%)

Tax Ditch Budgeting

<i>Tax Ditch Organization</i>	<i>2007 Spending</i>	<i>Funding Source</i>	<i>LongTermBudget</i>	<i>AdequateFunding</i>
Andrewville Tax Ditch	\$605.00	Taxes	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Beach-Neidig	\$0.00	Taxes	<input type="checkbox"/>	<input type="checkbox"/>
Beaver Dam Tax Ditch	\$11,260.00	Taxes, Matching funds	<input type="checkbox"/>	<input type="checkbox"/>
Blackarm and Horsepen	\$13,978.00	Taxes	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Cattail Tax Ditch	\$1,550.00	Taxes	<input type="checkbox"/>	<input type="checkbox"/>
Crout Tax Ditch	\$1,782.00	Taxes, Interest on 2 CDs, Savings	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Culbreth Tax Ditch	\$1,274.00	Taxes	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Ditch Road Tax Ditch	\$1,055.00	KCD	<input type="checkbox"/>	<input type="checkbox"/>
Golden	\$3,050.00	Taxes	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Goose Pond	\$0.00	Taxes	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Grambull	\$1,303.00	Taxes	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Grey Tax Ditch	\$0.00	Taxes, Interest and Government support	<input type="checkbox"/>	<input type="checkbox"/>
Grey Tax Ditch	\$0.00	Taxes	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Guytown	\$0.00	Taxes and Cost share	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Harrington-Beaverdam	\$8,487.00	Taxes	<input type="checkbox"/>	<input type="checkbox"/>
Hazelwood tax Ditch	\$0.00	Taxes and matching funds	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Hughes Crossroads Tax Ditch	\$5,749.00	Taxes	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Jacksons	\$1,000.00	Taxes and Cost share	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Jordan Branch Tax Ditch	\$7,600.00	Taxes	<input type="checkbox"/>	<input checked="" type="checkbox"/>

<i>Tax Ditch Organization</i>	<i>2007 Spending</i>	<i>Funding Source</i>	<i>LongTermBudget</i>	<i>AdequateFunding</i>
Luther- Marvel	\$1,373.00	Taxes	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Marskyhope Tax Ditch	\$0.00	Taxes and financial assistance from KCD	<input type="checkbox"/>	<input type="checkbox"/>
Melton Ditch	\$3,208.00	Taxes	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Meredith Tax Ditch	\$9,388.00	Taxes	<input type="checkbox"/>	<input type="checkbox"/>
N/A	\$0.00	Taxes	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Prospect Tax Ditch	\$0.00		<input type="checkbox"/>	<input type="checkbox"/>
Short & Hall Tax Ditch	\$903.00	Legislative and matching thru KCD and SCD, Taxes	<input type="checkbox"/>	<input checked="" type="checkbox"/>
South Mill Creek Tax Ditch	\$525.00	Taxes, Cost share	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Tomahawk Tax Ditch	\$2,452.00	Taxes	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Vernon Tax Ditch	\$0.00	Taxes	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Webb Tax Ditch	\$638.00	Ditch Tax and Share Cost	<input checked="" type="checkbox"/>	<input type="checkbox"/>
White Marsh	\$2,070.00	Taxes	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Wildcast tax Ditch	\$0.00	Taxes	<input type="checkbox"/>	<input type="checkbox"/>
Yarema		Taxes	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

SUMMARY OF TAX DITCH FUNCTIONS, ACTIVITIES AND OPERATIONS

FUNCTIONS

	<i>Mowing</i>	<i>Weed Wiper Bar</i>	<i>Herbicide Application</i>	<i>DipOuts</i>	<i>Erosion Control</i>	<i>Beaver Dam Removal</i>	<i>Pipe Replacements</i>
<i>Number that Perform (of 32)</i>	22	12	4	12	7	9	9
<i>% Performing</i>	69%	38%	13%	38%	22%	28%	28%

ACTIVITIES

	<i>Annual Meeting</i>	<i>Financial Audit</i>	<i>Inspection of Ditches</i>
<i>Number that Perform (of 32)</i>	31	27	26
<i>% Performing</i>	97%	84%	81%

OPERATIONS

	<i>SCD Financial Assistance</i>	<i>Familiar with SCD Cost Share Program</i>	<i>Receive SCD Technical Assistance</i>	<i>Responsibilities Understood</i>	<i>Bonded</i>	<i>Work not performed due to lack of funds</i>	<i>Would Attend a Workshop</i>
<i>Number that Perform (of 32)</i>	30	32	29	30	4	8	29
<i>% Performing</i>	94%	100%	91%	94%	13%	25%	91%

Tax Ditch Issues

<i>Tax Ditch Organization</i>	<i>PrimaryNeeds</i>	<i>Needs Met</i>	<i>FutureNeeds</i>	<i>CurrentIssues</i>	<i>FutureIssues</i>	<i>Obstructions or Invasive Species</i>
Andrewville Tax Ditch		<input type="checkbox"/>		Lack of mowing contractors		<input type="checkbox"/>
Beach-Neidig	Pipe replacement	<input type="checkbox"/>	Dipout, Pipe replacement	Crossover pipe replacement		<input checked="" type="checkbox"/>
Beaver Dam Tax Ditch	Dipout	<input type="checkbox"/>		Short on funding.	Development- financing. See Survey for comment.	<input checked="" type="checkbox"/>
Blackarm and Horsepen	Mowing, maintenance and control of beaver dams.	<input type="checkbox"/>	Keeping federal cost share to the financial burden or the ditch	Controlling the ditches to prevent damage of ground water and to allow for the water to move slowly enough through the ditches for the vegetation to utilize the nitrates.		<input type="checkbox"/>
Cattail Tax Ditch	Mowing	<input checked="" type="checkbox"/>	Mowing	Mowing (1 replacement)	Dipout	<input type="checkbox"/>
Crout Tax Ditch	Remove excess water efficiently and maintain clear access for maintenance	<input type="checkbox"/>				<input checked="" type="checkbox"/>
Culbreth Tax Ditch		<input type="checkbox"/>				<input type="checkbox"/>
Ditch Road Tax Ditch	Clear trees in ditch	<input type="checkbox"/>	Mowing, Dipout, Weed wiper, Pipes	Clear trees out of ditch	Erosion and Beaver dams	<input type="checkbox"/>
Golden	More funding	<input type="checkbox"/>		Losing rights-of-way to development		<input checked="" type="checkbox"/>
Goose Pond	Mowing, Dipout, Pipe replacement	<input checked="" type="checkbox"/>	Mowing, Dipout, Pipe replacement	Only have adequate funding with Cost share.	Cost share programs and technical support.	<input type="checkbox"/>
Grambull		<input type="checkbox"/>				<input checked="" type="checkbox"/>
Grey Tax Ditch	Cleaning, Access	<input type="checkbox"/>		Access to right-of-way, Funding maintenance		<input type="checkbox"/>
Grey Tax Ditch	Keep it mowed and maintained	<input type="checkbox"/>		Getting the ditch mowed		<input type="checkbox"/>

<i>Tax Ditch Organization</i>	<i>PrimaryNeeds</i>	<i>Needs Met</i>	<i>FutureNeeds</i>	<i>CurrentIssues</i>	<i>FutureIssues</i>	<i>Obstructions or Invasive Species</i>
Guytown	Pipe replacement, Ongoing Maintenance	<input type="checkbox"/>		Land use issues		<input type="checkbox"/>
Harrington-Beaverdam	Mowing, Weed Wiping, Dipout	<input type="checkbox"/>		People blocking ditch rights-of-way with fences, buildings and lanes		<input checked="" type="checkbox"/>
Hazelwood tax Ditch	New pipe, Total cleanout	<input type="checkbox"/>	Maintenance	Water flow, Cleaning of leaves		<input checked="" type="checkbox"/>
Hughes Crossroads Tax Ditch	Access to mow, Tree removal	<input type="checkbox"/>	Access to mow, Tree removal	Access to mow, Tree removal	Access to mow, Tree removal	<input checked="" type="checkbox"/>
Jacksons	Mowing	<input checked="" type="checkbox"/>	Some dip-out and minor maintenance			<input type="checkbox"/>
Jordan Branch Tax Ditch	Mowing, Tree removal, Erosion repair.	<input checked="" type="checkbox"/>	Dipout.	Responsibilities of residences along tax ditch to leave adequate space between right-of-way		<input checked="" type="checkbox"/>
Luther- Marvel	More funding	<input type="checkbox"/>		Losing rights-of-way. Land owner using using rights-of-way of trees and bushes		<input type="checkbox"/>
Marskyhope Tax Ditch	Proper drainage	<input checked="" type="checkbox"/>		Maintaining ditch when it needs to be dipped-out.		<input checked="" type="checkbox"/>
Melton Ditch		<input type="checkbox"/>		Everything seems fine now.		<input type="checkbox"/>
Meredith Tax Ditch	Maintenance of ditch, Mowing, Dipout	<input type="checkbox"/>		Current maintenance schedule		<input checked="" type="checkbox"/>
N/A		<input type="checkbox"/>				<input type="checkbox"/>
Prospect Tax Ditch	Taxes and financial assistance from KCD	<input type="checkbox"/>				<input checked="" type="checkbox"/>
Short & Hall Tax Ditch	Continue mowing and maintenance	<input type="checkbox"/>		Maintenance		<input checked="" type="checkbox"/>

<i>Tax Ditch Organization</i>	<i>PrimaryNeeds</i>	<i>Needs Met</i>	<i>FutureNeeds</i>	<i>CurrentIssues</i>	<i>FutureIssues</i>	<i>Obstructions or Invasive Species</i>
South Mill Creek Tax Ditch	Depends on when the proposed housing- New neighbors may have new demands.	<input type="checkbox"/>		What effect will the new drainage ponds at Sunnyside Elem School have on our ditch.		<input type="checkbox"/>
Tomahawk Tax Ditch	Replacement of private crossings and maintenance pipes	<input type="checkbox"/>		Lack of mowing contractors		<input checked="" type="checkbox"/>
Vernon Tax Ditch	Mowing	<input type="checkbox"/>	Cost of mowing	Mowing	Mowing	<input type="checkbox"/>
Webb Tax Ditch	Dipping- Lack of funds	<input type="checkbox"/>		Dipping- Lack of funds		<input type="checkbox"/>
White Marsh	Mowing, Wiping, Some cleanout	<input checked="" type="checkbox"/>	Total cleanout	Development	Development	<input checked="" type="checkbox"/>
Wildcast tax Ditch	Water flow	<input checked="" type="checkbox"/>	Water flow	That it works	That it still works	<input type="checkbox"/>
Yarema	Maintenance	<input type="checkbox"/>		Keep ditch nice and flowing	Keep ditch nice and flowing	<input type="checkbox"/>