REPORT OF THE

WORKING GROUP ON WATER QUALITY FUNDING

2017 ACT 73, SECTION 26

Submitted to the

General Assembly

November 15, 2017

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Vermont Act 73 § 26. WORKING GROUP ON WATER QUALITY FUNDING

(a) Establishment. There is established the Working Group on Water Quality Funding to develop recommendations for equitable and effective long-term funding methods to support clean water efforts in Vermont.

(b) Membership. The Working Group shall be composed of the following six members:

(1) the Secretary of Natural Resources or designee (**Julie Moore**);
(2) one member from the Vermont League of Cities and Towns, appointed by the Board of Directors of that organization (**Dominic Cloud**);
(3) the Secretary of Agriculture, Food and Markets or designee (**Anson Tebbetts**);
(4) a representative of the Vermont Center for Geographic Information **(John Adams**);
(5) the Commissioner of Taxes or designee (**Kaj Samsom**);
(6) one member representing commercial or industrial business interests in the State, to be appointed by the Governor, after consultation with other business groups in the State (**John Grenier**);

(c) Advisory Council. The Working Group shall be assisted by an Advisory Council to be made up of:

(1) the State Treasurer or designee (**Beth Pearce**);
(2) the Secretary of Transportation or designee (**Joe Flynn**);
(3) one member from the Vermont Municipal Clerks and Treasurers Association appointed by the Executive Board of that organization (**Dawn Custer**);
(4) one member from the Vermont Mayors Coalition appointed by that organization (**Jordan Redell)**
(5) a representative of an environmental advocacy group appointed by the Speaker of the House (**Jared Carpenter**);
(6) a representative of the agricultural community appointed by the Vermont Association of Conservation Districts (**Jill Arace**); and
(7) a representative of University of Vermont Extension appointed by the President Pro Tempore of the Senate (**Chuck Ross**).

(d) Powers and duties. The Working Group on Water Quality Funding shall recommend to the General Assembly draft legislation to establish equitable and effective long-term funding methods to support clean water efforts in Vermont.

(e) Consultation with Advisory Council. The Working Group shall meet at least three times with the Advisory Council for input on the report to be submitted to the General Assembly under subsection (f) of this section. The Advisory Council's comments shall be included in the final report.

(f) Report. On or before November 15, 2017, the Working Group on Water Quality Funding shall submit to the General Assembly a summary of its activities, an evaluation of existing sources of funding, and draft legislation to establish equitable and effective long-term funding methods to support clean water efforts in Vermont.

(g) Meetings.

(1) The Secretary of Natural Resources shall call the first meeting of the Working Group to occur on or before July 1, 2017.
(2) The Secretary of Natural Resources shall be the Chair of the Working Group.
(3) A majority of the membership shall constitute a quorum.
(4) The Working Group shall cease to exist on March 1, 2018.
(5) No specific state appropriations shall be used to support the working group or advisory council.

(h) Assistance. The Working Group on Water Quality Funding shall have the administrative, technical, and legal assistance of the Agency of Natural Resources and the Department of Taxes. The Working Group on Water Quality Funding shall have the technical assistance of the Vermont Center for Geographic Information or designee.

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Executive Summary

Significant long-term investment is needed to continue cleaning up Vermont's waterways. These investments are necessary to reduce pollution washing into Vermont's rivers, streams, lakes, ponds and wetlands, ensuring Vermont's environment and economy remains strong and resilient. Investing in clean water also provides a unique opportunity to protect the Vermont landscape by revitalizing working landscapes, school campuses, downtowns and village centers, supporting farmers and local agriculture, upgrading state and local roads, and restoring important natural resources.

In state fiscal years 2016 and 2017, the state invested roughly $32 million a year in clean water efforts. The 2017 State Treasurer's Report recommended investing an additional $25 million per year in state funding for clean water through a combination of capital dollars, transportation dollars, and the property transfer tax surcharge for state fiscal years (SFY) 2018 and 2019. Following the Treasurer's report, Governor Scott proposed investing $56 million a year on clean water efforts, an average increase of $24 million a year on clean water over previous years. The Legislature is on track to fulfill this commitment to clean water in SFY18 and SFY19.

There is a critical need to establish long-term clean water funding that extends beyond SFY 2019. To address this need, the General Assembly passed Act 73 in the spring of 2017. Section 26 of Act 73 established a six-member working group "to develop recommendations for equitable and effective long-term funding methods to support clean water efforts in Vermont." The Working Group met ten times, including three meetings with the advisory council. Agendas, handouts and minutes from those meetings are available online.[1]

As part of its charge, the Act 73 Working Group reviewed the most recent cost estimates for compliance with clean water laws and regulations from state agencies, surveyed existing sources of revenue, identified funding gaps, made recommendations for cost-effective regulatory and technological innovations to close this gap, and outlined a path forward for establishing new revenue sources. For the five-year period SFY20-SFY24, the Working Group anticipates that overall spending on clean water will be roughly $78 million a year, including a sustained investment of state resources at SFY18 and SFY19 levels, coupled with municipal and private investments that are required by Act 64 and various total maximum daily limits (TMDLs) for impaired waters statewide.

The Act 73 Working Group recommends continued work on financial and technical tools needed to support most cost-effective measures to reducing water pollution. With respect to "equitable and effective long-term funding," the Working Group supports further investigation and evaluation of a series of possible service delivery models that would provide the technical and administrative capacity needed to raise and ensure the efficient, effective disbursement of

[1] http://anr.vermont.gov/about/special-topics/act-73-clean-water-funding

funds. These might include: government-led or a 3rd party administrator; geography-based (e.g., local, regional or statewide); or, sector-based (e.g., agriculture, developed lands, natural resources). Specifically, the Working Group recommends that the state issue a request for proposals in spring 2018 to evaluate possible service delivery models and recommend a path forward.

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I. Introduction

It is often tempting for Vermonter's to take our state's vast water resources for granted, after all water in Vermont is abundant and generally high quality. However, conditions during the late-summer and fall of 2017 provided a stark reminder of importance of and need for constant stewardship of our water resources.

In September 2017, Lake Carmi residents reported to the Vermont Agency of Natural Resources (ANR) that a 15-foot ribbon of teal, white, green algae hugged the shoreline, causing a horrific stench. As one person wrote, "We cannot sit outside and keep our windows closed for fear of breathing toxic spores in the air around us…. we don't dare go out on the lake in our boats, eat the fish, bring the water into our homes for showering etc. and our property values are plunging. We are afraid the lake is reaching a point whereby it will be too late to save."[1]

Lake Carmi is located near the Canadian border in northwest Vermont, in the Missisquoi Watershed. Throughout the summer, the Department of Health's website[2] reported cyanobacteria (blue-green algae) outbreaks at beaches across Vermont, with high-level alerts reported on Lake Champlain in Addison, Burlington, Ferrisburgh, Franklin, Georgia, Shelburne, St. Albans, and elsewhere. High alerts mean that water is not safe for swimming.

Like Lake Carmi and Lake Champlain, many Vermont waters are under stress and many of them are impaired. The Vermont Legislature has responded to this impending crisis with a series of legislation designed to protect water quality, including:

- 2012 Act 138 (Report "Water Quality Remediation, Implementation, and Funding)[3],
- 2014 Act 97 (Report "Vermont's Clean Water Initiative")[4] and
- 2015 Act 64 (Report "Annual Clean Water Investment")[5].

Act 64 of 2015 – often referred to as Vermont's Clean Water Act – laid the foundation for the protection and restoration of Vermont's waters by adopting a cross-sector "all in" approach, with a broad suite of programs regulations addressing: agricultural practices, stormwater runoff from roads and other developed lands, and natural infrastructure (river corridors, wetlands and forest management).

[1] Email from Diana Larose, September 11, 2017.
[2] http://www.healthvermont.gov/tracking/cyanobacteria-tracker
[3] http://dec.vermont.gov/sites/dec/files/wsm/erp/docs/Act-138-Report-Water-Quality-Funding-Report-Jan-2013.pdf
[4] http://dec.vermont.gov/sites/dec/files/wsm/erp/docs/Act-97-Report-What-Is-The-Clean-Water-Initiative-Jan-2015.pdf
[5] http://dec.vermont.gov/watershed/cwi/reports

Act 64's water quality requirements, summarized below, are extensive.

Summary of 2015 Act 64 Requirements			
Agriculture	Roads	Developed Lands	Natural Resources
• Required Agricultural Practices adopted by Agency of Agriculture (eff.12/5/16) • Nutrient Management Plans • Manure and Nutrient Storage standards • Livestock exclusion • Cover cropping in critical areas • Extended winter spreading ban on floodplains • Setbacks (25 feet from surface waters, 10 feet from ditches)	• Municipal Roads General Permit (Rule eff. 7/31/18, permits in place by 1/1/21, 10-year compliance period) • State Highways "Transportation Separate Storm Sewer System" (TS4) permit	• Sites with >3 acres impervious surface will require a new permit. Sites that do not comply with 2002 or more recent standards will need to implement new practices. (Rule eff. 1/1/18, Lake Champlain parcels must implement practices 2023-2028, other parcels must implement practices 2028-2033) • MS4 permits must incorporate phosphorus reduction standards.	• Acceptable Management Practices for Maintaining Water Quality on Logging Jobs in Vermont adopted by Dept. of Forests, Parks & Recreation (eff. 7/1/16) • Ongoing implementation of Act 138, River Corridor Planning

In addition to the state's response to need to protect waters statewide in Act 64, the U.S. Environmental Protection Agency (US EPA), in June 2016, adopted Total Maximum Daily Limits (TMDLs) for phosphorus in Lake Champlain.[6] For each segment of Lake Champlain, and for each broad category of phosphorus source, the US EPA set reduction targets.

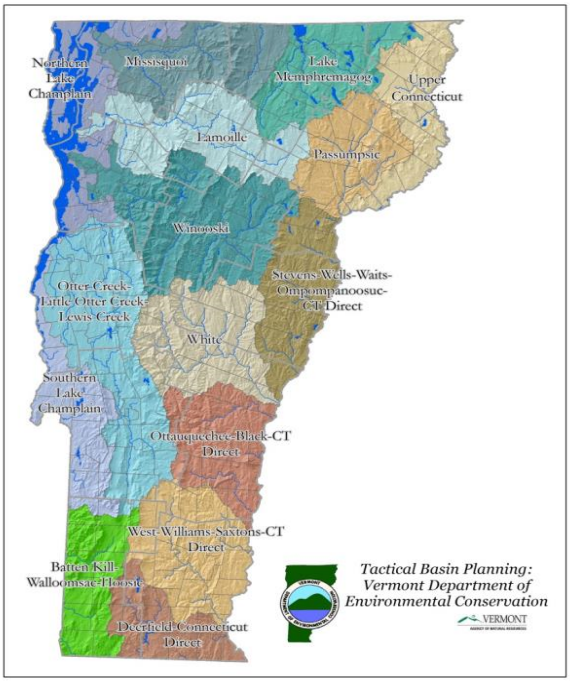
In approving the TMDLs, the US EPA relied on the commitments made in Act 64 to address nonpoint sources of nutrient pollution statewide and, in addition, required phosphorus reductions at certain wastewater treatment facilities in the Lake Champlain basin.

[6] https://www.epa.gov/tmdl/lake-champlain-phosphorus-tmdl-commitment-clean-water (Table 8, page 45).

Vermont's Phase 1 Implementation Plan,[7] which was finalized in September 2016, identifies the actions and activities needed to achieve the targets set by the US EPA. Vermont's Phase 1 Implementation Plan sets forth multiple milestones for adopting new permits and standards, which will drive the implementation of water quality best management practices and ultimately change the way Vermonters live with both land and water.

Lake Segment	WWTF	Develop-ed Land	Ag Prod Area	Forest	Streams	Ag	Total Overall
1. South Lake B	0.0%	23.7%	80.0%	60.0%	30.5%	59.5%	43.4%
2. South Lake A	0.0%	21.0%	80.0%	5.0%		59.5%	52.7%
3. Port Henry		10.6%	80.0%	5.0%		20.0%	15.8%
4. Otter Creek	0.0%	22.2%	80.0%	5.0%	40.1%	46.9%	24.7%
5. Main Lake	61.1%	23.8%	80.0%	5.0%	28.9%	46.9%	21.3%
6. Shelburne Bay	64.1%	21.3%	80.0%	5.0%	55.0%	20.0%	12.5%
7. Burlington Bay	66.7%	38.1%	0.0%	0.0%		0.0%	30.5%
9. Malletts Bay	0.0%	26.3%	80.0%	5.0%	44.9%	23.9%	17.6%
10. NE Arm		9.8%	80.0%	5.0%		20.0%	13.0%
11. St. Albans Bay	59.4%	9.8%	80.0%	5.0%	55.0%	34.3%	24.3%
12. Missisquoi Bay	51.9%	30.1%	80.0%	60.0%	65.3%	82.8%	64.3%
13. Isle LaMotte	0.0%	12.0%	80.0%	5.0%		20.0%	12.4%
Total	42.1%	24.1%	80.0%	23.4%	43.4%	51.5%	33.8%

The State of Vermont reports on its progress meeting the Phase 1 goals in an annual Clean Water Report.[8]

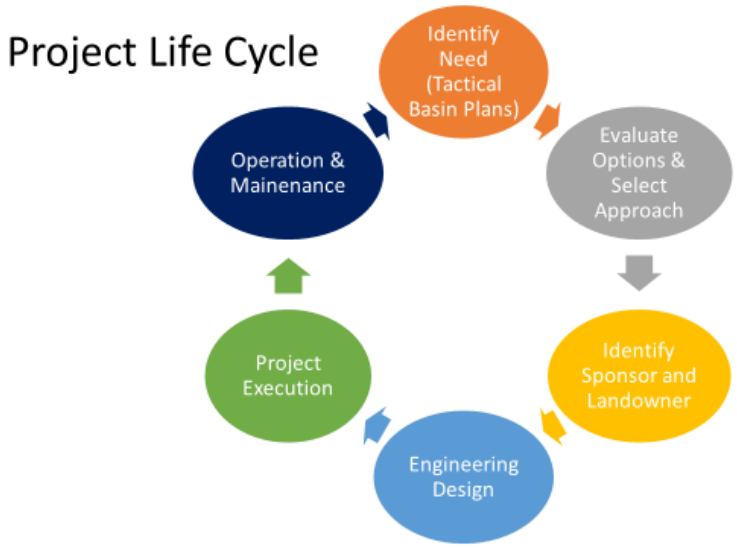


Concurrent with Phase 1 implementation efforts, the Department of Environmental Conservation (DEC) is rolling out its Phase 2 Implementation Plans, also known as Tactical Basin Plans.[9] Each plan covers a five-year period and will identify and prioritize both regulatory and non-regulatory activities needed to meet water quality goals.

DEC is also in the process of designing a project database that will be used to track activities identified in the Basin Plans, including a project grading system that addresses project readiness, environmental benefits, funding sources, and costs. The same database will also be used to track progress as projects move

[7] http://dec.vermont.gov/sites/dec/files/wsm/erp/docs/160915_Phase_1_Implementation_Plan_Final.pdf
[8] http://dec.vermont.gov/sites/dec/files/wsm/erp/docs/2017-01-20%20Clean%20Water%20Initiative%20Deliverables.pdf
[9] http://dec.vermont.gov/watershed/map/basin-planning

through their "life cycle" – from evaluating possible solutions thru engineering design to implementation and the on-going operation and maintenance. Ultimately the database will be used to quantify phosphorus load reductions and to measure progress towards clean water.[10]



II. Existing Sources of Clean Water Funding

Act 73, Section 26(f) required the Working Group, as a first step, to conduct "an evaluation of existing sources of funding." Vermont's clean water efforts are supported by a myriad of federal, state, and municipal revenue sources and financing tools. This funding provides substantial support for clean water, albeit leaving gaps in certain areas, as further examined later in this report.

A. State

1. Capital Bill

The Capital Bill is the vehicle used by the Legislature to appropriate revenues from the issuance of general obligation bonds. Vermont's Capital Debt Affordability Advisory Committee, established in 1990, determines each year a prudent level of new debt issuance for the State, and thus the ceiling on annual capital appropriations. During fiscal years 2016 and 2017, the Legislature appropriated on average $10 million a year to clean water. The Treasurer's Report (January 2017) recommended that an additional $15 million a year in capital funds, or a total of $25 million a year, should be dedicated each year to clean water. Governor Scott supported this recommendation, and the capital appropriations in fiscal years 2018 and 2019 is $24 million a year.

The Agency of Agriculture, Food and Markets (AAFM) uses capital funds to support implementation of on-farm agricultural water quality improvements including production area

[10] https://anrweb.vt.gov/DEC/IWIS/ARK/ProjectSearch.aspx

practices (barnyard improvements, manure pits and livestock exclusion fencing, either alone or in conjunction with federal NRCS funds.

DEC uses capital funds to support several grant program, including:

- Ecosystem restoration grants for stormwater treatment on non-road developed lands.
- Ecosystem restoration grants for natural resources restoration, including floodplains, river corridors, wetlands, and riparian areas for flood resilience, water quality, and habitat benefits.
- Municipal pollution control grants for wastewater, stormwater and combined sewer overflows, pursuant to 10 V.S.A. Chapter 55.
- Municipal Roads Grants-in-Aid pilot project, which provides funding to municipalities, via regional planning commissions, to implement Best Management Practices (BMPs) on municipal roads, ahead of the state Municipal Road General Permit (MRGP).

Generally, early project life-cycle activities, such as tactical basin planning and project scoping are not considered to be eligible for funding through the Capital Bill. In addition, the Legislature has imposed several further restrictions on the type of spending that can be funded through the Capital Bill. The Legislature has been reluctant to authorize capital funds to be used for projects on private lands, even though federal law allows states to award grants funded by tax-exempt bonds to private entities without restriction. The Legislature has also been reluctant to authorize loans to private entities, even though federal law allows states to use tax-exempt bonds for loans to private entities if they serve a public purpose such as clean water.[11] Finally, the Legislature has been reluctant to authorize the use of capital funds to purchase equipment, even though the expected life of the equipment is equal to or greater than the average bond term. The Act 73 Working Group recommends a relaxation of these restrictions to allow for the most effective use of capital funds.

2. Clean Water Fund

The Legislature established the Clean Water Fund in 2015 as part of Act 64, the Vermont Clean Water Act. The Clean Water Fund derives its revenues from a surcharge on the property transfer tax, which was extended in 2017 for an additional nine years and will now sunset in 2027. Annual expected revenues are in the range of $4 million a year.

- AAFM uses Clean Water Funds to support nutrient management plans, best management practices, training classes for manure applicators and agricultural technical service providers, grants for agricultural assistance partners, alternative phosphorus reduction strategies, and for soil and manure testing.

[11] See Treasurer's Report on Private Activity Bonds.

- ANR and DEC use Clean Water Funds to support grant programs that target delivery of: (a) technical assistance, project development and implementation of stormwater pollution abatement on developed lands including roads, (b) natural resources restoration for improvements in water quality and flood resilience and (c) technical assistance, outreach and education to operators of municipal wastewater treatment (WWTF) and pretreatment facilities on strategies to optimize facility processes to reduce nitrogen and phosphorus loadings.

3. Transportation Bill

The Agency of Transportation (VTrans) administers and provides grants to municipalities through the Better Roads Program. The Vermont Better Roads Program provides grants and technical assistance to municipalities to correct erosion problems and adopt road maintenance practices that protect water quality while reducing long-term highway maintenance costs. Its long-term goal is to enable and encourage municipalities to practice best management practices in road maintenance and repairs and institutionalize these practices into municipal capital budget priorities.

The Transportation Infrastructure Bond (TIB) is another source of bond revenue available for transportation-related spending on clean water, both for state-owned and municipally-owned highways. The State generally uses these revenues to draw down federal match (80%). Since spending on municipally-owned highways does not draw down federal match, these monies are used almost exclusively for state-owned highways, including water quality operations and maintenance. The Legislature makes these appropriations through the Transportation Bill.

4. General Fund

The Legislature appropriates money in the General Fund in the Appropriations Bill ("the Big Bill"). General Fund revenues include the personal income tax, the sales and use tax, and other general taxes and fees. AAFM uses general funds to support the Farm Agronomic Practices (FAP) program. FAP provides money to farmers for the implementation of annual practices that are not eligible for capital funds, such as cover cropping, conservation tillage, and alternative manure incorporation practices such as injection or aeration.

5. Special Funds

The Department of Fish and Wildlife (DFW) uses half of the revenues derived from the sale of the Vermont Conservation License Plates to fund the Vermont Watershed Grant Program. The Program is administered by DFW with assistance from DEC. It distributes grant dollars for local and regional water-related projects that protect habitat, water quality and shorelines, reduce

phosphorus and sediment loading, enhance recreational use, identify cultural and history resources, and increase education and monitoring.

6. Clean Water State Revolving Fund (CWSRF)

The CWSRF is a state-run program, authorized by US EPA, that provides low-cost financing for water quality infrastructure projects including municipal wastewater, stormwater, combined sewer overflow and other infrastructure projects. The fund is capitalized through federal and state funds, principal repayments, and interest. 24 V.S.A. 4753(a)(1).

B. Federal

1. U.S. Department of Agriculture, Rural Development (RD)

   - USDA RD Water and Environmental Programs (WEP) Annual Loan and Grant Appropriations. Low interest loans and grants to qualifying communities with a population under 10,000.
   - USDA RD Rural Economic Area Partnership (REAP) Zone Grant**.** This is a pilot program for rural revitalization and community development to qualifying communities in the Northeast Kingdom (Caledonia, Essex and Orleans Counties) with a population under 10,000.

2. U.S. Department of Agriculture (USDA)

   - USDA Best Management Practices (base funding). The US Department of Agriculture Natural Resources Conservation Service (NRCS) provides a large amount of funding for agricultural best management practices and conservation measures in Vermont. These funds go to implementation of improvements to farm production areas (barnyard improvements, manure pits) and field practices (cover crops, reduced tillage, manure injection or controlling field gully erosion). In 2014, then USDA Secretary Vilsack committed $45M over the next five years to Lake Champlain water quality improvement. This resulted in substantially larger funding from NRCS, however, these funds are expected to decrease to prior levels (approximately $5M/year) in FY18.
   - USDA Regional Conservation Partnership Program (RCPP) Best Management Practices. DEC and AAFM jointly received a $16M grant from USDA in 2015 which provides funds for farm and forest water quality improvement practices, wetland restoration and conservation, and land conservation easements. The Regional Conservation Partnership Program funds are available through 2020. The Clean Water Initiative Program provides ecosystem restoration grant funds as match to the five-year state RCPP to incentivize high

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priority wetland restoration and conservation. This match is used to leverage federal Wetland Reserves Program funds and increase payments above the traditional rates where wetland conservation is considered most critical for water quality and flood resilience.

- USDA Agriculture Technical Assistance (VACD RCPP). The Vermont Association of Conservation Districts received an $800,000 grant from USDA in 2015 that provides funds for increased nutrient management plan development and implementation for farmers. Nutrient management plans are required for all large, medium and certified small farms, and document the water quality concerns and practices to remediate. VACD is holding classes, in conjunction with UVM Extension, to teach farmers how to develop their plans, and conducting follow-up outreach to assist with implementation. Funds are available through the spring of 2018.

3. USDA NRCS Agriculture Conservation Easement Program Wetland Reserve Easement component (ACEP-WRE). This is a voluntary conservation easement program that provides technical and financial assistance to private landowners to restore, protect and enhance wetlands in exchange for retiring eligible land from active agriculture.

4. U.S. Federal Highway Administration.

   - Federal Highway Administration Transportation Alternatives Grant Program. VTrans administers this federally funded grant program for both non-traditional transportation-related projects. Eligible activities under this program include "any environmental mitigation activity, including pollution prevention and pollution abatement activities and mitigation to address stormwater management, control, and water pollution prevention or abatement related to highway construction or due to highway runoff." All available program funds are dedicated for projects eligible under this activity for SFY18 and SFY19. Per Act 38 of 2017, no funds will be set aside for these types of projects in SFY20 and SFY21. Starting in SFY22, one half of the funding will be set aside for these types of projects.

   - Municipal Highway and Stormwater Mitigation Grant Program. VTrans administers this grant program with federal funds for non-traditional transportation-related projects for SFY18 and SFY19. Project eligibility is the same as for Transportation Alternatives.

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- Federal Highway Administration – Project Development, Construction. Federal funds that are used by VTrans that can be used for state highway-related compliance costs under the TS4 General Permit.

5. U.S. Fish and Wildlife Service, Partners for Fish & Wildlife Program. The Partners Program serves as a bridge to owners and managers of private lands to develop partnerships for the benefit of federal trust species. The Partners program focuses on restoration of wetlands, woodlands and riparian areas that provide breeding habitat and critical migratory stopovers for migratory birds and benefit fish populations.

6. Lake Champlain Basin Program (LCBP) is a Congressionally-designated geographic area program tasked with working to restore and protect Lake Champlain and its surrounding watershed. LCBP works with partners in New York, Vermont and Quebec to coordinate and fund efforts to address challenges in the areas of phosphorus pollution, toxic substances, biodiversity, aquatic invasive species, and climate change. The LCBP also administers the Champlain Valley National Heritage Partnership which builds appreciation and improves stewardship of the region's rich cultural resources by interpreting and promoting its history. The LCBP is supported through annual appropriations from the U.S. Environmental Protection Agency, the Great Lakes Fishery Commission, and the National Park Service.

C. Municipal

Vermont municipalities have three potential sources of revenue for clean water investments: sewer rates, stormwater utility fees, and property taxes. Cities, towns, villages and prudential committees have authority to establish rates for the operation of sewer and stormwater systems. 24 V.S.A. 3507. Municipalities can use the revenue from sewer and stormwater rates to pay back loans obtained to finance clean water investments. Four Vermont municipalities have established stormwater utilities, with per parcel and impervious surface fees as sources of revenue. And finally, all municipalities impose local property taxes, which are a source of revenue for highway investment, including stormwater best practices.

D. Private

Most of the costs identified in this report are regulatory costs of compliance with Act 64 and the TMDLs. This report acknowledges that the private sector, including farmers and businesses, will share in the regulatory cost of clean water in their role as landowners. For purposes of this report, the Act 73 Working Group has assumed that current levels of subsidization will be maintained. For example, farmers currently receive subsidies as high as 90%, municipalities receive subsidies ranging from 35% to 80%, while owners of private land generally receive no

cost share for compliance with permit requirements. Adjusting the cost share will, in turn, impact the cost to the state of clean water compliance. Although not part of its statutory mandate, the Act 73 Working Group has explored below some innovations that may enhance the cost-effectiveness of clean water investments for both public and private landowners. A summary of current levels of water quality cost share by project type is presented in Section IV of this report.

III. Treasurer's Report on Clean Water Funding (January 2017)

The Act 73 Working Group's efforts follow and build upon the January 2017 Treasurer's Report to the Legislature on clean water funding, which was mandated by 2015 Act 64 and was to include "a recommendation for financing water quality improvement programs in the State.".[12]

To fulfill this statutory mandate, the Treasurer needed to know both existing sources of funding and estimated costs meet clean water compliance over time. With support from agencies across state government, the Treasurer reviewed existing sources of clean water revenues and estimated the cost of achieving Vermont's water quality goals statewide, including compliance with 2015 Act 64; the Lake Champlain Total Maximum Daily Limit (TMDL), the Lake Memphremagog, Lake Carmi, Connecticut River and Long Island Sound TMDLs; and Vermont's 2016 Combined Sewer Overflow (CSO) Rule.

The cost estimates in the Treasurer's Report and in this report are driven primarily by regulatory requirements. Act 64 requires the state, municipalities, farmers and private landowners to obtain permits, retrofit existing parcels with stormwater practices, implement nutrient management plans including attendant conservation measures, and upgrade gravel roads and paved highways. Regulated entities will have up to 20 years to implement these fixes, but the fixes are required. Even in the absence of state or federal subsidies, landowners will be expected to implement stormwater mitigation to reduce pollutant loads to Vermont's waters.

It is important to note that the cost estimates in the Treasurer's Report did <u>not</u> include:

- Staffing costs at ANR and AAFM, for administering the state's clean water regulatory programs; or
- Operation and maintenance (O&M) costs following construction and implementation of clean water projects. It is generally assumed that the O&M costs will be borne by the project owner.

[12] http://www.vermonttreasurer.gov/sites/treasurer/files/committees-and-reports/_FINAL_CleanWaterReport_2017.pdf

Following the structure of the US EPA's TMDLs for Lake Champlain, the cost estimates in the Treasurer's Report were organized into four sectors: municipal wastewater control (including CSOs), stormwater pollution control (including roads and developed lands), agriculture pollution control, and natural resources restoration. The Treasurer's Report assumed a 20-year planning horizon to coincide with Lake Champlain TMDL and Act 64 compliance schedule. Further, the Treasurer's Report estimated that the average annual investment needed for compliance with clean water goals during the 20-year planning horizon was $115 million a year; and the annualized average gap between costs and revenues was $62 million a year. The Treasurer's report concluded that an "all-in" approach requires shared responsibility for the costs across all sectors, with the State subsidizing a portion, but not all, of these costs

In state fiscal years 2016 and 2017, the state spent roughly $32 million a year on clean water efforts. The Treasurer recommended that the state invest an additional $25 million per year in clean water through a combination of capital dollars, transportation dollars, and the property transfer tax surcharge.

In state fiscal years (SFY) 2018 and 2019, following the Treasurer's recommendation, Governor Scott proposed to invest $56 million a year on clean water efforts, an average increase of $24 million a year on clean water over previous years. The Legislature is on track to fulfill this commitment to clean water in SFY18 and SFY19.

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FY18-19 VERMONT CLEAN WATER APPROPRIATIONS

	A	B	C	D	E	
	Baseline	As Passed House & Senate (5/5/2017)			Filling Gap= D-A	
	(2 year total)	FY18	FY19	FY18 & FY19	(2 year total)	
1 **Capital Bill, H.519 Section 11: Clean Water Investments**						
2 (a)(1) & (e)(1) AAFM BMP & CREP	$ 3,800,000	$ 3,450,000	$ 2,000,000	$ 5,450,000	$ 1,650,000	
3 (a)(2) AAFM Water Quality Grants & Contracts	$ -	$ 600,000	$ -	$ 600,000	$ 600,000	
4 (b)(1)&(f)(1) DEC Clean Water State Revolving Fund (SRF)	$ 2,400,000	$ 1,000,000	$ 1,200,000	$ 2,200,000	$ (200,000)	
5 (b)(2)&(f)(2) DEC Ecosystem Restoration Grants	$ 7,460,000	$ 6,000,000	$ 5,000,000	$ 11,000,000	$ 3,540,000	
6 (b)(3) DEC Municipal Pollution Control Grants (prior)	$ 35,000	$ 2,982,384	$ -	$ 2,982,384	$ 2,947,384	
7 (b)(4)&(f)(3) DEC Municipal Pollution Control Grants (new)	$ 3,306,500	$ 2,704,232	$ 1,407,268	$ 4,111,500	$ 805,000	
8 (c) VTrans Municipal Mitigation Program	$ -	$ 1,400,000	$ -	$ 1,400,000	$ 1,400,000	
9 (d)(1) VHCB: water quality projects	$ 3,750,000	$ 2,800,000	$ 2,750,000	$ 5,550,000	$ 1,800,000	
10 (d)(2) VHCB: farm grants or fee purchase water quality projects	$ -	$ 1,000,000	$ -	$ 1,000,000	$ 1,000,000	
11 (f)(4) FY19 Statewide Clean Water Implementation	$ -	$ -	$ 11,112,944	$ 11,112,944	$ 11,112,944	
12	$ 20,751,500	$ 21,936,616	$ 23,470,212	$ 45,406,828	$ 24,655,328	
13						
14 **Transportation Bill H.494**						
15 State Highway Compliance	$ 16,280,000	$ 8,140,000	$ 8,140,000	$ 16,280,000	$ -	*
16 Section 14: Transportation Alternatives (for stormwater)	$ 2,200,000	$ 2,200,000	$ 2,200,000	$ 4,400,000	$ 2,200,000	*
17 Section 8: Municipal Mitigation (for stormwater)	$ 2,880,000	$ 1,240,000	$ 1,840,000	$ 3,080,000	$ 200,000	*
18 Section 8: Municipal Mitigation from Federal Hgwy STBG Fund	$ -	$ 5,442,342	$ 5,242,342	$ 10,684,684	$ 10,684,684	*
19	$ 21,360,000	$ 17,022,342	$ 17,422,342	$ 34,444,684	$ 13,084,684	
20						
21 **Appropriations Bill**						
22 DEC Federal match pass through for DEC Clean Water SRF	$ 20,000,000	$ 10,000,000	$ 10,000,000	$ 20,000,000	$ -	*
23 DF&W Watershed Grants Program	$ 70,000	$ 35,000	$ 35,000	$ 70,000	$ -	*
24 AAFM Farm Agronomic Practices Program	$ 300,000	$ 150,000	$ 150,000	$ 300,000	$ -	*
25 AAFM Water Quality Grants and Contracts	$ 594,000	$ 297,000	$ 297,000	$ 594,000	$ -	*
26 AAFM Operational Funds	$ 750,000	$ 375,000	$ 375,000	$ 750,000	$ -	*
27 **Clean Water Fund**	$ -	$ 4,000,000	$ 4,000,000	$ 8,000,000	$ 8,000,000	
28 **FY19 Capital Bill: Bond premium from sale of bonds**	$ -	$ -	$ 2,259,988	$ 2,259,988	$ 2,259,988	*
29						
30 **GRAND TOTAL**	**$ 63,825,500**	**$ 53,815,958**	**$ 58,009,542**	**$ 111,825,500**	**$ 48,000,000**	

* Rows 15-18, 22-26, 28: Appropriations for FY19 are projected

Vermont's baseline annual spending on clean water projects is close to $32 million, including more than $15 million in federal funds.

In FY18, Vermont has appropriated $54 millon for clean water projects (state and federal funds).

In FY19, Vermont is projected to spend $58 million on clean water efforts (state and federal funds).

Over 2 years, this represents an increase of $48 million over baseline spending, or $24 million average annual increase (state and federal funds).

Work to efficiently and effectively expend the resources made available in the FY18 budget has taught several lessons:

1. Restricted versus non-restricted funds. In the FY18 budget, many of the state's appropriations are restricted. For example, federal highway pass-through funds can only be used on highway projects that meet federal funding requirements. Likewise, as a policy matter, the Legislature has restricted the use of capital funds to municipal and agricultural projects, making these funds less flexible than other general funds. Given these restrictions, state agencies are targeting projects in FY18 that are "shovel ready." The need for non-restricted funds to stage "shovel-ready" project and pay for planning, scoping, and technical assistance will likely become more acute as time goes on.

2. Annual cost projections versus average annualized cost projections. In FY18, the Legislature targeted the annualized average budget gap, rather than the estimated budget gap for FY18. In future years, including the FY20-24 estimates presented later in this report, more careful attention will need to be paid to the effective dates of permit requirements, which in turn will affect the type of funds and subsidies that will be most effective.

3. Capacity. The Legislature will also need to consider the staffing capacity of state agencies to oversee and administer grants and construction activities, and the capacity of partners (municipalities, farmers, non-profit organizations) to implement projects on the ground. State agencies are actively exploring new partnerships and new grant programs for lowering the cost of administering grant awards, but staffing will be a challenge, regardless of the granting entity.

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IV. Matching Existing Sources of Revenue with Projected Costs, SFY20-24

Like the State Treasurer, the Act 73 Working Group has been tasked with making a recommendation on "equitable and effective long-term funding methods to support clean water efforts in Vermont." Act 73 Section 26(a).

One of the lessons learned from the FY18 budgeting process was the importance of matching revenue sources with costs, since many revenue sources are restricted. To facilitate the matching of revenues and costs, the Act 73 Working Group refined the estimates made in the Treasurer's Report.

Five-Year Estimates. The Act 73 Working Group asked each agency that contributed to the Treasurer's Report to review their cost estimates and provide updates as appropriate, with particular attention to the five-year period starting with the next legislative biennium, SFY20-24. This five-year focus has several advantages over the twenty-year estimates, including:

- Facilitating the state budgeting process by looking at annual spending estimates for each of the five years as opposed to annualized averages over a twenty-year period;
- Showing the timing of anticipated costs in more detail;
- Incorporating the capacity or "ability to spend" in the timing of anticipated costs;
- Allowing policy makers to match, on an annual basis, funding needs with funding sources, especially given the restricted nature of certain types of transportation and capital funds; and
- Providing more accurate cost estimates in the near-term years.

Twenty-Year Estimates. Given the uncertainty in predicting the magnitude and timing of costs out to year 2038, the Act 73 Working Group did not modify any of the 20-year cumulative cost estimates in the Treasurer's Report.

Revenues vs. Financing Tools. In the Treasurer's Report, the Clean Water State Revolving Fund (CWSRF) was labeled as a funding source for the construction of municipal infrastructure such as wastewater treatment facilities and combined sewer overflows. Because this funding source represents loans that must be repaid by municipal ratepayers, the Act 73 Working Group Report shows that repayment of CWSRF loans will be borne by municipalities.

Existing Grant Program and Match Amounts. In matching costs with existing revenues, the Act 73 Working Group assumed no change in the state's grant programs. For example, since there currently exists no grant program for stormwater treatment retrofits on privately-owned developed lands, such as the forthcoming retrofit requirement for parcels with more than 3 acres of impervious surface; the Act 73 Working Group assumed that these costs would be 100% funded by private landowners. Stormwater projects on privately owned developed lands that are municipally sponsored may be eligible for up to 50% match if the stormwater

treatment is regulatorily required, or up to 100% match if the treatment is voluntary. The statute governing municipal pollution control grants authorizes the state to award grants up to 35% of the cost of the project, depending on the number of points awarded in the application process; however, because not all projects will receive the maximum grant, the Working Group assumed an average grant award of 20%. The table below [working on graphic to simplify] lists the state's existing grant programs and match amounts.

SUMMARY OF WATER-QUALITY GRANT MATCH & ELIGIBILTY		
Type of Project	State or Federal Maxium Match	Program Name
Municipal Regulatory Projects		
Municipal Roads	80%	VTrans Better Roads
Municipal Roads	80%	DEC/Ecosystem Restoration Program
WWTF Construction	35%	FED Municipal Pollution Control Grants
Stormwater - MS4s (include private partnerships)	50%	DEC/Ecosystem Restoration Program*
Stormwater - developed lands permits (≥3 acre)	50%	DEC/Ecosystem Restoration Program**
Stormwater - new & redevelopment permits (≥1 acre)	0%	See note**
Municipal Non-Regulatory project		
Stormwater - Non-MS4	35%	FED Municipal Pollution Control Grants (10%-35%)
Stormwater - Non-MS4 (includes private partnerships)	80%	DEC/Ecosystem Restoration Program*
Natural Resources Projects (includes private partnerships)	80%	DEC/Ecosystem Restoration Program*
Private Regulatory Projects		
Stormwater - developed lands permits (≥3 acre)	0%	See note**
Stormwater - new & redevelopment permits (≥1 acre)	0%	See note**
Agriculture Regulatory Projects		
Construction	90%	State AAFM Grant/Federal NRCS Grant
Non Construction	90%	State AAFM Grant/Federal NRCS Grant
Equipment	100%	AAFM Capital Equipment Ag Practice (CEAP)
Nonregulatory Projects (municipal, municipally sponsored, and non-profit)		
Municipal and municpally-sponsored planning*	80%	DEC/Ecosystem Restoration Program
Non-profit planning	80%	DEC/Ecosystem Restoration Program
Construction or implementation	80%	DEC/Ecosystem Restoration Program

Notes

* Definition of municipally sponsored:

1. Municipality assumes full legal responsibility, or
2. Municipality is a co-permittee and agreement identifies O&M responsibility

** Might need to pay impact fees, or be eligible to receive impact fees, under proposed stormwater rule

Glossary

ERP = Ecosytem Restoration Program Grants, Clean Water Initiative Program, Department of Environmental Conservation)
FED = Facilities and Engineering Division, Department of Enviornmental Conservation
VTrans = Vermont Agency of Transportation
AAFM = Vermont Agency of Agriculture, Food and Markets
NRCS = Natural Resources Conservation Service, U.S. Dept of Agriculture

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Overall Findings

The Act 73 Working Group estimates that Vermont's average annual cost to comply with clean water commitments for each of the next five years is $84 million, average annual revenue sources both public (federal, state, local) and private are $79 million, leaving an annual average gap over the next five years of $5 million.

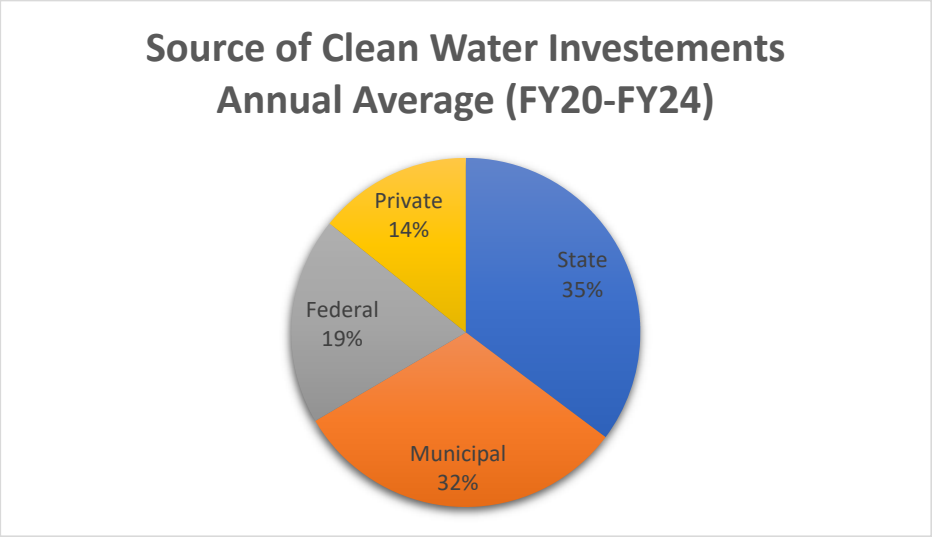
	Estimated Costs		Estimated Revenues		Estimated Gap	
SECTOR	Treasurer 20-yr avg	Act 73 5-yr avg	Treasurer 20-yr avg	Act 73 5-yr avg	Treasurer 20-yr avg	Act 73 5-yr avg
1. Wastewater	$ 43	$ 35	$ 30	$ 35	$ 13	$ -
2. Agriculture	$ 29	$ 18	$ 12	$ 13	$ 17	$ 5
3. Developed Lands	$ 36	$ 27	$ 11	$ 27	$ 25	$ -
4. Natural Resources	$ 7	$ 4	$ 2	$ 4	$ 5	$ -
	$ 115	$ 84	$ 54	$ 79	$ 61	$ 5

Notes

Sector 1: Assumes state grants of 20% for municipal infrastructure; municipal ratepayers will fill gap.

Sector 2: Assumes funding and capacity constraints will lead to a gap in agricultural sector spending.

Sector 3: Assumes private landowners will pay 100% compliance costs on private developed lands unless projects are municipally sponsored.



Revenue sources include both public and private investments. Of the $78 million in revenues, the Working Group assumed the following shares: state 33%, municipalities 33%; federal government 20%; and private landowners 14%. The Act 73 Working Group assumed that the Legislature will on average allocate $19 million each year from the Capital Bill for clean water and $4 million from the Clean Water Fund; that municipal voters will approve clean water bond requests; that the federal funding for clean water remain at current levels; and that private landowners will be able to access capital for their portion of costs.

- A modest gap remains between anticipated estimated costs and revenues beginning in FY21. The Act 73 Working Group suggests that the Legislature revisit clean water costs every two years going forward to incorporate new data from water quality monitoring, geospatial mapping, and actual costs of implementation to ensure sufficient funding is available to meet the need. There are several possible sources of funding that may be available to support clean water work that are not currently accounted for in the estimated revenues, including:
    - The Act 73 Working Group noted that additional revenues of $5 million a year may become available if TDI-NE constructs an electric transmission line in Lake Champlain. In a stipulation with the State of Vermont, incorporated in TDI-NE's Certificate of Public Good (CPG), TDI-NE agrees to deposit into the Clean Water Fund, 10 V.S.A. § 1388: (i) $1 million on the fiscal close of the Project; (ii) $6 million on July 1 of the initial year of commercial operations of the Project; and (iii) $5 million on July 1 of each year thereafter for 39 years. Compliance with the terms of the stipulation is a condition of the Vermont Public Utility Commission's approval of the TDI-NE project.
    - While other sources of federal funding may become available during this five-year period, such as new funding through the Lake Champlain Basin Program (LCBP), this Report like the Treasurer's Report assumes a continuation of historic levels of funding, namely $250,000 in LCBP annual funding for developed lands and $200,000 in LCBP annual funding for natural resources.

- The Act 73 Report does not include DEC or AAFM staff costs to administer grant programs, to track spending, to maintain project inventories, to monitor water quality, or to assess cost effectiveness. The Agency of Administration submitted a legislatively mandated report to the Vermont Legislature on September 1, 2017, outlining how reductions in federal EPA grants could affect ANR and AAFM. If federal funding cuts are realized, ANR and AAFM may need to seek compensating revenue increases from the Vermont Legislature to maintain current grant programs.

- Finally, these estimates do not include on-going operations and maintenance costs, which can be significant. Operations and maintenance are necessary to obtain the benefit of many clean water investments. It is generally assumed that the project owner will assume the costs of operations and maintenance.

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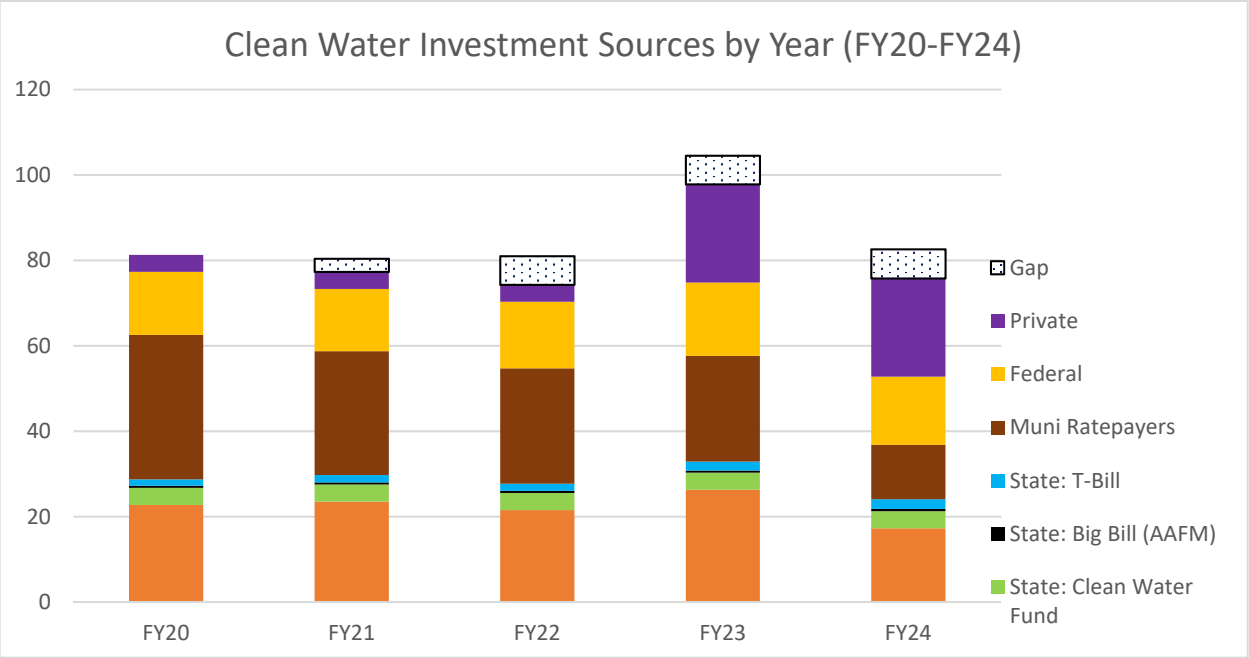
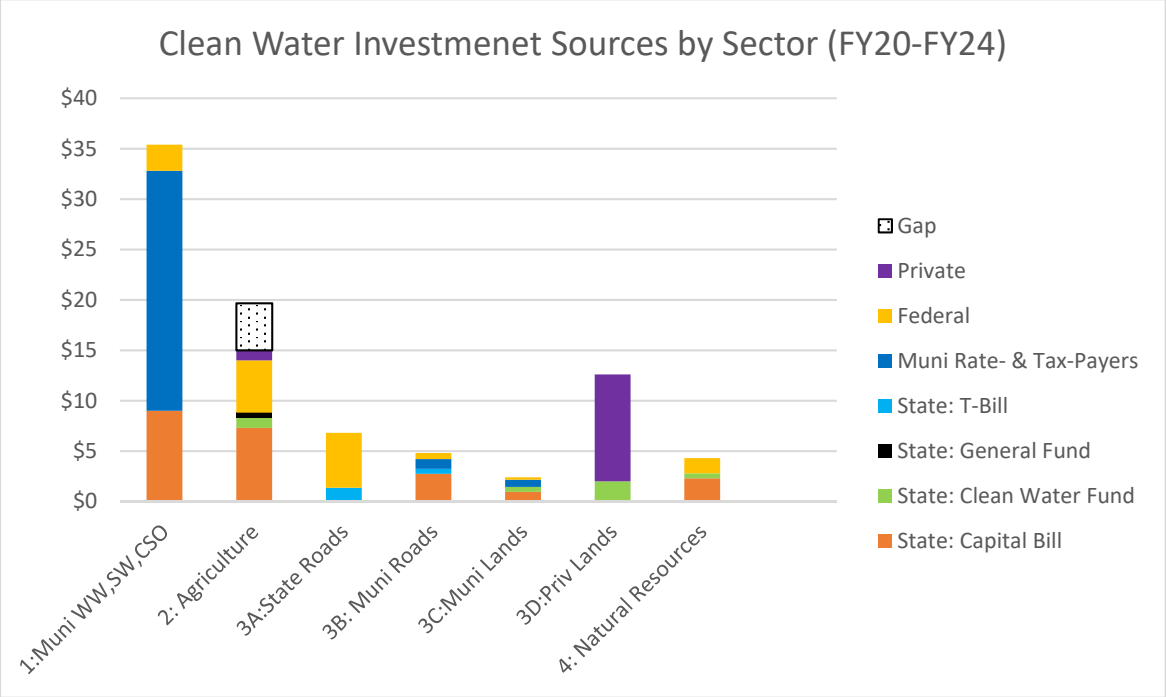
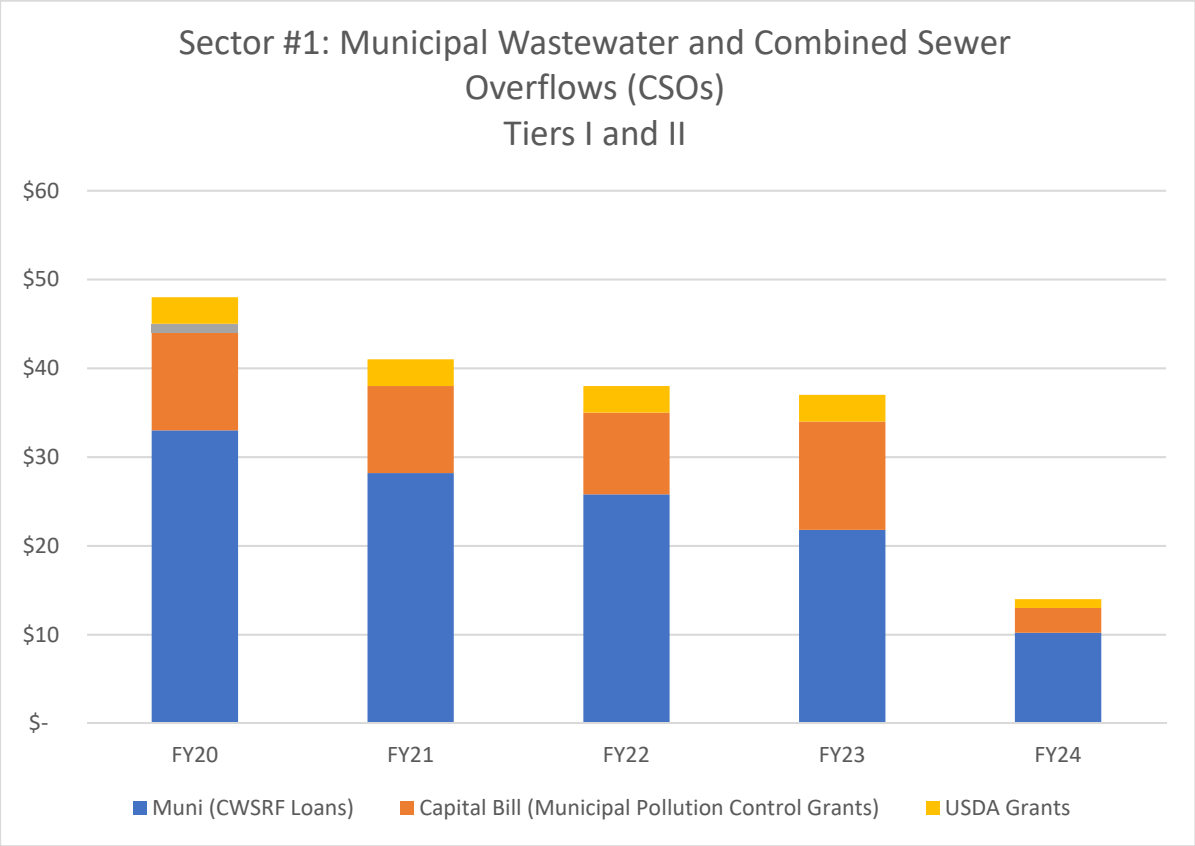
Summary Charts





Sector 1: Municipal Infrastructure



- Funding. The Act 73 Working Group anticipates that municipal wastewater infrastructure upgrades and refurbishments can be funded through a combination of debt incurred by municipal ratepayers, municipal pollution control grants through the Capital Bill, and federal grants through USDA.

  The Vermont Legislature has set a maximum award of 35% for municipal pollution control grants, and minimum grant award of 10%. These estimates use an average grant award of 20%. The municipal pollution control grant program is funded through the Capital Bill. The Legislature may want to consider supplemental affordability grants for municipalities where loan repayments for required phosphorus upgrades, combined with regular service payments, may exceed 2% of median household income (MHI) – a threshold considered by EPA to have significant socio-economic impacts.

Municipal ratepayers are assumed to pay their share of project costs in the form of loan repayments, obtained either through the state's Clean Water State Revolving Fund (CWSRF) or USDA loan programs. Both programs offer loans with 0% interest and some forms of loan forgiveness. Municipalities must obtain voter approval prior to incurring bonded debt. 24 V.S.A. § 1755, 1786a.

Vermont's Clean Water State Revolving Fund (CWSRF) carries a balance of $79 million as of date. In the unlikely event that all of the projects on the municipal intended use plans are approved by voters, the CWSRF may approach a zero balance as early as FY20. Additional capacity may be available through the USDA loan programs and the Vermont Municipal Bond Bank (VMBB). ANR intends to collaborate with the Treasurer's Office to explore alternatives to the CWSRF should that source of lending become exhausted.

- Wastewater Treatment Facilities. The State and the federal government have invested over $600 million since the 1970s to safeguard public health by funding the construction of and upgrades to wastewater treatment facilities (WWTFs). Over 120 municipally- and privately-owned wastewater collection and treatment facilities exist in Vermont, serving approximately half the state's population. Those investments continue to pay substantial dividends to public health and safety, local economies, and the environment.

  Many municipal WWTFs are reaching the end of their design life and will require refurbishment; in addition, a number of these facilities will need to implement enhanced nutrient removal technologies to meet allocations included in TMDL plans for Lake Champlain (phosphorus), Lake Memphremagog (phosphorus) and the Connecticut River and Long Island Sound (nitrogen).

  Based on their intended use plans, thirty-four municipalities intend to construct sewer, wastewater treatment, or stormwater infrastructure projects, other than those required by a TMDL or the CSO rule, during the period FY20 to FY24. The aggregate project costs are $31 million in FY20, $17 million in FY21, $12 million in FY22, $9 million in FY23, and $0.6 million in FY24. Because the municipalities' intended use plans likely underestimate activity in FY21 to FY24, an upward adjustment of $5 million a year was made for each of these years.

- Phosphorus Upgrades at Wastewater Treatment Facilities. Collectively, the 49 wastewater treatment facilities in the Lake Champlain basin are responsible for approximately 4% of the phosphorus loading to the lake, and will need to reduce their annual phosphorus contributions by 42% over the next 20 years. The Treasurer's Report projected that providing enhanced nutrient removal at the 13 facilities identified in the TMDL as requiring upgrades would cost $78.4 million. Several recent WWTF pilot projects suggest that the cost of nutrient removal could be substantially less than

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originally estimated in 2016. More recently, DEC has estimated that the cost would be $54 million.

Five municipalities are likely to upgrade wastewater treatment facilities between FY20 and FY24 to comply with the Lake Champlain TMDLs. The municipalities and estimated project costs are: North Troy ($1 million), Plainfield ($1 million), Richford ($8 million), Swanton ($3 million), Winooski ($8 million). The St. Albans' WWTF upgrade should be completed by FY20; improvements to the Williamstown WWTF have an expected construction date of FY25.

- Combined Sewer Overflows. Combined sewer systems are collection systems designed to convey both sewage and stormwater in the same pipe to a treatment facility. Storm events can cause flows to exceed the capacity of the collection system or treatment facility, resulting in discharges from CSOs of untreated wastewater, diluted with stormwater, to surface waters. ANR's 2016 Combined Sewer Overflow Rule requires municipalities to establish timeframes for addressing combined sewer overflows. The 2016 Combined Sewer Overflow (CSO) rule addresses discharges from the CSOs statewide.

  Four municipalities currently have specific plans to address combined sewer overflows between FY20 and FY24. The municipalities and estimated project costs are: Northfield ($500,000), Middlebury ($1 million), Rutland ($3 million), St. Albans ($1 million). Because current plans likely underestimate future CSO activity, an average upward adjustment of $6 million per year was made for FY21 through FY24.

  Since xxx, municipalities have eliminated many CSOs, reducing the number of CSOs from xxx to xxx. As of 2017, there remain 66 CSOs in 15 Vermont municipalities.

  ANR anticipates working with the 15 municipalities that are responsible for the remaining combined sewer overflows to develop comprehensive long-term control plans, including cost estimates, with results available by November 2018.

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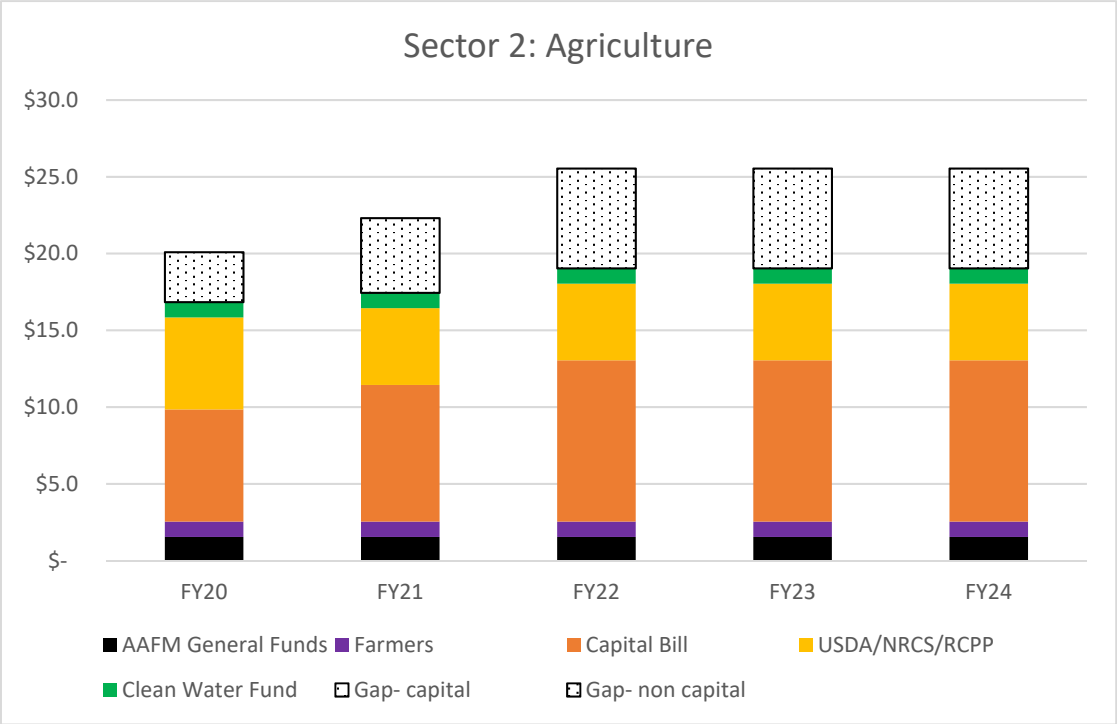
Sector 2: Agriculture



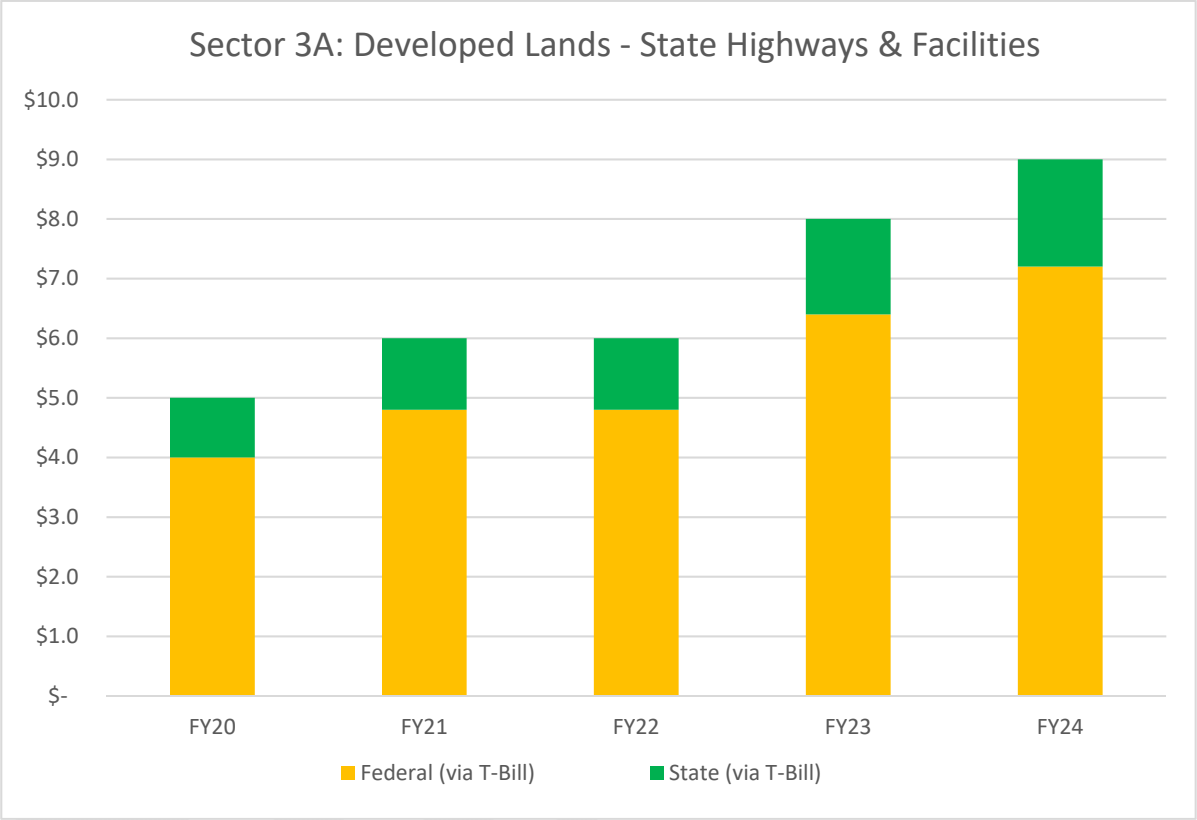
- The Treasurer's Report (1/15/2017) estimated that the cost within the agricultural sector of complying with the TMDLs and the Vermont Clean Water Act of 2015 averaged $27 million a year over 20 years. Of this, $8 million are capital costs and $19 million are non-capital costs. Capital costs include implementation of best management practices (BMPs) for production areas and livestock exclusion infrastructure. Non-capital costs include implementation of BMPs for cropland areas, development of nutrient management plans, deployment of agronomic practices and field-based conservation measures such as cover cropping, technical assistance and training.

- AAFM is currently delivering approximately $6 million in technical and financial assistance programming to farmers each year. USDA's Natural Resource Conservation Service (NRCS) delivers another $5 million in technical and financial assistance. Farmers are expected to contribute $1 million each year in cost share.

- The capacity does not currently exist within the agriculture sector – AAFM, NRCS and their partners – to deliver $27 million in technical and financial assistance programming to farmers. AAFM is working on plans to increase the agency's capacity to deliver services to farmers. Specifically, AAFM continues to implement the new certified small farm inspection program, along with increased numbers of inspections on the medium and large farms due to changes in statutory requirements. These inspection will increase

the demand for capital improvement projects on farms over time as farmers work to resolve the concerns identified during these inspections.

Sector 3A: Developed Lands – State Highways and Facilities



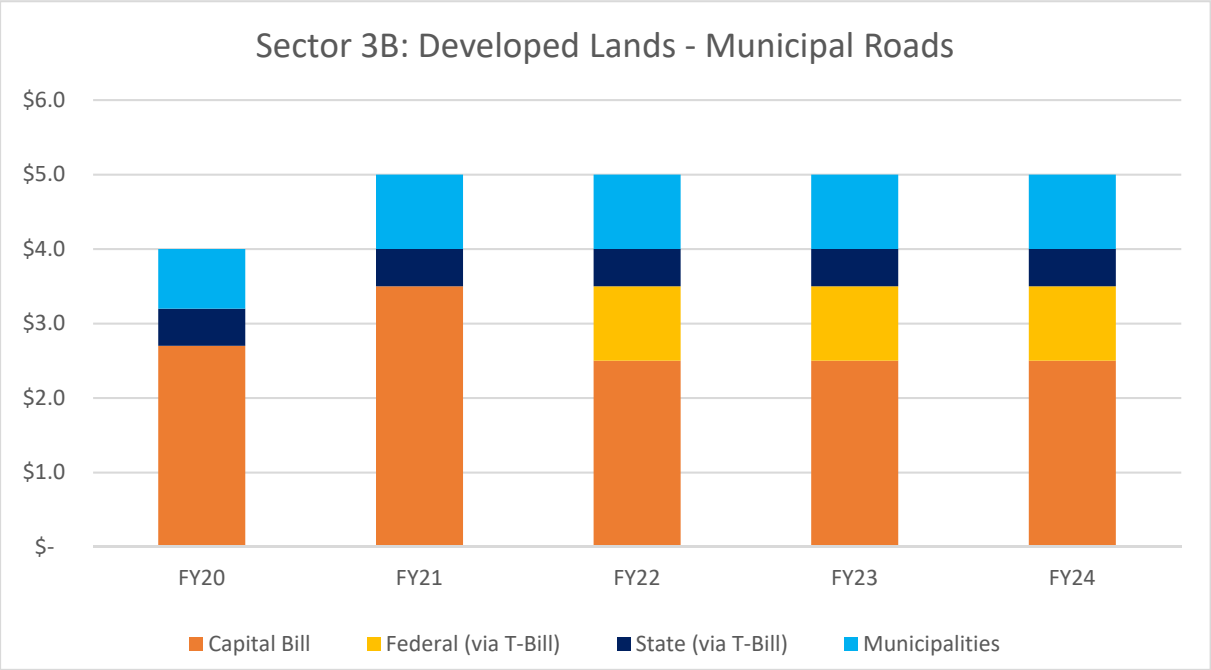
- The Act 73 Working Group anticipates that the costs of implementing stormwater practices on state highways and facilities to comply with Act 64's TS4 ("Transportation Separate Storm Sewer System") permit will be fully covered by the Transportation Bill, and that the state's revenues will be matched by federal funds on an average 20/80 ratio. The actual match varies on a project by project basis.

- The Act 73 Working Group noted that the cost of the state highway compliance with the TMDLs and Act 64 over 20 years is likely to decrease from the estimate in the Treasurer's Report. This is because the estimates in the Treasurer's Report relied on draft modeling by US EPA to determine the number of acres of highway roads must be treated to comply with the Lake Champlain TMDLs. The Act 73 Report relies on US EPA's final modeling. However, given the uncertainty is estimating costs over a 20-year period, the Act 73 Working Group has not revised any of the 20-year estimates. Instead,

the Act 73 Working Group recommends revisiting these estimates every two to four years.

- VTrans' cost estimates to comply with the TS4 permit include the cost of retrofitting state highway facilities, including garages, park & rides, and welcome centers.

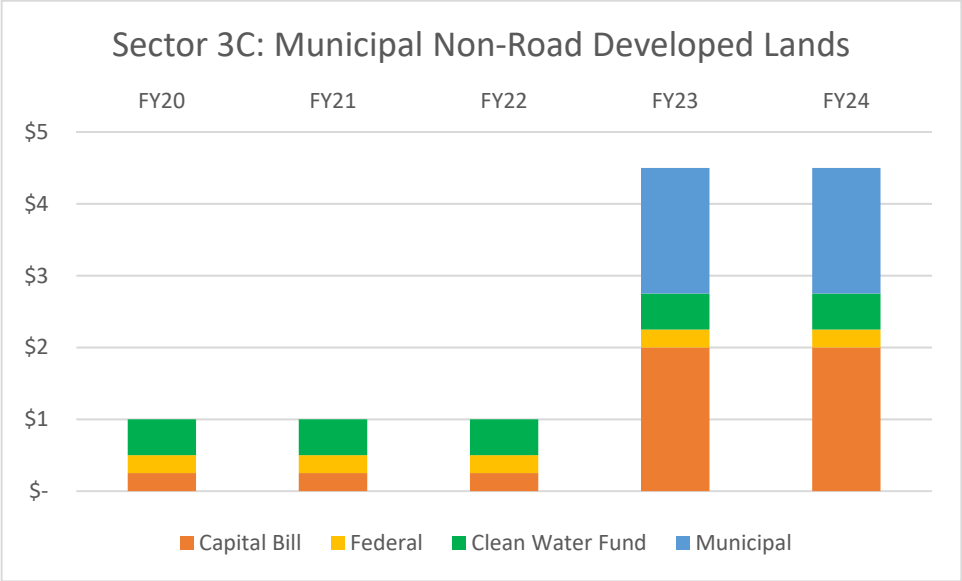
Sector 3B: Developed Lands – Municipal Roads



- The Act 73 Working Group anticipates that funding for compliance with Act 64's Municipal Roads General Permit (MRGP) will be shared by federal funds in the Transportation Bill ($1.5 million); state funds in the Transportation Bill ($0.5 million); state funds in the Capital Bill ($2.0 million); and municipalities ($1 million).

- As with state highways, the Act 73 Working Group noted that the cost of municipal road compliance with the TMDLs and Act 64 over 20 years is likely to be less than the estimate in the Treasurer's Report. However, given the uncertainty is estimating costs over a 20-year period, the Act 73 Working Group has not revised any of the 20-year estimates. Instead, the Act 73 Working Group recommends revisiting these estimates at least every two to four years.

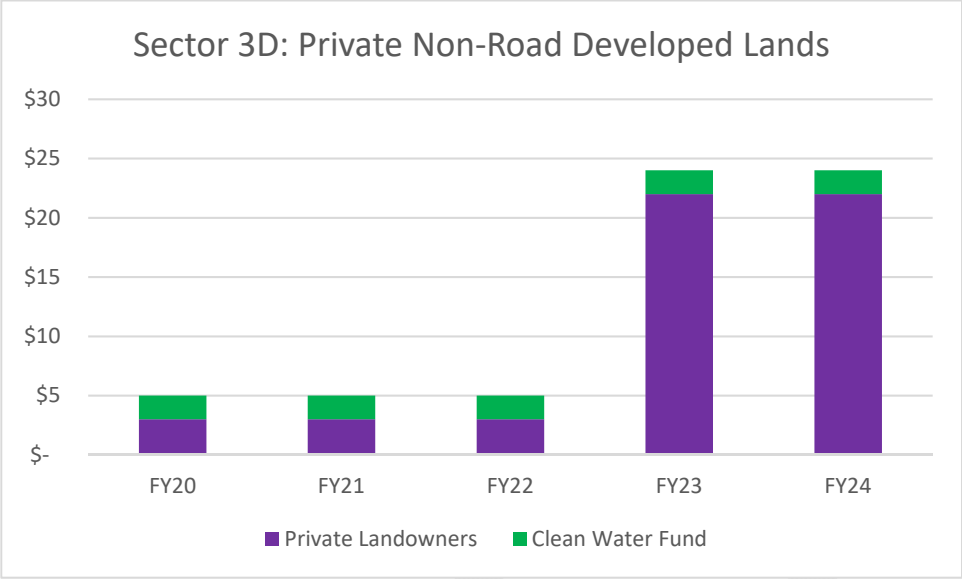
Sector 3C: Developed Lands – Municipal Non-Road Lands



- The Act 73 Working Group anticipates that the cost of implementing stormwater practices on parcels owned by municipalities with greater than 3 acres of impervious surface will be fully reimbursed in FY20, FY21 and FY22 through grants from the Capital Bill, Lake Champlain Basin Program and Clean Water Fund. Starting in FY23, when compliance with Act 64's 3-acre permit becomes mandatory, municipalities will need to provide a 50% match.

- Starting in FY23, it is assumed that the Capital Bill will provide 50% match for municipal projects through DEC's Ecosystem Restoration Grants, while federal sources and the Clean Water Fund will provide fixed amounts of $250,000 and $500,000 respectively.

Sector 3D: Developed Lands – Private Non-Road Developed Lands



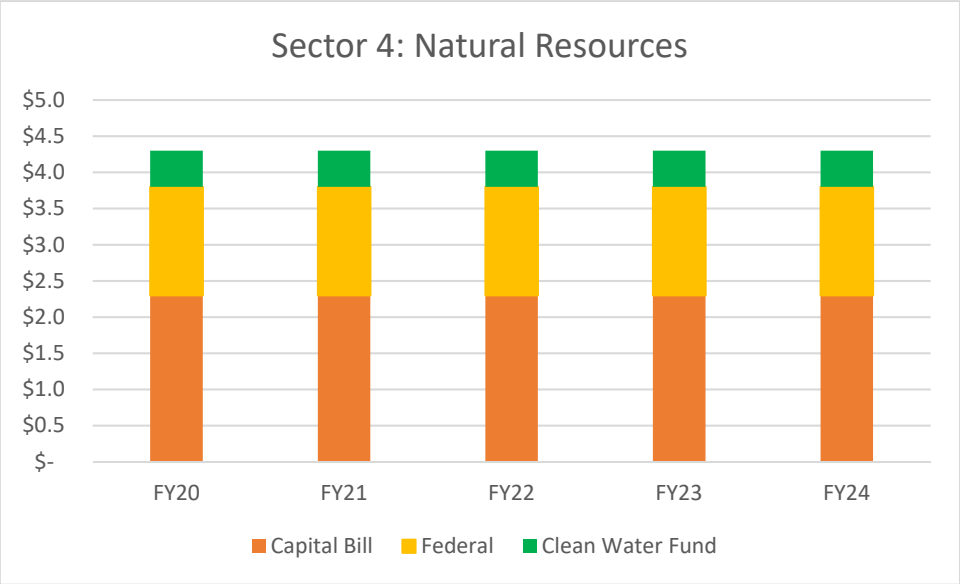
- The Act 73 Working Group assumed that private landowners would bear the cost of implementing stormwater practices on existing parcels of land that have 3-acres or more of impervious surface, as required by Act 64, codified at 10 V.S.A. § 1264(c)(7).

- Current cost estimates assume that private landowners will not have to access state grants to support the implementation of projects required by the Lake Champlain TMDLs or the 2015 Vermont Clean Water Act; however, private owners may become eligible for grant funding by entering into public-private partnerships with municipalities. Private projects that are municipally-sponsored may be eligible for up to 50% grant funding through DEC's Ecosystem Restoration Program.

- Under existing programs, stormwater improvements that are not required by statute are eligible for ecosystem restoration grants up to 100%, funded through the Clean Water Fund. Stormwater improvements that are sponsored by municipalities are eligible for ecosystem restoration grants up to 50%, funded through the Clean Water Fund and the Capital Bill.

- The Legislature may want to consider expanding eligibility for loans from the Clean Water State Revolving Funds (CWSRF) to private entities that are constructing stormwater improvements required by the Lake Champlain TMDLs or the 2015 Vermont Clean Water Act, including the up to 35% municipal pollution control grants available through DEC's Facilities and Engineering Division. Add information from consultant's report due October.

Sector 4: Natural Resources



- The Act 73 Working Group anticipates that implementation costs related to natural resources will be fully funded through state and federal grants. Funding will allow partners to acquire river corridor easements to secure permanent channel management rights, passive restoration of floodplains, and the restoration and maintenance of undisturbed riparian buffers.

- Well-functioning rivers, wetlands, shorelands and vegetated buffers are natural infrastructures reduce the amount of pollution that enters our lakes and waters. Rivers and streams in their equilibrium condition provide floodplain protection and promote high quality aquatic habitats. Wetlands filter pollutants, reduce erosion, and minimize flood hazards. Shorelands resist erosion that otherwise occurs from high water levels and wave action. Vegetated buffers and wetlands absorb nutrients in runoff; support erosion-resistant stream banks; support fish habitat function, and provide habitat and movement corridors for wildlife. Forested areas, particularly headwaters, protect water quality and can be managed to prevent discharges into waterways.

V. Technological and Regulatory Innovations

While not part of its statutory mandate, the Act 73 Working Group recognized that technological and regulatory innovations could increase the cost-effectiveness of pollution reduction activities, while accelerating the clean-up of Vermont's waters. This section highlights some of those opportunities.

1. Watershed Mass Balance

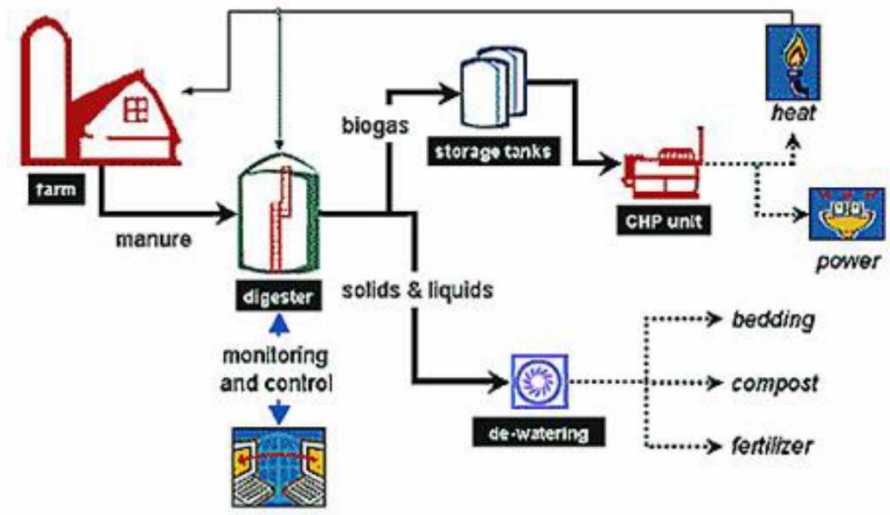
The concept of phosphorus mass balance may help guide future policy in selected watersheds. Mass balance is an accounting of the total importation and exportation of phosphorus in a watershed. Historically in Vermont's watersheds, the importation of phosphorus has exceeded exportation, resulting in accumulation of excess phosphorus in soils – especially in the agricultural sector. For context, in the agricultural sector phosphorus *exports* include: milk production and sales, crop harvest, manure production and application, fertilizer application, and surface water and soil loss. Phosphorus *imports* include feed from out of watershed, fertilizers, beddings, and other smaller sources. Under current practices, producers most often import more phosphorus than is exported.

Vermont is therefore contemplating an incentive-based program where one or more key subwatersheds may be targeted for interventions designed to achieve a phosphorus mass balance. Several approaches are under consideration, including sequestering phosphorus from manure for export, and limitations on importation of fertilizer. Producers who enroll would be eligible for best management practice funding for manure exportation, challenge-based payments to offset the financial risk of reducing importation of fertilizer, and use of feed derived from on-farm production.

2. Anaerobic Digesters and Enhanced Nutrient Removal

Anaerobic digesters hold the promise of solving several environmental and economic challenges facing Vermont, especially when paired with enhanced phosphorus removal technologies and air emissions controls. As shown in the figure below, anaerobic digesters break down raw dairy manure, producing biogas in the form of methane, which can be used for hot water and space heating on the farm or transformed into electricity. The solid and liquid byproducts are separated upon completion of the digestion process. The solids are commonly separated using a screw press, and the separated solids, also known as fibers, can be used as fertilizer, compost, animal bedding, or separated nutrients, most notably phosphorus.[13]

[13] A. Babcock et al., "The Viability of Biomethane Digesters in Vermont," (Middlebury College 2016), page 12.



Source: A. Babcock et al., "The Viability of Biomethane Digesters in Vermont," (Middlebury College 2016), citing http://www.plugflowdigester.com.

Without proper air emission controls, methane combustion can be a source of air pollution. Internal combustion engines, regardless of the fuel burned, emit nitrogen oxides, carbon monoxide and hydrocarbons. Air emissions can be controlled by scrubbing hydrogen sulfide (H_2S) from the digester gas before it is burned in the engine, followed by an oxidation catalyst on the engine exhaust. The scrubbing of hydrogen sulfide is expected to also reduce maintenance and damage to biomethane engines caused by the formation of acids when the hydrogen sulfide is burned.

There are currently eighteen digesters in Vermont on farms of sizes ranging from 45 to 2500 cows. Due to the high initial capital costs, the installation of new digesters has stagnated since funding from an initial series of federal grants ended in 2011. In order to make anaerobic digesters profitable, a variety of revenue streams will be necessary. Vermont's 2009 Standard Offer Program incentivized the kilowatt-hour rate for biodigesters, as did the 2015 Renewable Energy Standard. Finding a market for phosphorus products, which are more easily recovered from digested manure, could further compensate farmers, as well as address Vermont's phosphorus imbalance.

3. Engineered Ecosystems

ANR is partnering with the Lake Champlain Basin Program and the Army Corps of Engineers to evaluate a pair of engineering-based phosphorus reduction projects targeting St. Albans Bay. The intent of these engineered phosphorus reduction projects is to provide a measure of relief to the unacceptable late-summer cyanobacteria blooms in the Bay more rapidly than would be expected were watershed reductions alone to be pursued.

The first project, currently supported by the Lake Champlain Basin Program, is evaluating the feasibility of constructing a phosphorus "treatment train" in the Jewett Brook portion of the St Albans Bay watershed. Treatment trains divert a portion of stream flow from a polluted stream, pass it thru a series of engineered treatment cells or constructed wetlands, before returning the water to the stream or a natural wetland. This type of approach has been applied in Ohio, and demonstrated to be effective at treating a portion of the total phosphorus load from a similarly polluted stream.

The second project is being conducted by the Army Corps of Engineers with DEC, and will evaluate the cost and feasibility of removing historical phosphorus buildup in the sediments of the Black Creek Wetland, at the confluence of Jewett and Stevens Brooks. All of the phosphorus delivered from the Jewett and Stevens Brook subwatersheds to St. Albans Bay flows through this wetland. For hundred years, this wetland has acted to slow and settle sediment, and its associated phosphorus load. An analysis done in the early 2000's indicated that the capacity for the wetland to retain this sediment-bound phosphorus is likely exhausted, and thus the wetland is now acting as a phosphorus source. The current work of the Army Corps of Engineers is to evaluate the costs, efficacy, and range of technical options available to reduce or eliminate the legacy phosphorus loading to the Bay from the wetland complex.

4. Integrated Planning and Permitting

Burlington is one of five cities across the United States chosen by the U.S. EPA to test an integrated planning process. As explained by the U.S. EPA:

> "An integrated planning approach offers a voluntary opportunity for a municipality to propose to meet multiple CWA [Clean Water Act] requirements by identifying efficiencies from separate wastewater and stormwater programs and sequencing investments so that the highest priority projects come first. This approach can also lead to more sustainable and comprehensive solutions, such as green infrastructure, that improve water quality and provide multiple benefits that enhance community vitality."[14]

[14] https://www.epa.gov/npdes/integrated-planning-municipal-stormwater-and-wastewater

The Act 73 Working Group is supportive of integrated planning and permitting as a way of achieving water quality goals while reducing and staging overall costs. DEC is actively promoting integrated planning through asset management grants that encourage municipalities to plan for and schedule clean water infrastructure improvements in the most cost-effective way possible. Increased funding for asset management planning could reduce overall costs of compliance with stormwater mandates.

5. Public-Private Partnerships

Public Private Partnerships (P3) are innovative strategies that can help municipalities optimize their limited resources to address infrastructure needs. P3s involve municipalities and private entities entering into agreements to design, build, finance and/or maintain public infrastructure.[15] This approach has been used to support improvements to roads (using revenues from tolls), wastewater and water supply facilities and energy efficiency investments. States across the country are now evaluating the merits of P3s to help install lower cost stormwater treatment systems.

The fundamental benefit of a P3 approach is to gain efficiencies at the operational level. For example, a municipality may need to implement stormwater treatment practice. However, site-specific conditions (e.g., soils, slope conditions, land uses, and natural or existing infrastructure constraints) may make the installation of stormwater treatment on municipal lands inside its right-of-way more expensive. Lands outside the municipal right-of-way may be more suitable, thus becoming a lower cost option to site the stormwater treatment. P3s can help support the implementation of the more relatively lower cost options.

Philadelphia's Greened Arce Retrofit Program (GARP) uses this model. Philadelphia operates a stormwater utility that uses parcel-based fees and credits to incentivize landowners to adopt stormwater treatment practices. Philadelphia also offers grants to private companies or contractors who can install stormwater practices on private property below a defined cost-efficiency threshold. The project benefits the city because it is installing cost-effective practices and benefits the private landowner who receives a credit on its parcel fee.

6. State Grant Incentives for Municipal Adoption of Stormwater Zoning Standards

The State of Vermont currently provides to municipalities up to 35% municipal pollution control grants for wastewater and stormwater infrastructure; 50% ecosystem restoration program

[15] U.S. EPA Region 3, "Community Based Public-Private Partnerships (CBP3s) and Alternative Market-Based Tools for Integrated Green Stormwater Infrastructure," April 2015. https://www.epa.gov/sites/production/files/2015-12/documents/gi_cb_p3_guide_epa_r3_final_042115_508.pdf

grants for required stormwater practices on developed lands; 80% grants for stormwater practices on roads, whether regulatorily required or not; and 100% grants for practices on developed lands that are not regulatorily required. Many of these municipalities do not have local zoning for stormwater.[16] The Act 73 Working Group would encourage the state to adopt a tiered grant structure to incentivize municipalities to adopt a local stormwater ordinance.[17]

7. Market-Based Solutions

In mandating a general permit for existing impervious surfaces greater than 3 acres, the Legislature directed ANR to allow for the use of offsets, impact fees, and phosphorus credit trading. 10 V.S.A. § 1264(g)(3)(D). The Agency's draft stormwater management rule will allow for both offsets and impact fees, which are both forms of phosphorus credit trading.[18]

DEC has an existing offset program that allows regulated entities to meet "net zero" requirements for discharges to impaired waters without a TMDL. An "offset" typically refers to a practice implemented by a regulated source at a site not owned or managed by that source to meet its regulatory requirement or permit limit. An offset could also be a state-permitted action or project within a subwatershed of an impaired water body that a regulated discharger may complete. The action or project is designed to mitigate the impacts associated with an existing or proposed discharge that the permitted source has or is expected to have on the impaired water body.

Impact fees have broader applicability than offsets. This approach may allow projects that are unable to meet full permit requirements due to site constraints a means of equitably contributing to overall pollution reduction solutions. ANR's draft stormwater rule proposes a relatively simple impact fee system where dischargers are assessed fees based on the level of pollutant reduction achieved, and those fees are directed to other pollutant reduction efforts in the watershed.

Phosphorus credit trading, or "banking," allows permit holders to buy or sell quantifiable pollutant load reduction credits in order to meet permit requirements. Credits are generated from actions that extend beyond the minimum threshold baseline requirements. To establish a phosphorus banking system, the state would need to develop a legal, policy, technical and administrative trading framework to ensure that there is a net benefit to water quality; and ensure that verification, accountability and enforceability measures are in place to guarantee that phosphorus reductions take place over time. North Carolina has several different types of water quality banking programs; more information about these banking programs is available

[16] VLCT Water Resources: http://www.vpic.info/Publications/Reports/Implementation/GreenInfrastructure.pdf
[17] VLCT Model Stormwater Bylaw: http://dec.vermont.gov/sites/dec/files/wsm/erp/docs/2015-LID-GSI-VLCT%20model-bylaw.11-2015.pdf
[18] http://dec.vermont.gov/watershed/stormwater/stormwater-rule-2017-update

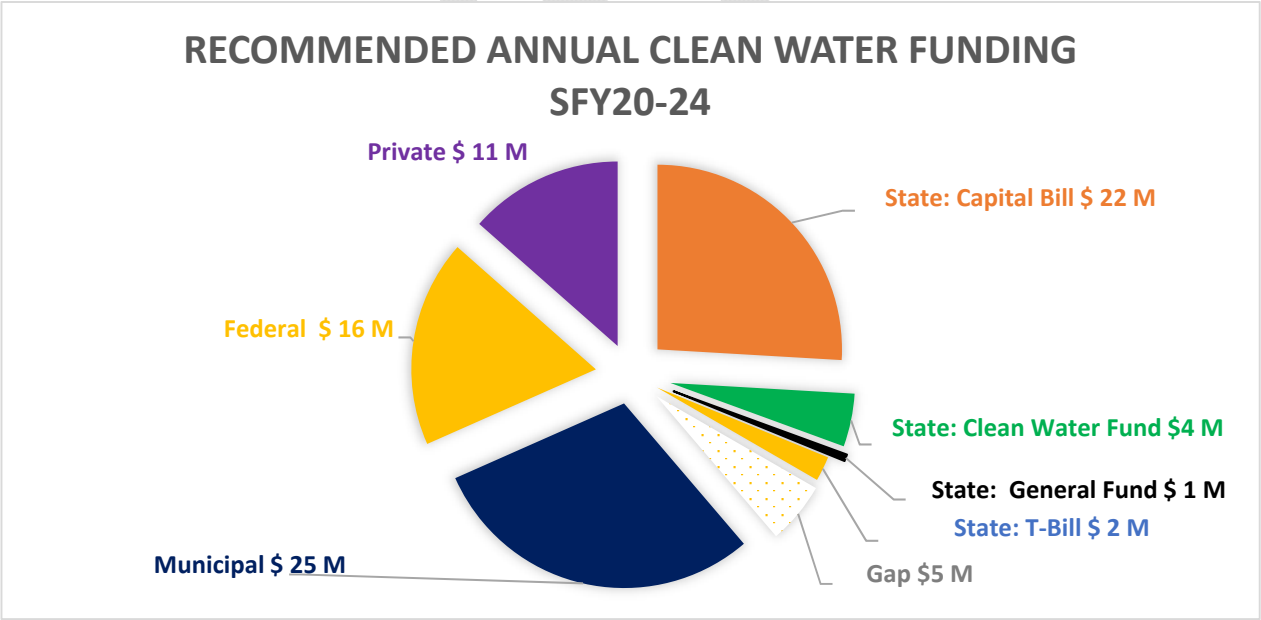
on North Carolina's website.[19] The Act 73 Working Group supports further research into the establishment of a phosphorus banking system managed by a third-party administrator.

VI. Recommendations

1. In the near term, the Act 73 Working Group recommends existing revenue sources to fund clean water investments.

   Existing revenues sources, totaling on average $78 million a year, including $25 million in state funds, $25 million from municipalities, $16 million from federal sources, $11 million in private investments.

   State funds comprise $19 million from the Capital Bill, $4 million from the Clean Water Fund; $1 million from the General Fund; and $2 million in state funds from the Transportation Bill.



   Capital Bill: The Act 73 Working Group recommends that the Legislature maintain its Capital Bill clean water investments in the range of $22 million a year. This compares to clean water investments in the Capital Bill of $10 million in FY16 and FY17, and $22

[19] https://deq.nc.gov/about/divisions/water-resources/water-resources-permits/wastewater-branch/401-wetlands-buffer-permits/401-stream-wetland-mitigation-program.

million in FY18, and roughly $23 million in FY19. As a policy matter, the Legislature has been reluctant to appropriate capital funds for planning, for equipment, or to private entities. If the Legislature expands the types of clean water activities that could be funded by revenues from general obligation bonds, the demand for the investment of capital funds will be high and sustained.

Clean Water Fund: Likewise, the Act 73 Working Group recommends that the Legislature maintain its Clean Water Fund investments at a minimum level of $4 million a year. Funded by the property transfer tax surcharge, the Clean Water Fund is a critical source of flexible money that can be used for scoping, creating inventories, as well as for construction projects on private lands. In 2017 the Legislature extended the sunset date for the property transfer tax surcharge until 2027.

2. The Act 73 Working Group recommends an adaptive management approach and periodic report back so the Legislature.

   The Act 73 Working Group suggests that the Legislature revisit clean water costs every two to four years to incorporate new data from water quality monitoring, geospatial mapping, and actual costs of implementation.

3. The Act 73 Working Group recommends that the Legislature take the following actions to provide the maximum flexibility to state agencies working to implement clean water programs:
   - Expand eligibility for CWSRF loans to private entities to the extent authorized by federal law;
   - Allow capital dollars to be spent on private lands and equipment;
   - Authorize DEC's Ecosystem Restoration Protection (ERP) program to fund private projects that are regulatorily required;
   - Explore the possibility of a private activity bond to increase access to capital by private landowners who are implementing clean water practices to comply with Act 64 and the TMDLs.

4. The Act 73 Working Group recommends that the Legislature and Executive Agencies continue to pursue technological and regulatory innovations to reduce costs and accelerate results.

   Specifically, the Act 73 Working Group advises that the state continue to investigate options and opportunities for nutrient recovery, with particular attention to improving the nutrient mass balance on a watershed-by-watershed basis across Vermont.

5. <u>To address clean water revenue needs beyond FY24, the Act 73 Working Group recommends that the state contract with a consultant to analyze options for providing technical and administrative support for implementation.</u>

   The Act 73 Working Group received reports from both the Tax Department and the Vermont League of Cities and Towns (Appendices A and B) on estimated costs, as well as other considerations, were their organizations to be tasked with collecting a broad-based fee in support of clean water. In both instances, the administrative overhead costs approached 20% of the total revenue to be raised – meaning that the cost for either of these approaches for administering a separate statewide fee was disproportionate compared to the revenues that would be generated and other options need to be evaluated. The Act 73 Working Group recommends consideration of a fee paired with an existing billing system.

   In addition, the Working Group recommends that the Legislature complete a thorough evaluation of service delivery models (see table below) to raise revenue needed to address long-term costs and expand technical capacity related to agricultural and developed land stormwater practices. An entity with ability to design, construct, operate and maintain larger (centralized) practices may be able to better leverage efficiencies and implement more cost-effective strategies than current regulatory models which largely rely on solutions implement on a parcel-by-parcel basis. The Legislature should consider various funding models for this entity including, but not necessarily limited: to impervious surface fees, parcel fees, and phosphorus banking. It will be important to consider the availability and maintenance of the data needed to support many of these approaches (e.g., electronic parcel maps, impervious cover data); the Vermont Center for Geographic Information prepared a summary of data needs and availability (Appendix C) which highlights current efforts, as well as on-going opportunities and challenges.

   As a clear next step, the Act 73 Working Group advises that the state issue a request for proposals in spring 2018 to further investigate, and ultimately recommend, a service delivery model for creating sustained capacity for clean water implementation. The investigation should consider models for collecting and disbursing funds, as well as increasing project management capacity, that could be housed either inside or outside state government. A preliminary list of options is provided below.

In conclusion, the Act 73 Working Group found that existing revenues are generally adequate to address clean water needs through FY21, and, with the exception of agriculture, to address clean water needs through FY24. There are crtical public policy decisions regarding the level of cost share the state is willing to provide to each sector for clean water projects that will further

influence the revenue required. These decisions need to be made in lock-step with consideration of potential approaches for both raising and disbursing revenue in FY25 and beyond, including the evaluation of service delivery models described above.

We complete this report encouraged by what has been accomplished so far, and bouyed by the hard work and effort of many people dedicated to seeing this effort through to the end.

DRAFT

Service Delivery Models for Supporting Clean Water Implementation

1. Type of Fee
    a. Parcel - flat
    b. Parcel – tiered
    c. Impervious – flat
    d. Impervious – tiered
    e. Impervious – based on actual acreage
    f. Combination of above
2. Type of collection
    a. Municipal collection
    b. State collection
    c. State collection of both stormwater fee and statewide education property tax
    d. Local, regional, agricultural or statewide district
    e. Combination of above
3. Appeals process
    a. Decision of local board is appealed to the Environmental Court
    b. Decision of local board (BCA) is appealed to Tax Dept (PVR), which is appealed to Superior Court
4. Use of revenues
    a. Developed lands (3 acres impervious)
    b. Roads (municipal)
    c. Agriculture
    d. Stormwater systems (MS4, non-MS4)
    e. Combination of above
5. Delivery of services
    a. Governmental or non-profit
    b. Geography (local, regional or statewide)
    c. Sector based (agriculture, developed lands, natural resources)
6. Possible glidepaths
    a. Start with parcel fees, move to impervious surface fees
    b. Start with voluntary local option, move to statewide fees
    c. Wait until impervious surface fee based on actual acreage is feasible
    d. Combination of above