Testimony related to H. 35 and the Lake Champlain TMDL

A Municipal Stormwater Perspective:

Burlington Stormwater Program

Stormwater Fee Calculation Methods

Stormwater Phosphorus Management Costs

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Wet-Weather Landscape in Burlington, VT

COMBINED SEWER

- 25% Combined Sewer (3 WWTPs)
  - 4 CSO outfalls
  - Wet weather events at Main WWTP
  - Pipe Capacity: combined sewer surcharge into basements or streets
- > 100 year old Sanitary and Combined Sewer infrastructure
- Lake Champlain Phosphorus TMDL (being revised, due in early 2015)
  - 0.8 mg/L → 0.2 mg/L P-limit reduction at 3 plants
  - 14% reduction in wet weather related P load

Wet-Weather Landscape in Burlington, VT

SEPARATE STORM SYSTEM

- 75% Separate
  - Second gen, Phase II MS-4 permit
  - 80+ separate SW outfalls
- Younger infrastructure generally, but much of Separate Storm Sewer System is corrugated metal (and rotting)
- Stormwater flow based TMDLs for 3 streams – Centennial, Englesby and Potash
- Lake Champlain Phosphorus TMDL
  - 25% reduction for Burlington Bay
  - 12% reduction for Main Lake (Winooski River)
- Bacteria TMDL for Englesby Brook

Stormwater Fees

FY 15 ISU Rate = $1.687	# ISUs	Monthly Fee	Annual Fee
Single Family Home	2.67	$ 4.50	$ 54.00
Duplex	2.65	$ 4.47	$ 53.64
Triplex	3.06	$ 5.16	$ 61.92
Property types other than the above	as measured	depends on amount of impervious	depends on amount of impervious
eg. 10,000 sq. ft. commercial	10.0	$ 16.87	$ 202.44

- SW Utility started in 2009, fees charged on Water/Wastewater Bill
- $5 million spent to date on stormwater operation, maintenance and management
  - ~$325K of total on stormwater treatment (~$96 K grant funded)
  - ~$300K of total on mapping and planning activities (~$178K grant funded)
  - Additional $1.1 million on CSO stormwater reductions (50 % ARRA forgivness funding)

Impervious based billing

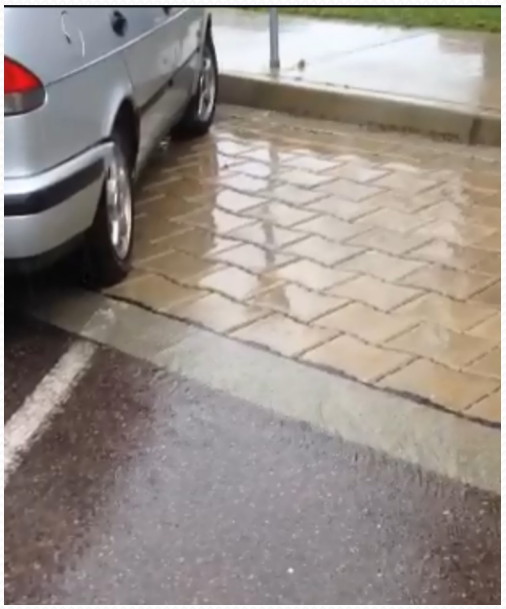
- Most equitable method, but time intensive
- Impervious recognition algorithms not perfect, so QA/QC and manual delineations are important

Burlington Stormwater Program

Main Functions:

- MS4 permit compliance (applied to the CSS areas also)
- Stormwater Management Practice Planning and Implementation
- Stringent Project Review under Chapter 26 ordinance (MS4 and CSS)
  - Jurisdiction over > 400 s.f. of earth disturbance
  - All projects must submit an Erosion Prevention and Sediment Control Plan (to reduce construction site runoff)
  - Projects that are adding or redeveloping impervious must submit a stormwater management plan for their impervious
    - Residential properties must minimize “connected” impervious and receive technical assistance
    - Commercial properties must mitigate new impervious and mitigate redeveloped/existing impervious to the maximum extent practicable

Typical Burlington SW Practices



- Smaller treatment volumes than traditional practices due to lack of available open space
- Challenging to site, design and build due to existing utility conflicts
- Emphasis on green infrastructure to ensure maximum community benefit

BURLINGTON, VT
PUBLIC WORKS

Removing Phosphorus from SW

- How do you "remove" phosphorus from SW
  - Absorb the flow
  - Treat the wash-off (the P that is in stormwater runoff) through filtration/adsorption
  - Slow down the flow to reduce the erosion that happens from excess SW runoff
- The only way to remove ALL of the P is to:
  - Remove the impervious surface
  - Infiltrate the stormwater (for 1 year, ~2" storm)
    - Direct the stormwater into the soils where it can soak in
- High capacity infiltration (sandy soils) is only possible in limited areas of Burlington
- Other practices only get a fraction of the P, so a 25% P reduction means that you will likely have to mitigate > 25% of the impervious.

Estimating P removal Costs

1 ha = 2.47 acres

Structural Stormwater Control Practice	Proposed Phosphorus Load Reduction Rates for various Stormwater Control Practices based on Design Capacity					Unit capitol Costs for structural controls (site adj. factor of 1.4 & 35% contingencies =1.89)			Capitol cost per unit area for selected Water Quality Volume (WQV) $/ha				
	Percent Reduction In Annual Phosphorus Load, %												
	Physical Storage Capacity of Control Structure - runoff depth from contributing impervious area, inches								Physical Storage Capacity of Control Structure - runoff depth from contributing impervious area, inches				
	0.25 in	0.5 in	0.9 in	1.5 in	2 in	Structural control base cost, $/ft^3	site cost adj. factor includes 35% engineering and contingencies	adj. cost, $/ft^3	0.25 In	0.5 In	0.9 In	1.5 In	2 In
Surface Infiltration Practices HSG A&B (1)	54%	77%	92%	98%	99%	$ 4.0	1.89	$ 7.6	$ 16,953	$ 33,906	$ 61,031	$ 101,719	$ 135,625
Infiltration Trench (2) (Includes dry wells) HSG A&B	51%	77%	93%	98%	99%	$ 8.0	1.89	$ 15.1	$ 33,906	$ 67,813	$ 122,063	$ 203,438	$ 271,250
Biofiltration with underdrains (3)	38%	59%	74%	84%	89%	$ 10.0	1.89	$ 18.9	$ 42,383	$ 84,766	$ 152,578	$ 254,297	$ 339,063
Gravel Wetland (4)	30%	46%	59%	65%	66%	$ 8.0	1.89	$ 15.1	$ 33,906	$ 67,813	$ 122,063	$ 203,438	$ 271,250
Wet Pond & constructed wetlands	n/a	42%	50%	56%	65%	$ 3.0	1.89	$ 5.7	n/a	$ 25,430	$ 45,773	$ 76,289	$ 101,719
Sand filters	n/a	42%	50%	56%	65%	$ 8.0	1.89	$ 15.1	n/a	$ 67,813	$ 122,063	$ 203,438	n/a
Open channel/dry swale	n/a	n/a	34%	n/a	n/a	$ 8.0	1.89	$ 15.1	n/a	n/a	$ 122,063	n/a	n/a
Extended Dry Detention Pond	n/a	n/a	19%	n/a	n/a	$ 2.0	1.89	$ 3.8	n/a	n/a	$ 30,516	n/a	n/a

- From *"Methodology for Developing Cost Efficiencies for Lake Champlain TMDL Phosphorus Control Measures: Stormwater BMP Component, Working draft prepared by EPA Region 1, February 18, 2014"*
- *Some studies (and professional judgment/experience) indicate that a site adjustment factor of 2 -3 (vs. 1.4 as in table above) is necessary for more developed areas like Burlington.*
- *Green infrastructure programs such as Philly Water Department pay $100k/acre for stormwater retrofits ($247k/ha)*
- *Practices such as wet ponds are not feasible in an area with no remaining large open parcels to which stormwater can be directed*

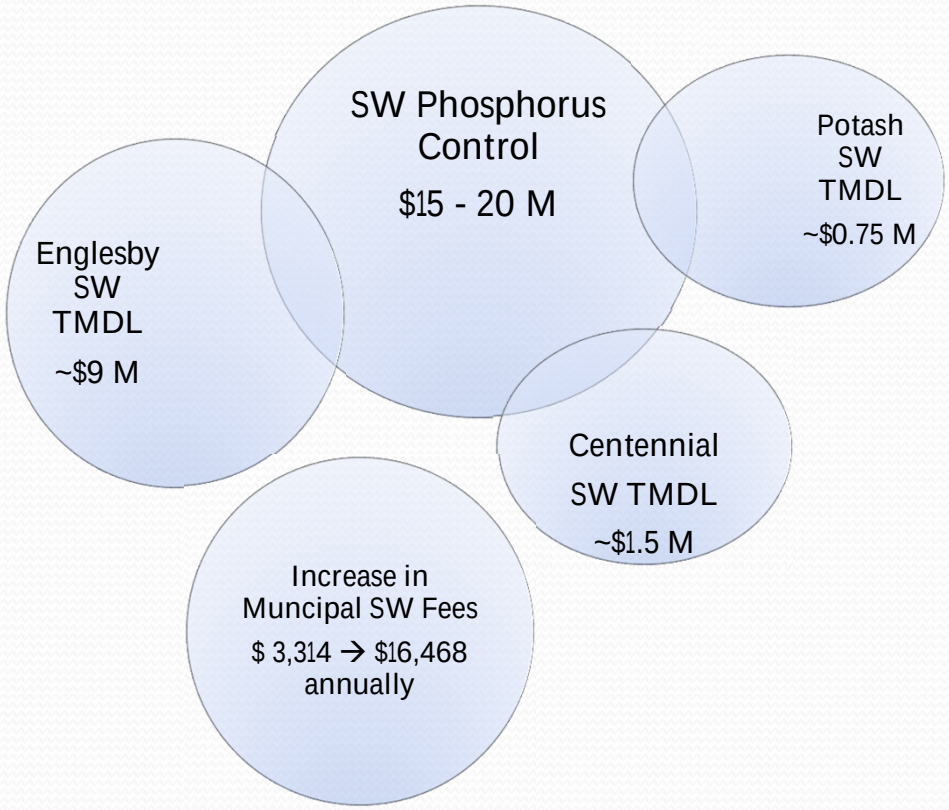
BURLINGTON, VT PUBLIC WORKS

Possible SW Phosphorus Control $ in Burlington

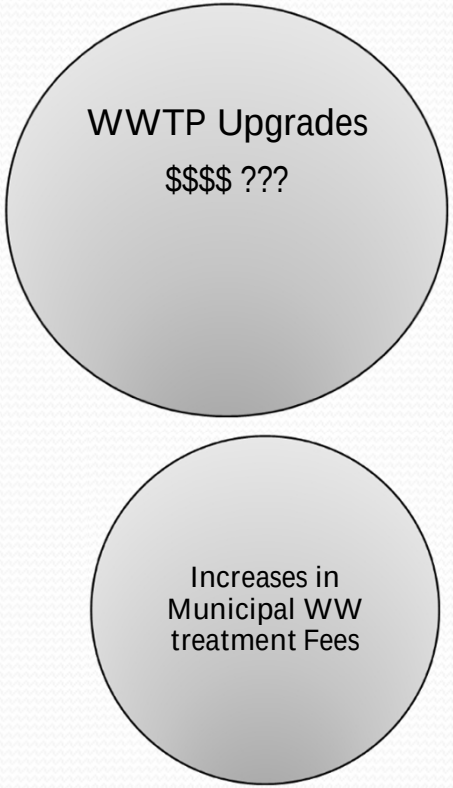
- Phosphorus from the equivalent of 278 impervious acres must be fully mitigated
  - Burlington Bay :950 impervious acres (25% = 237 ac)
  - Main Lake: 340 impervious acres (12% = 40 acres)
- But because of the challenges of not being able to always infiltrate, we will have to apply a suite of practices to the equivalent of more than 278 acres
  - One scenario using a suite of practices, including infiltration, bio filtration and residential stormwater management, as well as enhanced street sweeping
    - Runoff from 496 acres (38% of our total impervous) would need treatment
    - Capital cost estimates to meet TMDL target = $15 -20 million

Municipal Impact

Cost increases to rate payers (VT citizens)



$34-$? million total impact



Costs passed on to renters (58% of Burlington population) in an areas where rental costs are already challenging

Comments

- It is clear that all sectors must make a contribution to cleaning up Lake Champlain
- The TMDL does spread out the loading reductions across various sectors and geographic areas based on what the modeling shows is feasible and effective
- But the COST is <u>not spread out evenly</u> AND
  - There is little funding assistance available to the MOST COSTLY of Phosphorus reduction efforts (WW and SW)

Comments

- A Statewide funding strategy must be implemented to offset the disparity in financial burden for these necessary, but unfortunately very costly municipally based solutions.
- Maximum flexibility must be given to municipalities (and MS4 communities, in particular, which have other Clean Water Act obligations) to address load reductions
  - Compliance deadlines must be based on more comprehensive financial picture, such as that provided by integrated WW/SW planning which also addresses the need for re-investment into our aging infrastructure
  - All doors for funding must be kept open (don't limit WW Phosphorus abatement funding to 25%; we understand that allowing 100% funding doesn't mean that 100% funding will be available)
  - Trading must be allowed within sectors (SW ⟷ SW) and across sectors (SW ⟷ WW, AG ⟷ WW etc.)