PA 12-155 Nonpoint Source Phosphorus Subcommittee

Meeting notes from November 25, 2013, 1 p.m. meeting, DEEP 2B

Co-Chairpersons:

Chris Malik, DEEP, christopher.malik@ct.gov (860) 424-3959

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Introductions: new attendees Chuck Lee: DEEP Lakes Management, Greg Bugbee: CT Ag. Expt. Station, and Bill Hoerle: CT Air Force National Guard.

Meeting notes from 10/28 were shared along with agenda, statistics from http://www.phosphatesfacts.org/uses_apps.asp Useful lists of possible sources. We are tasked to emphasize those sources which cause pollution to surface waters.

Agenda Item: Phosphorus in the environment vs. phosphorus in water. In reply to previous comments: Due to the abundance of phosphorus in the soil, bedrock and living things, it is not practical or useful to employ a mass balance approach to quantify overall quantities of phosphorus entering and leaving the State of Connecticut. We need to be concerned with phosphorus that enters waters of the State, consistent with CT Water Quality Standards, above natural level in water bodies. Natural variability in water bodies exists. Correlation can generally be made in the natural environment of phosphorus with turbidity. Not all turbidity is natural in origin. There are also soluble forms of phosphorus that are not associated with turbidity, and are generally anthropogenic.

Our role is to evaluate how to reduce and mitigate nonpoint source phosphorus which reaches the waters of the State. It is within our scope to work with DEEP's Stormwater Permitting and Enforcement section to develop strategies to reduce phosphorus input to permitted sources of stormwater.

Our role in dealing with phosphorus in consumer products is related to their role to contributing to nonpoint source water pollution.

It is not practical or useful to suggest limiting phosphorus in food. Proper disposal mechanisms should be stressed. Phosphorus is naturally present in most food and is an essential nutrient for bone and cell function. http://www.phosphatesfacts.org/pdfs/PFA%20Nutrition.pdf The body does not effectively recycle phosphorus from feces, urine or perspiration. Quantities of phosphorus from phosphorus-based food additives probably don't contribute large amounts to water, and likewise outside of the scope of the nonpoint source committee.

Fresh water systems are phosphorus limited for blue green algae, which fix nitrogen; Ambient phosphorus levels we are concerned about are 30 ppb and up. Our nutrient reduction strategies should target both phosphorus and nitrogen. Phosphorus reduction in water will not reduce rooted aquatic vegetation very much. We have been required by EPA to adopt nutrient criteria for moving waters.

Phosphorus is nonrenewable. There are limits on mineable resources, and there is a need to conserve to protect sustainability of food production.

The Municipal Implementation committee will consider the role of anti-corrosion additives to public water supplies.

Phosphorus in turf fertilizers was reduced in 2012, along with limits on how and where it can be used. PA 12-155 http://www.cga.ct.gov/2012/ACT/PA/2012PA-00155-R00SB-00440-PA.htm

Discussion of 5 categories and contribution by committee members:

1) **Fertilizers**

a lawn and garden,

b agriculture croplands,

c container nurserys,

d golf course

e commercial grounds,

2) **Animal Waste**,

a pets dogs,

b horses

c livestock large scale cafo etc, dairy poultry

d livestock small scale hobby farms

e wildlife:

f geese

g other unnatural concentrations feeding etc,

h urban pigeons raccoons rats etc,

3) **Septic Systems**,

a malfunctions,

b high water table,

c automatic dishwashing detergents

d garbage disposals and food waste

4) **Urban Stormwater**

a litter

b other urban

c animal see 2)

5) **Soil Erosion**

a ag cropland

b construction

c post construction

d glacio-lacustrine soils, silt - clay/colloids

We will add an additional category #

6) **Internal Loading from Lake Sediments**

In summer thermal stratification occurs in lakes; O_2 cannot diffuse to the bottom, due to thermal barrier, water becomes anoxic below thermocline ~18ft +/-), in the reducing environment bacteria use oxygen from iron oxides, converting Fe3+ to Fe2+ The $PO_4$2- which was previously sequestered by iron oxides now becomes soluble and available to plants. When wind mixing occurs, or the lake cools, stratification breaks down, and phosphate in bottom waters mixes with top waters triggering a blue green algae bloom. Sampling at bottom, 10-20 ppm not uncommon at surface; numbers in 100s ppm in lakes with nutrient loading. Treatment options: flocculate with alum or other chelating agent, dredge sediments, add O_2 to hypolimnetic waters.

DEEP is responsible to collaborate with municipalities, then report to the State legislature. Committee members are encouraged to contribute in writing on the 6 categories, stressing: **Analysis of Problem, Goals and Objectives, Identify Alternative Solutions, Evaluation of Outcome and Discussion of Next Steps** for each phosphorus pollution source category. Fill in to the extent practical. It is not expected that contributors will prepare a full report. Cost estimates for

recommended practices will be critical, DEEP will hold conversations with EPA to clarify.

Scientific validity and consensus must be achieved on submissions. Material submitted must be scientifically vetted and hopefully will add support to the group's recommendations. Material that does not meet these criteria will not be included in the report. We don't want anyone to waste their time or feel slighted, so communication along the way with co-chairs is encouraged.

Listings of annotated sources and relevant data are encouraged, web links, data. It will be necessary to rewrite or synthesize information into a format that conveys the information effectively to the reader. Information submitted may not end up in format submitted, but if information is valid and useful, it will be utilized.

Translation to action steps will be stressed. Where feasible, recommendations will integrate into ongoing watershed planning and implementation activities, see 6 Measures for MS4 permits and 9 elements for Watershed Based Plans handout. Watershed pollution prevention and BMP implementation activities are not stand alone and will address other components of NPS, such as pathogens simultaneously. Long term efforts will be required to implement recommended solutions for nonpoint source pollution due to the nature of sources.

The following offered to contribute information:

1) Fertilizers Greg Bugbee

2) Animal Waste: Geese Chuck Lee, talk to Joe Wetteman about other animal waste issues

3) Septic: Nelson Malwitz, will talk to DPH and Dave Potts

4) Urban stormwater: Cindy Baumann

5) Soil erosion: Mike Jastremski

Aggregation of academic sources with references included, email to Chris Malik, copy Virgil Lloyd and Mike Jastremski, expanded scope will be distributed.

Connecticut-specific information regarding sources is helpful.

Relative contributions of POTWs to NPS is published for permits at www.ct.gov/deep/phosphorus along with criteria, Precision of models are being updated.

Communication/ coordination between subcomittees, Co-chairs will make effort to attend…

Meeting for subcommittee co-chairs scheduled quarterly to report back to coordination committee.

Each source may be affected by climate change, especially 4 and 5. Where relevant, recommendations will be added to each source category.

Chris Malik, Virgil Lloyd, and Mike Yastremski will collaborate on bibliography, and on the best way to share info. Best examples:

Lake Champlain http://www.epa.gov/region1/eco/tmdl/lakechamplain.html

Charles River, MA: http://www.epa.gov/region1/charles/tmdl.html

James River/Chesapeake: http://www.epa.gov/reg3wapd/tmdl/ChesapeakeBay/tmdlexec.html and other sources, see: "Section 7 Reasonable Assurance and Accountability"

NYC water supply reservoirs. http://www.dec.ny.gov/chemical/23835.html Mike Yastremski may have contacts in NY for unpublished information/data.

Source reduction vs. treatment? Determine effects and costs

Lynn will work on P2 educate source reductions, funding from EPA not as easy to justify as implementation / BMPs. Recommendations will be for ongoing programs. Collaborations with partners, funding sources, letting people know that others care about the watershed can lead to shift to more sustainable practices such as lawn care / yard waste disposal. Environmentally preferrable products procurement system. State takes lead, municipalities can tack onto the system. MA model.

Cost of funding necessary for outreach will be sought for final report,

Review of James River study data, results of stormwater bmp effectiveness, annual cost of removal per pound vary from 32 to 70k. Most effective: http://www.cwp.org/cost-effective-stormwater-management-in-the-james-river-watershed

Look at results from other organizations, hard to quantify, best estimates, and factor how much assurance that strategies will work.

Education manuals repeated / repackaged to reach peoples' interest. Employ different approaches and electronic and social media to reach different audiences.

How to organize outreach and package for watersheds, central municipalities and environs, replicate to neighboring small towns that have fewer resources. Criteria for phosphorus limits How to effectively address nps aspect of problem for specific

watersheds, use numeric goals to justify on a watershed scale. Scientific Methods workgroup is defining still.

NPS outreach and implementation may be most effective if regionalized. Educate, specific reductions:?? car washes, pressure washing TSP.

Expand MS4 education and outreach

Quinnipiac and Naugatuck analyzed first, also Quinebaug, pilot program then replicate.

When reports are merged, estimation of overall totals phosphorus loadings and csot to mitigate from nonpoint source pollution will be valuable. Subcommittees will report to Deputy, report to legislature will be completed. Vetting by academics?

Updated information will be posted as it becomes available at www.ct.gov/deep/phosphorus

Look at categories determine pollution rates and develop strategies for load reductions.

Committee Members in attendance:

Chris Malik, DEEP

Bill Hoerle, CT National Guard

Justin Milardo, DPH

Greg Bugbee, CT Ag Experiment Station New Haven

Chuck Lee, DEEP

Nelson Malwitz, Brookfield WPCA

Michael Jastremski, Housatonic Valley Association

Virgil Lloyd, Municipal Rep.

Cindy Baumann, CDM Smith

Lynn McHale, Waterbury