

MEMORANDUM



TO: TAC Team
FROM: Long Creek Technical Consultants
DATE: 1/31/08
RE: Long Creek Structural Stormwater Retrofit Strategy

Based on discussions between the project consultant team and the MaineDEP the following is the recommended structural stormwater retrofit inventory strategy. The components of the retrofit strategy are ranked in relative importance. Comments from team members are included.

1. **Utilize riparian shade, floodplain restoration and natural stream design techniques on identified segments.** We will rely on J. Field and J. Varrichione's field data and identified restoration segments. The team will consider an analytical "natural channel design" approach for constrained floodplains and artificially straightened reaches.

Team Comments:

Jeff Varrichione: *Good idea to pursue with an open mind! Keep in mind, though, that some sections have some hurdles that would need to be overcome. For example:*

A) A roughly 100 yd stretch of Long Creek-mainstem below Foden Rd. is, as well as a roughly 50 yd stretch of Long Creek-north branch above Foden Rd. currently are constrained by what appears to be floodplain fill (needs to be verified possibly by drilling or radar).

B) Some sections of Long Creek south branch have road and parking lot infrastructure that impinge upon the floodplain region.

Dr. Robert Roseen: *Okay but be careful with regards to \$\$ of restoration. It can be very expensive and perhaps not the best value for WQ improvements in a highly impervious watershed.*

Steve Johnson: *From a technical standpoint, I think there is some opportunity to provide natural channel design, although I think it will be on a case by case basis. I think that politics will play very heavily here.*

2. **Focus stormwater retrofit inventory on existing above-ground detention facilities.** The Long Creek watershed contains many older detention facilities. Due to the high land value in the watershed and the likely complications related to acquiring easements, existing detention facilities are an attractive stormwater retrofit opportunity. These facilities will be assessed for the potential to modify the existing design with an improved multi-cell wet pond or gravel wetland system. The determination of critical design criteria will be accomplished as a part of this retrofit strategy (e.g. inlet to outlet elevations, available size, existing outlet design and general "pond" condition, construction access).

Team Comments:

John Field: *One caveat should be added on making use of existing storage facilities and that is those in the floodplain, for which there are at least 2, should not be part of this process.*

3. **Focus on the larger highly impervious, directly connected catchment areas.** The technical team has reviewed existing water quality, biological criteria and the drainage infrastructure GIS data to determine the highest priority stormwater mitigation areas. The individual "catchment areas" have been determined by the MaineDEP and will be used as the basis for evaluation. Within these catchments we will identify pollution prevention opportunities, water quality and water quantity management opportunities. The first priority will be to determine above-ground water quality



treatment options within un-developable portions of the parcel (i.e. front yard setbacks) or underutilized portions of the parcel. Secondly, the project team will consider available locations for above ground water quality systems that are of minimum impact to infrastructure and below ground water quality and quantity systems. The land-use draining to the retrofit location will be assessed for potential sediment and trash loading which will influence treatment system options.

Team Comments:

Jeff Varricchione: *Also, it may be obvious, but don't forget about improving upon water quantity issues (e.g., working on channel protection hydrology in the subwatersheds downstream of I-95 and working on baseflow conditions [i.e., increasing baseflow] in the mainstem sections upstream of I-95 (e.g., Col. Westbrook area, Sable Oaks area).*

4. **Identify retrofit opportunities along South Portland Land Trust project corridors.** Coordination with the West End Trails (WET) committee of the South Portland Land Trust is going to greatly enhance implementation options, cooperation and grant funding and should be a priority for the retrofit inventory. The project team will work closely with the WET committee to identify stormwater management opportunities related to their trail and community access projects.
5. **Focus on identified hotspot parcels.** Hotspot parcels outside of the priority retrofit areas will be assessed for pollution prevention opportunities and simple water quality treatment options that can fit within available above-ground space.

Key Questions/Issues:

- 1) If we consider below grade storage (which I think is necessary considering no max. impervious ratio in South Portland's commercial zone). What systems should we be recommending? UNH has very good success with ADS Water Quality Unit and leach field. UNH has coastal clay issues similar to this area and I think this is may be a good approach. I would essentially look for off-line below grade opportunities with above grade space requirements. Head issues with this system would also have to be considered. Other field considerations?

Answers: Promote the use of multiple unit treatment train for below ground systems to reduce the potential clogging of underground filtration options. This will increase cost but reduce potential system failure. Require inspections and inspection reporting in order to reduce the likelihood of system failure. Document potential sediment loading at the retrofit site in order to develop the appropriate system.

Team Comments:

Personal communication with Jeff Dennis.

Dr. Robert Roseen:

Head is a huge challenge. These can be done with or without infiltration. Clogging is definitely a concern but designs can be done such that they are maintainable. This is a very important design consideration. The Isolator row by Stormtech on a bed of sand would have very good performance and are the most maintainable.

Steve Johnson:

One thing we should definitely consider when proposing below grade storage is post construction system maintenance. Who does it being the biggest question. Typically future maintenance is ignored until the things are chocker block full and failing.



- 2) No high resolution GIS topo data available in this area greatly restricts our ability to appropriately size or determine adequate sizing for systems. Site survey data is available for many sites but transferring this to GIS is very time consuming.

Answers: Best effort will be made to determine contributing area for individual retrofit sites and rely on available DEP catchment areas and flow directions. Structural options will be only be conceptual without full site survey, infrastructure evaluation, soil borings and utilities assessment.

- 3) Do we think that porous pavements can function for sidewalks along state roadway corridors? High sediment load make me nervous but numerous good opportunities. Should PP be one of our standard BMPS for retrofit or only in isolated cases due to significant costs.

Answers: Porous pavement may have some limited application for use on sidewalks depending on municipal maintenance schedule. These systems should be considered for retrofit on a site by site basis.

Team Comments:

Dr. Robert Roseen:

High sediment load is not really an issue so long as they are maintained. Pervious pavements should be considered for sidewalks b/c they require much less design consideration than do typical roads and parking. As such they can be very cheap b/c they only have maybe 8" of material or less under them.

Steve Johnson:

Regarding porous pavement on the state roadway corridors. All of the arterial roadways in the Mall area are very rarely sanded during winter operations. Those routes are considered "main drags" by SPPW and are treated chemically; hence you will have little, if any, winter sand applied. Normal operations has SPPW applying rock salt and Ice B'Gone (Magnesium Chloride and distiller solids) using ground speed control equipment outfitted on the sand trucks, which is very efficient and minimizes material application. However, the sidewalks themselves are always sanded and never treated with chemical. I am also pretty sure that the only Mall area sidewalk segment that is maintained in the winter is from Broadway to Philbrook Avenue.

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