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Memorandum

To: Northfield Technical Steering Committee
From: Barr Engineering
Subject: City of Northfield Regulation Development Project
Technical Assessment Report: Incorporating Elements of the DNR Shoreland Model Ordinance
Date: May 10, 2010
Project: 23661006.00 100 DRP

Executive Summary

Background and Purpose

This is one of four “technical assessment reports” intended to support the development of a new Stormwater Management Ordinance. This report identifies opportunities for incorporating regulations from the Preliminary Draft of Minnesota’s Shoreland Rules: Standards for Lake and River Conservation¹ (e.g. the Model Shoreland Ordinance) into the Stormwater ordinance.

The Minnesota Legislature directed the DNR to commence rulemaking to update the statewide minimum shoreland conservation standards (Chapter 6120). Local governments are responsible for the implementation, administration, and enforcement of shoreland zoning ordinances that meet or exceed the state’s standards. These local ordinances affect shoreland property owners and the use and development of shoreland areas.

The City has a Shoreland Overlay District. The City does not have a shoreland ordinance specifying development regulations for the mapped district but intends to develop one after the state adopts final shoreland rules. Anticipating the development of new shoreland regulations, the city wants to avoid duplicating similar regulations in both the shoreland ordinance and the stormwater ordinance. The purpose of this report is to identify regulations in the Model Shoreland Ordinance that would be appropriate to

¹ The 3rd Preliminary Draft dated April 20, 2009 was used for this analysis.

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place in the new stormwater management ordinance and not in the future shoreland ordinance. This approach helps to streamline the city's regulations by avoiding duplication or having similar but somewhat different regulations in different ordinances.

Recommendations

This report recommends model shoreland regulations that are relevant and appropriate for including in the stormwater ordinance. These fall into two categories, regulations that should pertain only to shoreland areas and regulations that have generally applicability throughout the city.

Model Shoreland Regulations that Pertain only to Shoreland Areas

These recommendations provide heightened levels of measures to protect shoreland areas. These measures often cost more to implement at time of development and may require additional administrative time by city staff to implement. As such, these regulations are recommended to only pertain to development in designated shoreland areas as opposed to all areas of the city.

Buffer and Vegetation Management. These regulations address how vegetation within 50 feet of regulated surface waters should be preserved, managed and/or restored at the time of development. These regulations would be the most significant addition to the stormwater ordinance to be brought in from the Model Shoreland Ordinance.

Volume Reduction as a Treatment Measure. Volume reduction regulations specify how much of the runoff volume generated by a site must be treated. The regulation from the Model Shoreland Ordinance strongly encourages that one inch of runoff generated from at least 3,000 square feet of impervious parking surface be treated with volume reduction techniques (e.g. infiltration).

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Model Shoreland Regulations that have General Applicability throughout the City.

These regulations represent good policy that has become generally accepted practice. There are little, if any, costs associated with these regulations.

Best Management Practices. Regulation includes a definition that best management practices include porous pavement, grass parking overflow areas, filter strips, shoreline buffers, swales, infiltration and bioretention basins, disconnected impervious areas, rain gardens and other conservation designs.

Separation of Infiltration BMPs from Bedrock. This regulation states that there shall be a minimum of 3 feet of separation from the seasonally saturated soils or from the bedrock to ensure soil absorption and enhanced retention of stormwater. This measure helps to prevent the infiltration of pollutants into drinking water supplies.

Consistency with the MN Stormwater Manual. This regulation requires that all BMPs are designed consistently with the MN Stormwater Manual, a commonly used reference tool.

Certified Professional Engineer. This item requires that all stormwater system designs be reviewed approved by a licensed professional engineer.

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Report Objective

The objective of this report is to identify opportunities for incorporating regulations from the Preliminary Draft of Minnesota's Shoreland Rules: Standards for Lake and River Conservation² (e.g. the Model Shoreland Ordinance) into the city's Stormwater ordinance. This report examines regulations that are relevant to a Stormwater ordinance and assesses their consistency with policies of the City's Surface Water Management Plan (SWMP). The criteria used to determine relevance is whether the model ordinance regulations can be implemented at the time of development and are related to post construction stormwater management techniques. These techniques include performance standards affecting structural and non-structural or site design best management practices (BMPs).

Any Model Shoreland Ordinance regulations that are dependent on land use, lot size, density, lot location (riparian or non-riparian) were not included. These land use and zoning type regulations are more appropriate to the Shoreland Overlay District. The city's future shoreland overlay district ordinance will detail these specific issues which vary based on water body classification.

Regulation Element Discussion

This section discusses regulations within the Model Shoreland Ordinance that are relevant to, and typically included, in a stormwater management ordinance. For each element, the language from the model ordinance is included. Following this language, the relevance of the regulation to the Northfield stormwater ordinance is discussed. This may include how the model code regulation compares to SWMP policies as well as any important cost concerns. Lastly, a recommendation is made for each element. Note that the model shoreland regulations only pertain within the designated Shoreland Overlay District. The shoreland overlay district covers an area that is within 300 feet of the top of a stream or river bank, or the width of the floodplain, whichever is greater³.

² The 3rd Preliminary Draft dated April 20, 2009 was used for this analysis.

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High Water and Lowest Floor Elevations

Model Ordinance Language: Structures must be placed at an elevation consistent with the flood protection elevation specified in state-approved, local floodplain management controls (e.g. FEMA floodplain regulations).

Discussion: The City's Floodplain District ordinance applies only to FEMA designated floodplains. The ordinance requires that the lowest floor elevation (including basement) be at least one foot above the 100-year flood elevation. Lowest floor elevations of the stormwater management ordinance will be based on SWMP policies. These policies are broader (apply beyond FEMA designated floodplains) and stricter than those contained in the Floodplain District. . The SWMP policies require that the lowest floor elevation be at least two-feet above the 100-year flood elevation.

Recommendation: SWMP policies are broader and stricter than Model Shoreland Ordinance language and thus take precedence over shoreland language – no impact from the Model Shoreland Ordinance.

Buffer and Vegetation Management

Model Ordinance Language (pertaining to new developments): See Appendix 1

Discussion: This extensive language details measures to protect and restore shoreline vegetation at the time of new development. These measures are fairly specific and support policies for erosion control, and filtration of surface flow in the SWMP as well as maintaining green infrastructure policies in the Greenway System Plan. This Model Shoreland Ordinance language can be administered through existing site plan and subdivision review procedures without a significant additional burden on the city. Maintaining compliance with the requirements after development may require periodic monitoring.

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The model ordinance also contains other buffer and vegetation management standards for situations other than those that would be implemented at time of development. These would likely be included in the city's future shoreland overlay district ordinance:

- Buffer programs (e.g. incentive, marketing, and education) to be developed locally.
- Buffers in areas of existing agricultural use and forest management
- Buffers for lots of record with structures

Recommendation: Include the model shoreland language “verbatim” as a buffer performance standard pertaining only to “Shoreland Areas.”

General Stormwater System Performance Standards

Model Ordinance Language: Treated stormwater runoff must use existing natural drainage ways and vegetated soil surfaces to convey, store, further filter, and retain stormwater runoff before discharge to public waters. Preference must be given to designs using surface drainage, vegetation, and infiltration rather than buried pipes and human-made materials and facilities.

Discussion: These are general performance standards required of all stormwater designs in shoreland areas. This language operates more as a design guideline instead of a strong requirement. Only “preference” must be given to these “LID” designs.

Recommendation: Place this language in a section pertaining only to “Shoreland Areas.”

Model Ordinance Language: New constructed stormwater outfalls to public waters must provide for filtering or settling of suspended solids and skimming of surface debris before discharge.

Discussion: Existing policies in the SWMP already cover this issue.

Recommendation: No impact.

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Road Width

Model Ordinance Language: Low-volume private roads shall have pavement widths of 22 feet or less.

Discussion: This may or may not be an issue depending on whether the city allows private roads. Road widths are rarely included in stormwater ordinances. It would be relatively easy to include such language as an LID performance standard, but it could be confusing to administer from a stormwater ordinance.

Recommendation: Do not include in the SW ordinance, it should remain in the Shoreland Overlay District.

Volume Reduction as a Treatment Measure

Model Ordinance Language: Parking areas with 10 or more spaces or in excess of 3000 square feet must be designed to permanently treat one inch of runoff from the impervious surfaces created, and preference must be given to volume reduction techniques.

Discussion: SWMP policies require one inch of infiltration in the Rice Creek Subwatershed. In all other areas the 0.34 inch rain event needs to be infiltrated. The shoreland requirement to treat 1-inch of runoff from impervious surfaces exceeding 3,000 square feet supersedes the 0.34 inch infiltration policy in shoreland areas. This regulation could increase costs of development in shoreland areas, especially with redevelopment; however, traditional treatment methods (e.g. NURP ponds) are an option; only preference must be given to volume reduction techniques.

Recommendation: Place this language in a section pertaining only to “Shoreland Areas.” Any references to volume reduction techniques would include caveats to address soils, shallow bedrock, high water table, pollution hot spots, etc

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Model Ordinance Language: One-inch of runoff from the impervious surfaces created by development or redevelopment, including roads shall require permanent treatment. Preference must be given to volume reduction techniques that include infiltration basins, rain gardens, enhanced infiltration swales, filter strips, disconnected impervious areas, and other conservation designs.

Discussion: The “one-inch” of treatment is superseded by the city’s SWMP policy requiring that the 2.5 inch rainfall event be treated. The model ordinance does state that treatment preference be given to the following volume reduction techniques: infiltration basins, rain gardens, enhanced infiltration swales, filter strips, disconnected impervious areas, and other conservation designs. The Model Shoreland Ordinance is not clear on the threshold level that would trigger this regulation. It implies that impervious surfaces created by all development and redevelopment are covered. If these were true than the previous volume reduction measure that is triggered by a specific 3,000 square or more of impervious surface would be irrelevant.

Recommendation: No impact, Regulation is superseded by the city’s stricter policy.

Maximum Impervious Surface Coverage

This issue is not addressed. Model ordinance language on this topic is tied to lot sizes and location of lots, something that will be included in the Shoreland Overlay District. A 25% maximum impervious standard is typical, but under some conditions, a lower maximum is required.

Structure Setbacks

Model Ordinance Language: Roads, driveways, and parking areas must meet structure setbacks (defined by water body classification in the Shoreland Overlay District) and must not be placed within bluff and shore impact zones.

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Discussion: These types of impervious surfaces are occasionally included in stormwater ordinances. These facilities are considered structures by the Model Shoreland Ordinance and are required to meet the structure setback requirements based on water body classification as specified in the Shoreland Overlay District. Including this language in the stormwater ordinance would require reference to the Shoreland Overlay District for water body classification and relevant setbacks. It's not clear when the Shoreland Overlay District will be developed to provide the needed references.

Recommendation: Do not include this language in the stormwater ordinance. It would be more efficient to leave these for the future Shoreland Overlay District.

Model Ordinance Language: Public roads, rail lines, and trails must meet structure setbacks and must not be placed within bluff and shore impact zones, when other reasonable and prudent placement alternatives exist.

Discussion: Same as above.

Recommendation: Same as above; do not include this language in the stormwater ordinance.

LID Practices

Model Ordinance Language: Best management practices may include porous pavement, grass parking overflow areas, filter strips, shoreline buffers, swales, infiltration and bioretention basins, disconnected impervious areas, rain gardens and other conservation designs.

Discussion: These practices are mentioned throughout the Model Shoreland Ordinance and are intended to reduce runoff volume. These are generally accepted good management practices and are promoted in the Minnesota Stormwater Manual. As an encouragement type of standard in the Model Shoreland Ordinance, there is no direct development cost.

Recommendation: Include this language as a general performance standard that the city encourages with caveats to address soils, shallow bedrock, high water table, pollution hot spots, etc.

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Model Ordinance Language: The base of the installed infiltration system shall have a minimum of 3 feet of separation from the seasonally saturated soils or from the bedrock to ensure soil absorption and enhanced retention of stormwater

Discussion: This is an accepted standard industry practice and is stated in the MN Stormwater Manual and is also a specific policy.

Recommendation: Include as a general performance standard

General Performance Standards

Model Ordinance Language: All stormwater management technologies shall be consistent with the latest Minnesota Stormwater manual.

Discussion: This is a generally accepted practice and should be included in general performance standards that apply to all developments.

Recommendation: Include as a general performance standard

Model Ordinance Language: A Minnesota licensed professional engineer shall design and inspect the installation and use of best management practices

Discussion: This is a generally accepted practice and should be included in general performance standards that apply to all developments.

Recommendation: Include as a general performance standard

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Appendix 1 - Shoreline Buffer Standards for New Developments

Shoreline buffer standards for new developments on parcels without a structure prior to the date of adoption of these standards shall include the following:

1. Removal or alterations of vegetation shall follow these standards:
 - a. A shoreline buffer shall be at least 50 feet as measured from and perpendicular to the ordinary high water level or a surface water consisting of trees, shrubs, and low ground cover of plants and understory in a natural state.
 - b. Cutting of trees and shrubs and the removal of ground cover plants within the shoreline buffer shall not be allowed, except as follows:
 - i. Removal of vegetation only necessary to accommodate the placement of a stairway or chairlift and associated landing, access path, recreation use area, and a permitted water-oriented accessory structure of facility shall be allowed. Trees, shrubs, and a low groundcover consisting of plants and understory shall be maintained in a natural state within this area. Excluding a stairway and associated landing, an access path within this area shall not exceed a cleared width of 8 feet and must be incorporated as part of any recreation use area. Only one shoreline recreation use area shall be allowed on each residential lot with a lot width less than 300 feet, and recreation use area shall not exceed 25 feet in width and 25 feet landward in depth. For shoreland conservation subdivisions, planned unit development, new resorts, and residential lots with a lot width 300 feet or greater, shoreline recreation use areas may be increased by 25 feet in width for each 100 feet in width along the shoreline, not to exceed 5000 square feet in total area, with the depth of the shoreline recreational area not exceeding 25 feet landward from the ordinary high water level.
 - ii. The removal of trees or branches that pose a safety hazard or are disease shall be allowed.
2. Vegetation shall be maintained to screen structures with trees and shrubs so that the structures are at most half visible when viewed perpendicular to the structure from the surface of the public waters during summer, leaf-on conditions.
3. Restrictions that prohibit any shoreline vegetation alteration, except those allowed in items b.i and b.ii above shall be deed recorded.

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4. Violations of this subpart creating open areas or lawns within the shore impact zone, except those allowed in items b.i and b.ii above, shall be left unmowed or uncut and planted with trees and shrubs along with a natural ground layer of understory plants to reestablish a vegetative buffer. The city shall require a restoration plan. At a minimum, the plan must provide for the reestablishment of a well-distributed planting of saplings and shrubs spaced so that there is at least one sapling or shrub per 100 square feet of shoreline buffer. Planted saplings shall be no less than 3 feet tall for coniferous species and no less than 6 feet tall for deciduous species. The plan must include a mix of native tree species found growing in adjacent areas. All aspect of the plan must be maintained, and loss of plantings must be replaced in kind.