



## Memorandum

**To:** Bassett Creek Watershed Management Commission  
**From:** Barr Engineering Co.  
**Subject:** Item 5C – Review Results of Comparative Analysis of Linear Projects: Water Quality Treatment Outcomes  
**Date:** September 12, 2018  
**Project:** 23270051 2018 003

## Background

At their May 18, 2017 meeting, the Commission approved revisions to the BCWMC's Requirements for Improvements and Development Proposals (Requirements document) that revised the BCWMC's water quality performance standards for linear projects. The previous (2015) standards required MIDS treatment for linear projects when the project would result in 1 acre of new/fully reconstructed impervious:

MIDS standard: capture and retain the larger of 1.1 inches off the net increase in impervious – or – 0.55 inches off the new/fully reconstructed impervious (acre-feet). Follow flexible treatment options if volume reduction BMPs are not feasible or not allowed.

The revised/current (2017) standards require treatment for linear projects when the project will result in 1 acre of net new impervious:

BCWMC standard: capture & retain 1.1 inches off the net new impervious area (acre-feet). Follow flexible treatment options if volume reduction BMPs are not feasible or not allowed.

At their June 2017 meeting, the Commission requested an analysis comparing the revised linear project standards and the previous MIDS standards on linear projects reviewed by the BCWMC after the BCWMC revised the standards.

## Analysis

We compared the MIDS water quality (previous) requirements and the BCWMC water quality (current) requirements for the 11 linear projects that triggered BCWMC review, since the May 2017 commission meeting. Table 1 shows the 11 linear projects, pertinent project data, the required water quality treatment volume under previous and current requirements, and the amount of treatment that was provided.

As shown in Table 1, none of the 11 linear projects reviewed triggered water quality treatment per the current requirements, whereas 8 of the 11 projects would have triggered water quality treatment per the

previous requirements. For the 8 projects that would have triggered water quality treatment per the previous requirements, the total required treatment volume would have been 1.11 acre-feet. However, many projects in the Bassett Creek watershed are unable to meet volume reduction requirements, often due to low infiltrating soils, and it is not known if the project proposers could have provided that treatment volume.

Linear and non-linear projects that triggered water quality treatment since the May 2017 Commission meeting were reviewed. Linear projects (11 total) have created 25.94 acres of new/fully reconstructed impervious surfaces resulting in an estimated TP loading of 46.3 pounds per year. The previous requirements would have required 60 to 100 percent TP removal, based on volume reduction capacity of the site, resulting in estimated pollutant removals of 27.8 - 46.3 pounds per year of TP. However, the net new impervious surface added by the linear projects was 1.17 acres, resulting in an additional TP loading of 2.1 pounds per year compared to existing conditions. Non-linear projects (8 total) have created 15.35 acres of new/fully reconstructed impervious surfaces resulting in an estimated TP loading of 33.77 pounds per year. These non-linear projects have provided an average of 72% TP removal for a total estimated TP removal of 24.16 pounds per year.

The magnitude of the reduced water quality treatment for linear projects was also evaluated by comparing the estimated TP loading from the linear projects to the total TP loading for the watershed. The BCWMC P8 model, developed and adopted in 2012, estimates TP loads at the BCWMC Tunnel of 1168.33 pounds per year. Based on this loading, the linear projects submitted since the May 2017 Commission meeting, are contributing up to 2.4% - 4.0% additional TP loading to Bassett Creek relative to the loading that would have occurred with the previous requirements in place. Compared to existing conditions, the linear projects submitted since May 2017 are contributing approximately 0.2 % additional TP loading to Bassett Creek. However, water quality benefits and TP removal may be provided by downstream treatment prior to discharging to Bassett Creek, therefore the estimated 2.4% - 4.0% TP loading increase should be viewed as a maximum. A more detailed analysis of the specific effects of these linear projects could be performed using a P8 model.

**Table 1. Comparison of previous (2015) and current (2017) BCWMC triggers and water quality performance standards for linear projects**

BCWMC Reviews of Linear Projects			2017-33 Metro Transit C Line BRT	2018-02 Hwy 55 Frontage Road Reconstruction	2018-04 GV 2018 PMP	2018-05 Luce Line Regional Trail Reconstruction	2018-07 Toledo-Scott Avenue Reconstruction	2018-08 Kilmer Park Street Reconstruction	2018-09 CenterPoint Energy 2018 MBLC GV West	2018-11 CenterPoint Energy Boone Avenue N Mill	2018-15 Trunk Highway 55 (TH 55) West Improvements	2018-18 CenterPoint Energy 2018 MBLC GV Central	2018-21 MCEs Golden Valley Interceptor
BCWMC Project Review Data	Project Disturbance (acres)		5.50	1.50	8.37	1.92	3.40	7.70	1.80	0.90	2.66	1.77	4.42
	Existing Impervious (acres)		5.40	1.15	5.27	0.76	2.89	4.58	1.80	0	0.92	1.77	0.86
	Proposed Impervious (acres)		5.00	1.17	5.07	0.73	3.00	4.96	1.80	0	1.58	1.77	0.86
	Change in Impervious (acres)		-0.40	0.02	-0.20	-0.03	0.11	0.38	0	0	0.66	0	0
	New Impervious (acres)		0	0.02	0	0	0.11	0.38	0	0	0.66	0	0
	Reconstructed Impervious (acres)		5.00	1.15	5.07	0.73	2.89	4.58	1.80	0	0.92	1.77	0.86
	Total New and Reconstructed Impervious (acres)		5.00	1.17	5.07	0.73	3.00	4.96	1.80	0	1.58	1.77	0.86
Previous (2015) BCWMC Requirement:	Trigger MIDS at 1 acre of new/fully reconstructed impervious	MIDS Treatment: Capture & retain larger of 1.1 inches off the net increase in impervious – or – 0.55 inches off the new/fully reconstructed impervious (acre-feet)	0.23	0.05	0.23	0	0.14	0.23	0.08	0	0.07	0.08	0
Current (2017) BCWMC Requirement:	Trigger treatment at 1 acre of net new impervious	Capture & retain 1.1 inches off the net new impervious area (acre-feet), plus go through MIDS flexible treatment options for the net new impervious area if it's not possible to capture and retain 1.1 inches of runoff from these areas	0	0	0	0	0	0	0	0	0	0	0
Actual Treatment Provided:	Capture and Retain Volume Provided (acre-feet) <sup>1</sup>		0	- <sup>2</sup>	0 <sup>3</sup>	0	- <sup>2</sup>	0	0	0	0	0	0

<sup>1</sup> Projects with site restrictions may not be required to "capture & retain" the water quality volume. These projects must follow BCWMC Flexible Treatment Options (FTOs).

<sup>2</sup> Water quality treatment provided but information and/or documentation not provided for review.

<sup>3</sup> No volume retained specifically as part of project, but a filtration basin proposed as mitigation for 2016 PMP project and 2017 PMP project.