

2010 NORTHDALE MIDDLE SCHOOL POND MODIFICATION

Project Summary

The Anoka Conservation District (ACD) completed a Sand Creek stormwater retrofit assessment for the Coon Creek Watershed District (CCWD) that identified cost-effective stormwater BMPs. As a result of the assessment, the existing rate control pond at the Northdale Middle School was modified. The pond outlet elevation was raised by 18 inches to improve phosphorus removal efficiency and provide direct water quality benefits to Sand Creek via decreased nutrient and sediment loading. Modification of existing stormwater treatment ponds to increase their efficiencies is one of the most cost effective methods to enhance stormwater treatment. Much of the existing stormwater infrastructure was designed for rate control, and inexpensive retrofits such as this can add water quality benefits and volume reduction. Project dollars were provided by CCWD and the Clean Water Fund (CWF) from the Clean Water, Land and Legacy Amendment. Project promotion and construction oversight was conducted by CCWD.



Project Specs

Date InstalledSeptember 2010
 Total Ponding Area45,172 ft²
 Total Capacity135,036 ft³
 Watershed Treated 158 acres

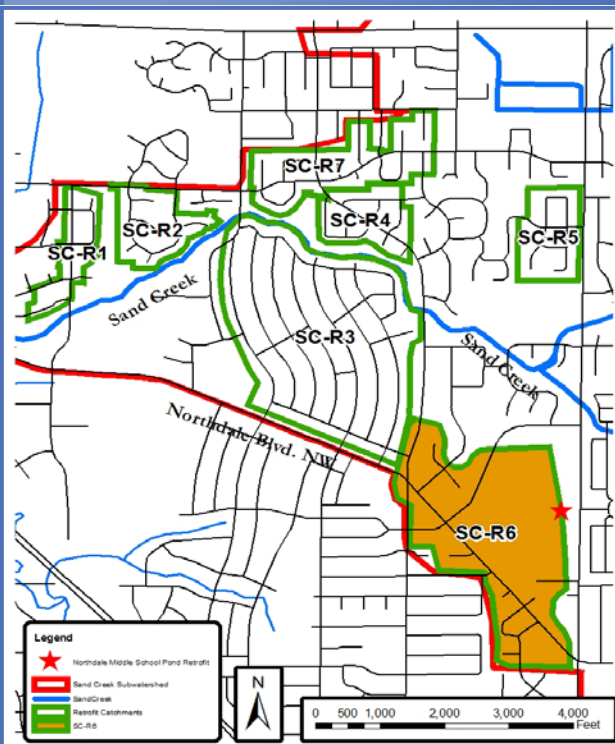
Installation Funding

CCWD \$3,802.50
 State of MN CWF..... \$4,647.50
 Total Installation Cost \$8,450.00

Other Funding (Source)

Design (CCWD)..... \$1,598
 Const. Oversight (CCWD) \$3,740
 Maintenance (CCWD) \$3,340/yr

SC-R6 Catchment



Within catchment SC-R6 of the Sandcreek Subwatershed Stormwater Retrofit Assessment, the Northdale pond outlet modification was identified to;

- Decrease stormwater volume,
- Decrease pollutant loads, and
- Increase infiltration to recharge groundwater.

The catchment land cover consists of residential, schools, and open space. The table below highlights important characteristics of the catchment as well as WinSLAMM model outputs of total phosphorus (TP), total suspended solids (TSS), and volume contributions prior to the pond modification. Wenck Assoc. Inc. designed the project.

| | |
|------------------------------|----------------------------------|
| Acres | 158 |
| Dominant Land Cover | Residential, Schools, Open Space |
| Parcels | 254 |
| TP (lbs/yr) | 48.6 |
| TSS (lbs/yr) | 34,657 |
| Volume (acre-feet/yr) | 79.4 |

Installation

Detailed analysis of the pond by Wenck Assoc. Inc. identified the potential to improve phosphorus removal efficiency by raising the outlet elevation 18 inches. Installation of a horizontal weir Designed by Wenck provides water quality benefits without causing backwater issues in the existing stormwater infrastructure.

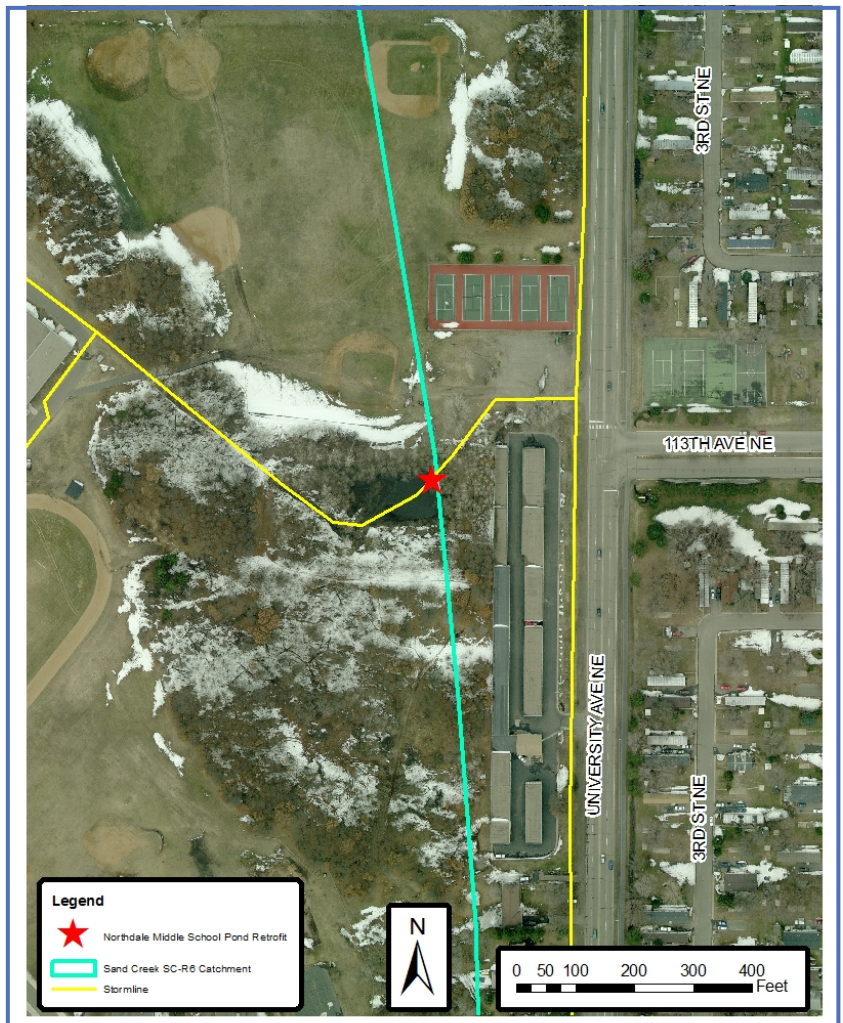


Placement and installation of weir to raise outlet elevation by 18" and increase downstream water quality benefits.

Retrofit of existing outlet to accommodate new weir installation and minimize project expenses.



Fully functioning modification will increase pond storage capacity, promote infiltration and sedimentation, and ultimately improve Sand Creek water quality.



Location of Northdale Middle School pond retrofit.

Site Monitoring/Post-Project

Pond operation maintenance was calculated assuming a 10 year period prior to required maintenance. Maintenance includes excavation and disposal of accumulated sediment at a rate of \$2,000 per 10 acres of contributing watershed. An additional \$3,000 was added for mobilization and site restoration.

Modeled Pollutant Reductions and Calculated Benefits

WinSLAMM modeling conducted by ACD estimated reductions in water volume, total suspended solids (TSS), and total phosphorus (TP) following pond modification. The table to the right highlights these reductions. Water resource benefits to receiving water bodies associated with these reductions include:

- Groundwater recharge,
- Increased water clarity,
- Reduced streambank erosion and flooding, and
- Decreased nutrient, pollutant, and toxin loading.

| | Volume Reduction | | TSS Reduction | | TP Reduction | |
|---|----------------------------------|----|--------------------|----|--------------------|----|
| | ft ³ /yr | % | lbs/yr | % | lbs/yr | % |
| Annual Total | 1,562,000 | 45 | 12,494 | 36 | 19.9 | 41 |
| 30 Yr Project Total | 46,860,000 ft³ | | 374,820 lbs | | 597 lbs | |
| Benefit / \$100 Spent* (over 30 years) | 41,110 ft³ | | 329 lbs | | 0.52 lbs | |
| 30 Yr Cost* / Unit | \$105.96/acre-ft | | \$0.30/lb | | \$190.93/lb | |

* Includes installation, design, oversight, administration, and 30 year maintenance costs