Pollutant Reduction for Casey Lake

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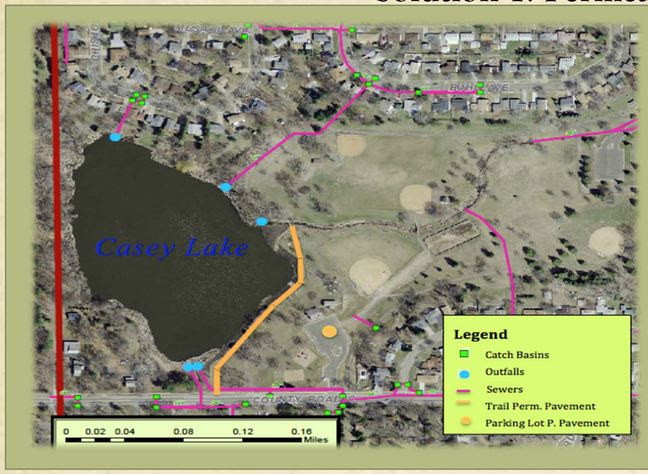
Purpose

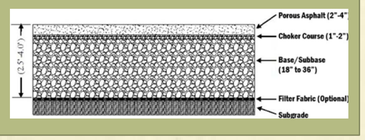
The City of North Saint Paul is looking to provide stormwater treatment to reduce pollutant loading into Casey Lake.

Solution 1: Permeable Pavement



Characteristics:

- Porous asphalt
- 2 Possible locations: Trail and parking lot
- Base: Iron Enhanced sand (trail) or Aggregates (lot)
- Modeled using P8



Solution 2: Infiltration Basin

Characteristics:

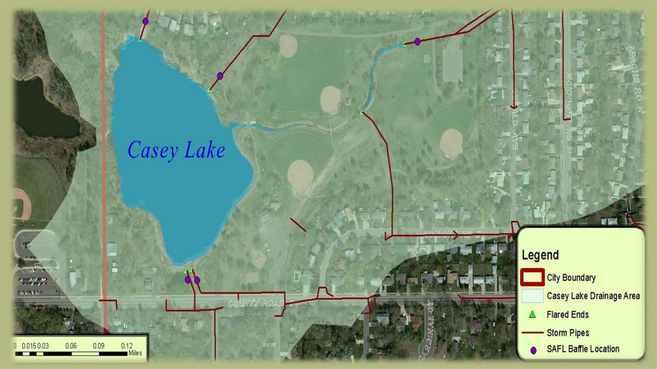
- Collects polluted stormwater from a city storm sewer outlet
- Infiltrates stormwater into the ground
- Modeled using P8

Solution 3: Street Sweeping

Characteristics:

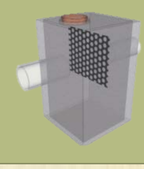
- Prevents leaves, sediment, and other debris from entering the stormwater system
- Proposed sweeping once per month from April to October
- Modeled using Street Sweeping Planning Calculator by Stormwater U

Solution 4: Sump Pump Cleaning



Characteristics:

- Requires installation of SAFL Baffles
- Vacuum truck used to remove sediment and has a low maintenance cost
- Increase sediment capture by 10-20%
- Modeled using SHSAM



Results and Recommendations

Method	TSS Removed/Year (lbs/year)	TP Removed/Year (lbs/year)	Total Cost/Year (for a 20 year lifetime) ($/year)	TSS ($/(lb/year))	TP ($/(lb/year))
Street Sweeping	91,652.00	96.40	$3,690.50	$0.04	$38.28
Infiltration Basin	17,513.30	54.80	$10,320.50	$0.59	$188.33
Permeable Pavement Trail	265.60	1.14	$5,768.26	$21.72	$5,059.88
Permeable Pavement Lot	292.20	1.10	$6,932.60	$23.73	$6,302.36
Sump Cleaning	---	8.00	$1,285.00	---	$160.63

Street sweeping was found to be the most cost-effective method to reduce total suspended solids and total phosphorus in the subwatershed. Sump cleaning was the second most cost-effective at reducing total phosphorous. Although more frequent street sweeping is the most highly recommended practice, there are several other treatment methods that the city of North St. Paul could implement to improve water quality depending upon the city's budget and schedule.

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