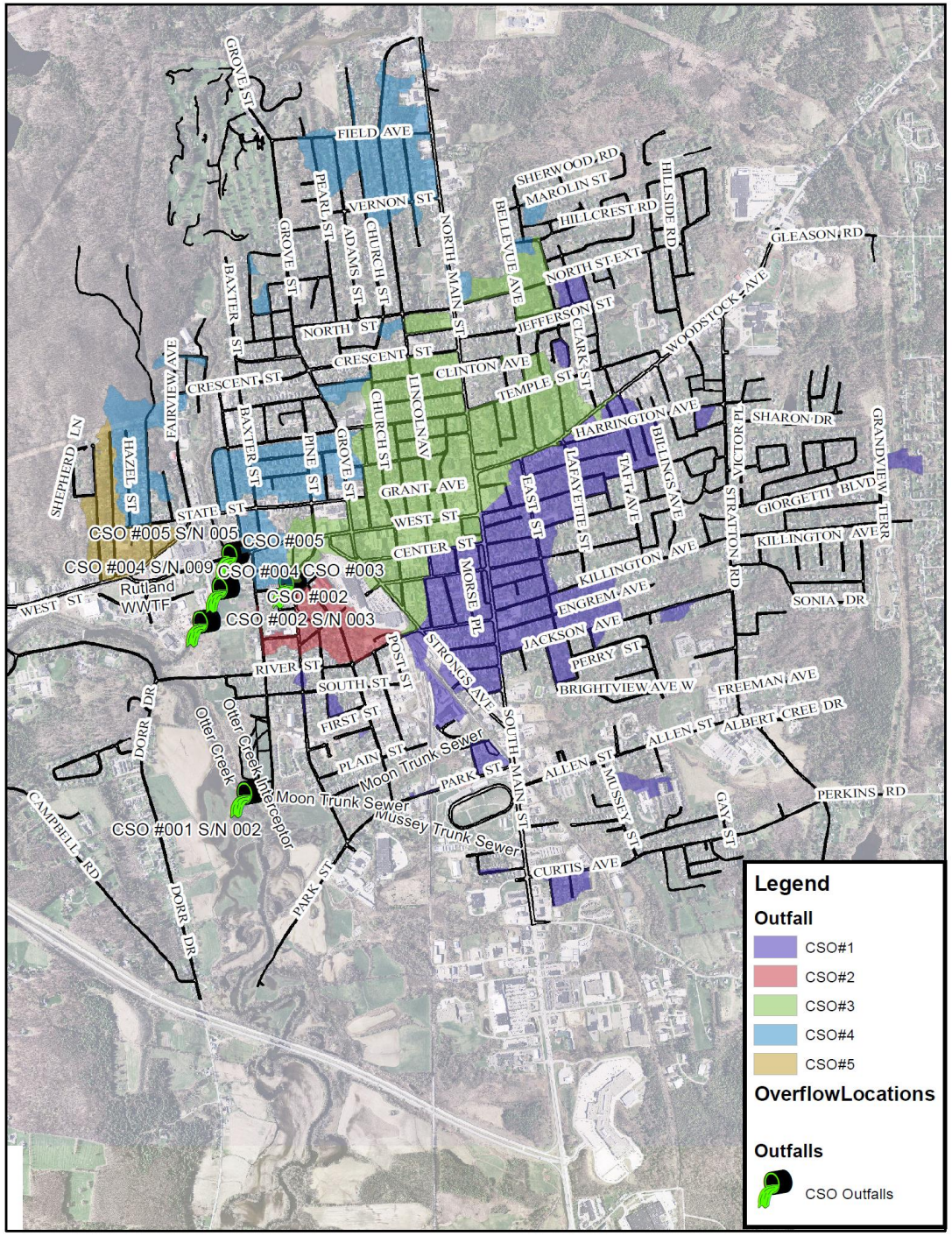
July 26, 2042

# “EPA requires cities to combine storm and sanitary sewers”



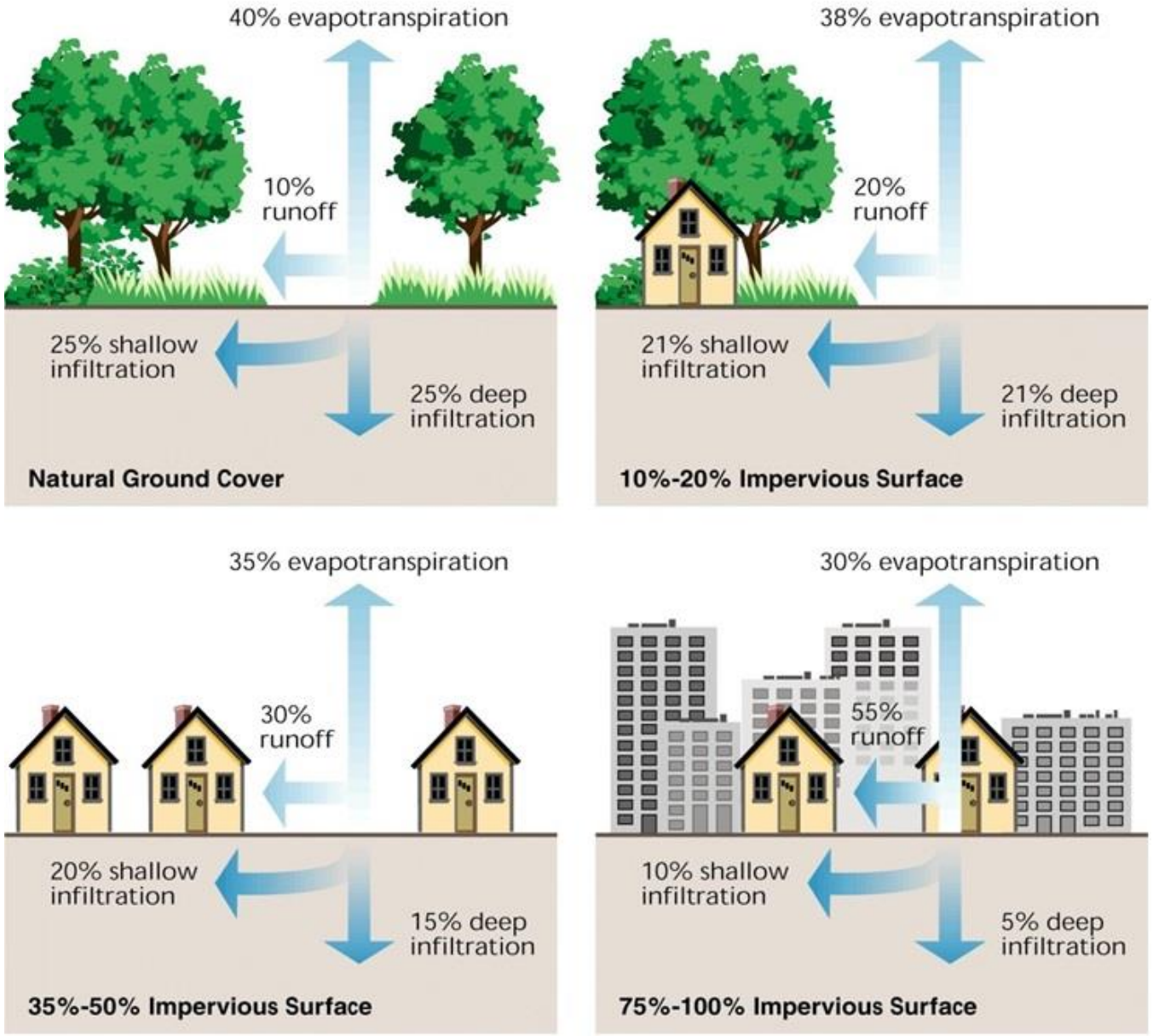

- ~900 acres served by CSS
- Hundreds of millions of $ to separate everything
- 1989: Enlarge plant to handle most wet weather flows
- Rutland's strategy: Treat stormwater FIRST; control CSOs second

**Table 4-4. Comparison of Water Quality Parameters in Urban Runoff with Domestic Wastewater (mg/l)**

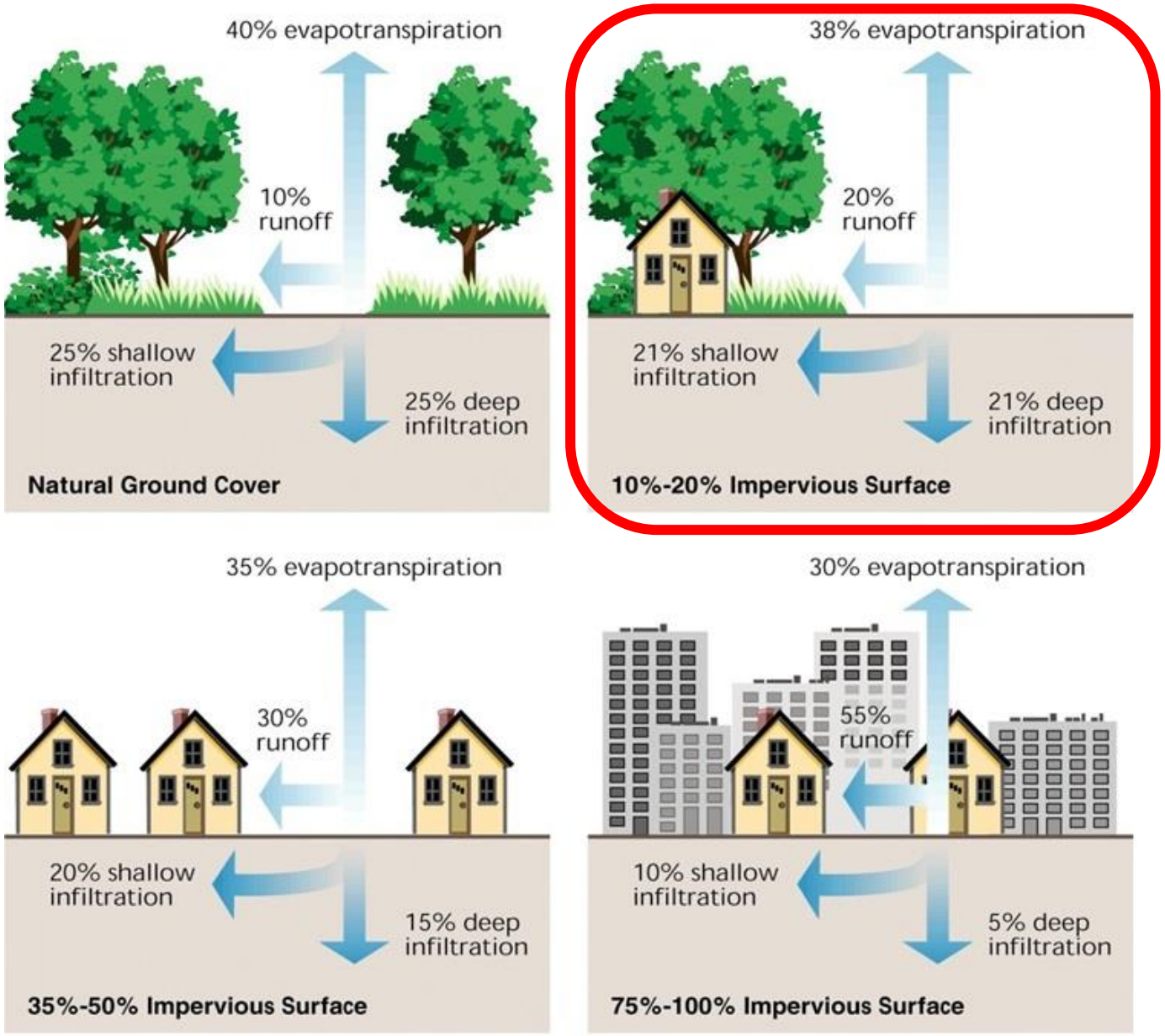
| Constituent | Urban Runoff | | Domestic Wastewater | | |
|---|---|---|---|---|---|
| | Separate Sewers | | Before Treatment | | After Secondary |
| | Range | Typical | Range | Typical | Typical |
| COD | 200-275 | 75 | 250-1,000 | 500 | 80 |
| TSS | 20-2,890 | 150 | 100-350 | 200 | 20 |
| Total P | 0.02-4.30 | 0.36 | 4-15 | 8 | 2 |
| Total N | 0.4-20.0 | 2 | 20-85 | 40 | 30 |
| Lead | 0.01-1.20 | 0.18 | 0.02-0.94 | 0.10 | 0.05 |
| Copper | 0.01-0.40 | 0.05 | 0.03-1.19 | 0.22 | 0.03 |
| Zinc | 0.01-2.90 | 0.02 | 0.02-7.68 | 0.28 | 0.08 |
| Fecal Coliform per 100 ml | 400-50,000 | | $10^6$-$10^8$ | | 200 |

Source: Bastian, 1997

As indicated in Table 4-4, the concentrations of select water quality parameters in urban runoff is comparable to that found in untreated domestic wastewater. When untreated urban runoff is discharged directly to receiving streams, the loadings of pollutants can be much higher than the loadings attributable to treated domestic wastewater.

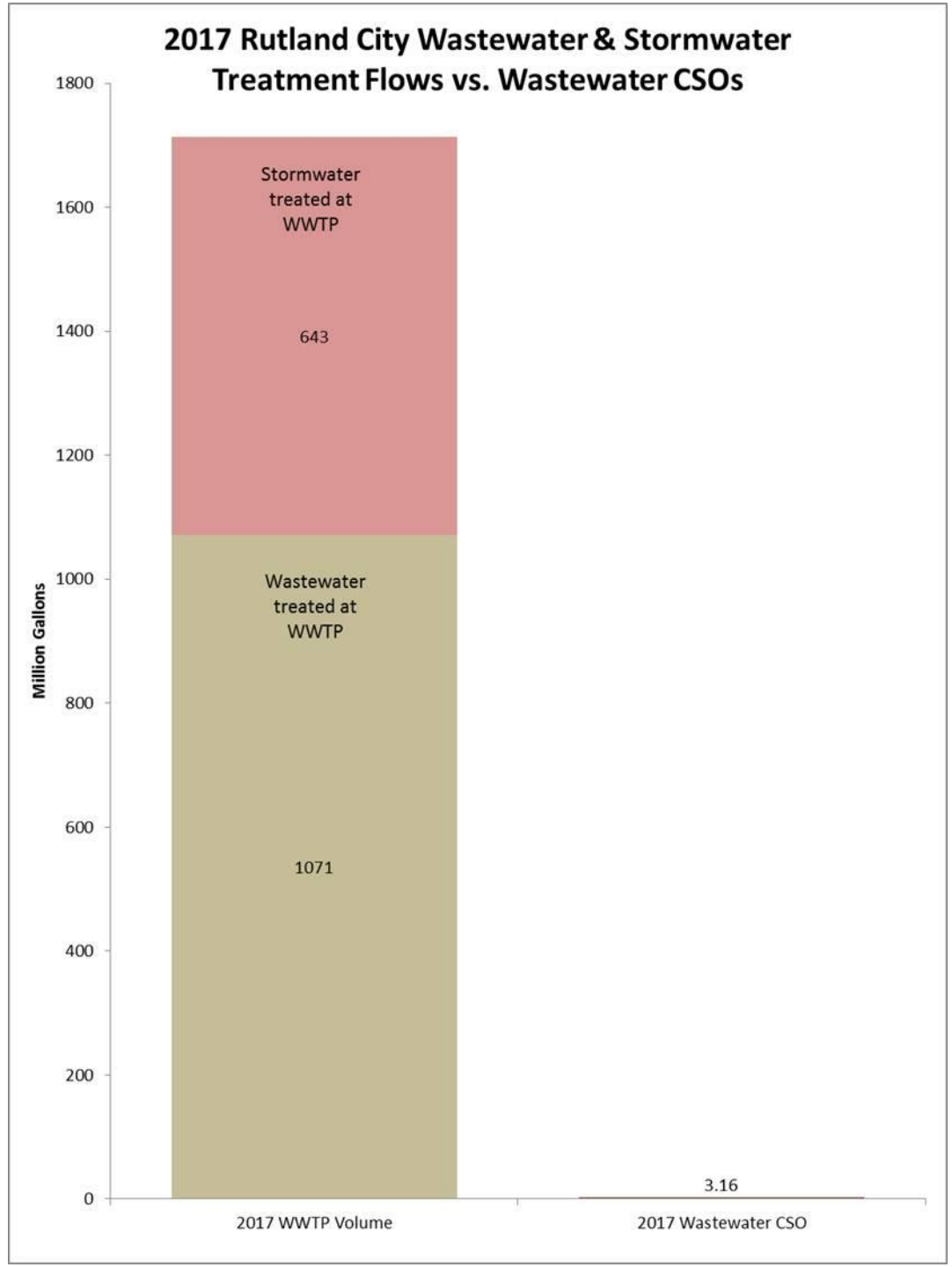



https://megamanual.geosyntec.com/npsmanual/sectionintrourbanstormwaterrunoff.aspx

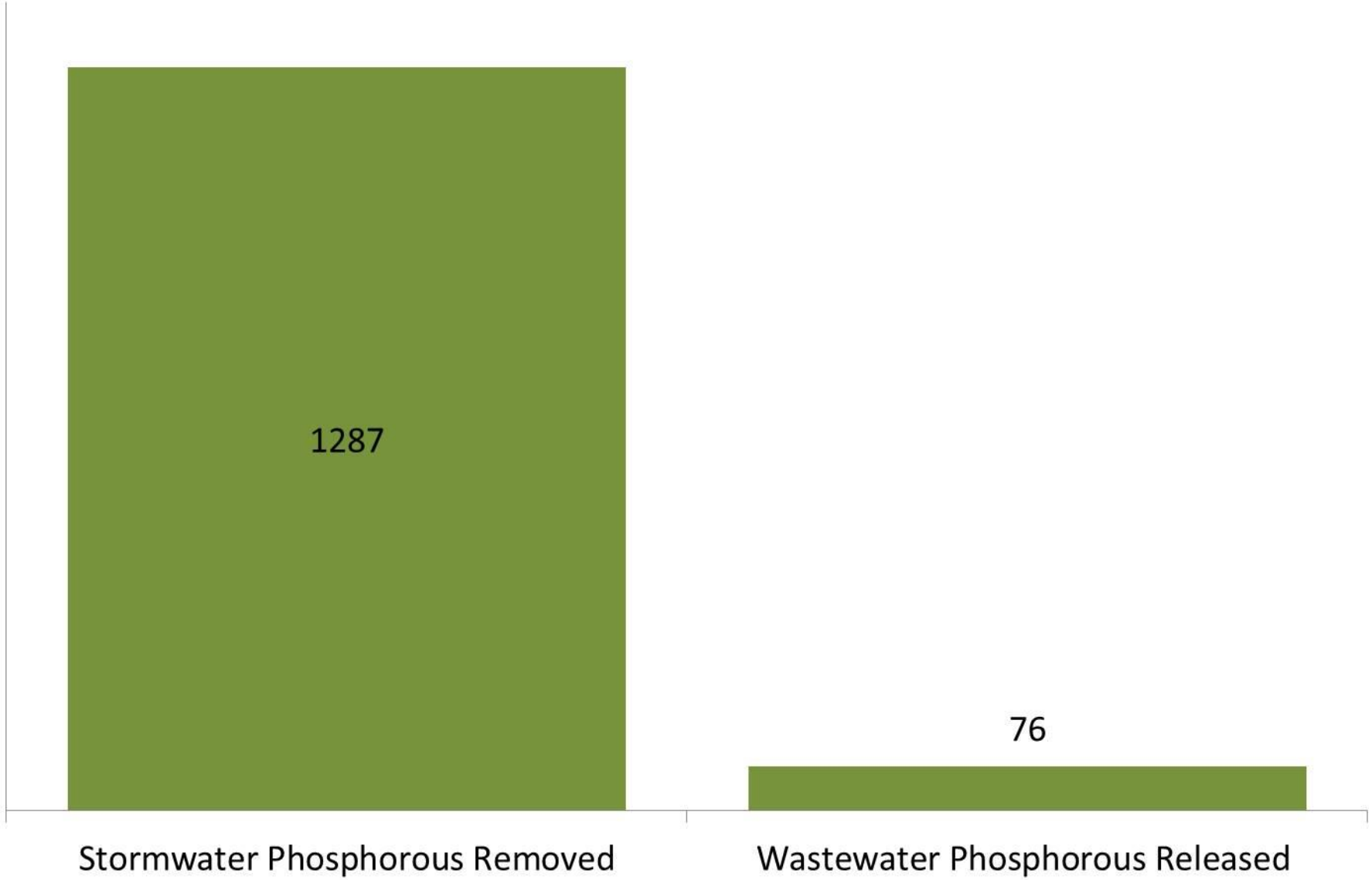



https://megamanual.geosyntec.com/npsmanual/sectionintrourbanstormwaterrunoff.aspx

| | Urban Runoff Separate Sewers | Combined Wastewater After Treatment | Runoff loading per acre for a 1" storm (untreated 20% runoff) | | Effluent loading per acre for a 1" storm (combined sewers) | | Percent reduction |
|---|---|---|---|---|---|---|---|
| | Typical mg/L | Typical mg/L | 20,600 | L | 20,600 | L | |
| BOD | 75 | 7 | 1,545 | kg | 144 | kg | 90.7% |
| TSS | 150 | 4 | 3,090 | kg | 82 | kg | 97.3% |
| Total P | 0.36 | 0.13 | 7 | kg | 3 | kg | 63.9% |
| Fecal Coliform per | 400 | 2 | 82,400,000 | col | 412,000 | col | 99.500% |
| 100 ml (range) | 50,000 | 2 | 10,300,000,000 | col | 412,000 | col | 99.996% |


2017 Rutland City Wastewater & Stormwater Treatment Flows vs. Wastewater CSOs
Million Gallons
1800
1600
1400
1200
1000
800
600
400
200
0
Stormwater treated at WWTP
643
Wastewater treated at WWTP
1071
3.16
2017 WWTP Volume
2017 Wastewater CSO

**Rutland WWTP 2017 Pounds of Phosphorous Removed from Stormwater vs. Wastewater Phosphorous Released During Overflows**



# Vermont Water Quality Standards:

§ 29A-106 Discharge Policy

(a) Discharge Criteria. In addition to the other provisions of these rules, *new discharges of wastes may be allowed only when all the following criteria are met*:

. . . (2) *There is neither an alternative method of waste disposal, nor an alternative location for waste disposal, that would have a lesser impact on water quality* including the quality of groundwater, or if there is such an alternative method or location, it would be clearly unreasonable to require its use.

For communities like Rutland with older infrastructure and large areas served by combined sewers, water quality is clearly better served by collecting and treating stormwater at the WWTP.

This means there will be periodic CSOs, but these can be minimized, controlled and managed at much lower cost and with far greater water quality benefits than total separation.

Strategies to minimize and control CSOs include:

1. intercepting and delaying or infiltrating stormwater before it reaches the collection system;
2. Installing controls to manage flows in real time within the collections system;
3. Building large storage and disinfection treatment at CSO locations to reduce CSO incidence and kill pathogens before CSO releases.

# Main takeaways:

While everyone is focusing on CSOs, which contribute a miniscule fraction of total pollutant loading to the lake, trillions of gallons of untreated or minimally treated urban stormwater are dumped into receiving waters every time it rains - without public notice or concern.

Funding and regulatory priorities must support the strategies that result in the greatest water quality benefit for each unique situation.