

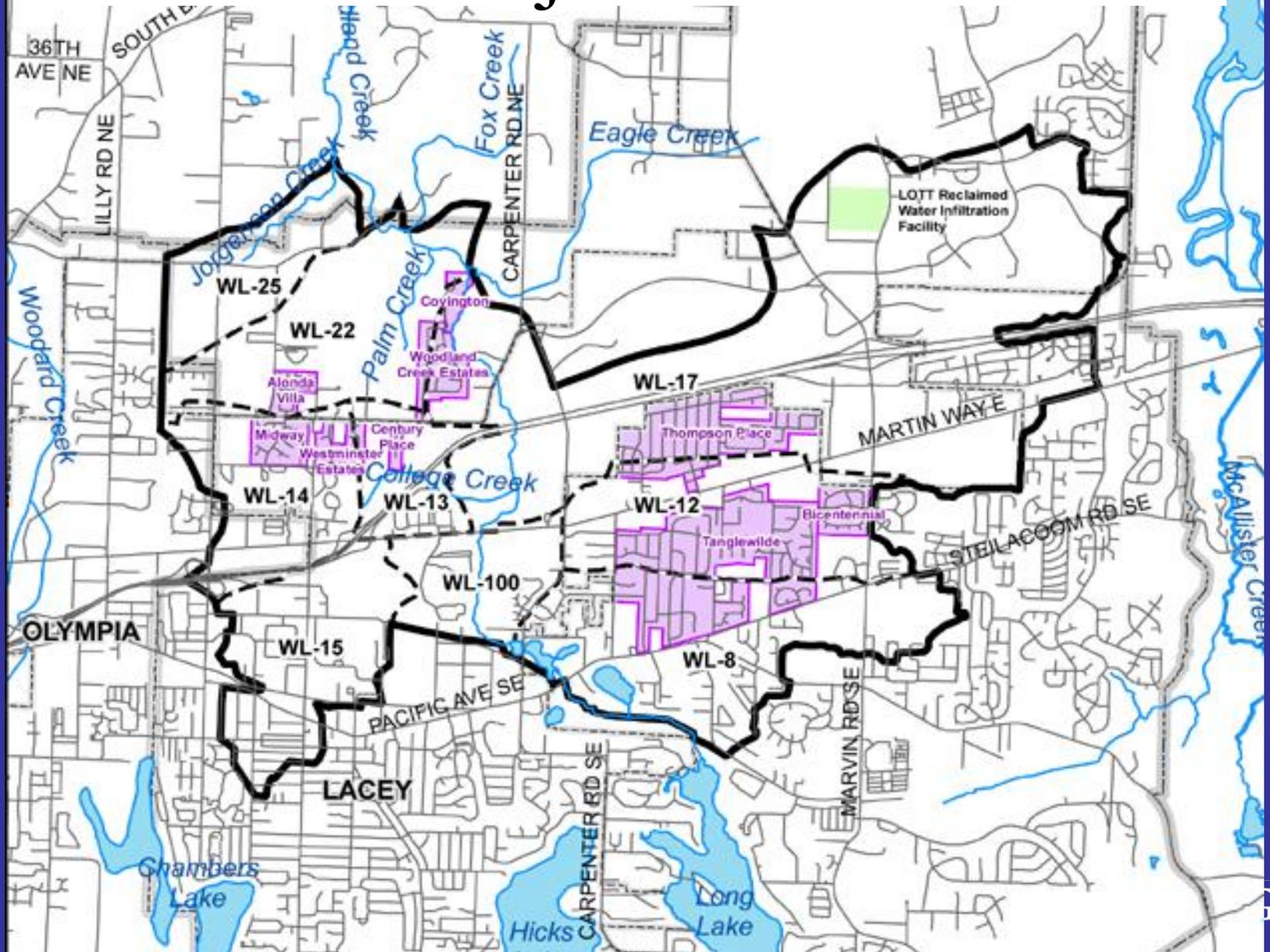
# Woodland Creek Pollutant Load Reduction Project



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# Project Area



# Why is this being done?

- Woodland Creek and Henderson Inlet do not meet State fecal coliform bacteria standard



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# Why is this being done?

- Shellfish in lower Henderson Inlet are not safe to eat

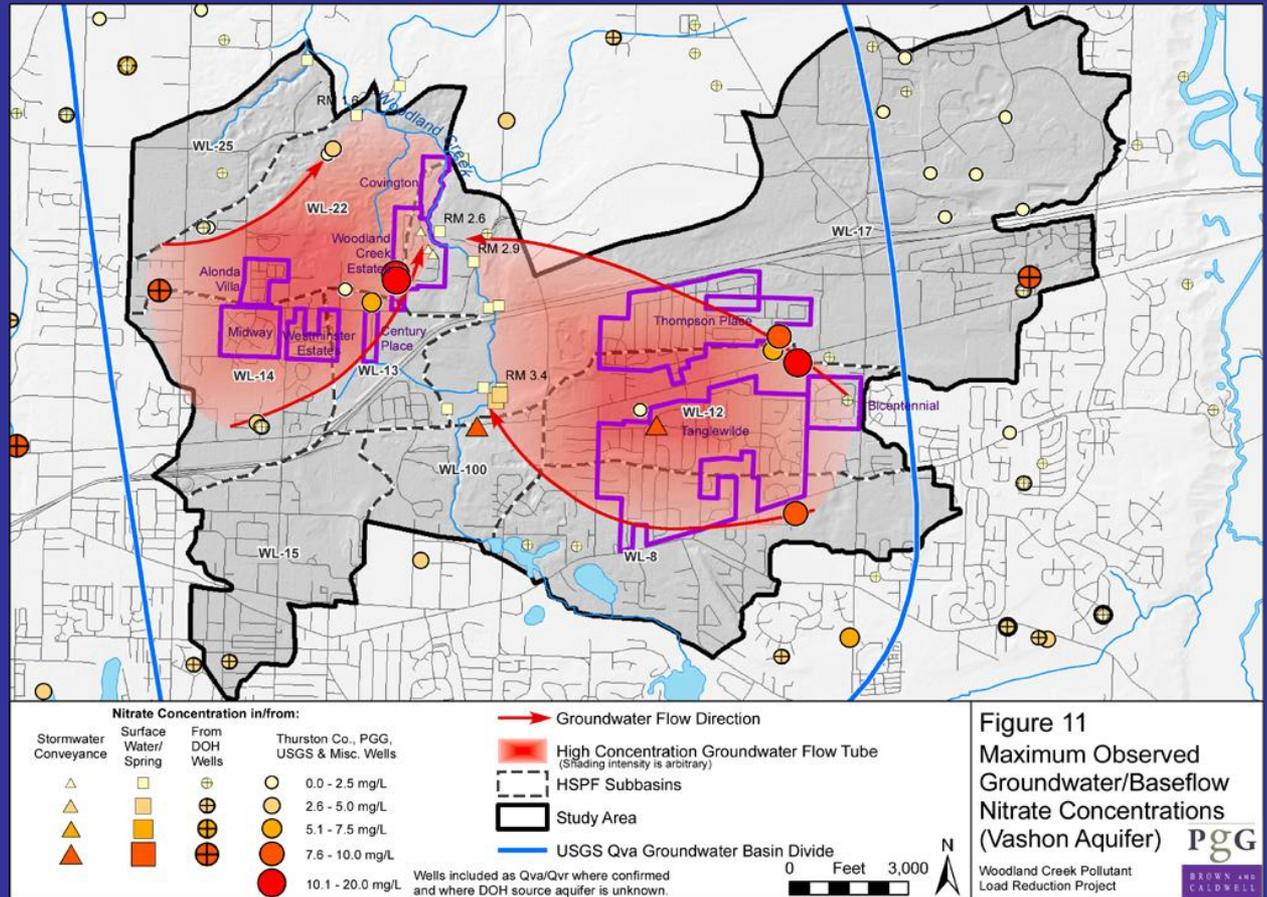


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# Why is this being done?

- Nitrate pollution in shallow groundwater is over safe drinking water limit

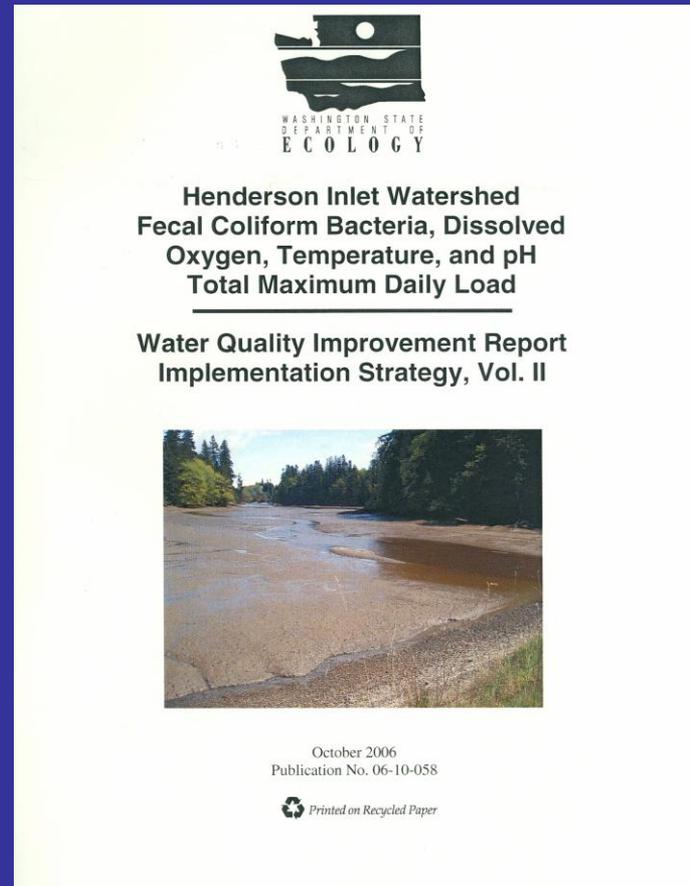


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# Why is this being done?

- State set bacteria reductions – must reduce fecal coliform pollution by 43% to 99% in specific areas

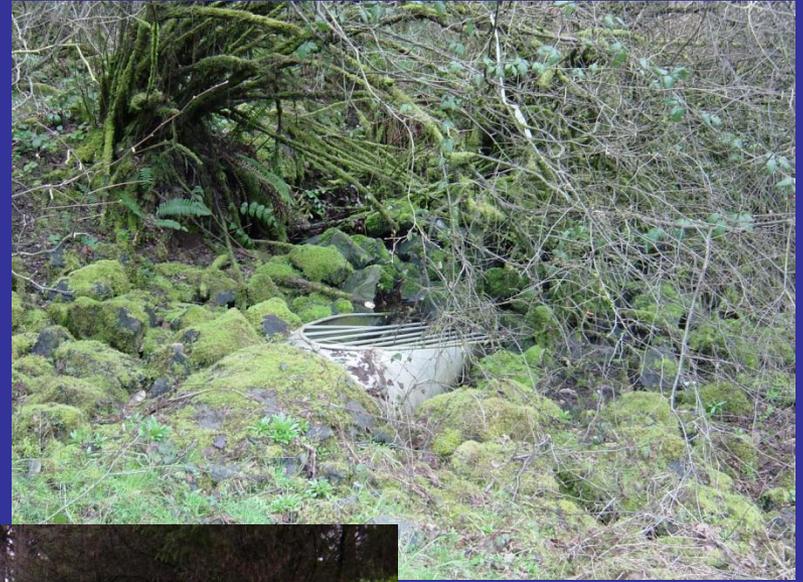


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# Why is this being done?

- Stormwater permits for Thurston County and Lacey require pollution reduction



# Facts about the project area...

- 5,885 Acres
- More than 3,000 septic systems
- 880,000 gallons of sewage per day into the ground from septic systems
- 1/4 of the project area is paved or roof tops
- 66% of the project area is developed
- 53 miles of stormwater pipes and ditches



# Project Goals

- Restore water quality in Woodland Creek for people and wildlife
- Meet fecal coliform water quality standards
- Meet State-required pollution reductions
- Meet action level for nitrate in shallow groundwater

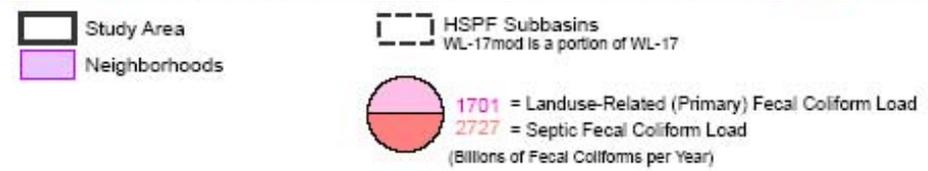
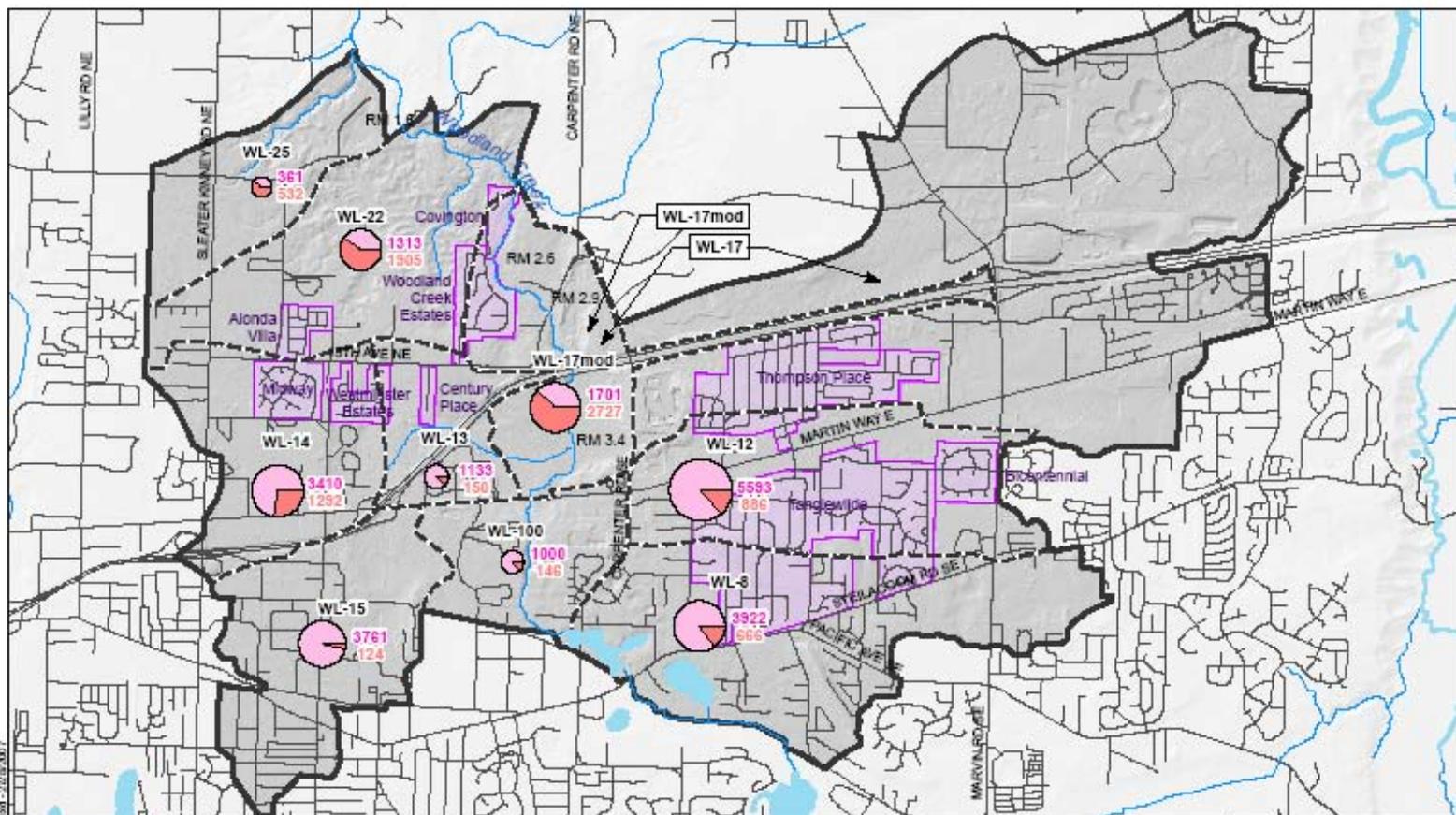


# Steps to Pollution Reduction Plan

1. Describe the Current Conditions using Model
2. Define goals
3. Identify potential solutions
4. Group into “Management Options”
5. Model Future Water Quality Conditions
6. Estimate Costs
7. Base Recommendation on Option that meets Goals at Lowest Cost



WTM - Calculated Fecal Coliform Loads.mxd - 2/2/2007



**Figure 14**  
WTM-Calculated Annual Fecal Coliform Loads



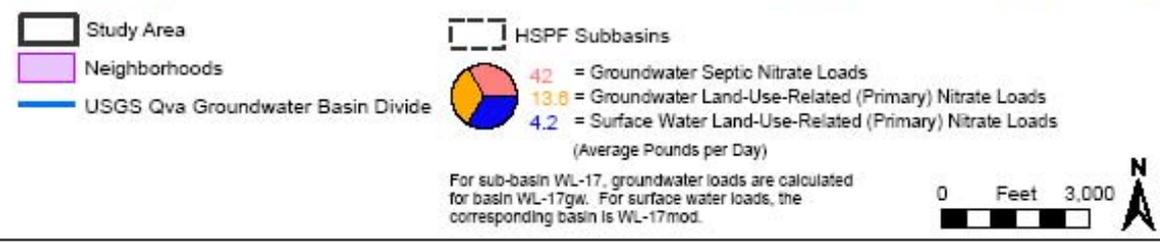
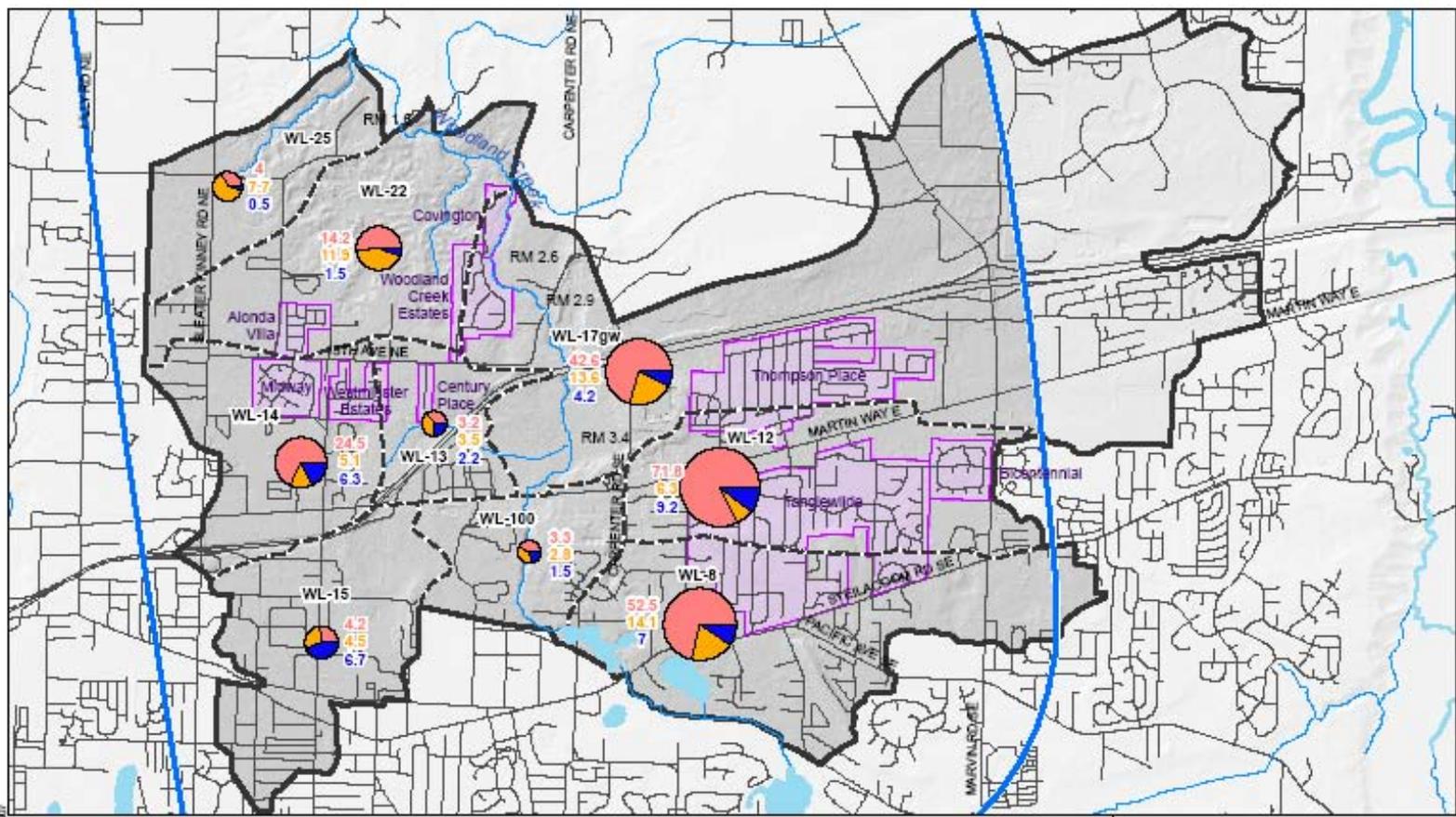
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WTM\_CW\_nitrogen\_loads.mxd - 2/12/2017



**Figure 16**  
**WTM-Calculated Average Daily Nitrogen Loads**  
 (Average Pounds per Day)

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 WOODLAND CREEK  
 POLLUTANT LOAD REDUCTION PROJECT

0 Feet 3,000



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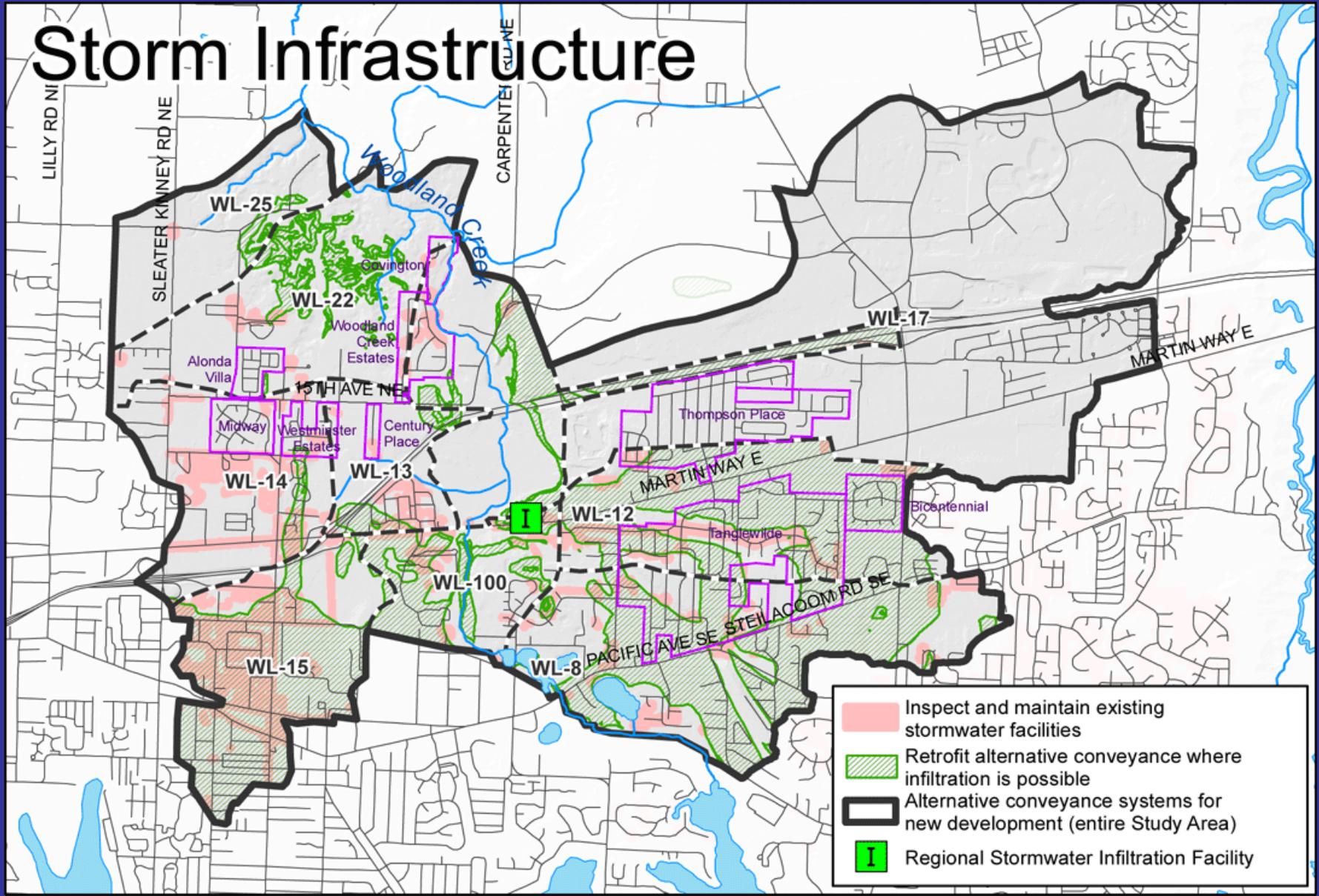
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# Group Workable Solutions into “Mgt Options”

Possible Solutions		Management Option (Level of Effort)		
		Low	Medium	High
Septic Systems	Convert to sewer	NONE	Woodland Ck Estates, Tanglewilde, Bicentennial, So. of Pacific	Most high-density neighborhoods
	<u>Require</u> fecal coliform treatment	Systems near streams north of I-5	Systems near streams north of I-5	All systems near streams
	<u>Promote</u> nitrate reduction treatment	Most systems	Systems not converting to sewer	NONE
Stormwater Treatment	Maintain all stormwater facilities	Public only	Medium level of effort	High level of effort
	Alternative stormwater systems for new development	All actions included in each option, but may vary in level of effort		
	Replace pipes with stormwater swales			
	Regional infiltration pond	NONE	Tanglewilde/ Martin Way	Tanglewilde/ Martin Way
Stormwater Management	Pet waste management and owner education	All actions included in each option, but may vary in level of effort		
	Landscaping/fertilizing education			
	Implement 2005 Ecology Stormwater Manual			

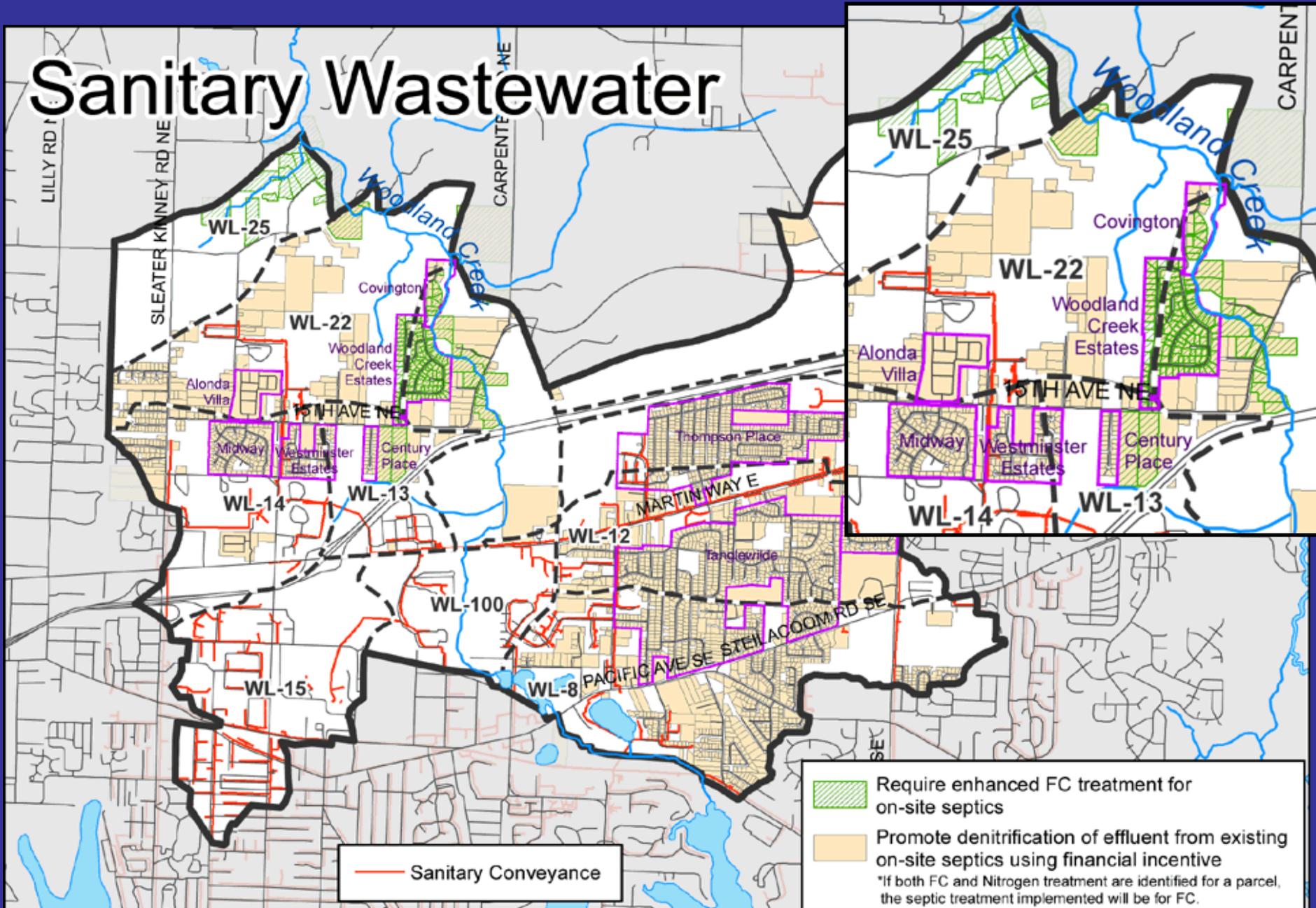
# Medium Level Option for Stormwater

## Storm Infrastructure



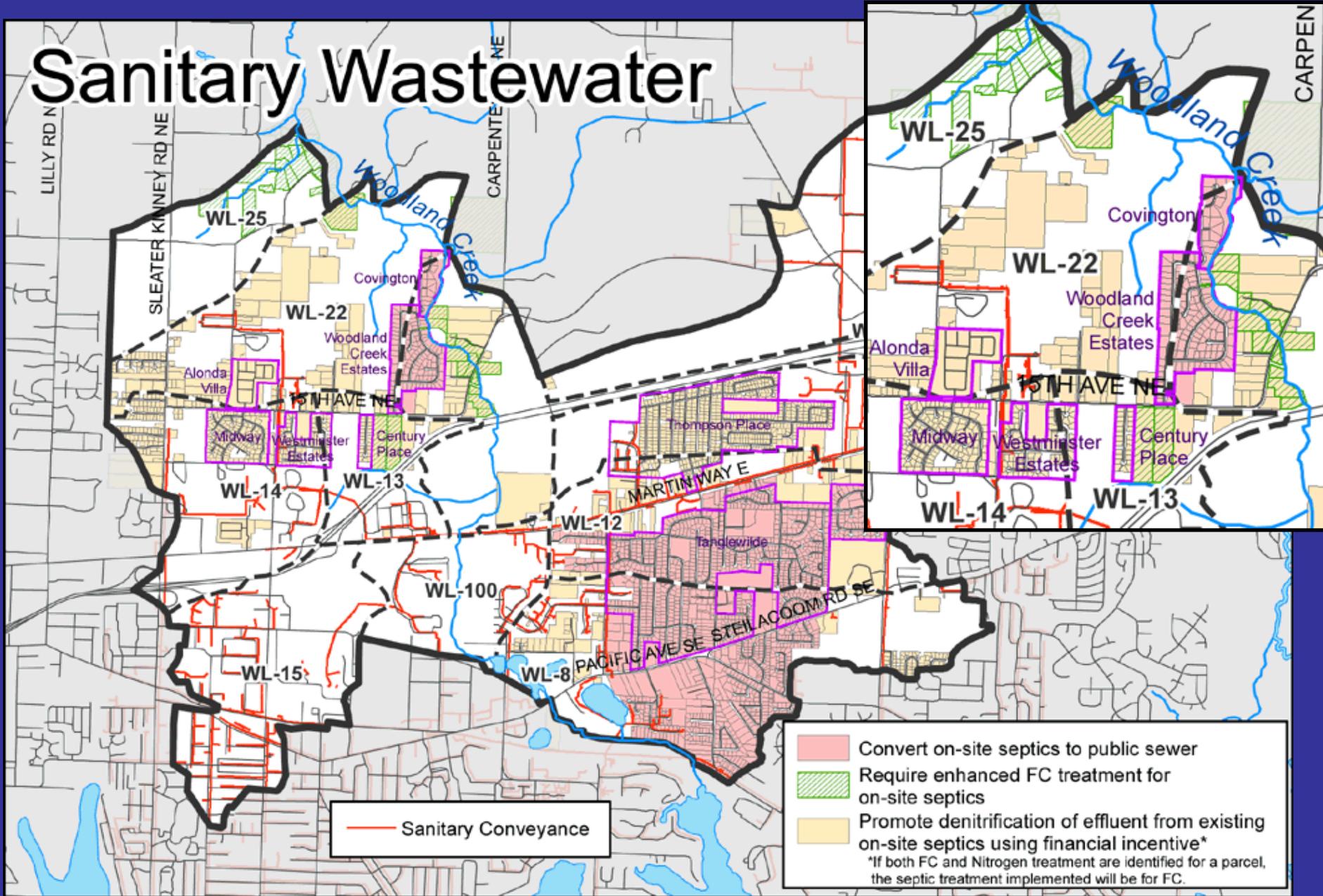
# Low Level Option

## Sanitary Wastewater



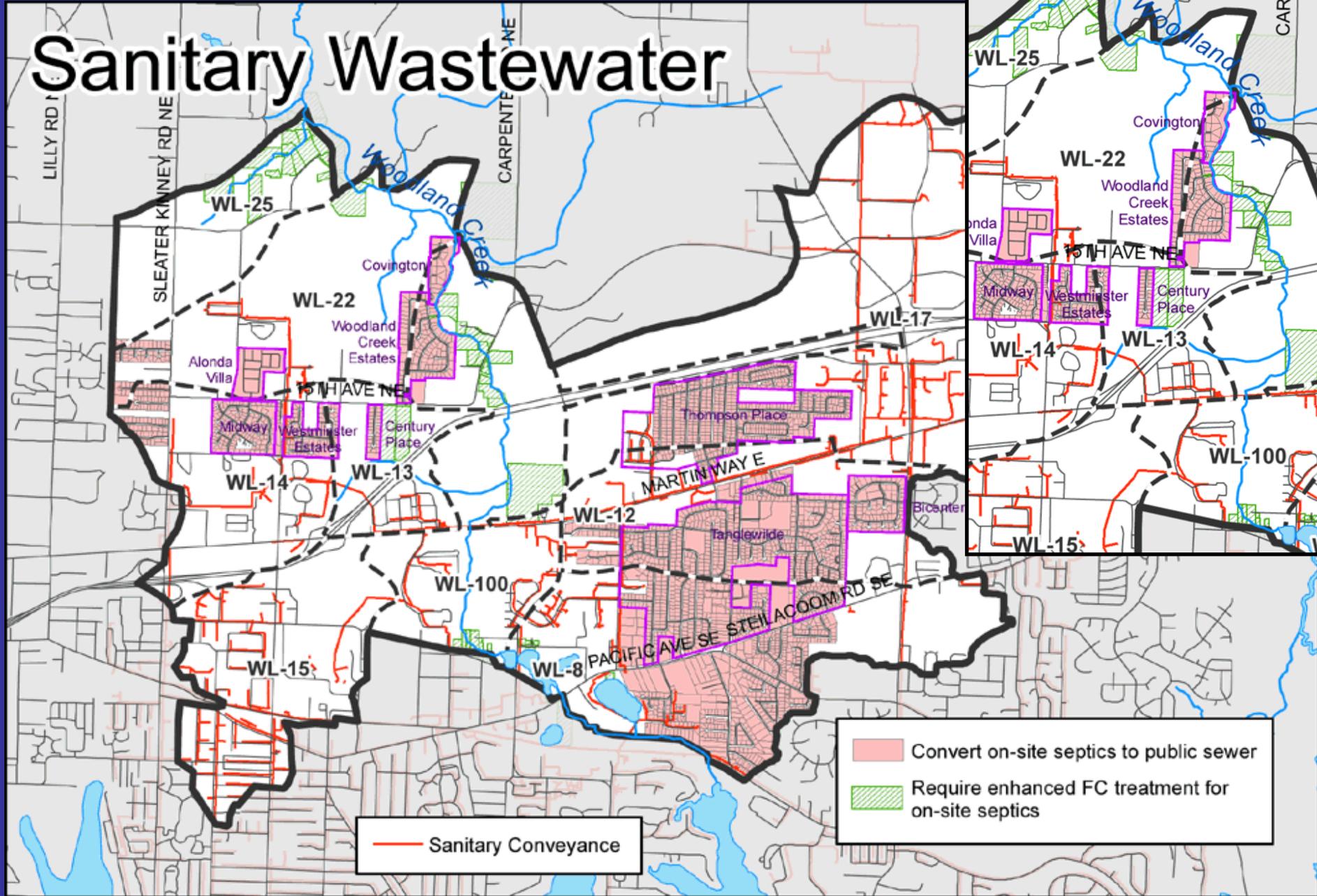
# Medium Level Option

## Sanitary Wastewater

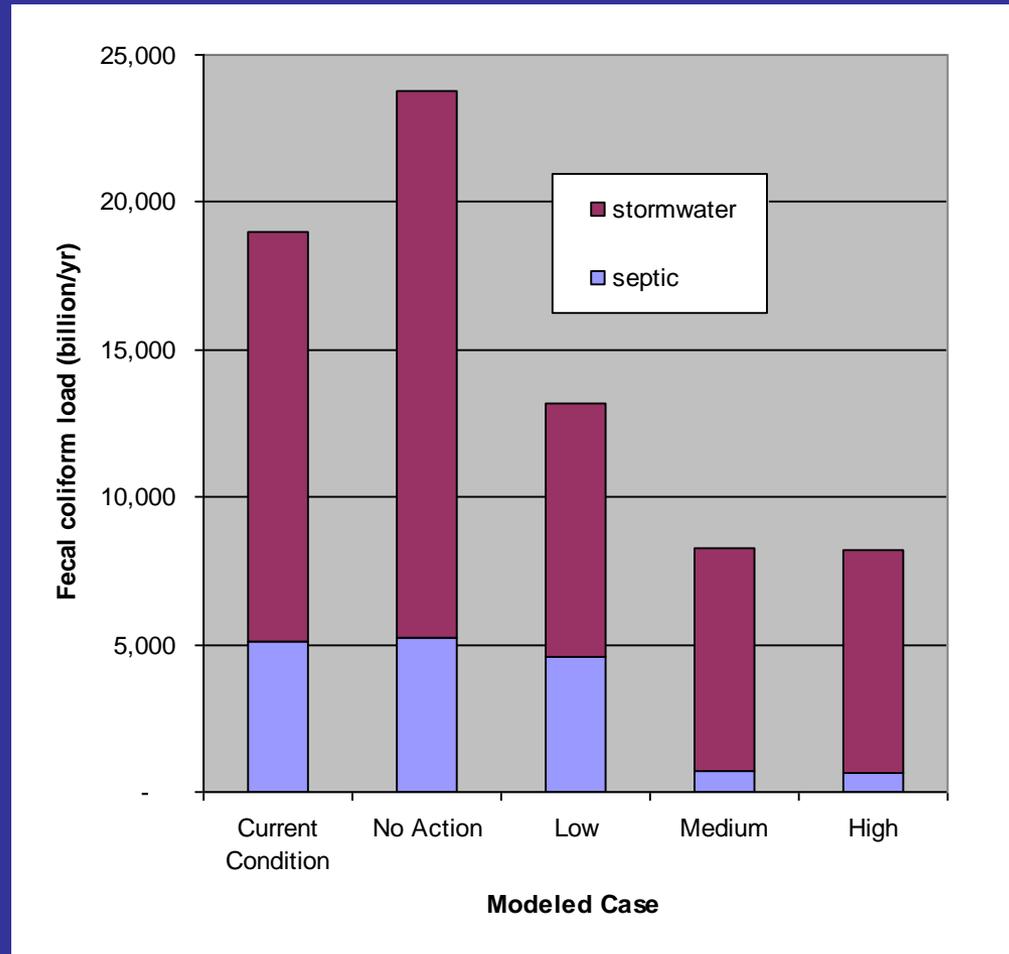


# High Level Option

## Sanitary Wastewater



# Estimated Future Fecal Coliform Loads



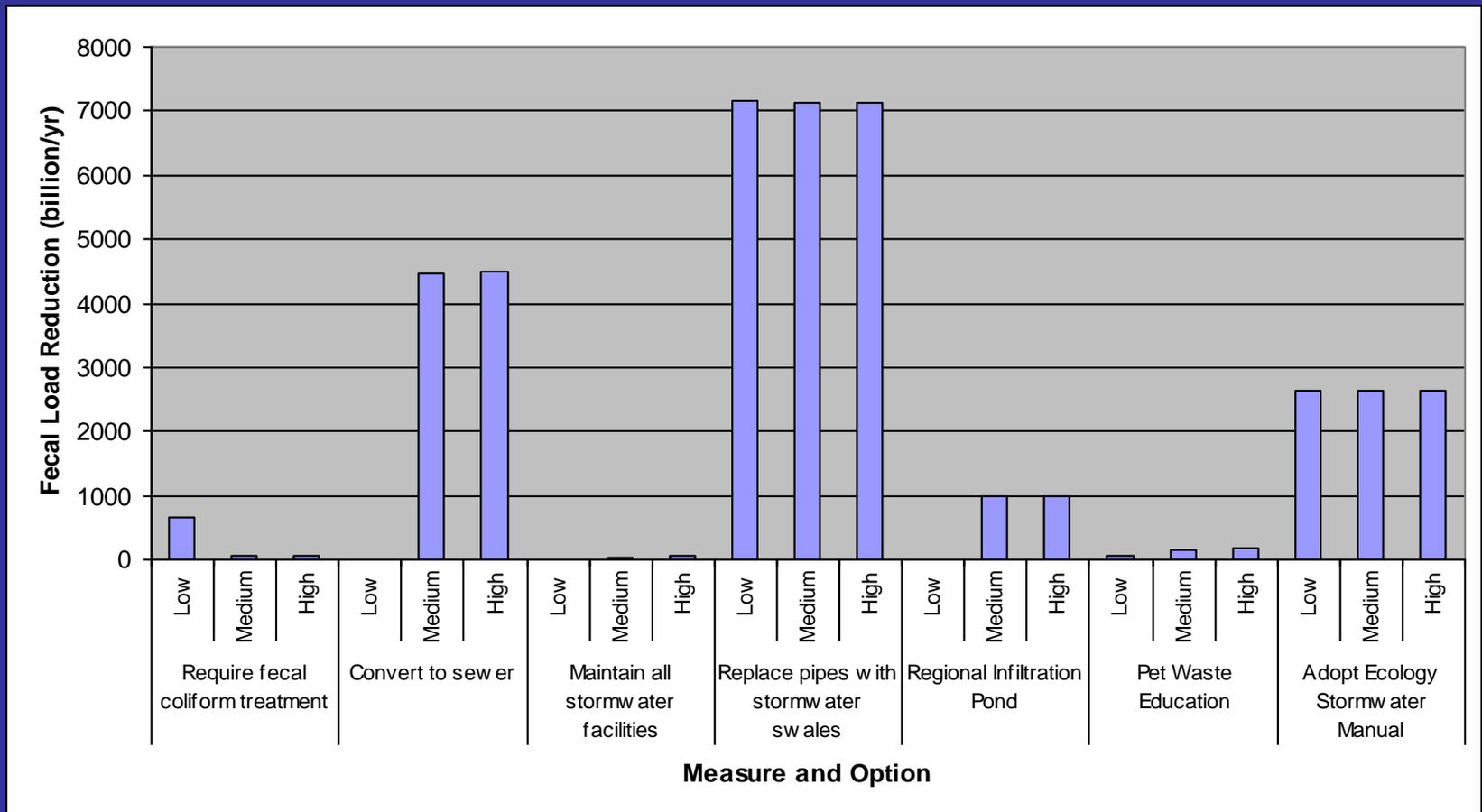
Summed for sub-basins adjacent to creek



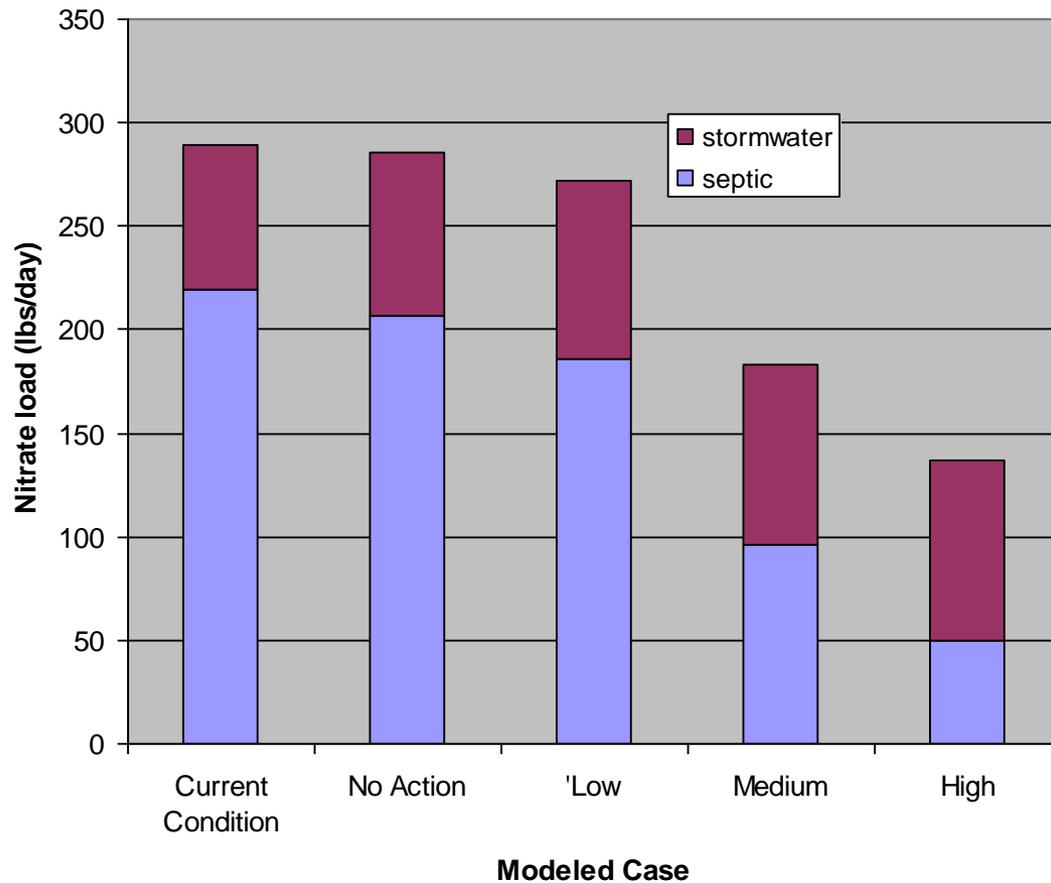
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# Estimated Future Fecal Coliform Reduction



# Estimated Future Nitrate Loads



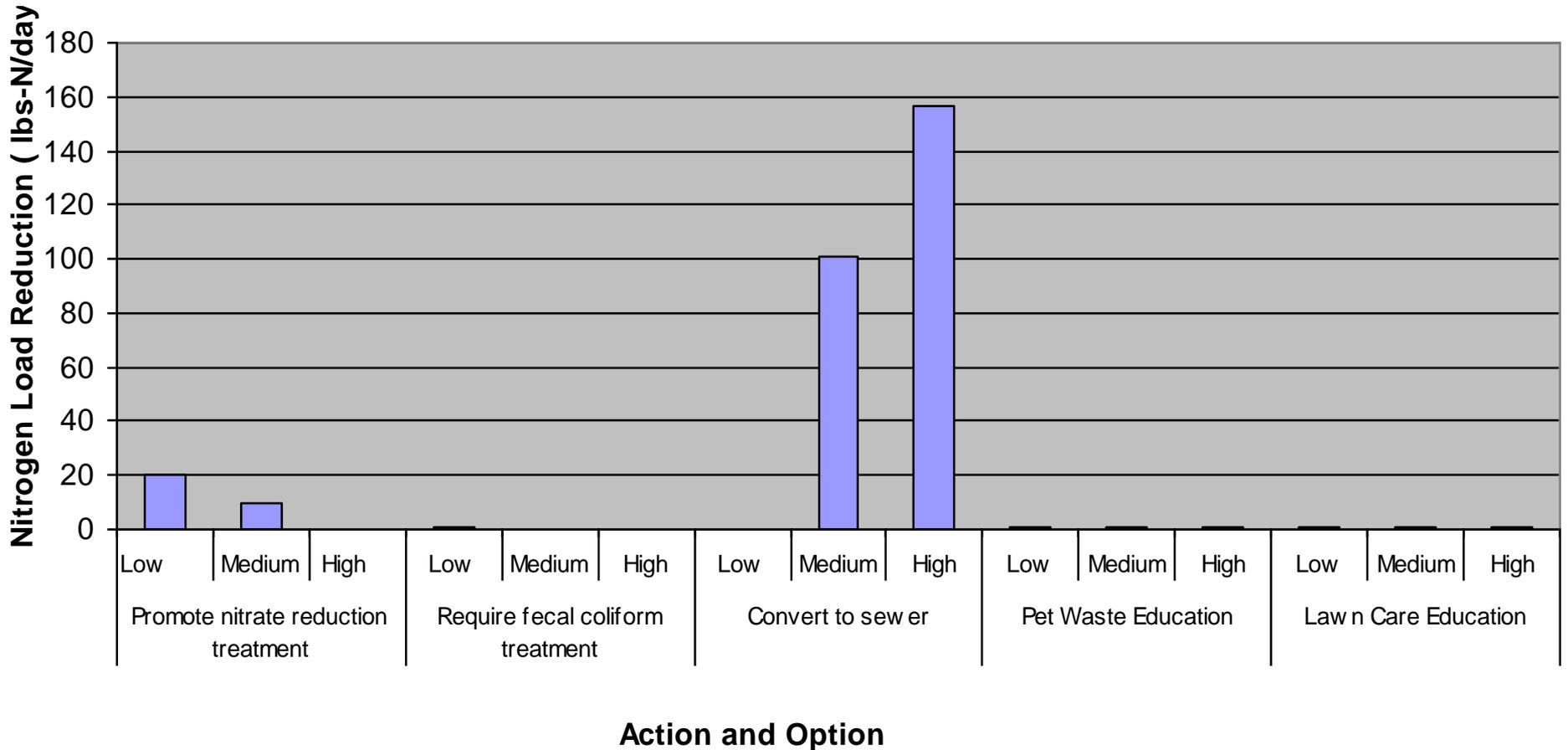
Summed for all sub-basins



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# Estimated Nitrate Reduction to Groundwater



# Cost Estimates

Low option:	\$27 million
Medium option:	\$78 million
High option:	\$105 million

\* Construction plus 20-years of operation (present value)



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# Medium Option is Consultants' Recommendation

- Low Option does not meet goals
- High Option is too expensive
- Medium Option - meets the goals at lowest cost



# Woodland Creek Estates Sewer Project

- Addresses fecal coliform bacteria pollution to Woodland Creek and nitrate pollution in shallow groundwater
- Project would sewer 131 homes
- Thurston County has secured \$5 million in grant and loan funding.
- Design and easement acquisition in 2011.
- Construction to begin 2012.



# Tanglewilde Stormwater Project

Obtained Ecology grant to reduce stormwater volume and treat stormwater through:

- Rehabilitation of existing stormwater dry wells
- Construct rain gardens and swales

