



Principles of Conservation

July 9, 2015

Dan Haller, PE



Conservation Principles

- *Ecology is statutorily mandated to encourage conservation.*
- *Ecology and others fund conservation projects.*
- *Conservation generally results in non-consumptive water savings.*
- *After conservation, consumptive use under a water right increase.*
 - *Yields increase in agricultural rights.*
 - *Municipal consumption inversely proportional to %loss.*
- *Conservation typically results in reach benefits (e.g. primary reach benefits).*

Toilet Conservation Water Budget

Conventional Toilet



5 gal/flush



Wastewater Treatment Plant



Low-Flow Toilet



1.6 gal/flush

Low Flow

1.4+ gal to river

0.2 gal to ET

1.6 gal/flush

Conventional

4.5+ gal to river

0.5 gal to ET

5 gal/flush

Conservation Savings

~3 gallons/flush



House is ~50% consumptive.

1.5 gallons to ET.

1.5 gallons to river.

River flow diminished by 1.5 gal/flush.

Reclaimed Water Budget

Reclaimed Water



Reclaimed Water Treatment Plant



1 gpm / 1,440 gpd

Reclaimed Water

RCW 90.46.130 “. . . facilities that reclaim water under this chapter shall not impair any existing water right . . .”

Before (1 gpm)

1,300 gpd to river

140 gal to ET (10%)

1,440 gpd

After (0 gpm)

1,440 gpd to new uses

Conservation Savings

1,440 gpd



House is ~50% consumptive.

720 gpd to ET.

720 gpd to reclaimed treatment plant.

River flow diminished by 720 – 1,440 gpd.



Pipe Leak Conservation Water Budget



Before (1 gpm leak)
1,300 gpd to river
 140 gal to ET (10%)
1,440 gpd

After (0 gpm)
1,440 gpd not pumped

Conservation Savings
1,440 gpd



House is ~50% consumptive.
720 gpd to ET.
720 gpd to river.
River flow diminished by 720 gpd.

