Orenco Systems®, Incorporated

Orenco Effluent Sewers & Packed Bed Treatment

Integrating Decentralized Technology Into Regional Wastewater Planning

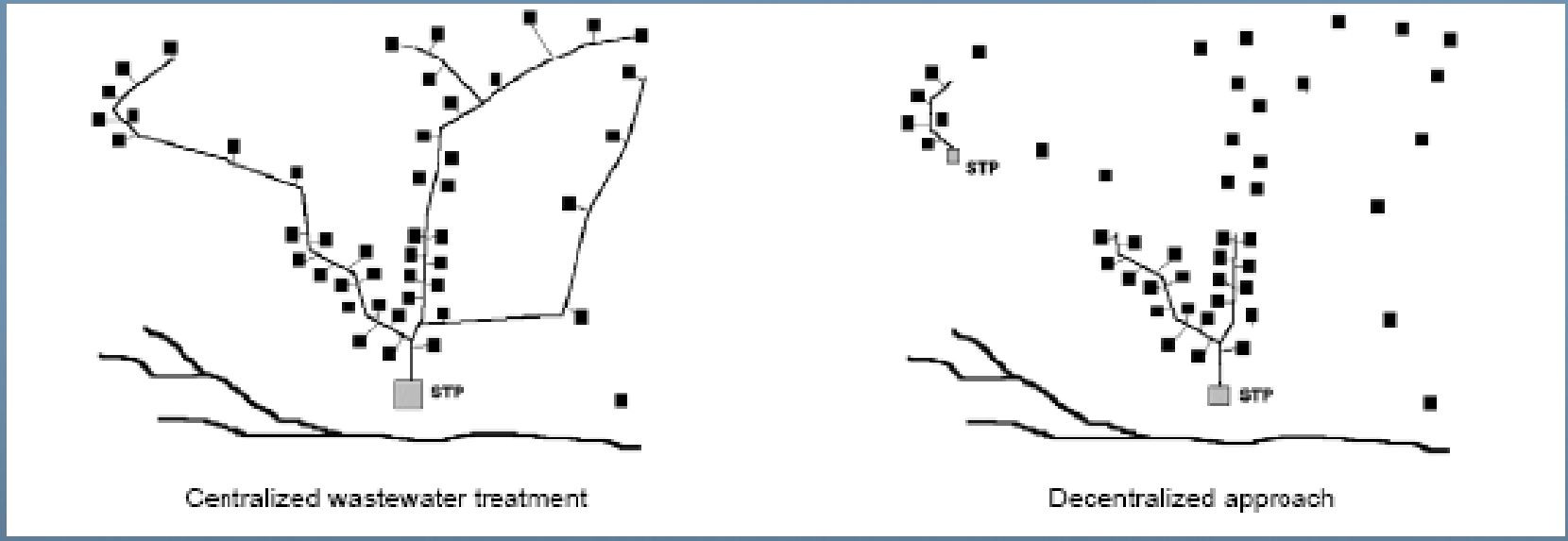
- Death
- Taxes
- Turning Into a Red Sox Fan

- 3 Things you can count on if a Long Island Community chooses the wrong sewer program

Decentralized Wastewater Management (DWM)

The collection, treatment, and disposal/reuse of wastewater from individual homes, clusters of homes, isolated communities, industries, or institutional facilities, as well as portions of existing communities at or near the point of waste generation. (Tchobanoglous 1998)

Centralized vs. Decentralized



Centralized wastewater treatment

Decentralized approach

Source: Draft Handbook for Management of Onsite and Clustered (Decentralized) Wastewater treatment Systems (USEPA 2003)

Clustered Wastewater System

- Bridges the gap between on-site treatment (the original decentralized system) and centralized systems
  - ~ Technology
  - ~ Responsible Management Entity (RME)
  - ~ Sustainability / Life Cycle Cost
  - ~ Implementing a Successful Project

Components of a Wastewater System

1. Onlot – from house tight to right of way (usually in the street in front of house)
2. Collection – all piping, lift stations, transmission mains and appurtenances between the onlot and the treatment headworks.
3. Treatment- between collection and dispersal, usually begins at the treatment plant headworks.
4. Dispersal- end of plant treatment train, going to a receiving body of water, or surface/subsurface re-use.

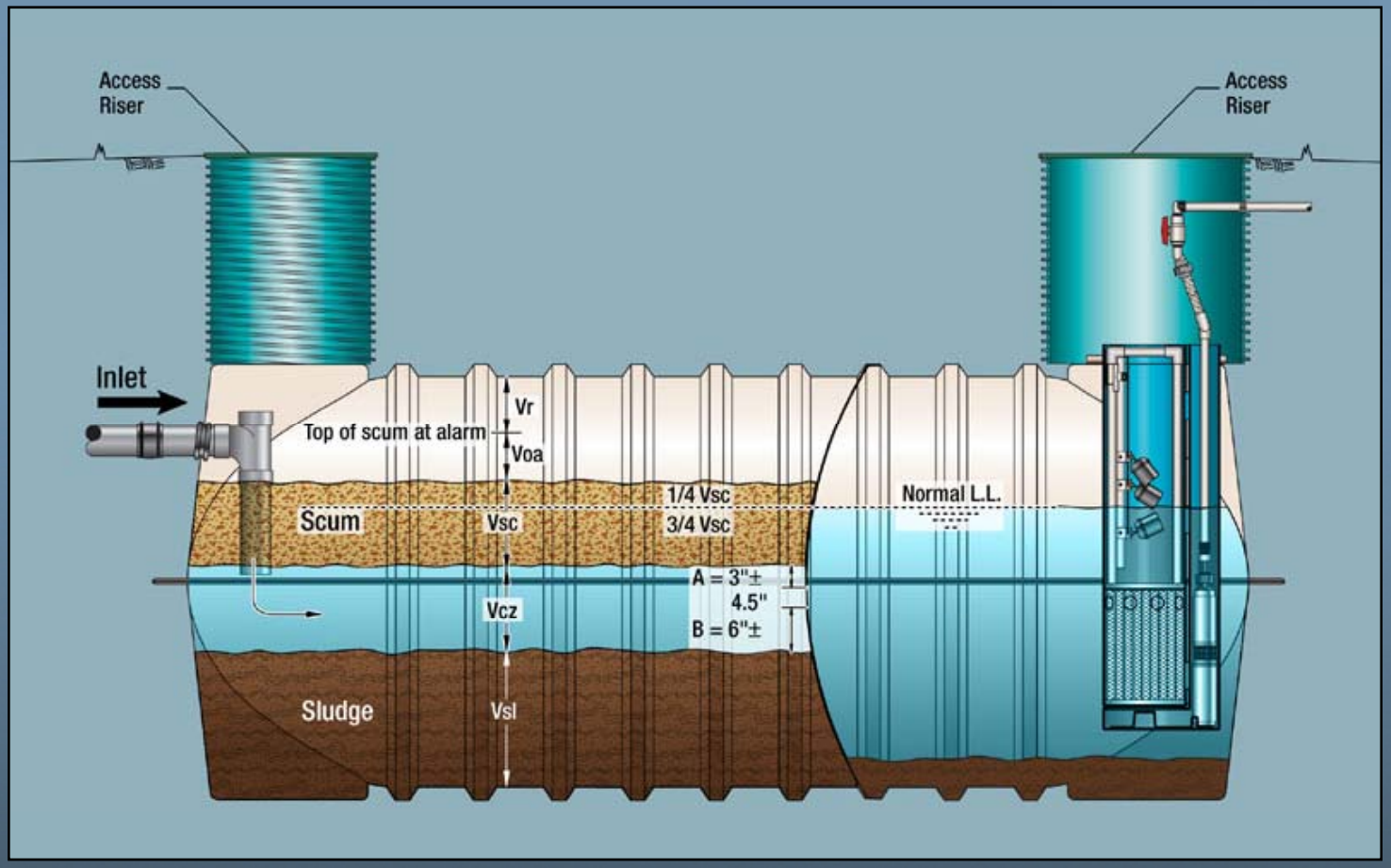
Components of a Clustered Collection & Treatment Approach

Wastewater Collection

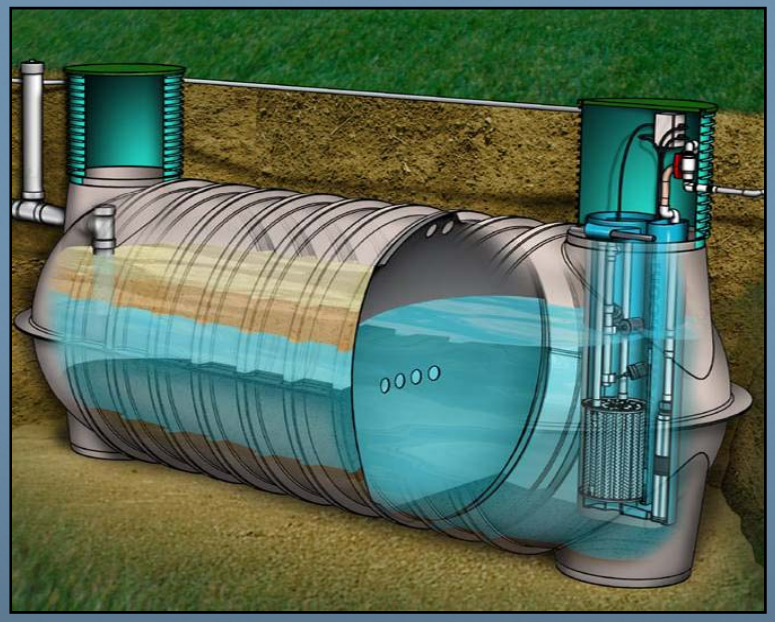
ized Sewer Systems

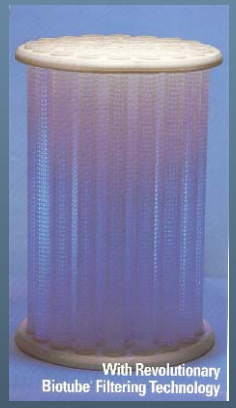
Clustered Treatment & Dispersal

Effluent Sewer



Effluent Sewer – Major Components





Quality of Treatment, cont.

	Orenco® Effluent Sewer	Conventional Gravity Sewer	Grinder Pump Sewer
Characteristics	low strength *(liquids only)*	full strength *(liquids & solids)*	full strength *(slurry)*
BOD_5	100-150 mg/L	200-450 mg/L	300-450 mg/L
TSS	20-40 mg/L	200-450 mg/L	300-450 mg/L
Fat, Oil, & Grease	10-20 mg/L	50-150 mg/L	60-160 mg/L

What is AdvanTex®?

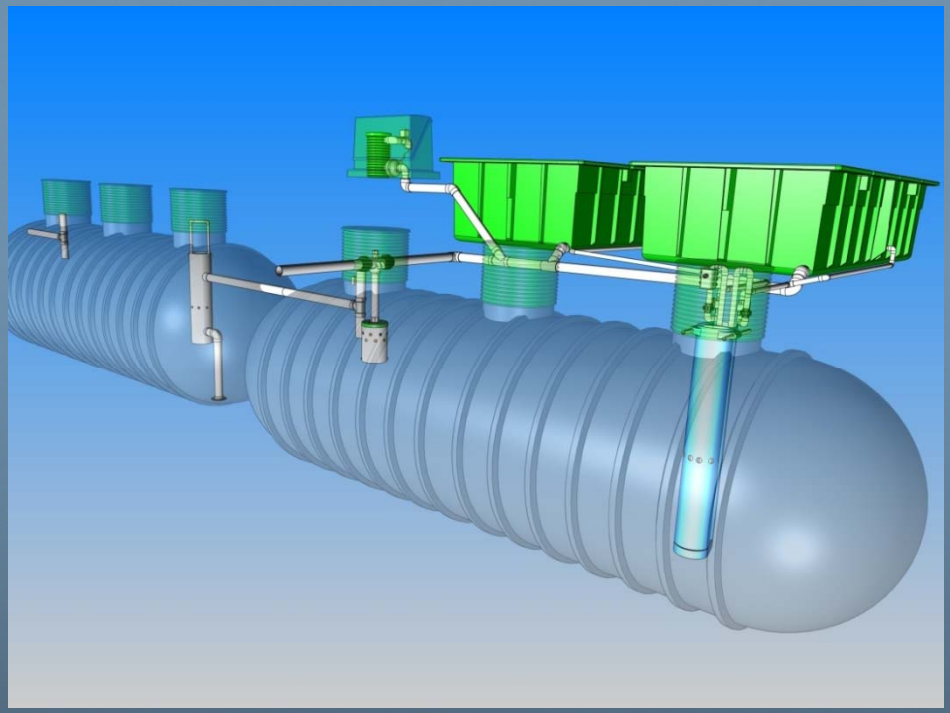
- Packed bed filter
- Engineered textile material
- Appropriate tankage and timed dosing
- Complete, pre-manufactured modular package

Treatment

Commercial AdvanTex® ... AX100

- Physical specifications
  - ~ 16' x 8' x 3.5'
  - ~ Footprint: ~128 sq. ft.
  - ~ Dry weight: ~2000 lb.
- Treatment capacity
  - ~ Design flow: 5000 gpd

AdvanTex® Treatment Systems



- R&D since 1996
- 3rd party technology verification (NSF, NovaTec, UC Davis)
- Monitoring at government-funded demonstration sites
- Documented treatment performance
- Thousands of units in operation

We Know Management is Essential!

- **Without it**, even the BEST of rules, regulations, guidelines, and programs won't succeed!
- **With it,** even the POOREST of rules, regulations, guidelines, and programs can succeed!

5 Models For Management of WW Systems

Per the EPA*

1. System owned and operated by property owner
2. System owned by property owner and managed through maintenance contract
3. System standards established by permit; owner contracts with maintenance entity
4. System owned by property owner; utility (RME ... Responsible Management Entities) provides operation and maintenance
5. System owned and managed by utility (RME)

** Voluntary National Guidelines for Management of Onsite and Clustered (Decentralized) Wastewater Treatment Systems, US EPA, March 2003.*

South Alabama Utilities

- 16 Systems
- 1,300 Connections
- Maintained by 2 FTE's

An Introduction to Your
Wastewater System

Your house has an effluent sewer system that is serviced and maintained by South Alabama Utilities.

Effluent sewers are different from the sewer you may be used to. Effluent sewers are kind of a water system in reverse, with a watertight underground tank somewhere in the yard. (See illustration.)

Here's how it works:

- Wastewater flow from your house to the underground tank. There, it settles into three layers: sludge on the bottom, scum on the top, and clear effluent in the middle.
- The effluent is pumped (or flows by gravity) through a filter.
- Then the filtered effluent (and ONLY the effluent) flows through service lines, to a main line, that runs to a treatment system.
- A control panel operates the pump, which pumps the effluent out of your tank, to the treatment system.

Solids remain in the tank, where they decompose naturally. The whole system is environmentally friendly and energy efficient.

South Alabama Utilities checks your system regularly, maintains the pump and control panel, and pumps the tank when necessary.

If you take good care of your system, it will work quietly and invisibly for you, just like any other sewer system. If you don't, it won't. That means, you can't do the following:

- You can't pour grease down the drain.
- You can't pour harsh de-cloggers, such as Drano®, down the drain. (Use a plunger or metal snake instead.)
- You can't flush any nonfood items down the drain (for example, no sanitary napkins, no condoms).

Enclosed is a pamphlet with more information about "Do's and Don'ts" for your system. Please familiarize yourself with this pamphlet. It is your responsibility to take good care of the tank that's on your property. If your tank has to be pumped prematurely because of misuse, you will be responsible for paying that cost. This is written into the deed on your property.

If you have any problems with your wastewater system, please call South Alabama Utilities at 251-649-4536.

South Alabama Utilities
Office and Emergency Phone Number
(251) 649-4536
P.O. Box 519
6903 McGeary Road
Semmes, AL 36575

centralized Sewer Systems

Responsible Management Entity

- O&M Considerations
  - ~ Can be maintained with small equipment
  - ~ Collection & treatment are integrated to produce manageable O&M cost
  - ~ Less biosolids
  - ~ I&I (Infiltration and Inflow of extraneous water) can be eliminated
  - ~ Less costly R&R (Renewal and Replacement) events
  - ~ R&R is generally a component of O&M (R&R cannot be ignored)

Sustainability

- Sustainability

"Sustainability" was popularized by the World Commission on Environment and Development (WCED) in its 1987 report entitled Our Common Future, suggests that a project is sustainable where it;

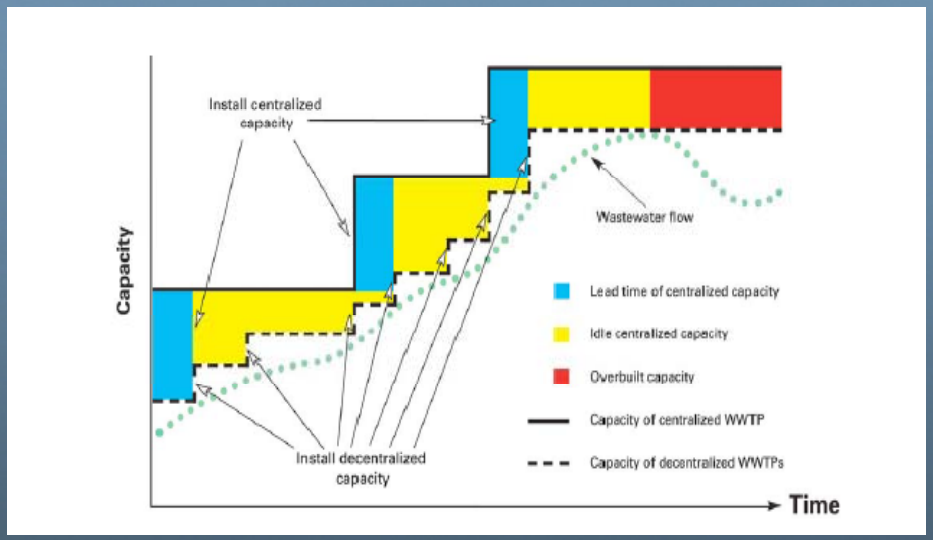
"meets the needs of the present without compromising the ability of future generations to meet their own needs."

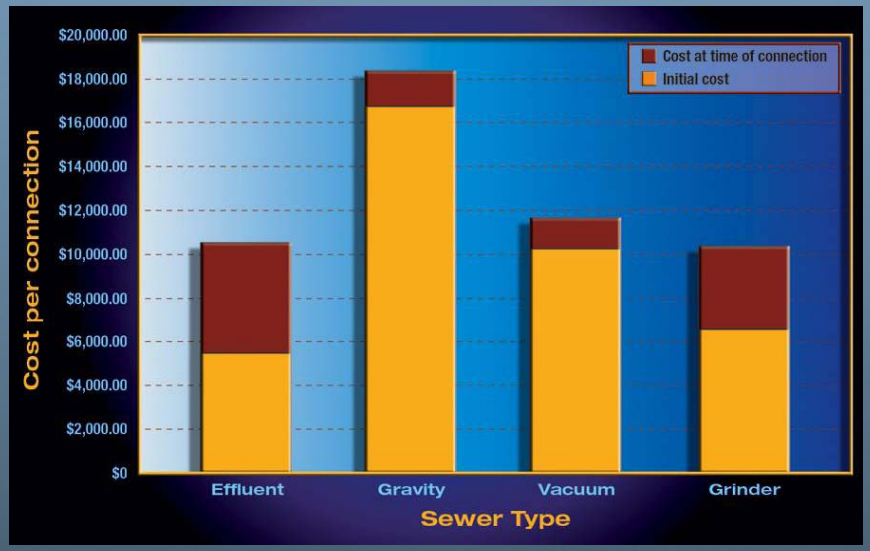
Important Principle to Remember

"only systems can be sustainable"

Final Discussion Items

- Reduced Up-front Capital Cost
  - ~ Small diameter, shallow bury collection mains
  - ~ On-site costs are deferred until time of connection
  - ~ Treatment is modular and conducive to phasing





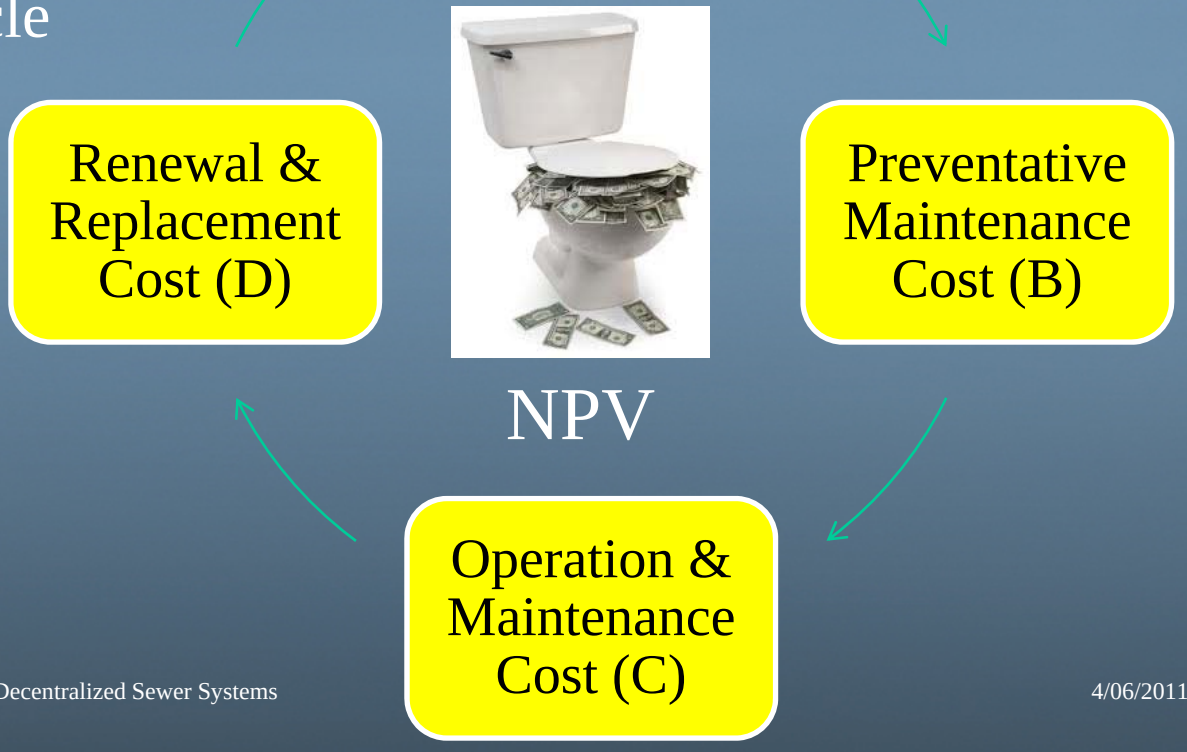
Life Cycle Costs

Life Cycle Cost (Net Present Value)

NPV= Total Cost in Today's $

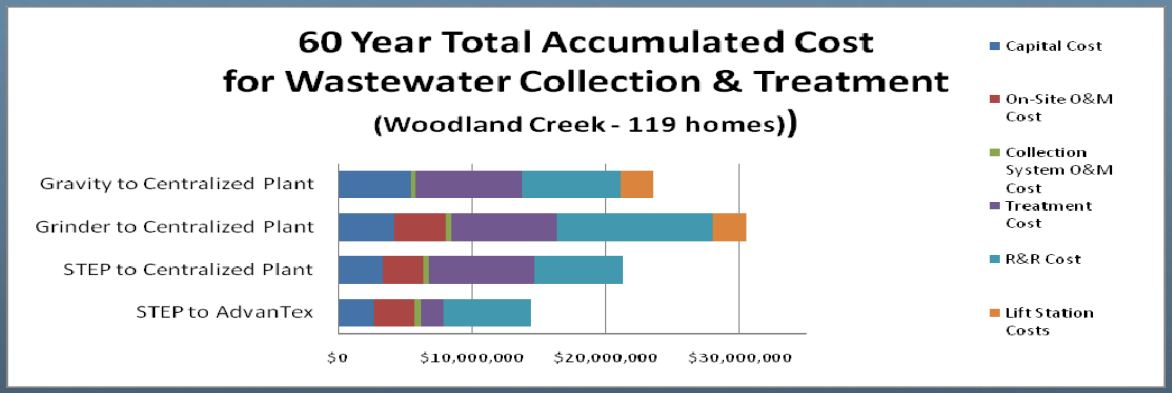
of A+B+C+D

For a ***complete*** life cycle



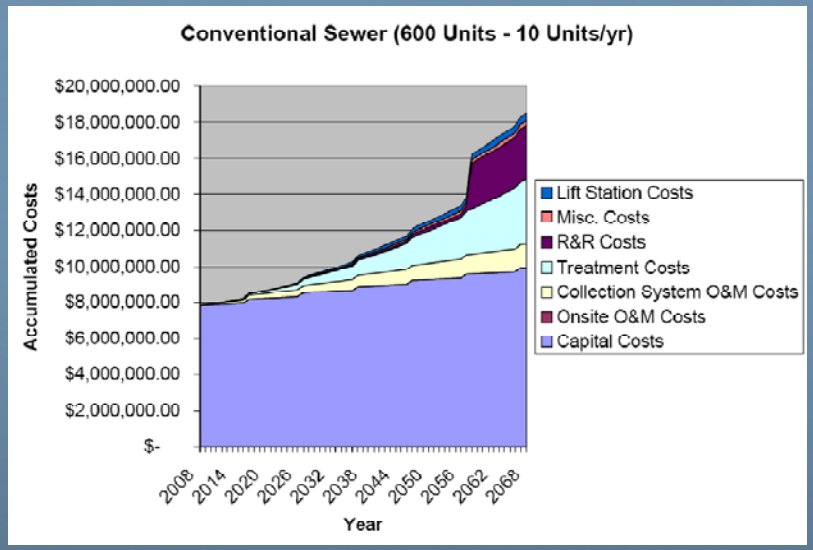
Life Cycle Costs (Continued)

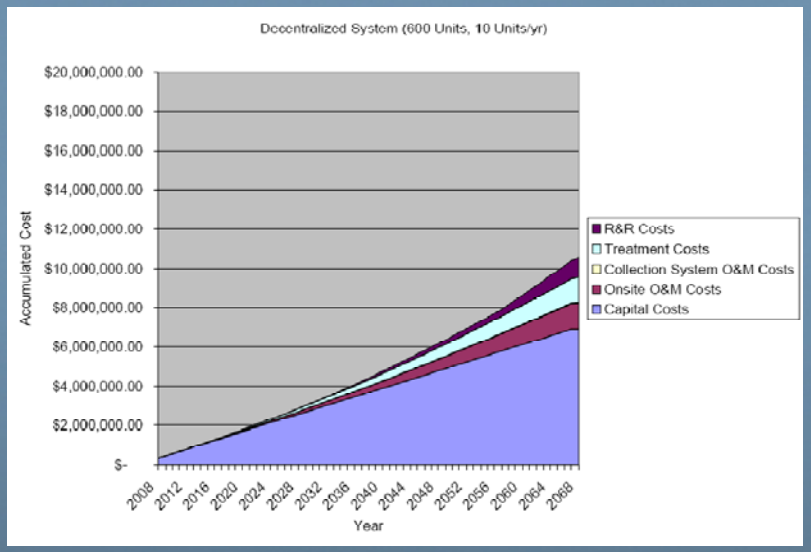
- Life Cycle Cost Considerations
  - ~ 20 Year life cycle analysis does not capture the significance of long term R&R for conventional systems
  - ~ There is value in deferring capital expenses until time of connection
  - ~ Life cycle cost should be for the system, not the components of a system



Life Cycle Costs (Continued)

~ Life cycle costs must capture costs that increase with age (I&I, system failures, etc)





~ Analysis should consider lot density and rate of build-out

~ O&M is not a "snap-shot" in time, it is a variable cost that starts very low and increases relative to time

Implementing a Successful Project

Project Delivery

- Design Build vs. Design Bid Build
  - ~ Saves Time
  - ~ Lowers Cost
  - ~ Lowers risk
  - ~ Incentivizes Innovation

  Design Build Institute of America (www.dbia.org)

C'mon Out To Oregon

Thanks for your hospitality!!!!

Orenco Systems®, Inc.

www.orenco.com