Moving to Utility of the Future

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Introduction

- Urban sanitation - change needed
- Improve efficiency and cost
- Disposal of treated water is expensive
- Consider:
  - Water re-use from wastewater facilities
  - Energy recovery
  - Nutrient recovery

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Wastewater

- Water quality adversely affected by human activity
- Can cause disease if not treated
- Originates from activities, runoff, infiltration

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Nutrient Recovery

- Recovers phosphorus and nitrogen
- Transforms into fertilizer
- Prevents harmful algal blooms (HAB’s)

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Wastewater Cleanup

- Physical, chemical and biological treatment
- Primary treatment: ⇩ BOD and settleable solids
- Secondary treatment: ⇩ BOD, solids, pollutants
- Tertiary treatment: ⇩ pathogens and pollutants

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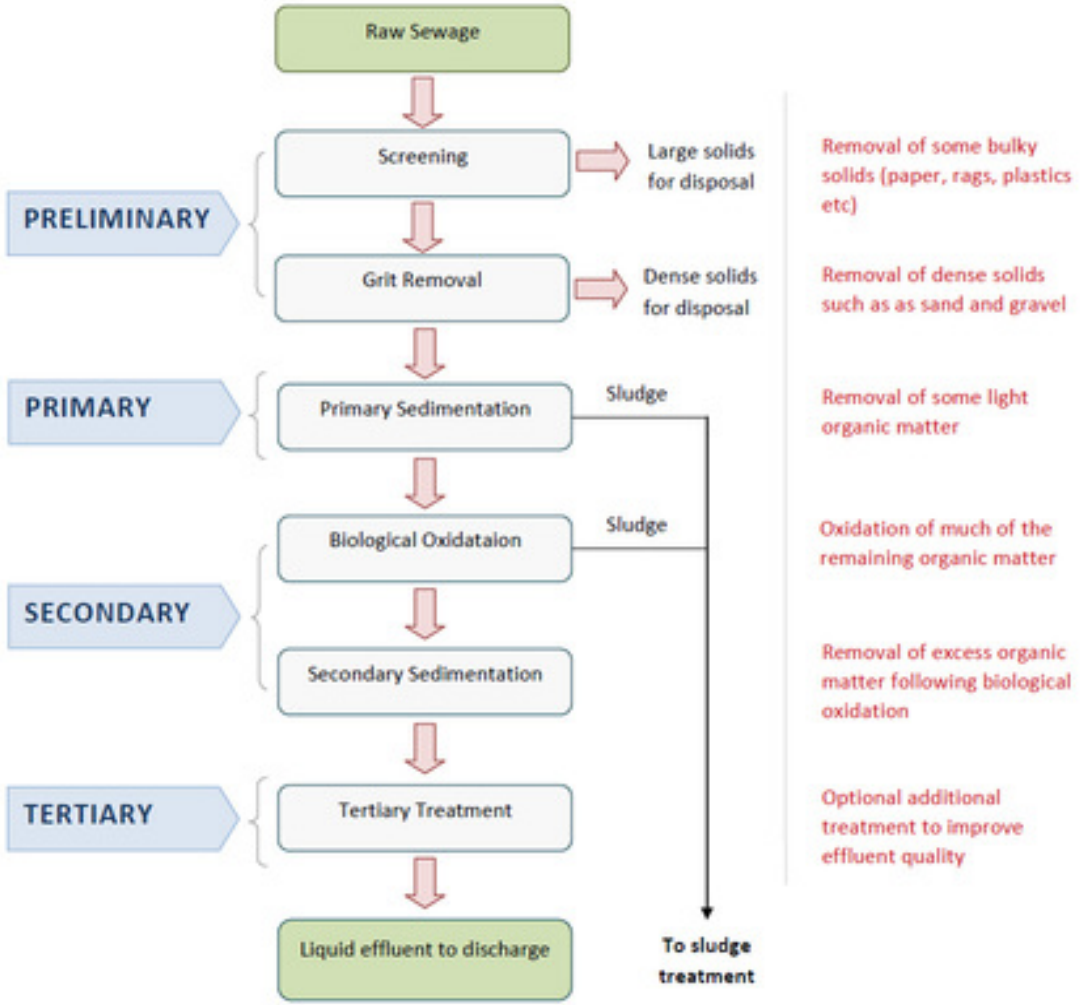
Typical Stages in Wastewater Treatment



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Disadvantages to Current Wastewater Treatment

- Sludge generated – expensive to dispose
- Cannot respond to composition variation
- High energy requirements
- Expensive operations and maintenance

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Sludge Removal

- Current treatment process: sludge removal
- Digestion: reduce organic matter and disease-causing microorganisms
- Anaerobic, aerobic, composting
- New technologies for sludge removal:
  - Automated Chemostat Treatment (ACT)
  - KemiCond Process

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Utility of the Future (UOTF)

- No longer cleaning wastewater prior to discharge to waterways
- Instead reclaims and reuses water
- Extracts and finds use for nutrients
- Generates renewable energy
- Uses green infrastructure

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UOTF cont'd

- Non-potable wastewater reuse
  - industrial cooling, toilet flushing, landscape irrigation, fire fighting and ecological enhancement
- Distributed, automated and circular
- Automated, web-enabled, cloud computing

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Conclusion

- Pace of change is slow
- But change is achievable
- Benefits: financial and environmental

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Thank You

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