

# Everett Long-Range Strategic Plan for Biosolids Management Plan

## Biosolids 101 Workshop



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# Agenda

1. Project Overview
2. Introductions
3. General Wastewater Treatment & Biosolids Generation
4. City of Everett Wastewater & Biosolids Program
5. Regulations
6. Trends in Biosolids Management
7. Assurance of Sustainable Biosolids Management Program
6. Future Steps for Strategic Planning
7. Treatment Facility & Biosolids Use Facility Tours



## Project Overview

**Strategic Plan = A plan to define strategy, direction, and allocation of resources.**

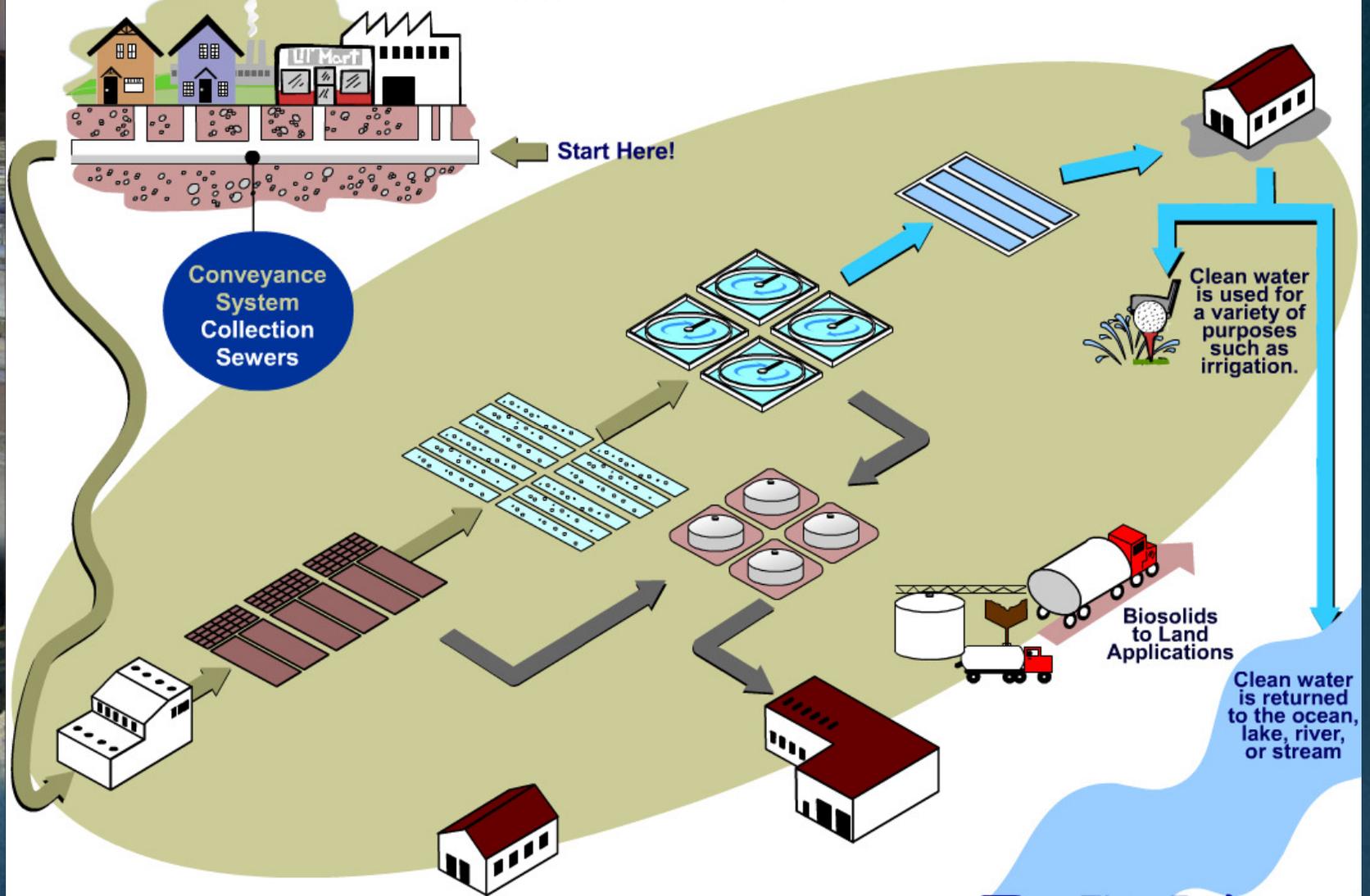
- **Form Stakeholder Committee**
- **Basis of Planning (HDR) & Biosolids 101**
- **Strategy Development (Goals/Vision, SWOT analysis) workshop**
- **Market Survey (HDR)**
- **Develop evaluation criteria**
- **Cost projections (HDR)**
- **Recommendations on future direction of Everett's biosolids management program**



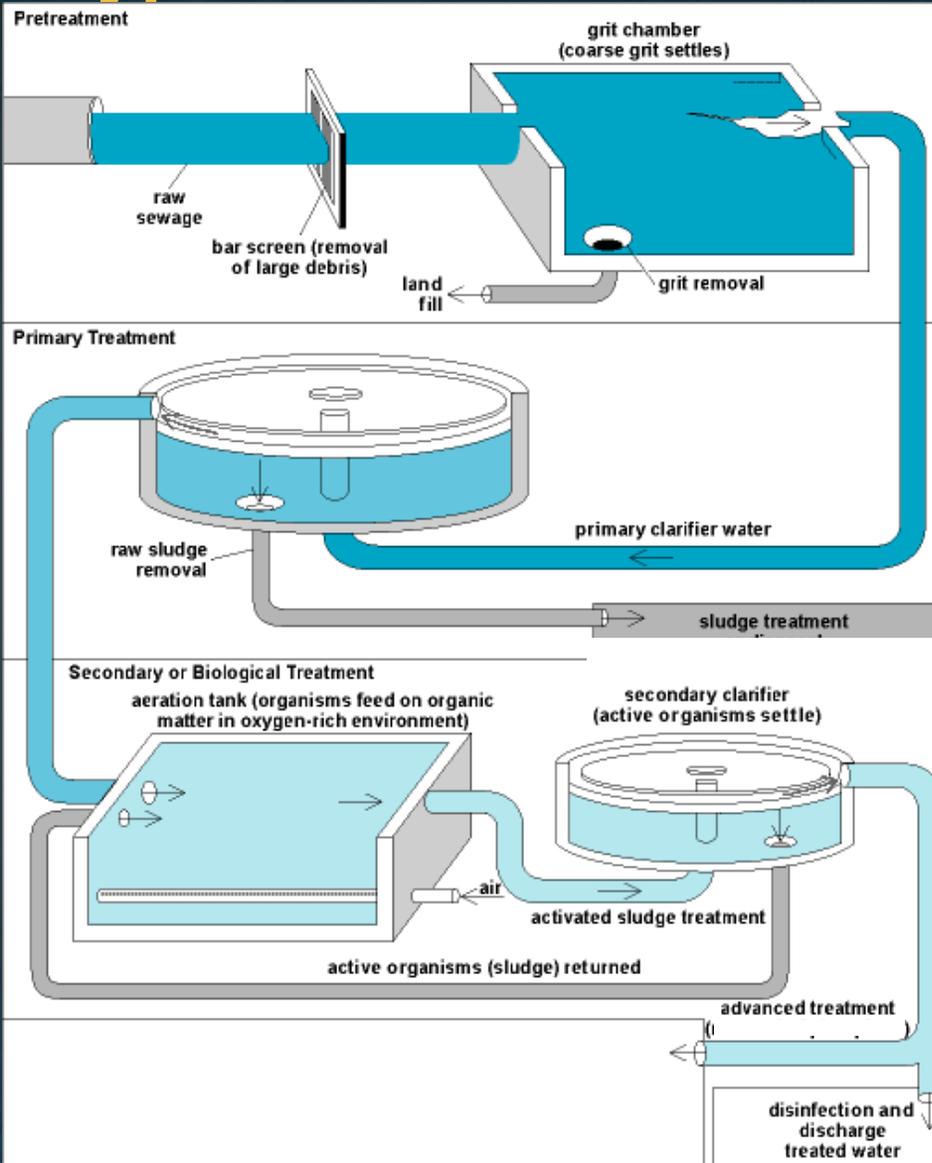
# Introductions

1. Name?
2. Organization?
3. Wastewater treatment knowledge level/background?
4. Biosolids knowledge level/background?
5. Other?

# Wastewater Collection and Treatment



# Typical Wastewater Treatment



Pretreatment: removal of contaminants prior to discharge into sewer

Preliminary Treatment: removal of rocks and debris

Primary Treatment: gravity settling of organic solids

Secondary Treatment: biological treatment for removal of soluble BOD

Tertiary Treatment: advanced removal of solids (filtration),

nutrients, etc.

# Typical Solids Processing Schematic

Primary  
sludge



Thickening



Waste  
Secondary  
Sludge (WSS)



Stabilization



Dewatering  
(optional)



- Agriculture
- Compost
- Landscaping
- Forests
- Golf courses
- Coal substitute

Examples:

- Anaerobic Digestion
- Aerobic Digestion
- Lime stabilization

Screenings  
Grit



Landfill





# Definitions

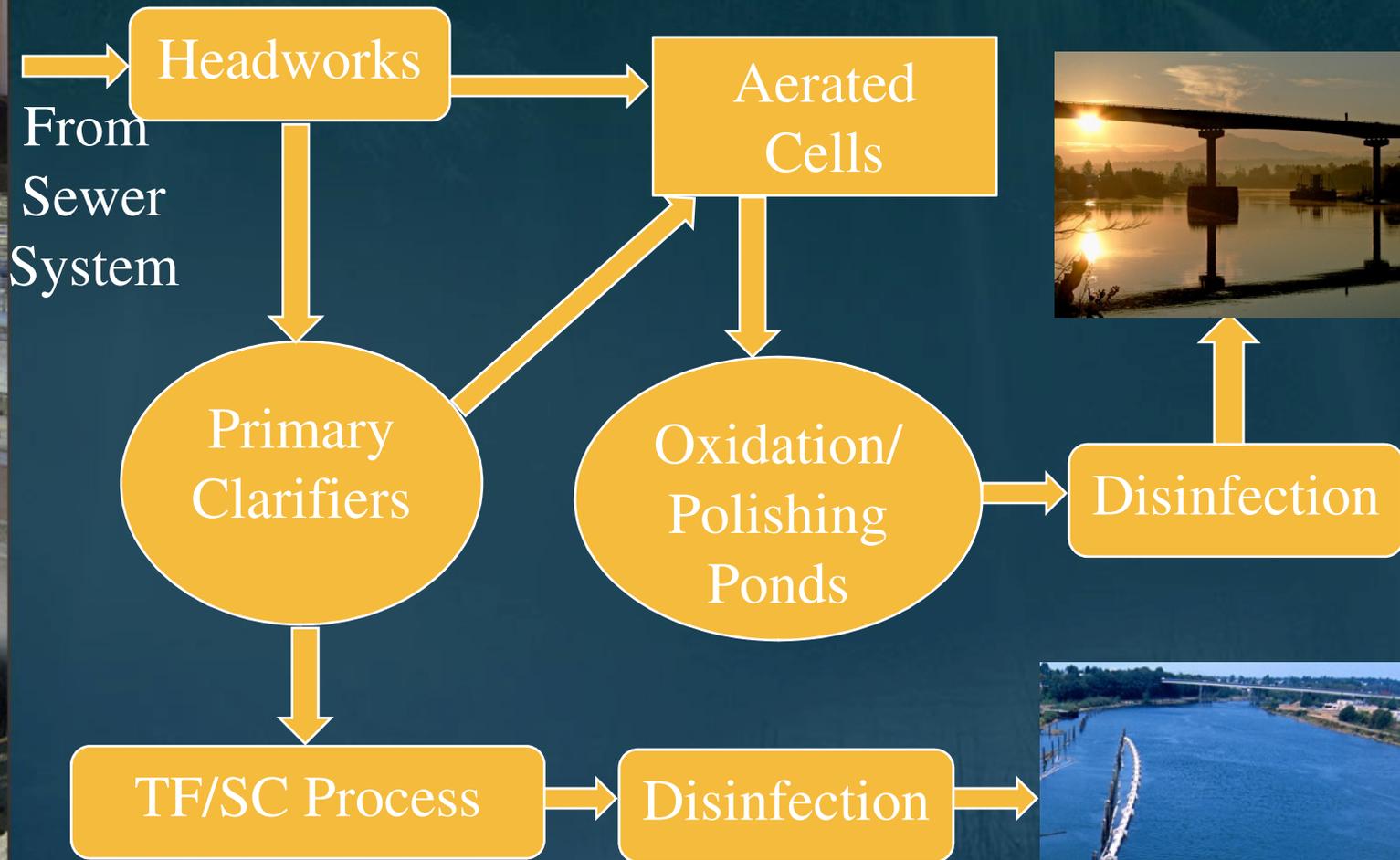
## Sludge

- Semi-solid organic residuals generated during the water reclamation process
- Not suitable for beneficially recycling

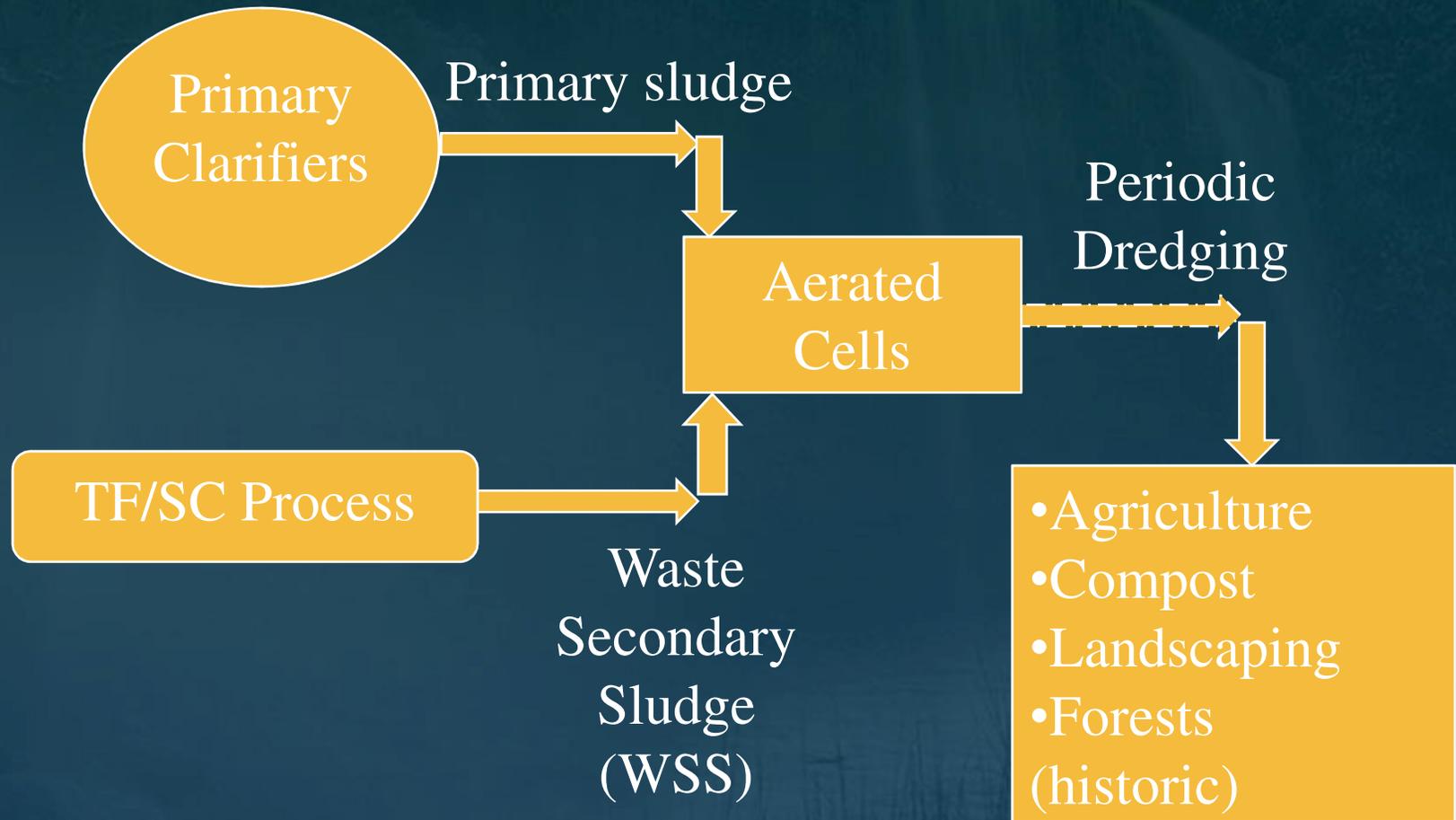
## Biosolids

- Treated (digested) sludge suitable for beneficially recycling
- Meets state and federal treatment standards

# City of Everett WPCF Schematic



# City of Everett WPCF Biosolids Schematic

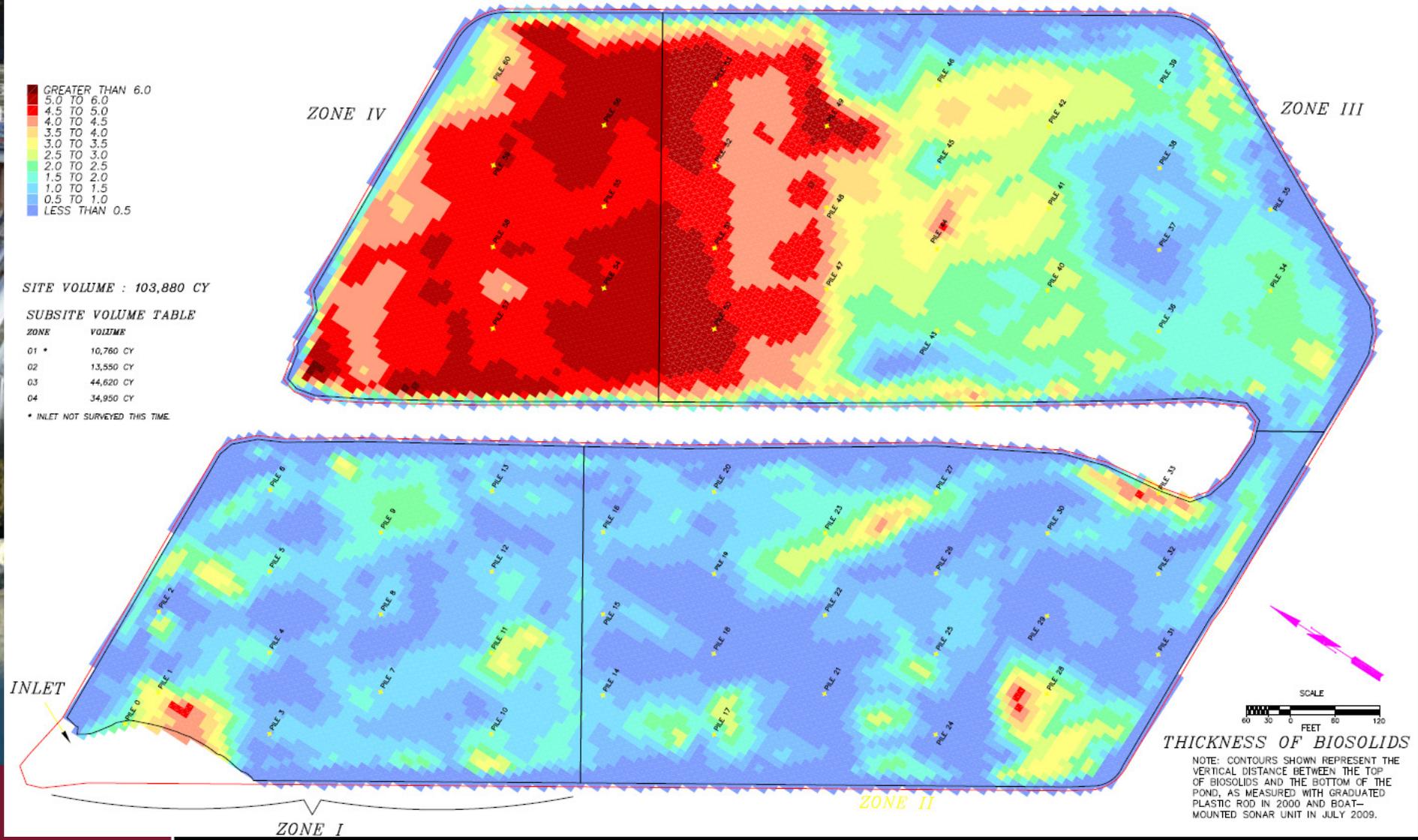
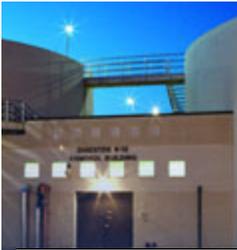


# City of Everett WPCF Biosolids Removal Process

- Biosolids quality sampling and quantity survey
- Contracted biosolids dredging and dewatering approximately every two years
- Contracted biosolids hauling and land application



# Aeration Cell Hydrographic Survey



GREATER THAN 6.0  
 5.0 TO 6.0  
 4.5 TO 5.0  
 4.0 TO 4.5  
 3.5 TO 4.0  
 3.0 TO 3.5  
 2.5 TO 3.0  
 2.0 TO 2.5  
 1.5 TO 2.0  
 1.0 TO 1.5  
 0.5 TO 1.0  
 LESS THAN 0.5

SITE VOLUME : 103,880 CY

**SUBSITE VOLUME TABLE**

ZONE	VOLUME
01 *	10,760 CY
02	13,550 CY
03	44,620 CY
04	34,950 CY

\* INLET NOT SURVEYED THIS TIME

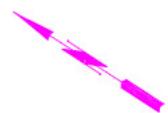
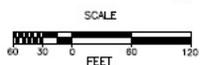
INLET

ZONE I

ZONE II

ZONE IV

ZONE III



# Biosolids Dredging



# Biosolids Dewatering (high speed centrifuges)



# Biosolids Temporary Stockpiled



# Biosolids Management



# Biosolids Land Application Projects



# Future EWPCF Biosolids

- Base Solids Treatment

- Anaerobic Digestion (biological treatment at 95 degrees F or higher for a minimum of 15 days)
- Dewatering: reduce moisture content to 70-80%

Year	Plant Flow	Biosolids (Wet tons per day <sup>1</sup> )
2008	14.5 mgd	~16,000
2010	14.8 mgd	11,000 (actual), 23,000 (projected)
2030	20.2 mgd	31,500

1. Assumes minimum 25% solids





# Biosolids Regulations

- **40 CFR Part 503 – Federal Rule contained within the U.S. Clean Water Act**
  - EPA administered
  - Requirements in NPDES permits
- **WAC Chapter 173-308 – Washington State requirements**



# Biosolids Quality

The Part 503 regulation focuses on three parameters as a basis for determining biosolids quality:

1. The presence of *pollutants* (As, Cd, Cu, Pb, Hg, Mo, Ni, Se, Zn)
2. The presence of *pathogens* (e.g., bacteria, viruses, parasites)
3. The biosolids *attractiveness to vectors* (e.g., rodents, flies, mosquitoes).

Periodic Table of Elements

Legend - click to find out more...

- H - gas
- Li - solid
- Br - liquid
- Tc - synthetic
- Non-Metals
- Transition Metals
- Rare Earth Metals
- Halogens
- Alkali Metals
- Alkali Earth Metals
- Other Metals
- Inert Elements



# Pathogen Reduction Standards

- **Class A:**
  - Pathogen free
  - Unrestricted use
- **Class B:**
  - Pathogens significantly reduced
  - Restrictions on use
- **Class B with appropriate restrictions equally protective as Class A according to state and federal regulations**



# Washington Requirements

## WAC Chapter 173-308 - Landfill Disposal Not a Long Term Management Strategy:

- For long term landfilling, requirements must be met:
  - Authorization in an NPDES permit or state waste discharge permit
  - Evaluate “the various management Alternatives that demonstrates to the satisfaction of the department that Alternatives for beneficial use are economically infeasible”
- Landfilling not a long-term management option:
  - City will not meet requirements
  - Inconsistent with Facility Plan



# Common Biosolids Products/Management Options

- **Class B dewatered:**
  - Agriculture
  - Landfill Cover/Reclamation of Disturbed Areas
  - Forestry
- **Compost:**
  - Nurseries
  - Landscaping
  - Residential
- **Dried pellets:**
  - Golf courses
  - Landscaping

# Agriculture

- Agreements with private farmers
- Agency-owned land
- Public-Private Partnership
  - Contractor permitting, siting, and operations
- Permitting, siting, application
- Hauling



# Agriculture

- Advantages

- Cost effective
- Environmentally and economically beneficial
- Most common management alternative in Pacific Northwest

- Disadvantages

- Public perception may be negative
- Depends on farmer participation
- Most susceptible to changing regulations
- Can't be used in organic farming per USDA and WSDA organic rules; 3 year waiting period required after biosolids application



# Land Application Old Technology Still Innovative

- Land application for Bio-diesel crops
- Sally Brown Research
  - <http://faculty.washington.edu/slb/>



# Alternative Landfill Cover & Disturbed Land Restoration/Reclamation

- Possible soil manufacturing: blending biosolids with amendment such as wood chips
- Advantages
  - Environmentally beneficial
  - Typically long-term projects
  - Less susceptible to future regulatory changes
  - Non food chain use
- Disadvantages
  - Limited number of end users in local area



# Forestry

- Advantages

- Environmentally and economically beneficial
- Cost effective
- Non food-chain use

- Disadvantages

- Higher application costs
- Limited by terrain and access roads
- Only one potential customer identified to date



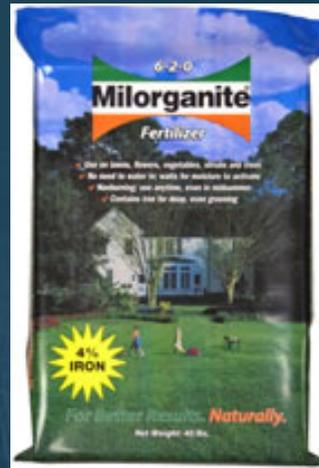
# Compost Production

- Composting (EPA Class A): 131 deg F or more for 3 days (aerated static pile or in-vessel methods)
- Advantages
  - Marketable product (public loves compost)
  - Revenue potential (not profit)
  - Less susceptible to future regulatory changes
- Disadvantages
  - Higher costs
  - May need additional land
  - Potential siting challenges

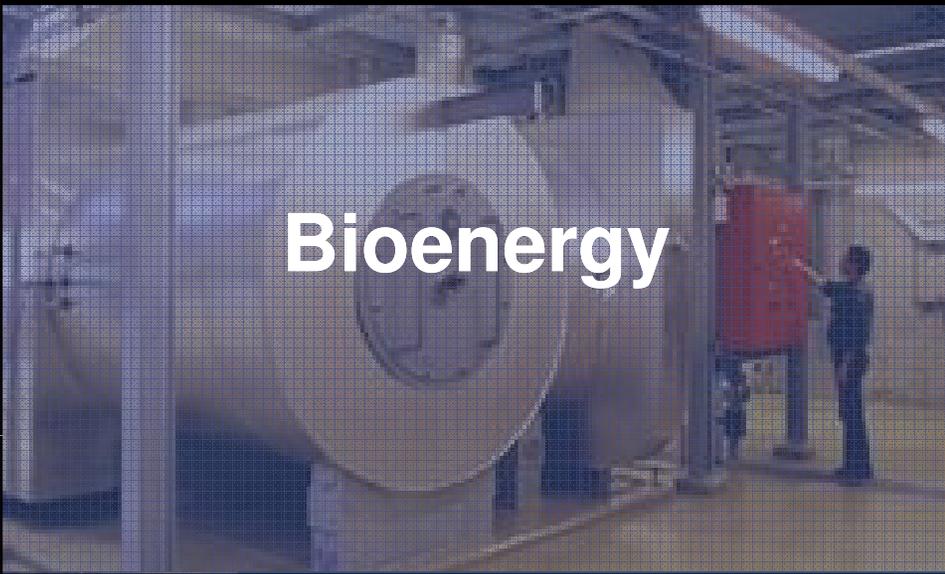


# Dried Pellet Fertilizer Production

- Thermal Drying definition (EPA Class A): 90% solids, biosolids or gas leaving dryer is 176 deg F or more
- Advantages
  - Marketable Product
  - Revenue potential (not profit)
- Disadvantages
  - Less control over final use of biosolids fertilizer
  - Higher costs



# Biosolids Trends

A photograph showing large industrial tanks and machinery used for bioenergy production, with a person standing nearby.

**Bioenergy**

A photograph of a green tractor with a large agricultural implement, likely a harrow or similar, operating in a field.

**Agricultural,  
Industrial Residuals  
and Product Use**

A photograph of a group of people gathered outdoors, possibly at a community meeting or event, with trees and a building in the background.

**Municipality Infrastructure  
Improvement with  
Community in Mind**

A photograph of a large group of people seated at tables in a room, attending a meeting or presentation.

**Outreach, Education  
And Stakeholder  
Involvement**

# Bioenergy Technologies

- Anaerobic Digestion
  - Biogasification
  - Thermal Drying
  - Thermal Oxidation
  - Combinations/Other:
    - Thermal Conditioning type processes
    - Cement Kilns
- Regulatory Considerations





## **National & International Issues**

- **Emerging Contaminants**
- **Micro-constituents**
- **Reactivation and Re-growth of Bacteria**
- **Phosphorus & Other Nutrient Issues**
- **Various Legal and Regulatory Challenges to Biosolids Recycling**
- **Thermal Processes**
- **Public Perception Issues**
- **USEPA Updates**



# Emerging Contaminants, Micro-Constituents, Reactivation & Re-growth

## “Public Perception or Real”

- Organic Contaminants
  - Methyl-Ethyl Bad Stuff
- Pharmaceuticals and Personal Care Products
  - Endocrine Disruptors
- Pathogens
  - Disease causing agents



## Issue Breakdown

- **Constituents of Concern**
  - Biosolids – Most Studied Fertilizing Agent
- **Technology & Sustainable Practices**
  - “If it looks like dirt, if it smells like dirt...”
- **Pathogens and Products**
  - Science & Reality
  - Best Practices & Personal Hygiene = Public Health Protection



## Legal, Regulatory & Perception

- **Bans on Product Use or Out of Area Materials**
  - Ban on Class B (Except “in-county” Class B)
  - Ban on all but “Class A, EQ Compost”
- **Increased Regulatory Control & Decreased Constituent Limits**
  - New EPA As limits, elimination of test method for Class A, Nutrient Limits
- **Product Use (San Francisco Compost Use)**
  - Center for Food Safety

# Getting Biosolids Recognized as “Value-Added Products”

- Bioenergy
- Compost Product
- Nutrients to bio-diesels
- Carbon Sequestration
- Biosolids Products & Bio-Gas Utilization Recognized as “Renewable Resources”





**Product Mentality =**

**More Education on  
Marketing and Economics**

- ✓ Supply and demand
- ✓ Market research  
& development

# Environmental Management Systems

- Sustainability through EMSs
- Importance of Demonstrating Value of NBP EMSs
- Continuous Improvement





# Sustainable Biosolids Program “The Bottom Line”

Sustainable Biosolids Programs =

Long Range Planning

Diversification

Cost Effectiveness

Publically Supported



# Stakeholder Committee

- **Next Steps**
  - Strategy Development (SWOT analysis) workshop
  - Market Survey (HDR)
  - Develop evaluation criteria
  - Cost projections (HDR)
  - Recommendations
- **Next Meeting**



# PUBLIC WORKS Department

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[Sewer Plan](#)

[Treatment plant](#)

## Biosolids

### What are biosolids?

Biosolids are the nutrient-rich organic by-product of the wastewater treatment process which can be recycled and used to enhance soil conditions.

### Is biosolids recycling safe?

Long-term scientific studies have repeatedly demonstrated that biosolids recycling is safe. Monitoring of biosolids, soils, water resources and plants continue to show benefits from recycling. These studies formed the basis for federal and local biosolids regulations.

### Everett's role in biosolids recycling

The City of Everett generates and recycles biosolids in forestry, agriculture and soil improvement projects. Everett is a member of the Northwest Biosolids Management Association ([www.nwbiosolids.org](http://www.nwbiosolids.org)), which provides collaborative research, technical assistance and public information for biosolids managers in the region.

#### Contact Info:

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#### RELATED LINKS

- ▶ [EPA](#)
- ▶ [Northwest Biosolids Management Association](#)



# Tour Description, Instructions & Directions

- ✓ Treatment Plant Tour
- ✓ Land Application Site





# Questions?

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