

# Bio Recycling – North Ranch Lagoon Proposal

**April 9, 2018**

Kelsey Dunne

Regional Biosolids Coordinator

Peter Lyon

Regional Section Manager



# Agenda

- Biosolids & Permitting
- Steps Taken
- Lagoon Proposal
- Options



# What are Biosolids?



## Biosolids

- Biosolids are produced during the treatment of wastewater.
- Treated to meet standards for land application.

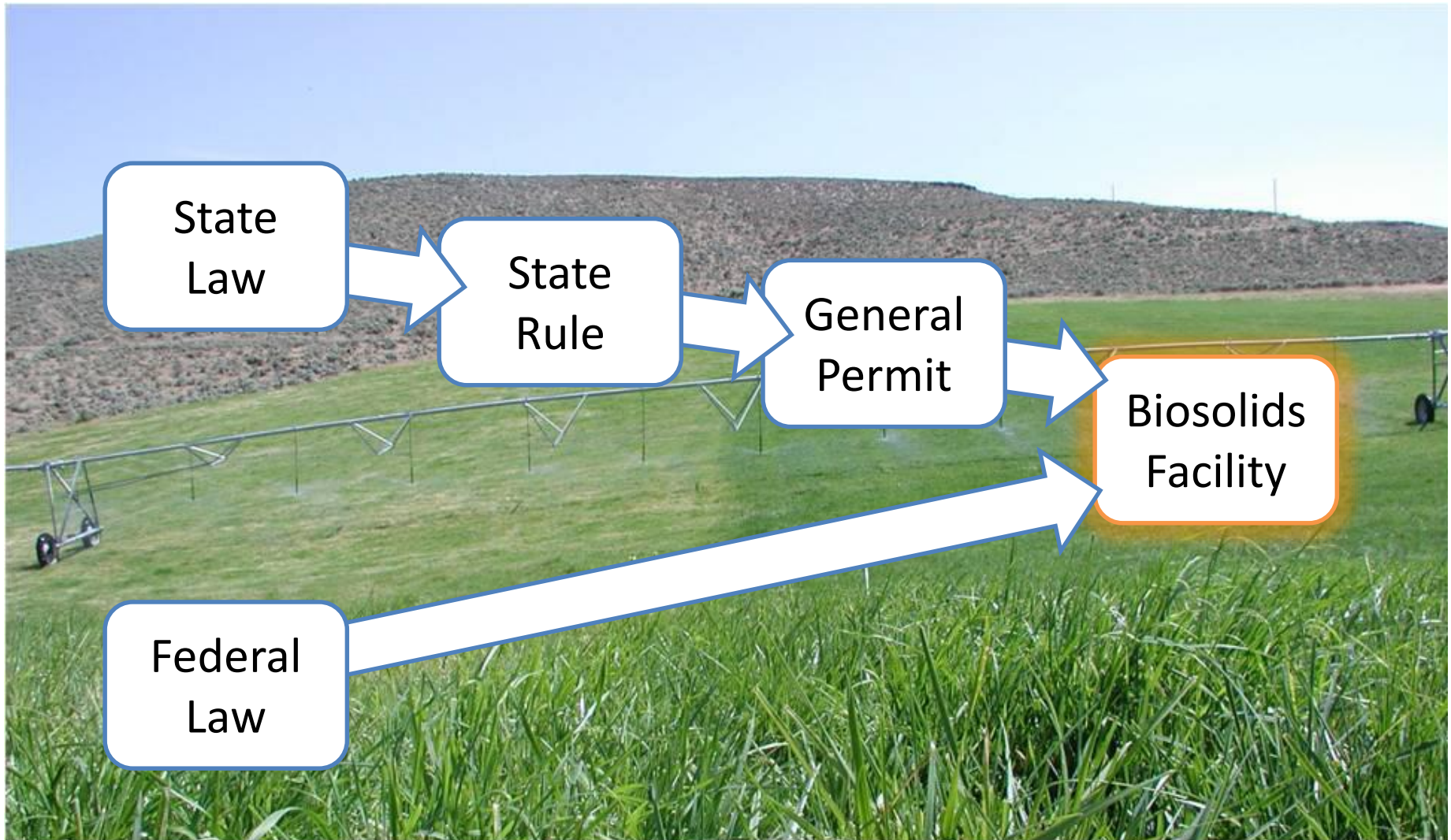


## Septage

- Material removed from septic tanks, portable toilets, RVs, etc.
- Commonly treated to meet biosolids standards.

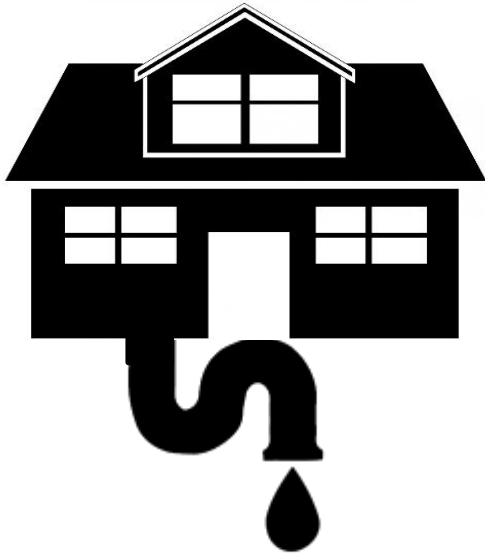


# How are Biosolids Regulated?

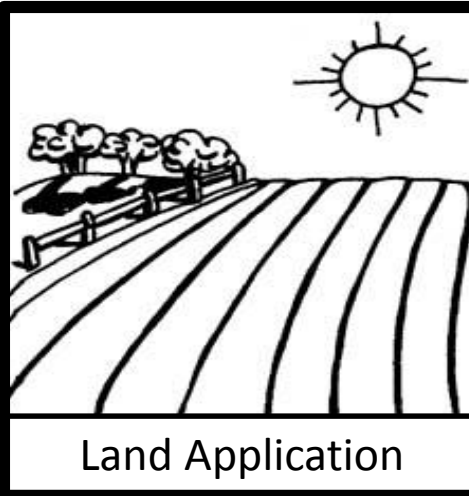


# General Permit

5 Year  
Duration



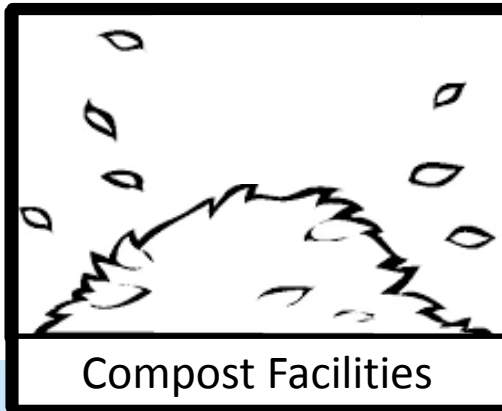
Wastewater Treatment Plants



Land Application



Septage Facilities



Compost Facilities



# 3 Criteria for Land Application



**Pollutant Limits**



**Pathogen Reduction**



**Vector Attraction Reduction**





# Pollutant Limits

Pollutants	Benefit/Concern
Arsenic	Human Toxin
Cadmium	Human Toxin
Copper	Plant Micronutrient / Plant Toxin
Lead	Human Toxin
Mercury	Human Toxin
Molybdenum	Plant Micronutrient / Livestock Toxin
Nickel	Plant Toxin
Selenium	Livestock Micronutrient / Human Toxin
Zinc	Plant Toxin



# Treatment Process



## Pathogen Reduction:

- Lime Stabilization: Raise pH to 12 or higher for 2 hours.



## Vector Attraction Reduction:

- pH Adjustment: Raise pH to 12 or higher for 2 hours, & 11.5 or high for 22 hours.



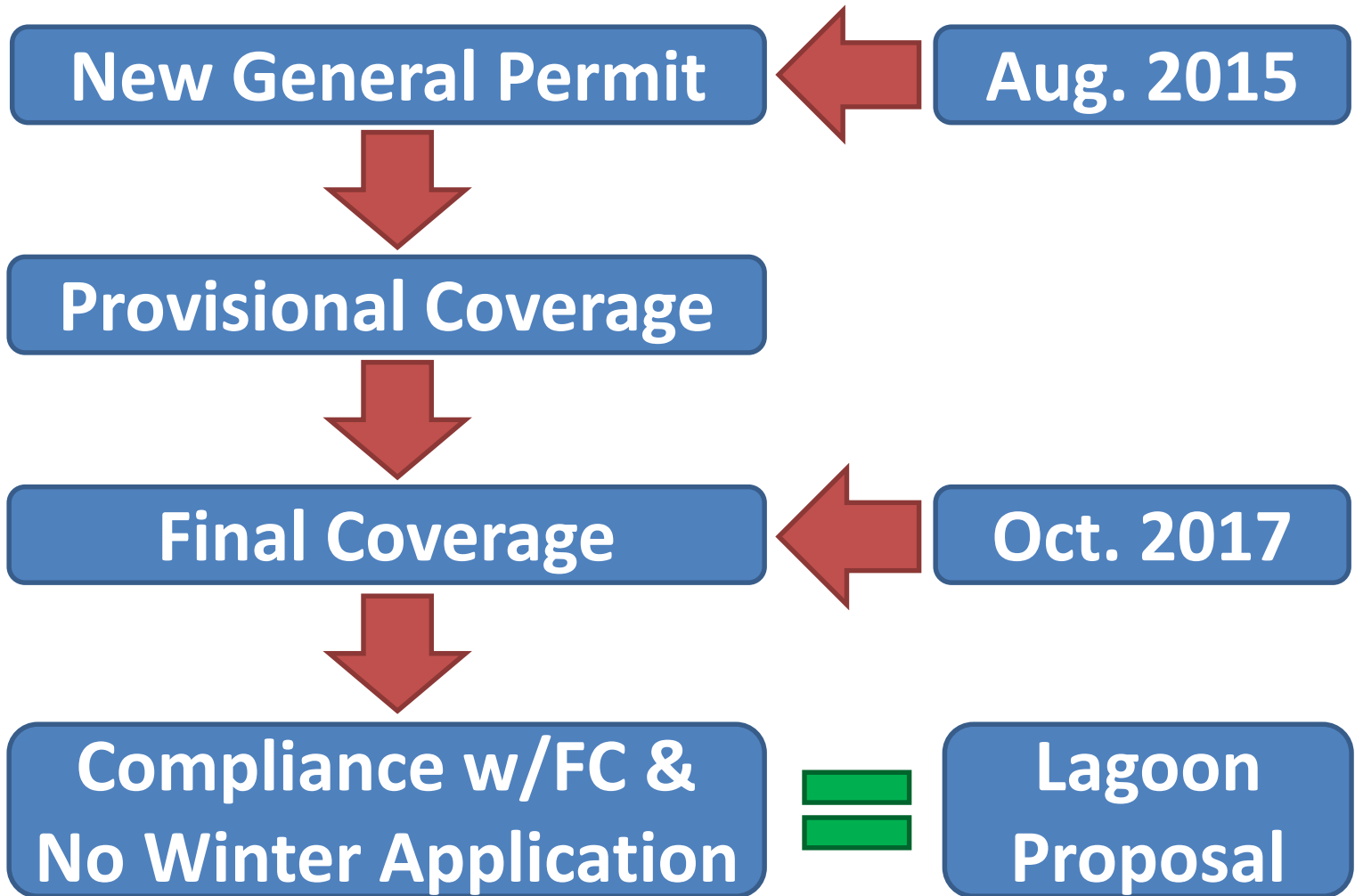


# Additional Treatment

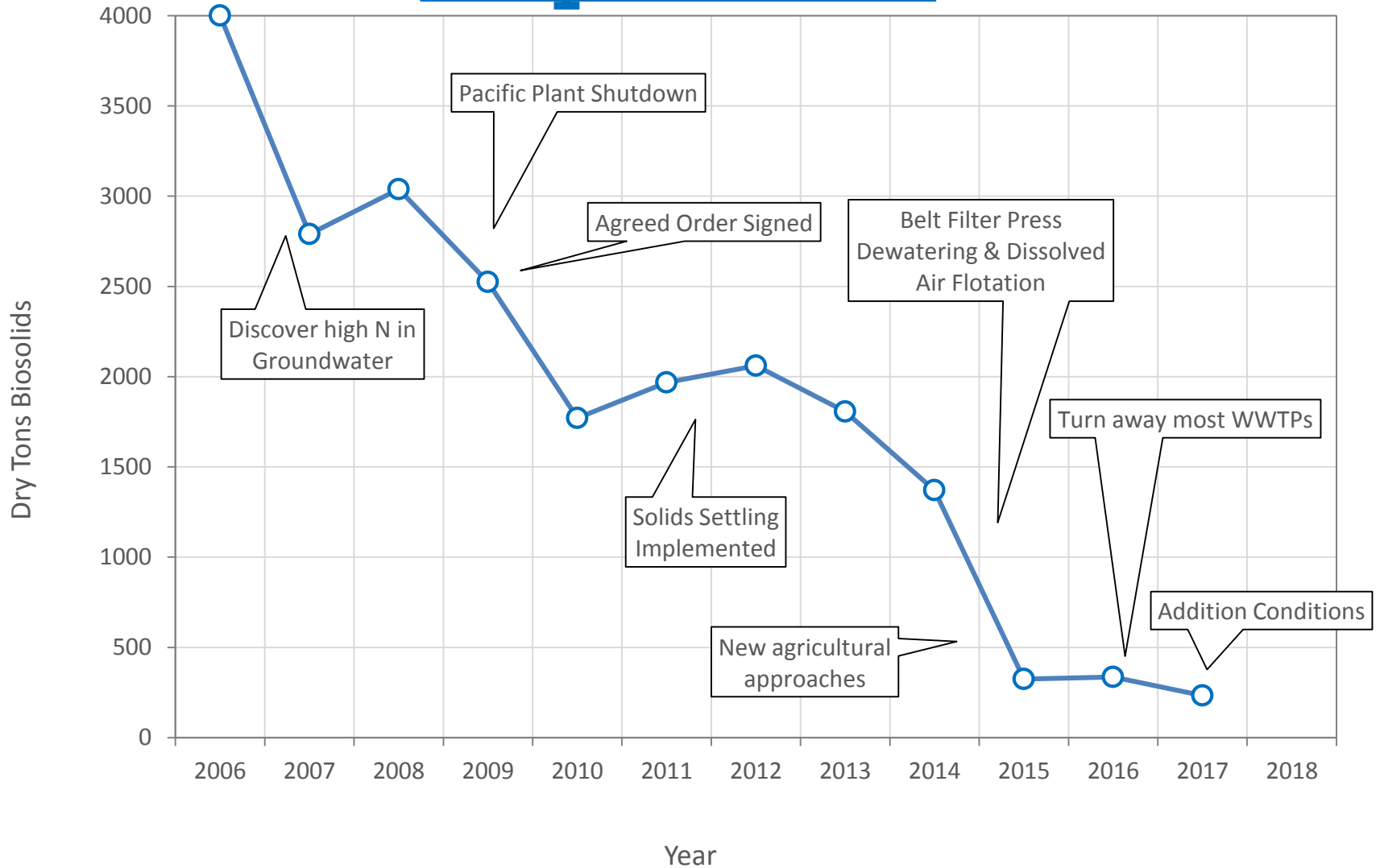
- Separates treated solids/liquids
- Solids are sent to other permitted farm sites (Cowlitz & Yakima counties)
- Liquids are land applied
  - At rates estimated for each crop
- Site is grazed and farmed for hay



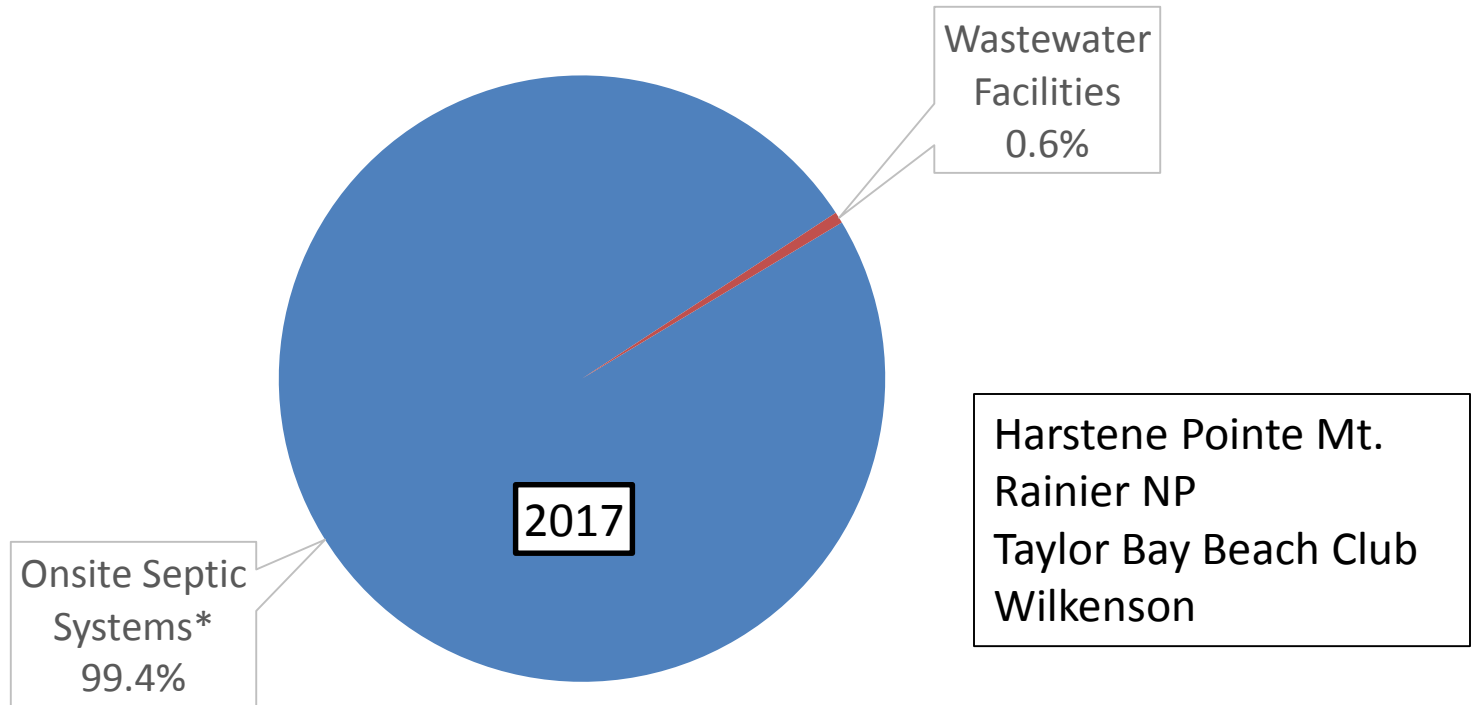
# Biosolids Permitting



# Steps Taken



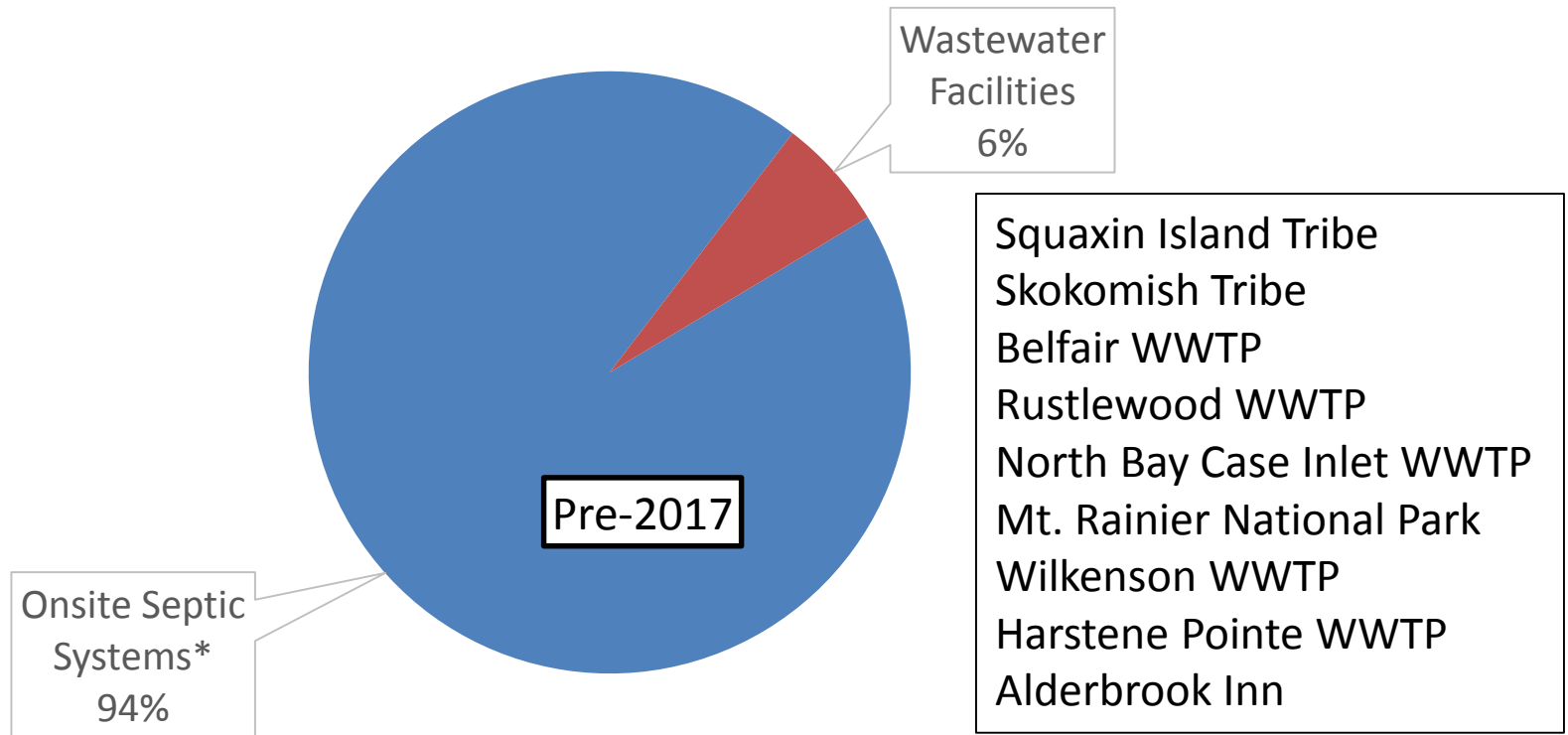
# Current Customers



\* WAC 173-308-020 – Grease trap wastes from restaurants and similar food service facilities may be mixed with domestic septage up to 25 percent by volume.



# Historical Customers



\* WAC 173-308-020 – Grease trap wastes from restaurants and similar food service facilities may be mixed with domestic septage up to 25 percent by volume.



# Current Permitting

## Mason County

- Land Modification Permit

## Ecology

- Dam Safety Permit
- Approve use of surface impoundment for storage of biosolids
- Stormwater Construction Permit



# State Environmental Policy Act

Co-Lead Agencies – Mason County  
and Washington State Department  
of Ecology.



# Options for Treatment

1. Use of existing facilities
2. Upgrade a publically owned WWTP to receive and treat septage
3. Permit another septage Management Facility
4. Permit individual septage pumpers to land apply





# Treatment Option #1

Facility Name	Septage Rec'd 2017 (million gallons)	Approximate Distance (miles each way)
Bio Recycling – North Ranch	14.9	N/A
Central Kitsap WWTP (Poulsbo)	6.5*	45
Tacoma WWTP	5.4	64
Aberdeen WWTP	1.3*	58
Port Angeles WWTP	2.8*	94

\* Limited capacity. Would likely need to ration pumpers.



# Treatment Option #2

Upgrade Mason County WWTPs:

- Rustlewood
- Belfair
- North Bay/Case Inlet

None currently have the ability to receive and treat septage or meet Biosolids land application standards.



# Treatment Option #3

- Permit another septage management facility like Bio Recycling
- Can be either public or privately owned



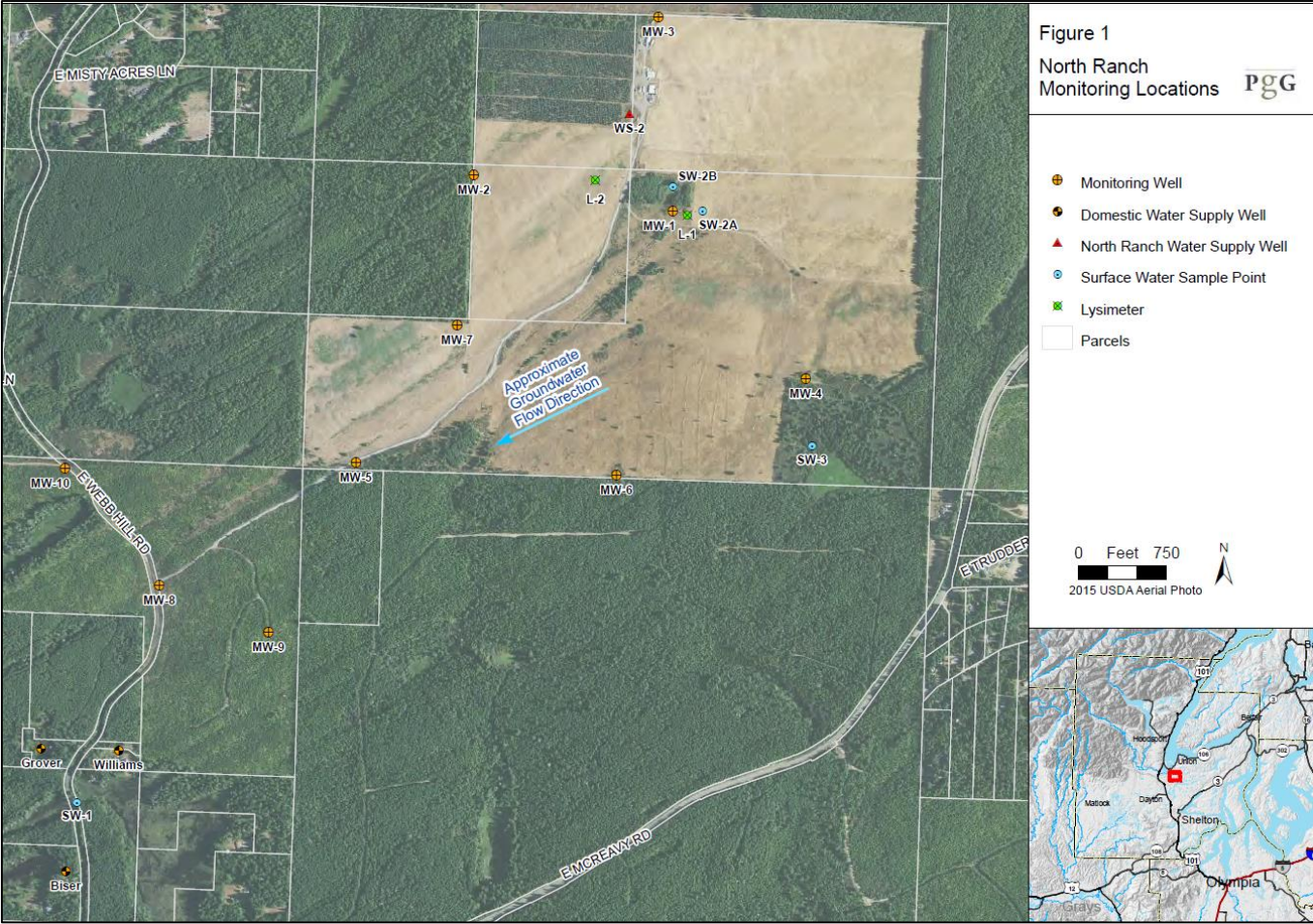
# Treatment Option #4

- Individual septic pumpers may apply to the biosolids land application permit to land apply septage.

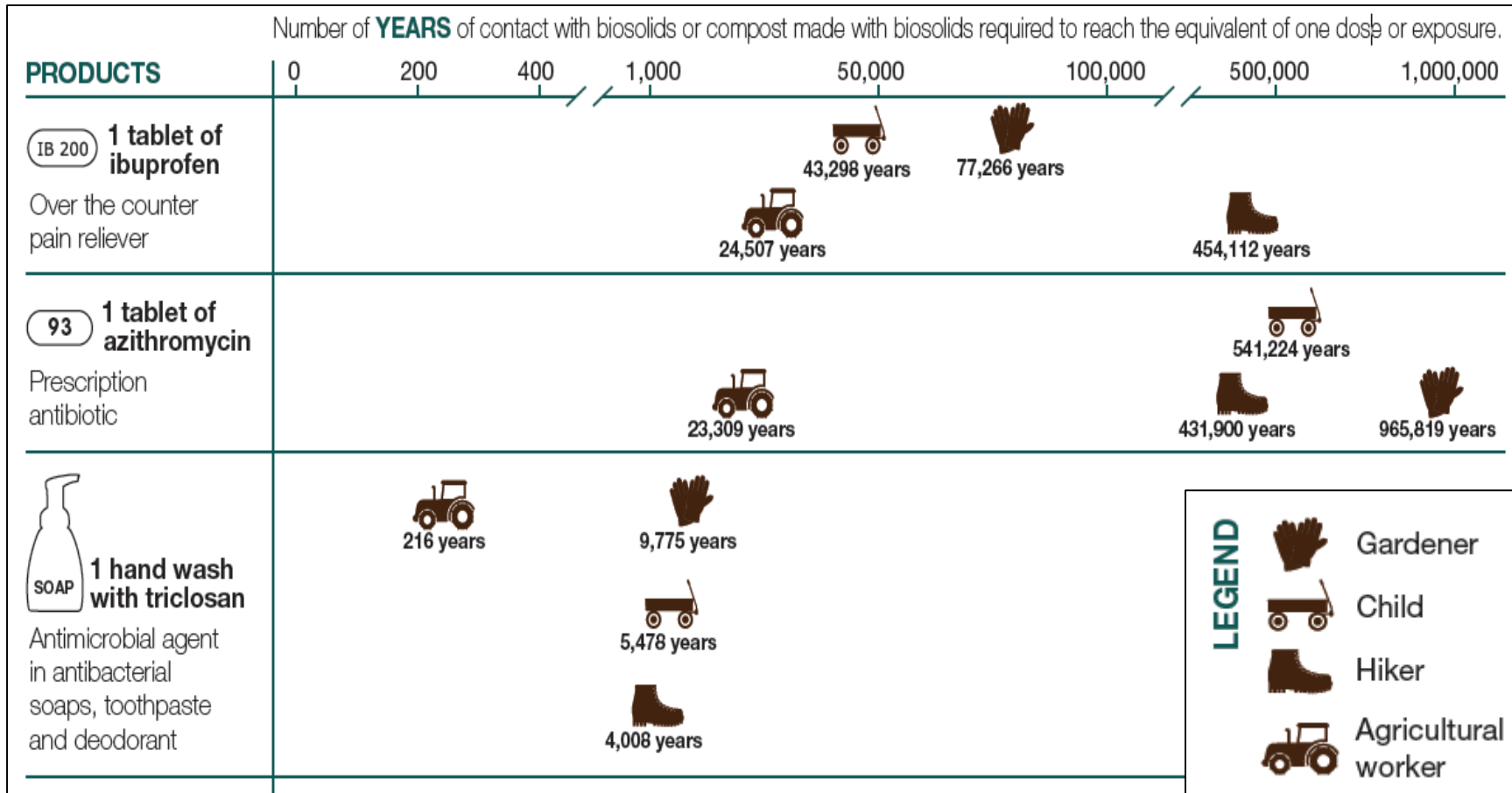


QUESTIONS?

# North Ranch Site Map



# Understanding Risk



- Authored by the NW Biosolids Association in collaboration with the University of Washington.
- NW Biosolids is comprised of many wastewater treatment plants from around the Pacific NW.



# North Ranch Groundwater

- Elevated nitrate levels confirmed
- Detection of other chemicals,
  - Artificial Sweetener
  - Seizure Medication
  - Antibiotics
  - Sunscreen Additive





# PPCPs

- Very low concentrations
- Many chemicals bind to soils and do not move through the soil.
- Many are broken down by soil microbes and other environmental factors such as UV radiation.
- Antibiotic levels similar to cow manure.



**Table 2. Pharmaceutical and Personal Care Products Detected at MW-1 and MW-6, North Ranch**

	Oxybenzone	Sulfamethoxazole	Carbamazapine	Dilantin	Sucralose
<i>Uses</i>	<i>sunscreen lotion</i>	<i>antibiotic used to treat urinary tract infections, middle ear infections, bronchitis, traveler's diarrhea, dystentry, postatitis, and pneumonia</i>	<i>anti-seizure medication</i>	<i>anti-seizure medication</i>	<i>artificial sweetener (Splenda)</i>
<b>Laboratory Results</b>					
MW-1 (ng/L)	--	--	13	--	1300
MW-6 (ng/L)	20	3.8	19	3	1700
<b>Calculated Annual Mass Consumed<sup>1</sup></b>					
MW-1 (g)	--	--	1.79E-05	--	1.79E-03
MW-6 (g)	2.76E-05	5.24E-06	2.62E-05	4.14E-06	2.35E-03
<b>Dosage Information</b>					
Daily Dose or Assumed Standard Dose	1 tablespoon, assumes the sunscreen is composed of 4% oxybenzone <sup>2</sup>	0.8 g x 2 daily <sup>3</sup>	0.2 g x 2 daily <sup>4</sup>	0.1 g x3 daily <sup>5</sup>	1 packet (1 g)
Grams Ingested Daily	--	1.6	0.4	0.3	1
Grams in Urine Following Dermal Use <sup>6</sup>	0.0059	--	--	--	--
<b>Years of Water Consumption Required to Experience Daily Dose or 1 Standard Dose</b>					
MW-1	--	--	22,301	--	558
MW-6	214	305,177	15,259	72,480	426

1 Annual mass consumed is calculated assuming a person drinks 1 gallon of water per day from MW-1 or MW-6.

2 Assumed percent oxybenzone is based on its amount in Banana Boat Sport Performance Lotion SPF 30.

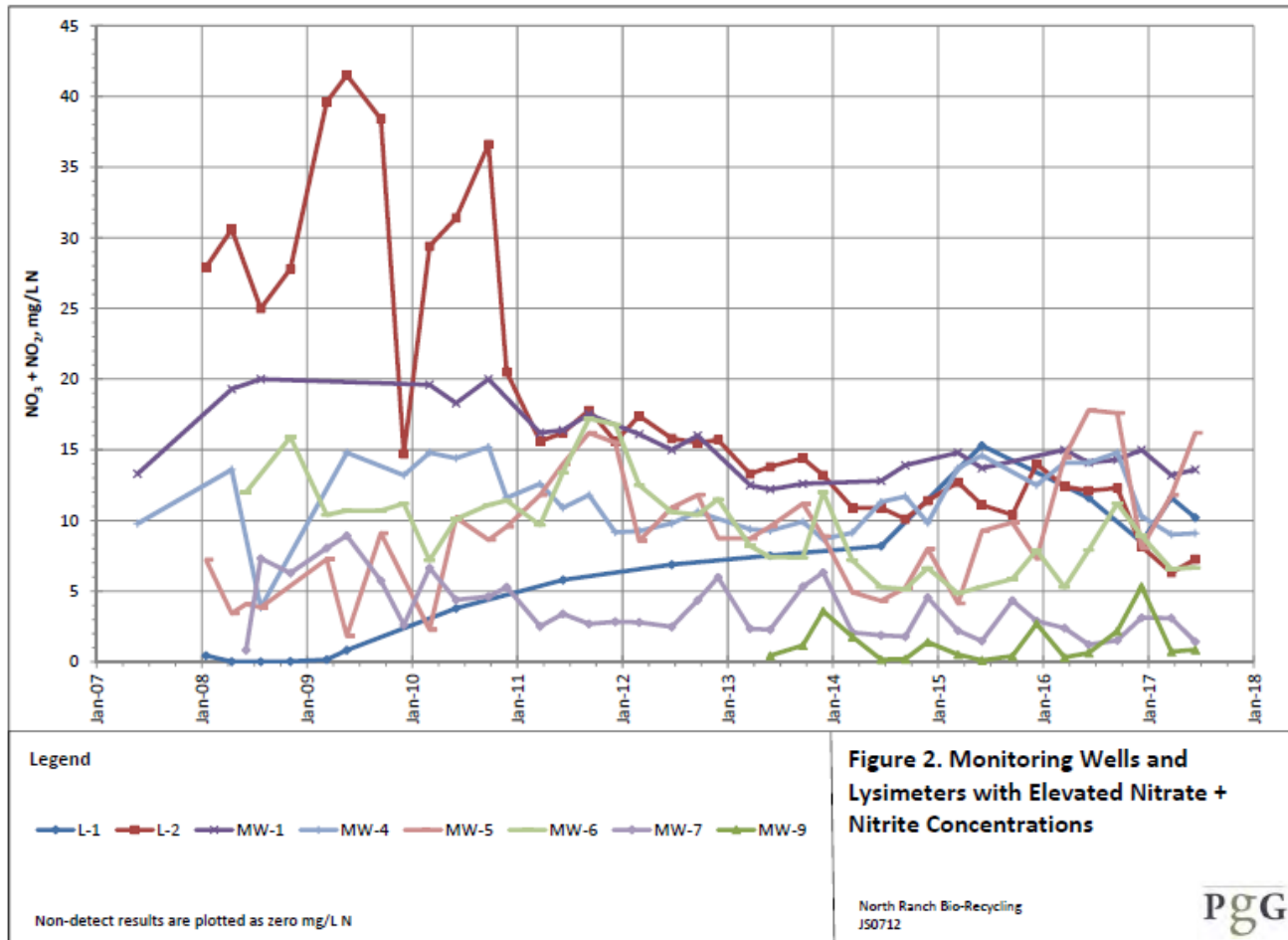
3 <https://www.mayoclinic.org/drugs-supplements/sulfamethoxazole-trimethoprim-oral-route/proper-use/drg-20071899>, accessed 11/28/17

4 <https://www.mayoclinic.org/drugs-supplements/carbamazepine-oral-route/proper-use/drg-20062739>, accessed 11/28/17

5 <http://labeling.pfizer.com/ShowLabeling.aspx?id=546>, accessed 11/28/17

6 Up to 1% of oxybenzone applied to skin is later measureable in urine. <http://www.sciencedirect.com/science/article/pii/S157002320400008X?via%3Dihub>, accessed 11/28/17

# Nitrate Concentrations



# Nitrate Concentrations

