Adventures in Water System Consolidation

A Drama in Three Acts

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ERWOW Fall Conference, 2024
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Sunlight Beach

Island County Hydrogeology Dashboard

Last Updated August 20, 2024

Interface Options: INDIVIDUAL WELL SEARCH | INTERACTIVE MAPS | PUBLIC WATER SYSTEMS

Physical Well Parameters | Groundwater Quality | Long-Term Monitoring Wells

Why Consolidate?

The Need

Island County:
400 Group A water systems
750 Group B water systems
6000? Two party and single-family wells

Well Type
Private Well
Community Water System Well
Resource Protection (Monitoring)

9000 wells in total – one for every seven people drinking groundwater. Adding hundreds every year!

Notes:

**Elevation data is considered approximate and NOT professional survey grade.*
***Seawater intrusion risk category estimated from best available information and may not reflect current conditions.*
Island County makes no guarantee as to the validity, accuracy, or completeness of this data.
bgs - Below Ground Surface
ft - feet
msl - Mean Sea Level

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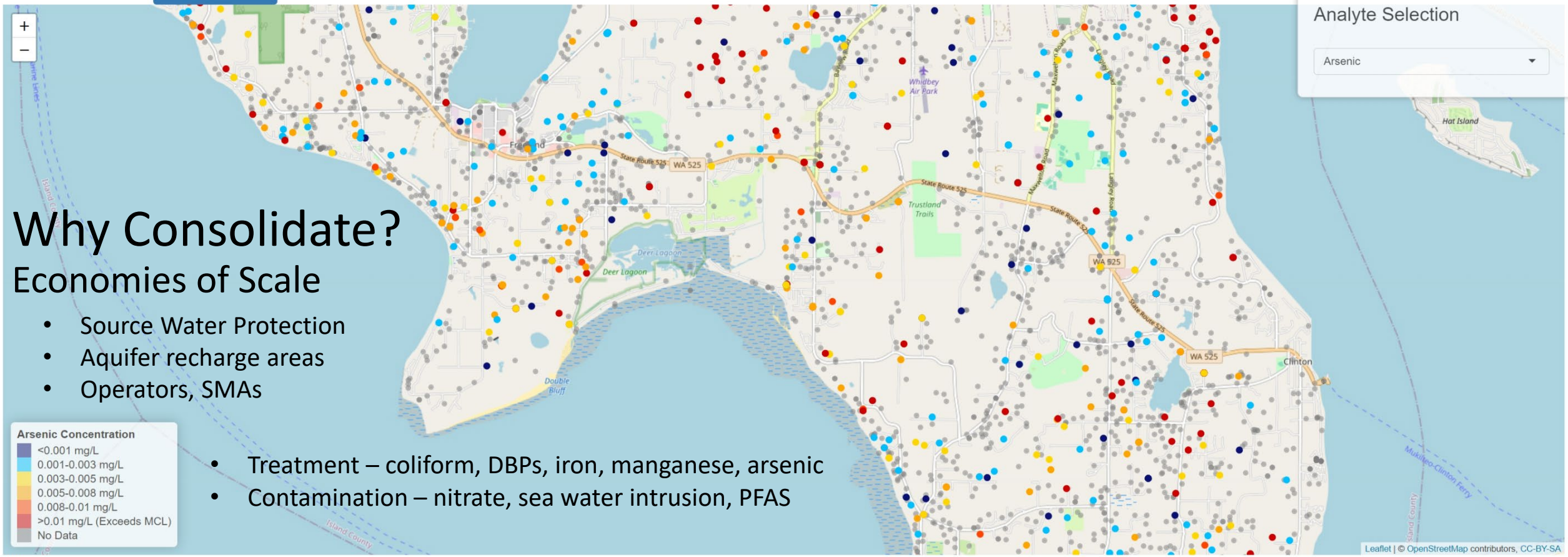


Why Consolidate?

Economies of Scale

- Source Water Protection
- Aquifer recharge areas
- Operators, SMAs

- Treatment – coliform, DBPs, iron, manganese, arsenic
- Contamination – nitrate, sea water intrusion, PFAS

Notes:

Only most recent sample data shown

Island County makes no guarantee as to the validity, accuracy, or completeness of this data.

mg/L - milligram per liter (equal to part per million [ppm])

ng/L - nanogram per liter (equal to part per trillion [ppt])

µS/cm - microsiemens per centimenter

EPA - United States Environmental Protection Agency

HAL - Health Advisory Level, established by EPA, describe nonregulatory concentrations of the contaminant in water that are expected to be without adverse effects on both health and aesthetics.

MCL - Maximum Contaminant Level, EPA established maximum allowable amount of a contaminant in drinking water which is delivered to the consumer.

SMCL - Secondary Maximum Contaminant Level, EPA established guideline to assist public water systems in managing their drinking water for aesthetic considerations, such as taste, color, and odor.

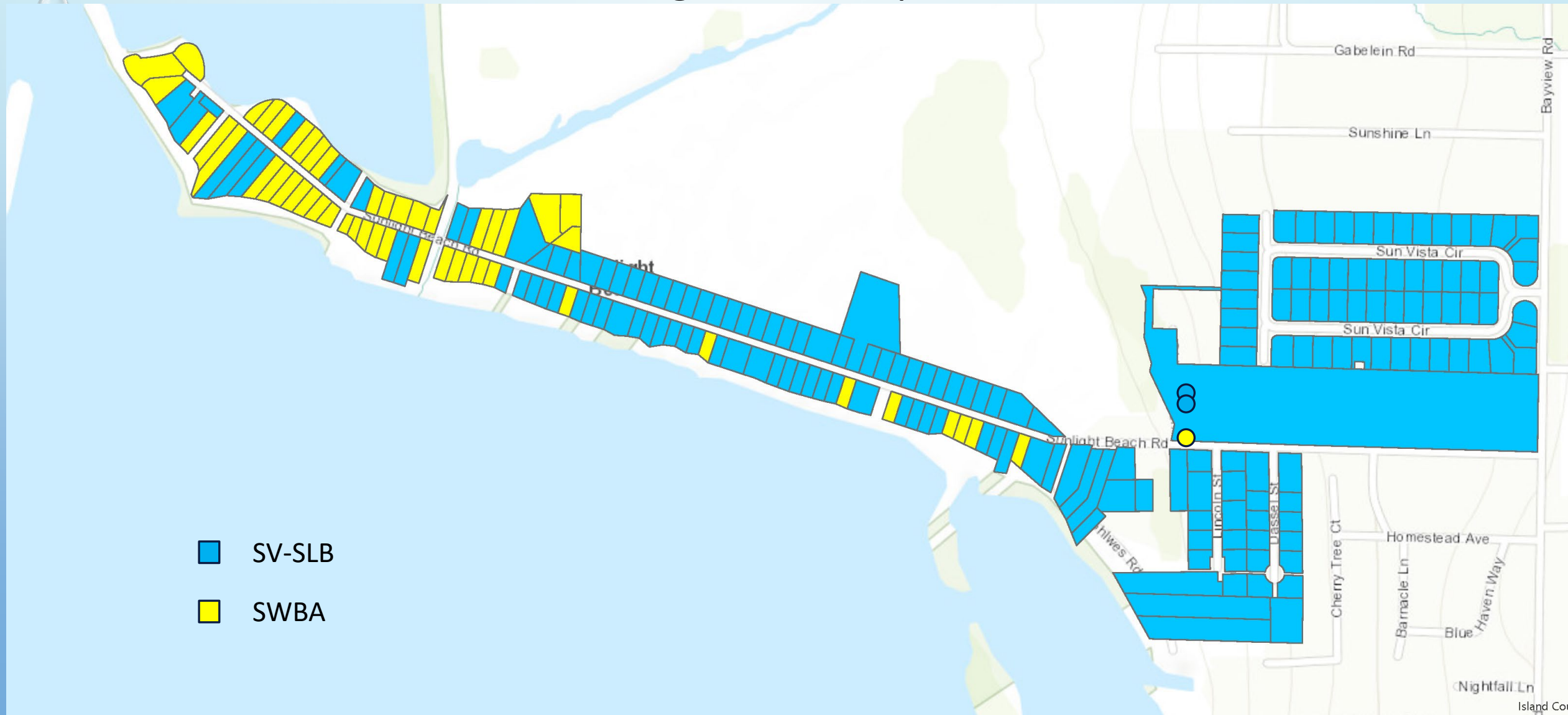
SAL - State Action Level, Washington State Board of Health adopted State SAL is a level that is set to protect human health based on the best available science at the time

Why Consolidate?
Survival

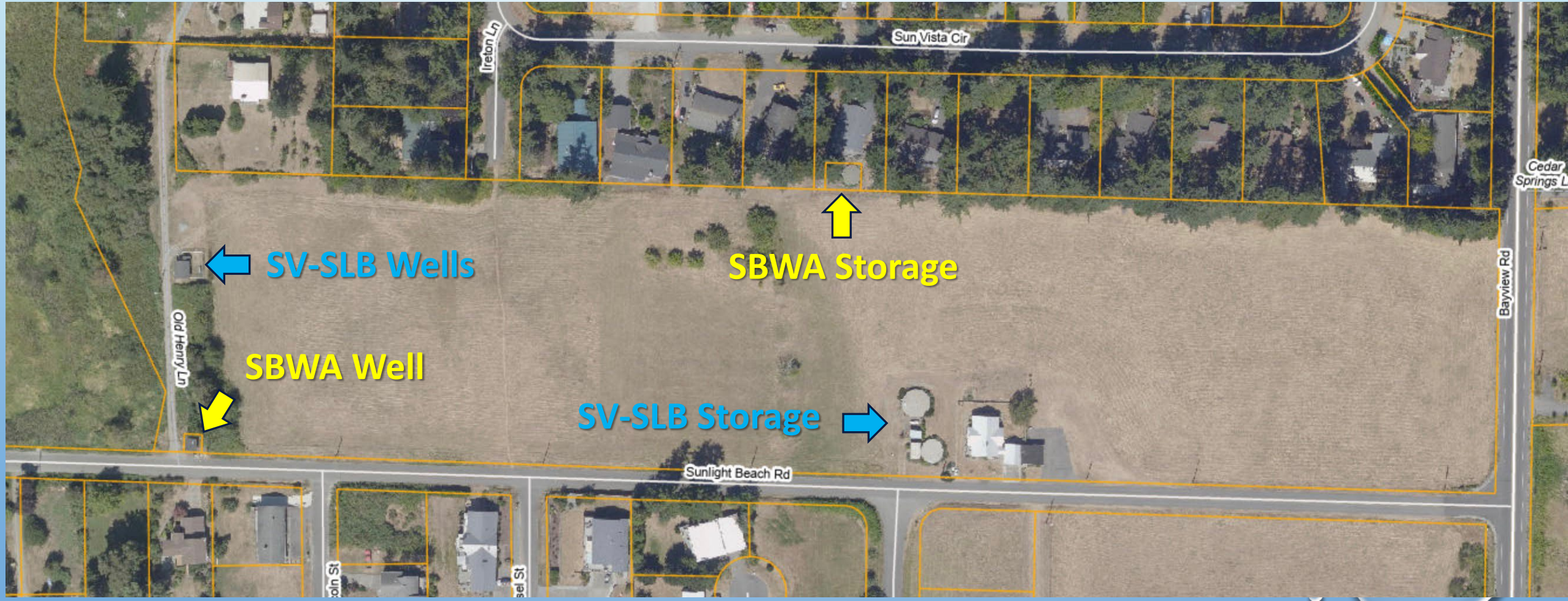
- Keep public water in public hands
- “Remunicipalization” - the return of previously privatized water supply and sanitation services to municipal authorities
  - Paris
  - Philadelphia
  - Bozeman
  - Buenos Aires
  - Malaysia

Service Areas and Well Sites

“Montagues and Capulets”



Existing Water System Facilities



Existing System Statistics

SV-SLB

- Group A Community, 169 connections
- Two wells
- “Green” permit
- Treatment coliform, As, Fe, Mn
- Gravity plus pressure
- Backup generator
- Tiered rate structure
- This SMA
- HOA
- Reserves

SBWA

- Group A TNC, 44 connections
- One well
- “Blue permit” – lacks sanitary control area
- No treatment
- Gravity only
- No generator
- Flat rate
- That SMA
- Water Association
- Not so much

“You might want to move your wells”

- 2013: Landowner lists property for sale
- 48 Septic systems uphill from our well
- Sanitary Survey
- Wellhead Protection Plan!

Unique opportunity!

16 acres with vast Useless Bay water view. Fully cleared for development of 48 units, zoned 3 units per acre with a 35 ft height limit.

Retirement housing, apts (needed on South Whidbey), farm, orchard/vineyard, equestrian (subject to buyer's use verification with Island County).

Develop or create your estate above the sparkling waters of Puget Sound trimmed with majestic snow-capped Olympic Mountains.

Shipping lanes in & out of Seattle provide non-stop parade of container & cruise ships!

Birding, beachcombing!

Private golf & country club, retail nearby.

Only 30 min. to Boeing and an hour to Seattle!

Developing a Wellhead Protection Plan

John Lovie
Sun Vista/Sunlight Beach HOA

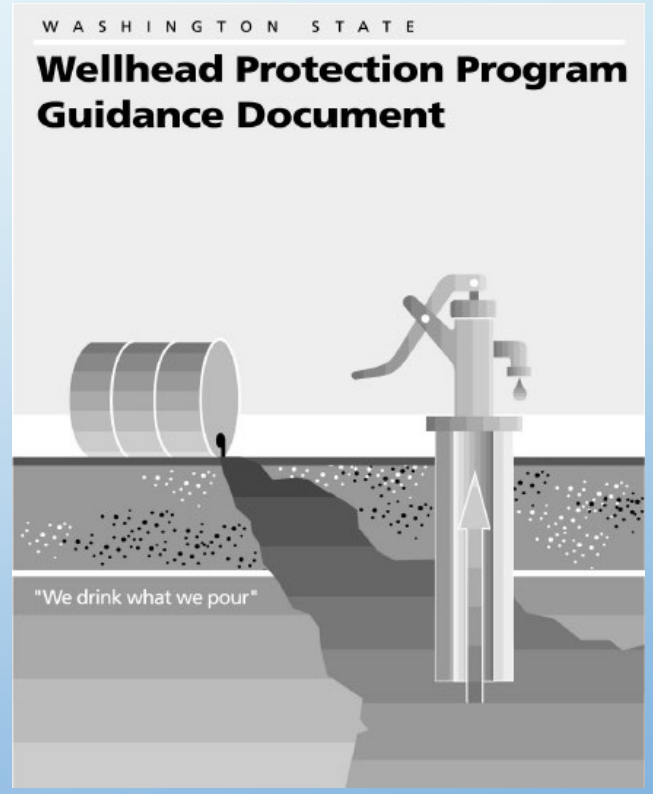
Presented to ERWOW Fall Conference 2014

Wellhead Protection Program

Roles and Responsibilities – Water System

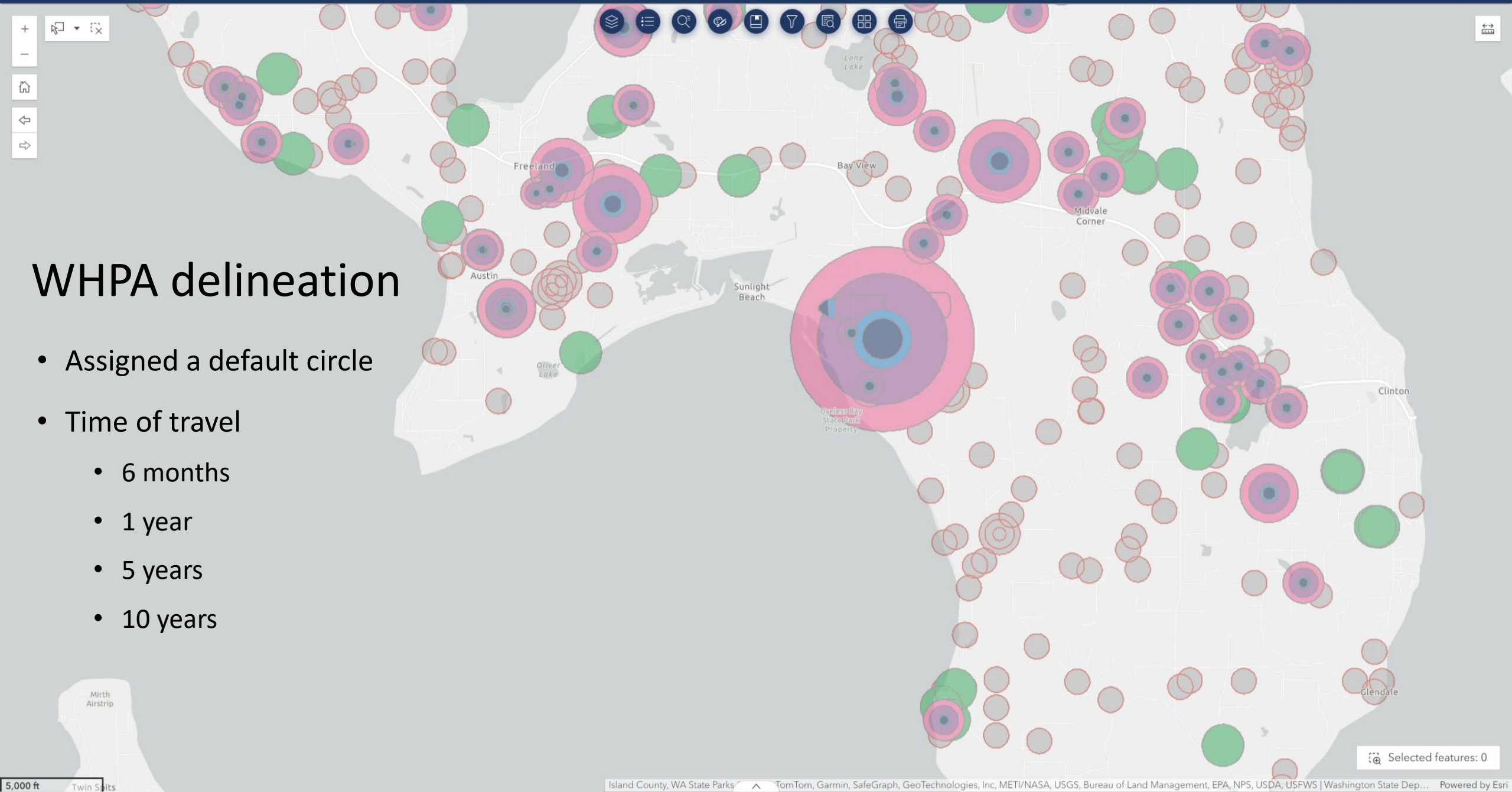
1. Susceptibility assessment
2. Wellhead Protection Area delineation
3. Inventory of contaminant sources
4. Notification to regulatory agencies
5. Notification to property owners
6. Contingency plan for potable water
7. Coordination with emergency responders

Source Water Protection | Washington State Department of Health



Susceptibility Assessment

- Shallow wells
- Septic systems
- Underground heating oil storage tanks
- Coastal aquifer

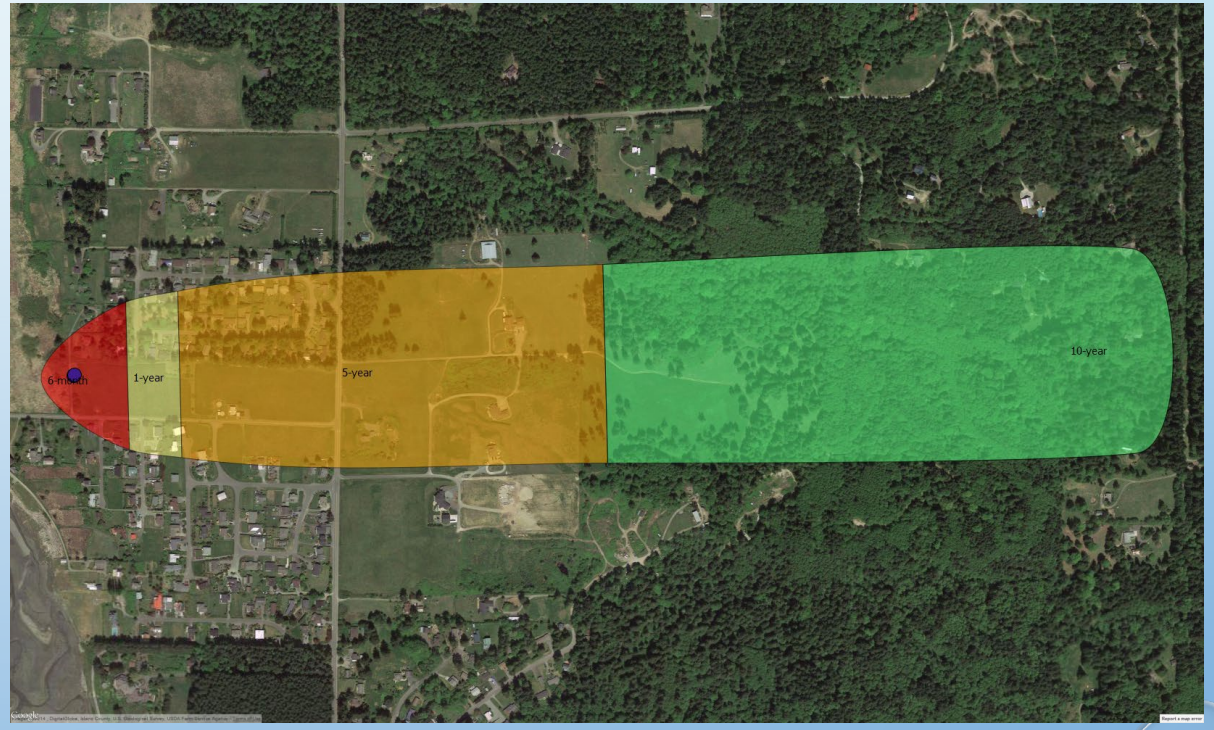


WHPA delineation

- Assigned a default circle
- Time of travel
  - 6 months
  - 1 year
  - 5 years
  - 10 years

SWAP Map
Times of Travel

Assigned

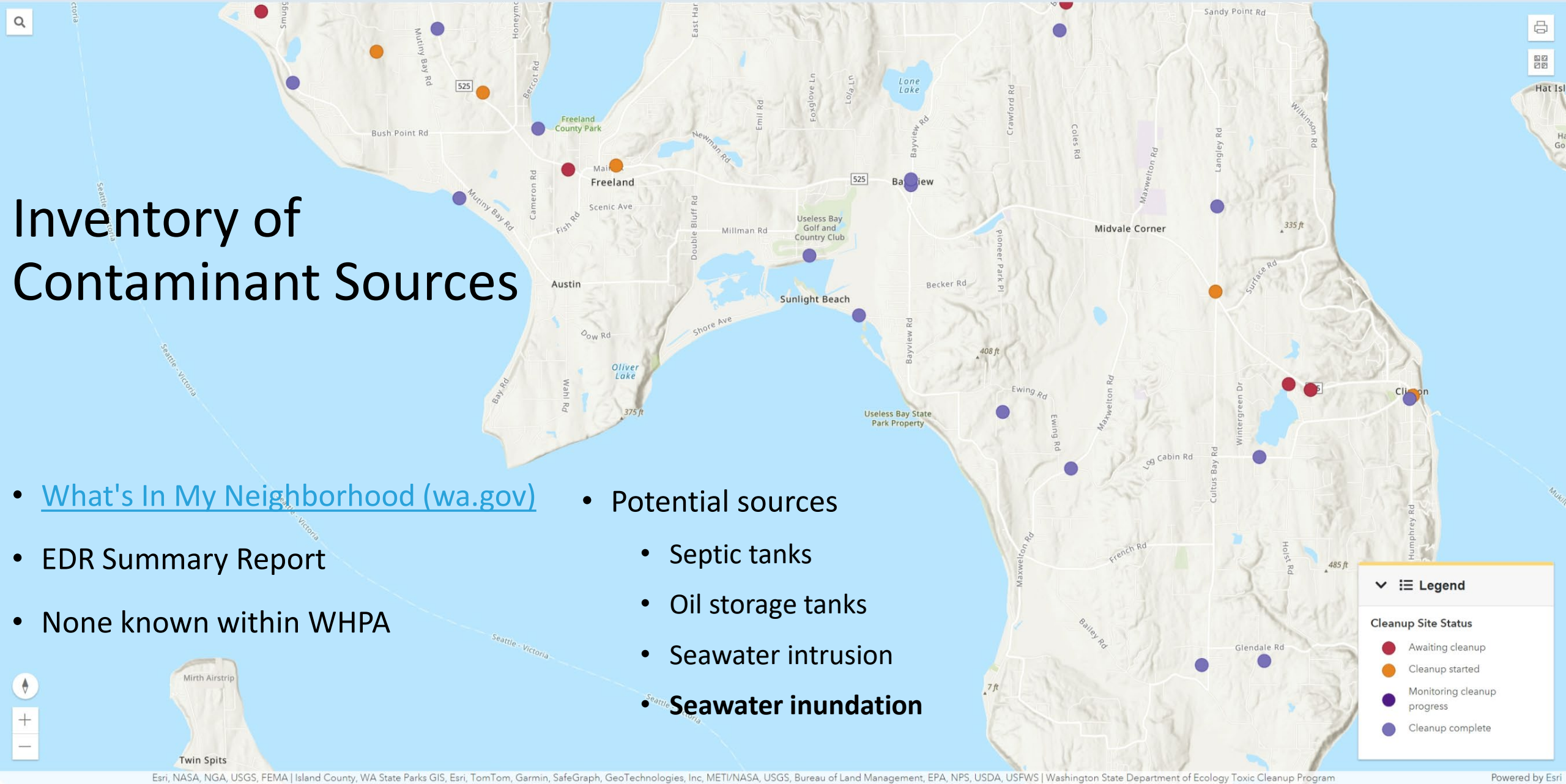


WHPA Delineation

Inventory of Contaminant Sources

- [What's In My Neighborhood (wa.gov)]
- EDR Summary Report
- None known within WHPA

- Potential sources
  - Septic tanks
  - Oil storage tanks
  - Seawater intrusion
  - **Seawater inundation**



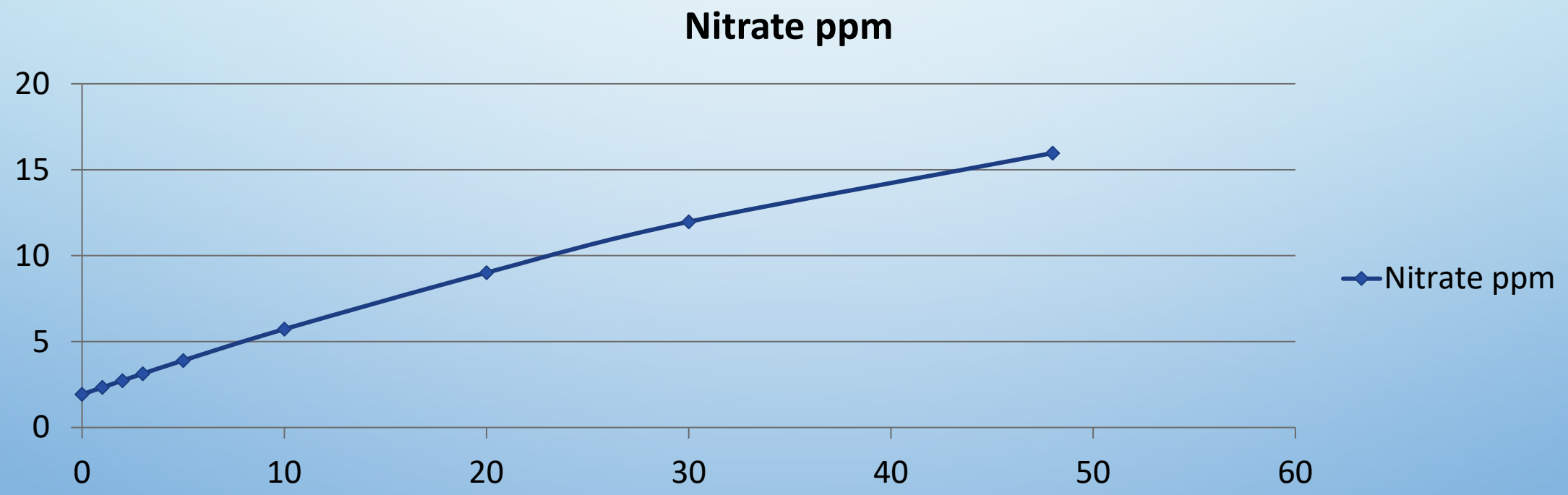
Washington Department of Health

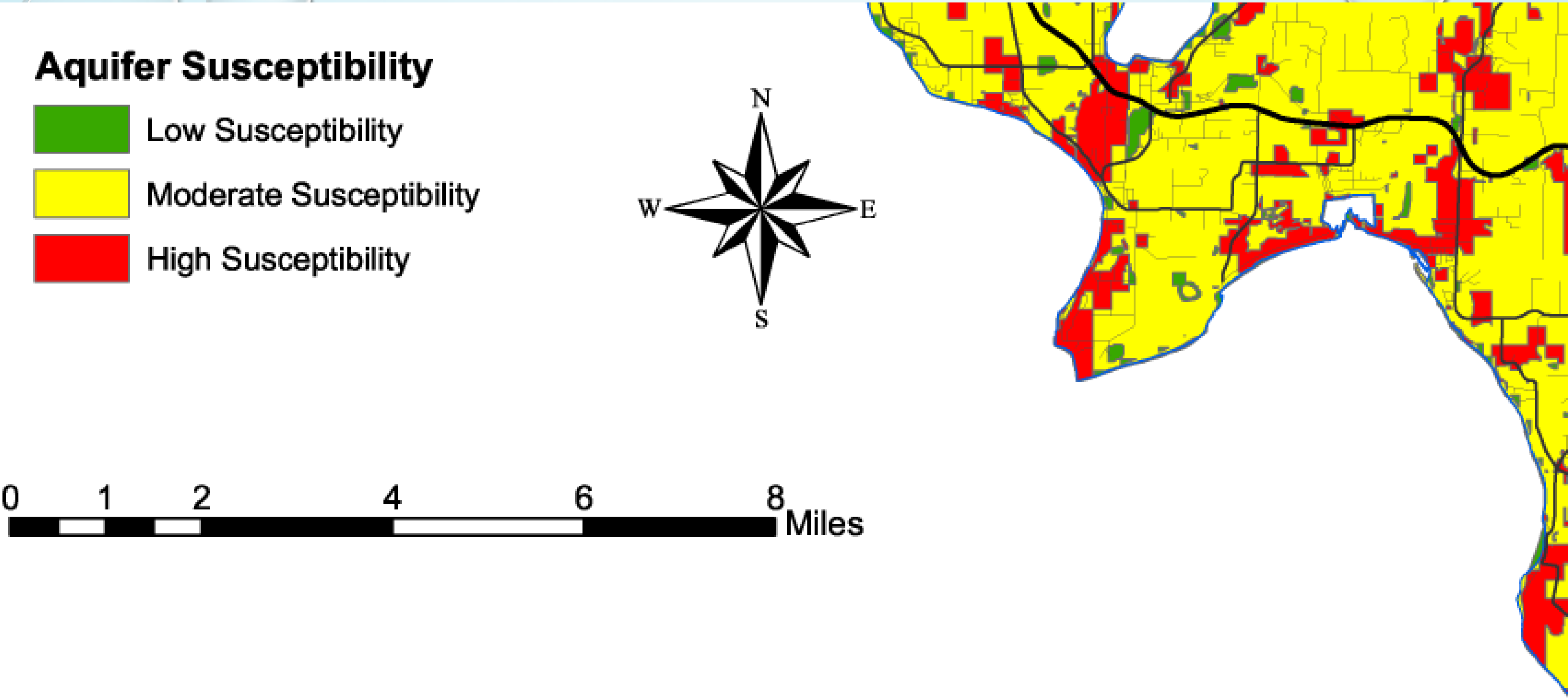
Level 1 Nitrate Balance for Large On-Site Sewage Systems

Effect of addition of 48 septic systems on hillside above wells

Input Values	Factor	Units	Values	Instructions	Information Source
Nitrate concentration in precipitation	N_R	mg/l as N	0.24	Default	Default
Total nitrogen concentration in wastewater	N_W	mg/l	60	Default - residential strength	Default
Soil denitrification	d	unitless	0.1	Default	Default
Aquifer thickness	b	ft	20	Default or aquifer thickness if known	WHP
Drainfield area	A_D	ft^2	385,000	Primary drainfield area	Lot width*length
Distance from drainfield to property boundary	D_{pb}	ft	100	Measure in direction of GW flow	Sanitary control area
Aquifer width	W_A	ft	275	Perpendicular to GW flow	Lot width
Aquifer hydraulic conductivity	K	ft/day	400	Measured or literature value	WHP (T/b)
Hydraulic gradient	i	ft/ft	0.002	If unknown, use 0.001	WHP
Recharge	R	in/yr	3.00	Recharge will be a % of ppt	USGS Recharge map
Nitrate concentration of upgradient ground water	N_B	mg/l	2	Prefer sampling data	Current background
Wastewater volume	V_W	gpd	12,960	Design flows or measured volume	lots*gpd/lot
Output Values					
Groundwater nitrate value	N_{GW}	mg/l as N	16.01	Point of Compliance (POC)	
Groundwater nitrate value	$N_{GW\ ALT}$	mg/l as N	15.97	Alternative POC	

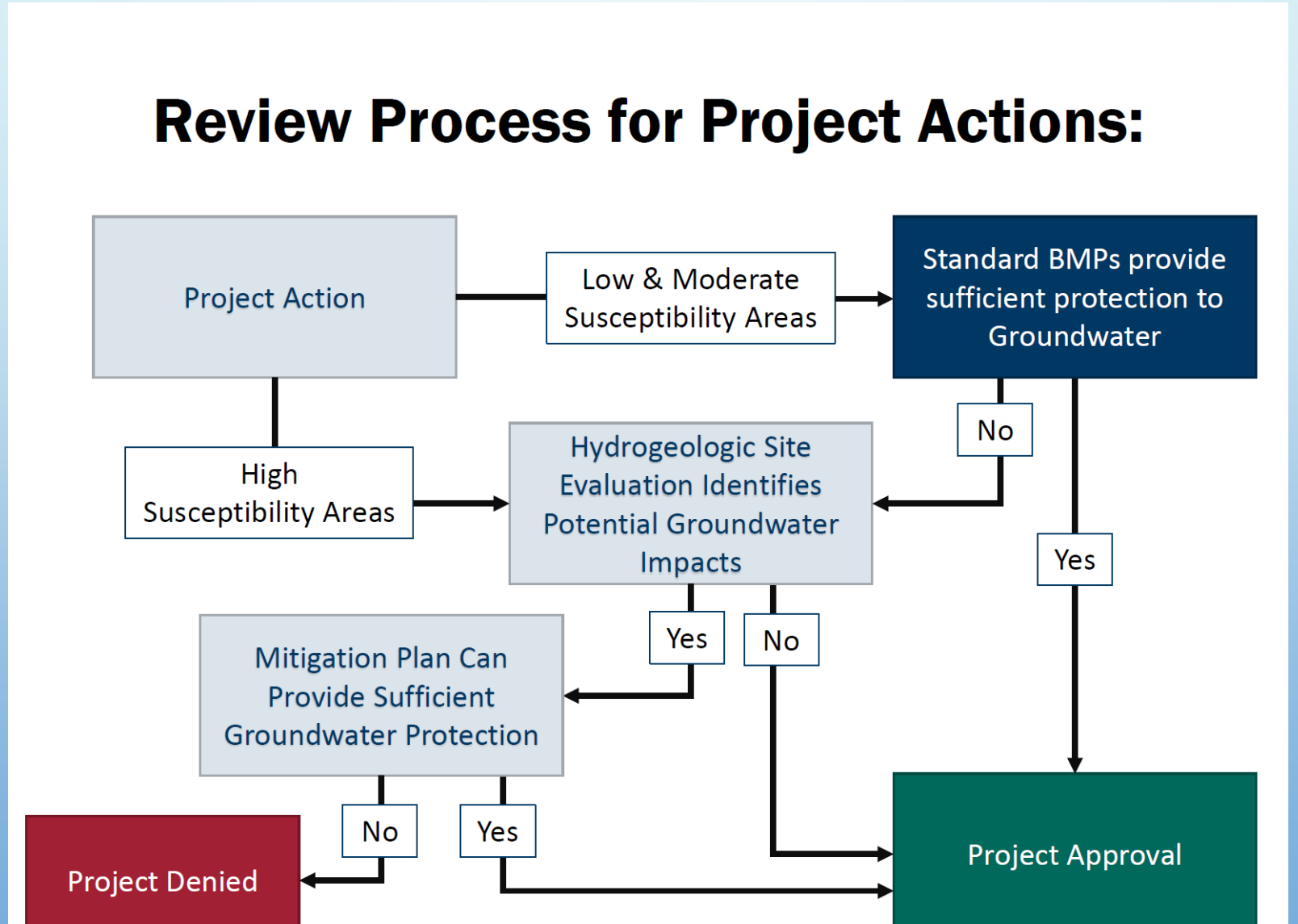
Nitrate ppm vs Number of Septics





Island County
Critical Aquifer Recharge Area Map

Projects Within a CARA
Island County Hydrogeology



Recent History

2014

- Property listing removed
- Property relisted with 29 lots at a lower price
- SV-SLB Water system makes an offer
- Declined
- Property listing removed

2021

- Another potential development project sparks… discord

2022– a Turning Point

- Board personnel changes
- Landowner decides to develop property
- Peace breaks out
- Reach out to DOH Planner
- Water systems agree to discuss consolidation
- Apply for, and obtain, a Consolidation Feasibility Study Grant
- December 27, 2022, storm causes flooding on Sunlight Beach Road. Water comes within feet of our wells, adding further urgency

Consolidation Feasibility Study Grant

DWSRF

- Group A Community Water System must lead
- Agreement from both (all) systems to study
- Vote on outcome
- $50,000
- RFP for Engineer

Assembling the Team

SV-SLB

A Professional Mediator

Me

SWBA

The Scion of the Capulets

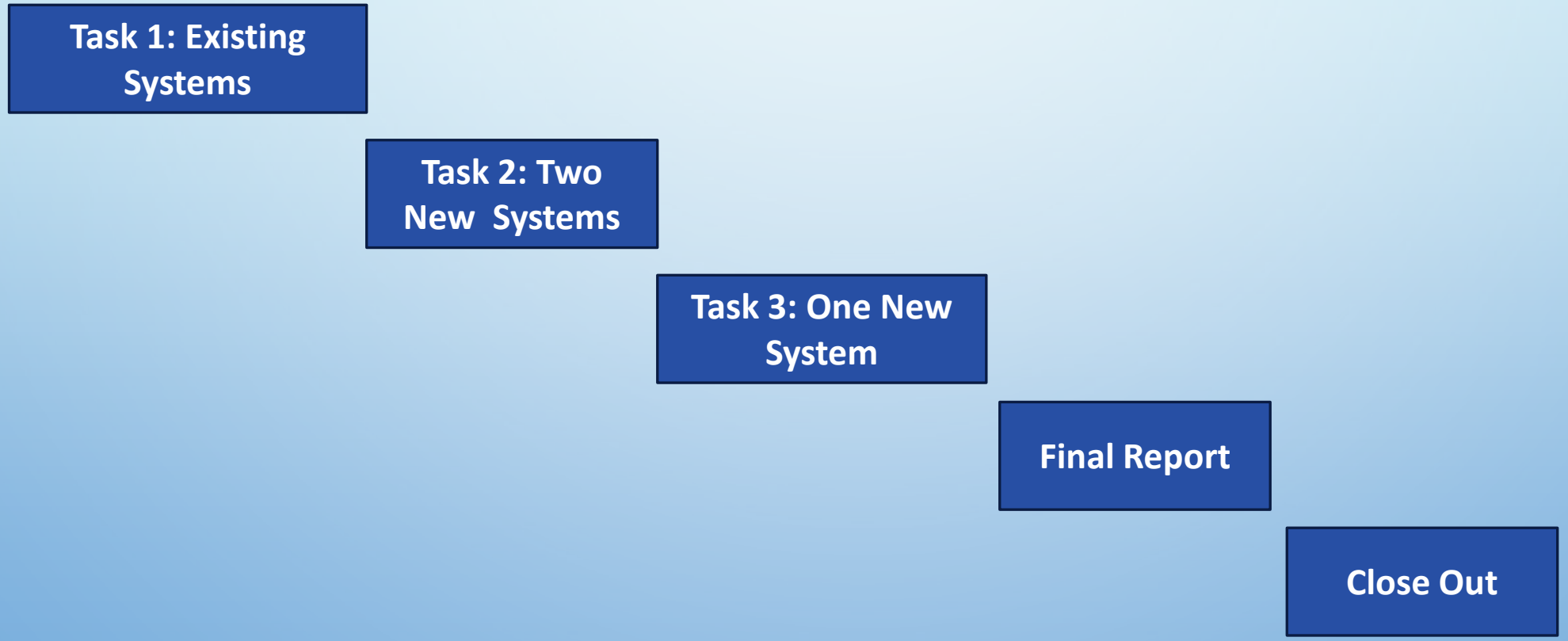
A Rocket Scientist

Engineer: Anchor QEA

Consolidation Study Scope and Schedule

June 2023

October 2024



Consolidation Issues

Technical

- Sea level rise
- Nitrate
- Equipment
- Treatment

Financial

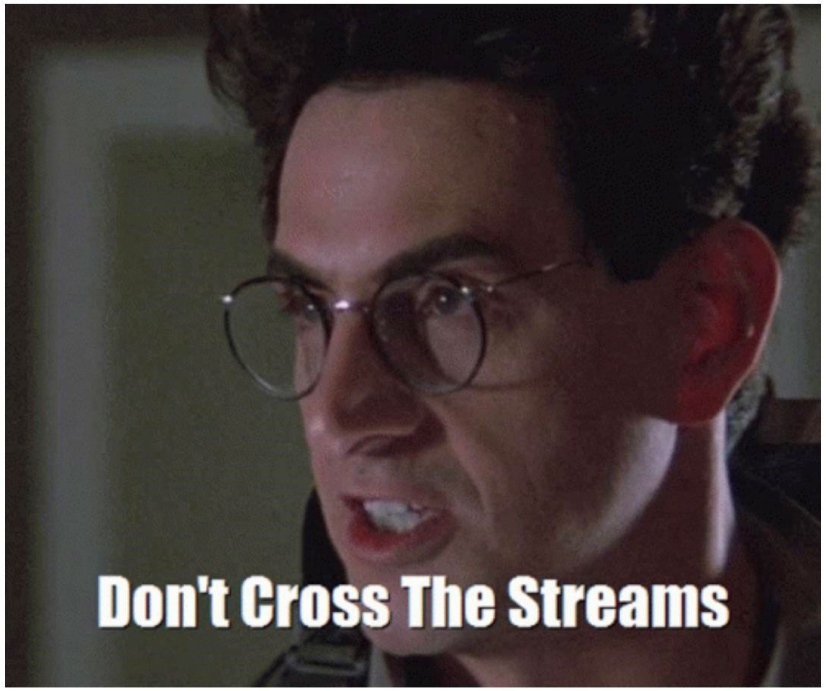
- Cost
- Rates
- Reserves

Managerial

- Organizational
- Operational
- Water rights

Community Resistance

- Historical issues
- “Independence”



Conclusion from the Report

“The risks of contamination of the groundwater wells is sufficiently credible to recommend that affirmative actions be taken to protect the water supply in the future.”

“A prudent alternative will be to pursue construction of wells at a new location that is upslope of these potential contamination risks.”

Big Picture

- Water system is aging and faces several risks.
- Do we want to continue to operate separately?
  - Future maintenance would be funded by assessments or commercial loans
  - If we move the wells we would need a special assessments for the down payment and rate increases to repay commercial loans.
- Do we want to explore consolidation?
  - May be possible to fund maintenance, modernize the system, and move the wells using low-cost state loans.

Cost Estimates for Moving Wells

Rough estimate comparison of options

Annual Surcharge for Loan Repayment Per Connection		
Average over 25 Years	**SBWA**	**SVSLB**
Separate Systems Assumes 7% commercial loan	$ 1,625	$419
Consolidated Systems	$131	$131
Annual savings from consolidation	$1,594	$288
Estimated Special Assessment for Down Payment Assumes 20%		
Year 4	$950	$258
Year 6	$4,700	$1,247
Year 20	$3,800	$959

Impacts of SBWA Adopting SV-SLB HOA Water Rate Structure

SV-SLB HOA Water Rate Structure

- Base Rate: $92.50/qtr = $370/yr
- Tier 1: 0 to 2,499 CF/qtr: $0.01/CF
- Tier 2: 2,500 to 3,499 CF/qtr: $0.06/CF
- Tier 3: > 3,500 CF/qtr: $0.18/CF*

SBWA water rates impacts would be minimal for 90% of SBWA members based on current usage

- ~ 80 % would pay an average of ~ $50/ year LESS
- ~ 10% would pay an average of ~ $30/ year MORE
- ~ 10% would pay an average of ~ $700 / year MORE (Only four SBWA Connections*)

* “War on lawns” or “class warfare”

Modeling a Rate Structure for Conservation

John Lovie,
Sun Vista/Sunlight Beach HOA
john.lovie@whidbey.com

ERWoW Annual Conference 2013

Consolidation Issues

The study took care of some

Technical

- ~~Sea level rise~~
- ~~Nitrate~~
- ~~Equipment~~
- ~~Treatment~~

Financial

- ~~Cost~~
- ~~Rates~~
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Managerial

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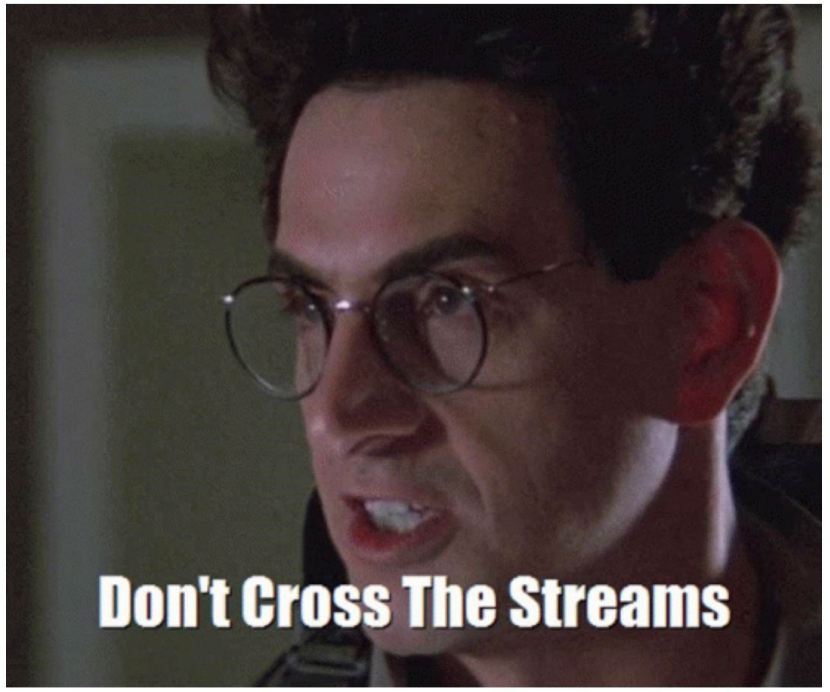

Current status

- Both water systems held annual meetings
- Thorough presentations on the Consolidation Feasibility Study report
- No serious objections!

Getting to “Yes”

- Negotiations with landowner - Change the team
- Reserve study - Reserves and equalization
- Organizational structure and governance IACC
  - HOA
  - Water Association
  - Water District
- Operations - SMA?
- Community issues - Patience
- Memberships vote

Funding Sources for Land Acquisition, Design, and Construction

- IACC
- DWSRF – Preconstruction and construction loans
- USDA RD – Land Acquisition
- PWB – if a water district
- RCAC – some
- ERWOW – tech assistance
- Commercial – last resort

Summary

- Consolidation = survival
- Almost always makes technical, managerial, and financial sense
- Ample money and resources available
- Failure is usually due to community resistance
- Shoveling the driveway while it’s still snowing
- Really hard to do this bottom up
- Building community IS the point

Contact Information

- John Lovie
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- ETI Consulting LLC – Water and Environment
- DOH Feasibility Grant — Sun Vista / Sunlight Beach HOA (sv-slb.com)
- A copy of this presentation