



We work with others to protect the health of the people of Washington State by ensuring safe and reliable drinking water.



## DRINKING WATER SOURCE PROTECTION FUNDING

Washington State Department of Health  
Office of Drinking Water



- Who are we?
- Who's in the room?
- Do you know where your community gets its water from?
- How much do you know about source water protection?



- Correlating local plans with water system plans
- Benefits of good working relationships between local governments & water systems
- Establishing wellhead protection areas (WHPAs) & benefits of upgrading to modeling
- Source water protection funding available from DOH and what it can be used for

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## What Do Local Plans Have to Do with Water?

- Service area land use & zoning (source water protection, ID pressure/lift issues, main sizing)
- Practicality—system growth & capital investments vs. where new growth is planned to occur
- Zoning dictates land use in wellhead protection areas (WHPAs)
  - Many local jurisdictions overlook small systems in planning
- Critical areas—critical aquifer recharge areas (CARAs—relationship with WHPA)

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### Required Groundwater Planning

- Protecting **quality & quantity** of groundwater used for public water supply
- **Required content in comp plan land-use element**
- 1984—All local jurisdictions statewide  
RCW 35.63.090—towns & non-code cities  
RCW 35A.63.061(1)—code cities  
RCW 36.70.330(1)—counties
- 1990—GMA (RCW 36.70A.070(1))—all fully planning jurisdictions

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### Local jurisdictions need to know

- Water availability
- Available level of service
- Source water protection needs

### Critical Intersection: Where Local Jurisdictions & Water Systems Need to Communicate

### Water systems need to know

- What kind of development to expect
- Where new development will go
- Development proposals in WHPAs

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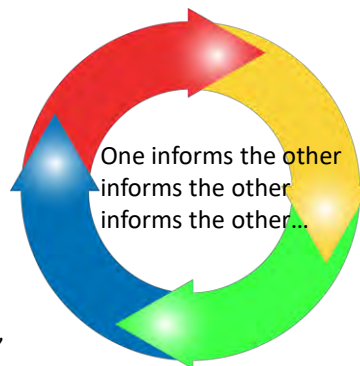
## Who's Leading the Charge?

As required



“Consistency with local plans & regulations”  
(WAC 246-290-108)  
Water system plan complies with comp plan

In practice



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## What is Source Water Protection, Anyway?

- Actions, not policies
- Preventative, not reactive
- Tailored & planning-based considering such things as geography, surroundings, future growth & land uses, capacity, & emergency response
- Actively maintained (current/updated)
- Bottom line: steps to keep your drinking water clean and drinkable!

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## Source Water Protection 101

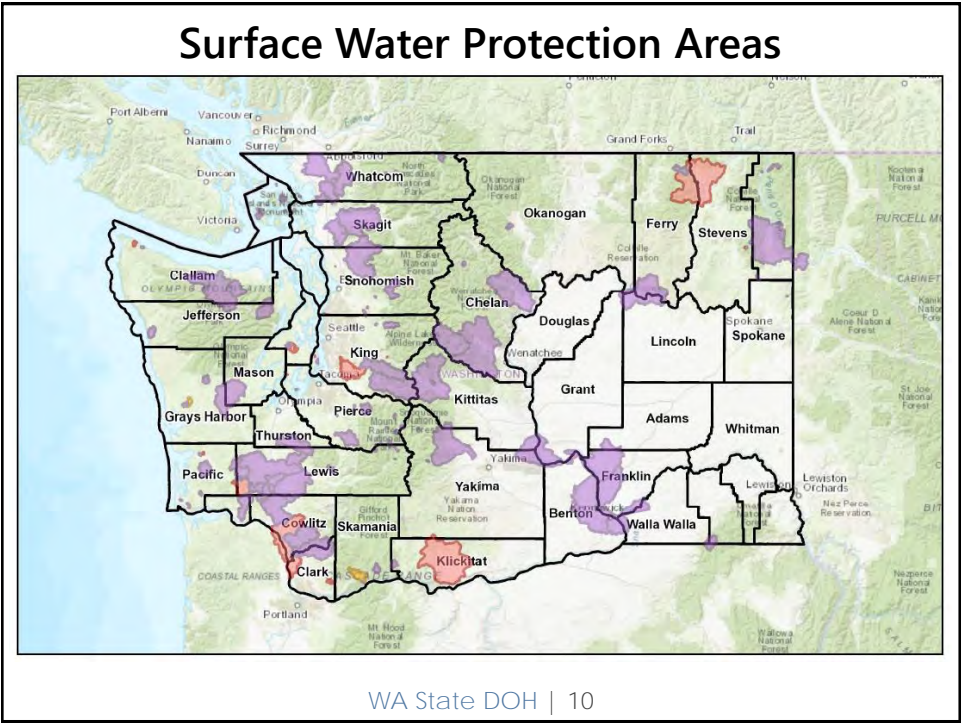
- 1996 amendments to federal Safe Drinking Water Act
- WAC 246-290-135—sanitary control area, wellhead protection program (wells & springs), watershed control program (surface water/GWI)
- Part of Group A water system plan or small water system management program (WAC 246-290-100 or -105)
- For Group B—within WAC 246-291-125

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## Surface Water Protection Requirements

- Watershed control plan
  - Watershed description
  - Identification of activities & land uses detrimental to water quality
  - Watershed management & control measures
  - System operation
  - Documentation of water quality trends
- Update as needed (at least with water system plan update)

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### Contamination is Expensive!

A community may spend millions of dollars responding to contamination.

Responding to contamination is about 200 times more costly than prevention.



*Can your community afford it?*



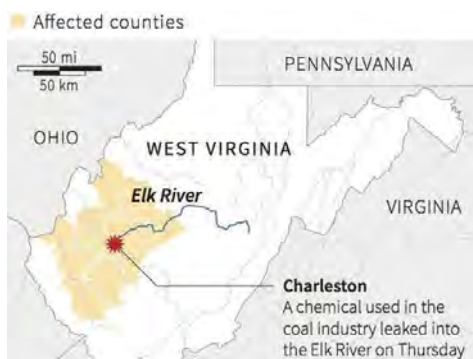
Crude MCHM  
(4-methylcyclohexanemethanol)  
is chemical foam/wash agent  
used in coal processing

### Case Study: Elk River Spill, January 2014

Up to 10,000 gals. of MCHM  
combined with PPH (glycol  
ethers) leaked onto ground then  
transited into the Elk River, 1.5  
miles upstream of the West  
Virginia American Water intake

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- 300,000 customers
- Up to nine-day "do not drink" order



- National Guard engaged to distribute water
- Business, school & public sector closures
- Declared state of emergency
- Replaced all treatment plant filters (\$1.2M)
- Total cost \$70M



## Contamination Leads to Change

As a result, West Virginia lawmakers passed legislation to protect drinking water

- Required planning
- Established an early warning monitoring & response system
  - Baseline monitoring
  - Alternatives for real-time source water monitoring
  - Real-time sensor monitoring system considerations
  - Consequence management
  - Communication planning

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## Risks beyond spills

Landscape impacts future water quality

Changes:

- Increased nutrients
- pH changes
- Increased organics
- Increased sediment (turbidity)

Impacts at the plant

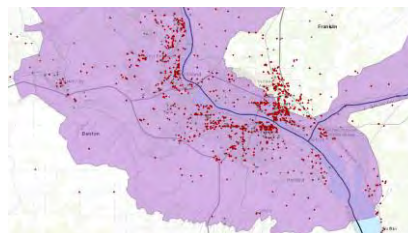
- Plugging
- Taste & odor issues
- Effectiveness of chlorine
- Increased shut-downs
- Shorter life cycle





## Make Your Source Protection Meaningful

- Watershed control plan
  - Watershed description
  - Identify activities & land uses detrimental to water quality
  - Watershed management and control measures
  - System operation
  - Document water quality trends
- Consider a regional approach
  - Work with other utilities
  - Engage the public
  - Communicate with local government & emergency response agencies



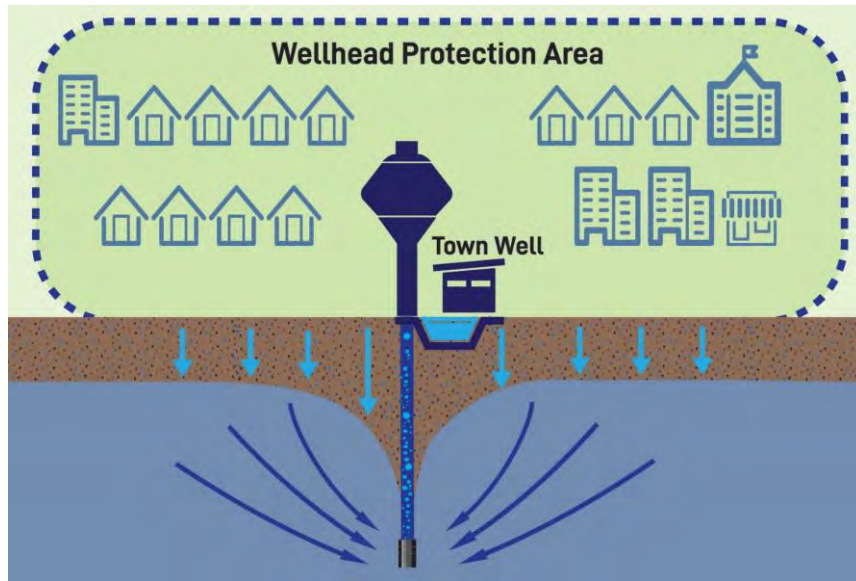
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## Wellhead Protection Requirements

- Source water susceptibility assessment
- Sanitary control area (SCA)
- Wellhead protection program
  - Define & map WHPAs
  - Inventory of potential contamination sources
  - Notify others of findings
  - Contingency planning
  - Coordination with local emergency responders
- Repeat inventory & notification every two years
- Update as needed (at least with water system plan update)

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## What are Wellhead Protection Areas?

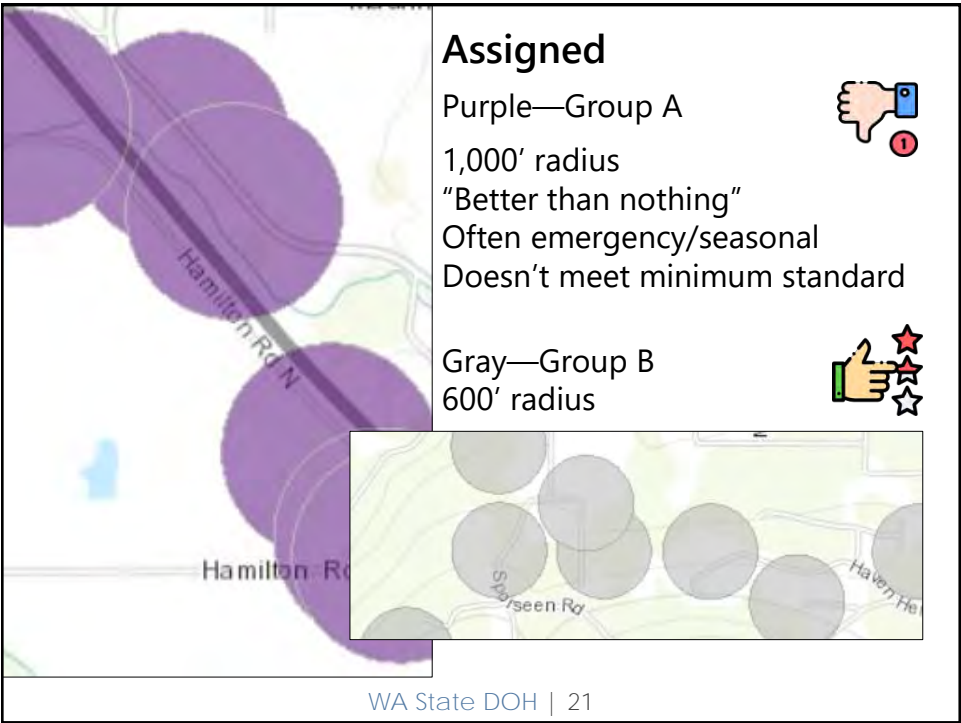
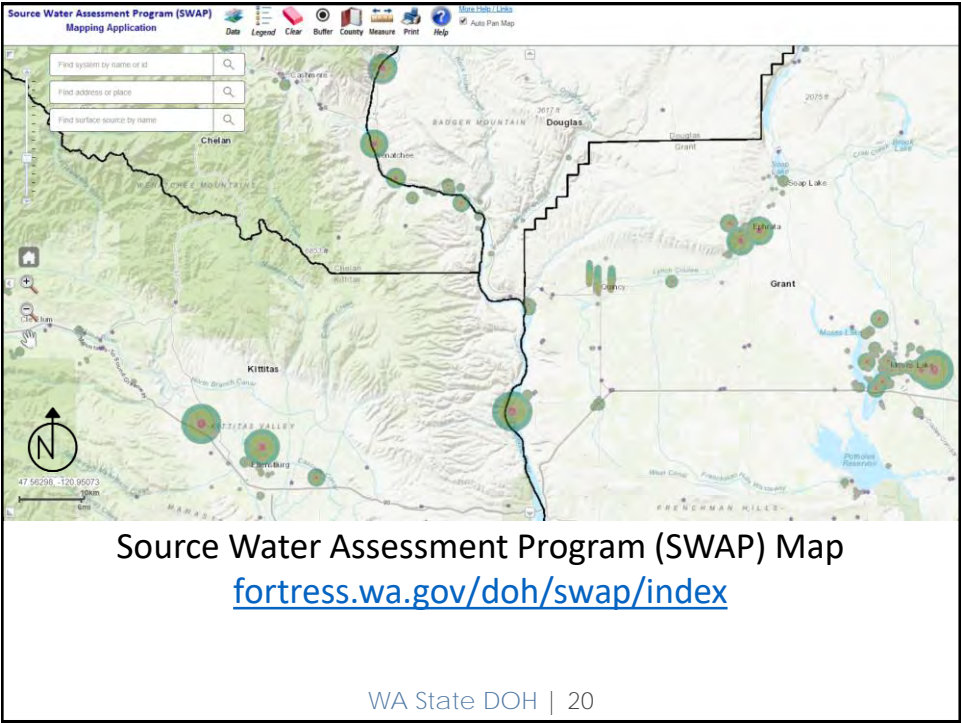


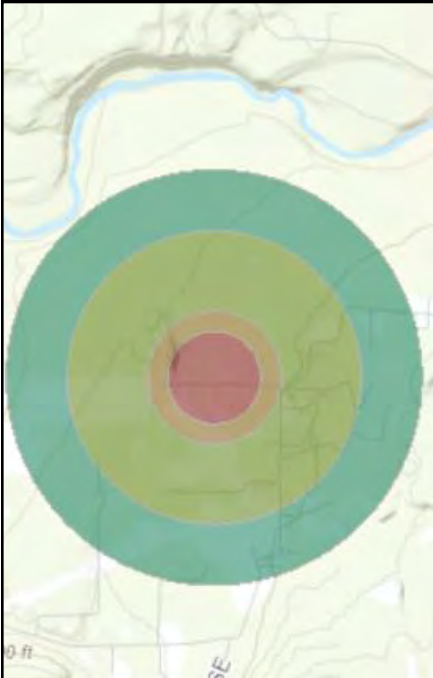
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## Defining Wellhead Protection Areas

- What are the methods?
  - Modeled
  - CFR
- How do you decide the best method?
  - Landscape
  - Source susceptibility
  - Available data
  - Cost

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### Calculated Fixed Radius (CFR)


Most common

Red—6-month TOT  
Tan—1-year TOT  
Green—5-year TOT  
Teal—10-year TOT


Always a bullseye

Math formula using operational characteristics

Theoretical approach; doesn't consider topography, soils, groundwater flow, etc.



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### Modeled

Irregularly shaped

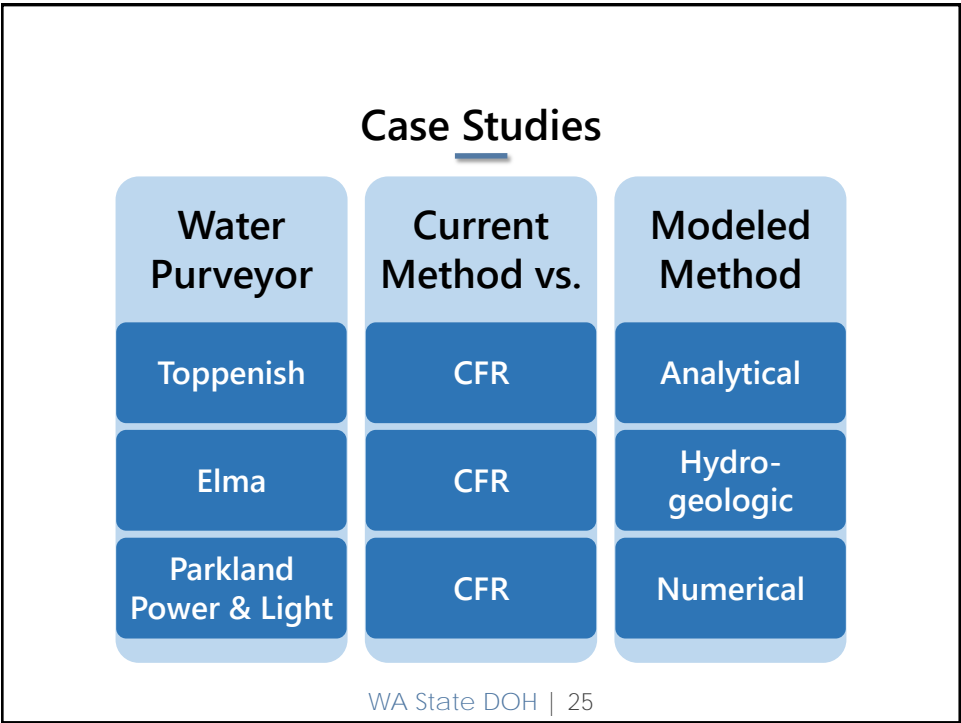
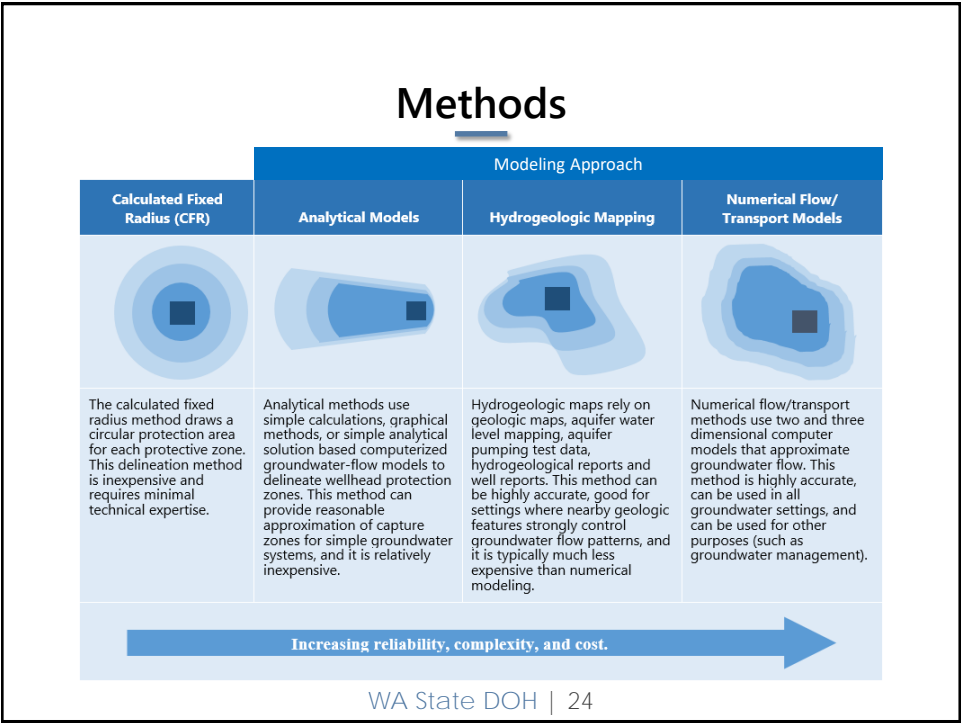
Considers physical land & water features

In practice, best means of protecting source water

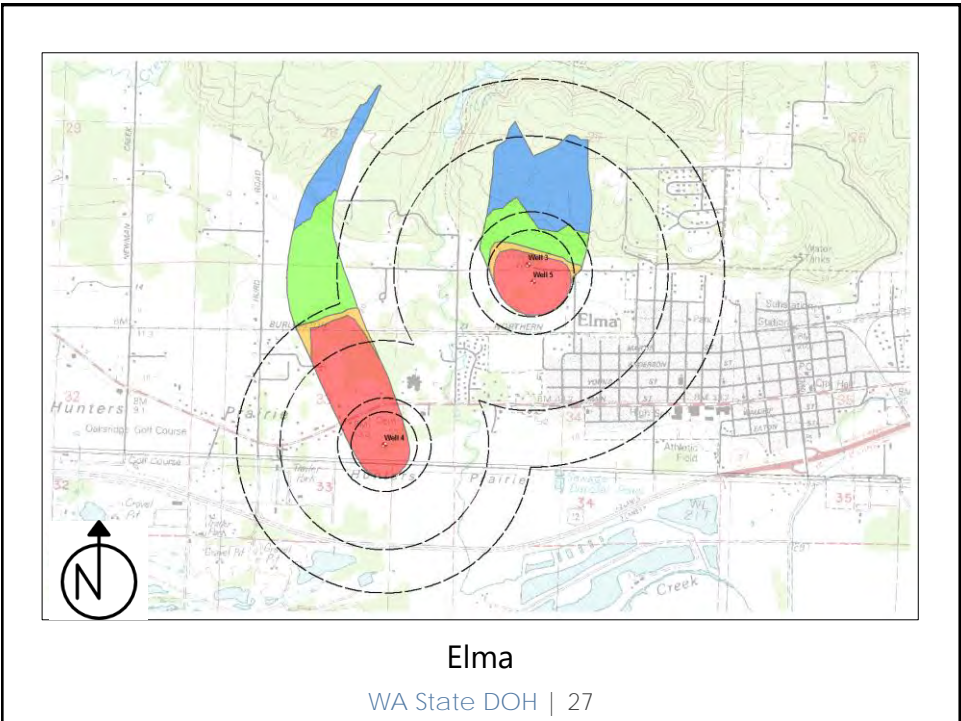
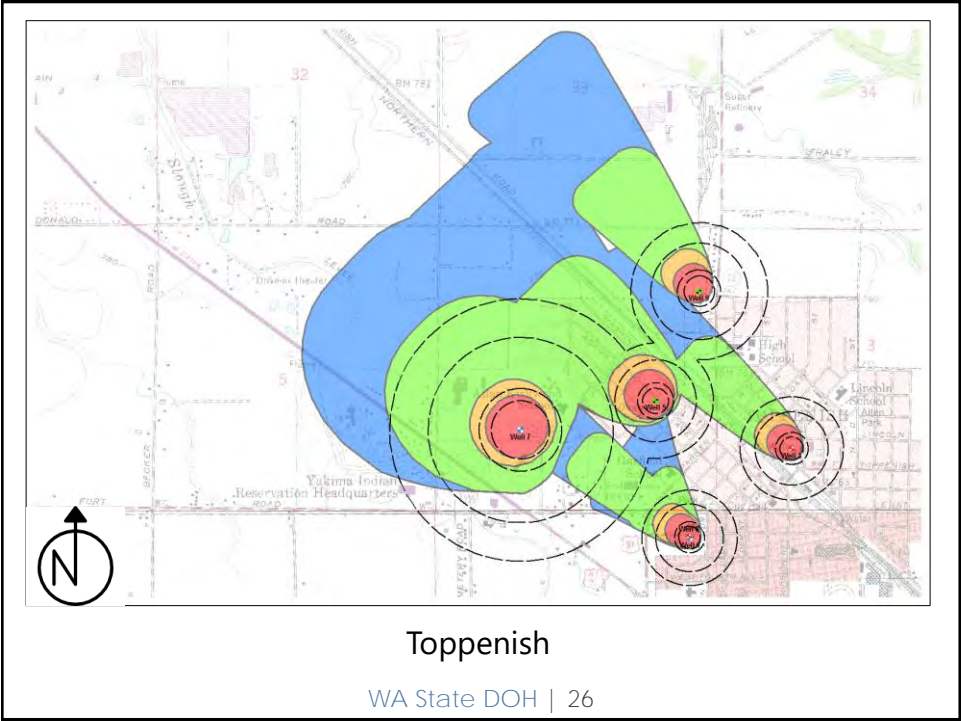


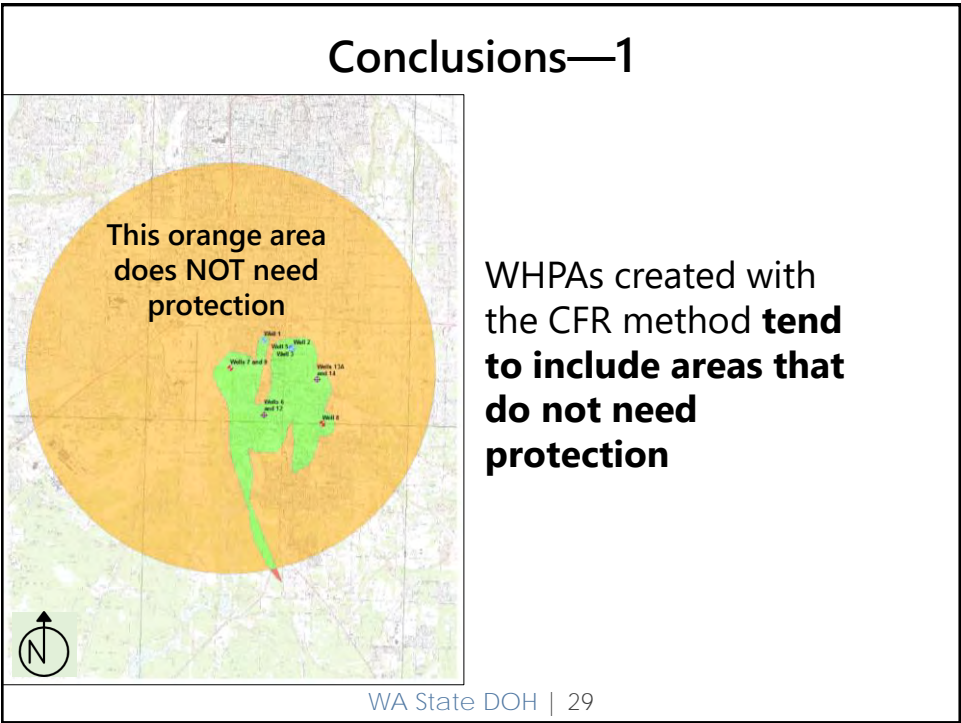
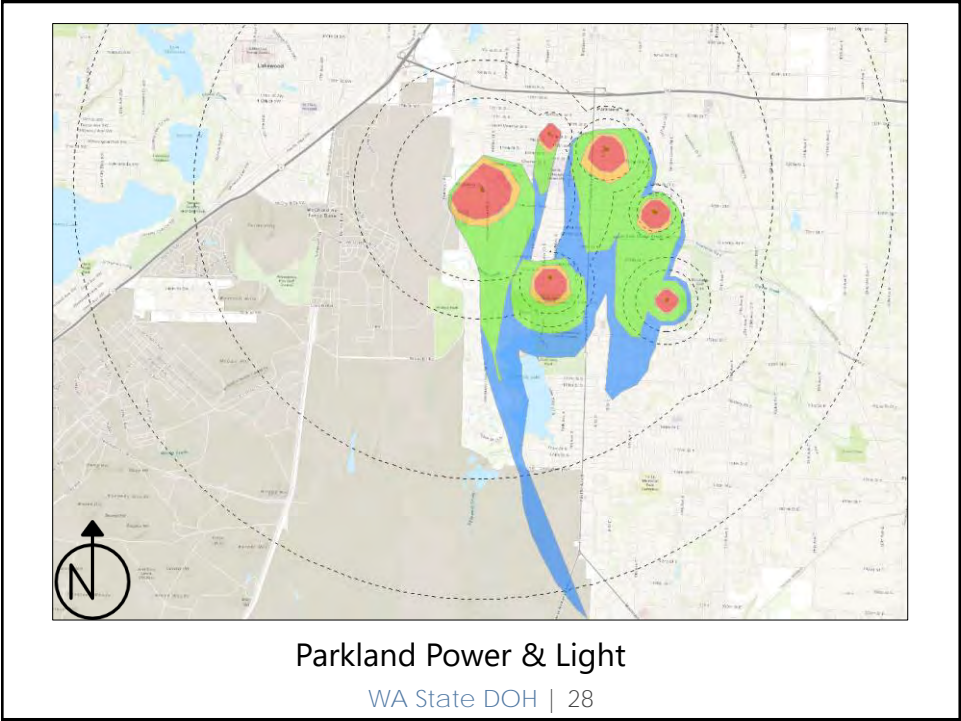


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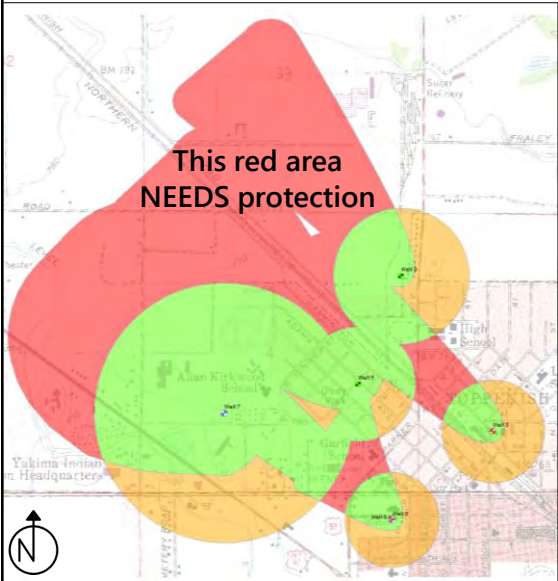






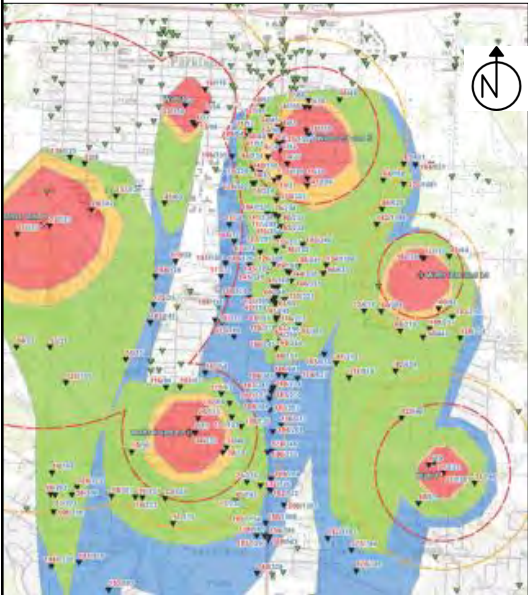


### Conclusions—2



WHPAs created with the CFR method sometimes include the WHPA defined by modeling, **but often do not include areas that need protection**

### Conclusions—3







WHPAs created with the CFR method tend to

- **Erroneously identify potential hazards.**
- **Under-rank hazards that are identified by modeling**

Nearly 2,000 hazards here were identified by the CFR method, but not the numerical modeling method

## Assessing Your Wellhead Delineation Method

The following factors can help you determine whether you should switch from using a CFR method to a more advanced method.

Well Production	Specific Capacity	Susceptibility	Land Use
			
Advanced methods are recommended for wells with high production rates.	Advanced methods are recommended for wells with high specific capacity rates (the quantity of water produced per unit of drawdown).	Advanced methods are recommended for wells with high susceptibility as determined by DOH.	Advanced methods are recommended for wells within urban environments with nearby hazardous land uses.
			DOH PUB 331-636

## Case Study: Subarea Plan

- 2018-19 economic development initiative City of Rock Island & Port of Douglas Co.
- Brownfield redevelopment plan for 200+ ac. fronting onto Columbia River (silicon smelter 1940s-2000)
- Industrial development district (Ch. 53.25 RCW)
- Reuse plan combines light industrial, business park, innovation center, mixed use, tourist-serving & general commercial, recreation, & other uses

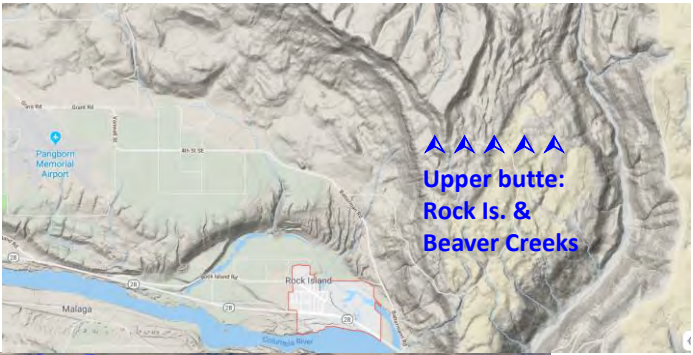
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# Planning Subarea & Wellhead Protection Area



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Base images  
Google Maps &  
Google Earth



## Where is groundwater likely to be going?



**Base image**  
Google Earth

● = approx. well location

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## Case Study Issues

- Likely that groundwater travels away from wells toward planning subarea & that subarea would drain toward Columbia = probably little or no actual wellhead protection concerns associated with site
- CFR WHPA is "best available" & part of approved water system plan so must be used
- Resulting applicability of critical areas regs to project area could disrupt some planned uses for site
- Modeling seems likely to result in resolving WHPA/ critical areas applicability to project

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## What You Put Into It/What You Get Out of It

		Modeling Approach				
		CFR	Analytical Modeling	Hydrogeologic Mapping	Numerical Modeling (Existing Model)	Numerical Modeling (New Model)
Effort	Time	quick	moderately quick	weeks to months	moderately quick	months
	Cost	minimal	relatively low	moderately expensive	relatively low	expensive
	Required Data	low	moderate	high	low	extremely high
	Technical Expertise Required	low	moderate	high	high	high
	Software	none	special modeling software	special modeling software (optional)	special modeling software	special modeling software
Result	Accuracy	low	moderate	high	very high	very high

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## Benefits of Moving from CFR to Modeling




- Improved reliability & predictability
- Improved planning certainty
- Better able to identify contaminants
- Better able to correspond to zoning

but...



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**We can help!**

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## Source Water Protection Funding Basics

- Available for all non-DWSRF projects & project costs
- Available to all nonprofit Group A systems
- Available year around until funding is exhausted
- Projects must be expected to provide long-term benefit to drinking water quality or quantity
- \$30,000 per project (unless regional)



## Using Source Water Protection Funding



- Used for studies
- Projects must be expected to provide long-term benefit to drinking water quality or quantity
- Need to meet all contracting requirements
  - Cost reimbursement
  - 30-45 days - contract execution
  - Eligible to receive federal grant
- [Local Assistance Grant Program](#)

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## Successful Projects

- Preparations needed to acquire 250 acres of priority watershed
- Update WHPAs using modeling method
- Forest management plans to maintain or enhance water quality
- Watershed protection through community outreach & education
- Nutrient study
- Alternate supply studies—hydrogeological studies
- Critical aquifer mapping

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### Drinking Water Provider Partnership

- Restore & protect the health of watersheds that communities depend on for drinking water while also benefiting aquatic & riparian ecosystems, including native fish
- Support local partnerships between drinking water providers, landowners & restoration practitioners
- \$10,000 – \$50,000 per project
- Proposal deadline 1/17/2020
- Application link [www.workingwatersgeos.org](http://www.workingwatersgeos.org)



### Ecology Funding Sources

Clean Water State Revolving Fund	CWSRF	Loans
Stormwater Financial Assistance Program	SFAP	Grants
Centennial Clean Water Program	Centennial	Grants
Clean Water Act Section 319 Program	Section 319	Grants

## Ecology Source Water Protection Funding

- Surface water
  - Mashel River—acquisition
  - Yakima River—improved connectivity to existing riparian area & floodplain
  - Gilligan Creek—acquisition
- Groundwater
  - Spokane County—stormwater retrofit projects to reduce the risk of untreated stormwater on sole source aquifer
  - City of Vancouver—stormwater retrofit projects to reduce the risk of untreated stormwater on sole source aquifer used for drinking water
  - Source protection delineations

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## USDA—NRCS

- 2018 Farm Bill requires 10% funding deduction to benefit drinking water
- Funding goes to producers as a cost share
- Opportunity to partner with conservation districts & other regional agricultural partners
- Similar programs may develop for other agencies under USDA

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## Let's not forget about your community

- Don't underestimate your ratepayers' willingness to contribute
  - Santa Fe, New Mexico
  - City of Bellingham, Washington
- Speak to your customers in a language they understand
  - Watershed vs. source of drinking water
- Look for businesses in the community as partners



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Any  
Questions

Need to know more? Need help?

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# Contact Information

**Corina Hayes**

360-236-3114

[corina.hayes@doh.wa.gov](mailto:corina.hayes@doh.wa.gov)

**Deborah Johnson**

360-236-3133

[deborah.johnson@doh.wa.gov](mailto:deborah.johnson@doh.wa.gov)

[doh.wa.gov/DrinkingWater](http://doh.wa.gov/DrinkingWater)



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