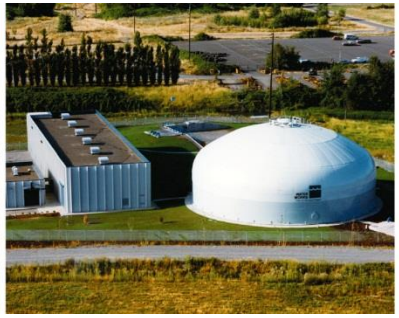
Portland Water Bureau

A Multi-Jurisdictional Approach to Transboundary Groundwater Protection


May 3, 2019

Amanda Fritz, Commissioner | Michael Stuhr, PE, Administrator

PORTLAND WATER BUREAU
FROM FOREST TO FAUCET

CITY OF PORTLAND, OREGON 1851

Portland Water System Overview

Bull Run Supply Challenges – Summer, Sediment, and Uncertainty

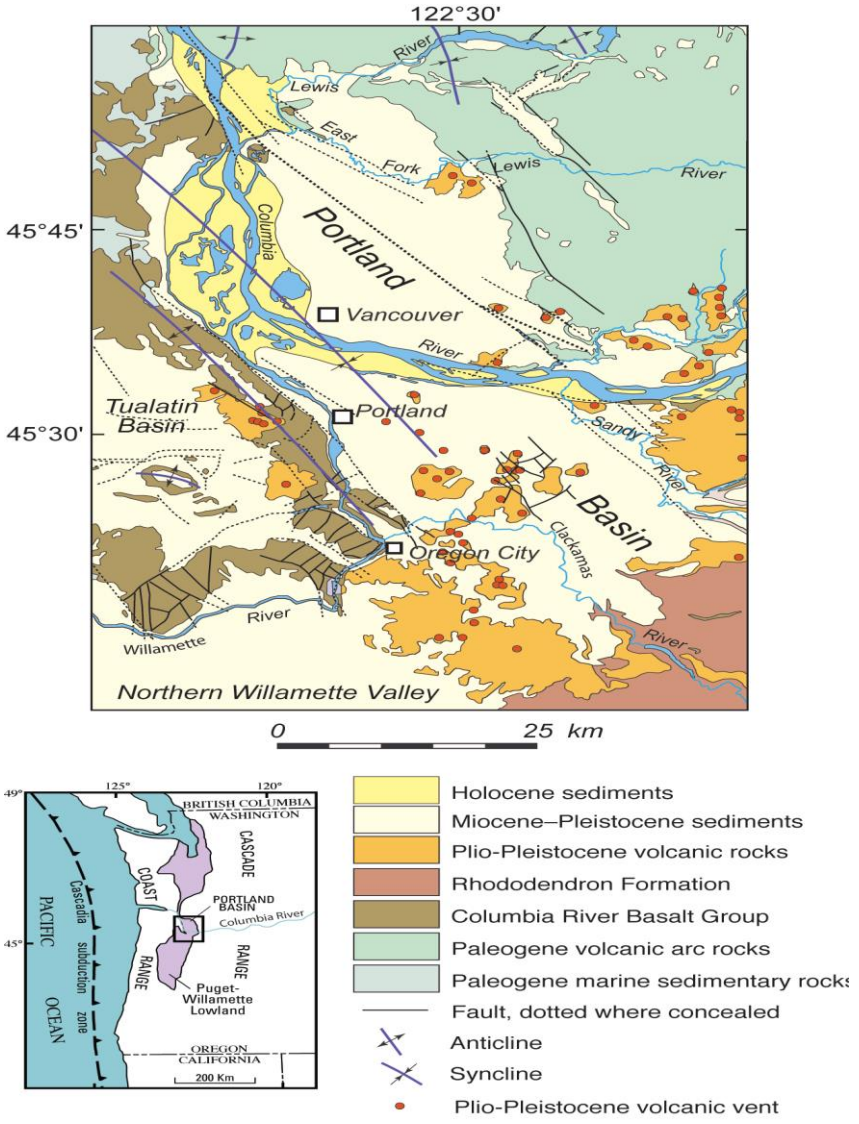
Winter Turbidity / Emergencies

- **15 Events**
- **191 Days**
- **11.4 BG Groundwater**
- **Supply is 100% Groundwater**

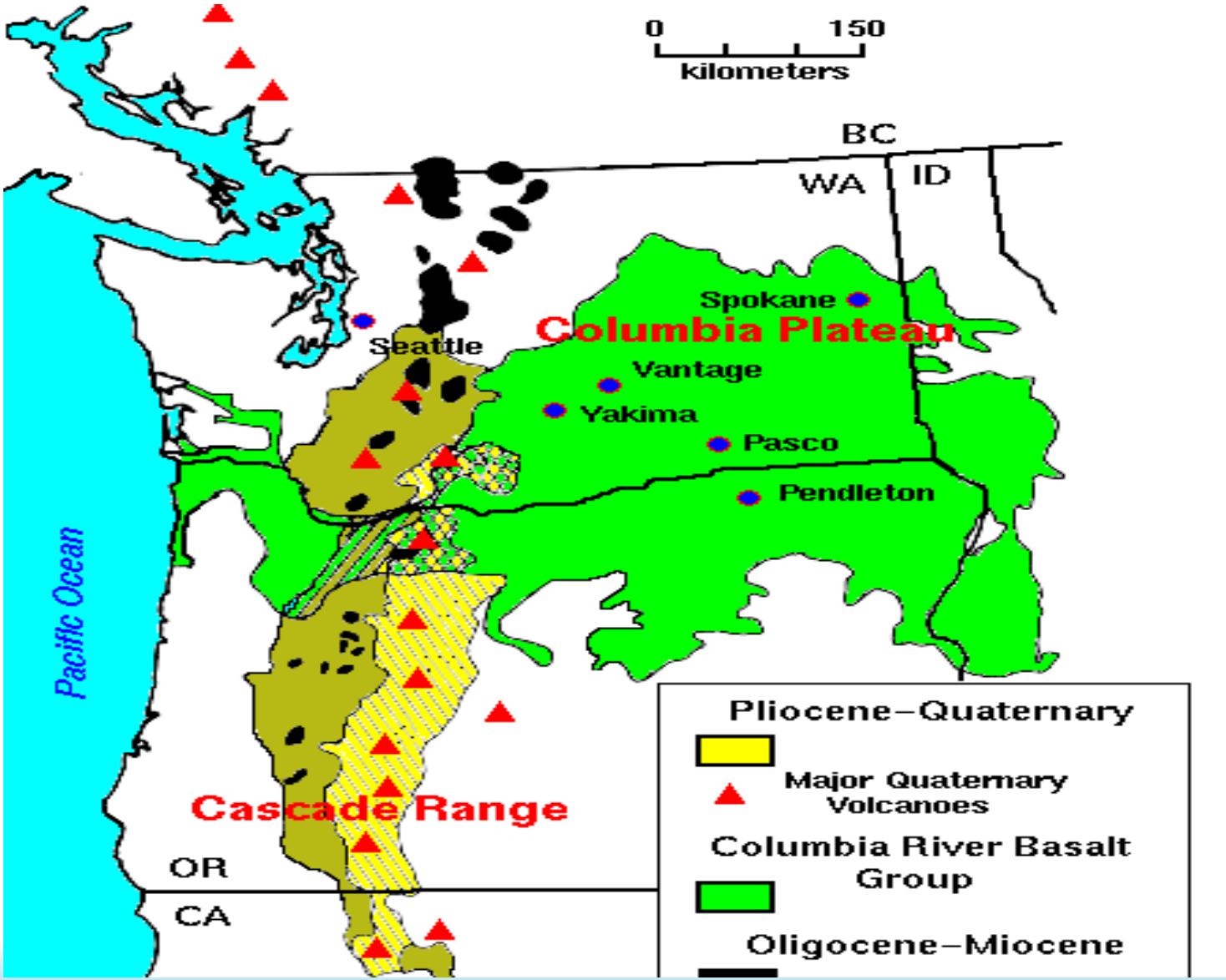
Summer Supply Augmentation

- **15 Events**
- **829 Days**
- **34 BG Groundwater**
- **Supply is Blended GW/SW**

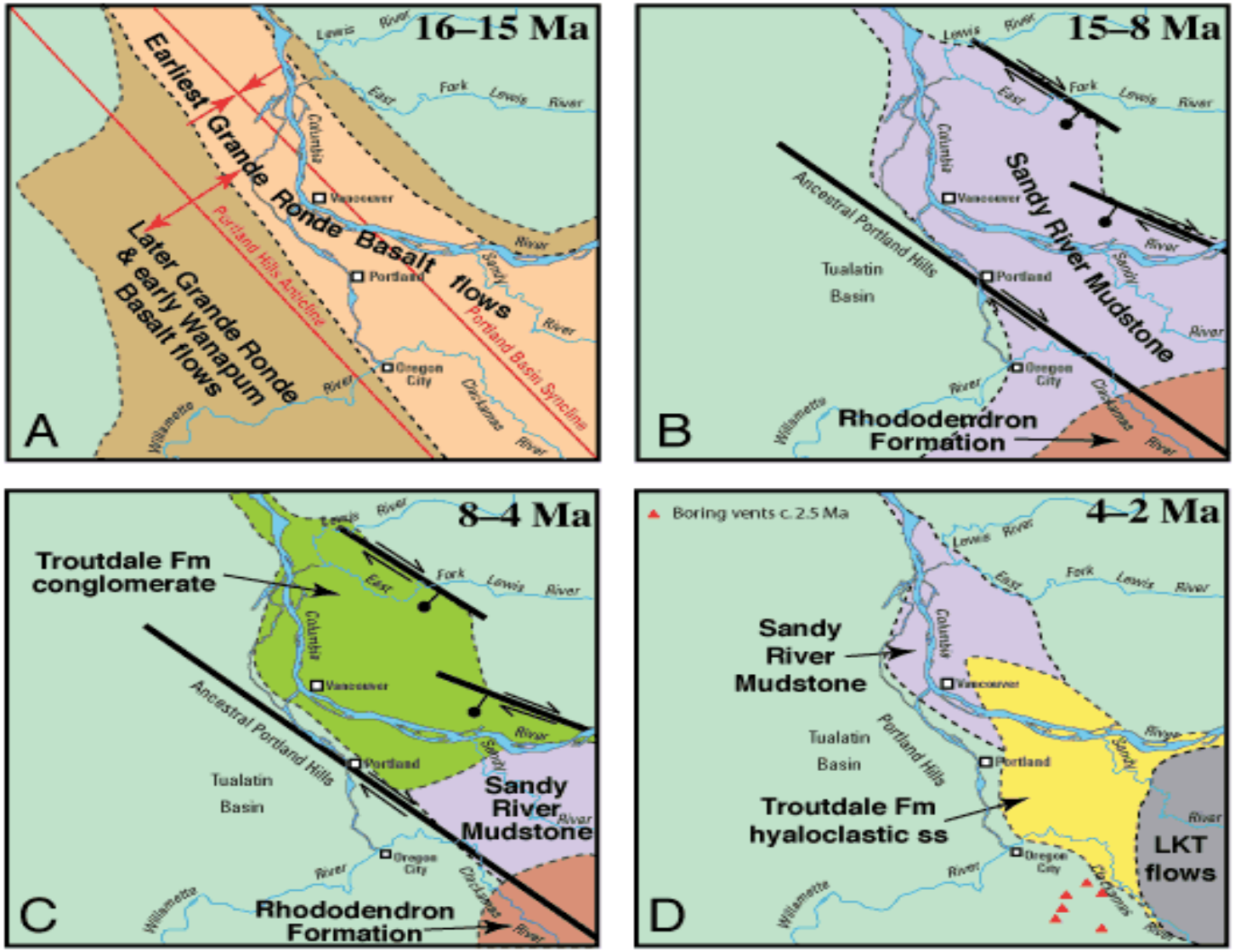
The Portland Basin Forms (20-14 MYA)



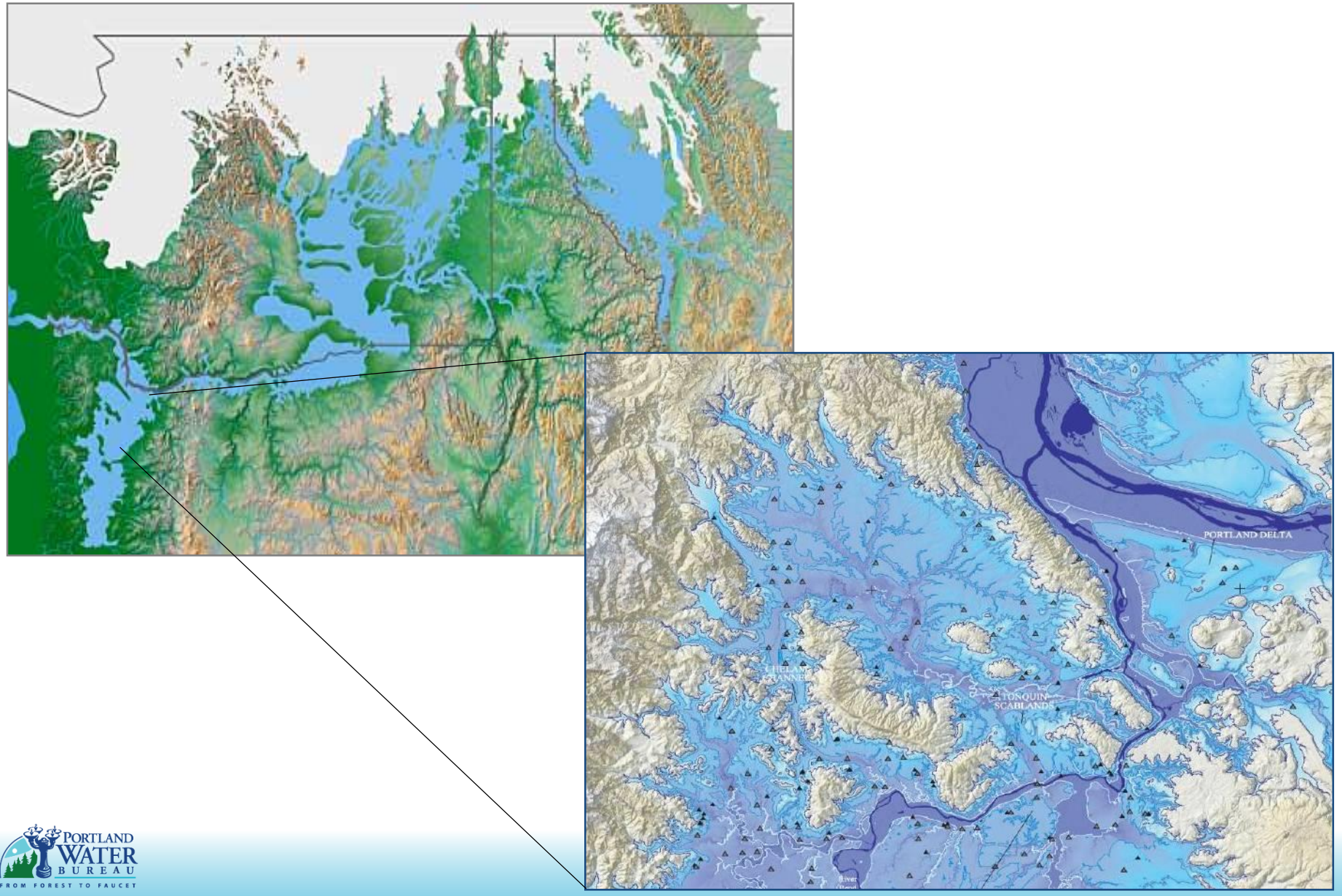
Columbia River Basalts (17-15 MYA)



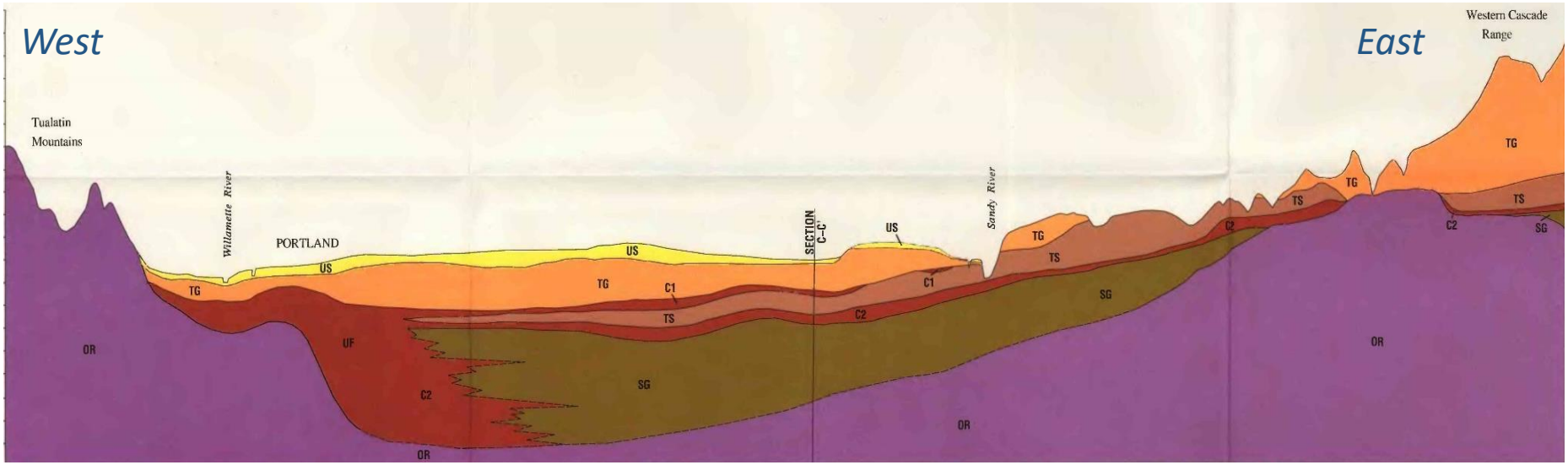
Portland Basin fills in with ancestral Columbia River deposits

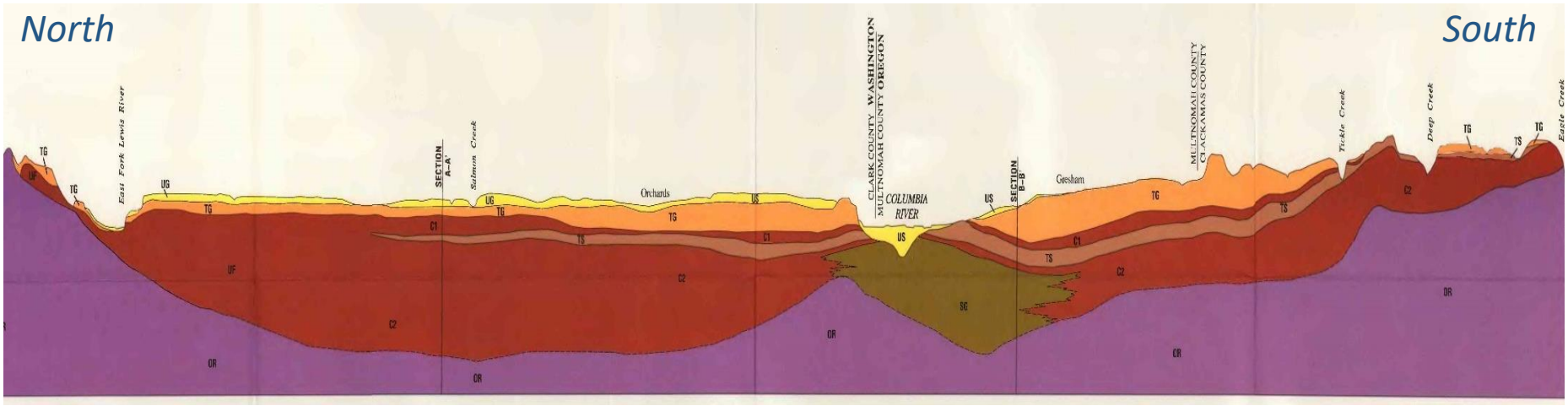


Missoula Floods (15,000 – 20,000 YA)



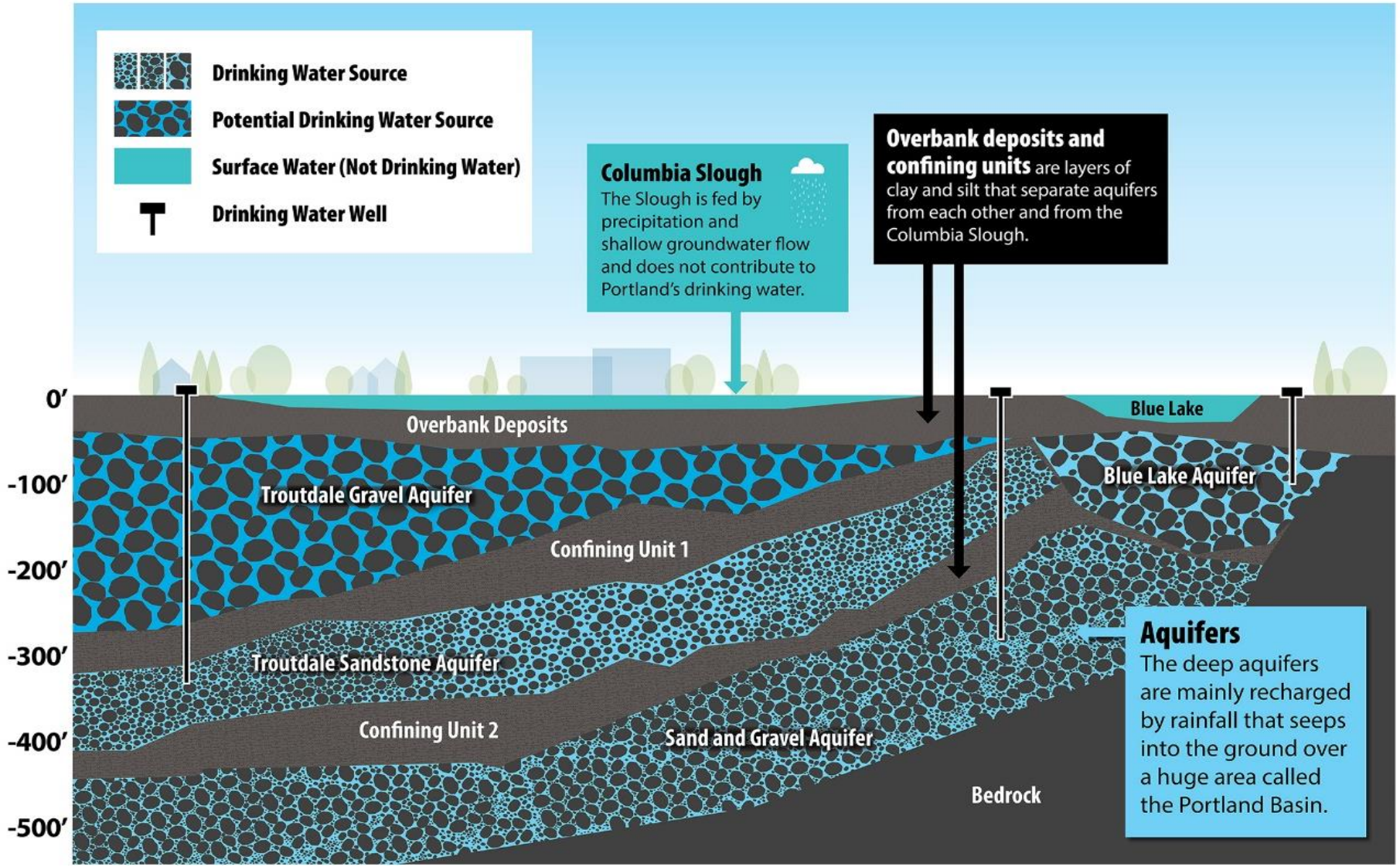
Portland Basin Cross Sections





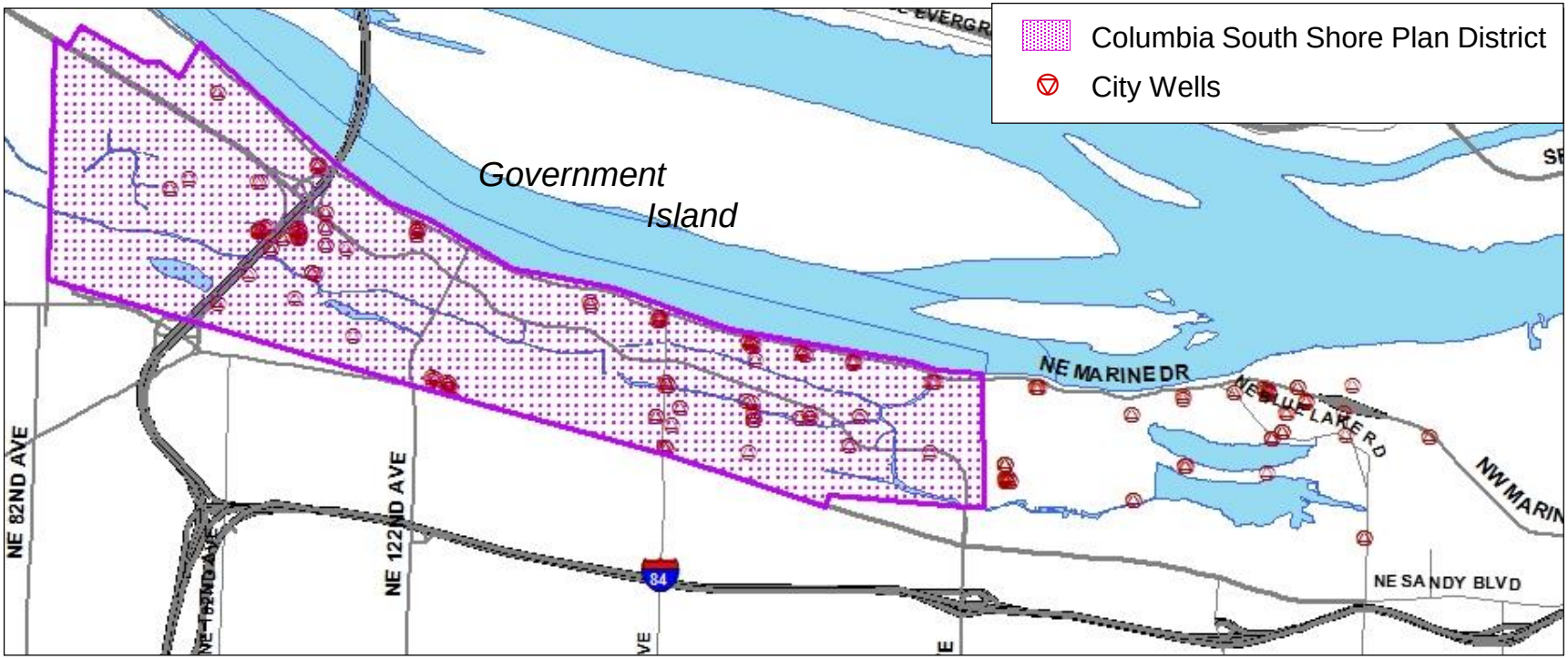
PORTLAND WATER BUREAU
FROM FOREST TO FAUCET

Columbia South Shore Well Field Aquifers



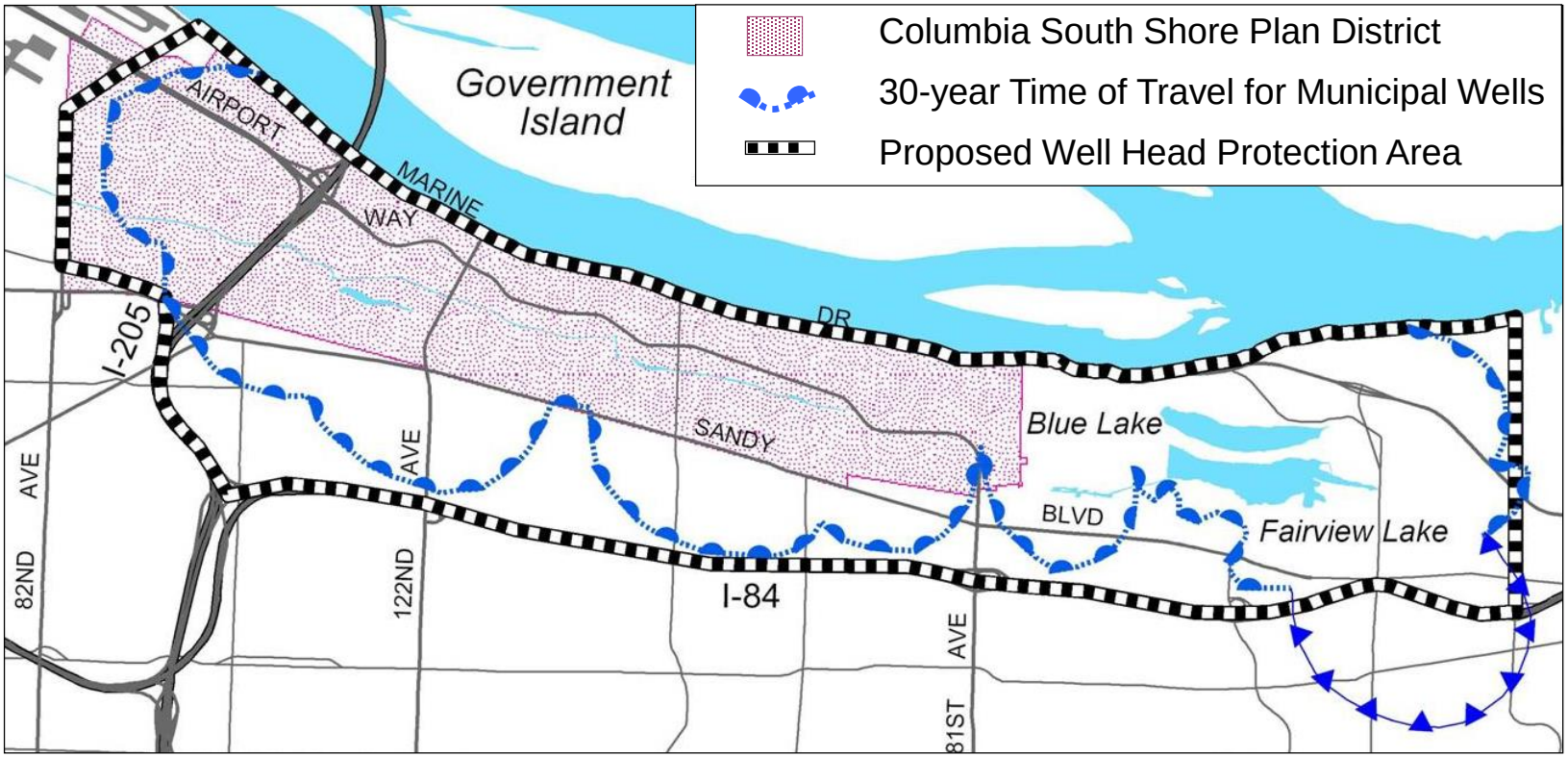
1988 - Early Groundwater Protection Planning-Driven Approach

- Columbia South Shore Plan District Amended
  - Prohibited some uses (e.g. gas stations)
  - Affected new and re-development only
  - High risk uses required special review



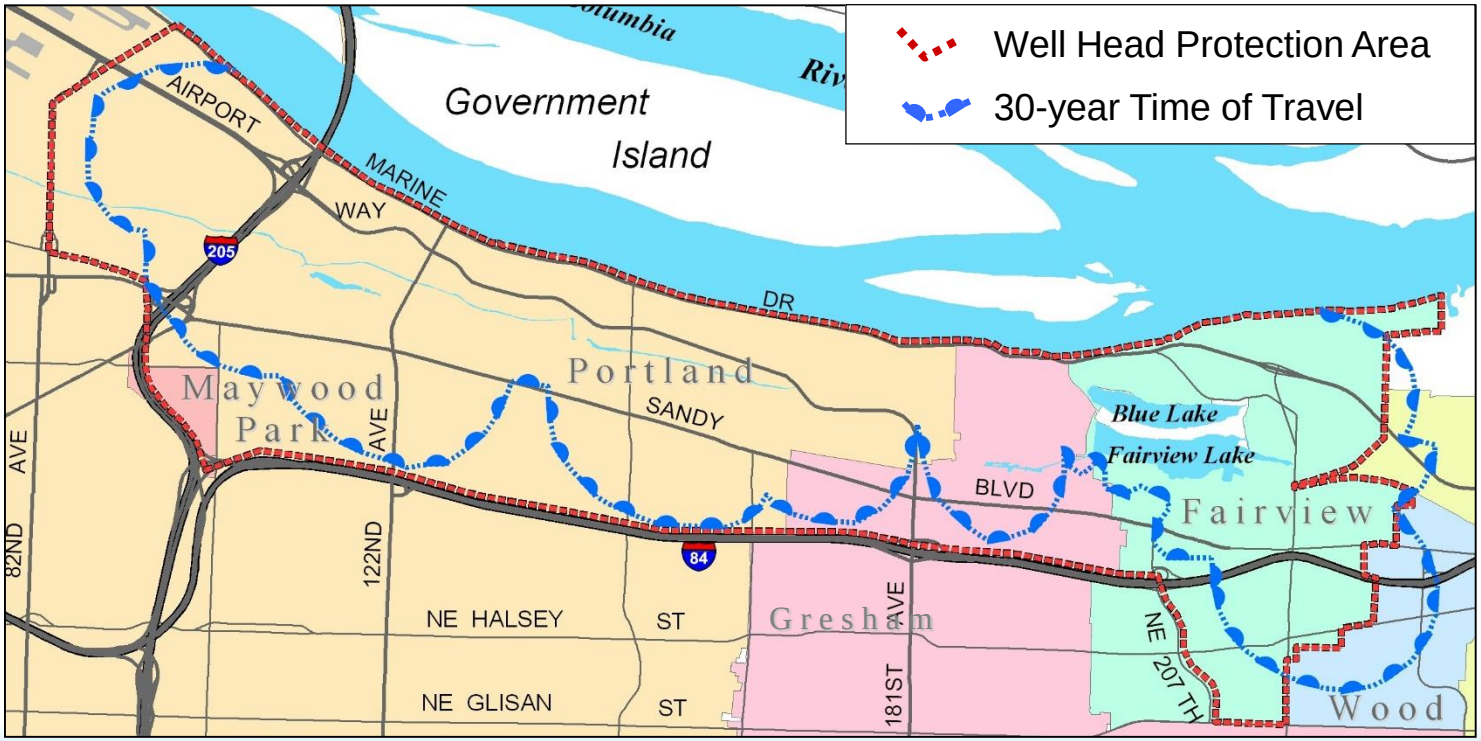
Limitations of Original Program

- Political boundary, not science-based
- Exempted existing facilities
- No on-going reporting, inspection or enforcement



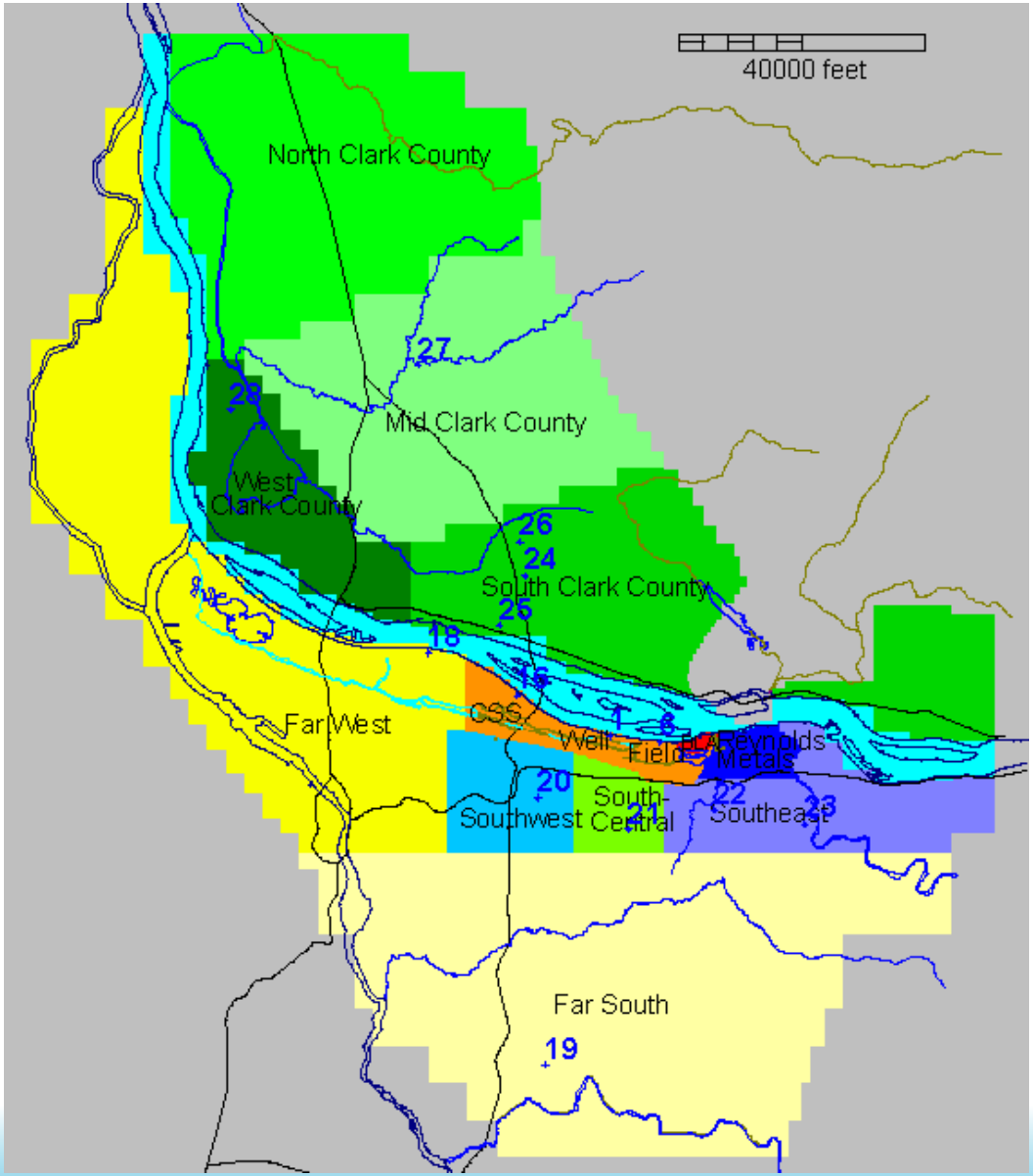
2000 - Groundwater Protection
Source Water Assessment Approach

- Delineate protection area based on time of travel
- Inventory potential contamination sources
- Develop requirements to address risks



PORTLAND WATER BUREAU
FROM FOREST TO FAUCET

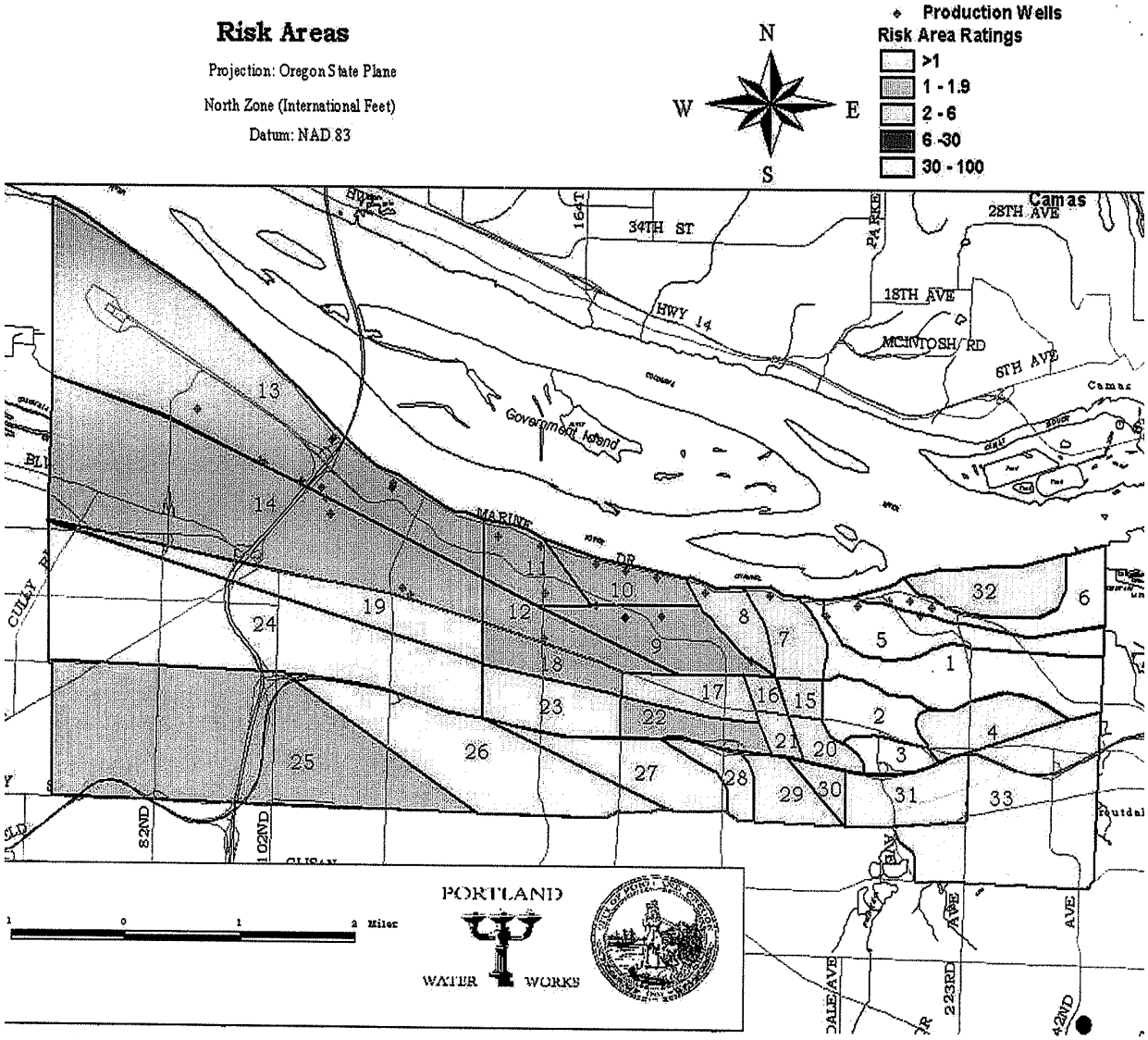
CSSWF MODFLOW Model: Basin-Scale Domain Needed



Risk Assessment & Source Inventory

- Zoning/Land Use
- DEQ Information
  - Hazardous Waste, Underground Storage Tanks, Cleanup Sites
- Other Agency Data
  - State Fire Marshall, City stormwater programs, (1,000 sites!)
- Public Information
  - Business listings, windshield surveys

Risk Modeling



- Quantitative risk assessment
  - Hydrogeology + Chemical Uses
- Greatest risk of groundwater impacts determined to be:
  - Solvent Spills
  - Activities in Facilities
  - Non-Conforming Uses

Groundwater Protection Program

Where

1. Protection area in 3 cities

What

2. Regulation of specific chemicals
   - Threshold quantities determine if regulations apply

How

3. Functional area requirements
   - Both structural & operational
   - Employee Training
4. Inspections & enforcement

Why

5. Education & technical assistance

Regulated Chemical Thresholds

Wellhead protection regulations apply if a facility handles more than these amounts:


Halogenated Solvents – 10 gal


DEQ Hazardous Wastes – 30 gal


EPA's 'List-of-Lists' Substances – 50 gal

(There is a searchable version on our website)


Petroleum-Based Liquid Fuels – 50 gal

(reporting only for non-fuel petroleum)

Perspective

How many gallons of water can be contaminated by ONE gallon of trichloroethylene (TCE)?

(TCE is a solvent typically used to clean metal parts)

292 million gallons

Maximum Contaminant Level Standard

5 ug/l (ppb)

Maximum Contaminant Level GOAL

0

Reference Manual & P.I.G.

Columbia South Shore Well Field
Wellhead Protection Area

Reference Manual

June 25, 2003
Amended March, 2017

City of Portland
Portland Water Bureau

City of Gresham

City of Fairview

GROUNDWATER
PROTECTION PROGRAM
COLUMBIA SOUTH SHORE

Columbia South Shore
Groundwater Protection Program

GROUNDWATER
PROTECTION PROGRAM
COLUMBIA SOUTH SHORE

Program Implementation Guidance

May 2006
Revised July 2013

CITY OF PORTLAND
WATER BUREAU

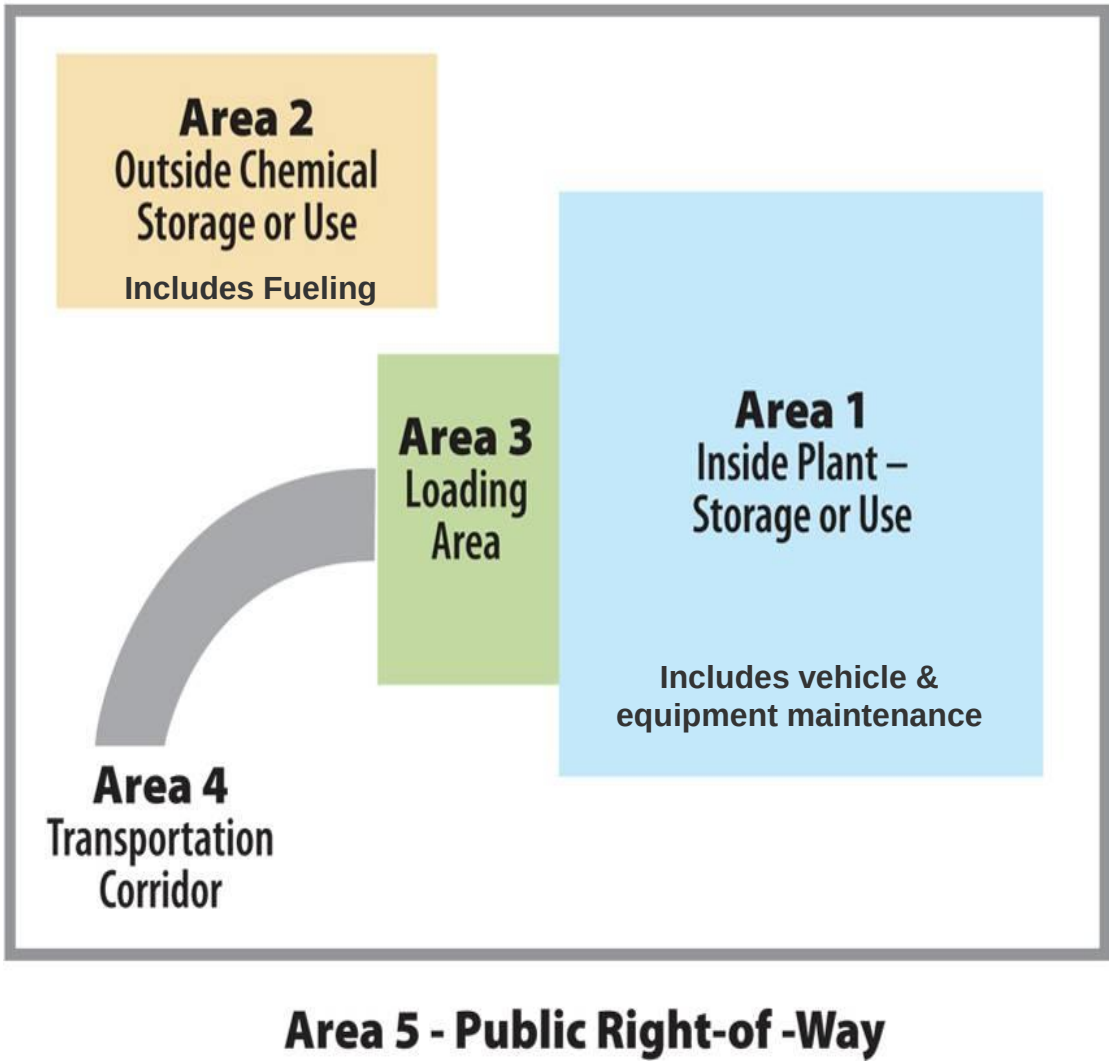
CITY OF GRESHAM
ENVIRONMENTAL
SERVICES

CITY OF FAIRVIEW
PUBLIC WORKS
DEPARTMENT

PORTLAND WATER BUREAU
FROM FOREST TO FAUCET

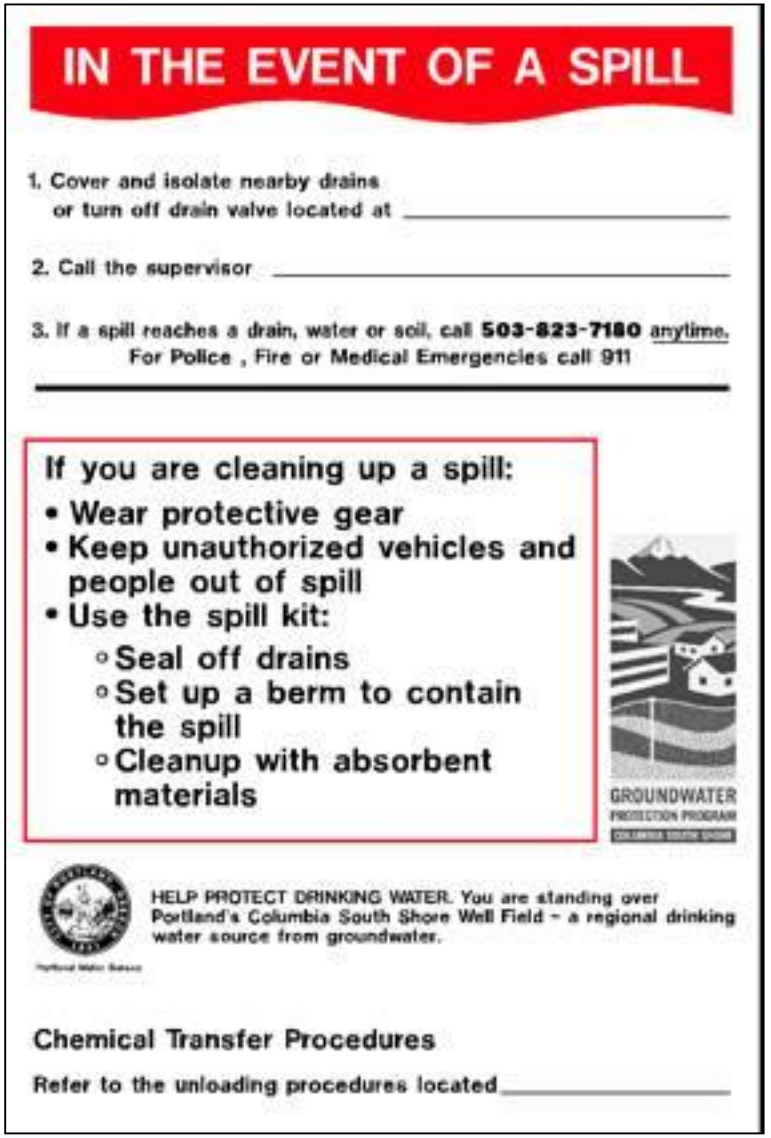
Structural Requirements

- Impervious Surfaces
- Secondary Containment
- Spill Control



Operational Requirements

- Pollution Prevention Team
- Good Housekeeping
- Spill Prevention & Clean-up
- Inspections
- Record Keeping
- Employee Training
- Annual Reporting
- Site Plan



IN THE EVENT OF A SPILL

1. Cover and isolate nearby drains or turn off drain valve located at _____
2. Call the supervisor _____
3. If a spill reaches a drain, water or soil, call **503-823-7180** anytime. For Police , Fire or Medical Emergencies call 911

If you are cleaning up a spill:

- Wear protective gear
- Keep unauthorized vehicles and people out of spill
- Use the spill kit:
  - Seal off drains
  - Set up a berm to contain the spill
  - Cleanup with absorbent materials

GROUNDWATER PROTECTION PROGRAM

HELP PROTECT DRINKING WATER. You are standing over Portland's Columbia South Shore Well Field – a regional drinking water source from groundwater.

Chemical Transfer Procedures

Refer to the unloading procedures located _____

Annual Reporting

SECTION B – Annual Hazardous Material Inventory Report & Instructions

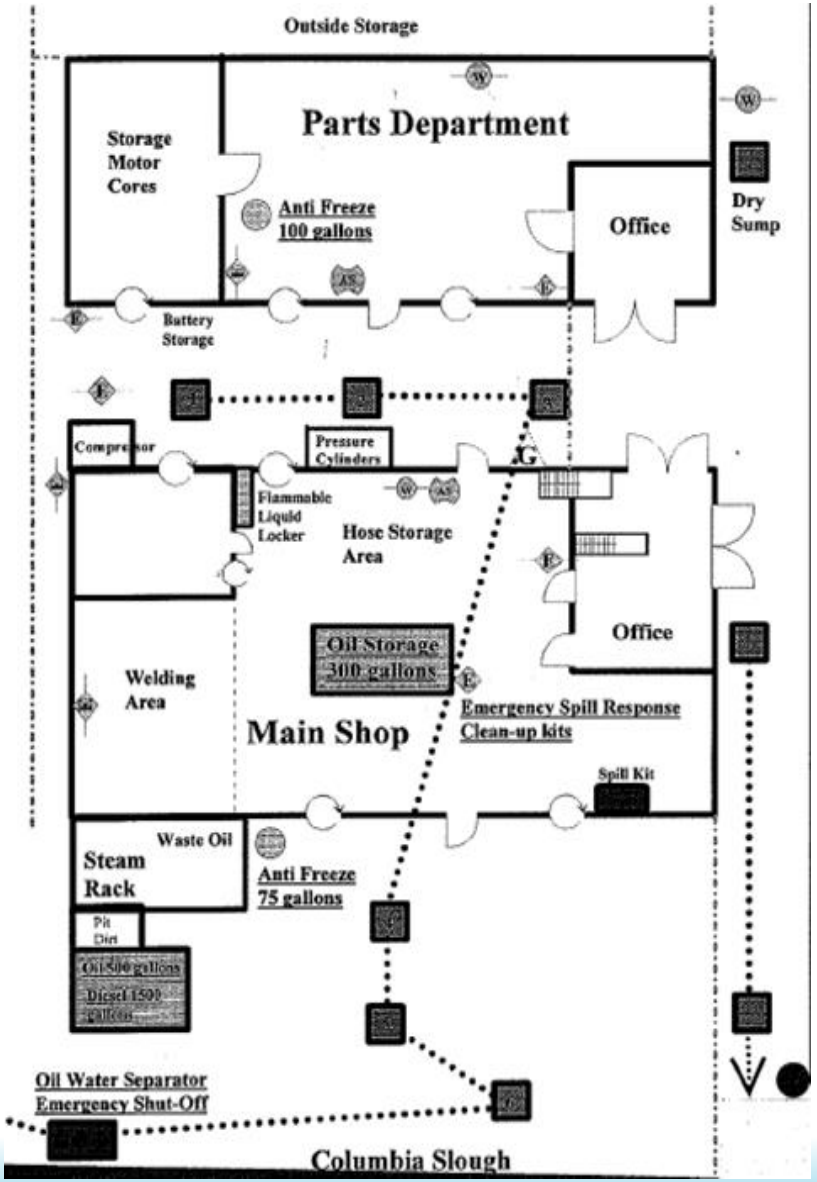
Columbia South Shore Well Field Protection Program – Fuel and Hazardous Material Inv

Company Name: _____ Date: ____/____/_

Functional Area(s) [1]	Common or Trade Name [2]	Chemical [3]	CAS No. *(Important!)* [4]	Physical State [5] S	Physical State [5] L	Quantity [6]
Shop	*Super Goop*	*Methylene-di-goopinate*	*123-45-6*		*X*	*55 gal*

INSTRUCTIONS

1. Indicate the locations where the fuel or hazardous material is stored or handled. All storage and use must occur inside your facility or in a covered and contained
2. **Nonwaste:** Provide the common or trade name of the material. **Waste:** In lieu of trade names, you may provide the Waste Category.
3. Provide the chemical name(s) of the major constituents that exceed the concentration threshold(s) identified in Section 1.3.1 of the Reference Manual, which can
4. Enter the Chemical Abstract Service identification number (CAS number). This can be found in Appendix B of the Reference Manual, which is searchable at the li
5. Check the box that applies to each material: S = Solid L = Liquid
6. Enter the quantity of the material stored at this location. Report in Gallons if the material is a liquid, report in Pounds if the material is a solid.
7. Check the category that applies to each material reported. Per the definition of hazardous material in Section 1.3.1 in the Reference Manual, each hazardous r chemical categories above. More than one category may apply to each material.
8. To find your NAICS code visit: www.naics.com or www.census.gov/eos/www/naics



PORTLAND WATER BUREAU
FROM FOREST TO FAUCET

Inspection and Enforcement

- Portland: Fire Bureau, bi-annual compliance inspections for all businesses

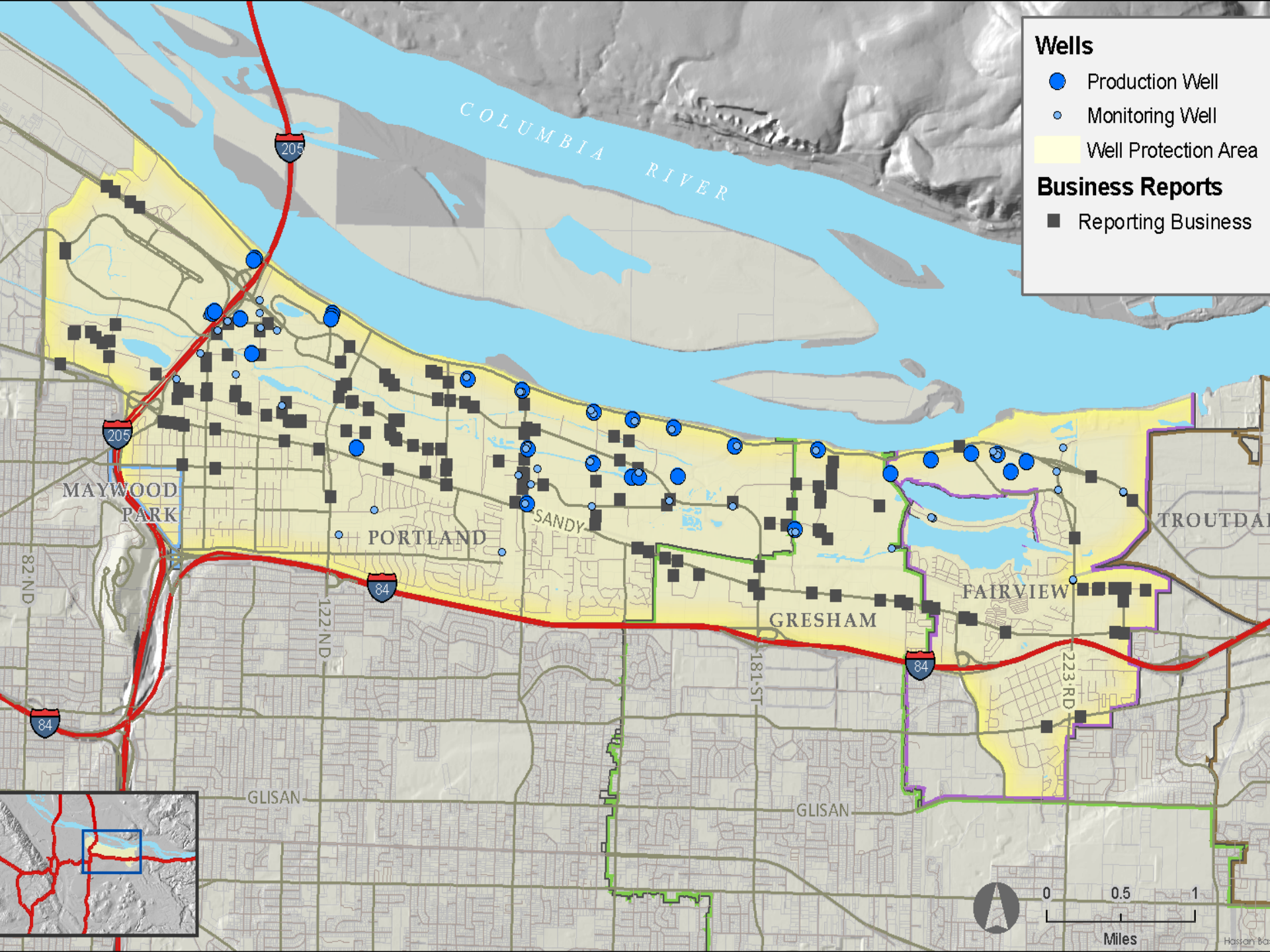
- Gresham & Fairview: Shared environmental inspector

- Planning and Permit Review

Technical Assistance, Outreach and Education

- Columbia Corridor Association
  - Technical assistance & training for businesses
- Cities of Portland, Gresham & Fairview
  - Inspections, technical assistance
- Columbia Slough Watershed Council
  - Family events, school education, classes

We reach thousands of people every year!


Wells
Production Well
Monitoring Well
Well Protection Area
Business Reports
Reporting Business
COLUMBIA RIVER
205
MAYWOOD PARK
PORTLAND
SANDY
TROUTDALE
FAIRVIEW
GRESHAM
GLISAN
GLISAN
82ND
122ND
181ST
223RD
84
0
0.5
1
Miles

Groundwater Monitoring

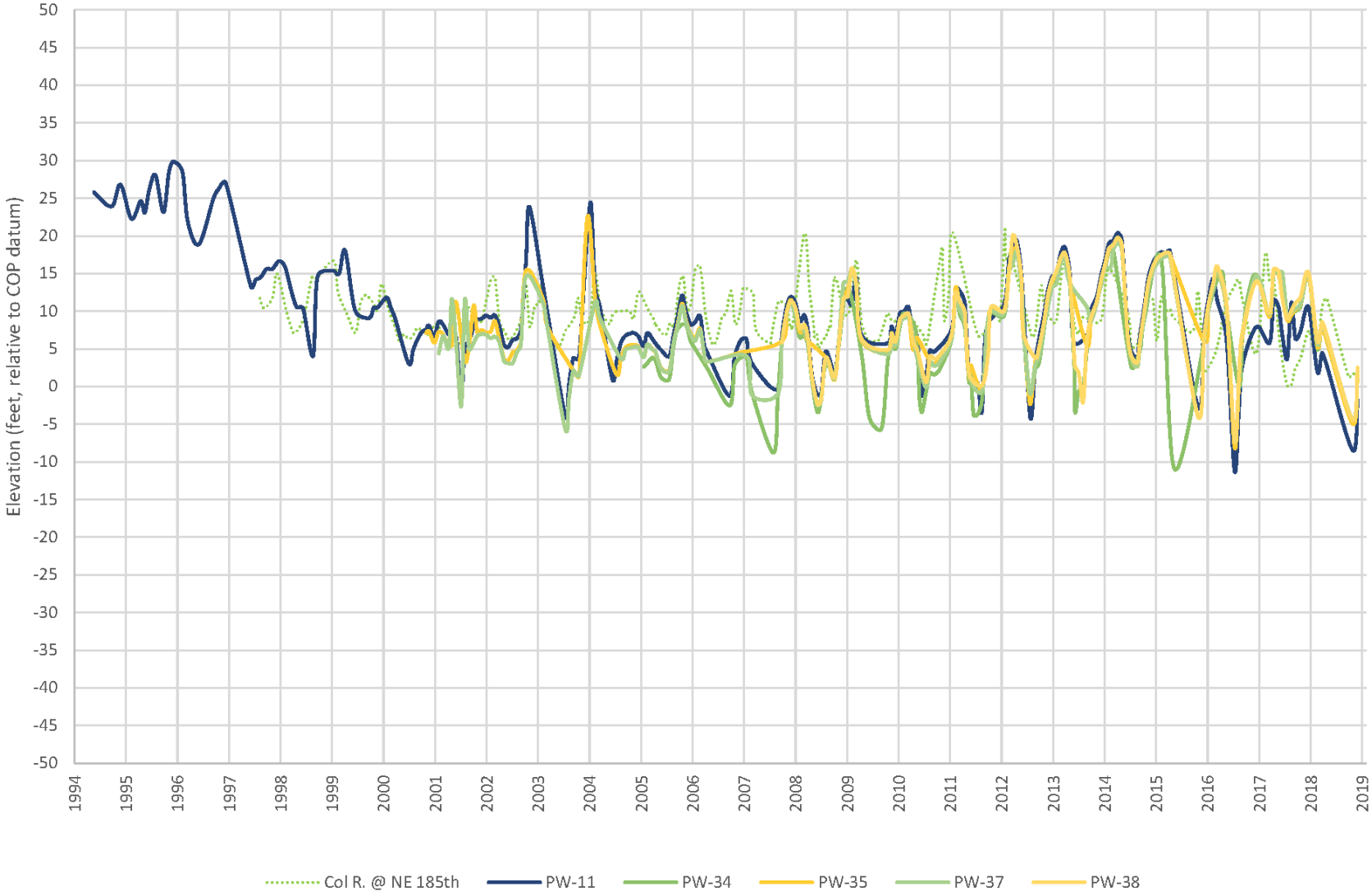
- 80+ Active monitoring wells
- Timely warning of potential problems
- Allows use of well field for water supply with increased confidence
- Helps track progress of DEQ site cleanups
- Integral to policy of source water protection
- Zero detection goal for man-made contaminants

Monitoring Program Results

- Supply wells not affected: most instances of groundwater contamination are older, shallow and isolated; all active city production wells are negative for man-made contaminants
- Good natural geologic protection: fine-grained floodplain deposits and confining units between aquifers

Recent core of Confining Unit 2

Sand & Gravel Aquifer Levels



Expanding Regional Coordination

Clark PUD

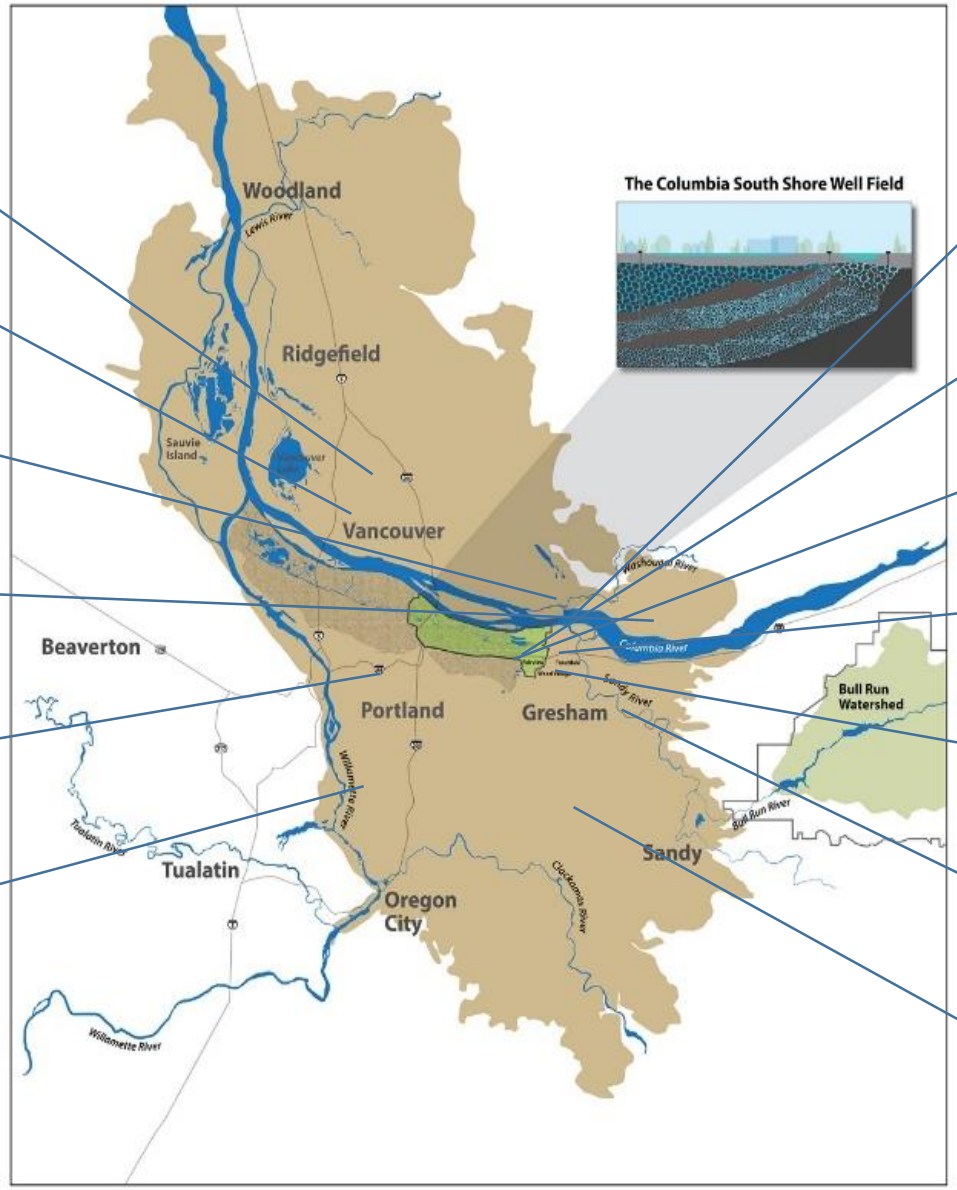
City of Vancouver

City of Camas

City of Washougal

Portland Water Bureau

City of Milwaukie



City of Troutdale

City of Fairview

Rockwood PUD

City of Gresham

City of Wood Village

Lusted Water District

Boring Water District

PORTLAND WATER BUREAU
FROM FOREST TO FAUCET


COLUMBIA SOUTH SHORE WELL FIELD - WELLHEAD PROTECTION AREA
Wellhead Protection Area
GROUNDWATER PROTECTION PROGRAM
COLUMBIA SOUTH SHORE
N
Miles
0
1
2
WASHINGTON
Vancouver
COLUMBIA RIVER
Government Islands
NE AIRPORT WAY
I205
Columbia Slough
Johnson Lake
May's Lake
NE 82ND AVE
NE 105TH AVE
NE 122ND AVE
MARINE DRIVE
North Channel
NE PRESCOTT ST
NE SANDY BLVD
Maywood Park
NE 112TH AVE
Portland
NE FREMONT ST
I84
NE 148TH AVE
NE 162ND AVE
Upper Columbia Slough
Gresham
NW MARINE DRIVE
NW BLUE LAKE RD
Blue Lake
Fairview Lake
Fairview Creek
Fairview
Salmon Creek
Troutdale
NW SUNDIAL RD
NE FAIRVIEW AVE
NE HALSEY ST
Wood Village
NE 181ST AVE
NE 201ST AVE
NE 223RD AVE
NE HOGAN DR
NE GLISAN ST
NE 102ND AVE
SE STARK ST
E BURNSIDE ST