



Presentation By:

Adam Stebbins

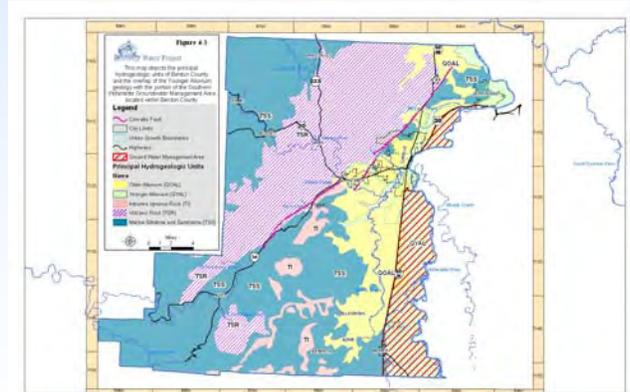
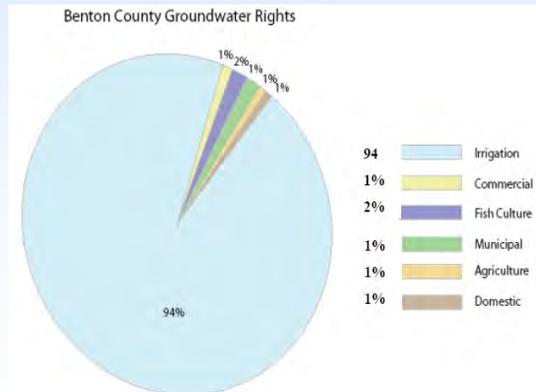
**Water Projects Coordinator,
Benton County**

Dave Livesay

**President,
Hydrogeologist**



Figure 2-2 Benton County Conceptual Hydrogeology Diagram. Courtesy of Dr. Todd Jarvis, OSU- Institute for Water and Watersheds



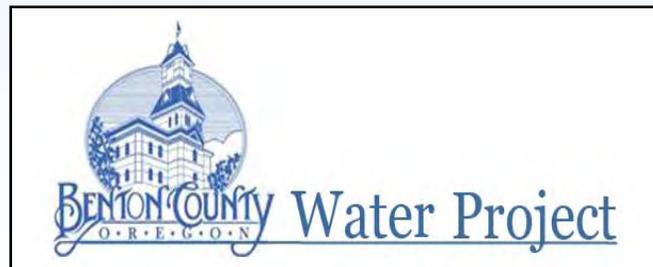
“Wells and the Well-Being of Oregon”

Downloadable at: www.co.benton.or.us/boc/water/resources

Outline of Presentation

- **Overview of Benton County Water Situation**
 - **Phase 1: Water Analysis and Demand Forecast**
- **Benton County Groundwater**
 - **Groundwater analysis: Methods and Findings of Phase 1 Project**
 - **Ordinance Requirements and Results to Date**

- **Questions**





Land Use

Water



Phase 1: Water Analysis and Demand Forecast Overview



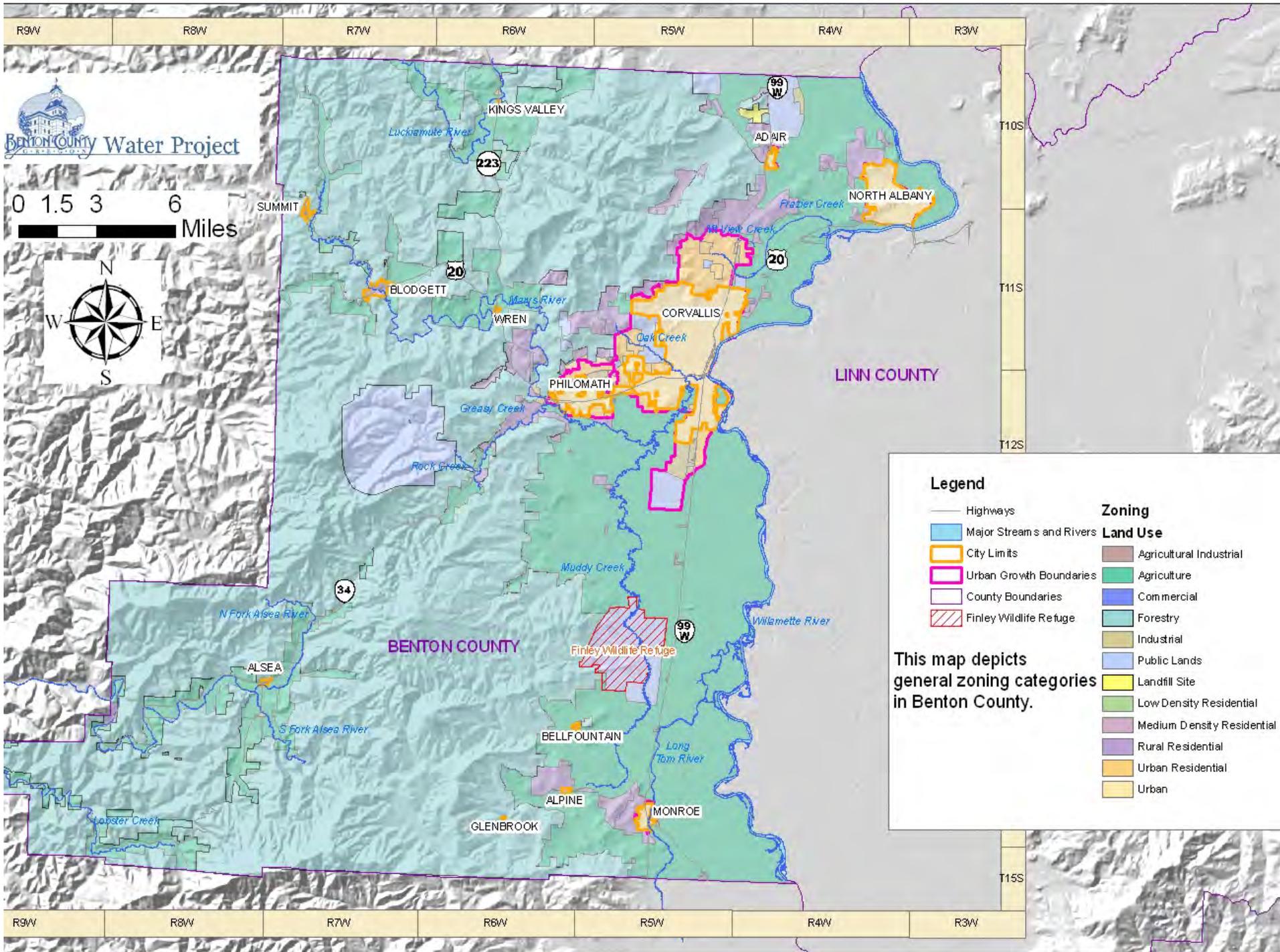
Data Collection and Compilation: Use OWRD-**OWSCI funding** to compile and project local and regional data, including projected demands.



Education and Outreach: Collaborate and collect concerns, issues and values on countywide water supply, while increasing the level of awareness.



Water Plan: Establish cross-jurisdictional project collaboration, and develop a setting and process to address future water issues.



Benton County Water Project

0 1.5 3 6 Miles



Legend

- Highways
- Major Streams and Rivers
- City Limits
- Urban Growth Boundaries
- County Boundaries
- Finley Wildlife Refuge

Zoning Land Use

- Agricultural Industrial
- Agriculture
- Commercial
- Forestry
- Industrial
- Public Lands
- Landfill Site
- Low Density Residential
- Medium Density Residential
- Rural Residential
- Urban Residential
- Urban

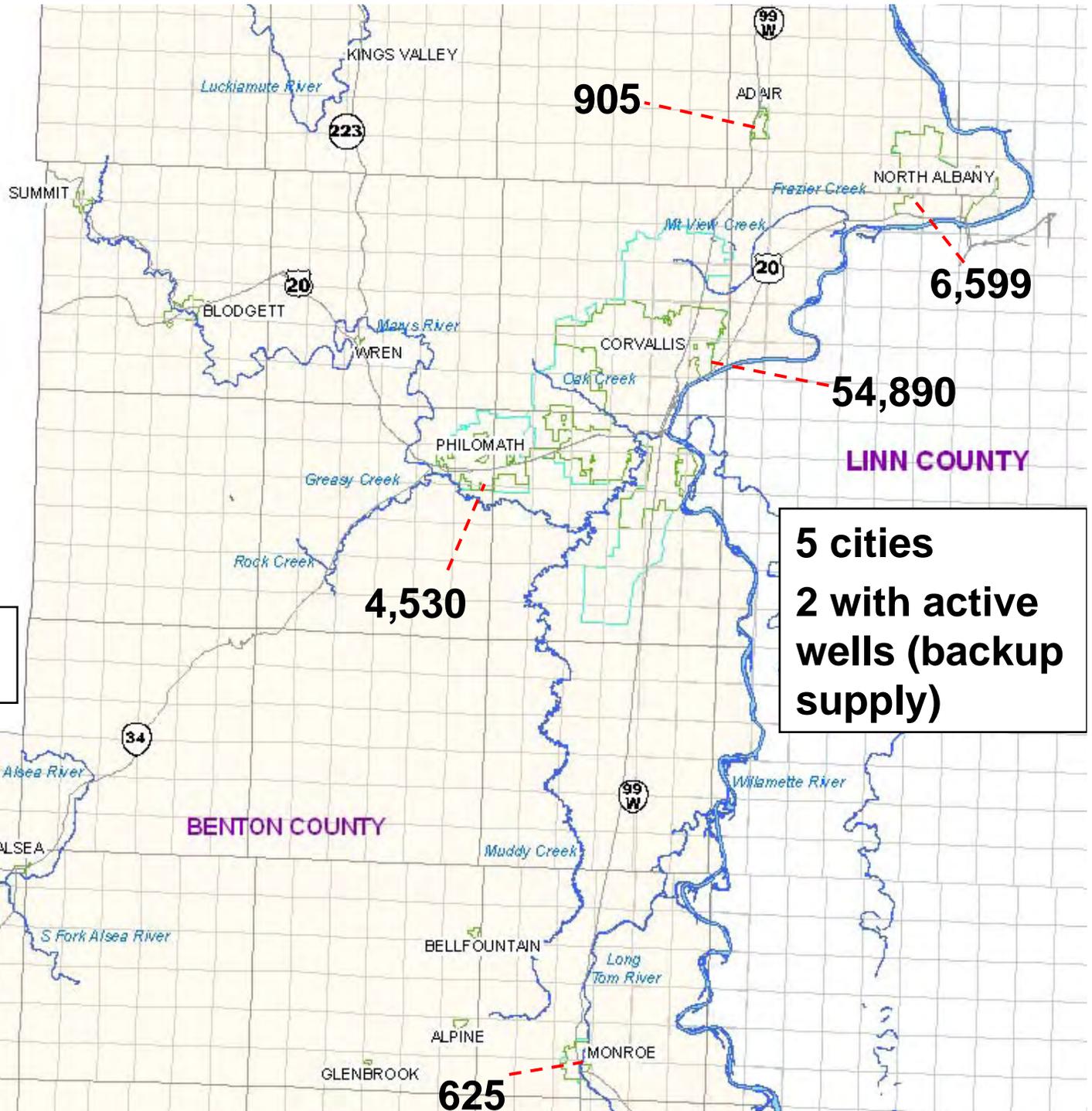
This map depicts general zoning categories in Benton County.

This map depicts the major surface water streams in Benton County.

0 1.5 3 6 Miles



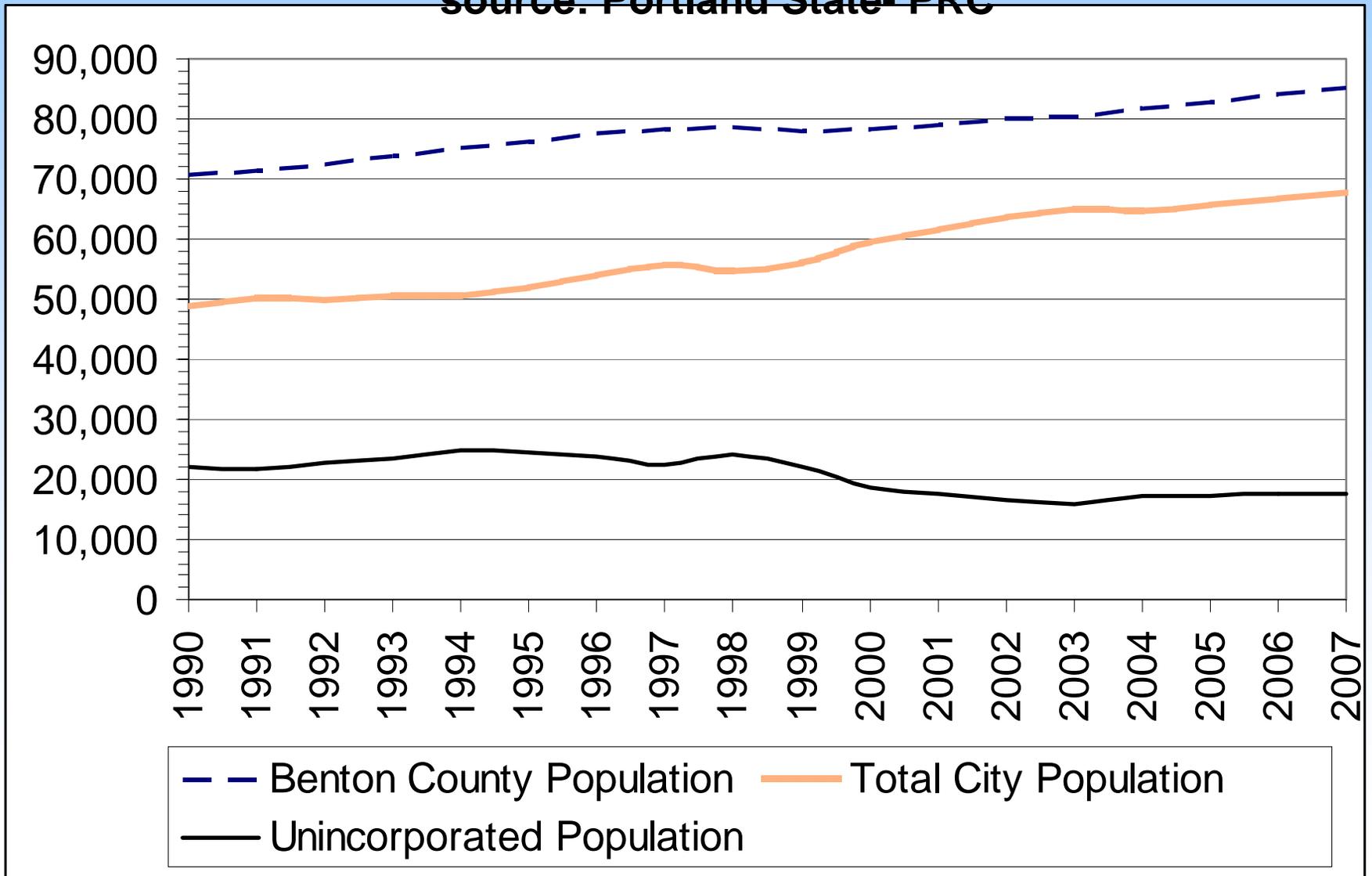
2007 City Population
Source: PSU- PRC



5 cities
2 with active wells (backup supply)

County Population Trend

source: Portland State- PRC





This map depicts points of diversion for community water systems in Benton County.

0 1 2 4 Miles

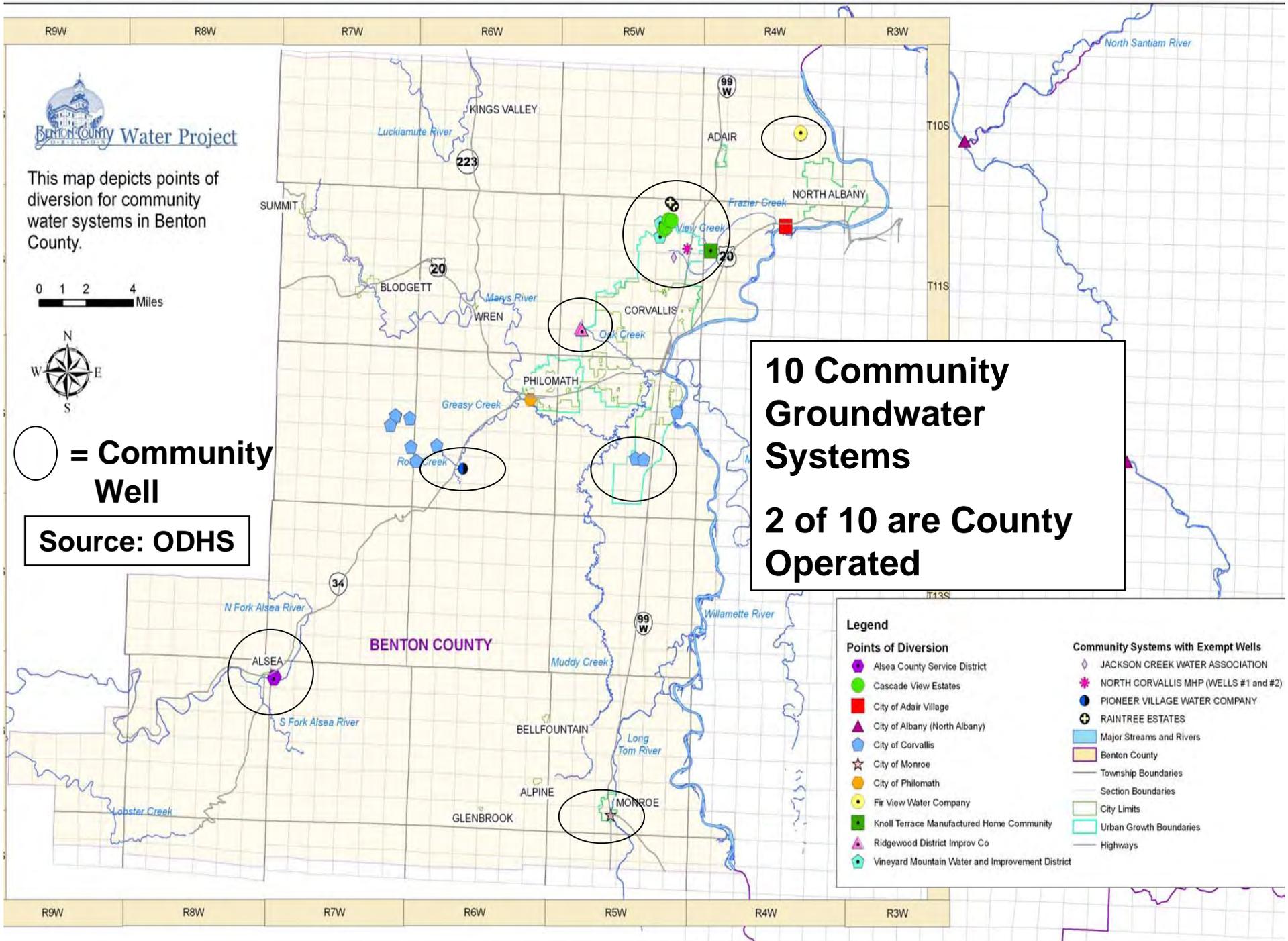


○ = Community Well

Source: ODHS

10 Community Groundwater Systems

2 of 10 are County Operated



Legend

Points of Diversion

- ◆ Alsea County Service District
- Cascade View Estates
- City of Adair Village
- ▲ City of Albany (North Albany)
- ⬠ City of Corvallis
- ★ City of Monroe
- City of Philomath
- Fir View Water Company
- Knoll Terrace Manufactured Home Community
- ▲ Ridgewood District Improv Co
- ◆ Vineyard Mountain Water and Improvement District

Community Systems with Exempt Wells

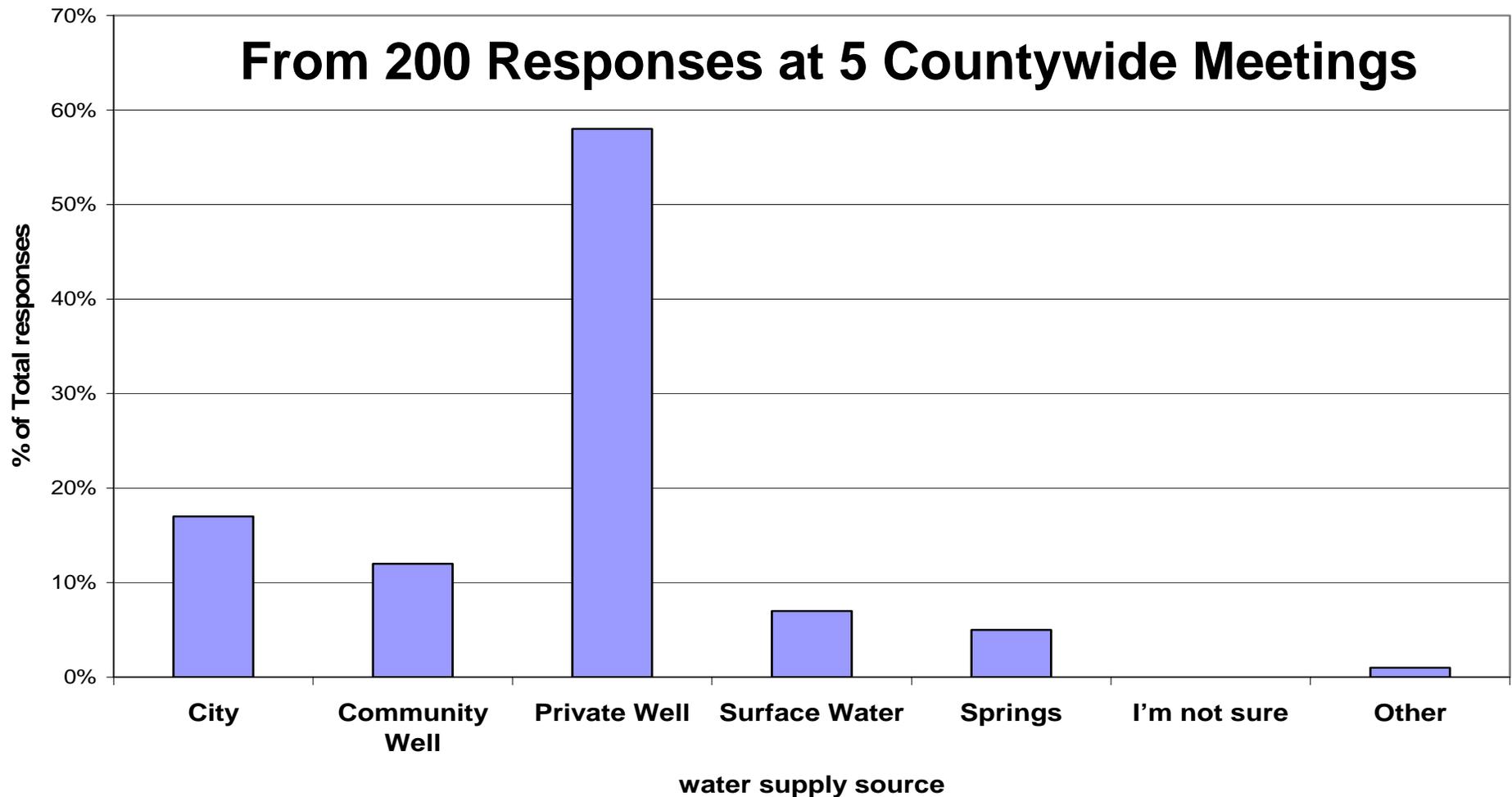
- ◆ JACKSON CREEK WATER ASSOCIATION
- ◆ NORTH CORVALLIS MHP (WELLS #1 and #2)
- PIONEER VILLAGE WATER COMPANY
- ⊕ RAINTREE ESTATES
- Major Streams and Rivers
- Benton County
- Township Boundaries
- Section Boundaries
- City Limits
- Urban Growth Boundaries
- Highways

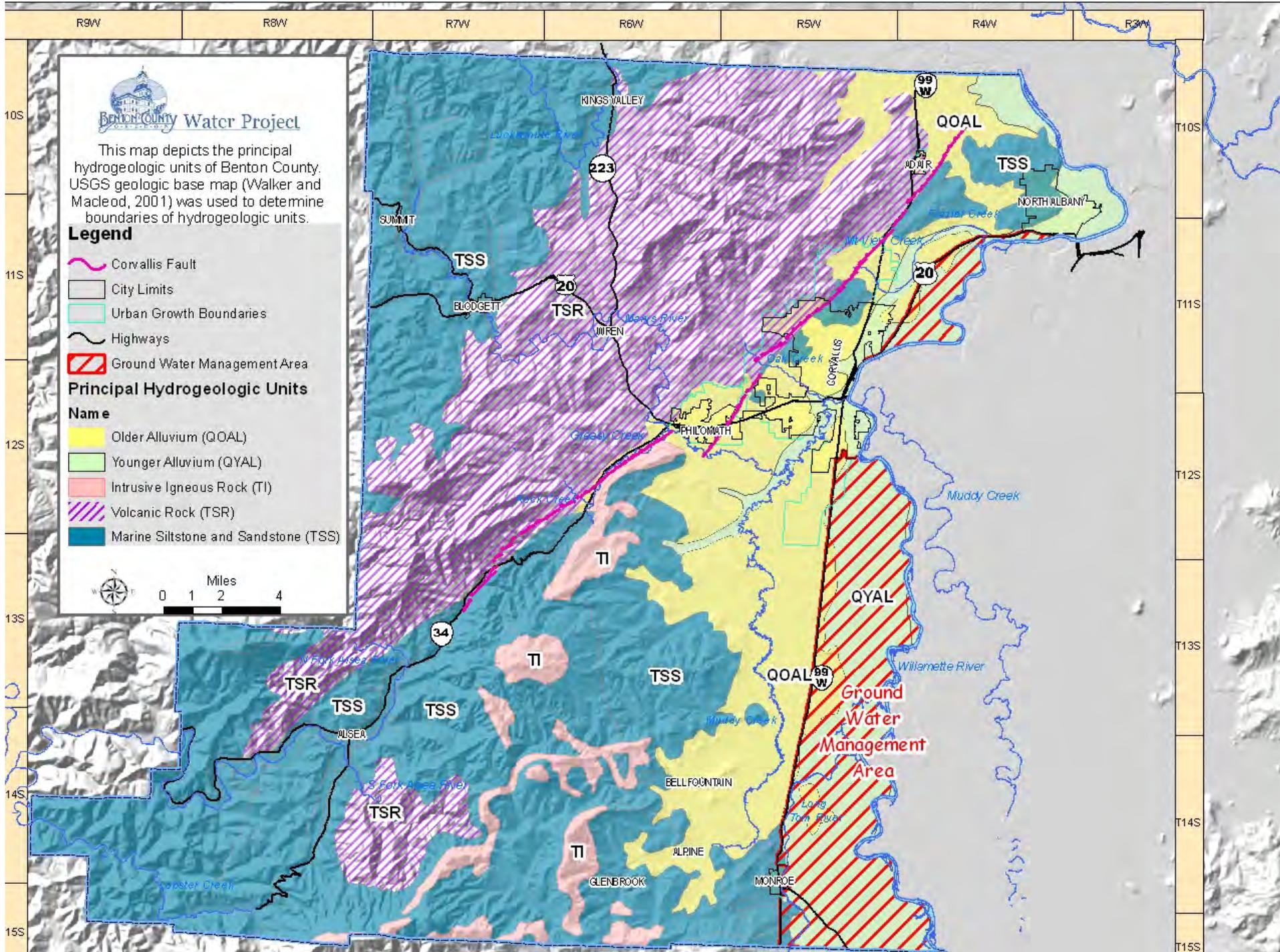


Community Outreach Findings

Well Users

What is your Water Supply Source or Sources? Choose all that apply.





BENTON COUNTY Water Project

This map depicts the principal hydrogeologic units of Benton County. USGS geologic base map (Walker and Macleod, 2001) was used to determine boundaries of hydrogeologic units.

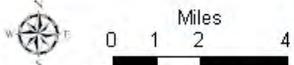
Legend

- Corvallis Fault
- City Limits
- Urban Growth Boundaries
- Highways
- Ground Water Management Area

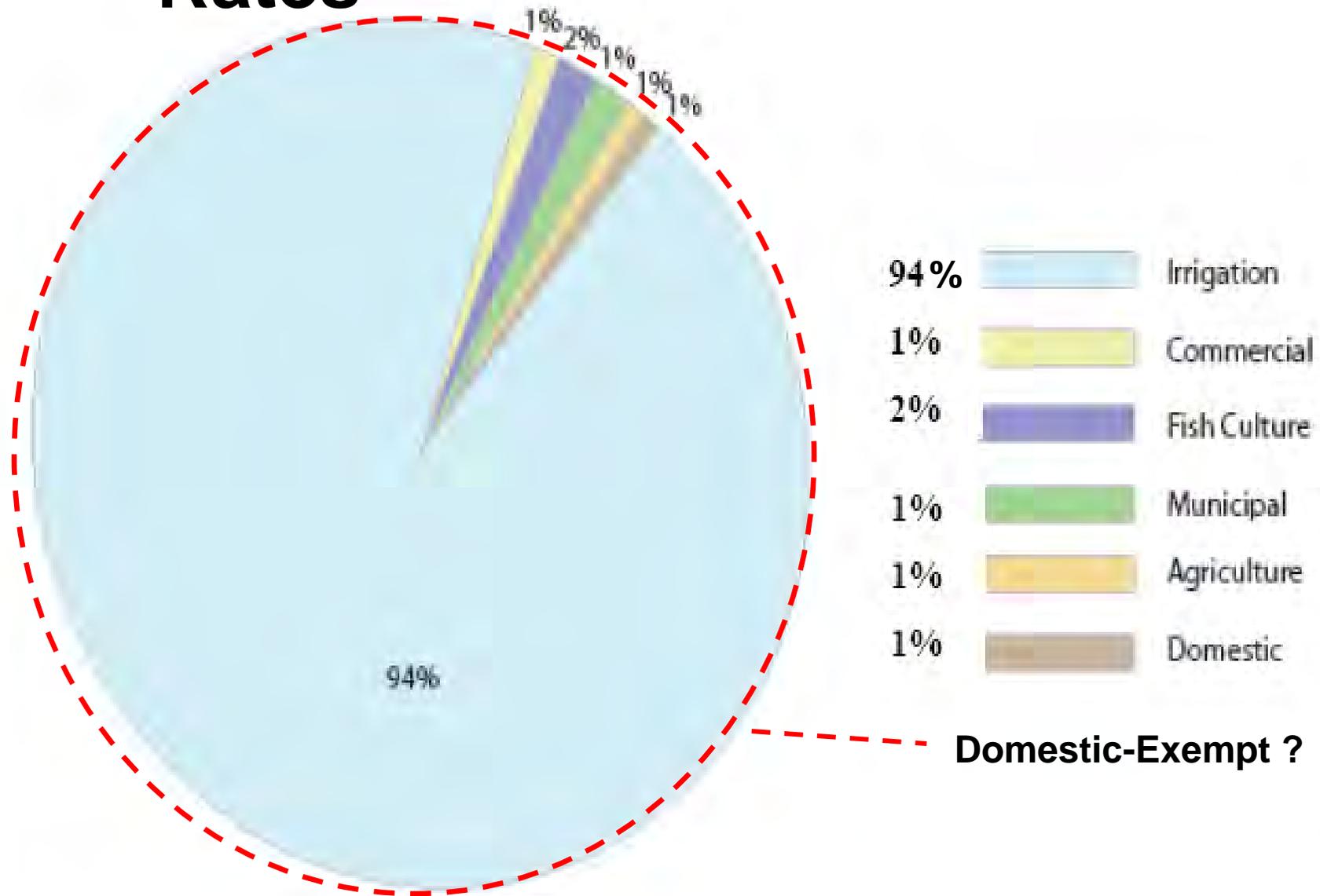
Principal Hydrogeologic Units

Name

- Older Alluvium (QOAL)
- Younger Alluvium (QYAL)
- Intrusive Igneous Rock (TI)
- Volcanic Rock (TSR)
- Marine Siltstone and Sandstone (TSS)



Authorized Groundwater Rates



Total Rate Authorized= 232,698 cfs



Figure 3-4

Benton County Water Project

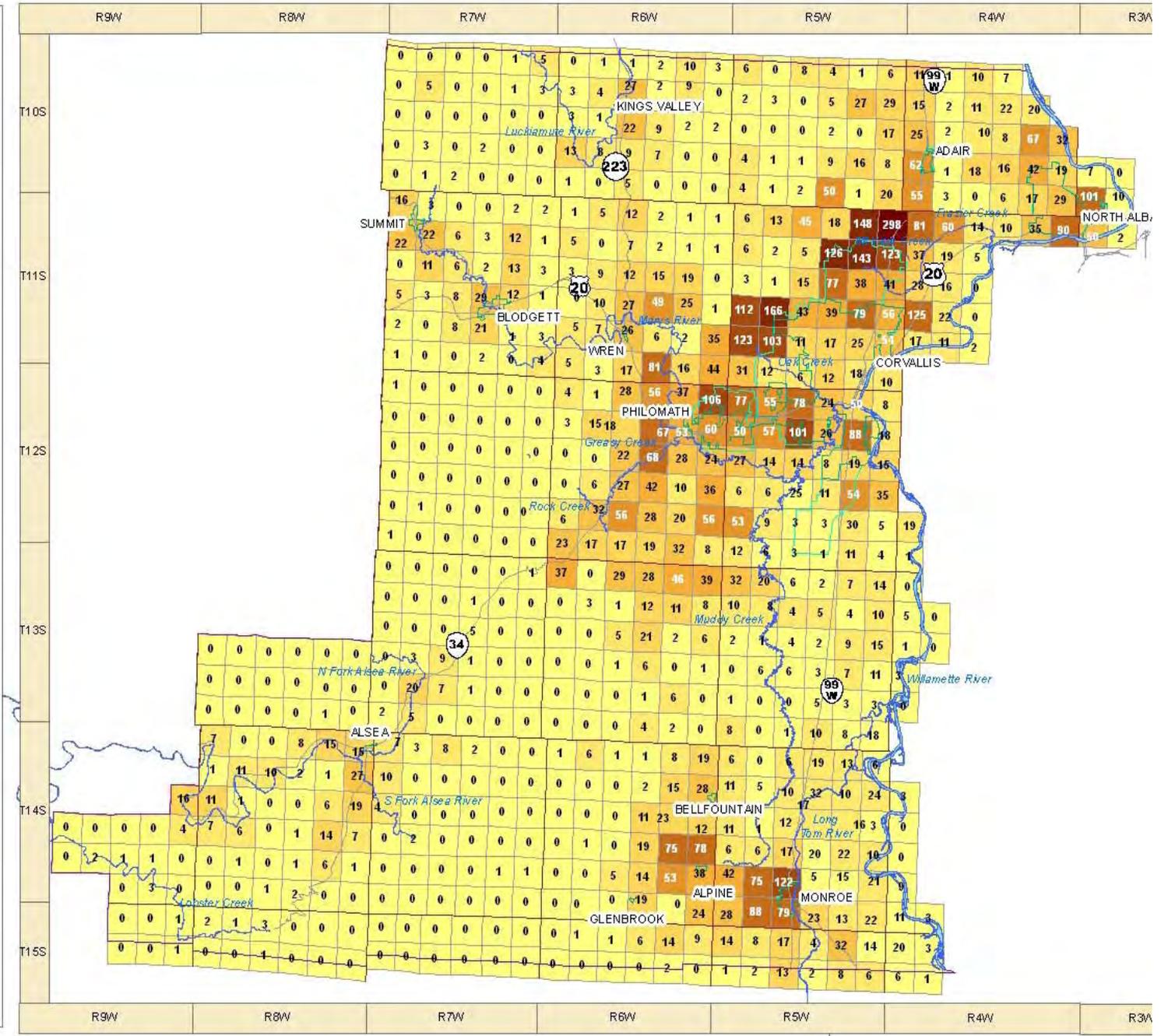
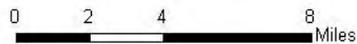
This map depicts the density of domestic wells at the section level in Benton County. Domestic wells in this case are those that were recorded as OWRD well logs for domestic use only.

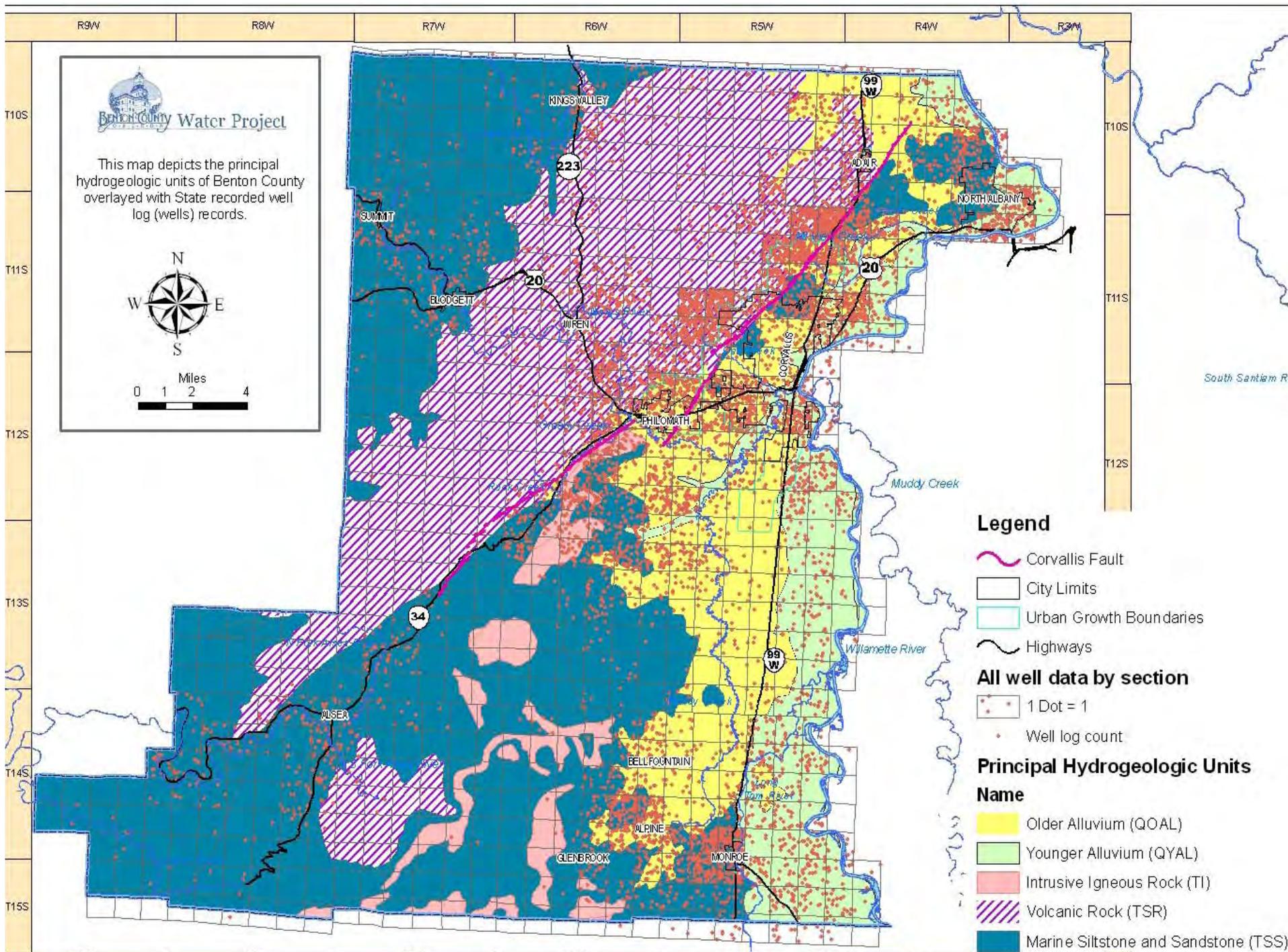
Legend

-  Major Streams and Rivers
-  City Limits
-  Urban Growth Boundaries
-  County Boundary

Domestic only

-  0 - 3
-  4 - 10
-  11 - 19
-  20 - 31
-  32 - 44
-  45 - 61
-  62 - 87
-  88 - 117
-  118 - 154
-  155 - 279





South Santiam R

Muddy Creek

Willamette River

KINGS VALLEY

223

99 W

NDWR

NORTH ALBANY

20

BUDGET

WREN

CORVALLIS

PHILOMATH

34

ALSEA

BELLFOUNTAIN

ALPINE

GLENBROOK

MONROE

R9W

R8W

R7W

R6W

R5W

R4W

R3W

T10S

T10S

T11S

T11S

T12S

T12S

T13S

T14S

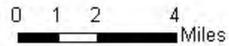
T15S





Benton County Water Project

This map depicts points of diversion for community groundwater systems in Benton County.



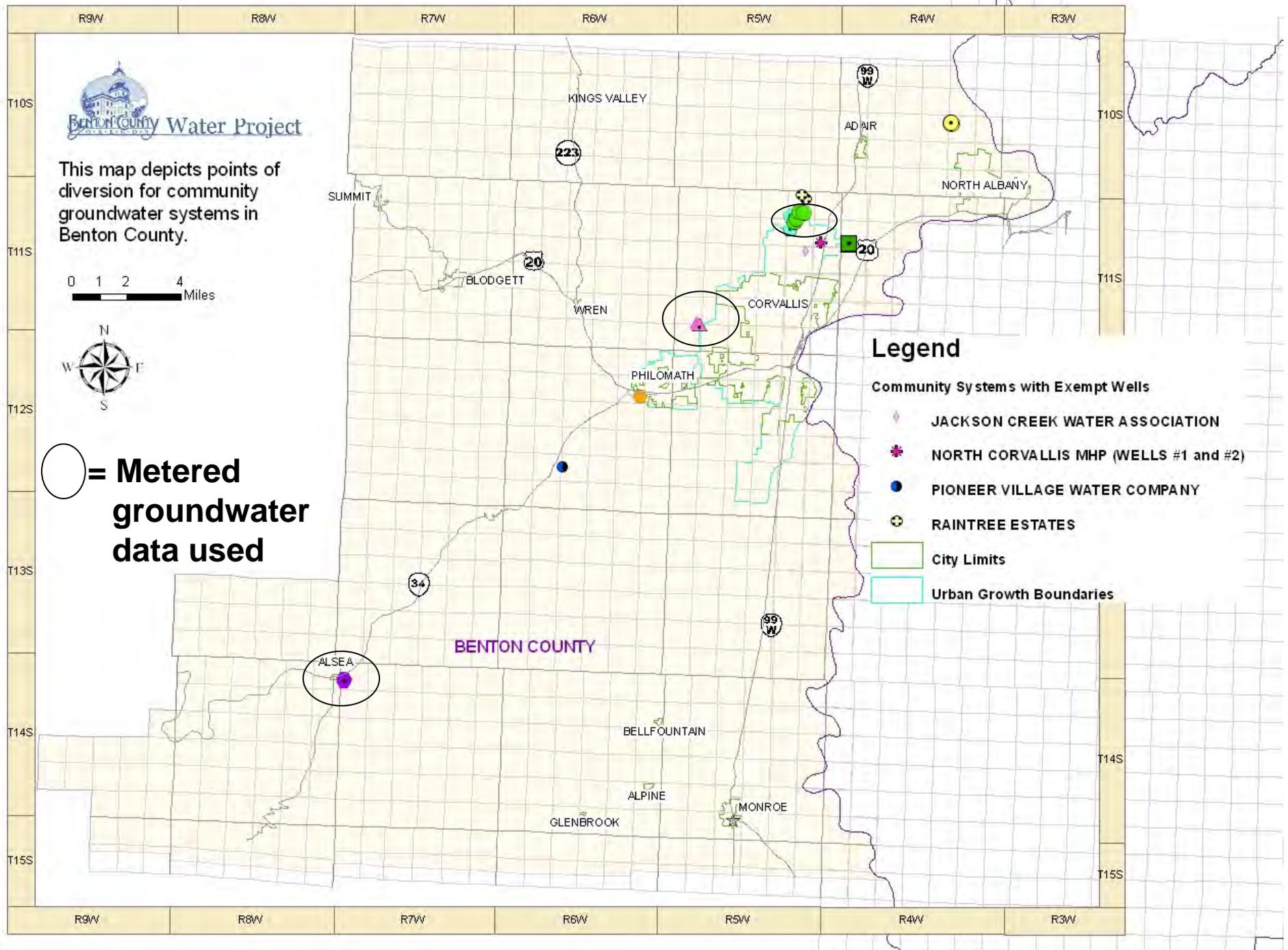
 = Metered groundwater data used

Legend

Community Systems with Exempt Wells

-  JACKSON CREEK WATER ASSOCIATION
-  NORTH CORVALLIS MHP (WELLS #1 and #2)
-  PIONEER VILLAGE WATER COMPANY
-  RAIN TREE ESTATES

-  City Limits
-  Urban Growth Boundaries



Exempt Groundwater Use Estimate Assumptions/Method

- Extrapolation of data from rural community groundwater systems that span a range of lot size, property value and location within the county.
 - 1.) Average Daily and Peak water use by residence (connection)
 - 2.) Data also used to estimate proportion of domestic and irrigation water use
 - 3.) Household use estimates were then multiplied by the number of households recorded in Benton County, excluding households served by all recorded community water systems.

Data compiled from: Oregon Drinking Water Program

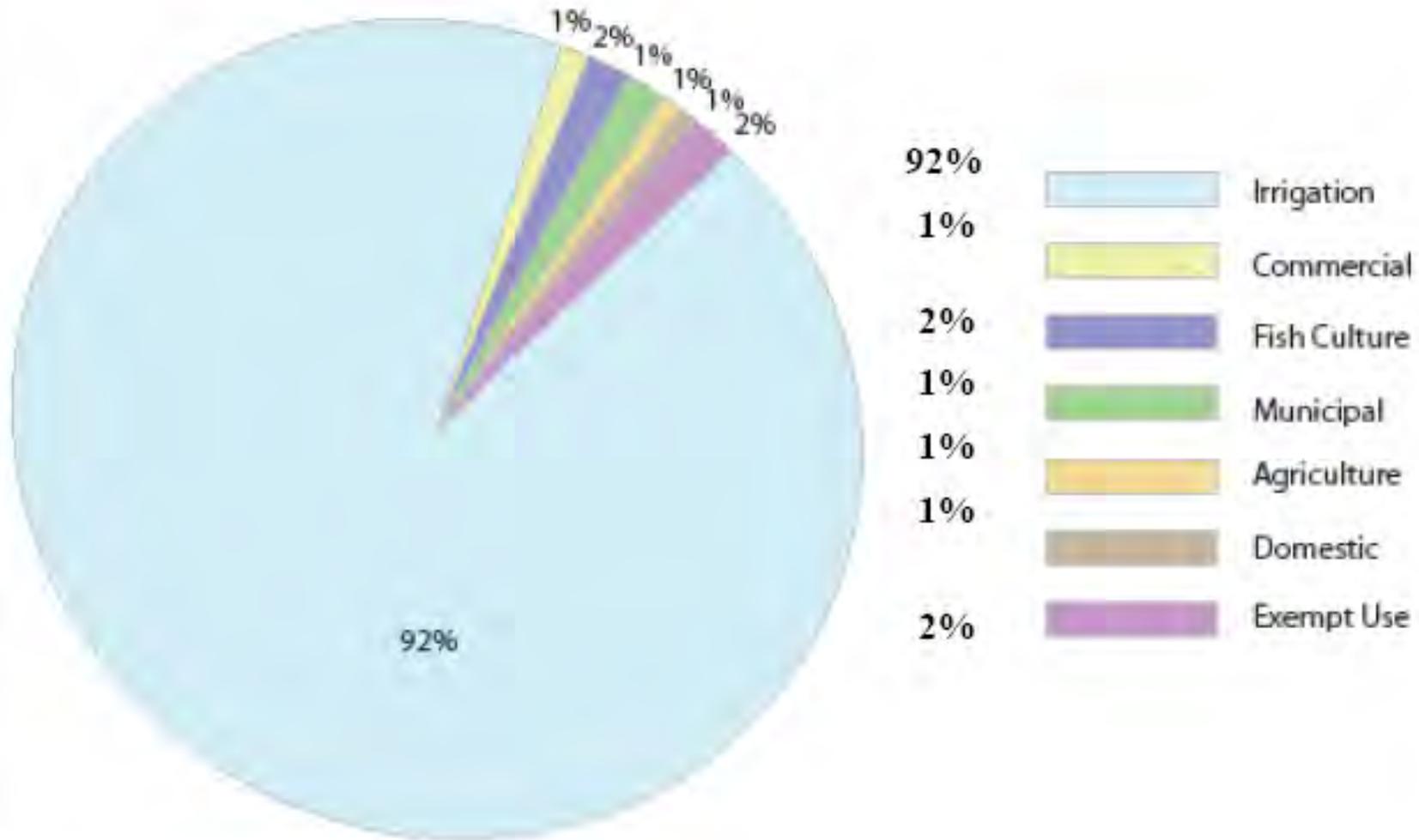
Rural Exempt Groundwater Use Estimate

Community Water System	Average Use per Household (gallons/day)	Average January Use per Household (gallons/day)	Average Peak Use per Household (gallons/day)	Seasonal Irrigation Use per Household (gallons/day)
Cascade View County Service District	300	150	600	450
Alsea County Service District	200	130	300	170
Ridgewood District Improvement Co.	330	180	700	520
Total Averages	277	153	533	380

Daily Use Estimate (Domestic-Exempt Wells)	Current
Average (MGD)	2.0
Maximum (MGD)	3.8

Exempt Groundwater Use Estimate Compared to Authorized Rate

Total Benton County Groundwater Use



Total Rate Authorized= 238,598 cfs

The Future of Groundwater and Wells in Benton County, Oregon



Future Exempt Groundwater Use Estimate Assumptions/Method

- Groundwater use is driven by land use.
- Lots within city limits are served by City.
- Lots within UGBs but outside city limits will be on domestic wells until annexed to a City (health hazard, vote).
- Outside of UGBs max development density on currently zoned Rural Residential Land was estimated through a 'Buildable Lands' methodology.

This map depicts buildable residential, industrial and commercial land. Buildable residential land is either vacant or can be subdivided to produce vacant lots. Buildable industrial and commercial land includes land that is vacant or currently has low improvement value and can be redeveloped.

Legend

-  City Limits
-  Urban Growth Boundaries
-  Rural Residential undeveloped
-  Urban Residential undeveloped
-  Industrial undeveloped
-  Commercial undeveloped
-  Highways
-  County Boundary
-  Taxlots

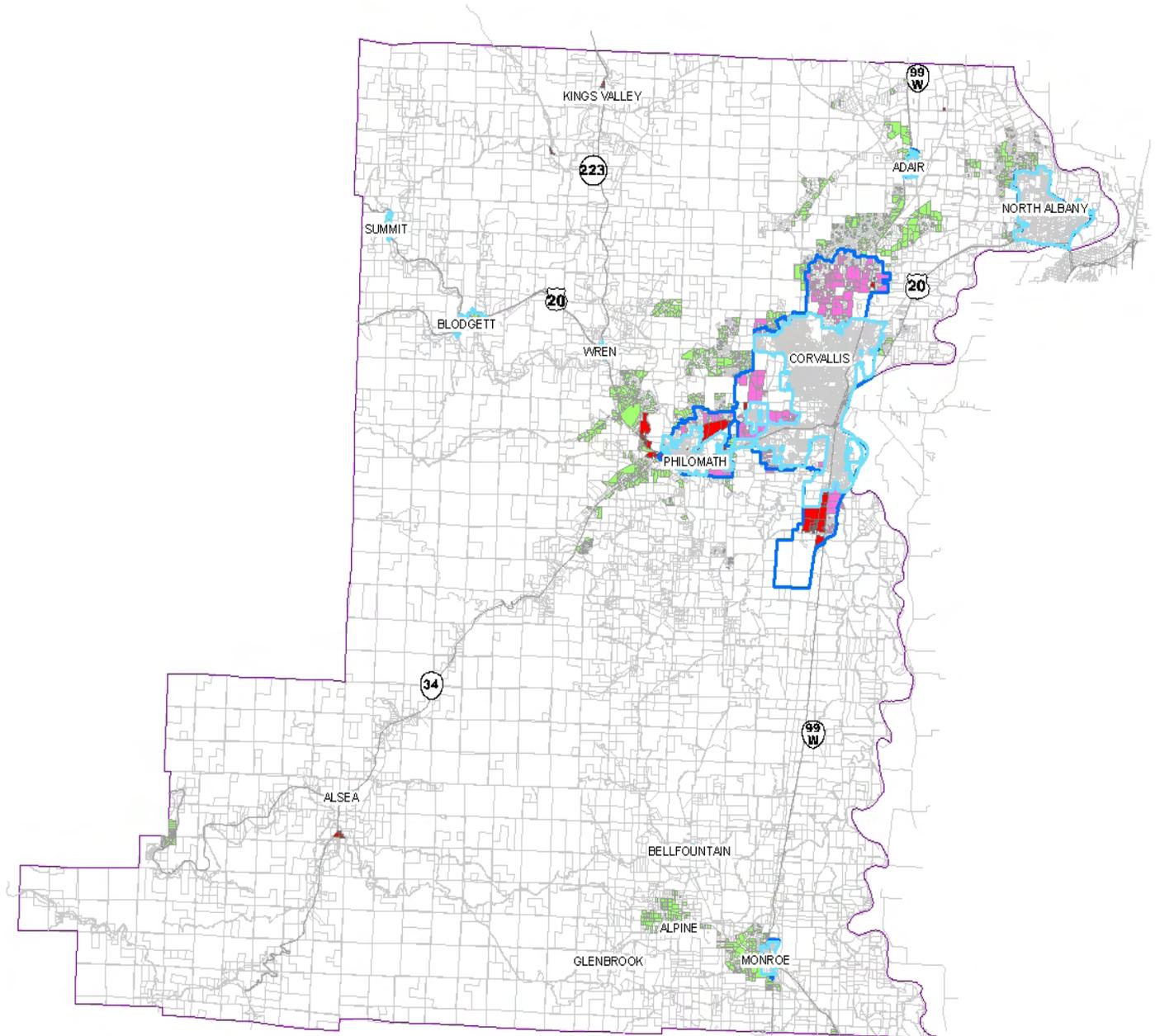
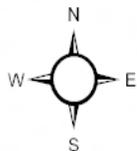




Figure 4-2

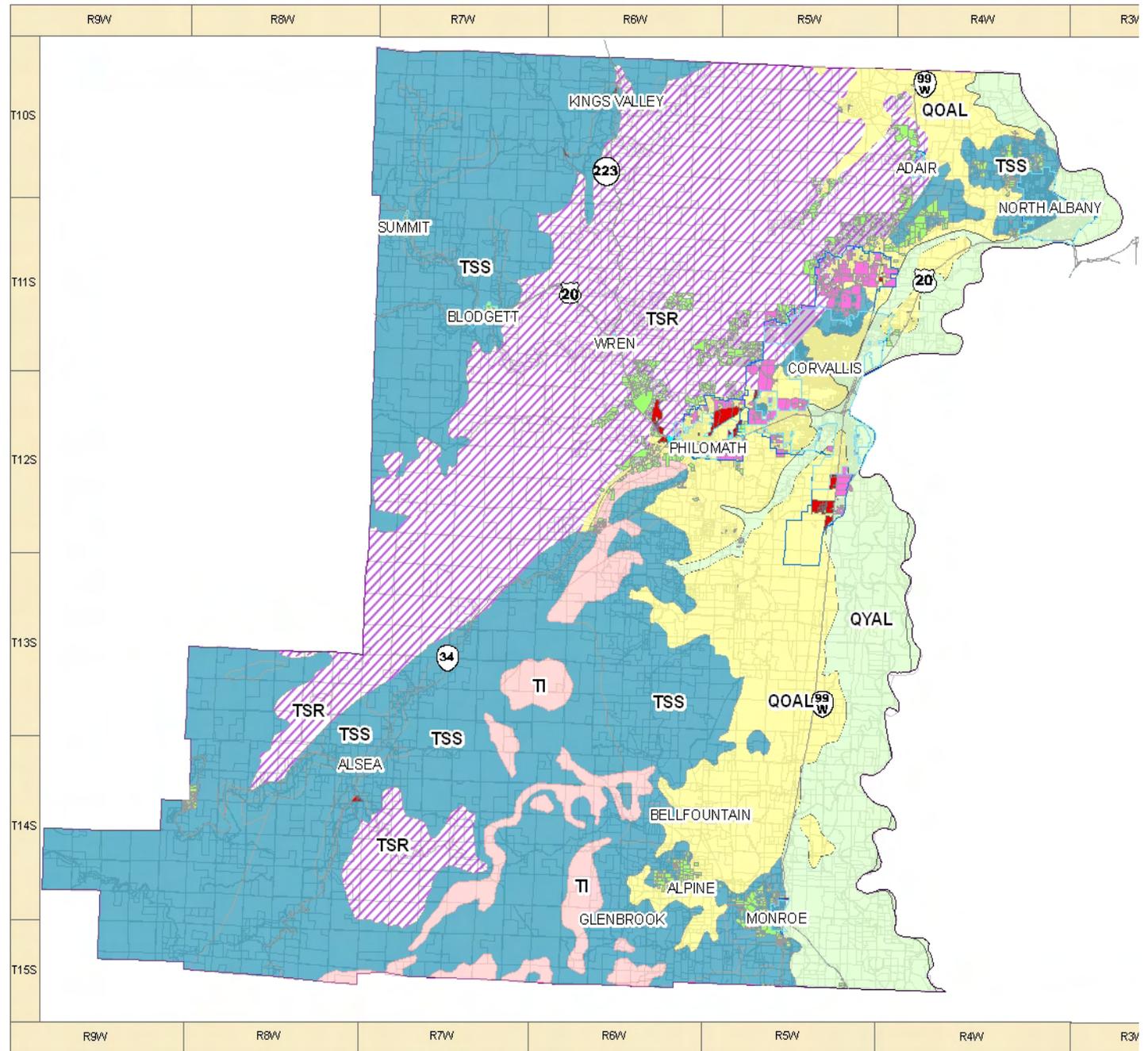
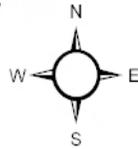
This map depicts buildable residential, industrial and commercial land, overlaid on the principal hydrogeologic units of Benton County.

Legend

- City Limits
- Urban Growth Boundaries
- Rural Residential
- Urban Residential
- Highways
- Commercial
- Industrial

Principal Hydrogeologic Units

- Name**
- Older Alluvium (QOAL)
 - Younger Alluvium (QYAL)
 - Intrusive Igneous Rock (TI)
 - Volcanic Rock (TSR)
 - Marine Siltstone and Sandstone (TSS)
 - County Boundary
 - Taxlots



Daily Use Estimate-Exempt Wells	Current	Future Scenario 1: <u>Prior to Annexation</u>	Future Scenario 2: <u>Annexation within UGB</u>
Average (MGD)	2.0	2.8	2.6
Maximum (MGD)	3.8	5.3	4.9

Benton County Groundwater Ordinance

Water Supply Requirements and Stats to

www.co.benton.or.us/cd/documents/water_regs_bp_10-8.pdf

- Two Types of Requirements- 1.) For New Dwellings and 2.) for New Partitions and Subdivisions

1.) If your pump test was performed during this time period and showed a sustained yield of this many gallons per minute...		...then you are required to install this much water storage:
October 16 through July 14	July 15 through October 15	
5 gpm or more	5 gpm or more	None
<5 gpm (may proceed with building but will need to re-test July 15 through October 15 and install storage based on that re-test)	3 to 4.99 gpm	500 gallons
	2 to 2.99 gpm	1000 gallons
	1 to 1.99 gpm	1500 gallons

A well producing less than 1 gpm is inadequate to serve as a water supply.

The required storage may be a combination of tank and well storage.

Benton County Groundwater Ordinance

2.)- Prior Requirements plus the following:

Subdivision or Series Partition

(partition of a parcel that exceeds six times the minimum parcel size)

Your application will need to include:

- A water quality test for coliform bacteria and nitrates.
- A water quantity test as follows:

If the average size of the resulting parcels or lots is...	...and your well is drilled into bedrock then you will need to conduct a:	...and your well is drilled into alluvium then you will need to conduct a:
less than 5 acres	Hydrogeologic Study	Hydrogeologic Study
5 acres to less than 10 acres	Hydrogeologic Study	Major Pump Test
10 acres to less than 20 acres	Major Pump Test	Minor Pump Test
20 acres or larger	Minor Pump Test	Minor Pump Test

* **Notify All Neighbors within 250 feet radius if in UGB or 1,000 ft if outside UGB.**

* **Neighbors can monitor wells. Applicant must document Mailing.**



This map depicts drinking water source areas in Benton County. These areas were delineated by Oregon DEQ and DHS. Concentric circles indicate the timing and area of groundwater movement through the aquifer to the well intake.

Legend

- Drinking Water Source Areas (1-2 years)
- Drinking Water Source Areas (1-30 years)
- Major Streams and Rivers
- City Limits
- Urban Growth Boundaries
- County Boundary

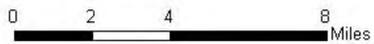
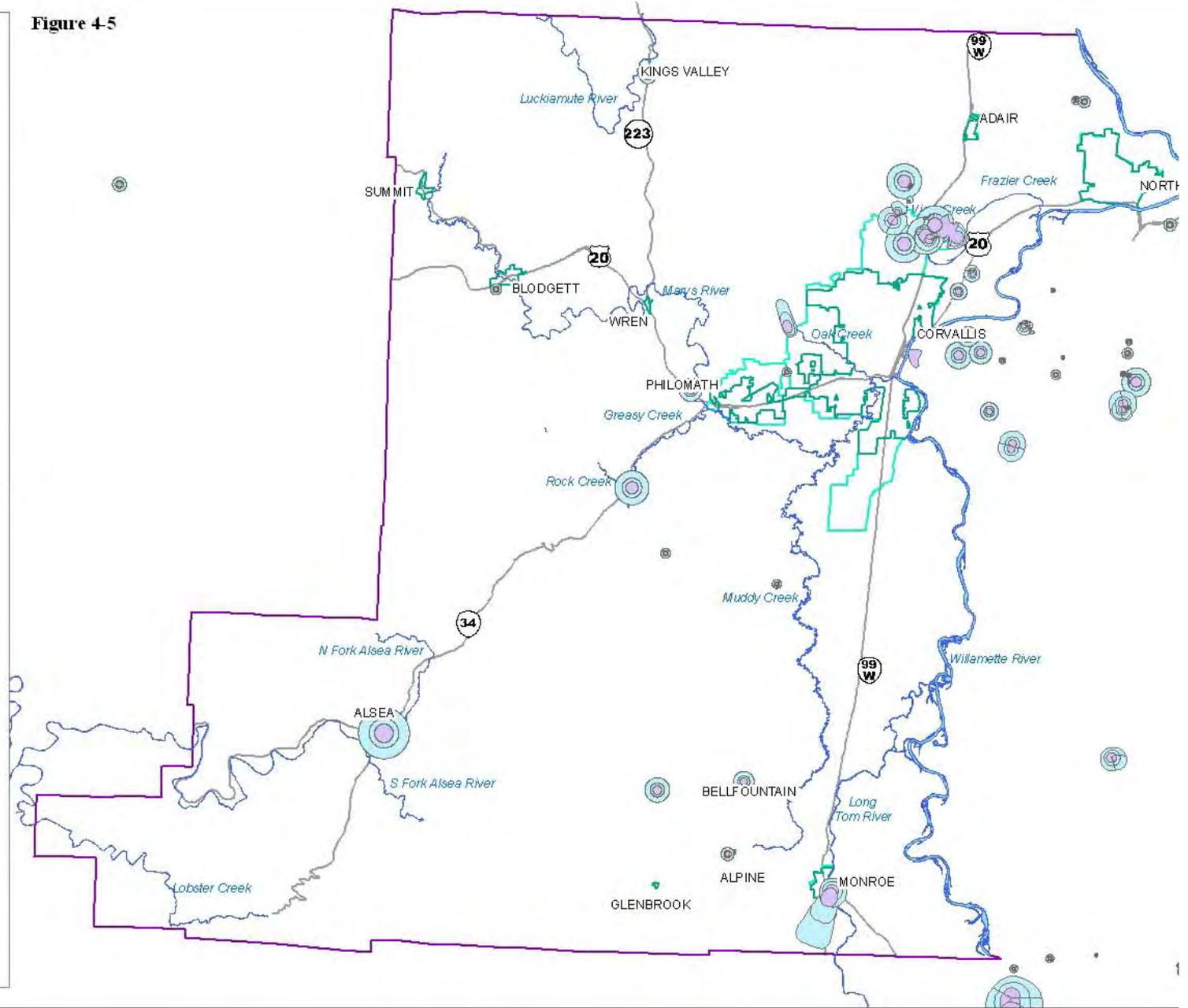


Figure 4-5





Moving Forward

- **Phase 2**

- Tri-County, Watershed Based Assessment and Planning (Washington WRIA model?) 
- Increase monitoring and fill data gaps assessed during **Phase 1**
- Phase 1 template for organizations interested

- **County Management Changes Likely**

- Location, Location, Location...Groundwater?
- Monitoring, Conservation, Source (wellhead) Protection

