



# Discussion Guide Growth Projections

WRIA 7, 8, & 9 WREC Technical Workgroup  
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## Purpose of Discussion

The purpose of the technical workgroup discussion is to:

- (1) Discuss the methods for growth projections and associated assumptions and data needs.
- (2) Provide input to the counties and technical consultants on which method or methods to use for growth projections and which assumptions to make.
- (3) Direct the technical consultant to preferred data sources.

## Background and Context

### Why we need growth projections:

RCW 90.94.030(3) says plans must include actions to offset new consumptive use impacts associated with permit-exempt domestic water use (emphasis added):

*(c) Prior to adoption of the watershed restoration and enhancement plan, the department must determine that actions identified in the plan, after **accounting for new projected uses of water over the subsequent twenty years**, will result in a net ecological benefit to instream resources within the water resource inventory area.*

*(d) The watershed restoration and enhancement plan must include an evaluation or estimation of the cost of offsetting new domestic water uses over the **subsequent twenty years**, including withdrawals exempt from permitting under RCW 90.44.050.*

*(e) The watershed restoration and enhancement plan must include estimates of the cumulative consumptive water use impacts over the **subsequent twenty years**, including withdrawals exempt from permitting under RCW 90.44.050.*

The WREC plan must estimate growth projections for the watershed for January 2018 through January 2038 (at a minimum). Based on the projected growth, the plan will estimate the amount of rural growth and associated new permit exempt wells.

### Ultimately, the methods used to estimate growth projections need to address two primary questions:

1. How many new single-family permit-exempt domestic wells connections will be installed throughout each watershed over the next 20 years? (e.g. rural population growth), and
2. Where will the well connections be installed (at the subbasin level)?

## Methods and Data Sources for Committee Consideration

There are numerous ways to make such projections for WRIAs or subbasins. The four methods discussed below have been used for growth planning in other WRIAs or similar studies. The first two methods rely on building permit data and population data, respectively. The third method is based on geospatial analysis of developable lands, similar to the King County Water Availability and Permitting Study; this method provides more spatially specific projections than the building permit and population methods. The fourth method described below is an analysis of Ecology's well log data, however, results relying on those data tend to be less reliable as discussed at previous meetings. Committees can apply some hybrid of these methods or use multiple methods and compare the results.

## Building Permits

One method for predicting future permit-exempt domestic well connections involves conducting a Geographic Information System (GIS) analysis of county building permits, zoning, and parcel information. Once these data have been segregated into WRIsAs or subbasins, single-family building permit data can be evaluated to determine the number of building permits issued over some previous time period (e.g. the past 10 years). Those results can then be used to project permit-exempt domestic wells over the subsequent 20- year period, based on assumptions regarding how many of those building permits translate into permit-exempt domestic wells, zoning restrictions, information on undeveloped parcels, etc. Further extrapolation is then required to apportion projected new permit exempt wells within the planning area.

## Subbasin Implications on This Method

If correlations are developed at the subbasin scale, there is potential for those to change if boundaries are adjusted, requiring reanalysis. If this method is combined with geospatial analysis to identify locations of rural development, there would be fewer implications of subbasin changes.

## Population Data

### Washington State Office of Financial Management (OFM) Data

Another method of predicting future permit-exempt domestic wells relies on population data. The Washington State Office of Financial Management (OFM) website provides estimates of past and current populations by WRIA, and projected future household populations on a county basis<sup>1</sup>. One way to predict future populations is to look at historical population estimates (e.g. 2000 through 2018), then use that rate of increase to predict future populations. Upon request, OFM can also prepare 2000-2018 small area estimates to show the historical population growth distribution within a county. For this option, the Committee could provide OFM GIS shapefiles for their subbasins, and OFM can provide historical population estimates for individual subbasins which can be used to predict future populations at the subbasin level.

OFM also provides population growth projections for one-year increments, but only at the county scale. The Committee could use these projections for the rate of expected population growth but would still need to apportion the growth throughout the county. The Committee would use current populations for a given subbasin or WRIA as a base, then increase that number based on county population projections. This latter method requires subjectivity, however, since the WRIA spans two counties, and varying assumptions would need to be made for each subbasin.

### Puget Sound Regional Council (PSRC)

The Puget Sound Regional Council is a regional organization that conducts growth, transportation, and economic development planning for Puget Sound governments, special purpose districts and tribes. Both King and Snohomish Counties are PSRC members. PSRC utilizes OFM-generated population forecasts, and then provides projections that distribute that growth according to Growth Management Act principles and informed by the tapestry of cities, rural areas, manufacturing and employment

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<sup>1</sup> OFM population by WRIA 2000 through 2017 is available at: <https://www.ofm.wa.gov/washington-data-research/population-demographics/population-estimates/small-area-estimates-program>

OFM projected growth rate by county 2010–2050 by one-year intervals is available at: [https://ofm.wa.gov/sites/default/files/public/dataresearch/pop/GMA/projections17/gma\\_2017\\_1yr\\_2050.xlsx](https://ofm.wa.gov/sites/default/files/public/dataresearch/pop/GMA/projections17/gma_2017_1yr_2050.xlsx)

centers, and transportation systems in the Puget Sound region. The currently applicable plan is called Vision 2040, and the PRSC is underway with its next update – Vision 2050.

Vision 2040 provides more specific population growth planning information, including a projected breakdown between urban and rural areas of each county – 10% of population growth in Snohomish County will be in rural areas, and 3% in King County will be in rural areas. Counties can then use this and other planning results in developing their Comprehensive Plans.

### Converting Projected Populations to Projected Permit-Exempt Wells

Once future WRIA populations have been estimated, those populations that will be served by community water systems and municipalities must be removed. This can be done relying on available information on the distribution/growth rate patterns of populations served by water systems.

Finally, future populations that will be served by permit-exempt domestic wells can be divided by the average number of people per household currently (U.S. Census Bureau Quick Facts) to estimate the number of future permit-exempt domestic well connections.

### Subbasin Implications on This Method

If population projections are obtained /developed by subbasin area (e.g., from OFM small area estimates), they would need to be revised for changed subbasin delineations. If this method is combined with geospatial analysis to identify locations of rural development, implications of subbasin changes would be less.

### Developable Lands

This method includes using existing GIS data to identify buildable/developable land that is likely to be served by a permit-exempt well. This method is similar to those used in the King County Water Availability Study, which focused on future development that would use permit exempt wells as the source of potable water. This method would rely on existing parcel and zoning information and a set of agreed upon assumptions (e.g. growth would not occur within the UGA, water service areas, forest production areas, public parcels, etc.) to capture maximum residential growth potential (i.e. full buildout). We would then use population growth projections/rate of growth to determine the likelihood of development in the next 20 years.

### Subbasin Implications on This Method

Since the developable lands method is a spatially based assessment, changes to subbasin delineations would not affect fundamental assumptions. Results would need to be reaggreated over revised areas.

### Well Log Data

A fourth potential method relies on spatial data for well reports (logs) available from Ecology<sup>2</sup>. Wells in this data set with a “W” in the Well type field correspond with water supply wells (Ecology does not have the ability to search the data set for permit-exempt domestic wells). Those data can be analyzed using GIS to determine the number of recorded water supply wells for two past years (e.g. 2007 and 2017), then those data can be used to predict the rate of well increase into the future. However, the reliability of estimates for future wells using this method will likely be less reliable. The consultant technical team advises against using this method due to the level of uncertainty and reliability of the well log data.

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<sup>2</sup> <https://ecology.wa.gov/Research-Data/Data-resources/Geographic-Information-Systems-GIS/GISdata>

## Conclusions

Based on previous work completed in other watersheds and ongoing work being completed by King and Snohomish Counties, Committees will likely use a combination of the methods described above. The attached table summarizes major considerations for the Committees focused on the two primary questions:

1. How many new single-family permit-exempt domestic well connections will be installed throughout each watershed over the next 20 years? (e.g. rural population growth), and
2. Where will the well connections be installed (at the subbasin level)?

Assumptions and data needs will be dependent on the specific method selected; however, the list below summarizes common assumptions that will need to be addressed/agreed upon as well as data needs for the various methods.

## Assumptions for Committee Discussion and Agreement

### Building Permits

1. Past development rate as represented by building permit issuance correlate to future building permit issuance
2. Spatial pattern of future building is informed by past building permit locations
3. Type of future development will be similar (or correlated) with past development

### Developable Lands

1. Whether to consider potential annexations
2. No changes to current zoning (for example up-zoning 40-acre parcels to 5-acre parcels)
3. Areas where new single-family residences would be restricted – these would be removed from land base where future permit-exempt wells are projected. Assumptions regarding the following areas and designations (and possibly others) would need to be agreed upon:
  - a. Parcels in public ownership
  - b. Parcels in Agricultural Production Districts
  - c. Parcels in Forest Production Districts
  - d. Parcels with conservation easements
  - e. Parcels in the Farmland Preservation Program
  - f. Parcels that are within the Transfer of Development Rights Program sending site properties
  - g. Parcels within the 100-year floodplain
  - h. Parcels in the Severe Channel migration zone with less than one acre outside the zone
  - i. Parcels less than one-acre in size
4. Areas where new single-family residences would be likely to connect to a Group A water system. Assumptions regarding the following areas (and possibly others) would need to be agreed upon:
  - a. Parcels within the Urban Growth Area
  - b. Parcels within a certain distance of existing water mains

### Population Growth

1. Past population growth rates correlate to future population growth rates
2. Spatial patterns of population growth will follow past patterns or can be identified from other available sources (e.g. comprehensive plans)
3. Average number of people per household

## **Data Needs**

### Building Permits and Developable Lands

1. Building permit numbers, types, location
2. Water service area boundaries and distribution system / connections
3. Water distribution lines for water systems
4. Zoning
5. Sewer service areas
6. Parcels with no structures (vacant land)
7. City limits
8. UGA boundaries
9. State and national forest land
10. Private ownership
11. Zoning
12. Criteria for whether property can be subdivided – existing and proposed County code
13. Projection for future new single family residences (SFR) in the areas identified by above method over 20-yr period.
14. Spatial distribution of these new single family residences – maybe from PSRC?
15. Areas where new single-family residences would be restricted as described above

### Population Growth

1. OFM (or PSRC) population growth projections per WRIA

## **Questions for Committee Discussion**

- Do you have a preferred method or methods for rural growth projections?
- How will subbasin delineations impact this method? Will the number of subbasins impact your preference?
- What assumptions should we make for the preferred method or methods?
- Do you have a preferred source for population projections? (e.g. OFM, Comprehensive plan, Vision 2040, Vision 2050)
- What data is available? How can the technical consultants access it?
- Will you need higher level approval to make a decision on the acceptable data sources and methods?

**Information Source Options, Data Needs, and Assumptions  
for Key Permit-Exempt Well Projection Questions**

**How many new permit-exempt well connections are projected through January 18, 2038?**

Data Source / Method	Comments
<u>OFM</u> – population projections	<ol style="list-style-type: none"> <li>1. Can provide population projections at 1-yr intervals, but only at County level, not for smaller areas</li> <li>2. Can provide historical estimates for small areas (2000-2017)</li> <li>3. Used as a basis for more detailed regional planning described below.</li> </ol>
<u>Puget Sound Regional Council</u> – population projections <ul style="list-style-type: none"> <li>• Vision 2040</li> <li>• Vision 2050</li> <li>• UrbanSim</li> </ul>	<ol style="list-style-type: none"> <li>1. Snohomish County’s Comprehensive Plan is based on Vision 2040, so method should be consistent with that. King County’s population growth projections are also aligned with Vision 2040.</li> <li>2. UrbanSim may be able to provide both the projected growth and location, which would be a big advantage if this model is acceptable.</li> <li>3. Assumptions include consistency between UrbanSim, Vision 2040 and Comp plans (need to confirm).</li> </ol>
<u>County Comprehensive Plans</u> – population projections <ul style="list-style-type: none"> <li>• Useful for distributing to subbasins</li> </ul>	<ol style="list-style-type: none"> <li>1. County Comprehensive Plans lay out the framework for County land use, so consistency with these is essential.</li> <li>2. Neither King nor Snohomish County's Comprehensive Plan syncs exactly with our planning timeframe – SnoCo Comp Plan goes through 2035; KC goes through 2036?</li> <li>3. Growth projections in both Comp Plans are a few years old now.</li> <li>4. Could use as guide for apportioning projected population to subbasins.</li> <li>5. Data needs include unpublished update data.</li> </ol>
<u>Building permits</u> – historical rates, project forward	<ol style="list-style-type: none"> <li>1. Provides specific information about location of past single-family residents.</li> <li>2. Rate of issuance also gives insights into permitting capacity at each county.</li> <li>3. Past permit issuance rate and location does not necessarily correlate to future applications, permit issuance or locations.</li> </ol>
<u>Well logs</u> – historical rates, project forward	<ol style="list-style-type: none"> <li>1. Provides spatial data for wells but is not reliable data source for accurate estimate.</li> <li>2. Does not identify permit-exempt wells.</li> <li>3. Same issue as building permits – these are historical data that must be projected into the future.</li> </ol>

**Information Source Options, Data Needs, and Assumptions  
for Key Permit-Exempt Well Projection Questions**

**Where will the new permit-exempt wells be located?**

<b>Data Source / Method</b>	<b>Comments</b>
<p><u>Developable lands analysis</u></p> <ul style="list-style-type: none"> <li>• KC Water Availability Study (complete)</li> <li>• Snohomish County – GIS rural capacity analysis (in progress)</li> </ul>	<ol style="list-style-type: none"> <li>1. Both Snohomish and King Counties have already done or are beginning this analysis.</li> <li>2. Completed KC Water Availability Study did not include 20-year new permit-exempt well projection.</li> <li>3. Assumptions about where new wells will be concentrated will need to be vetted with Committee. Some of this has been discussed related to KC Water Availability Study, but no discussion has yet occurred for Snohomish County assumptions.</li> <li>4. If Committee is interested in assumptions beyond what the counties are using, those need to be identified soon.</li> <li>5. Related to impacts analysis – we will also need to determine assumptions for well locations (e.g. clustered upgradient, distributed evenly, or clustered in downgradient area of subbasin).</li> </ol>
<p><u>Water system service areas</u></p> <ul style="list-style-type: none"> <li>• Need to identify limits of distribution system; areas that won't have water service by 2038 will likely rely on permit-exempt wells</li> </ul>	<ol style="list-style-type: none"> <li>1. Portions of water service areas will be subtracted from projected future permit-exempt well areas. Where water distribution lines do not yet serve the entire service area, we will need to decide about whether permit-exempt wells are projected.</li> <li>2. Data needs include water service areas, distribution lines, capital program plans for expansion of distribution systems.</li> <li>3. We are not able to conduct in-depth research for all Group A water systems, so priority systems will need to be identified for further research, and assumptions made for others.</li> </ol>
<p><u>Building permits</u> – historical distribution, project forward</p>	<ol style="list-style-type: none"> <li>1. Same issues described above under “How many new permit-exempt wells are projected through January 18, 2038?”</li> </ol>
<p><u>Well logs</u> – historical distribution, project forward</p>	<ol style="list-style-type: none"> <li>1. Same issues described above under “How many new permit-exempt wells are projected through January 18, 2038?”</li> </ol>