# WRIA 7 Growth Projections: Summary of Methods

The WRIA 7 Watershed Restoration and Enhancement Committee is tasked with estimating the consumptive use from new permit-exempt domestic withdrawals over the planning horizon (The 20-year period beginning on January 19, 2018 and ending on January 18, 2038). The first step in that task is to estimate the number of new permit-exempt domestic well connections (PE wells[[1]](#footnote-2)). **GeoEngineers estimates 3,357[[2]](#footnote-3) new permit-exempt domestic well connections in WRIA 7 over the planning horizon.** The Committee can decide to apply a “safety factor” after estimating consumptive use.

WRIA 7 includes parts of unincorporated King County and Snohomish County and 18 incorporated cities and towns. The methods used to estimate new wells in unincorporated and incorporated areas in WRIA 7 are summarized below.

## Snohomish County – Unincorporated area

* Snohomish County developed growth projections by (1) looking at past development trends in permit-exempt wells areas for each HUC 12[[3]](#footnote-4) within its portion of WRIA 7, (2) using those trends as well as population projections to estimate the number and location of new homes (housing units or HUs) relying on wells over the planning horizon, and (3) comparing the estimated number of new homes to the rural capacity in each HUC 12.
  + Snohomish County reviewed year-built data for 2008-2018 from the County Assessor’s office to calculate growth distribution by HUC and growth distribution in public water service areas vs PE well areas.
  + PE well areas are based on the following assumptions: 1) any portion of a property boundary within 100 feet of a water distribution line will hook up to public water (i.e. will not rely on a PE well) (proposed water code) and 2) sub-dividable properties within ¼ mile from a water distribution line will hook up to public water (i.e. will not rely on a PE well) (existing code requirement).
  + Snohomish County updated their 2011 rural land capacity analysis. They reduced the estimated capacity from 2011 by development that has occurred since then outside of UGAs (based on year-built data).
* The workgroup discussed four growth projection scenarios for the unincorporated portion of Snohomish County. Snohomish County staff developed the scenarios listed as 1, 2, and 4 and GeoEngineers developed scenario 3.
  + Scenario 1: 20-year projection - "Past trends" uses the historical rate of rural development in areas served by wells (based on year-built data from 2008-2018) and projects that rate into the future. Snohomish County calculated an average of 249 housing units per year. The initial scenario 1 estimates 2,059 new homes[[4]](#footnote-5) within permit-exempt well areas. This initial estimate was/will be modified as follows:
    - GeoEngineers added 275 new permit-exempt well areas to Snohomish County’s scenario 1 estimate to account for insufficient capacity of Seven Lakes Water Association to serve new customers in the Quilceda and Tulalip-Frontal Procession Sound HUC-12 subwatersheds. After adjustments, scenario 1 estimates 2,334 new homes within permit-exempt well areas.
    - Tulalip Tribes is developing estimates for new permit-exempt well areas on tribal owned lands within the Quilceda and Tulalip-Frontal Procession Sound HUC-12 subwatersheds. Tulalip Tribes is using past trends methods similar to Snohomish and King Counties. This estimate will be added when complete.
  + Scenario 2: 20-year projection - "Comp Plan" uses the population growth rate from the 2015 comprehensive plan, allocates 7.9% of the population increase to the rural areas, assigns 62% of the county’s total rural share to WRIA 7 (the remainder to WRIAs 3, 5, and 8), then assigns the growth projection to HUC-12 sub-watersheds based on past development trends. Scenario 2 estimates 1,463 new homes within permit-exempt well areas.
  + Scenario 3: 20-year projection - OFM High (2012 data) uses the same method as Scenario 2 but uses the population growth rate from the 2012 OFM high population forecast for Snohomish County. The consultants prepared Scenario 3 and Snohomish County does not support using this option. Scenario 3 estimates 2,723 new homes within permit-exempt well areas.
  + Scenario 4: 2019 Available Capacity is an estimate of the number of rural parcels within a HUC 12 that have the potential for new homes that would rely on a well. Scenario 4 estimates 6,346 available parcels within permit-exempt well areas.
* All of the scenarios likely overestimate the number of new homes within permit-exempt well areas because they don’t account for the expansion of water lines.
* **The workgroup discussed the scenarios and recommended the Committee use Scenario 1: “past trends” as the 20-year growth projection, and adding in Tulalip Tribes’ growth projection for tribal owned lands.** 
  + This scenario uses similar methods as the King County growth projection. Scenario 1 estimates 2,334 new homes within permit-exempt well areas.
* The Committee can still consider Scenario 4: 2019 capacity as an offset target.

## King County – Unincorporated area

* King County developed one growth projection scenario based on historical building permit data.
* King County used the average number of building permits per year in WRIA 7 (104) for the 18 year period (2000-2017) multiplied by the historical percent of homes using permit-exempt wells (44.7%) to come up with the estimate of 36 new permit-exempt wells per year in the WRIA 7 portion of rural unincorporated King County. The 20-year estimate of new PE wells is 926.
  + For all building permits, King County looked at parcel information from the Assessor’s office, which lists the water source as public or private (private water sources are wells), and then used this information to come up with a percent of buildings that rely on wells.
  + The “other” category for water service info includes parcel information with “unknown” listed for water source (likely vacant land) and where the building permit data and parcel attribute data did not match up. King County used the “other” category to calculate an error of 6% (of the total number of building permits).
  + The analysis likely over counts the number of homes on wells because any homes outside a Group A water service area boundary are assumed to use a well. Some of those homes might actually connect to a group B system that has a water right.
  + The building permit data for 2000-2017 includes both periods of high growth and periods of low growth. King County compared this data with information from Vision 2040 and population data and is confident in using the average of this time period to project into the future.
  + The growth percent maps show the historical distribution of growth between the stream basins.[[5]](#footnote-6) The stream basins with most of the rural growth are Snoqualmie River (19%), Patterson Creek (17%) and South Fork Snoqualmie River (14%).
  + The building permit maps shows building permit locations for 2000-2017.
  + King County used the time period 2000-2017 because those data were available.
* King County is still working on the developable lands/rural capacity analysis and expects to have something to share with the workgroup in September.
* **The workgroup recommends the Committee use the King County 20-year growth projection (926) plus the error (6%), which is 983 new domestic permit-exempt wells from 2018-2038.**
* To estimate the King County 20 year well projection by stream basin, GeoEngineers used the historical data (2000-2017) for average number of building permits per year in WRIA 7 (104) and the historical distribution of building permits by stream basin to estimate the average building permits per year for each stream basin. The average building permits per year is then multiplied by the historical percent of homes on wells to estimate the average number of wells per year. The 6% error is added to the average number of wells per year, and then calculated for the 20-year planning horizon.

## GeoEngineers - Incorporated area (UGA)

* GeoEngineers did a spot check for wells from the Ecology well log database that plot within the Urban Growth Area. In WRIA 7, 80 wells plot within the UGA for 1998-2007 and 46 wells plot within the UGA for 2008-2018. GeoEngineers checked about 61% of those wells by looking at the well logs and noting whether the wells were identified as being for domestic, irrigation, or other purposes (test, industrial, errors, etc.). About 30% of the wells were for domestic use.
  + Domestic and Irrigation well numbers were adjusted by cross-checking well addresses with UGA boundaries.
* **The workgroup recommended adding the estimate of domestic wells within the UGA to the growth projections by subbasin. The estimate of domestic wells within the UGA over a 20-year period is 40[[6]](#footnote-7).**
* GeoEngineers took the number and distribution of wells from the 1998-2018 data and projected the same rate and distribution for the 20-year planning horizon.

1. "PE wells" is used to refer to new homes associated with new permit-exempt wells and also new homes added to existing wells on group systems relying on permit-exempt wells. [↑](#footnote-ref-2)
2. This estimate will increase when Tulalip Reservation projected wells are added (see discussion on page 2). [↑](#footnote-ref-3)
3. HUC 12 is a level of [hydrologic unit code](https://water.usgs.gov/GIS/huc.html) [↑](#footnote-ref-4)
4. The estimates within the Snohomish County growth forecasts spreadsheet vary slightly due to rounding numbers used in the calculations. [↑](#footnote-ref-5)
5. King County “stream basins” or “drainage” basins are [sub-watershed areas used by King County](https://www.kingcounty.gov/services/environment/watersheds.aspx). [↑](#footnote-ref-6)
6. GeoEngineers took the total of 38 potential new domestic wells over 20 years and estimated new wells by subbasin. After rounding numbers by subbasin, the total is 40. [↑](#footnote-ref-7)