WRIA 14: PE Well Growth and

Consumptive Use Discussion Guide

September 10, 2020

# Background

For background information on previous Committee discussions on these topics, please review the [“technical progress to date”](https://app.box.com/s/yo5gfrrpqsyrzhsyx6jdwkp5w170p7we) memo from January 2020.

# PE Well/Connection Growth

At the January 9, 2020 WREC meeting, the Committee agreed to a range of working numbers for PE well/connection growth using the analysis provided by HDR for Mason County, and the Thurston Regional Planning Council (TRPC). HDR provided PE well connection growth information for the “baseline growth”, and a “higher growth” estimate, which took into account PE well/connection growth in water systems of rural areas. The latter analysis was suggested to account for the uncertainty that while *most* homes will connect to water systems within a service area, there are still occasionally PE wells that go into these areas.

Table 1 below shows the range of working numbers for projected PE well growth. It was the recommendation of the Committee in January 2020 that the range of working numbers for projected PE well growth be used to calculation the consumptive use offset.

**Table 1: Number of PE Wells Projected between 2018 and 2038 for the WRIA 14 Subbasins**

|  |  |  |
| --- | --- | --- |
| **Number of Permit-Exempt Wells Added between 2018 and 2038** | | |
| **Subbasin** | **Baseline** | **Higher Growth** |
| **Case** | 418 | 512 |
| **Goldsborough** | 509 | 546 |
| **Harstine** | 143 | 143 |
| **Hood** | 74 | 117 |
| **Kennedy** | 556 | 588 |
| **Mill** | 462 | 466 |
| **Oakland** | 1,481 | 1559 |
| **Skookum** | 363 | 363 |
| **Totals** | **4,006** | **4,294** |

# Consumptive Use

In January 2020, the WRIA 14 WREC agreed to a primary working number for consumptive use, which is a range as a result of the range of projected PE well growth. Many Committee members stated that they were not prepared to finalize the working numbers without comparing the consumptive use offset to the offsets available from projects.

The average outdoor irrigated area analysis was limited to a sample size of 80 parcels distributed by location and property values. Also, the interpretation of irrigated areas from aerial photos is subject to error. Some committee members voiced concern over these uncertainties in the outdoor irrigated area analysis. To help address the potentially limited sample size, the Committee estimated the error margin achieved with the 80 parcels, and determined that it was approximately 0.03 acres (i.e., the arithmetic average of 0.07 acres has an error margin of 0.03 acres). Applying this error margin increased the irrigated area to 0.11 acres. Also, the committee calculated the 95 percent upper confidence of the irrigated area average. The 95 percent upper confidence limit was 0.14 acres. The 95 percent upper confidence limit represents an upper estimate of the mean that has a 95 percent probability of being less than that upper limit (i.e. an over estimate of irrigated area that would likely result in a more conservative consumptive use estimate). The Committee generally agreed that the outdoor irrigation area for new permit-exempt connections are likely to be smaller than the 95 percent confidence limit (0.14 acres).

Potential bias in methodology was addressed in a comparability study with GeoEngineers (technical consultant for WRIAs 7, 8, 9). The comparability study found that the results were usable and that while the method is subject to error, there was not systemic bias. The two consultant teams developed a [memo](https://app.box.com/s/ph4y6dy602miywbo3t5n7r25xebu172w) with their findings, which Angela distributed to the Committee for review.

Of the methodologies presented to address uncertainty in the calculations of consumptive use, the Committee agreed that the most appropriate estimate for WRIA 14 should be based on the assumption to assign a minimum value of 0.05 acres to the 80 parcels used to calculate the average irrigated area. This resulted in an irrigated area of 0.10 acres, which was applied to the calculations to determine indoor, outdoor, and total consumptive use estimates by subbasin (Table 2 and Table 3). [Comment: the Committee has agreed to use this as the primary “working number”, and can be changed to reflect any final decisions.]

**Table 2: Indoor and Outdoor Consumptive Use Estimates by Subbasin (“baseline growth”)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Subbasin** | **Projected PE wells** | **Indoor CU (AF/year)** | **Outdoor CU (AF/year)** | **Total CU/year (AF/year) in 2038** |
| **Case** | 418 | 7.0 | 66.9 | 73.9 |
| **Goldsborough** | 509 | 8.6 | 81.4 | 90.0 |
| **Harstine** | 143 | 2.4 | 22.9 | 25.3 |
| **Hood** | 74 | 1.2 | 11.8 | 13.1 |
| **Kennedy** | 556 | 9.3 | 89.0 | 98.3 |
| **Mill** | 462 | 7.8 | 73.9 | 81.7 |
| **Oakland** | 1,481 | 24.9 | 237.0 | 261.8 |
| **Skookum** | 363 | 6.1 | 58.1 | 64.2 |
| **TOTAL** | 4,006 | 67 | 641 | 708.3 |

Table 3: Indoor and Outdoor Consumptive Use Estimates by Subbasin (“higher growth”)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Subbasin** | **Projected PE wells** | **Indoor CU (AF/year)** | **Outdoor CU (AF/year)** | **Total CU/year (AF/year) in 2038** |
| **Case** | 512 | 8.6 | 81.9 | 90.5 |
| **Goldsborough** | 546 | 9.2 | 87.4 | 96.5 |
| **Harstine** | 143 | 2.4 | 22.9 | 25.3 |
| **Hood** | 117 | 2.0 | 18.7 | 20.7 |
| **Kennedy** | 588 | 9.9 | 94.0 | 103.9 |
| **Mill** | 466 | 7.8 | 74.6 | 82.4 |
| **Oakland** | 1,559 | 26.2 | 249.4 | 275.6 |
| **Skookum** | 363 | 6.1 | 58.1 | 64.2 |
| **TOTAL** | 4,294 | 72 | 687 | 759.2 |

# Project Offset by Subbasin

For comparison of the offset estimates for consumptive use to the current WRIA 14 projects that are estimated to provide offset, table 4 below is presented for context. [Comment: info is pending, Angela will send out a revised version with this information ASAP]

**Table 4 Offsets from Projects by Subbasin**

|  |  |
| --- | --- |
| **Subbasin** | **DRAFT Project Offset Estimate (afy)** |
| **Case** |  |
| **Goldsborough** |  |
| **Harstine** |  |
| **Hood** |  |
| **Kennedy** |  |
| **Mill** |  |
| **Oakland** |  |
| **Skookum** |  |
| **TOTAL** |  |

# Questions for Committee members:

1. Does the committee want to finalize PE well growth or a CU estimate through a consensus decision?
2. If the Committee does not want to select a single number, is the group comfortable with a range?
3. Does the committee want to include a safety factor through a consensus decision?
4. What other information is needed, if any?

# Next Steps:

1. Committee members to decide on how to present PE well growth and CU estimates.
2. Angela to revise chapter 4 and technical memo accordingly.