AGENDA

WRIA 15 Watershed Restoration and Enhancement Committee Meeting

February 6, 2020 | 9:30a.m.-1:45p.m. | WRIA 15 Committee Webpage

Location
Kitsap County Commissioners Chambers
619 Division St
Port Orchard, WA

Committee Chair
Stacy Vynne
Svyn461@ecy.wa.gov
(425) 649-7114

Handouts
- Agenda
- Growth projection discussion guide
- Updated consumptive use calculator

Welcome

9:30 a.m. | 5 minutes | Susan Gulick

Meeting Agenda and Meeting Summary

9:35 a.m. | 5 minutes | Susan Gulick

Updates and Announcements

9:40 a.m. | 10 minutes | Stacy Vynne, All
- Grant Program
- Meetings Held
- Other Announcements

Plan Review Process

9:50 a.m. | 30 minutes | Stacy Vynne, All
- Committee members report out on the process and time needed for their local review.

Growth Projections

10:20 a.m. | 30 minutes | Stacy Vynne |Discussion
- Agreement on final Kitsap numbers

Consumptive use

10:50 a.m. | 60 min | Stacy Vynne, All |Discussion
- Develop working numbers
- Next steps: how to deal with uncertainty
  - Sensitivity analysis

BREAK |11:25 a.m. | 20 minutes | Move your car if you parked in 2-hour parking space!

—Continue conversation on consumptive use as needed—

Project Considerations

12:10 p.m. | 75 minutes | Stacy Vynne, Burt Clothier, All | Discussion
- Debrief on hydrology/hydrogeology workshop
- Debrief on workgroup meeting
- Updates on potential projects
  - Acquisition opportunities
  - Other projects
- Recommendations on path forward

Public Comment

1:25 p.m. | 5 minutes | Angela Pietschmann

Next Steps and Action Items

1:30 p.m. | 15 minutes | Angela Pietschmann, Stacy Vynne

- Homework/Preparation for March Meeting
    - Add comments to project inventory
    - Review lists from previous brainstorm and identify issues you would like further discussion (in addition to climate change and adaptive management, which we know need significant further discussion)
    - Review revised subbasin memo and growth projections memo that Ecology will distribute shortly.
- Next meeting—Thursday, March 5, 2020, Kitsap County Commissioner's Chambers, Port Orchard, 9:30-2:30

WRIA 15 Upcoming Meetings: https://ecy.box.com/v/WRIA15UpcomingMtgs

MEETING SUMMARY

WRIA 15 Watershed Restoration and Enhancement Committee Meeting

December 5, 2019 | 9:30 a.m.-1:15 p.m. | WRIA 15 Committee Webpage

Location
Kitsap County
619 Division Street
Port Orchard, WA

Committee Chair
Stacy Vynne McKinstry
Svyn461@ecy.wa.gov
(425) 649-7114

Handouts
- Agenda
- Project Discussion Guide
- Growth Projections Discussion Guide
- Consumptive Use Discussion Guide

Attendance

Committee Representatives and Alternates *

Joel Purdy (*Kitsap Public Utility District*)
David Winfrey (*Puyallup Tribe)*
Stacy Vynne McKinstry *(WA Dept of Ecology)*
Greg Rabourn *(King County)*
Dave Nash (*alternate) (Kitsap County)*
Sam Phillips *(Port Gamble S'Klallam Tribe)*
Teresa Smith *(City of Bremerton)*
Mike Michael *(City of Bainbridge Island)*
Dave Ward (*Kitsap County)*
Zach Holt *(alternate) (City of Port Orchard)*
Shawn O'Dell *(ex officio)* (*Washington Water Service)*
Josie Cummings *(Building Industry Association of Washington)*
Larry Boltz *(ex offio)(Mason-Kitsap Farm Bureau)*
Brienn Ellis (*City of Gig Harbor)*
Alison O'Sullivan (*alternate) (Suquamish Tribe)*
Joy Garitone *(Kitsap Conservation District)*
David Windom *(Mason County)*
Erica Marbet *(alternate) (Squaxin Island Tribe)*
Brittany Gordon *(WDFW)*
Austin Jennings (*Pierce County*)
Dana Sarff (*Skokomish Tribe*)

Committee Representatives Not In Attendance*

City of Poulsbo
Great Peninsula Conservancy

Other Attendees

Susan Gulick *(Sound Resolutions, Facilitator)*
John Kiess *(Kitsap Public Health)*
Michael Pollock (*NOAA)*
Angela Pietschmann (*Cascadia Consulting Group, Information Manager*)
Fern Schultz *(Washington Department of Health)*

*Attendees list is based on sign-in sheet.

Meeting Agenda and Meeting Summary

Susan reviewed the agenda.
No revisions to the agenda.

Susan acknowledged minor revisions to the November meeting summary, including minor edits and corrections to the attendee list. No concerns were shared with the revised version. Ecology will post the final meeting summary on the committee webpage.

No further refinements to the meeting summary provided.

Updates and Announcements

Stacy provided updates from Ecology.

- Reminder of key upcoming dates:
  - Dec 11 – Workshop on WRIA 15 Hydrology and Hydrogeology organized by Paul Pickett; WebEx option available.
  - Jan 8 - Project Workgroup; will discuss MAR and gravel pits project challenges and opportunities; screening criteria.
  - Jan 14 (10AM-12PM) – Webex on Streamflow Restoration Competitive Grant Guidance.
  - Feb 6 - Next committee meeting.
  - No committee meeting in January.
- WRIA 15 Region Delineation:
  - There was agreement at the November meeting to split Hood Canal region into a North and South. Stacy followed up with representatives who were not present at the meeting and received support for the refinement. Ecology and HDR will reflect changes in the growth projections, consumptive use and webmap.
- Resources and Reminders:
  - A 1 page document is available for those that are interested in talking with their entities or other partners about project ideas for the plan. The document provides a brief overview of the planning process and types of projects we are looking to include in the plan. Please let Stacy know if you need additional copies.
  - Ecology is working on a Committee Brochure to share with committee members' leadership/decision makers. Please let Stacy know if you need an early version. We anticipate a final version in early February.
  - Reminder to complete the form for Local Process for Plan Review by Feb 6: Local Process for Plan Review (https://ecy.box.com/v/WRIA15PlanReviewLocalProcess)
- The committee discussed concerns that the technical workgroup may be getting ahead of the committee. The committee recognized that there is a lot of work to be done, but would like to have the conversations happen at the committee level. The committee prefers to dedicate more time to the committee meeting as opposed to having multiple meetings a month. Stacy and Susan will extend the committee meetings, and likely build in work sessions as part of the meeting. We will shape the meetings to make sure it is clear when we will cover committee business (e.g. meeting summary approval, agreement on products) compared to sections of the meeting that will be more open for folks to come in and out of the discussion depending on their interest.
  - Stacy will cancel the Jan 14 Technical Workgroup meeting.
  - Stacy will update the calendar invites, extending the time of the regulator committee meeting.
  - The Project Workgroup will continue to meet for the time being.
  - **Note: Following the December Committee meeting, the Technical Workgroup meeting was canceled. The Project Workgroup meeting was rescheduled from Jan 8 to Jan 14.**
- Stacy has heard interest in having other expertise at the table for committee discussions. Committee members should send Stacy organizations or individuals that they would like to have join for committee discussions.

Project Screening Criteria

The committee may consider criteria for screening projects in consideration for inclusion in the watershed restoration and enhancement plan. The project workgroup has discussed the initial criteria and provides a recommendation to the committee on fatal flaw screening criteria.

Reference Material

- Discussion guide (available on committee webpage)
- Screening criteria memo (living document) (available on Box: https://ecy.box.com/v/WRIA15projectscreening)

Discussion

- Members of the committee are concerned about projects that come forward and require salmon recovery funding dollars. Some members of the committee are uncomfortable including these projects and having them count towards the offset. DFW asked if the Puget Sound Partnership or Salmon Recovery Funding Board would be comfortable having projects identified for salmon recovery counted as offset project. Members of the committee want to ensure that we aren't using restoration dollars to offset future water use.
    - Ecology recognized that there are different opinions on the committee as well as across the committees, but we could consider a criteria that looks at the funding source. For instance, projects that can only be funded with salmon recovery funding sources could be flagged.
- Other members of the committee recognized that many projects are used across multiple recovery plan lists and it shouldn't matter what the funding source is as long as the project is completed.
- Some committee members want to ensure that we are focused on projects that benefit streamflow, even habitat projects should provide a benefit to streamflow.
- The committee agreed that if a project is going over and above the requirements under permit or law, this would be an acceptable project (such as for NPDES). While we don't want to allow for "double counting" projects, above and beyond requirements would be considered.
- The committee raised questions about additional details in terms of what is allowed or not allowed under the fatal flaws category of "already required under regulatory obligation" and it was recognized that there may be nuances that need to be considered on a project by project basis.
- The committee agreed that projects that are flagged under fatal flaws will be documented in a separate list so that they can be considered in the future if things change. It was recommended that our adaptive management plan includes considerations for what happens if projects develop fatal flaws further in the process.
- The committee was comfortable in general with the proposed fatal flaws criteria and did not have additions or significant revisions.

Considerations for Beaver Projects

Michael Pollock, NOAA, presented on opportunities and challenges with beaver projects. Brittany Gordon, DFW, presented on local opportunities and challenges with beaver projects.

Reference Material

- Michael Pollock's presentation. https://ecy.box.com/v/WRIA15Beavers
- Materials from DFW. https://ecy.box.com/v/WRIA15Beavers

Discussion

- Michael discussed projects in California and the Northwest that showcase the beaver's ability to improve the watershed through creating more complex habitat, raising the water table, reducing water temperature, and attracting plant and animal species.
- Concern was raised over the heavily engineered restoration projects, with interest in focusing on more natural conditions/structures.

- Some of the challenges faced with beaver dams include fish passage (for some species) and maintenance.
- There is not empirical data on streamflow benefits, but researchers do have some water storage data and have been able to demonstrate increased water storage. It is not clear how we can quantify streamflow benefit without complex modeling. We are seeing more storage than expected and can quantify storage, but it is more complicated when trying to translate this into streamflow benefit.
- Beavers prefer low gradient areas, but will move to less suitable habitat once they are fully established in the preferred habitat.
- DFW receives calls about 1x per week in regards to conflicts with beavers. Since 2017, beaver relocation west of the Cascades has been allowed and the application and permitting process is overseen by DFW.
- In some areas of the state, concerns about beavers as vectors of disease has limited relocation, but this is unlikely a concern in Kitsap as most of the diseases are already detected in watersheds and beavers are moving across the landscape all of the time.
- While a low levee may provide a similar flow or storage role as a beaver dam, it would not have the same multiplier effects for fish as a beaver dam as it does not provide fish passage or may not bring in native vegetation to attract other plants and animals (may also have permitting concerns).
- Beavers can exist in highly dynamic and diverse types of systems.
- We should include a monitoring component for beaver projects so we can collect data on changing streamflow. We have a lot of gauging data in the watershed and need to put it to use for monitoring since funding monitoring is challenging.

Permit Exempt Well Projections Based on Growth

Stacy provided a summary of the discussion guide on projections. The committee considered initial agreement on the projections for King, Pierce and Mason counties. The committee considered updates on the Kitsap County data from Kitsap County and Kitsap PUD.

Reference Material

- Committee discussion guide (available on committee webpage)

Discussion

- The Committee discussed the following ranges for King, Pierce and Mason counties.

	Low Range	Medium Range	High Range
Pierce	624	978	1,416
Mason	1,301	1,301	1,301
King	368	368	368

- Squaxin Island Tribe wants to have a high growth scenario for Mason County. They are willing to continue to move forward with the process, but want to see the higher range/safety factor included in the future.
- Mason County wants to ensure that the adaptive management component of the plan considers the results of the census for changes in population growth (available in 2022).

- Pierce County clarified that the growth projection data shown is only for the WRIA 15 component of the county, in the south sound (Key Peninsula-Gig Harbor-Islands) watershed, and that the numbers are based on Pierce County health data.
- It was recognized that the permit exempt well projections may not be representative of future growth as most of the growth is allocated to urban areas.
- The committee agreed that the growth projections for King, Pierce and Mason counties as presented will be used as interim numbers as the full plan is pulled together. The committee recognized that some members of the committee may want to propose alternative ranges or safety factors in the future.
- Kitsap County summarized the methods and reasoning for revisions to the Kitsap County projections, as provided in detail in the discussion guide. Their revised estimate is 2077 wells, not including Bainbridge Island.
- The assumptions made for the County don't necessarily carry over to Bainbridge Island; therefore, a few options for Bainbridge Island were presented for committee consideration. Bainbridge Island staff looked at the Notice of Intent database – which likely provides an inflated number as captures more than permit exempt wells and some of the wells are never drilled – and estimated a conservative range for Bainbridge Island of ~ 400-500 wells over twenty years.
- KPUD provided a summary of the Notice of Intent for the entire Kitsap County, compared with the actual wells drilled data from the Kitsap Public Health District, and projects about 2920 new wells over twenty years.
- Kitsap Public Health District recognizes that their numbers are likely inflated as some of the wells may have a water right associated with them or may be a replacement well. In addition, they decommission 80-100 wells per year which is not represented by the numbers. They encouraged the committee to recognize that there is a conservative safety factor built in.
- Kitsap County is comfortable applying a +/- 5% margin of error for the projections.
- When comparing the County data and KPUD data, we are likely in the range of 2800-2900 wells for Kitsap County over the next twenty years. The County, KPUD and Bainbridge Island will discuss the best scenario for Bainbridge Island and put forward a proposal for the Kitsap County range to the committee in February. Committee members are interested in considering both the County and KPUD methods for the range.
- The committee should let Stacy know by December 31 if additional information is needed on the Kitsap County projections.

Consumptive Use and Outdoor Irrigation Analysis

Stacy summarized the discussion guide. There are three different methods the committee is considering to calculate how much water is needed to offset. The committee and workgroup are considering the outdoor irrigation acreage (as part of the outdoor irrigation method); assumptions within any of the methods that warrant adjustment based on local data; and application of a safety factor to the overall consumptive use estimate.

Reference Material

- Committee discussion guide (available on committee webpage)

Discussion

- Stacy reminded the committee that the outdoor irrigation analysis is one component of one method for consumptive use. The committee may choose not to use the outdoor irrigation method, but Ecology encourages us to go through the calculation

- It was recognized that the outdoor irrigation method results in a number that is likely very inflated for WRIA 15 (e.g double the USGS number). The outdoor irrigation method also assumes that water use would be commensurate with commercial irrigation of turf, which is much higher than most residential uses.
- Paul Pickett has completed an evapotranspiration analysis to look at potential future conditions under climate change, and considerations for a safety factor. Stacy will ask Paul to present his analysis to the full committee in February.
- It was clarified that the average water use takes into account the seasonal irrigation.
- The committee discussed the outdoor irrigation analysis completed by HDR.
    - HDR found 0.08 average outdoor irrigation in WRIA 15, based on analysis of 80 parcels.
    - It was recognized that DFW still has concerns with the limited number of parcels used for the analysis, but DFW won't hold up the process from moving forward.
    - Some members of the workgroup completed their own independent analysis of the 80 parcels. HDR also generated an additional set of parcels for those that want to broaden the analysis.
    - Members of the workgroup recommended applying a minimum irrigation to the parcels that were found as non-irrigated (0.03 acres; based on statistical analysis and the confidence interval); which results in .1 acre.
    - After further consideration, members of the workgroup reconsidered their recommendation and prefer to use the 0.08 acre which was the calculated average acreage. Some members felt it was too early to apply a safety factor to this component of the method and would prefer to apply an overall safety factor to the consumptive use estimate or the offset target.
    - Some members of the committee would like to see metering of future permit exempt wells to provide data on actual water use to support adaptive management.
    - The committee was comfortable moving forward with 0.08 acre for the outdoor irrigation analysis as part of the outdoor irrigation method as long as the committee considers at a future meeting applying a safety factor (such as for climate change) and considerations for adaptive management.

Letters of Support for Competitive Grant Applications

The Streamflow Restoration Competitive Grant Program application period is February through March 2020. The WRIA 15 Operating Principles allow the committee to provide letters of support, by consensus, for project sponsors in WRIA 15. The scoring criteria does not provide additional points if letters of support come from the committee versus individual entities. There is concern about the amount of work on the committee's plate and taking time out of our packed agendas to consider letters of support.

Reference Material

- Streamflow restoration competitive grants: https://ecology.wa.gov/About-us/How-we-operate/Grants-loans/Find-a-grant-or-loan/Streamflow-restoration-implementation-grants

Discussion

- The committee decided not to provide letters of support for project sponsors. Individual entities can provide letters of support if requested by a project sponsor.
- Stacy will share the submitted, published project abstracts once available. Stacy can also invite project proponents to talk about projects we are considering for the plan if requested by committee.

Public Comment

No public comment.

Action Items for Committee Members

- Next meeting: February 6, Kitsap County Commissioner's Chambers, Port Orchard.
- REMINDER: WRIA 15 Committee will not meet in January.
- CANCELED: January 14 Technical Workgroup Meeting
- REMINDER: December 11 Hydrology Workshop; January 8 Project Workgroup
- Contact Stacy with any additional questions or concerns regarding the Kitsap County well projections.
- Kitsap County, KPUD and Bainbridge Island will bring forward a proposal for Kitsap County projections in February.
- Committee members should work on the local plan approval process form and prepare to share at the February meeting. (Carryover from November)
- Committee members should provide feedback on the draft plan outline to Stacy. (Carryover from November.)
- Committee members should send Stacy recommendations for additional attendees to participate in future committee meetings, based on expertise related to agenda items.
- Committee members should let Stacy know if they need an early version of the committee brochure.

Action Items for Ecology and Consultants

- Stacy will put the beaver presentations and information on Box.
- Ecology will distribute the committee brochure in February (carryover from October).
- Stacy will cancel the January 14th Workgroup meeting.
- Stacy will distribute the agendas for the January 8 workgroup meeting and December 11 hydrology meeting.
- Stacy will extend the room reservation and update the calendar invites for all future committee meetings.
- Stacy will share the submitted project proposals for the competitive grant program (likely April-May).

Discussion Guide: Recommendations for Kitsap County Growth Projections

Version 22 January 2020

Purpose of Discussion

At the December 5, 2019 WRIA 15 Committee meeting, the committee reached an interim agreement on the number of permit exempt wells expected between 2018 and 2038, based on growth projections, for King, Mason and Pierce Counties. The purpose of today's discussion is to provide a recommendation on growth projections for Kitsap County and seek feedback and direction from the committee on a path forward.

Permit Exempt Well Projections for Mason, King and Pierce Counties

At the December 5, 2019 WRIA 15 Committee meeting, we discussed the current projections for new permit exempt wells. (Note that we use "wells" as shorthand for "connections to permit exempt wells". Permit exempt wells do allow for multiple connections as long as they are within the legal limits of the water allowance.) During the meeting, the committee reviewed the methods used by each of the counties, the range or scenario the counties were comfortable with, and the projected number of new wells in WRIA 15 for each county. The committee provided an interim approval of the ranges as provided in Table 1. The following requests were made during the committee meeting:

- Squaxin Island Tribe wants to have a high growth scenario for Mason County. They are willing to continue to move forward with the process, but want to see the higher range/safety factor included in the future.
- Mason County wants to ensure that the adaptive management component of the plan considers the results of the census for changes in population growth (available in 2022).

Table 1. Low, medium and high projections for new permit exempt wells in WRIA 15 from 2018 through 2038 for Pierce, Mason and King Counties. Note the Pierce County low projection is based on the historical low and the high projection is based on the historical high of actual wells. Mason and King Counties do not include a low or high range.

	Low	**Medium**	**High**
Pierce	624	978	1,416
Mason	1,301	1,301	1,301
King	368	368	368

Permit Exempt Well Projections for Kitsap County

Background

At the December 5, 2019 meeting, Kitsap County presented the revised data for new permit exempt wells projections over the twenty year period. The method and reasoning for the revision is provided in detail in the December discussion guide on growth projections. The county projects about **2,077 new connections to permit exempt wells within the county, not including Bainbridge Island.**

The method used by the county did not adequately represent potential new growth for Bainbridge Island. The county provided various options for Bainbridge Island which ranged from **0 new wells to approximately 800. A projection of 491 residences** on permit exempt wells was based on an assumption of 1 residence per parcel, regardless of parcel size. The committee, including the Bainbridge Island representative, did not believe that either 0 or 800 wells was an appropriate projection for Bainbridge Island.

Kitsap PUD provided a proposal to the committee on December 5, 2019 to consider a scenario for future permit exempt wells in Kitsap County based on the historical trends for wells drilled. Based on County records from the last 16 years, the average for all new wells per year was 146 (this accounts for all water-supply wells). Using the historical trends for wells, **KPUD projects 2920 new wells** over the twenty year period. The Kitsap Public Health District attended the December 5 meeting. Kitsap Public Health District recognizes that the projection based on historical wells are likely inflated as some of the wells may have a water right associated with them or may be a replacement well. In addition, they decommission 80-100 wells per year which is not represented by the numbers. They encouraged the committee to recognize that there is a conservative safety factor built into the projection.

Recommendation

The committee recognized that the projections based on the County's method and KPUD's method were very close, once accounting for Bainbridge Island. The committee recommended that Kitsap County, KPUD and Bainbridge Island come back to the committee in February with a recommendation for the projections for Kitsap County. In follow up conversations with Kitsap County, KPUD, and Bainbridge Island in January of 2020, the following recommendation as presented in Table 2 is provided to the WRIA 15 Committee for consideration.

Table 2. Recommendations for Low, Medium and High New Permit Exempt Well Projections for Kitsap County 2018-2038.

	Low	**Medium**	**High**
Kitsap	2568	2920	3066
Justification	Use the 2077 projection plus an estimate of 491 wells for Bainbridge Island based on the method and the estimate provided by Kitsap County.	Use the KPUD proposal of an average of 146 wells per year, based on the historical average.	Use the KPUD estimate of 2920 plus 5% as a margin of error.

The total number of projected wells for WRIA 15, should the committee accept the Kitsap County recommendation, is provided in Table 3.

Table 3. Total projected new permit exempt wells from 2018-2038 in WRIA 15.

	Low	**Medium**	**High**
Pierce	624	978	1,416
Mason	1,301	1,301	1,301
King	368	368	368
Kitsap	2568	2920	3066
Total	4861	5567	6151

Question for the Committee

1. Does the committee accept the recommendation for the projected new well ranges in Kitsap County?
2. What additional information would the committee need to accept the recommendation?
3. What additional information would the committee need to revise the recommendation?
4. Does the committee approve the projected new permit exempt well ranges of 4861 (low), 5567 (medium), and 6151 (high)?

Consumptive Use Calculator for WRIA 15 - Preliminary, Revised January 15, 2020

Instructions: the variables in the box can be changed to see the sensitivity of the Annual CU estimates to inputs of water use, irrigated area and irrigation demand

Consumptive Use Calculation Using Water System Data (see water use data tab)

Average annual indoor use	49	gallons/day/capita (from metered water system data)
Average annual outdoor use	26	gallons/day/capita (from metered water system data)
Indoor loss	10%	default is 10% (Ecology recommendation)
Outdoor loss	80%	default is 80% (Ecology recommendation)
People per household	2.5	varies by county, usually 2.5
Total Consumptive Use	64.25	gallons/day/new PE well
	0.071974147	acre-feet/year/new PE well
	0.044618056	annual average gpm/new PE well
	9.95939E-05	annual average cfs/new PE well

Consumptive Use Calculation Using USGS Data

Average annual indoor use	66	gallons/day/capita
Average annual outdoor use	26	gallons/day/capita
Indoor loss	10%	default is 10%
Outdoor loss	90%	USGS used 90%
People per household	2.5	varies by county, usually 2.5
Total Consumptive Use	75	gallons/day/new PE well
	0.084016514	acre-feet/year/new PE well
	0.052083333	annual average gpm/new PE well
	0.000116257	annual average cfs/new PE well

Consumptive Use Method Using Estimate of Landscape Area for new PE wells (Ecology Method)

Average Irrigation Requirement	17	inches/year (see WAIG tab)
Average Landscape Area/lot	0.08	acres (see Irrigated Area Calcs tab)
Irrigation Efficiency	75%	%, default is 75%
Outdoor consumptive Use %	80%	%, default is 80%
Indoor use	60	gallons per day per capita, default is 60
Indoor consumptive use %	10%	%, default is 10%
Number people/household	2.5	people - default is 2.5, can vary by county
Total consumptive use:	122.9	gallons/day/new PE well
	0.137647383	acre-feet/new PE well
	0.085327283	annual average gpm/new PE well
	0.000190463	annual average cfs/new PE well

Annual Consumptive Use Estimates for WRIA 15

Subbasin	Projected No. PE Wells (See PE Growth tab)	Annual CU Using Water System Data			Annual CU Using USGS Estimates			Annual CU Using Irrigation Estimates		
		Ac-ft	gpm	cfs	Ac-ft	gpm	cfs	Ac-ft	gpm	cfs
West Sound	1,336	96.2	59.6	0.1331	112.2	69.6	0.1553	183.9	114.0	0.2545
North Hood Canal	656	47.2	29.3	0.0653	55.1	34.2	0.0763	90.3	56.0	0.1249
South Hood Canal	1,126	81.0	50.2	0.1121	94.6	58.6	0.1309	155.0	96.1	0.2145
Bainbridge Island	491	35.3	21.9	0.0489	41.3	25.6	0.0571	67.6	41.9	0.0935
South Sound	1,553	111.8	69.3	0.1547	130.5	80.9	0.1805	213.8	132.5	0.2958
Vashon – Maury Island	368	26.5	16.4	0.0367	30.9	19.2	0.0428	50.7	31.4	0.0701
McNeil Island, Anderson Island, Ketron Island	38	2.7	1.7	0.0038	3.2	2.0	0.0044	5.2	3.2	0.0072
Totals	**5568**	**400.8**	**248.4**	**0.5545**	**467.8**	**290.0**	**0.6473**	**766.4**	**475.1**	**1.0605**

Annual Consumptive Use Estimates for WRIA 15 - Higher PE Growth Projection

Subbasin	Projected No. PE Wells (See PE Growth tab)	Annual CU Using Water System Data			Annual CU Using USGS Estimates			Annual CU Using Irrigation Estimates		
		Ac-ft	gpm	cfs	Ac-ft	gpm	cfs	Ac-ft	gpm	cfs
West Sound	1,403	101.0	62.6	0.1397	117.9	73.1	0.1631	193.1	119.7	0.2672
North Hood Canal	689	49.6	30.7	0.0686	57.9	35.9	0.0801	94.8	58.8	0.1312
South Hood Canal	1,128	81.2	50.3	0.1123	94.8	58.8	0.1311	155.3	96.2	0.2148
Bainbridge Island	516	37.1	23.0	0.0514	43.4	26.9	0.0600	71.0	44.0	0.0983
South Sound	1,992	143.4	88.9	0.1984	167.4	103.8	0.2316	274.2	170.0	0.3794
Vashon – Maury Island	368	26.5	16.4	0.0367	30.9	19.2	0.0428	50.7	31.4	0.0701
McNeil Island, Anderson Island, Ketron Island	56	4.0	2.5	0.0056	4.7	2.9	0.0065	7.7	4.8	0.0107
Totals	**6152**	**442.8**	**274.5**	**0.6127**	**516.9**	**320.4**	**0.7152**	**846.8**	**524.9**	**1.1717**

Annual Consumptive Use Estimates for WRIA 15 - Lower PE Growth Projection

Subbasin	Projected No. PE Wells (See PE Growth tab)	Annual CU Using Water System Data			Annual CU Using USGS Estimates			Annual CU Using Irrigation Estimates		
		Ac-ft	gpm	cfs	Ac-ft	gpm	cfs	Ac-ft	gpm	cfs
West Sound	1,142	82.2	51.0	0.1137	95.9	59.5	0.1328	157.2	97.4	0.2175
North Hood Canal	561	40.4	25.0	0.0559	47.1	29.2	0.0652	77.2	47.9	0.1068
South Hood Canal	1,119	80.5	49.9	0.1114	94.0	58.3	0.1301	154.0	95.5	0.2131
Bainbridge Island	491	35.3	21.9	0.0489	41.3	25.6	0.0571	67.6	41.9	0.0935
South Sound	1,158	83.3	51.7	0.1153	97.3	60.3	0.1346	159.4	98.8	0.2206
Vashon – Maury Island	368	26.5	16.4	0.0367	30.9	19.2	0.0428	50.7	31.4	0.0701
McNeil Island, Anderson Island, Ketron Island	22	1.6	1.0	0.0022	1.8	1.1	0.0026	3.0	1.9	0.0042
Totals	**4861**	**349.9**	**216.9**	**0.4841**	**408.4**	**253.2**	**0.5651**	**669.1**	**414.8**	**0.9258**

Consumptive Use Estimates for WRIA 15 - Average Annual in Units of Millions of Gallons Per Day (mgd)

Subbasin	Water System Data Method mgd	USGS Estimates Method mgd	Irrigation Estimates Method mgd
West Sound	0.09	0.10	0.16
Hood Canal	0.04	0.05	0.08
South Hood Canal	0.07	0.08	0.14
Bainbridge Island	0.03	0.04	0.06
South Sound	0.10	0.12	0.19
Vashon – Maury Island	0.02	0.03	0.05
McNeil Island, Anderson Island, Ketron Island	0.00	0.00	0.00
Totals	**0.36**	**0.42**	**0.68**

Consumptive Use Estimates for WRIA 15 - Average Annual in Units of Millions of Gallons Per Day (mgd) - Higher PE Growth Projection

Subbasin	Water System Data Method mgd	USGS Estimates Method mgd	Irrigation Estimates Method mgd
West Sound	0.09	0.11	0.17
Hood Canal	0.04	0.05	0.08
South Hood Canal	0.07	0.08	0.14
Bainbridge Island	0.03	0.04	0.06
South Sound	0.13	0.15	0.24
Vashon – Maury Island	0.02	0.03	0.05
McNeil Island, Anderson Island, Ketron Island	0.00	0.00	0.01
Totals	**0.40**	**0.46**	**0.76**

Consumptive Use Estimates for WRIA 15 - Average Annual in Units of Millions of Gallons Per Day (mgd) - Lower PE Growth Projection

Subbasin	Water System Data Method mgd	USGS Estimates Method mgd	Irrigation Estimates Method mgd
West Sound	0.07	0.09	0.14
Hood Canal	0.04	0.04	0.07
South Hood Canal	0.07	0.08	0.14
Bainbridge Island	0.03	0.04	0.06
South Sound	0.07	0.09	0.14
Vashon – Maury Island	0.02	0.03	0.05
McNeil Island, Anderson Island, Ketron Island	0.00	0.00	0.00
Totals	**0.31**	**0.36**	**0.60**