

Methodology

A high level of community interest in developing a south Lake Samish community water system is driven by several unique circumstances including exposure to several types of public health and safety risk, compelling opportunities for collaboration, area-wide economies of scale, and drinking water quality challenges facing the residents of South Lake Samish Community.

As presented in the background, there is very little community support for a public drinking water system around Lake Samish. In addition to being cost prohibitive, the Lake Samish community is very concerned about the potential impacts that public water availability would have to the lakes water quality, quantity, and community culture. Currently, there are no new appropriations of water available from the Lake Samish Basin and exempt ground water wells are generally not feasible due to poor water quality. Therefore, lack of water in addition to other land use limitations is a barrier to further growth and development in the basin. Water quality at the north end of the lake is significantly better than at the south end of the lake which polarizes the community to some degree with regards to the need for a public water supply around the lake.

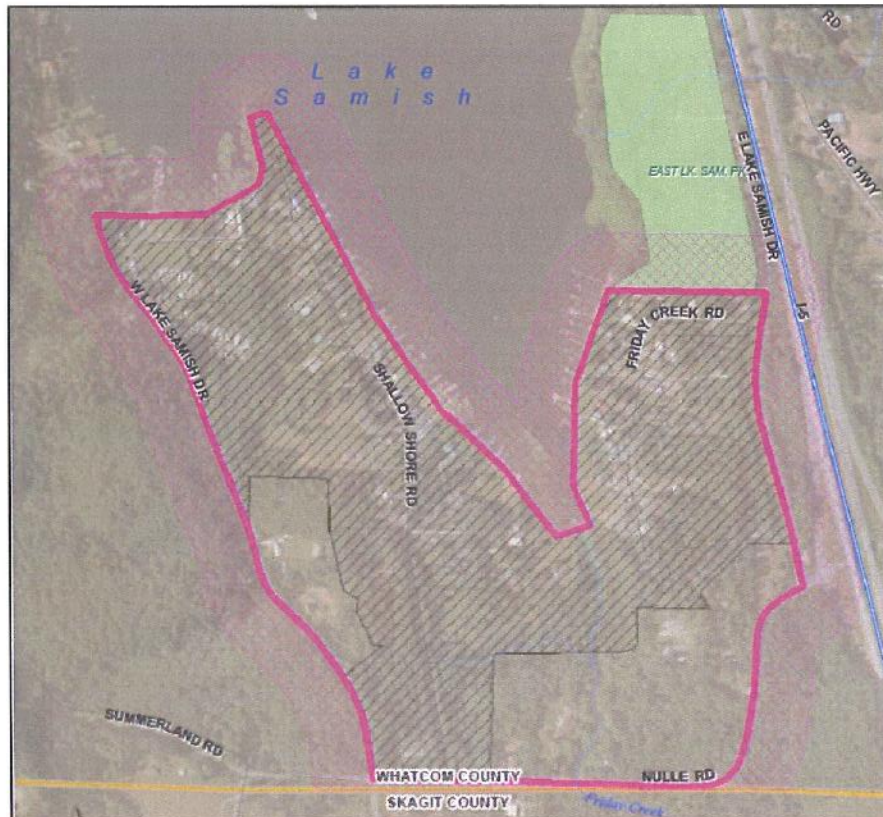
The primary intent of this study is to determine the most feasible means of providing safe and reliable potable water to the existing south Lake Samish property owners. A regional source solution is focused on resolving health related issues and is not intended to provide water for future growth in the region beyond the proposed service area which includes existing water systems and individual residential drinking water demand. The feasibility study will also evaluate the possibility of consolidation among the individual residential diversions and existing water systems at the south end of the lake with the goal of improving long term technical, managerial, and financial capacity within the region.

Study Area

While a broad understanding of the Lake Samish Basin is important to this study and was presented as background, the study area is focused on the south end of Lake Samish because there is little support for a broader public water system around Lake Samish, and the south end of the lake is subject to seasonally poor water quality. South Lake Samish is also the focus of this study in large part due to the persistent grass roots effort in the community to establish a water system at the south end of the lake. Therefore the study will explore options for potable water supply limited to the South Lake Samish community.

At this time it is not known which individual residential properties would participate in a South Lake Samish Water System. Calmor Cove is the most likely participate because they represent about twenty five percent of the potential connections in the proposed service area and they already operate a Group A Community Water System with surface water treatment. Calmor Cove's existing treatment facility is also at the end of its useful life and will need extensive upgrades or replacement in the near future.

We began the study area delineation process by including the residents of the Calmor Cove service area. We then included the area surveyed by the Grass Roots Community Group (represented by diagonal lines in Map 5) which indicated strong support for a public water system. Next we included the service areas of three Group B water systems in the vicinity. Finally, we took into consideration a variety of factors including but not limited to: geographic and political boundaries, the I-5 Corridor, population density and zoning, requests for service, and proximity to existing facilities. Once the study area boundary was delineated we added a 300 foot buffer for further consideration. The resulting Study Area Boundary, Survey Area within the boundary, and buffer is shown below and in Appendix Map 5.



Map 5: Study Area and Survey Area

Community Participation

Community participation has played an important role prior to and during the development of this study. Public input has thoroughly informed the plan and shaped the recommendations. At this early stage of planning it is important for Stakeholders to adopt roles and responsibilities that will be necessary to move forward with the findings and recommendations.

In addition to the research conducted for this study, community representatives participated in a variety of meetings to assist with the development of and support for this study.

- Informal stakeholders meetings were held with Calmor Cove and property representatives.
- Presentations were made to the Board of Directors and Members of the Calmor Cove Club.
- A community meeting was held at Camp Lutherwood to present the findings and conclusions of the study and solicit public input.
- Since the community meeting, representatives from each of the Zones have met and formed a strategy to move forward based on the information and findings of the feasibility study.

It is recognized at the outset that a complete solution will require a considerable amount of time and many parts, each building on the other, ultimately resulting in a local Water System Plan (WSP) that can be implemented with proper governance and funding to towards the ultimate goal of providing safe reliable drinking water for the community.

This remaining portion of this study is focused on gathering and analyzing information to determine if the essential elements are present to continue and engage the parties.

Feasibility Study: Findings

Regional Source Options

Historically, several potential sources of domestic water have been explored for the Lake Samish Area including springs, wells, the City of Bellingham, Skagit County Public Utility District No. 1, and Lake Samish.

The City of Bellingham has an adequate supply of water to serve the Lake Samish basin and no additional treatment would be required. If water were to be supplied from the City of Bellingham, approximately 5 miles of transmission main costing an estimated \$4.6 million dollars would be needed to connect to the City's distribution system west of Lake Padden to the south end of the lake. Map 2 shows the proximity of Bellingham city limits to the south end of Lake Samish. However, Bellingham is not currently willing to serve outside of its corporate limits and therefore Bellingham is not being considered as a viable source of water for south Lake Samish.

Skagit County PUD No. 1

Skagit County PUD No. 1 has an adequate supply of water to serve the south Lake Samish community. Skagit PUD supplies domestic drinking water to the western portion of Skagit County and north to the border of Whatcom County. They operate both transmission and distribution systems. If water were to be supplied by Skagit PUD from the Judy Reservoir System, over 4 miles of transmission main and additional storage would be required to provide service to the Skagit County Line at the corner of Lake Samish Road and Nulle Road for an estimated cost of \$5 Million. No additional treatment would be anticipated if Skagit PUD was the source of water. From the view of water quality and quantity Skagit PUD would be a viable source.

Whatcom County PUD No. 1 general manager and Skagit PUD No. 1 general manager met to discuss the availability of supply to the Lake Samish area. During the meeting it was confirmed that Skagit PUD has adequate supply of potable water available, including water rights, and is willing to sell water from the Judy Reservoir system to the Skagit county line. Skagit PUD engineers provided additional planning level information for this study.

Skagit PUD Transmission Improvements

Based on information provided by Skagit PUD, the existing pipeline and related booster system improvements located near the intersection of Bow Hill Road and Old Highway 99 have adequate capacity to supply water to the Lake Samish basin. However, about 4 miles of additional 12" transmission main (shown in yellow on Map 6) need to be constructed from Bow Hill Road, north along Old Highway 99 to Cain Lake Road in Alger in order to provide additional source of supply from the Judy Reservoir system to the Alger Water System which is also owned and operated by Skagit PUD.

Alger Water System

Skagit PUD operates the Alger Water System ID No. 01400K (See General Information in Appendix Exhibit 15) which includes a well located south of Cain Lake, 125,000 gallons of storage, and a 12" distribution system (shown in purple on Map 6) that runs from the well site in Alger west along Cain Lake Road, across Interstate 5, and continues north along Lake Samish Road to the Skagit County Line where it ends at the intersection of Lake Samish Road and Nulle Road near the south end of Lake Samish.

The Alger Water System existing 12" distribution mains are adequate to deliver water from the intersection of Old Highway 99 and Cain Lake Road in Alger to the intersection of Samish Lake Road

and Nulle Road. However, the Alger Water System does not currently have adequate storage capacity or existing water rights to serve the south Lake Samish area.

The well serving the Alger Water System has a water right for 100 gpm and 100 annual acre-ft. The Alger well is currently operating at 75 gallons per minute and does not have adequate water rights available to serve the proposed South Lake Samish Water System. Skagit PUD is also not willing to draw more than the current rate of 75 gallons per minute from the Alger well due to commitments and ongoing work with the Skagit Tribal Community. Therefore, the Alger well does not appear to be a viable source of water to serve the south Lake Samish community.

As discussed in the background Friday Creek at the basin outlet may not have sufficient flow. As part of a comprehensive plan to improve instream flow in Friday Creek, consideration may be given to the drawing ground water from the Alger Water System source to supply the south Lake Samish community with quality domestic supply in exchange for a corresponding reduction in the diversion from Lake Samish thereby mitigating the impact on Friday Creek.

Skagit PUD Improvement's required

Skagit PUD engineers provided the following planning level information regarding improvements that would be required in order to serve the south Lake Samish area based on domestic service to an estimated 200 single family residences and fire flow of 500 gpm.

- 23,000 feet of 12" pipeline along Old Highway 99 is required to deliver water from Bow Hill to the Alger distribution system. (Map 6: Yellow Line)
- 6" compound meter, Vault, and Reduced Pressure Backflow Assembly at the point of delivery (Skagit County Line near the intersection of Nulle Road and Lake Samish Road).
- System Development Fee based on a 6" meter (\$215,250).
- 250,000 gallons of additional storage:
 - Skagit PUD standards require 800 gallons of storage per residential connection to provide 48 hours of storage. Skagit engineers estimate that a 250,000 gallon concrete storage tank would be required to meet the storage requirement for 200 residential connections. This estimate is based on Alger water systems Average Daily Demand (ADD) of 164 Gallons Per Day (gpd) per equivalent residential unit (ERU). Maximum Day Demand (MDD) is estimated at 328 gpd per ERU or two times ADD. Peak hourly demand for the Alger water system is 287 gpm or 1.75 times ADD. It is unclear if the additional storage can be constructed adjacent to the Alger Water System's existing storage tank. If not a second site would need to be purchased along with additional distribution piping. Alternatively, storage and a booster system may be required as part of a South Lake Samish Water System. A more thorough analysis of each option would be part of the engineering analysis and Comprehensive Water System.

The planning cost estimate for a 12" transmission main from Bow Hill Road, north along Old Highway 99 to Cain Lake Road in Alger is shown below and also included as Exhibit 16

**PUD #1 OF SKAGIT COUNTY
BOW HILL PIPELINE
PLANNING COST ESTIMATE**

Item No.	Item Description	Estimated Quantity	Unit	Engineer's Estimate	
				Unit Price	Extension Price
1	12" Pipeline Example	23,000	LF	\$125	\$2,875,000
				Subtotal	\$2,875,000
				Sales Tax @ 8.5%	\$244,375
				Contingency @ 20.0%	\$575,000
				Construction Total	\$3,694,375
				Design Engineering @ 2.0%	\$73,888
				Construction Engineering @ 4.0%	\$147,775
				Geotechnical @ 1.0%	\$36,944
				Surveying @ 1.0%	\$36,944
				Administration @ 0.5%	\$18,472
				Legal @ 0.5%	\$18,472
				Land/Easements @ 0.0%	\$0
				Project Total	\$4,026,869
				ROUND	\$4,100,000

Planning level costs anticipated in addition to the 12" transmission line are summarized below.

23,000' of Pipeline (Detailed Above)	\$4,100,000
250,000 Gallon Concrete Storage (Current Location)	\$ 205,000
6" Service Meter Installation Fee	\$ 5,000
6" Backflow Assembly (RPBA)	\$ 10,000
Standard Development Fee	\$ 215,250
Subtotal	\$4,535,250

Skagit PUD has indicated from the outset that the costs of any capital improvements required for Skagit PUD to deliver service to the south Lake Samish area must be funded by those requesting service. Skagit PUD is able to explore the possibility of cost sharing or reduced System Development Fees until a formal proposal is presented to Skagit PUD by the organization representing the south Lake Samish community.

Lake Samish

The residents living at the south end of Lake Samish rely on the lake for their domestic water needs through surface water diversions or wells. The lake does not generally exceed surface water quality standards, however the majority of residents and small water systems at the south end of the lake employ some form of water treatment system. The residents drawing their water from the south end of Lake Samish are particularly susceptible to blue-green Algae blooms in the late summer months when both private and community treatment systems may meet drinking water quality standards.

Although lake water quality has improved over the years through best management practices and public sewer, in order to use the lake as a source of public water supply, it must be treated to meet the water quality standards set under the Safe Drinking Water act. From the viewpoint of water quality, Lake Samish is a viable source of supply with proper treatment.

As discussed in the background, it is believed that all the existing residents and small water systems in the study area have valid water rights. In order to have adequate water rights to serve a South Lake Samish Water System, the existing water rights of those participating in the community water system would need to be consolidated into a single portfolio of water rights to be withdrawn at a single point of diversion in the lake.

Water Quantity and Water Rights

Of the 560 residents withdrawing water from the Samish basin, about 330 are served by individual water rights including about 280 Permits with provisions to maintain 2 cfs in Friday Creek. The remaining 230 residents are by Claims, Exempt Wells, or accounted for by multiple users serviced by a single water right. Examples of multiple users on one water right are the Group A and Group B water systems discussed earlier in the study. South Lake Samish Wells & Diversions can be seen in Map 7.

Calmor Cove holds a water right certificate adequate to serve their existing demand. Calmor Cove's water right Certificate No. S1-24911C has a priority date of October 1, 1986 and was approved for 19.74 gpm and 18.0 annual acre feet based on use dating back to 1946. The place of use is the area served by the Calmor Cove Water System and the purpose of use is Community Domestic Supply – continuously. When reviewing any water right it is important to consider the "Report of Examination" which is an integral part of the water rights approval process and the approved water right. The Calmor Cove water right "Report of Examination" clearly indicates that the current water right certificate was granted on the basis of a Fisheries statement that "the requested amount corresponds to the historic use and does not represent an expansion". A copy of the water right and report of exam can be found in the Appendix Exhibit 5.

It is important to note that Calmor Cove water rights are approved for use by the Calmor Cove services based on historical use and not for additional services or expansion. This means that any inchoate (unused) water rights are not inherently available to serve additional connections beyond Calmor Cove Club. However, this does not preclude the Calmor Cove water right from being included as part of a larger water system.

Consolidation of Individual and Exempt Water Rights

The Department of Ecology supports the effort to consolidate diversions and withdrawals at the south end of Lake Samish. Fewer diversions and withdrawals are easier to manage and allow for better allocation of resources. Ecology is also in favor of a consolidated entity because local management of resources tend to self-regulate their use of water resources on behalf of their users.

Larger entities generally promote water use efficiency which is beneficial to the basin and they are typically more aware of the need to maintain their facilities including the point of diversion. WDFW and Ecology support minimizing the number of diversions which leads to better management of intake screens that protect fish rearing in the lake.

Although a formal process would need to be developed in cooperation with Ecology for the consolidation of individual water rights into a single water right for use by a new community water system the following summarizes the general process that would be needed.

Once an organization is formed to represent the new water system, and prior to submitting an application for water rights, those to be served by the new water system would participate in an agreement or memorandum of understanding whereby they agree to transfer their water right into trust in exchange for domestic water service to be provided under a new water right to be issued. The memorandum of understanding would be an essential part of the application submittal.

The goal would then be to submit a new "non-consumptive" water right application. Non-consumptive means that the new water right would include all the individual water rights that want to join the water system and the new water rights would have only that water that was available through the existing individual water rights. A non-consumptive application can be expedited through a Cost Reimbursement Agreement with Ecology. The new water right "Purpose of Use" would be continue to be for community domestic supply, the "Place of Use" would be the service area of the new water system, and the "Point of