

Service Area Delineation

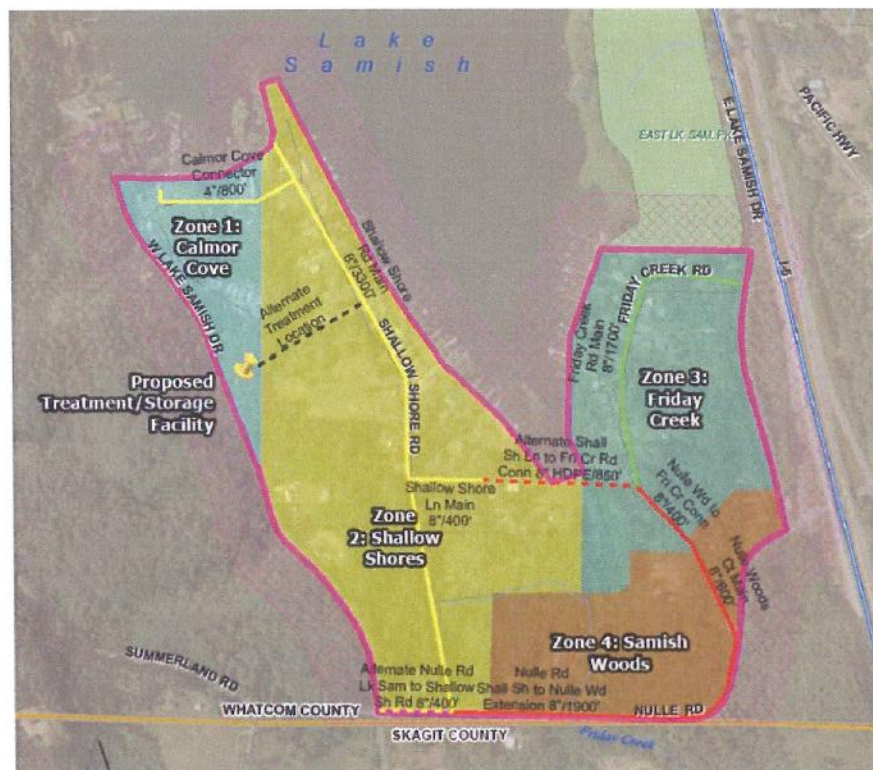
The south end of Lake Samish is the focus of this study in large part due to a persistent grass roots effort by local residents to establish a community water system that can provide a safe reliable supply of quality water. The focus area for this study is also consistent with poor water quality at the south end of the lake and a general lack of support by the greater community for a public water system in the basin around Lake Samish.

Service Area

While it is not known which residential properties would participate in a South Lake Samish Water System, it was logical to start by including areas where there is already interest in a community water system or a water system already established. The service area was initially based on the area covered in a survey conducted by the grass roots effort regarding interest in a community water supply. The survey area is shown in Map 11. The survey results showed overwhelming support for a community water system and are included as Exhibit 13. We also included the service area of Group A Water System Calmor Cove (Map 9) and each of the Group B Systems in the area: Samish Woods North, South, and East.

For planning purposes we then expanding the service area boundary's taking into consideration the following natural borders including but not limited to: geographic landmarks (lake Samish water front, Friday Creek), political boundary's (Whatcom/Skagit County borders), existing and future infrastructure (roads, bridges, water distribution), and land use (zoning, density, development, public land). The resulting overall service area is shown below and also in the Appendix as Map 12.

Once the overall service area was established it was then broken down into several zones based on existing water system service areas and other logical boundaries. The Zones are also shown in Map 12.



Map 12: Proposed Service Area, Zones, and Distribution

Service Area Zones

Zones 1-4 are described below and also summarized in Service Area Demand: Table 1 on the following page.

- Zone 1 shown in Blue represents the 49 residents served by the Calmor Cove Water System drawing water from the lake, plus 14 additional residences on Fire Lane which draw water from the lake.
- Zone 2 shown in Yellow represents 63 residents along Shallow Shores Road primarily drawing water from the lake and bordered by Lake Samish and Friday Creek to the East, Nulle Road at the County Line to the south, and West Lake Samish Road to the west excluding about 4 parcels that do not have frontage along Shallow Shores Road.
- Zone 3 shown in Green represents 45 residents primarily drawing water from the lake along Friday Creek Road and bordered by Lake Samish and Friday Creek to the west, Whatcom County Public Park Land to the north, East Lake Samish Road and the I-5 Corridor to the east, plus 6 residents from three private Group B service areas to the south (Nulle Woods North, South, and East).
- Zone 4 shown in Brown represents the remaining 5 residents from three private Group B service areas to the south (Nulle Woods North, South, and East), plus 5 additional individual residents in the area east and west of Friday Creek.

It is understood that there may be interest from property owners outside the initial overall service area included in Zones 1-4. However, the number of potential connections beyond the service area, availability of water rights, and the relative cost of additional distribution system improvements to serve a small number of additional customers beyond the study area appears to make service beyond the propose service area unfeasible at this time.

Service Area Demand

In order to determine the total quantity of water that various system components must accommodate, the number of connections and population that will be served by the system must be known. If this population data is not available, and estimate must be made of the population of the area for various planning horizons.

Existing Land Use and Land Use Trends

It is anticipated that most of the water consumed or used within the Lake Samish drainage basin will be for domestic purposes; this should be particularly true given the residential zoning of the area. A zoning map is provided in Map 8. About fifty percent of the home owners around the Lake Samish are full-time residents; the other fifty percent comp only during the summer months and on the weekends.

For planning purposes, to estimate the number of potential residential connections in the service area we determined the number of platted lots in the proposed service area. Parcel Maps for the proposed service area are also included in the appendix as Map 13-1, 13-2. We then briefly reviewed land use zoning in the proposed service area and observed that very few if any existing lots are eligible for subdivision. The table below summarizes the number of existing platted lots in each zone of the study area. Each parcel represents one single family residential connection with the exception of Calmor Cove which is counted based on the total number of existing residential lots.

Service Area	Lots	Source
Zone 1	63	
Calmor Cove (CC)	49	Group A Surface Water Treatment Plant
Fire Lane (FL)	14	Individual Surface Water & Wells (2)
Zone 2	63	
Shallow Shores East (SSE)	44	Individual Surface Water
Shallows Shores West (SSW)	19	Individual Surface Water & Wells (4)
Zone 3	45	
Friday Creek (FC)	39	Individual Surface Water & Wells (5)
Samish Woods North (SWN)	2	Group B Well
Samish Woods South (SWS)	1	Group B Well
Samish Woods East (SWE)	3	Group B Well
Zone 4	10	
Samish Woods North	2	Group B Well
Samish Woods South	1	Group B Well
Samish Woods East	2	Group B Well
East of Friday Creek	2	Individual Wells
West of Friday Creek	3	Individual Wells
Service Area Total	181	

Table 1: Service Area Connections

Water Consumption

A knowledge of the quantities of water required is essential to the evaluation and planning of water supply systems. Since such evaluation and planning is concerned with the water use at some future date, the quantities of water required must of necessity be approximated. However, through analysis of the various factors which influence water consumption, reasonable estimates of the requirements can be developed.

The physiological needs of people require less than a gallon of water daily. Yet demand for water for other purposes is such that average domestic consumption value between 60 and 100 gallons per capita per day (gpcd) are common and values in excess of 100 gpcd are not unusual. Most of the water delivered to homes is used in the kitchen, laundry, and bath, with lesser amounts used out-of-doors for lawn and garden irrigation and automobile washing. Other factors which particularly affect domestic consumption include weather and sewage disposal facilities. More water is used, both indoors and outdoors, when the weather is warm and dry.

Domestic Demand

Water consumption is usually expressed in terms of average daily consumption, based upon the total annual use. Actual rates of consumption change monthly, daily, and hourly. These variations are considered to be normal based on changes in weather conditions, community activities, and common habits of the population. Additionally there are large demands of water used in fighting fires. A knowledge of the extent of these variations from the average is necessary to the planning of a water supply system. Monthly and daily variations are a factor to be considered in planning adequate supply, storage, and transmission facilities. Hourly variations must be considered in designing distribution systems.

Calmor Cove's ADD is 125 gallons per day and MDD is 250 gallons per day per connection. For comparison, Skagit PUD's Alger Water System ADD and MDD is 164 and 328 respectively. The Alger Water System serves predominantly full time, residential dwellings on larger lots in comparison to the smaller lots and residents of the South Lake Samish community of which almost 50% are seasonal occupancy.

Fire Demand

Although the total water used for extinguishing fires usually is a negligible partition of the annual consumption, the rate at which it must be supplied is so great that, in all but the largest communities, fire flows are the largest variations imposed on water systems. Since fire protection is a primary importance, the planning and design of water works must include consideration of such demands. In this case minimum fire flow for a rural residential community is 500 gallons per minute for 60 minutes. However, as the size and composite material used in a residential structure change additional fire protection beyond that available may impose self-contained fire protection for each residence.

Chapter 246-290 of the Washington Administrative Code provides the requirements for Group A Public Water Systems. A Comprehensive Water System Plan (WAC 246-290-100) will be required for a South Lake Samish Water System including a complete water system analysis that will identify the facilities needed to meet demand in the community.