UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

WATER RESOURCES OF THE TULALIP INDIAN RESERVATION, WASHINGTON

By B. W. Drost

U.S. GEOLOGICAL SURVEY

WATER-RESOURCES INVESTIGATIONS

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TULALIP TRIBAL BOARD OF DIRECTORS

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UNITED STATES DEPARTMENT OF THE INTERIOR

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(Plate in pocket)

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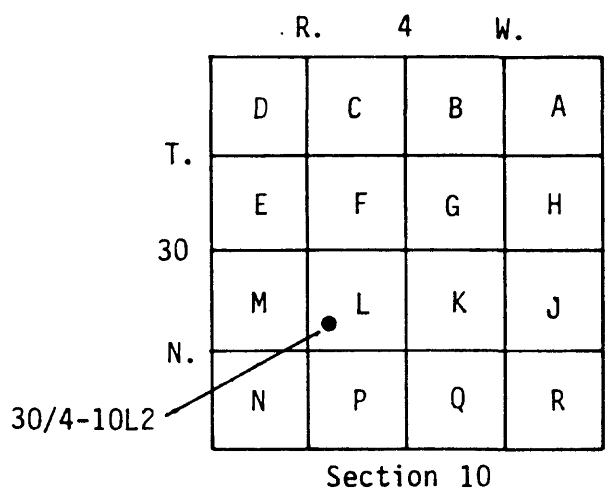
WELL- AND AREA-LOCATION NUMBERING SYSTEM

The well and area-location numbers used in this report give the location according to the official rectangular public-land survey. For example, in well number 30/4-10L2, the numbers preceding the hyphen indicate successively the township and range (T.30 N., R.4 E.) north and east of the Willamette base line and meridian, respectively. The first number following the hyphen indicates the section (sec. 10), and the letter (L) indicates the 40-acre subdivision of the section as shown in the sketch below. The last number is the sequence number of the well in the particular 40-acre tract. Thus, well 30/4-10L2 is the second well listed in the NE¼ of the SW¼ of sec. 10, T.30 N., R.4 E. An "s" following the sequence number indicates a spring.



Area-location numbers include only the township, range, and section numbers.

METRIC CONVERSIONS

Multiply	By	To obtain
Feet (ft)	0.3048	meters (m)
Miles	1.609	kilometers (km)
Acres	4047.0	square meters (m^2)
Acre-feet (acre-ft)	1233.0	cubic meters (m^3)
Cubic feet per second (ft^3/s)	28.32	liters per second (L/s)
	0.02832	cubic meters per second (m^3/s)
Gallons per minute (gal/min)	0.06309	liters per second (L/s)
Gallons per day (gal/d)	0.000044375	liter per second (L/s)
Gallons per minute per foot (gal/min/ft)	0.2096	liters per second per meter (L/s/m)
Degrees Fahrenheit (°F)	0.5556, after subtracting 32	degrees Celsius (°C)

National Geodetic Vertical Datum of 1929 (NGVD of 1929): A geodetic datum derived from a general adjustment of the first-order level nets of both the United States and Canada, formerly called "Mean Sea Level." NGVD of 1929 is referred to as sea level in this report.

WATER RESOURCES OF THE TULALIP INDIAN RESERVATION, WASHINGTON

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ABSTRACT

Water will play a significant role in the future development of the Tulalip Indian Reservation. Ground-water resources are sufficient to supply several times the 1978 population. Potential problems associated with increased ground-water development are saltwater encroachment in the coastal areas and septic-tank contamination of shallow aquifers. There are sufficient good-quality surface-water resources to allow for significant expansion of the tribe's fisheries activities.

The tribal well field is the only place where the ground-water system has been stressed, resulting in declining water levels (1.5 feet per year). The well field has a useful life of at least 15-20 years. This can be increased by drilling additional wells to expand the present well field.

Inflow of water to the reservation is in the form of precipitation (103 cubic feet per second, ft^3/s), surface-water inflow (13 ft^3/s), and ground-water inflow (4 ft^3/s). Outflow is as evapotranspiration (62 ft^3/s), surface-water outflow (40 ft^3/s), and ground-water outflow (18 ft^3/s). Total inflow and outflow are equal (120 ft^3/s).

Ground water is generally suitable for domestic use without treatment, but a serious quality problem is the presence of coliform bacteria in some shallow wells. High values of turbidity and color and large concentrations of iron and manganese are common problems regarding the esthetic quality of the water. In a few places, large concentrations of chloride and dissolved solids indicate the possiblity of saltwater encroachment, but no ongoing trend has been identified.

Surface waters have been observed to contain undesirably high concentrations of total phosphorus and total and fecal-coliform bacteria, and to have temperatures too high for fish-rearing. The concentration of nutrients appears to be related to flow conditions. Nitrate and total nitrogen are greater in wet-season runoff than during low-flow periods, and total phosphorus shows an inverse relationship. Total phosphorus and ammonia concentrations are greatest in dry-season storm runoff. Generally, surface-water quality is adequate for fish-rearing and (with treatment) for public supply.

All of the known geologic units produce usable quantities of water in at least some areas. Only one unit is capable of supplying more than a single-household (from one 6-inch diameter well) at most places on the reservation. Median well depth in this unit is 130 feet and median specific capacity is 4.0 gallons per minute per foot. The water-bearing properties of only the upper 300 feet of the 1,600 feet of unconsolidated materials are well known.

In 1978, four major areas of ground-water development supplied about 3,700 people at an average rate of 122 gallons per day per person. Virtually all water used on the reservation came from wells.

The two major surface-water basins, Tulalip and Mission Creeks, have calculated median annual mean flows of 12.1 and 6.7 ft^3/s, respectively. Estimated 7-day 5-percent low flows for the respective basins are 4.9 and 0.4 ft^3/s. Estimated flood discharges for the same basins at an exceedance probability of 1-percent are 260 and 155 ft^3/s, respectively.

INTRODUCTION

Water will play a significant role in the future development of the Tulalip Indian Reservation. The amount, character, and quality of development will greatly depend upon wise use of the available water resources. Aware of the importance of an ample supply of potable water, the Tulalip Tribal Board of Directors entered into a cooperative agreement with the U.S. Geological Survey in 1974 to evaluate the reservation's water resources.

Purpose and Scope

The purpose of the investigation and report is to evaluate the water resources of the reservation in order to provide the information required for current management decisions, long-range planning, and development and protection of vital water resources.

This is the final report of the investigation. Earlier reports presented preliminary assessments of available ground- and surface-water data (Drost, 1977 and 1979) and of Ross Lake, one of eight lakes in the reservation (Dion, 1979). This report includes the data collected during the course of the study and an assessment of the potential for further development of the reservation's water resources.

Description of the Area

The Tulalip Indian Reservation is in west-central Snohomish County, Wash., north of Everett and west of Marysville (pl. 1). The reservation, which is about 34.5 square miles (mi^2) in area, is bordered on the west and south by Port Susan and Possession Sound (fig. 1). The reservation's northern boundary is on the northern limit of township 30 and its eastern boundary coincides with the eastern right-of-way of Interstate Highway 5.

As of 1978, the total year-round population of the reservation was 3,987 (Gregg Selby, Snohomish County Planning Department, oral commun., 1978; see fig. 2). In addition, the reservation has an influx of about 1,600 residents each summer. Most of the population resides along the shoreline or along the eastern margin of the reservation. About 550 Indians live on the reservation, both tribal and non-tribal members.

The land within the reservation is largely undeveloped. As estimated from aerial photographs and topographic maps, 80 percent is forest, 10 percent is residential, 4 percent is agricultural, 3 percent is swamps and lakes, and 3 percent is tidal marsh.

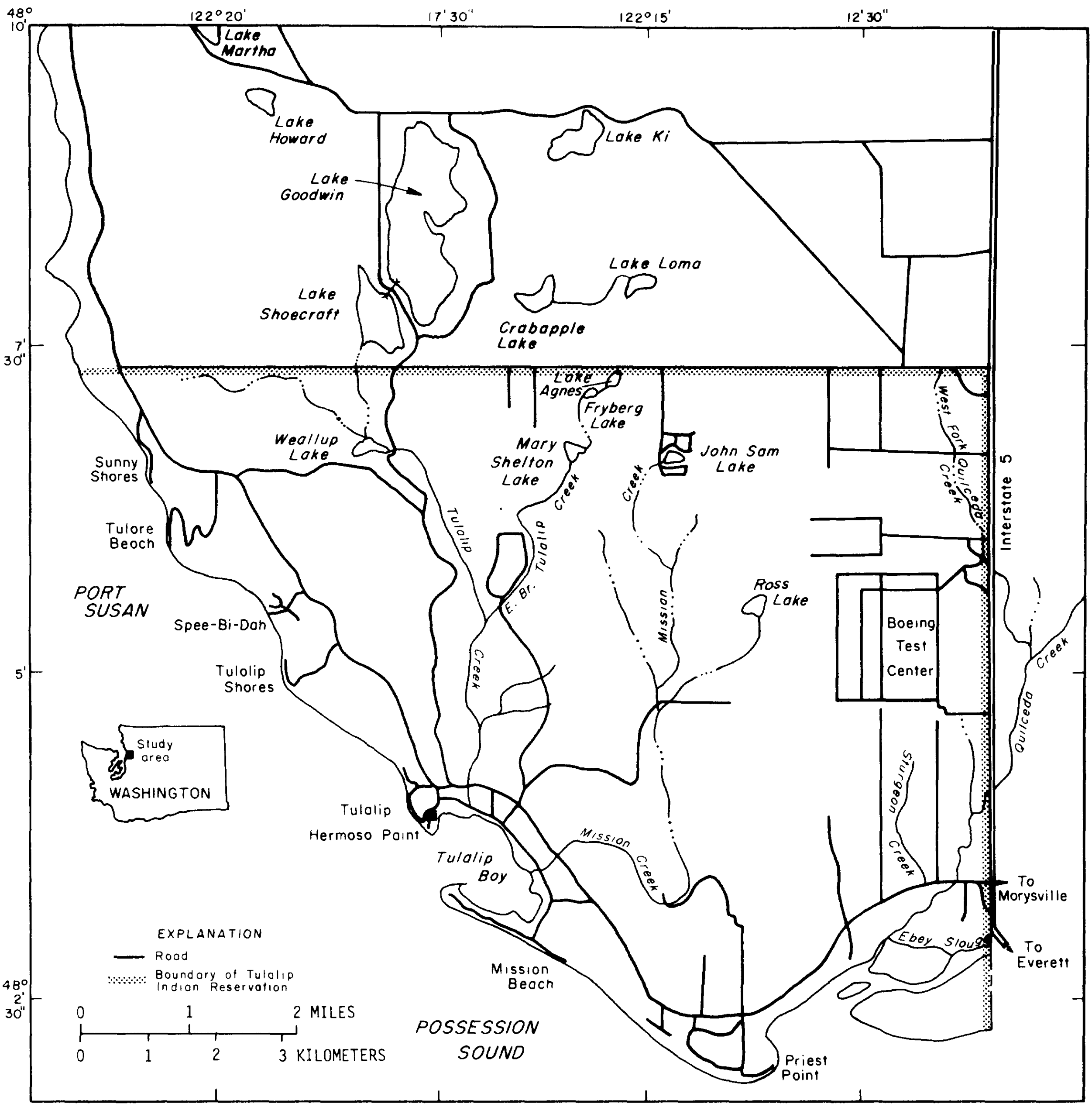

FIGURE 1.--Tulalip Indian Reservation, showing major roads, communities, streams, and lakes.

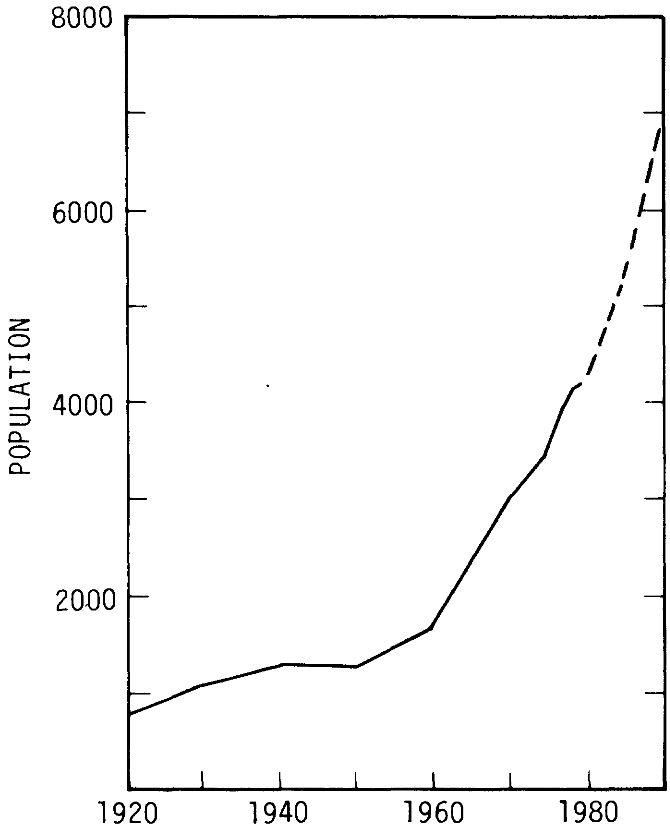

FIGURE 2.--Population trend in the Tulalip Indian Reservation, 1920-78, and projections, 1978-90. Data through 1970 from U.S. Department of Commerce (1971); data for 1974 from N. Dobos, Snohomish County Planning Department (oral commun., 1975); data for 1977-90 from Gregg Selby, Snohomish County Planning Department (oral commun., 1978).

About 30 percent of the land within the reservation boundaries is owned by the Tulalip Tribe, about 10 percent is owned by individual tribal members, and about 60 percent is controlled by non-tribal members, of which two large tracts are controlled by industrial interests. The only existing industrial development is the Boeing Test Center (fig. 1 and pl. 1), which is on tribal land. Potential industrial sites on non-tribal land include the Glacier Park Co. property in the northeastern part of the reservation, proposed for a railroad yard, and Union Oil Co. land in the west-central part. The tribe-owned Ebey Slough area also is considered for industrial development. Agricultural activities on the reservation are confined basically to its eastern lowland margin and consist primarily of small herds (less than 20 head) of beef and dairy cattle.

All but about the eastern 1½ mi of the reservation is situated on a rolling plain of glacial deposits (Tulalip Plateau). Most of this plain is at least 200 ft above mean sea level, reaching altitudes of about 580 ft at the northern boundary of the reservation. The eastern 1½ mi of the reservation is part of an approximately 3-mi-wide trough that extends from Marysville on the south to the Stillaguamish River (about 5 mi north of the reservation) on the north. The trough reaches an altitude of about 100 ft in the northeastern corner of the reservation.

The principal streams draining the reservation are Tulalip Creek, Mission Creek, and tributaries to Quilceda Creek. The headwaters of Tulalip Creek, north of the reservation, are regulated to maintain the levels of Lakes Goodwin and Shoecraft. The stream channel at the outlet of Lake Shoecraft is dry during part of most summers. The approximate extents of perennial streams, based on data from October 1974 to September 1977, are shown in plate 1. Eight lakes, ranging in area from 1.3 to 20.4 acres, are on the reservation.

The weather stations nearest the reservation, which are in Everett (about 1½ mi south of the reservation) and Arlington (about 5 mi northeast of the reservation), provide data representative of the climate of the reservation. The average annual precipitation at the stations during 43 years of record (1935-77) was about 40 in. Almost 70 percent of the precipitation occurs during the period October-March. The average annual temperature is 50.5°F (10.3°C), and the monthly average temperatures range from 38.2°F (3.4°C) in January to 62.8°F (17.1°C) in July. (All climatic data are from the U.S. Department of Commerce, 1960 and 1965, and the National Oceanic and Atmospheric Administration, 1977.)

Acknowledgments

This study was made in cooperation with the Tulalip Tribal Board of Directors. The Bureau of Indian Affairs participated in the planning of the study, and individual members of the Tulalip Tribe and other residents of the reservation were helpful in many ways during the field investigations. Well drillers Henry E. Deckmann and Robert E. Freeman provided numerous drillers' logs and other pertinent data. Representatives of the Indian Health Service provided information on the newly installed tribal well field. The consulting firm of Hammond, Collier, and Wade-Livingstone Associates, Inc., provided data on several test wells.

WATER RESOURCES

The Hydrologic Cycle

The hydrologic cycle describes the pattern of water movement as it circulates through the natural system. Precipitation as rain and snow is the immediate source of all freshwater. A part of this precipitation runs off rapidly to streams, and a part is evaporated directly back to the atmosphere from the ground and from lakes, streams, and plant surfaces. A part soaks into the soil where some is drawn up by plants and returns to the atmosphere by transpiration from their leaves; the remainder percolates downward to a zone of saturation to become ground water. In turn, ground water returns to the surface-water system by seepage to springs, lakes, streams, and marine waters.

Although most of the freshwater comes directly from rain or snow on the Tulalip Indian Reservation, some water enters the reservation as surface runoff and ground-water underflow from areas to the north. The hydrologic cycle on the reservation is diagrammatically illustrated in figure 3.

Precipitation

Precipitation was determined from data collected at the weather stations nearest the study area; Everett and Arlington. During the 1935-77 water years the average annual precipitation at the station was about 40 in., with a minimum of 32.9 in. in 1963 and a maximum of 56.6 in. in 1948 (fig. 4).

The probability that a particular amount of precipitation will occur in any single year can be estimated from figure 5. For example, the figure shows that only about 10 percent of the time will annual precipitation exceed 48 in., and that about 90 percent of the time it will exceed 32 in. These estimates of the probability of future precipitation shown in figure 5 are accurate only if the climatic factors in operation during the 43 years of record follow a similar pattern in the future.

Average monthly precipitation at Everett and Arlington is shown in figure 11. The figure shows a distinct wet season during October-March and a dry season during April-September. The average monthly precipitation is about 3.4 in., and monthly average precipitation ranges from 5.5 in. in December to 1.2 in. in July. The greatest monthly precipitation on record was 11.6 in. at Arlington in January 1971, and the least was 0.00 in. at Everett in July 1958.

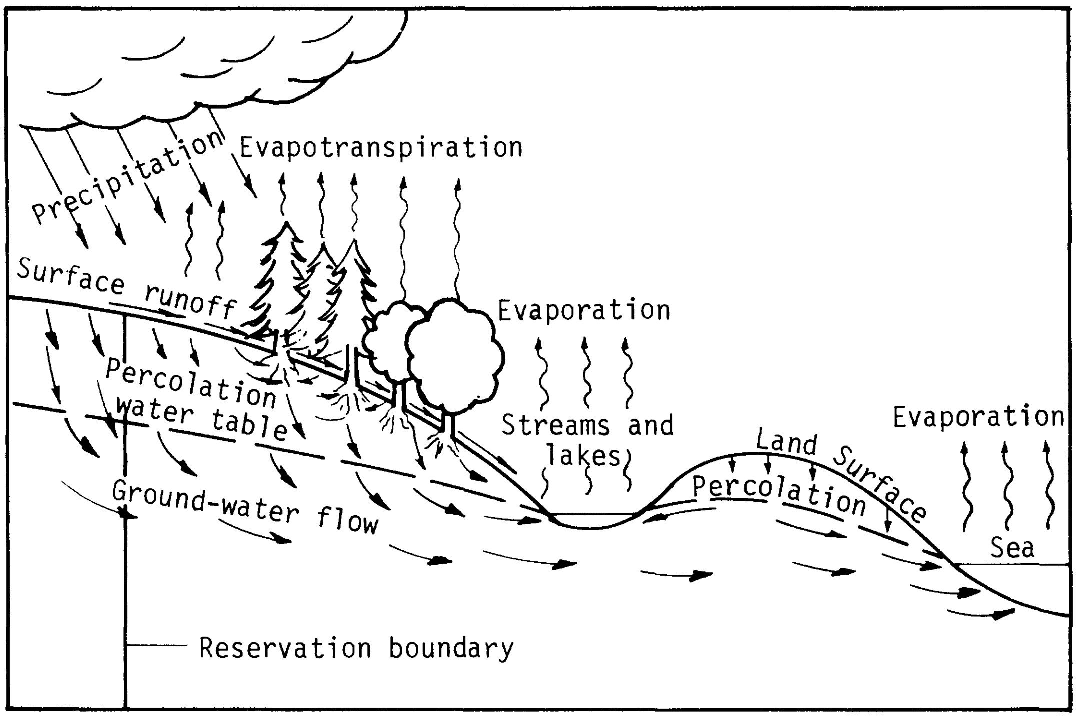

FIGURE 3.--Diagrammatic sketch of the hydrologic cycle.

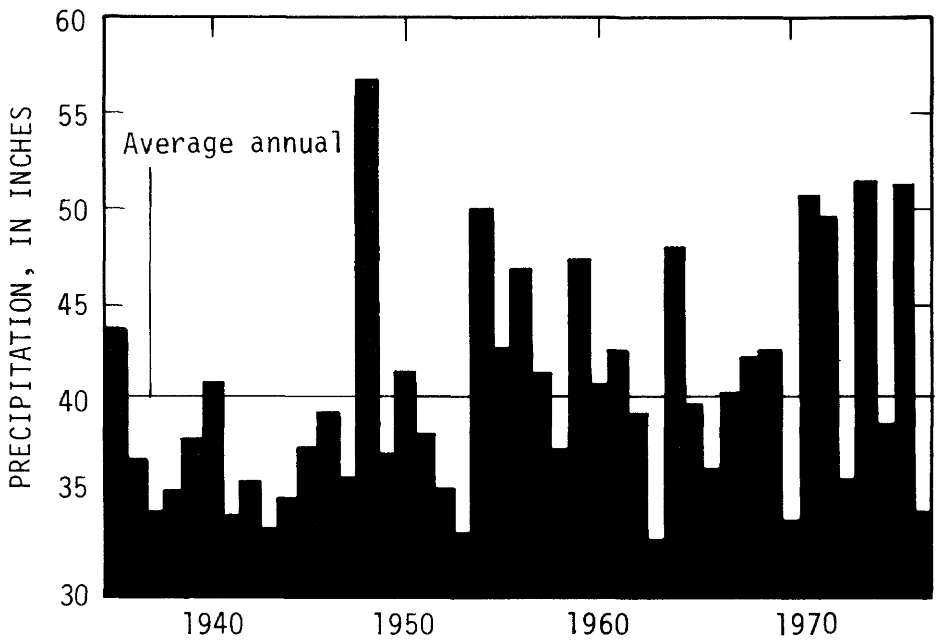

FIGURE 4.--Annual precipitation, 1935-77 water years. (U.S. Weather Bureau, 1935-65; U.S. Department of Commerce, 1966-73; [U.S.] National Oceanic and Atmospheric Administration, 1974-77).

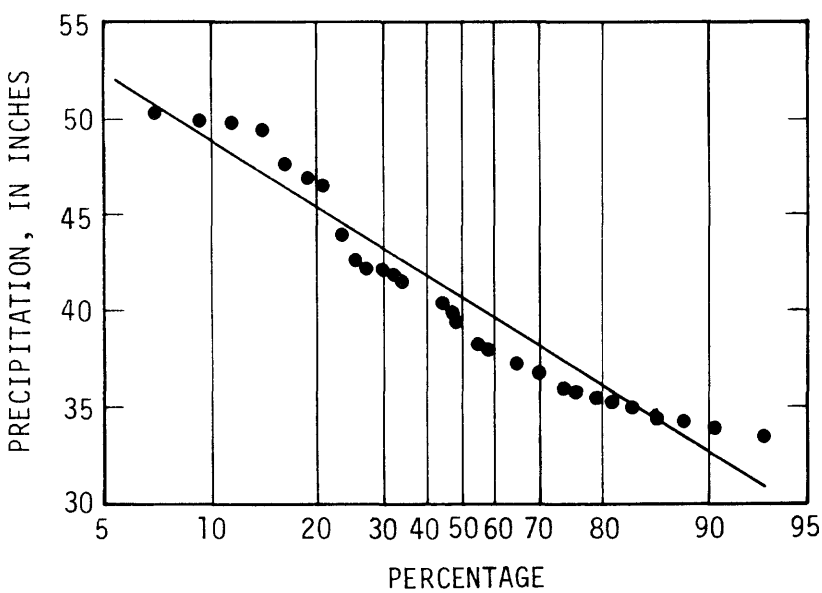

FIGURE 5.--Percentage of time various values of annual precipitation were equaled or exceeded, 1935-77 water years.

Evapotranspiration

Evapotranspiration refers to the transfer of water, in the form of vapor, from land areas and bodies of water to the atmosphere. In the study area, evapotranspiration occurs primarily as evaporation from vegetation and land surfaces that have been wetted by precipitation and from surface-water bodies, and as transpiration by vegetation of water derived from the unsaturated zone. Evapotranspiration also occurs directly from the ground-water reservoir, where it intersects or nearly intersects the land surface.

The amount of evapotranspiration from an area depends primarily on solar radiation, air temperature, vegetation type, and the availability of water. No direct measurements of evapotranspiration from the study area are available, but reasonable estimates can be made using a modified Blaney-Criddle calculation (U.S. Department of Agriculture, 1970). This method yields a value for potential evapotranspiration—the amount of water that would be evapotranspired if an unlimited source of water were available. However, an unlimited source of water does not exist in the study area.

In the study area, two different evapotranspiration regimes exist at different times: (1) wet periods, when precipitation is greater than potential evapotranspiration, during which the actual rate of evapotranspiration equals the potential rate, and (2) dry periods, during which potential evapotranspiration is greater than precipitation, and the actual rate of evapotranspiration is generally less than the potential rate. The actual rate during dry periods is considered equal to precipitation plus available soil moisture accumulated during previous wet periods, assuming no direct runoff. Assuming an average soil thickness of 3 ft as estimated by Anderson and others (1947), and assuming a water-holding capacity of 10 percent, the soil in the study area has the ability to store about 3.6 in. of water. Figure 6 shows the position of evapotranspiration within the hydrologic system: during wet periods (generally October-March), there is a surplus of water which is either stored in the soil (soil-moisture recharge) to remain available for evapotranspiration or is removed from the evapotranspiration environment as surface runoff or as recharge to the ground-water reservoir (water surplus).

During dry periods (generally April-September) there is a shortage of water, and most of the stored soil moisture is rapidly evapotranspired (soil-moisture utilization), usually by the first of July. From this time until precipitation once again exceeds potential evapotranspiration, the actual rate of evapotranspiration is less than the potential rate (water deficit).

The average annual potential evapotranspiration in the study area is 34.1 in. However, average calculated annual actual evapotranspiration is only about 22.3 in., because, as seen in figure 6, the periods of greatest potential evapotranspiration coincide with the periods of least precipitation. During 1935-77 water years the calculated annual actual evapotranspiration ranged from a maximum of 32.6 in. in 1954 to a minimum of 17.1 in. in 1967 (fig. 7). Figure 8 shows the probability, based on the data in figure 7, that a particular amount of actual evapotranspiration will take place in any single year. Actual evapotranspiration will probably exceed 18 in. in 9 of 10 years, but 26 in. in only 1 of 10 years.

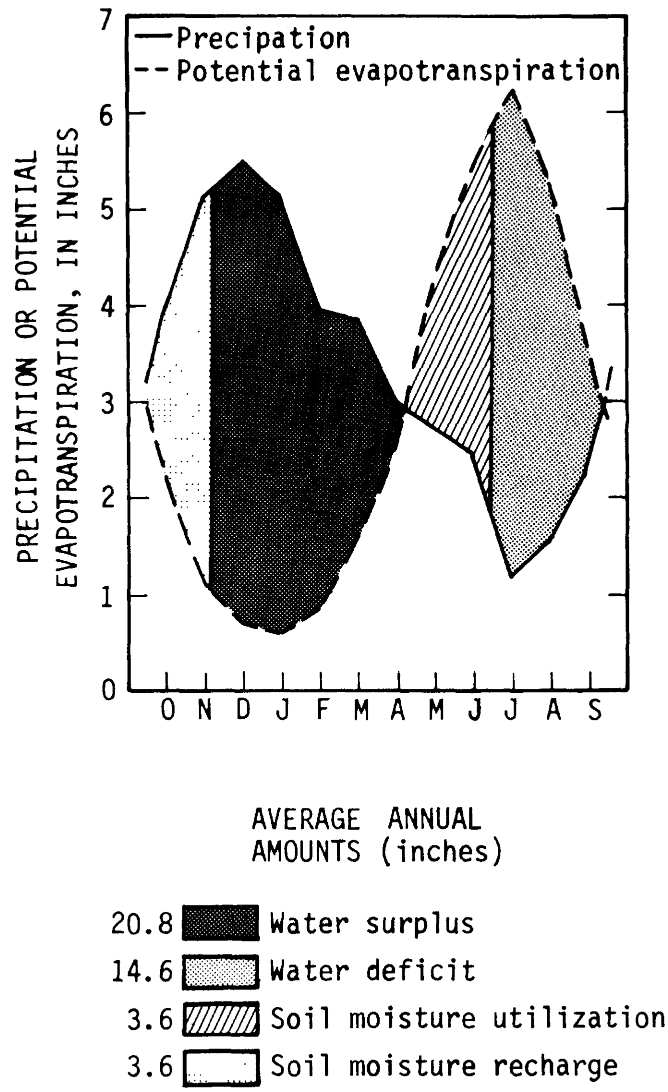

FIGURE 6.--Average annual water balance in the study area, based on data from 1935-77.

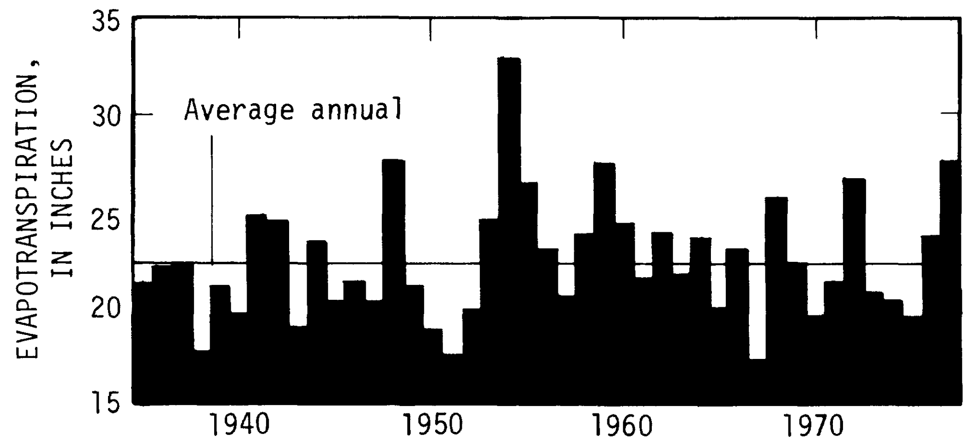

FIGURE 7.--Annual evapotranspiration, 1935-77 water years.

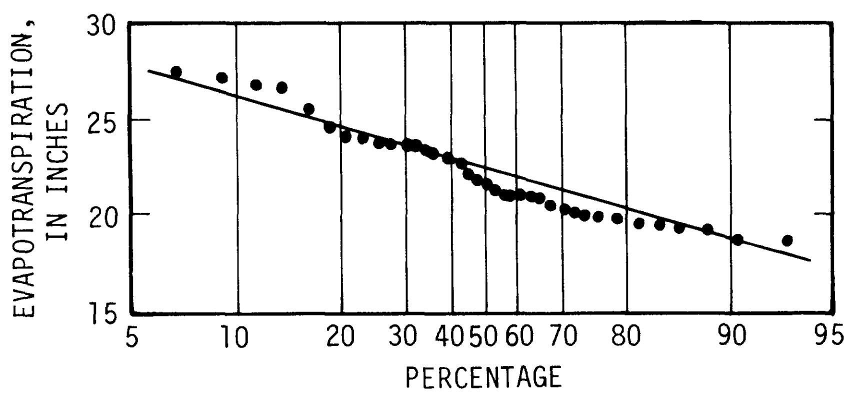

FIGURE 8.--Percentage of time that various values of annual evapotranspiration were equaled or exceeded, 1935-77.

Direct Runoff Plus Ground-Water Recharge

That part of precipitation not lost as evapotranspiration or stored as soil moisture leaves the study area as direct runoff (runoff entering stream channels promptly after precipitation), or recharges the ground-water reservoir. Direct runoff plus ground-water recharge is equal to precipitation minus actual evapotranspiration. Neither direct runoff nor ground-water recharge could be directly measured, therefore they are left as a sum. In the section on the water budget, calculations will be made to separate these two items. Figure 9 shows direct runoff plus ground-water recharge calculated for the 1935-77 water years. During this period, it averaged about 18 in./yr, and ranged from a minimum of 6.6 in. in 1977 to a maximum of 31.1 in. in 1974. Figure 10 shows the probability of the occurrence of a particular amount of direct runoff plus ground-water recharge in any single year. It will probably exceed 11 in. 90 percent of the time and 25 in. 10 percent of the time.

A summary of the monthly disposition of precipitation is shown in figure 11. The figure shows the long-term (1935-77 water years) average distribution of precipitation between evapotranspiration and direct runoff plus ground-water recharge. Not directly shown in the figure, but affecting the distribution, is the amount of water stored as soil moisture at any particular time. (See fig. 6 for soil-moisture distribution.)

Surface Water

To provide a basis for appraisal of streamflow in the reservation, continuous-record gaging stations were installed and operated during the period October 1974-September 1977 near the mouths of Tulalip and Mission Creeks (pl. 1). The streamflow records obtained represent discharges from drainage areas of 15.4 and 7.92 mi^2, respectively. Daily streamflows and water temperatures at these two sites are given in tables 10 and 11 at end of report. In addition, monthly streamflow measurements were made at 16 selected sites (pl. 1) to obtain information on the amount and distribution of surface-water flow along the main stream channels and their tributaries.

These periodic measurements are listed along with stream temperatures in table 12 at end of report. One of the selected measuring sites, site 1 on Quilceda Creek, was formerly operated as a continuous-record gage during 1946-69, and some miscellaneous streamflow measurements had been made at sites 12, 18, and 20 prior to this study. The drainage areas of the measuring sites are listed in tables 10 and 12.

Streamflow characteristics needed in the planning and development of surface-water resources include monthly and annual mean flows, and the frequencies and durations of selected flood discharges and low flows. All of those streamflow characteristics, except the flood-discharge characteristics, were obtained from the flow records at six long-term stations in the Puget Sound lowland area, and then transferred to selected sites in the study area through streamflow correlations. In the correlations, monthly measurements at the selected sites were related to same-day values at the long-term stations. Selection of the best relations depended upon (1) the highest accuracy as indicated by the lowest standard error of estimate (these ranged from 0.015 to 0.10 in base 10 logarithm units), and (2) the highest degree of correlation between the data for the selected station and the long-term station as indicated by the correlation coefficient nearest unity (these ranged from 0.77 to 0.92).

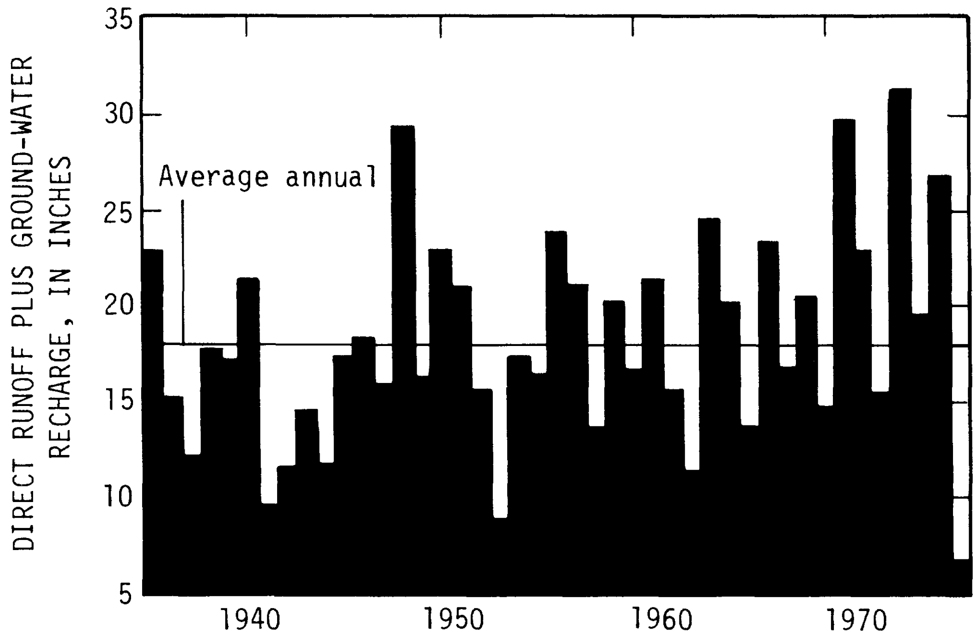

FIGURE 9.--Annual direct runoff plus ground-water recharge, 1935-77 water years.

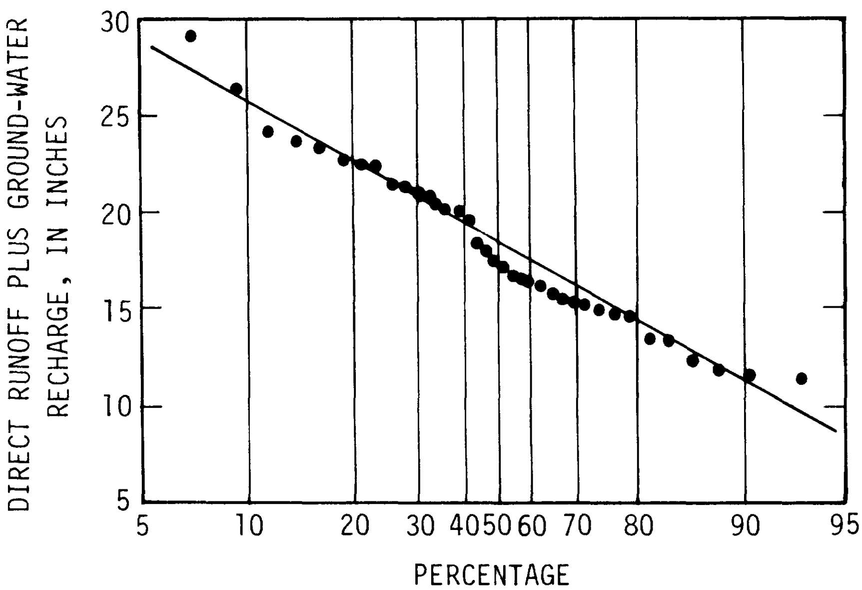

FIGURE 10.--Percentage of time that various values of annual direct runoff plus ground-water recharge were equaled or exceeded, 1935-77 water years.

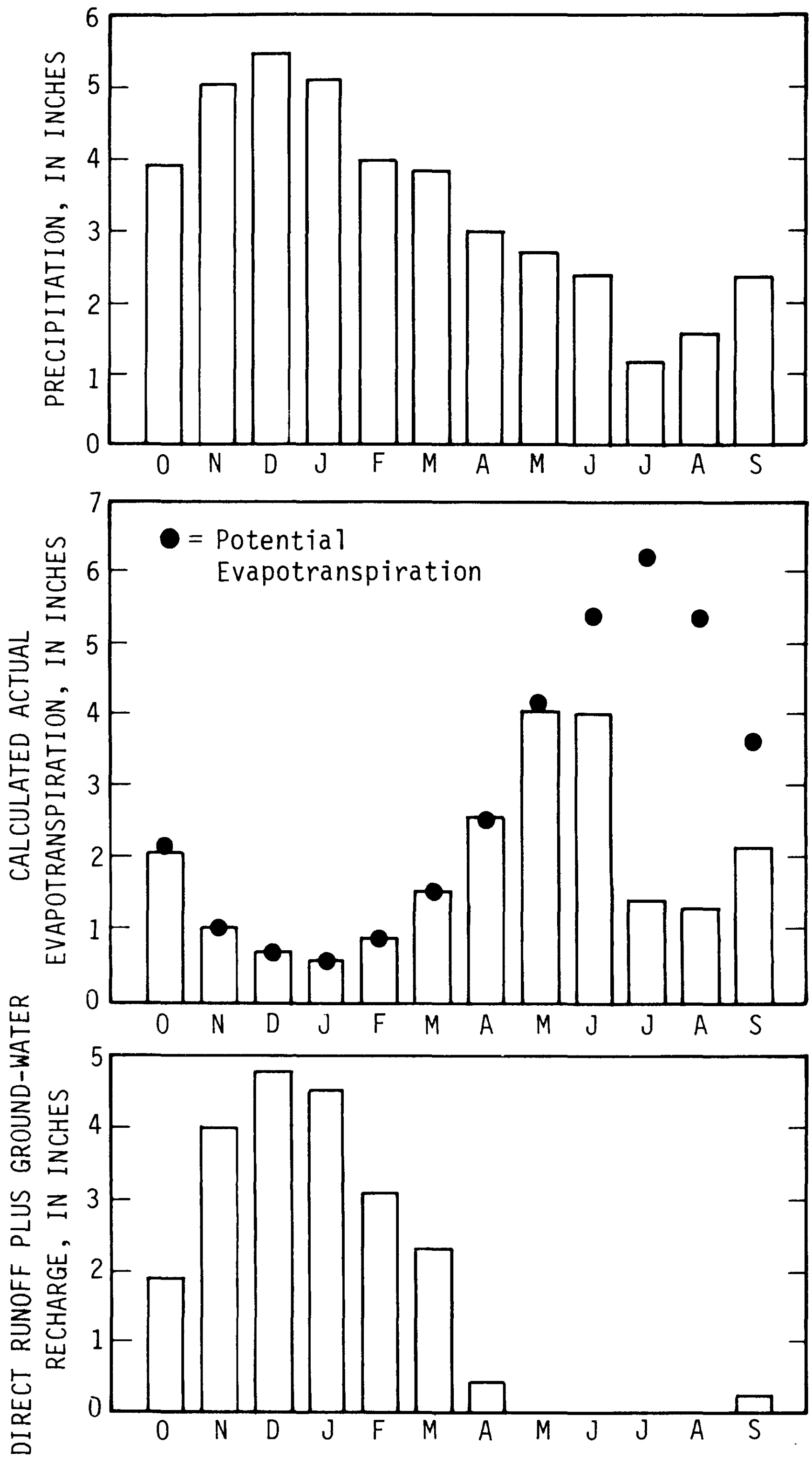

FIGURE 11.--Mean monthly distribution of precipitation, evapotranspiration, and direct runoff plus ground-water recharge, based on climatic data for Everett and Arlington from 1935-77 water years.

The "Log-Pearson Type III" method was used to obtain frequency distributions for annual and monthly mean discharges and low flows for selected durations at the six long-term stations. From the frequency distributions estimates were made of monthly mean and annual mean discharges at a 50-percent probability of exceedence and low flows at 5-, 10-, 20-, and 50-percent probability of exceedence. By definition, median flows have a 50-percent exceedence probability. Median annual mean flows (table 1) and median monthly mean flows for May-October (table 2) were estimated for nine sites from the correlations. Median monthly mean flows were not calculated for the wet season (November-April) because correlations with long-term stations were not as reliable as for the dry season. Low flows for the selected probabilities were estimated for intervals of 7, 30, and 90 consecutive days by correlation for 10 sites (table 3).

The low flows for specific periods of consecutive days and nonexceedence probabilities are interpreted as follows: for example, at site 2 a 7-day low flow of 1.7 ft^3/s at the 20-percent probability of being less than indicated means that during any year the minimum mean flow for 7 consecutive days has a 20-percent probability (chance of 1 in 5) of being less than 1.7 ft^3/s.

Annual maximum peak discharges, or flood discharge characteristics, were calculated for 18 sites in the study area for exceedence probabilities of 1, 2, 10, and 50 percent in any year. These discharges were calculated (table 4) from regression equations defined by Cummans, Collings, and Nassar (1975). Flood discharges for specific exceedence probabilities are interpreted as follows: for example, at site 1 a flood discharge of 120 ft^3/s at the 50-percent-probability level means that during any year the peak flow has a 50-percent probability (chance of 1 in 2) of exceeding 120 ft^3/s.

TABLE 1.--Annual mean flows at selected sites from correlations, with a 50-percent probability of being less than indicated, and from streamflow records and from a water budget

(cubic feet per second)

Station number	Station name and basin	Median annual mean flow from correlations	Measured annual mean flow (water year) 1975	1976	1977	Average annual[1] flow from water budget
	Quilceda Cr basin					
12157020	site 2	13.2	--	--	--	--
12157030	site 3	3.0	--	--	--	--
12157035	site 4	2.0	--	--	--	--
	Mission Cr basin					
12157150	site 6	1.6	--	--	--	--
12157210	site 9	1.0	--	--	--	--
12157250	site 12	6.7	6.3	7.2	3.8	6.2
	Tulalip Cr basin					
12158010	site 15	8.9	--	--	--	--
12158030	site 17	2.1	--	--	--	--
12158040	site 20	12.1	12.3	14.2	8.8	12.1

[1]See section on water budget.

TABLE 2.--Monthly mean flows from correlations at selected sites, May-October, with a 50-percent probability of being less than indicated

(cubic feet per second)

Station number	Station name and basin	May	June	July	August	September	October
	Quilceda Cr basin						
12157020	site 2	2.6	2.4	2.1	2.0	2.1	2.2
12157030	site 3	1.3	1.1	.9	.8	.8	.9
12157035	site 4	1.4	1.1	.7	.6	.6	.8
	Mission Cr basin						
12157150	site 6	.7	.7	.6	.6	.6	.6
12157210	site 9	.4	.4	.3	.3	.3	.4
12157250	site 12	3.2	2.2	1.3	1.2	1.7	2.8
	Tulalip Cr basin						
12158010	site 15	5.5	5.0	4.5	4.3	4.5	4.9
12158030	site 17	1.6	1.4	1.2	1.1	1.2	1.3
12158040	site 20	7.7	7.2	6.5	6.2	6.3	6.7

TABLE 3.-Low flows at selected sites for selected periods of consecutive days and probabilities of being less than indicated

Station number	Station name and basin	Number of consecutive days	Low flows (ft^3/s), for the indicated probability 50	20	10	5	Minimum measured flows[1] 7-day	1 day
	Quilceda Cr basin							
12157000	site 1	7	4.1	3.5	3.2	3.0	2.8	2.2
		30	4.6	3.8	3.5	3.2		
		90	5.4	4.6	4.3	4.0		
12157020	site 2	7	1.8	1.7	1.6	1.6	--	--
		30	1.8	1.7	1.6	1.6		
		90	2.0	1.8	1.8	1.7		
12157035	site 3	7	.6	.5	.5	.4	--	--
		30	.6	.5	.5	.4		
		90	.7	.6	.6	.5		
12157035	site 4	7	.4	.3	.3	.2	--	--
		30	.4	.3	.3	.2		
		90	.6	.4	.4	.3		
	Mission Cr basin							
12157150	site 6	7	.5	.5	.5	.4	--	--
		30	.5	.5	.5	.5		
		90	.6	.5	.5	.5		
12157210	site 9	7	.2	.2	.2	.2	--	--
		30	.2	.2	.2	.2		
		90	.3	.2	.2	.2		
12157250	site 12	7	.7	.5	.5	.4	.3	.1
		30	.8	.6	.5	.4		
		90	1.4	.9	.8	.6		
	Tulalip Cr basin							
12158010	site 15	7	3.9	3.8	3.7	3.6	--	--
		30	4.0	3.8	3.7	3.7		
		90	4.4	4.1	3.9	3.8		
12158030	site 17	7	1.0	.9	.9	.9	--	--
		30	1.0	1.0	.9	.9		
		90	1.1	1.0	1.0	1.0		
12158040	site 20	7	5.5	5.2	5.0	4.9	4.2	3.7
		30	5.6	5.2	5.1	4.9		
		90	6.1	5.7	5.5	5.3		

[1]Years of record: site 1 (22 yrs), sites 12 and 20 (3 yrs).

TABLE 4.--Flood discharges at selected sites for selected probabilities of exceedence

Station number	Station name and basin	Flood discharge (ft^3/s) for indicated probability of exceedence, in percent[1] 50	10	2	1	Maximum measured discharge[2]
	Quilceda Cr basin					
		(±42 pct) (±42%) pct)	(±45% pct)	(±55% pct)	(±61% pct)	
12157000	site 1	120	200	280	320	306
12157020	site 2	80	130	190	210	--
12157030	site 3	29	48	67	75	--
12157035	site 4	20	33	46	52	--
	Mission Cr basin					
12157140	site 5	4	7	9	10	--
12157150	site 6	13	22	30	34	--
12157170	site 7	13	22	30	33	--
12157202	site 8	8	13	18	20	--
12157210	site 9	15	25	34	38	--
12157247	site 11	51	85	120	130	--
12157250	site 12	60	99	140	155	41
	Tulalip Cr basin					
12158001	site 13	46	76	110	120	--
12158008	site 14	60	98	140	150	--
12158010	site 15	68	110	160	180	--
12158025	site 16	8	13	18	20	--
12158030	site 17	14	23	32	35	--
12158032	site 18	16	26	36	40	--
12158040	site 20	100	170	230	260	65

[1]Flood discharges calculated using repression equations defined by Cummans, Collings, and Nassar (1975).

[2]Years of record: site 1 (22 yrs), sites 12 and 20 (3 yrs).

Tulalip Creek Basin

Tulalip Creek drains an area of 15.4 mi^2, 9.3 mi^2 of which is on the reservation. The remaining 6.1 mi^2 lie north of the reservation and include Lakes Goodwin and Shoecraft, which have a combined surface area of about 1.1 mi^2. The drainage basin has a surficial cover primarily of till. Some areas have a surficial cover of sand and gravel with some silt and clay. A few small areas of silt, clay, and peat exist, as well as very small outcroppings of sand and gravel. The outflow from the large lakes north of the reservation is partly regulated by manipulation of planks in a wooden flume at the outlet of Lake Shoecraft. There is some natural regulation of flow by small lakes and beaver ponds. Prior to August 1975, the Tulalip Tribe diverted several tenths of a cubic foot per second of flow from the East Fork of Tulalip Creek for domestic use. After a ground-water supply was put into service, the surface-water system was placed on a standby basis. Present diversions (1978) are limited to fisheries operations near the creek's mouth and are nonconsumptive.

The calculated median annual mean flow from the basin (site 20) is 12.1 ft^3/s, which is an average rate of 0.79 ft^3/s per mi^2. The areas above sites 15 and 17 yield 0.91 and 1.4 ft^3/s per mi^2, respectively, and the remainder of the basin yields only 0.26 ft^3/s per mi^2. Calculated median monthly mean flows for the dry season at these three sites show a steady decrease in flow from May through August followed by increases in September and October.

The calculated low flows from the basin indicate an extremely reliable source of base flow. The 7-day 5-percent low flow (4.9 ft^3/s) and the 7-day 50-percent low flow (5.5 ft^3/s) differ by only 12 percent. The same low flow intervals and probabilities at sites 15 and 17 show similar reliability, with differences of 8 and 11 percent, respectively. The lowest 7-day low flow measured at site 20 (three years of record) was 4.2 ft^3/s, less than the calculated 7-day 5-percent probability low flow. However, this measured low flow occurred in the 1977 water year, which was the driest in 43-years of record (a 2.3-percent probability). This implies that the calculated low flows are reasonably accurate.

Flood discharges at seven sites in the basin were calculated. The greatest calculated discharge, 260 ft^3/s, is at site 20 and at a probability of exceedance of 1 percent in any year. A flood discharge of 100 ft^3/s with a 50-percent probability was calculated at the site, but during the three years record at the site, the greatest discharge was only 65 ft^3/s. This implies that the calculated discharges may be too large, but this can not be confirmed with the limited data available.

Mission Creek Basin

Mission Creek drains an area of 7.92 mi^2, all of which is on the reservation. The drainage basin has a surficial cover primarily of till. Some areas have a surficial cover of sand and gravel and some silt and clay. A few very small areas of silt, clay, and peat also exist. The only regulation of flow is natural, in lakes and beaver ponds. There are no known diversions, although a few residents reportedly pump small quantities of surface water on an infrequent basis.

The calculated median annual mean flow from the basin (site 12) is 6.7 ft^3/s, which is an average rate of 0.85 ft^3/s per mi^2. The areas above sites 6 and 9 yield 1.2 and 0.64 ft^3/s per mi^2, respectively, and the remainder of the basin yields 0.82 ft^3/s per mi^2. Calculated median monthly mean flows for the dry season at these three sites show a steady decrease in flow starting in May and reaching lowest flows in August.

The calculated low flows indicate an extremely reliable source of base flow at sites 6 and 9, but not quite so reliable for site 12. At site 12, the 7-day 5-percent low flow (0.4 ft^3/s) and the 7-day 50-percent low flow (0.7 ft^3/s) differ by 75 percent. The same low-flow intervals and probabilities at sites 6 and 9 show less variation, with differences of 25 and 0 percent, respectively. The lowest 7-day low flow measured at site 12 (three years of record) was 0.3 ft^3/s, less than the calculated 7-day 5-percent probability low flow. However, this measured low flow occurred in the 1977 water year, which was the driest in 43 years of record (a 2.3-percent probability). This implies that the calculated low flows are reasonably accurate.

Flood discharges at seven sites in the basin were calculated. The greatest calculated discharge, 155 ft^3/s, is at site 12 and at a probability of exceedance of 1 percent. A flood discharge of 60 ft^3/s with a 50-percent probability was calculated at that site, but during the 3 years of gaging at the site, the greatest recorded discharge was only 41 ft^3/s. This implies that the calculated flood discharges may be too large, but this can not be confirmed with the limited data available.

Quilceda Creek Basin

Quilceda Creek drains an area of about 42.2 mi^2, about 9.9 mi^2 of which is on the reservation. The part of the drainage basin on the reservation has a surficial cover almost entirely of sand with some till along its western edge and some clay, silt, and peat along its southern edge. There is no known regulation of flow other than natural regulation by beaver ponds. There are no known large diversions, but some residents pump small quantities of surface water on an irregular basis.

The calculated median annual mean flows at sites 3 and 4, which have drainage areas entirely within the reservation boundaries, are 3.0 and 2.0 ft^3/s, respectively. Site 2, which has 37 percent of its drainage area in the reservation, has a calculated median annual mean flow of 13.2 ft^3/s. The average rates of yield for sites 2, 3, and 4 are 1.4, 1.0, and 1.1 ft^3/s per mi^2. Calculated median monthly mean flows for the dry season at these three sites show a steady decrease in flow starting in May and reaching lowest flows in August.

The calculated low flows indicate an extremely reliable source of base flow at site 2 and less reliable sources at sites 3 and 4. At site 2, the 7-day 5-percent low flow (1.6 ft^3/s) and the 7-day 50-percent low flow (1.8 ft^3/s) differ by only 12 percent. The same flow intervals and probabilities at sites 3 and 4 show differences of 50 and 100 percent, respectively. The lowest 7-day low flow measured at site 1 (22 years of record) was 2.8 ft^3/s, which agrees well with the calculated 7-day 5-percent probability low flow of 3.0 ft^3/s.

Flood discharges at four sites in the basin were calculated. The greatest calculated discharge, 320 ft^3/s, is at site 1, off the reservation, and at a probability of exceedence of 1 percent in any year. Flood discharges of 200 and 280 ft^3/s with respective probabilities of 10 and 2 percent were calculated for the site. During 22 years of gaging at the site the greatest recorded discharge was 306 ft^3/s. This implies that the calculated flood discharges are reasonably accurate. The largest calculated flood discharge in that part of the Quilceda Creek basin on the reservation is at site 2, 210 ft^3/s, at a 1-percent probability.

Lakes

Eight lakes on the reservation range in area from 1.3 to 23 acres. Table 5 gives the location, name, and some physical characteristics of each lake. Table 6 lists lake levels and water-surface temperatures of the three largest lakes on the reservation, and of Lake Shoecraft, in the headwaters of Tulalip Creek north of the reservation. A reconnaissance study of Weallup Lake and an intensive water-quality investigation of Ross Lake have been made. The results are contained in two separate reports, Bortleson and others (1976) and Dion (1979).

Gages were installed on John Sam, Ross, and Weallup Lakes (all natural lakes) in late September 1974 to allow observations of water-surface elevations and their fluctuations during the study period. The gage heights were observed during the period from September 17, 1974, to September 6, 1977.

The net changes in the level of John Sam Lake were +0.32 ft, +0.18 ft, and -0.30 ft, during the 1975, 1976, and 1977 water years, respectively. Changes of level in Ross Lake were similar for the same period: +0.32 ft, +0.28 ft, -0.14 ft. Weallup Lake, however, showed a somewhat different pattern: +0.72 ft, +0.32 ft, +0.12 ft. The changes in Weallup Lake were at least partly caused by a beaver dam constructed in February-March 1975 which altered the elevation of the outlet of the lake.

Surface drainage from Ross and Weallup Lakes is by overflow into natural stream channels, whereas the outlet of John Sam Lake has been altered by a deposit of fill and the installation of a 2-foot diameter, concrete culvert. Additional regulation of the level of John Sam Lake is accomplished by partial blocking of the culvert with a removable wooden plate.

TABLE 5.--Some physical data on lakes

[Data from Wolcott, 1973]

Name	Location	Elevation (ft)	Area (acres)	Maximum depth (ft)
John Sam Lake-----	30/4-1M/N	506	15.3	40
Lake Agnes--------	30/4-2B/C	456	11.1	35
Fryberg Lake------	30/4-2C	450	4.0	shallow
Mary Shelton Lake-	30/4-2L/M	368	12.4	--
Weallup Lake------	30/4-4L/M	213	[a]23	12
Ross Lake---------	30/4-13A	375	[b]21	[b]73
Unnamed-----------	30/4-24B/C	270	1.3	--
Unnamed-----------	30/5-29H	15	1.3	--

[a]Data from Bortleson and others (1976).
[b]Data from Dion (1979).

TABLE 6.--Gage heights and water temperature of selected lakes

[Gages installed at arbitrary datum and temperatures measured within 1 foot of lake surface]

	John Sam Lake[1]		Ross Lake[2]		Weallup Lake[3]		Lake Shoecraft[4]
Date	Gage height (ft)	Water temperature (°C)	Gage height (ft)	Water temperature °C)	Gage height (ft)	Water temperature (°C)	Gage height[4] (ft)
1974							
Sept. 17	14.5	--	--	--	--	--	1.02
27	14.34	--	15.20	--	--	--	.94
30	--	--	--	--	15.24	--	.92
Oct. 8	14.22	16.1	--	--	--	--	.86
15	14.17	15.0	15.089	15.6	15.10	--	.84
Nov. 8	14.17	9.4	--	--	--	--	.92
14	14.17	11.1	15.16	10.6	15.12	11.1	.96
Dec. 5	14.44	6.7	15.40	7.8	15.33	8.9	1.22
12	14.49	5.6	--	--	--	--	1.28
1975							
Jan. 7	--	--	16.00	5.1	15.79	4.6	1.64
15	15.35	2.8	--	--	--	--	1.80
Feb. 4	--	--	16.18	3.0	--	--	1.60
5	15.71	3.3	--	--	16.82	1.0	1.60
11	15.84	--	--	--	--	--	1.66
Mar. 4	--	--	16.60	5.9	17.29	7.0	1.78
14	15.84	--	--	--	--	--	1.68
Apr. 9	15.76	--	16.30	9.6	--	--	1.62
10	--	--	--	--	16.66	9.0	1.62
16	15.72	11.1	--	--	--	--	1.62
May 7	15.78	12.4	16.29	12.2	16.91	15.5	1.80
13	15.81	19.4	--	--	--	--	1.88
June 3	15.55	--	16.05	--	17.15	--	1.70
16	15.44	21.5	--	--	--	--	1.58
July 10	15.28	25.0	15.79	22.6	16.54	22.6	1.56
21	15.12	21.5	--	--	--	--	1.46
Aug 5	14.89	21.5	15.48	--	--	--	1.27
6	--	--	--	--	16.02	16.0	1.25
19	14.78	19.5	--	--	--	--	1.22
Sept. 2	14.82	18.1	15.52	19.6	15.96	19.6	1.26
Oct. 7	14.56	13.7	15.36	15.6	15.62	12.0	--
21	14.83	11.8	--	--	--	--	--
Nov. 4	--	--	15.78	--	--	--	--
5	14.96	10.6	--	--	15.80	11.8	--
18	15.27	5.5	--	--	--	--	--
Dec. 11	15.45	5.4	16.58	6.5	17.50	5.4	--
16	15.31	3.0	--	--	--	--	--
1976							
Jan. 7	15.26	4.0	16.47	3.8	--	--	--
8	--	--	--	--	17.52	4.5	--
13	--	--	--	--	17.54	--	--
20	15.51	--	--	--	--	--	--
Feb. 3	15.17	6.4	16.37	3.8	17.60	5.6	--
17	15.23	--	--	--	--	--	--

TABLE 6.--Gage heights and water temperature of selected lakes--Continued

[Gages installed at arbitrary datum and temperatures measured within 1 foot of lake surface]

Date	John Sam Lake[1]		Ross Lake[2]		Weallup Lake[3]		Lake Shoecraft[4]
	Gage height (ft)	Water temperature (°C)	Gage height (ft)	Water temperature °C)	Gage height (ft)	Water temperature (°C)	Gage height[4] (ft)
1976							
Mar. 3	15.54	5.6	16.37	4.7	17.54	4.4	--
16	15.61	8.2	--	--	--	--	--
Apr. 7	15.81	--	167.40	--	--	--	--
8	--	--	--	--	17.70	--	--
19	15.84	11.3	--	--	--	10.3	--
May 3	15.77	16.7	16.39	11.1	17.46	16.0	--
17	15.67	18.2	--	--	17.23	--	--
June 2	15.68	15.8	16.19	16.2	17.16	17.8	--
22	15.54	--	--	--	--	--	--
July 12	15.28	--	15.92	--	16.67	15.6	--
16	15.23	--	--	--	--	--	--
Aug. 3	14.96	21.0	15.68	--	--	--	1.30
4	--	--	--	--	16.30	15.0	--
31	15.06	00	--	--	--	--	--
Sept. 8	15.00	--	--	--	16.28	--	--
9	--	--	15.80	--	--	--	1.40
21	14.90	--	--	--	--	--	--
Oct. 5	14.78	15.8	15.70	17.0	16.09	15.0	1.32
12	14.74	--	--	--	--	--	--
29	--	--	--	--	16.04	--	--
Nov. 3	14.68	12.6	15.65	11.6	15.98	12.8	1.29
15	14.65	--	--	--	--	--	--
Dec. 6	14.60	00	15.65	--	15.91	--	--
1977							
Jan. 4	14.66	--	15.78	--	15.96	--	1.47
Feb. 15	14.69	9.2	15.88	5.6	16.04	9.6	1.64
Mar. 7	14.87	--	16.09	--	16.48	7.2	1.81
Apr. 4	15.16	--	16.28	7.3	17.62	12.3	1.89
May 4	15.14	16.2	16.23	15.6	16.85	15.2	--
June 1	15.60	18.0	16.40	19.2	18.08	16.4	1.90
July 6	15.22	21.0	15.96	19.2	17.38	21.4	1.56
Aug. 3	14.86	26.0	15.70	24.6	16.78	26.6	1.34
Sept. 6	14.70	19.7	15.66	21.9	16.40	20.3	1.26

[1]John Sam Lake.--Enamel staff gage on Ralph Berring dock approximately 200 ft northeast of the concrete outlet. Top of dock is at 17.60 ft and top of concrete culvert outlet is t 17.26 ft gage height.

[2]Ross Lake.--Enamel staff gage on alder tree 150 ft north of access road at southeast side of lake. Reference mark is top of a square spike in alder tree 30 ft east of the gage and at 19.28 ft gage height.

[3]Weallup Lake.--Enamel staff gage about 100 ft south of access road at east end of lake. Reference mark is top of spike in cedar tree 10 ft east of gage and at 19.36 ft gage height.

[4]Lake Shoecraft.--Enamel staff gage on E. G. Gilbert's property at southwest side of lake. Reference marks are: (1)head of bolt in cedar tree 36 ft shoreward of gage and at 5.364 ft gage height, (2) head of bolt in maple tree 40 ft shoreward of gage and at 5.546 ft gage height, (3) head of bolt in maple tree 60 ft shoreward of gage and at 7.626 ft gage height.

Water Quality

In order to assess the quality of surface water on the reservation, 121 water samples were collected from 14 stream sites during the period November 1974-March 1977. All 121 samples were analyzed for coliform-bacteria concentrations, 71 were analyzed for nutrient[1] concentrations, and 24 were analyzed for common constituents. Table 13 (at end of report) contains the data from these analyses. Included in table 13 are data from two analyses of water samples collected from Weallup Lake in 1973 (Bortleson and others, 1976) and eight analyses of water collected from Ross Lake in 1975. The Ross Lake data are discussed in detail in an earlier report (Dion, 1979).

The water-quality data indicate that the only potential water-quality problems observed were high total and fecal-coliform bacteria concentrations, high total-phosphorus concentrations, and high temperatures.

Minimum, median, and maximum coliform bacteria concentrations are shown in table 7. The highest median concentrations were observed in water from the Quilceda Creek basin. The basin includes large residential areas as well as grazing areas for cattle and other domesticated animals. The basins of Tulalip and Mission Creeks are much less developed. Most coliform bacteria in these two creeks are probably associated with the abundant wildlife and natural vegetation in the basins.

High concentrations of total phosphorus can lead to the development of nuisance aquatic plant growths. Suggested acceptable limits for total phosphorus are (U.S. Environmental Protection Agency, 1974):

Water body	Maximum total phosphorus (P) concentration
Within lakes, ponds, and reservoirs	0.025 mg/L
At points where streams enter lakes, ponds, or reservoirs	.050 mg/L
Flowing streams	.100 mg/L

Samples from Ross Lake were well below the suggested limit, but one of two samples from Weallup Lake exceeded the limit. The area around Ross Lake is completely undeveloped. To the north of Weallup Lake lie residential communities surrounding Lakes Goodwin and Shoecraft. However, samples taken at the outlet of Lake Shoecraft (site 13), just above Weallup Lake, show low concentrations of total phosphorus, which implies that the high concentration observed in Weallup Lake may be natural.

Water samples collected at site 17 (inflow to the reservoirs for the tribal standby water-supply system) tended to have high concentrations of total phosphorus. One of six samples exceeded the limit of 0.050 mg/L, and two others equaled the limit.

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[1]A nutrient is any chemical element, ion, or compound that is required by an organism for the continuation of growth, reproduction, and other life processes. Nitrogen and phosphorus usually are considered the limiting nutrients for aquatic plant growth—algae in particular—and as such received the most emphasis in this study.

TABLE 7.--Coliform-bacteria concentrations in selected streams, November 1974-March 1977

Basin and site number	Total coliform bacteria (colonies/100 mL)				Fecal coliform (colonies/100 mL)		
	Number of samples	Minimum	Median	Maximum	Number of samples	Minimum	Maximum
Quilceda Creek							
2	7	220	930	4,400	1	--- 130 ---	
3	1	------ 1,000 ------			1	--- 84 ---	
4	1	------ 1,600 ------			1	--- 340 ---	
Mission Creek							
6	8	69	500	1,600	2	1	120
7	6	31	140	TNTC	--	-------	
9	8	38	175	1,800	2	1	8
11	6	44	265	610	--	-------	
12	26	10	120	1,600	4	1	294
Tulalip Creek							
13	5	14	25	220	1	--- 3 ---	
14	1	------- 100 -------			1	--- 26 ---	
15	2	69	204	340	2	3	11
17	22	7	89	370	--	--------	
18	2	130	320	510	2	11	11
20	26	36	2	4,100	4	11	1,500

TNTC = Too numerous to count.

Samples from flowing streams exceeded the limit in three places (two from Quilceda Creek basin, sites 2 and 4, and one from Tulalip Creek basin, site 20). The high concentrations in Quilceda Creek basin may be associated with agricultural and residential activities in the basin, but the high concentration in Tulalip Creek was probably a natural occurrence.

Although only Ross and Weallup Lakes of the sampled waters listed in table 13 had temperatures that exceeded the recommended level for fish-rearing purposes, 65°F (18.3°C) (Washington Department of Ecology, 1973), the temperatures at most sites probably exceeded the recommended level for at least brief periods each summer. Table 11 (at end of report) shows that water temperatures at sites 12 and 20, obtained from continuous-temperature recorders, frequently exceeded 65°F (18.3°C) from May through August of 1975 and 1976. During the period October 16, 1974-September 30, 1976, the temperature of Mission Creek ranged from 70°F (21°C) on July 5, 6, 7, and 27, 1975, to 33°F (0.5°C) on November 29, December 19 and 21, 1975, and February 6, 1976; during this period the temperature of Tulalip Creek ranged from 71° (21.5°C) on June 1 and July 26 and 27, 1975, to 32°F (0°C) on November 29, 1975, and February 5, 1976.

At both sites, the daily fluctuation in water temperature during the colder months (October-February) was about 2° to 4°F (1° to 2°C). During the warmer months (April-July), Tulalip Creek had a daily temperature fluctuation of about 16° to 18°F (9° to 10°C), and the fluctuation in Mission Creek was about 12° to 14°F (6° to 7°C).

The available data indicate that relationships apparently exist between flow conditions and concentrations of certain nutrients (table 8), although the number of samples is not sufficient to establish reliable correlations.

Nitrate and total-nitrogen concentrations tended to be greater during wet-season flows than during low flows at all sites sampled, whereas total-phosphorus concentrations tended to show an opposite relationship with flow conditions. The greatest total-phosphorus concentrations were generally observed in the dry-season storm runoff. Concentrations of ammonia, total organic nitrogen, and total Kjeldahl nitrogen in the Quilceda and Tulalip Creek basins were generally substantially higher during wet-season flows than during low flows. In the Mission Creek basin, higher concentrations of ammonia were recorded during low flows than during wet-season flows, but the concentrations of total organic nitrogen and total Kjeldahl nitrogen were similar during both wet-season flows and low flows. The highest ammonia concentrations at most sites were observed during the dry-season runoff. Nitrite, dissolved orthophosphate, and coliform-bacteria concentrations showed no consistent relationships with flow.

TABLE 8.--Average concentrations of nutrients under varying streamflow conditions

Basin name and site number	Flow condition[1]	Number of samples	Average discharge (ft^3/s)	Nitrate (total, as N)	Nitrite (total, as N)	Nitrogen, ammonia (total, as N)	Nitrogen, total organic (as N)	Nitrogen, total kjeldahl (as N)	Nitrogen, total (as N)	Phosphorus total (as P)	Phosphorus, dissolved orthophosphate (as P)
				Average concentrations, in milligrams per liter							
Quilceda Cr #2	Low flow	3	2.2	0.23	0.01	0.05	0.19	0.24	0.48	0.08	0.05
	Dry-season storm runoff	1	12	.40	.02	.25	.35	.60	1.0	.13	.05
	Wet-season flow	3	19	1.2	.01	.21	.40	.612	1.8	.07	.02
Mission Cr #6	Low flow	2	.74	.35	.01	.09	.28	.38	.74	.04	.04
	Dry-season storm runoff	1	.98	.65	.01	.22	1.1	1.3	2.0	.07	.02
	Wet-season flow		1.2	1.6	.01	.06	.26	.31	1.9	.02	.02
#7	Low flow	2	.04	.03	.01	.08	.24	.32	.62	.02	.00
	Dry-season storm runoff	1	.74	.23	.01	.10	.57	.67	.91	.03	.01
	Wet-season flow	3	1.3	1.7	.00	.05	.44	.49	2.1	.01	.01
#9	Low flow	2	.36	.72	.01	.06	.28	.33	1.1	.03	.02
	Dry-season storm runoff	1	.73	.73	.00	.07	.28	.28	1.0	.02	.01
	Wet-season flow	5	.98	1.7	.01	.05	.33	.38	2.1	.02	.01
#11	Low flow	2	2.5	.02	.01	.18	.40	.58	.60	.03	.02
	Dry-season storm runoff	1	7.4	.02	.01	.13	.33	.46	.49	.03	.01
	Wet-season flow	3	7.9	.89	.01	.10	.35	.45	1.3	.02	.01
#12	Low flow	3	2.2	.02	.01	.13	.43	.57	.60	.04	.03
	Dry-season storm runoff	1	8.8	.04	.01	.15	.39	.54	.59	.04	.02
	Wet-season flow	5	6.6	.58	.01	.11	.36	.47	1.0	.03	.02
Tulalip Cr #15	Low flow	1	3.8	.53	.01	.05	.23	.28	.82	.04	.03
	Wet-season flow	1	4.6	1.1	.01	.07	.34	.41	1.5	.04	.04
#17	Low flow	2	1.2	.95	.00	.04	.14	.19	1.2	.06	.04
	Dry-season storm runoff	1	1.8	1.1	.00	.03	.21	.24	1.3	.05	.04
	Wet-season flow	3	2.1	1.3	.00	.04	.23	.27	1.6	.04	.03
#18	Low flow	1	2.3	.60	.01	.03	.19	.22	.83	.07	.06
	Wet-season flow	1	2.8	1.0	.01	.06	.28	.34	1.3	.05	.05
#20	Low flow	3	6.3	.16	.01	.10	.30	.40	.57	.07	.04
	Dry-season storm runoff	1	10	.12	.01	.20	.39	.59	.72	.07	.05
	Wet-season flow	5	15	.55	.01	.10	.37	.47	1.0	.06	.04

[1]Low flow: Sites sampled on 11/6/74, 11/7/74, 9/18/75, and 9/9/76.
Dry-season storm runoff: Sites sampled on 6/3/76.
Wet-season flow: Sites sampled on 1/4/75, 2/5/75, 5/8/75, 12/18/75, 3/4/76, and 3/8/77

Ground Water

Geology

The major part of the reservation is situated on remnants of a glacial drift plain with most of its surface covered by till (or "hardpan") (unit 4, on figs. 12-18). This area is referred to as the Tulalip plateau. As noted by Newcomb (1952) and field observations, this glacially deposited material is a gray, concretelike mixture of clay- to gravel-size sediment and generally underlies the drift-plain surface to an average depth of 30 to 50 ft. The upper 10 to 20 ft of the till is generally weathered and does not exhibit the degree of cementation found at greater depths. The thickness of soils developed on the till is generally from 24 to 48 in. (Anderson and others, 1947). Below the soil zone the till is nearly impermeable, but inclusions of sand and gravel occur in places, allowing movement of water downward through the unit. Small areas of the drift plain are covered by thin patches of sand and gravel (unit 2) or silt and clay (unit 1), which in turn are generally underlain by the till unit.

Locally exposed in the sea cliffs along the western margin of the reservation is a sand unit (unit 5) as much as 200 ft thick. This unit is generally found beneath the till unit and contains some gravel and discontinuous layers of silt and clay. The sand unit is the most permeable of the known wide-spread units beneath the reservation.

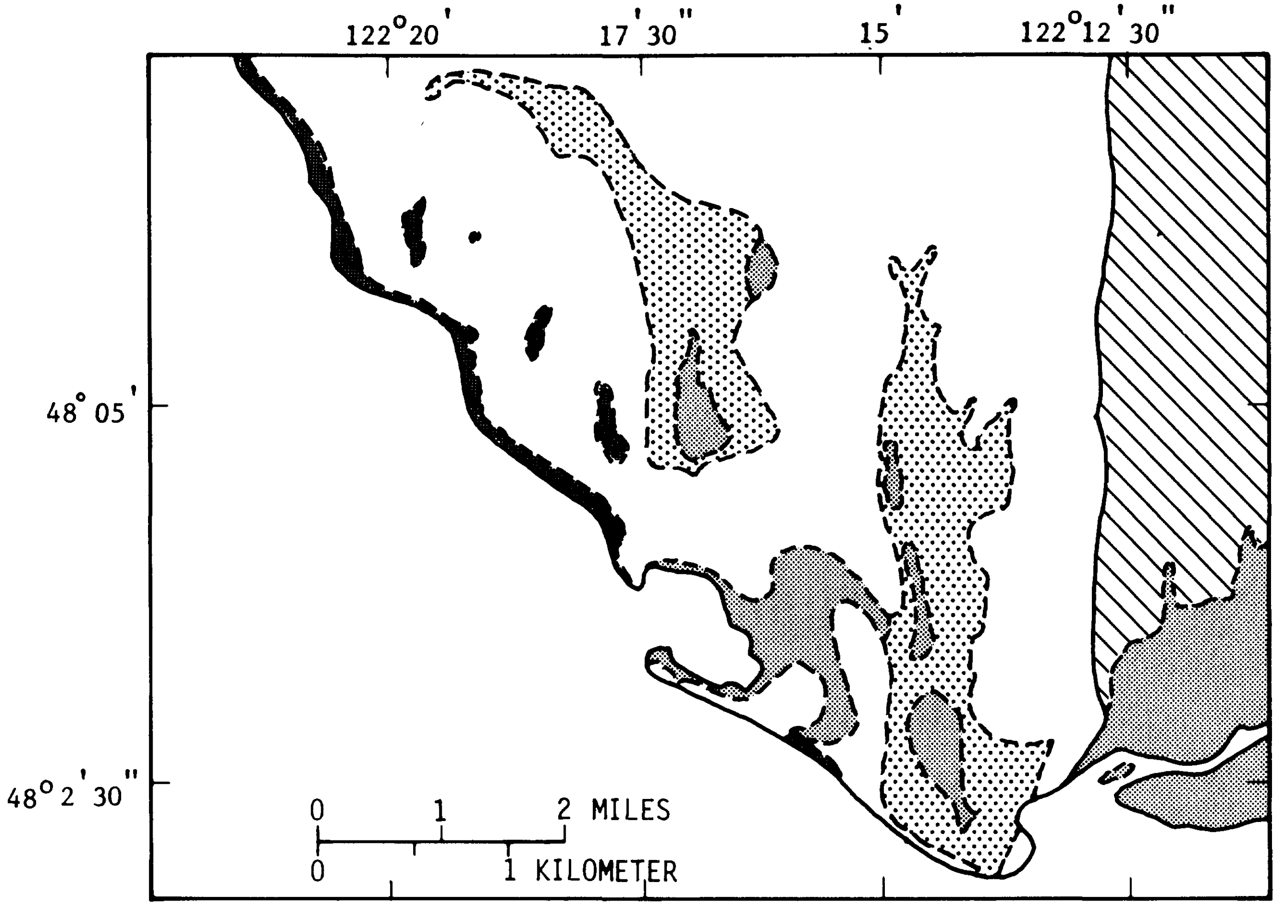
A clay-and-silt unit (unit 6) that extends well below sea level generally underlies the sand unit. The clay-and-silt unit has a very low permeability, but does include some thin sand layers with much higher permeabilities.

In a few places, where wells extend more than 200 ft below sea level, a permeable sand-and-gravel unit (unit 7) has been encountered. The thickness and areal extent of this unit are not known.

What occurs at depths greater than several hundred feet below mean sea level is not known. Well 30/4-17K1 extends about 317 ft below sea level and is the deepest well in the reservation. The unconsolidated deposits beneath the reservation are about 1,600 ft thick (Hall and Othberg, 1974) and extend about 1,200 ft below sea level.

The eastern 1½ mi of the reservation is in the Quilceda Creek lowland, which is part of the Marysville trough. In this area a unit (unit 3) composed predominantly of sand and silt is exposed. The unit ranges in thickness from a few feet at its western edge to several hundred feet near the eastern boundary of the reservation. To the south, the sand-and-silt unit grades into a unit of clay, silt and peat (unit 1). The till (unit 4), sand (unit 5), and clay-and-silt units (unit 6) that underlie the glacial drift plain to the west apparently underlie the sand-and-silt unit at places along the western margin of the lowland.

The surficial geology of the reservation is shown in figure 12. Schematic geologic sections are shown in figures 13-18. Drillers' logs are contained in table 14 (end of report).



EXPLANATION

1 Clay, silt, peat, sand and gravel. Typically high in orgainc matter; water table very near land surface. Variable permeability.

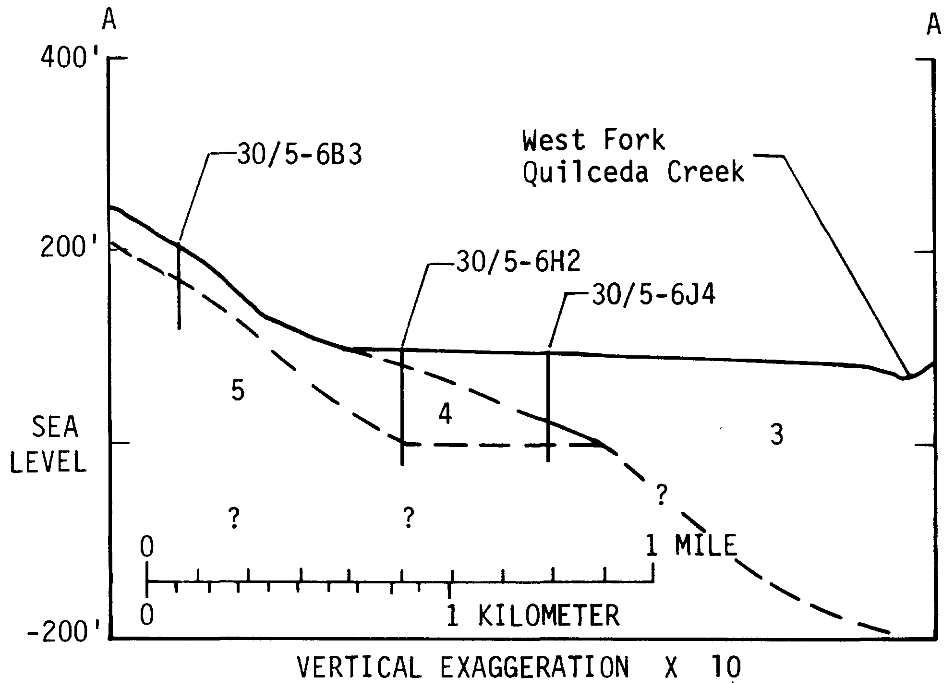
2 Sand and gravel with some silt and clay, mostly less than 50 feet thick. Variable permeability.

3 Sand and silt with streaks of gravel and clay. Usually more than 40 feet thick. Highly permeable.

4 Mostly till ("hardpan"). Gray concrete-like mixture of clay-to-gravel-size sediment, 10 feet to 110 feet thick. Poorly permeable, except for included streaks of sand and gravel, and the weathered surface zone (about 10 feet thick).

5 Sand and some gravel, about 200 feet thick. Contains discontinuous layers of clay and silt. Highly permeable.

FIGURE 12.--Generalized geology of the Tulalip Reservation. Modified from Newcomb (1952) and Mackey Smith (State of Washington Department of Natural Resources, written commun., 1977).



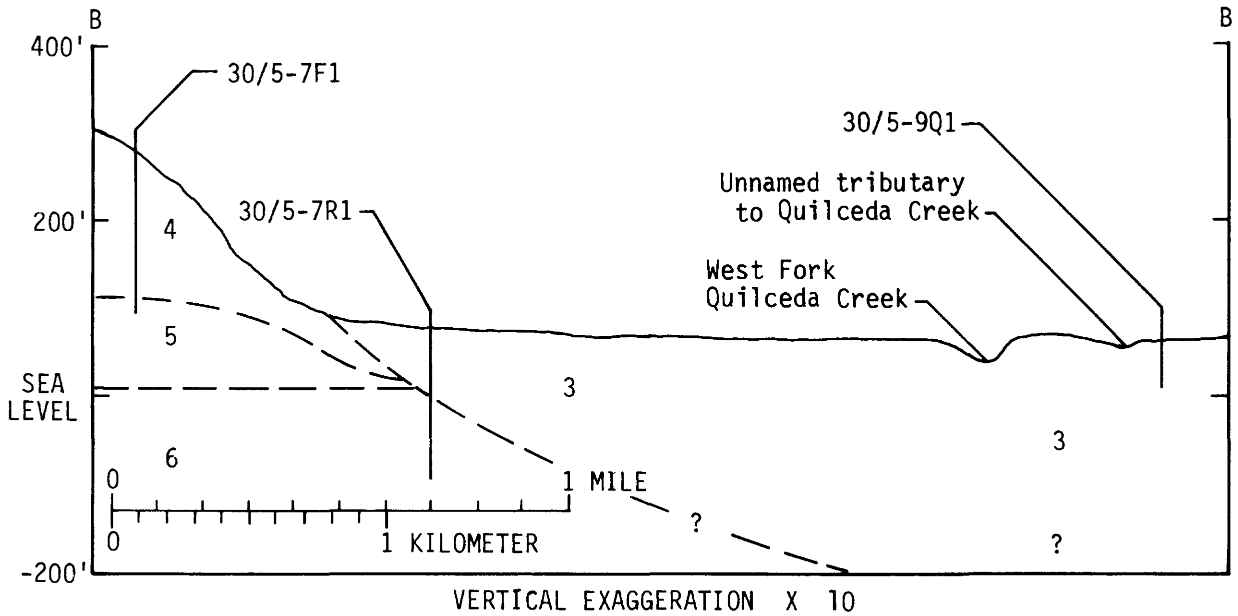
EXPLANATION

3 Sand, with streaks of clay and gravel near base.

4 Mostly till, with streaks of sand and gravel. Surface usually weathered to a depth of 10 ft or more.

5 Sand and gravel, with many discontinuous layers of clay and silt.

FIGURE 13.--Schematic geologic section along line A-A' of plate 1.



EXPLANATION

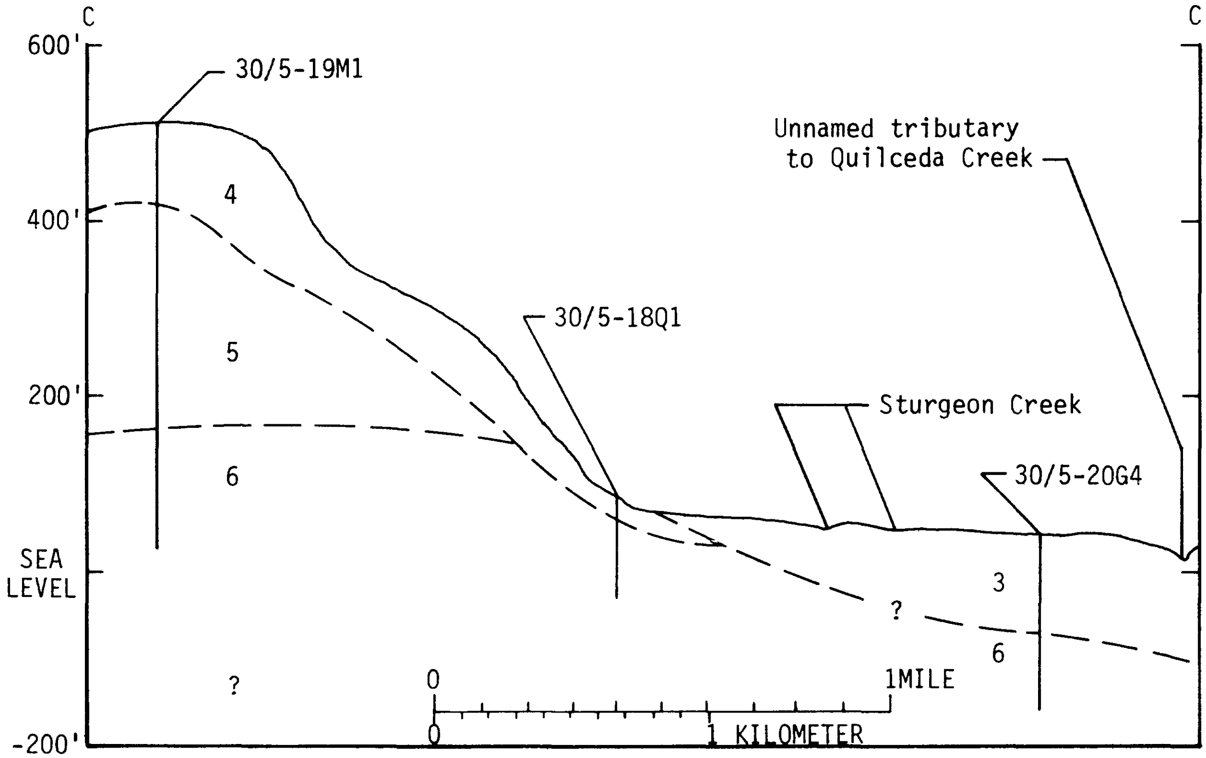
3 Sand, with streaks of clay and gravel near base.

4 Mostly till, with streaks of sand and gravel. Surface usually weathered to a depth of 10 ft or more.

5 Sand and gravel, with many discontinuous layers of clay and silt.

6 Clay, silt, and sand, with discontinuous layers of sand and gravel.

FIGURE 14.--Schematic geologic section along line B-B' of plate 1.



VERTICAL EXAGGERATION X 10

EXPLANATION

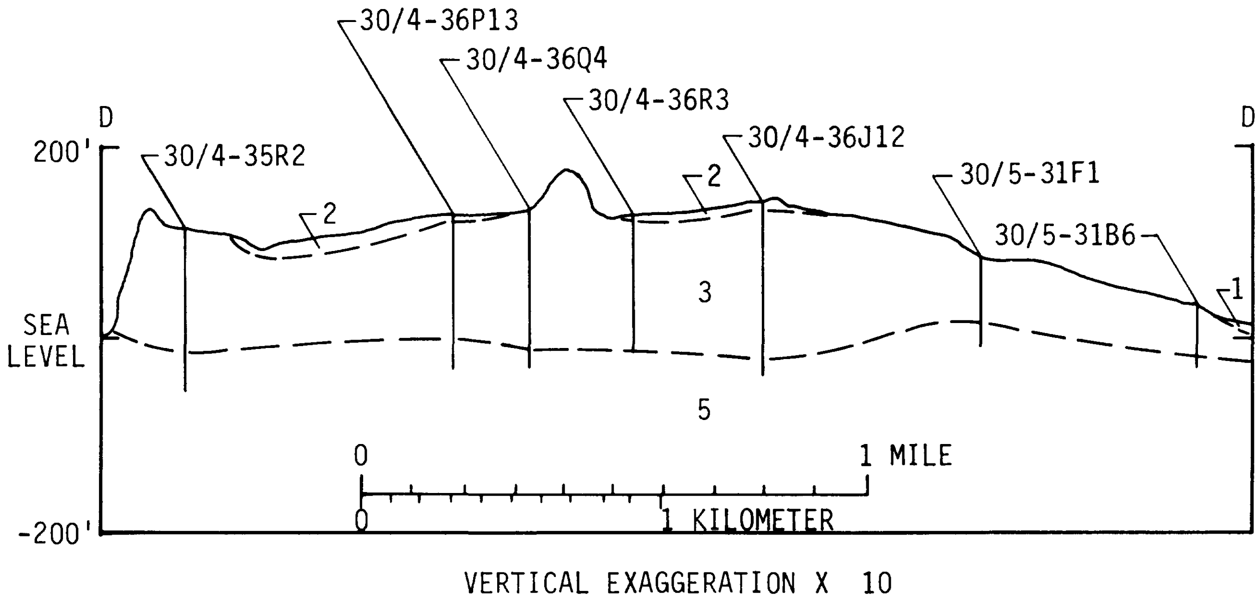
3 Sand, with streaks of clay and gravel near base.

4 Mostly till, with streaks of sand and gravel. Surface usually weathered to a depth of 10 ft or more.

5 Sand and gravel, with many discontinuous layers of clay and silt.

6 Clay, silt, and sand, with discontinuous layers of sand and gravel.

FIGURE 15.--Schematic geologic section along line C-C' of plate 1.



EXPLANATION

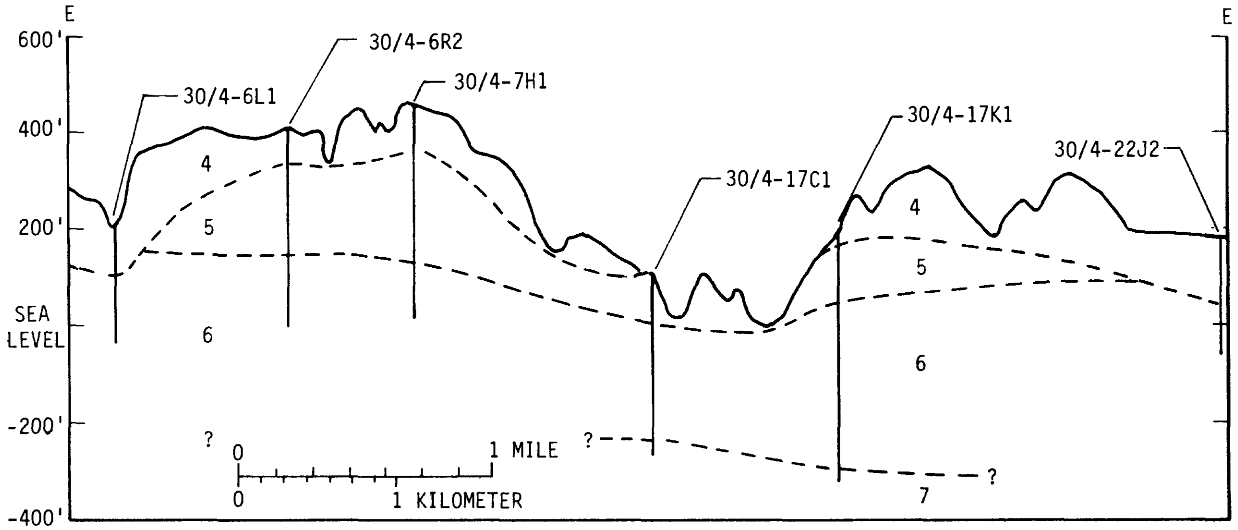
1 Clay, silt, peat, sand, and gravel. Typically high in organic matter; water table very near land surface.

2 Sand and gravel with some silt and clay.

3 Mostly till, with streaks of sand and gravel Surface usually weathered to a depth of 10 ft or more.

5 Sand and gravel, with many discontinuous layers of clay and silt.

FIGURE 16.--Schematic geologic section along line D-D' of plate 1.



VERTICAL EXAGGERATION X 10

EXPLANATION

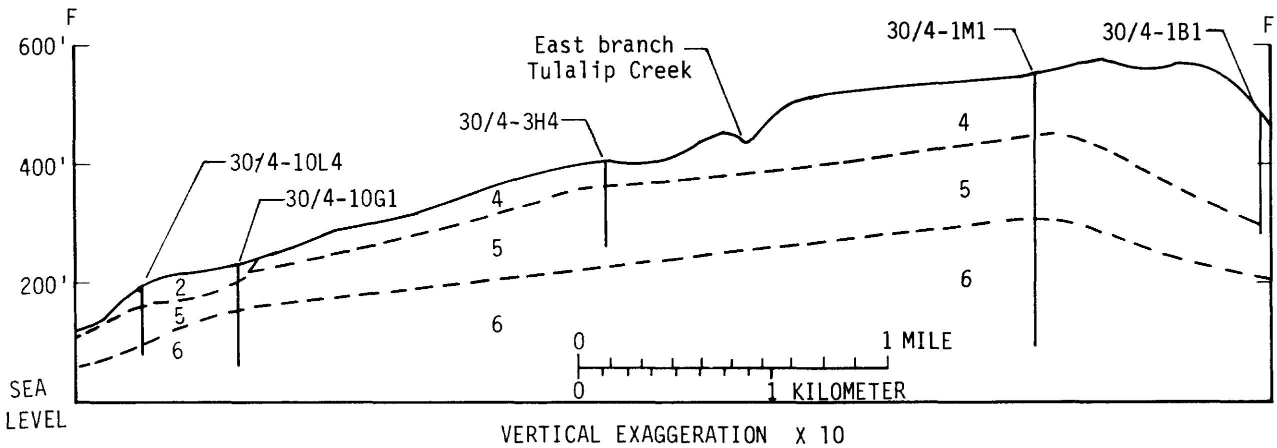
4 Mostly till, with streaks of sand and gravel. Surface usually weathered to a depth of 10 ft or more.

5 Sand and gravel, with many discontinuous layers of clay and silt.

6 Clay, silt, and sand with discontinuous layers of sand and gravel.

7 Coarse sand and gravel with discontinuous layers of sand and gravel.

FIGURE 17.--Schematic geologic section along line E-E' of plate 1.



EXPLANATION

2 Sand and gravel, with some silt and clay.

4 Mostly till, with streaks of sand and gravel. Surface usually weathered to a depth of 10 ft or more.

5 Sand and gravel, with many discontinuous layers of clay and silt.

6 Clay, silt, and sand, with discontinuous layers of sand and gravel.

FIGURE 18.--Schematic geologic section along line F-F' of plate 1.

Aquifers

All the known geologic units beneath the reservation (fig. 12-18) are capable, at least in some places, of producing usable quantities of water. However, only the sand unit (unit 5) can be depended upon to produce significant quantities of water (greater than a single domestic supply) at most places in the reservation. Records of wells and water levels are contained in tables 15 and 16 (at end of report).

Along the eastern 1½ mi of the reservation, the sand-and-silt unit (unit 3) is a dependable aquifer for single-domestic supplies. Wells are generally of large diameter (usually 3 ft or more) and from 10 to 30 ft deep. Where this unit grades into the unit of clay, silt and peat (unit 1) to the south, water supplies are commonly inadequate for single-domestic use. Yields from unit 3 vary greatly from place to place. Specific capacities[1] range from 0.1 to 26.0 gal/min/ft, with a median value of 4.4 gal/min/ft (based on data from 13 wells). Median "safe yield" (assuming maximum drawdown of one-half available drawdown) for a well in unit 3 is about 40 gal/min. No specific-capacity data are available from unit 1. Both of these units have very shallow water tables and are open to contamination from septic tanks.

The main surficial materials on the Tulalip plateau (units 2 and 4) yield small quantities of water in some places. Large-diameter wells, mostly less than 40 ft deep, generally are adequate for single-domestic use, but are insufficient in very dry years. No specific-capacity data are available for unit 2. The till (unit 4) ranges in specific capacity from 0.5 to 2.2 gal/min/ft, with a median value of 0.8 gal/min/ft (based on data from five wells). Median "safe yield" for a well in unit 4 is about 15 gal/min. Both units are open to contamination from septic tanks.

Of the known units beneath the reservation, the most widespread and productive aquifer is the sand unit (unit 5). This unit is found beneath almost all the Tulalip plateau and, in the northeast corner of the reservation, also extends a short distance beneath the surficial materials of the Marysville trough where flowing artesian conditions (water levels 21 to 50 ft above land surface) are found. Measured specific capacities range from 0.5 to 20 gal/min/ft, with a median value of 4.0 gal/min/ft (based on data from 43 wells). Median "safe yield" for a well in unit 5 is about 55 gal/min. Well depths range from a few feet (where they are dug into the base of the sea cliff at Priest Point) to nearly 300 ft (in the north-central part of the reservation), with a median depth of about 130 ft.

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[1]Specific capacity is the rate of discharge of water from a well divided by the resulting drawdown of the water level in the well. Most data available are for short-term (1-4 hours) bailer tests and, as such, probably result in values greater than the true specific capacity of the well, which generally is determined by a pumping test of 24-hours or more.

The clay and silt unit (unit 6) beneath the sand unit has discontinuous layers of sand or gravel, or both, that are moderately productive in some places. Specific capacities range from 0.2 to 2.0 gal/min/ft, with a median value of 0.95 gal/min/ft (based on data from 15 wells). Median "safe yield" for a well in unit 6 is about 45 gal/min. Well depths range from less than 100 ft (where they are drilled near sea level along the western shoreline) to more than 400 ft, with a median depth of about 180 ft.

Only two wells (30/4-17C1 and K1) have been drilled through the clay-and-silt unit. Both encountered underlying sand and gravel (unit 7), and both are used for public supply (20 homes or less). Wells 17C1 and 17K1 are 372 ft and 507 ft deep, respectively, and 17C1 has a measured specific capacity of 6.0 gal/min/ft. Specific-capacity data are not available for 17K1, but available water-level data and estimated pumping rates indicate a probable value of less than 1 gal/min/ft. The possible extent of this aquifer beneath other parts of the reservation is not known, nor is any information available regarding the possible existence of deeper aquifers.

Existing Ground-Water Development

As of 1978, four major parts of the reservation had significant ground-water development (pl. 1). The easternmost area (including the Marysville trough and the eastern edge of the Tulalip plateau) has the greatest number of wells, almost all of which are used for single domestic supplies. A very small amount of water is used for irrigation in the area. Most ground water obtained in this area comes from the sand-and-silt unit (unit 3), with minor amounts from the till and sand units (units 4 and 5, respectively).

The southernmost area (Priest Point area) has the second largest number of wells. Virtually all water use is for domestic purposes, either as single-domestic supplies or small public-supply systems (less than 50 homes). The water is obtained from units 2, 3, and 5, with all of the public-supply systems pumping from unit 5.

The westernmost area (the shoreline area from north of Sunny Shores to Hermosa Point) has intensive development around Spee-Bi-Dah, consisting of single-domestic and small public-supply systems (less than 20 homes). Development in the remainder of the area consists primarily of scattered small public-supply systems (less than 50 homes). The water is obtained primarily from unit 6, but also from units 4, 5, and 7. This is the only area where unit 7 has been encountered. Although the sand unit (unit 5) is present along much of the western shoreline, the unit is generally above the water table and therefore nonproductive in this area.

The final area (in the north-central part of the reservation) includes the tribal well field, which supplies the area around Tulalip Bay and most of the Indian homes in the southern and southeastern parts of the reservation. The rest of the area is a mixture of single-domestic and small public-supply systems (less than 50 homes). All the wells tap the sand unit (unit 5) except 30/4-1M1, which taps the underlying clay-and-silt unit (unit 6).

As of 1978, about 3,700 of the 3,987 year-round residents of the reservation were supplied by ground water obtained within the reservation boundaries. The remainder (primarily the "Marysville West" development) were supplied by the City of Marysville. Approximately 1,900 people were supplied by the tribal well field, 950 by small public-supply systems (more than 5 and fewer than 50 homes per well) and 850 by single-domestic supply wells. An additional 1,600 summer residents were supplied primarily by the tribal well field and the small public-supply systems along the shoreline.

The average rate of water use on the reservation (based on metered-flow records of the tribal well field for October 1977 through September 1978) is 122 gal/d per person. If an equal rate is assumed for the remainder of the reservation, then the annual use is about 183 million gallons (98 million from the tribal well field), or 0.78 ft^3/s. The water use is virtually all domestic, with insignificant amounts used for stock and irrigation. Approximately 75 percent of the ground water used comes from unit 5, 9 percent each from units 3 and 6, 3 percent from unit 4, 2 percent from unit 7, and 1 percent each from units 1 and 2.

Water Quality

On the basis of the available water-quality data, most of the ground water in the study area is chemically suitable for drinking without treatment. Table 9 lists the chemical standards for drinking water that went into effect in June 1977 in accordance with the Federal Safe Drinking Water Act (Public Law 93-523); also given are the number of sites and samples in the study area that have exceeded these standards in the past.

The maximum contaminant levels listed are of primary importance because they refer to concentrations of constituents that, if exceeded, may affect the health of consumers. The secondary recommended limits do not refer to health hazards, but to concentrations of constituents that may affect the esthetic quality of the water.

The maximum contaminant level determined for turbidity has been exceeded in the study area. Water with high turbidity values is hazardous primarily because it may interfere with chlorination processes. However, all high turbidity values in ground water in the study area are from deep wells in units 5, 6, and 7, which do not require chlorination, and are probably related to oxidation of dissolved iron after pumping and therefore do not indicate any significant health hazard.

One high lead concentration was observed in water from well 29/4-1A3. However, a sample collected on the same day at well 29/4-1A2 (which is about 100 ft from 1A3 and open at the same depth in the same aquifer, unit 6) showed no lead present. The source of the lead in 1A3 is unknown.

The unsanitary conditions of some wells, indicated by the presence of coliform bacteria, is the most serious water-quality problem in the ground water of the study area. Five of the 16 shallow wells (33 ft deep or less) tested showed the presence of coliform bacteria in at least one sample. The available data show the problem to be restricted to shallow wells in units 3 and 4; however, additional sampling would probably show the presence of coliform bacteria in some wells tapping units 1 and 2 also.

The secondary recommended limits of iron, manganese, chloride, dissolved solids, pH, and color have been exceeded in the study area. At the sites tested, iron and manganese were the most common problems, exceeding their recommended limits at 28 and 33 percent, respectively, of the sites tested. Large concentrations of either of these two constituents often create a bad taste, stain plumbing fixtures and laundry, and cause clogging of pumps and pipes. Excessive iron concentrations have been encountered in all the aquifers except units 1 and 2, which were sampled only at two sites each. Excessive manganese concentrations are apparently restricted to the deeper aquifers (units 5, 6, and 7). The recommended limit of chloride was exceeded in water from two wells tapping unit 6. The bottom of one of these wells (29/4-1B6) is about 74 ft below sea level, and the well has a static water level of about 5 ft above sea level. This well may be in the freshwater-saltwater zone of diffusion. The source of the high concentration of chloride in well 30/4-1M1 (which is 5 mi inland and only extends to a depth of 119 ft above sea level) is not known. A high value of 400 milligrams per liter (mg/L) was obtained upon completion of the well, and subsequent samples decreased to 100 mg/L and then to less than 10 mg/L. This is an indication that the well was probably contaminated in some way during drilling.

TABLE 9.--Comparison of ground-water quality in the study area with standards established by the Federal Safe Drinking Water Act

Constituent	Number of sites sampled	Number of samples tested	Chemical standards: Maximum contaminant level[1]	Chemical standards: Proposed secondary recommended limit[2]	Number of sites exceeding chemical standard	Number of samples exceeding chemical standard	Maximum value observed	Sites which have exceeded chemical standards
Iron	80	124	--	0.3 mg/L	22	35	9.4 mg/L	29/4-1A1, 1B2, 1B6, 1C1 30/4-1M1, 3C1, 10L1, 10L4, 17C1, 17K1, 21J1, 21J2, 35R1, 35R2, 36H1 30/5-5J1, 5K3, 8M7, 20F1, 20L1, 30G2, 30H1
Manganese	33	56	--	0.05 mg/L	11	15	0.23 mg/L	29/4-1C2 30/4-1M1, 10L1, 10L4, 17C1, 21G1, 21J1, 28A1, 35R1, 36H1; 30/5-6H1
Sulfate	31	54	--	250 mg/L	0	0	54 mg/L	--
Chloride	45	102	--	250 mg/L	2	7	820 mg/L	29/4-1B6; 30/4-1M1
Fluoride[3]	31	55	1.4 to 2.4 mg/L	--	0	0	0.4 mg/L	--
Nitrate	30	53	10 mg/L	--	0	0	9.0 mg/L	--
Dissolved solids	34	57	--	500 mg/L	2	8	1,440 mg/L	29/4-1A1, 1B6
pH	40	70	--	<6.5 or >8.5	1	1	Range 6.3-8.9	29/4-1C2
Color	35	59	--	15 platinum-cobalt units	5	7	40 units	29/4-1B6 30/4-1M1, 10L4, 21J1, 36H1
Turbidity[4]	29	51	1 JTU	--	9	15	75 JTU	29/4-1B6; 30/4-1M1, 6P1, 10L4,17K1, 21J1, 21J2, 35R1, 36H1
Coliform bacteria[5]	19	23	1 col/100 mL	--	5	9	800 col/100 mL	30/5-5M3, 7G2, 20K1, 20L1, 29G6
Arsenic	2	2	0.05 mg/L	--	0	0	<0.01 mg/L	--
Barium	2	2	1.0 mg/L	--	0	0	<0.04 mg/L	--
Cadmium	2	2	0.010 mg/L	--	0	0	<0.005 mg/L	--
Chromium	2	2	0.05 mg/L	--	0	0	<0.01 mg/L	--
Copper	2	2	--	1 mg/L	0	0	None	--
Lead	4	4	0.05 mg/L	--	1	1	0.07 mg/L	29/4-1A3
Mercury	2	2	0.002 mg/L	--	0	0	<0.001 mg/L	--
Selenium	2	2	0.01 mg/L	--	0	0	<0.005 mg/L	--
Silver	2	2	0.05 mg/L	--	0	0	<0.01 mg/L	--
Zinc	2	2	--	5 mg/L	0	0	0.47 mg/L	--

[1]U.S. Environmental Protection Agency, 1975, National interim primary drinking water regulations. Primary regulations are those which deal with constituents that may affect the health of consumers.

[2]U.S. Environmental Protection Agency, 1977, National secondary drinking water regulations. Secondary regulations are those which deal with the esthetic quality of drinking water, and are guidelines only.

[3]The maximum contaminant level for fluoride is dependent upon the annual average of the maximum daily air temperature at the location in which the water-supply system is situated; the mean air temperature at the Everett weather station (1915-1977) was 50.6°F, and the average maximum daily air temperature was about 60°F. At temperatures of 58.4° to 63.8°F, the maximum contaminant level is 2.0 mg/L.

[4]Although the maximum contaminant level for turbidity applies only to surface water, the relatively high turbidities in ground-water samples on the reservation warrant inclusion in this summary.

[5]The maximum contaminant level depends upon the number of samples taken and the method of determination. The 1 col/100 mL level in the table is a convenient value for evaluating the small public and private systems in the study area.

The generally high (more than 100 mg/L) chloride concentrations in wells 29/4-1A1 and 1B2, together with the concentrations in 29/4-1B6, are an indication of potential saltwater intrusion in the Priest Point area. However, as of 1978, the available data do not show any recognizable pattern of increased chloride concentrations with time. The two high concentrations of dissolved solids in the study area are associated with high chloride concentrations, one each from units 5 and 6.

One fairly low pH value (6.3) was measured in a sample from unit 5 in the Priest Point area. Other wells in the same aquifer and area have not shown a similar problem.

High values of color (platinum-cobalt units) have presented no significant problems in the study area, although water from five sites in units 5 and 6 has exceeded the recommended limit. These high values of color may be associated with the oxidation of iron and the resulting turbidity problems. Values above the recommended limit can be esthetically undesirable for domestic use and can be economically undesirable for some industrial uses.

Table 17 (at end of report) contains all available ground-water water-quality data.

Water Budget

Under natural conditions, the hydrologic system operating in the study area is presumably in a state of dynamic equilibrium. On a long-term basis, inflow to the system (precipitation, subsurface inflow, and surface-water inflow) is equal to outflow (evapotranspiration, subsurface outflow, and surface-water outflow), and there is no change in the amount of water in storage (at land surface, in the unsaturated zone, or in the ground-water reservoir).

Precipitation falling on the reservation follows three paths: (1) direct runoff to surrounding saltwater bodies or adjacent land areas, (2) evapotranspiration at land surface, and (3) infiltration to the unsaturated zone. Water in the unsaturated zone percolates downward to recharge the ground-water reservoir or moves to the land surface by capillary action and is evapotranspired.

Water that reaches the ground-water reservoir flows slowly toward the margins of the study area. Some water flows deeply, moves beneath the margins of the study area, and eventually discharges (below sea level) to saltwater bodies. Where the water table is within reach of rooted plants, some water is evapotranspired, and where it intersects the land surface, springflow (base runoff) occurs. Together, base runoff and direct runoff constitute the surface-water outflow from the hydrologic system.

Using the 3 years of surface-water discharge records on Mission and Tulalip Creeks (sites 12 and 20) it is possible to estimate annual net ground-water recharge by subtracting the annual surface-water discharge from the calculated annual direct runoff plus ground-water recharge values (fig. 9). Figure 19 shows a plot of net ground-water recharge versus direct runoff plus ground-water recharge for the 3 years of record. Long-term average annual net ground-water recharge is estimated by drawing a straight line through the data points and selecting the value (7.4 in./yr) corresponding to average direct runoff plus ground-water recharge (18.1 in./yr). This calculated value of ground-water recharge does not include water that recharges the ground-water reservoir, only to return as base runoff to surface-water bodies, and therefore is referred to as net ground-water recharge. However, the calculated value does include ground-water recharge that is subsequently lost as ground-water evapotranspiration.

Based on the values for average annual net ground-water recharge (7.4 in./yr) and average annual direct runoff plus ground-water recharge (18.1 in./yr) shown in figure 19, an average annual surface-water discharge of 10.7 in. can be calculated for Tulalip and Mission Creek basins. This is equivalent to discharges of 12.1 and 6.2 ft^3/s for each basin. These values are similar to the median annual mean flows calculated from streamflow records (table 1) of 12.1 and 6.7 ft^3/s.

A flow diagram of the hydrologic system and the water budget in the study area under natural conditions, including details of the budget calculations, is shown in figure 20. A land-surface area of 34.5 mi^2 was used to calculate the water budget. Natural inflow to the hydrologic system is in the form of precipitation, which averages 103 ft^3/s (40.4 in./yr on 34.5 mi^2 of reservation), average surface-water inflow of 13 ft^3/s, and average subsurface inflow of 4 ft^3/s, which gives an average total inflow of 120 ft^3/s. Natural outflow occurs primarily as evapotranspiration from the land surface and unsaturated zone at an average rate of 57 ft^3/s (22.3 in./yr on 34.5 mi^2), average evapotranspiration from the ground-water reservoir of 5 ft^3/s, average surface-water outflow of 40 ft^3/s, and average subsurface outflow of 18 ft^3/s. This budget is in balance, indicating that the hydrologic system is in a state of dynamic equilibrium.

The hydrologic system is in balance only relative to a long-term average. It is a dynamic system, constantly undergoing changes in inflow, outflow, and internal distribution of water in response to fluctuations in climatic and other factors.

Some of the observed effects of monthly variations in direct runoff plus ground-water recharge on streamflow and ground-water levels are shown in figure 21. During the period of observation, October 1974-September 1977, the study area received significant direct runoff plus ground-water recharge during November 1974-April 1975, October 1975-April 1976, December-March 1977, and in May 1977. Streamflows (site 20) and ground-water levels (30/4-3H1 and 30/5-5E2) responded in a predictable fashion. The large amount of direct runoff plus ground-water recharge in November-December 1974 produced only small increases in streamflow, probably because the major part became ground-water recharge. Although the rate of direct runoff plus ground-water recharge steadily decreased from about 5.5 in. in December 1974 to 3.7 in. in March 1975, streamflows continually increased. This probably occurred because the soils of the reservation reached their capacity to hold and transmit water by December and most of the additional water became direct runoff. Also, increased springflow, resulting from higher ground-water levels, contributed greater flows to the streams.

A similar pattern of direct runoff plus ground-water recharge and streamflow occurred in October 1975-February 1976. The relatively small amount of direct runoff plus ground-water recharge in December 1976-February 1977 had little effect on streamflows. The March and May 1977 direct runoff plus ground-water recharge values resulted in significant increases of streamflow.

The water level in well 30/5-5E2 (27 ft deep) showed rapid response to direct runoff plus ground-water recharge (usually in less than 1 month). This is as expected because the water table in the area around this well is generally less than 6 ft deep. The water level in well 30/4-3H1 (105 ft deep) showed a much slower (about 3 months) and more subdued response.

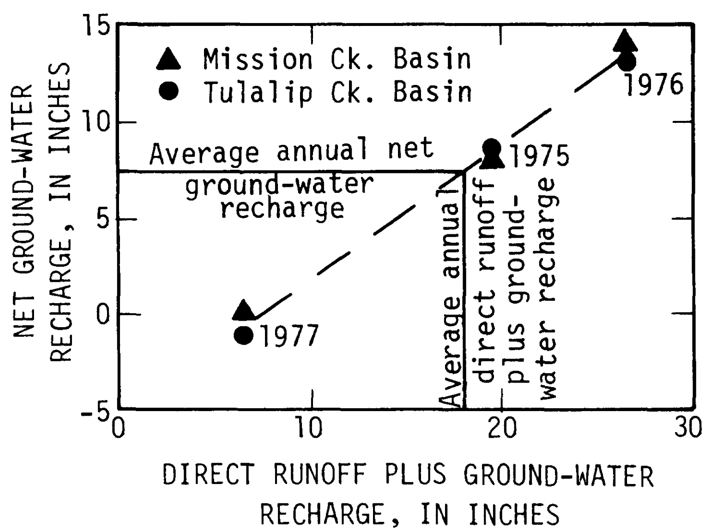
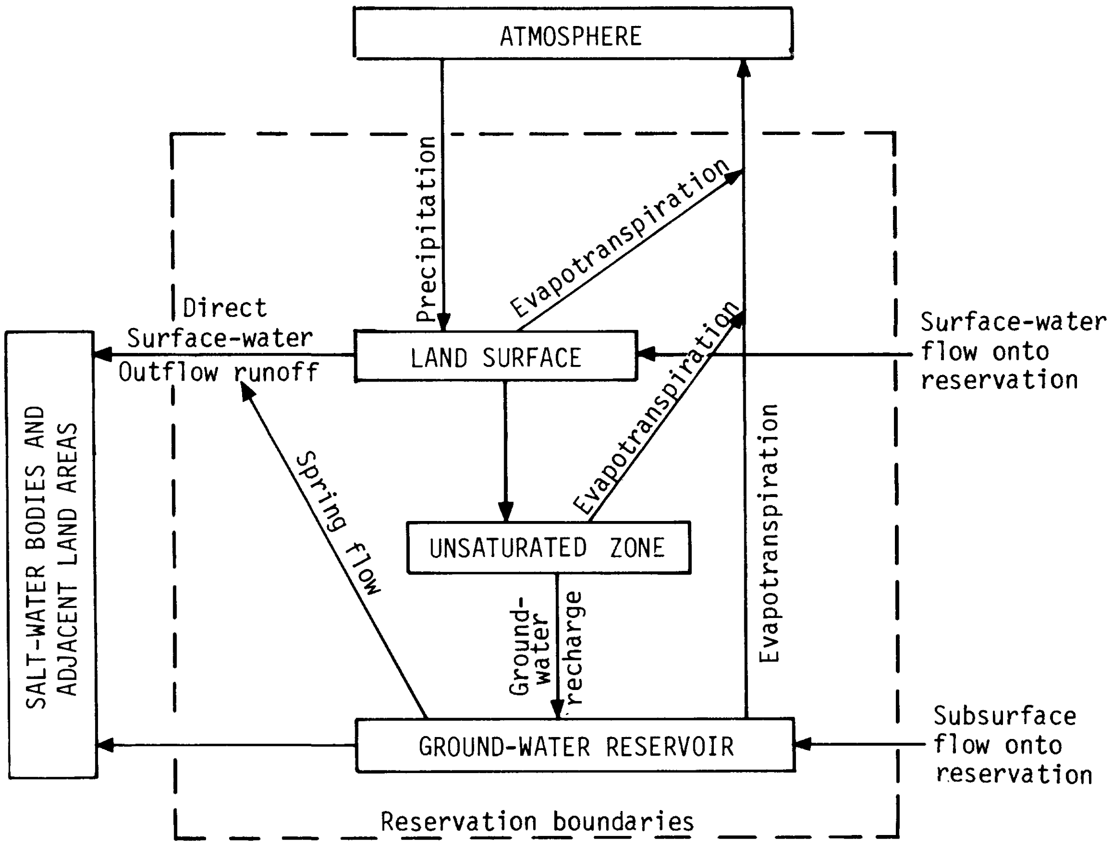


FIGURE 19.--Relationship of direct runoff plus ground-water recharge, in inches, to net ground-water recharge in the reservation.



Water Budget	
Inflow	(ft^3/s)
Precipitation	103
Surface water[1]	13
Subsurface[2]	4
	120
Outflow	
Evapotranspiration	
(from land surface and unsaturated zone)	57
(from ground-water)[3]	5
Surface-water[4]	40
Subsurface[5]	18
	120

1 Includes estimated flows at sites 2 and 13. Does not include main stem of Quilceda Creek.

2 Based on 7 mi^2 of basin off the reservation, with subsurface flow rate equal to net ground-water recharge rate.

3 Assumes 6 mi^2 of shallow water table where actual ET equals PET (an additional 11.8 inches of ET).

4 Includes calculated flows at sites 2, 3, 4, 12, and 20, and estimated flow from 9.2 miles of ungaged area.

5 Net ground-water recharge plus ground-water inflow minus ground-water ET.

FIGURE 20.--Flow diagram and water budget of the hydrologic system in the study area.

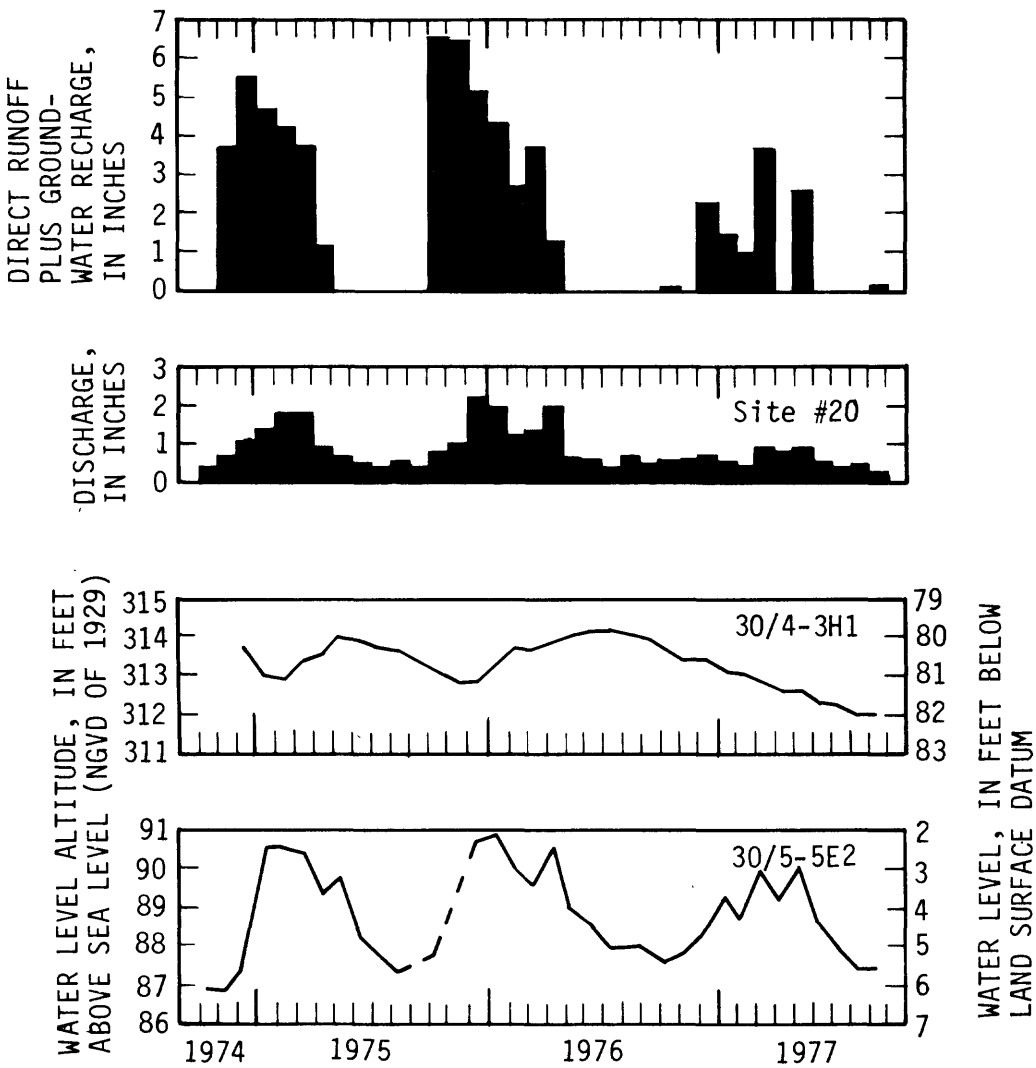


FIGURE 21.--Relationships between direct runoff plus ground-water recharge, surface-water discharge, and ground-water levels.

Potential For Further Development

Of primary concern to those responsible for water management in the study area is the potential for increased ground-water withdrawals and the associated consequences, and the potential for aquiculture development.

Because the hydrologic system in the study area has never been significantly stressed (except, perhaps, in the vicinity of the tribal well field), its reaction to potential future stresses imposed by man can be estimated only qualitatively. Any stress will produce a response by the system that is consistent with the hydrologic equation,

$$\text{Inflow} = \text{outflow} \pm \text{change in storage.}$$

A change in any item in the equation will cause one or both of the other items to change. Although the equation is simple, the types and magnitudes of responses may be complex.

Surface Water

As of 1978, there was no significant development of the reservation's surface water. The Tulalip Tribe's standby public-supply system on the east fork of Tulalip Creek had not been used since the installation of a ground-water supply system in August 1975. The tribal fish hatchery has been in operation at the mouth of Tulalip Creek for many years and will probably be greatly expanded in the near future. The hatchery water use is nonconsumptive.

The calculated low flows (table 3) for Tulalip (site 20) and Quilceda (site 2) Creeks show that relatively large minimum flows can be expected even in very dry years (7-day 5-percent probability low flows of 4.9 and 1.6 ft^3/s, respectively), with little variation from mean conditions (7-day 50-percent probability low flows of 5.5 and 1.8 ft^3/s respectively). The Mission Creek basin (site 12) has small, highly variable low flows (7-day 5-percent and 50-percent probability low flows of 0.4 and 0.7 ft^3/s, respectively).

For fish-rearing purposes, the crucial period is generally from December to March. During the December-March periods of the 3 years of gaging at Tulalip Creek (site 20) and Mission Creek (site 12), the lowest 1-day mean flows were 5.4 ft^3/s and 1.2 ft^3/s, respectively.

The quality of water in the Tulalip and Mission Creek basins is generally good either for fish-rearing or for public supply, with the exception of high coliform-bacteria counts (requiring treatment before use as public supply) and some instances of relatively high total-phosphorus concentrations. The Quilceda Creek basin has water of poorer quality (higher in coliform bacteria and total phosphorus), but possibly adequate for fish-rearing.

Ground Water

The four areas of the reservation that had significant ground-water development as of 1978 (see section on existing ground-water development) will probably experience further, and perhaps rapid, ground-water development in the future. The undeveloped parts of the reservation (as of 1978) may be developed in the near future, but assessments of ground-water resources in these areas are not possible until more data become available.

Listed below are some general considerations regarding further development of the ground-water reservoir in each of the four developed areas. These considerations and listed related factors, both favorable and unfavorable, are based primarily on hydrologic factors and do not take into account any associated economic or legal factors.

1. Easternmost area (Marysville trough and eastern edge of Tulalip plateau).

   a. The sand and silt aquifer (unit 3) is capable of supplying a population density several times greater than that of 1978.

      (1) The most efficient method of development of the aquifer (if continued) probably would be as at present, with large-diameter wells, each serving one or two households.

      (2) The major problem with intensive use of this aquifer is the potential for contamination, primarily from septic tanks. A water-quality monitoring program should be considered for this aquifer, with or without further development. Digging future wells to greater depths and installing sanitary seals would lessen the contamination potential.

   b. In the northern part of this area, where the sand aquifer (unit 5) is found beneath the surficial materials of the Marysville trough, large yields may be attainable.

      (1) The few wells drilled into the sand aquifer have specific capacities of about 2.5 gal/min/ft and water levels of 20 to 51 ft above land surface. Available drawdown in these wells ranges from 116 to 180 ft. Based on these data, a yield of about 180 gal/min may be attainable from a single 6-inch-diameter well (assuming use of one-half the available drawdown). However, the available specific-capacity data are of poor quality, and the aquifer has not yet been sufficiently stressed to allow for an estimate of long-term effects.

      (2) The areal extent of this aquifer is not known. It extends north of the reservation at least 1 mi, southward at least as far as 30/5-6J4, and eastward at least to 30/5-5M5. The eastern boundary is probably not more than 1/2 mi east of the base of the Tulalip plateau. Test wells 30/5-7R1 and 18Q1, drilled 1 and 2 mi south, respectively, of the known southern extent did not encounter the aquifer. The aquifer may be present at very localized areas at any of the untested places along the base of the plateau.

(3) This aquifer should be safe from septic-tank contamination, except for a slight possibility along the eastern edge of the plateau where the covering of till (unit 4) may be thin in places.

2. Southernmost area (Priest Point area).

   a. The sand unit (unit 5) is the only significant aquifer known in the area. The relatively intense existing development (the greatest well density of the four developed areas) has not caused any observable decline in water levels in the aquifer. The small public supply systems (less than 50 homes) operate on one or two wells, each with no reported shortages. The aquifer is probably capable of supplying a population in the Priest Point area several times greater than the present one.

   b. A freshwater-saltwater zone of diffusion apparently exists beneath (or in the lower parts of) the aquifer. Increased pumping from the aquifer may result in induced saltwater encroachment and, therefore, in severe deterioration of water quality. This danger can be lessened if the future wells are drilled as far as possible from the shoreline and no deeper than necessary. With or without future development, a water-quality monitoring program to warn of saltwater-encroachment problems should be considered.

3. Westernmost area (the shoreline area north of Sunny Shores to Hermosa Point).

   a. There the ground-water resources are less predictable than in any of the other developed areas. The clay-and-silt unit (unit 6) is the primary source of water. The water-bearing properties of the unit vary greatly from place to place. In most of the area, wells tapping the unit will probably yield at least a single-household supply, but at unpredictable depths. The underlying sand-and-gravel aquifer (unit 7) has been tapped by only two wells, therefore its areal extent is not known. Future supplies may be available from this unit, but will require deep wells (probably 400 ft or more). Even with rather small specific capacities, these future wells would probably be quite productive because they would have several hundred feet of available drawdown.

   b. Because many wells in the area are drilled to depths far below sea level, there is a potential problem of saltwater encroachment. However, existing data show no evidence of encroachment. Well 30/4-17K1, which is open from 307 to 314 ft below sea level, has a water level more than 100 ft below sea level when pumped. However, chloride concentrations in water from the well have generally been 8 mg/L or less. There has been no pattern of increase in chloride concentrations during the period of record (1967-78). Establishment of a monitoring network in the area to detect evidence of saltwater encroachment should be considered.

4. North-central area (including the Tribal well field).

a. The sand unit (unit 5) is apparently present beneath the entire area. Only the drillers' log of well 30/4-1M1 gives any indication that lateral variations in the unit might result in poorly productive areas. Further development of the unit is possible.

(1) The wells in the northern part of the area (both public and single-domestic supplies) have shown no evidence of declining water levels resulting from pumping.

(2) The tribal well field, where the withdrawal of water is greater than in any other part of the reservation, has shown evidence of declining water levels (see fig. 22). An average annual rate of decline of 2.5 ft/yr was observed for the period from August 1975 through June 1978. About 1.0 ft/yr was probably due to the abnormally low natural recharge rate during the period (based on water-level data from well 30/4-3H1), and the remaining 1.5 ft/yr was probably due to pumping. The cone of depression around the well field (the lowering of water levels due to pumping) will continue to expand until enough recharge is intercepted to equal the pumping rate. At that time the cone will stabilize.

The recharge area for the well field is not well defined, but probably totals about 4 mi^2. The 1978 rate of water use from the well field is calculated to be about 1.4 in./mi^2 of recharge basin. The average annual net ground-water recharge rate is about 7.4 in., therefore the well field was withdrawing about 19 percent of the water available annually. As a gross estimate, it can be assumed that the cone will expand to cover about 19 percent of the recharge area. With the data available, it is not known if the cone can expand that far without lowering water levels in the well field below minimum levels required by the present (1978) pumping system. Assuming a pessimistic view that the cone cannot expand far enough, continued pumping from the well field at the present (1978) rate will result in a useful life of the well field, in its present form, of about 15-20 years. The life of the well field can be extended by drilling additional wells, outside the present well field, to increase the area of recharge that can be intercepted. A minimum of interference between wells would probably be realized if any new wells were installed to the northwest or southeast of the present cluster of wells.

Water levels in the well field should be checked at least once a month in order to accurately forecast future problems.

(3) Withdrawals from the tribal well field may have an adverse effect upon flows in Tulalip Creek, by intercepting water that would naturally discharge to the creek as springflow. At the 1978 rate of withdrawal no adverse effect can be clearly identified. With increased withdrawals in the future, some decrease in flow in Tulalip Creek may become apparent.

b. The clay-and-silt unit (unit 6) and the sand-and-gravel unit (unit 7) may underlie much of the area and could prove to be productive.

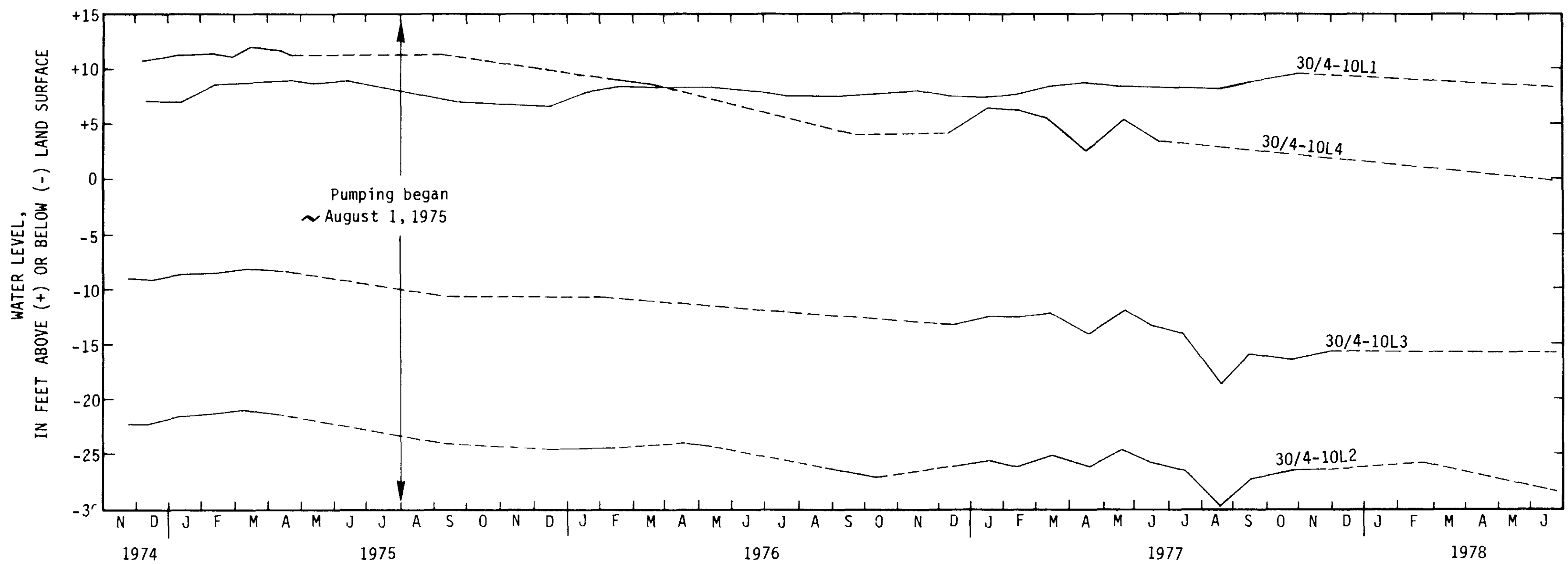


FIGURE 22.--Water-level fluctuations in wells 30/4-10L1-4, in the Tribal well field.

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APPENDIX TABLES 10-17

TABLE 10.--Mean daily discharges at Mission and Tulalip Creek gaging stations during October 1974-September 1977

[All values in cubic feet per second]

EXPLANATION

Gage heights (water level) at continuous-recording gages were automatically recorded once every hour. Manual discharge measurements were made once a month. The daily discharges were calculated by calibrating the recorded gage heights with the measured discharges.

Site 12. Mission Creek near Tulalip (station 12157250). Drainage area = 7.92 mi^2.

	1974			1975								
Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	1.6	5.0	3.0	7.2	5.3	15	7.2	7.2	2.0	2.3	2.5	3.2
2	2.0	4.2	3.4	6.9	5.0	32	7.9	6.9	2.2	2.0	2.0	2.8
3	2.5	3.2	3.7	6.9	5.3	26	8.2	8.9	2.5	1.9	1.8	2.3
4	2.0	2.5	6.6	11	5.0	18	9.2	8.2	2.5	1.8	1.6	2.0
5	1.7	2.5	6.6	16	4.7	14	8.9	7.5	2.5	1.5	1.5	1.9
6	1.6	2.3	5.6	14	4.4	12	8.2	7.2	2.3	1.6	1.4	1.6
7	1.5	4.7	5.0	13	9.6	11	7.5	6.3	2.0	1.5	1.5	1.5
8	1.5	5.9	4.4	14	14	10	6.6	5.9	1.9	1.4	1.5	1.5
9	1.5	4.4	4.7	13	11	16	5.6	5.6	1.9	1.4	1.4	1.5
10	1.5	3.7	5.9	11	9.6	16	5.9	5.6	1.8	1.4	1.4	1.5
11	1.5	3.7	6.6	9.6	11	12	5.9	18	1.9	1.9	1.4	1.5
12	1.5	3.4	5.3	9.9	20	11	5.9	13	2.2	2.0	1.9	1.5
13	1.5	2.7	5.0	11	24	11	5.3	8.2	1.6	2.0	1.8	1.5
14	1.5	2.1	4.4	12	25	11	5.6	6.1	1.4	1.9	1.2	1.5
15	1.5	2.0	4.7	11	18	9.6	5.6	5.0	1.6	2.3	1.3	1.5
16	1.6	2.1	6.3	9.9	17	15	5.3	4.3	1.9	2.3	1.4	1.8
17	1.6	2.7	12	19	14	18	5.6	3.8	3.0	2.3	3.2	1.9
18	1.6	5.0	11	30	18	18	5.3	4.3	3.4	2.5	5.5	1.8
19	1.5	5.3	9.2	20	17	16	7.2	4.3	2.6	2.6	10	1.8
20	2.3	11	9.2	16	37	14	7.2	4.3	2.3	2.3	5.8	1.6
21	3.2	14	22	14	24	12	6.6	3.8	2.3	2.0	3.4	1.4
22	3.0	7.9	17	11	18	14	5.6	3.2	2.0	1.9	3.2	1.5
23	2.3	5.6	10	11	16	12	5.3	3.0	2.3	1.6	9.2	1.6
24	2.0	4.4	7.9	11	17	12	7.9	3.6	2.2	1.6	7.6	1.6
25	2.0	6.3	6.9	9.2	14	11	19	3.4	2.8	1.5	4.8	1.6
26	2.0	6.9	7.5	7.5	12	10	15	3.0	4.1	1.5	3.2	1.6
27	2.1	4.4	17	6.9	11	9.2	11	2.8	5.8	1.4	2.0	1.7
28	3.0	3.7	15	6.6	9.6	8.2	9.6	2.8	5.3	1.5	2.0	1.8
29	3.7	3.2	9.9	6.3	--	7.9	8.5	2.6	3.8	1.9	3.0	2.3
30	3.4	3.0	8.2	5.9	--	7.9	8.2	2.5	3.0	2.0	3.4	2.6
31	3.9	--	7.2	5.6	--	7.5	--	2.2	--	1.8	3.6	--
TOTAL	64.0	137.8	251.2	356.4	391.5	417.3	230.8	173.5	77.1	57.6	95.5	53.9
MEAN	2.06	4.59	8.10	11.5	14.0	13.5	7.69	5.60	2.57	1.86	3.08	1.80
MAX	3.9	14	22	30	37	32	19	18	5.8	2.6	10	3.2
MIN	1.5	2.0	3.0	5.6	4.4	7.5	5.3	2.2	1.4	1.4	1.2	1.4
CFSM	.26	.58	1.02	1.45	1.77	1.70	.97	.71	.32	.23	.39	.23
IN.	.30	.65	1.18	1.67	1.84	1.96	1.08	.81	.36	.27	.45	.25
AC-FT	127	273	498	707	777	828	458	344	153	114	189	107

WTR YR 1975 TOTAL 2306.6 MEAN 6.32 MAX 37 MIN 1.2 CFSM .80 IN 10.83 AC-FT 4580

TABLE 10.--Continued

Site 12. Mission Creek near Tulalip (station 12157250)--continued

Day	1975 Oct	Nov	Dec	1976 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	2.0	4.8	16	9.9	7.9	10	17	6.8	6.7	1.6	1.2	2.3
2	1.8	4.2	19	9.2	7.6	8.5	13	7.4	8.9	1.4	1.2	2.5
3	2.5	4.4	20	8.9	7.3	7.3	11	7.3	8.2	2.1	1.8	2.5
4	3.5	4.2	32	11	7.0	6.7	9.8	6.6	5.5	1.7	2.2	2.2
5	4.5	4.4	24	11	6.4	6.1	8.8	7.6	4.1	1.7	1.9	2.5
6	5.5	8.8	17	11	6.1	5.8	8.2	7.3	2.8	1.7	1.9	4.5
7	4.5	11	17	11	7.3	5.8	7.5	6.0	3.4	1.6	3.2	4.3
8	3.0	8.9	21	12	6.4	5.8	8.3	5.1	3.0	3.0	8.9	3.4
9	3.2	6.7	19	11	6.1	5.5	8.7	4.5	2.8	2.3	6.4	2.5
10	7.6	5.5	16	9.9	5.8	6.2	7.5	4.5	2.6	2.2	2.8	2.3
11	5.8	4.8	14	11	5.5	7.8	9.5	5.7	2.8	1.9	1.5	2.3
12	3.2	4.1	12	11	5.8	6.9	11	6.6	3.0	1.8	1.6	2.3
13	3.0	4.3	12	9.9	6.4	5.7	8.9	5.3	3.4	1.9	1.8	2.5
14	2.8	9.2	12	10	6.7	5.5	7.8	4.8	3.8	1.4	2.2	3.8
15	2.8	16	11	17	6.1	5.0	11	4.3	3.4	1.1	2.6	4.3
16	3.2	15	9.9	35	6.1	4.9	11	4.1	8.9	1.3	6.7	3.4
17	7.9	13	9.2	23	6.4	5.3	9.1	3.6	8.2	1.1	4.8	2.8
18	25	11	8.5	19	6.4	5.4	8.8	3.0	4.6	1.2	3.0	2.6
19	15	7.6	7.6	16	6.4	6.7	13	3.0	3.2	1.3	4.1	2.5
20	8.9	6.1	7.6	13	7.3	7.1	33	2.5	3.3	1.2	9.2	2.0
21	6.3	5.3	7.0	12	6.7	7.1	26	3.0	2.8	1.4	6.1	1.9
22	5.2	5.0	7.3	14	5.8	8.5	20	2.6	2.6	1.4	3.2	2.0
23	4.3	8.2	11	17	5.5	13	16	3.6	2.2	1.5	2.8	2.2
24	3.4	23	16	12	5.8	13	15	3.2	2.1	1.3	3.0	2.3
25	4.2	20	14	11	7.0	17	17	3.8	2.8	1.3	6.1	2.3
26	7.9	18	13	11	8.2	13	13	3.8	2.3	1.2	13	2.5
27	6.6	17	14	11	9.9	11	11	4.1	2.0	1.2	7.0	2.2
28	5.1	13	12	10	13	12	9.8	4.8	1.4	1.1	4.8	2.0
29	5.3	10	12	9.2	12	12	8.5	4.5	1.2	1.2	3.4	2.0
30	7.3	12	14	8.5	--	10	7.6	4.5	1.4	1.4	2.8	1.6
31	6.4	--	12	8.5	--	21	--	4.3	--	1.0	2.5	--
TOTAL	177.7	285.5	437.1	394.0	204.9	265.6	366.8	148.2	113.4	47.5	123.7	78.5
MEAN	5.73	9.52	14.1	12.7	7.07	8.57	12.2	4.78	3.78	1.53	3.99	2.62
MAX	25	23	32	35	13	21	33	7.6	8.9	3.0	13	4.5
MIN	1.8	4.1	7.0	8.5	5.5	4.9	7.5	2.5	1.2	1.0	1.2	1.6
CFSM	.72	1.20	1.78	1.60	.89	1.08	1.54	.60	.48	.19	.50	.33
IN.	.83	1.34	2.05	1.85	.96	1.25	1.72	.70	.53	.22	.58	.37
AC-FT	352	566	867	781	406	527	728	294	225	94	245	156

CAL YR 1975 TOTAL 2753.9 MEAN 7.54 MAX 37 MIN 1.2 CFSM .95 IN 12.93 AC-FT 5460
WTR YR 1976 TOTAL 2642.9 MEAN 7.22 MAX 35 MIN 1.0 CFSM .91 IN 12.41 AC-FT 5240

TABLE 10.--Continued

Site 12. Mission Creek near Tulalip (station 12157250)--continued

Day	1976 Oct	1976 Nov	1976 Dec	1977 Jan	1977 Feb	1977 Mar	1977 Apr	1977 May	1977 Jun	1977 Jul	1977 Aug	1977 Sep
1	1.8	2.9	2.8	3.3	4.1	6.3	10	2.0	16	.34	.39	2.3
2	2.0	2.6	2.8	3.3	4.2	8.5	8.1	2.8	9.1	1.1	.36	1.6
3	2.3	2.3	3.0	3.3	3.9	20	6.0	6.6	5.8	1.1	.68	1.4
4	2.0	2.5	3.0	3.0	3.5	13	5.0	16	5.0	1.7	.33	1.9
5	2.5	2.8	3.0	2.6	3.3	7.8	4.4	15	4.6	1.8	.52	1.4
6	1.8	2.6	4.1	2.1	3.1	6.3	3.9	11	3.5	1.2	.53	.98
7	1.5	3.2	9.6	1.8	3.1	7.4	3.7	6.5	2.8	.75	.45	.79
8	1.7	3.2	8.2	1.6	3.0	9.4	3.7	5.2	2.2	.75	.52	2.7
9	1.7	3.2	5.8	1.4	2.8	13	3.8	3.7	1.9	.72	.41	1.1
10	2.3	3.2	4.3	1.2	3.7	10	3.8	3.4	2.0	.81	.68	.51
11	2.2	3.4	3.8	1.3	3.8	7.3	3.6	13	2.0	.86	.73	.57
12	2.3	3.2	3.6	3.1	3.9	6.4	3.3	14	1.4	1.3	.71	.42
13	1.9	3.0	3.4	5.8	3.7	5.4	4.2	6.9	1.3	1.2	.44	.55
14	2.0	3.0	3.0	7.2	3.5	5.3	4.4	5.7	1.4	1.2	.49	2.7
15	2.0	4.1	3.0	6.2	3.2	6.7	4.3	6.2	1.7	1.2	.31	.95
16	2.1	4.5	3.3	5.3	3.3	6.2	3.5	10	1.6	1.3	.28	.73
17	2.0	4.8	3.2	5.3	3.1	5.2	3.3	11	1.5	1.7	.32	.86
18	1.9	5.0	3.6	7.9	3.2	6.0	3.4	12	1.3	1.4	.33	1.0
19	2.0	4.8	3.4	20	3.1	6.9	3.6	8.4	1.3	1.3	.34	1.2
20	2.2	3.6	3.2	7.5	3.1	5.9	3.2	5.9	1.4	1.0	.42	2.1
21	2.1	3.8	3.0	5.6	4.4	5.2	3.1	4.8	1.2	.85	.45	4.8
22	2.4	3.6	3.2	4.8	4.6	4.6	3.1	4.2	.90	.80	.56	3.9
23	2.3	3.6	8.3	4.4	4.0	4.6	3.2	4.1	1.0	.69	16	5.7
24	2.7	4.1	7.8	4.1	3.7	4.2	3.2	6.0	.75	.67	12	13
25	3.5	5.3	5.7	3.9	3.4	3.9	2.7	5.2	.46	.68	9.3	9.2
26	4.0	3.6	6.6	3.7	3.5	5.1	3.6	5.8	.23	.58	7.5	5.1
27	3.6	3.4	6.3	3.5	3.5	7.6	3.6	4.2	.26	.67	6.0	3.9
28	6.0	3.2	5.1	3.5	4.6	6.9	3.0	3.8	.18	1.3	5.1	3.5
29	7.0	3.0	4.4	3.6	--	5.2	2.7	3.6	.13	2.5	4.0	3.3
30	4.5	2.8	3.9	3.4	--	4.4	2.6	3.5	.17	1.1	3.5	3.2
31	3.3	--	3.6	3.6	--	5.6	--	6.7	--	.44	2.9	--
TOTAL	81.6	104.3	138.0	137.2	100.3	220.3	120.0	217.2	73.08	33.01	76.55	81.36
MEAN	2.63	3.48	4.45	4.43	3.58	7.11	4.00	7.01	2.44	1.06	2.47	2.71
MAX	7.0	5.3	9.6	20	4.6	20	10	16	16	2.5	16	13
MIN	1.5	2.3	2.8	1.2	2.8	3.9	2.6	2.0	.13	.34	.28	.42
CFSM	.33	.44	.56	.56	.45	.90	.51	.89	.31	.13	.31	.34
IN.	.38	.49	.65	.64	.47	1.03	.56	1.02	.34	.16	.36	.38
AC-FT	162	207	274	272	199	437	238	431	145	65	152	161

CAL YR 1976 TOTAL 2066.50 MEAN 5.65 MAX 35 MIN 1.0 CFSM .71 IN 9.71 AC-FT 4100
WTR YR 1977 TOTAL 1382.90 MEAN 3.79 MAX 20 MIN .13 CFSM .48 IN 6.49 AC-FT 2740

TABLE 10.--Continued

Site 20. Tulalip Creek at Tulalip (station 12158040). Drainage area = 15.4 mi^2.

Day	1974 Oct	Nov	Dec	1975 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	5.2	8.3	10	13	15	33	13	10	6.4	6.4	5.9	8.3
2	5.4	6.8	11	12	15	48	13	10	6.1	6.1	6.4	7.3
3	6.0	6.6	12	12	15	37	14	15	6.4	6.1	6.1	6.6
4	5.4	6.3	18	23	14	32	16	12	6.8	6.1	5.9	6.6
5	5.2	6.6	14	21	14	24	16	11	6.8	5.9	5.9	6.4
6	5.2	6.3	13	18	14	22	15	11	6.8	5.4	6.1	6.1
7	5.2	8.9	12	16	24	20	13	11	6.4	5.6	6.6	6.1
8	5.2	8.1	11	18	22	19	12	10	6.1	5.6	6.1	6.4
9	5.2	7.3	12	15	19	29	13	9.7	5.9	5.6	6.6	6.4
10	5.2	8.3	15	13	18	26	13	10	5.9	5.6	6.4	6.1
11	5.2	7.3	14	12	22	22	13	28	5.9	6.8	6.6	6.1
12	5.2	7.1	12	14	34	19	13	14	5.6	6.6	6.4	5.9
13	5.2	7.3	12	17	31	20	13	11	5.4	6.4	6.6	6.1
14	5.2	7.2	12	16	34	19	12	10	6.1	6.4	6.6	6.1
15	5.2	7.2	12	14	27	17	12	8.9	6.1	6.6	6.6	6.4
16	5.2	6.6	15	13	28	26	11	8.1	6.6	6.1	7.3	7.1
17	5.2	7.6	22	27	25	32	11	8.3	7.8	6.6	8.1	7.3
18	5.2	11	16	31	23	31	10	9.2	7.1	6.6	11	6.6
19	5.4	9.2	14	24	30	29	14	8.9	6.6	6.6	12	6.4
20	7.1	19	14	27	48	23	12	8.1	6.4	6.4	8.1	6.4
21	6.3	22	28	25	38	20	11	7.8	6.6	6.1	7.1	6.4
22	5.6	14	16	24	33	23	10	7.8	6.6	5.9	8.3	6.4
23	5.4	12	13	24	31	22	10	8.1	7.1	6.1	12	6.4
24	5.4	12	12	23	34	21	17	7.8	6.8	6.1	10	6.6
25	5.4	15	12	21	29	19	26	7.3	8.3	6.1	7.3	6.6
26	5.6	13	13	20	27	18	17	7.1	10	5.9	7.1	6.6
27	6.1	11	25	19	26	16	15	7.3	26	5.9	6.8	6.6
28	7.1	11	18	19	25	15	13	6.8	11	6.8	7.1	6.6
29	7.3	11	13	18	--	14	12	6.8	8.8	6.6	8.1	6.6
30	6.6	10	12	18	--	14	11	6.6	7.1	6.4	7.3	6.8
31	8.3	--	12	16	--	13	--	6.6	--	6.1	10	--
TOTAL	176.4	294.0	445	583	715	723	401	304.2	225.5	191.5	232.4	196.3
MEAN	5.69	9.80	14.4	18.8	25.5	23.3	13.4	9.81	7.52	6.18	7.50	6.54
MAX	8.3	22	28	31	48	48	26	28	26	6.8	12	8.3
MIN	5.2	6.3	10	12	14	13	10	6.6	5.4	5.4	5.9	5.9
CFSM	.37	.64	.94	1.22	1.66	1.51	.87	.64	.49	.40	.49	.42
IN.	.43	.71	1.07	1.41	1.73	1.75	.97	.73	.54	.46	.56	.47
AC-FT	350	583	883	1160	1420	1430	795	603	447	380	461	389

WTR YR 1975 TOTAL 4487.3 MEAN 12.3 MAX 48 MIN 5.2 CFSM .80 IN 10.84 AC-FT 8900

Note.--No gage height record Mar 5 to Apr 9.

TABLE 10.--Continued

Site 20. Tulalip Creek at Tulalip (station 12158040)--continued

Day	1975 Oct	1975 Nov	1975 Dec	1976 Jan	1976 Feb	1976 Mar	1976 Apr	1976 May	1976 Jun	1976 Jul	1976 Aug	1976 Sep
1	6.7	7.1	20	19	20	19	39	16	18	5.9	5.2	6.3
2	6.7	7.4	26	18	29	17	34	15	14	5.9	5.2	6.7
3	7.4	9.1	21	18	19	16	31	12	10	6.3	7.4	6.3
4	9.1	7.1	37	22	17	15	28	10	7.8	7.1	7.8	6.3
5	10	8.2	38	24	16	15	27	13	7.1	6.3	6.7	7.8
6	15	20	35	22	16	14	25	10	7.1	5.5	6.7	11
7	7.1	15	40	22	16	14	24	9.1	6.7	5.9	9.5	8.2
8	6.7	12	46	25	17	14	25	8.6	6.3	7.8	14	7.1
9	9.1	10	40	21	16	14	25	7.8	6.3	5.9	9.1	6.3
10	10	8.2	36	21	15	16	22	8.2	6.3	6.3	7.8	5.9
11	7.4	9.1	33	21	15	18	30	11	6.7	5.9	6.7	5.5
12	6.7	7.4	30	21	15	15	26	8.6	7.8	6.3	6.3	5.9
13	6.7	7.8	31	19	17	14	22	8.2	8.2	6.3	6.7	5.5
14	6.3	18	29	23	17	14	22	7.8	6.7	5.5	7.8	10
15	8.6	28	28	39	16	13	28	7.4	9.5	5.5	9.1	8.6
16	10	19	27	50	16	13	27	7.1	18	5.2	16	7.1
17	21	16	25	41	16	14	22	6.7	11	5.5	9.1	6.7
18	38	12	23	37	16	14	21	6.3	7.8	5.2	7.1	6.7
19	14	9.1	22	32	16	18	24	6.3	8.6	5.2	12	6.7
20	13	8.2	21	29	18	16	52	6.7	8.6	5.5	21	6.7
21	10	7.4	21	26	16	14	38	6.3	6.7	5.9	10	7.1
22	8.6	8.2	21	32	15	20	31	6.3	7.4	6.3	7.4	7.1
23	7.4	16	30	33	15	28	27	6.7	6.7	6.3	7.4	7.4
24	6.7	34	34	28	16	28	28	7.1	7.1	5.5	7.8	7.8
25	12	19	25	27	18	27	30	8.2	7.4	5.2	14	7.4
26	16	25	28	25	20	22	24	7.1	6.3	5.2	17	6.7
27	9.5	18	28	25	24	20	22	9.5	5.9	5.2	10	6.3
28	8.2	12	24	24	27	22	20	11	5.9	5.2	8.6	5.9
29	11	10	24	22	22	21	19	8.2	5.5	5.5	7.4	5.9
30	11	17	25	21	--	19	17	9.1	5.9	5.9	7.1	5.5
31	9.1	--	21	20	--	43	--	8.6	--	5.9	6.7	--
TOTAL	329.0	405.3	889	807	506	567	810	273.9	247.3	181.1	284.6	208.4
MEAN	10.6	13.5	28.7	26.0	17.4	18.3	27.0	8.84	8.24	5.84	9.18	6.95
MAX	38	34	46	50	27	43	52	16	18	7.8	21	11
MIN	6.3	7.1	20	18	15	13	17	6.3	5.5	5.2	5.2	5.5
CFSM	.69	.88	1.86	1.69	1.13	1.19	1.75	.57	.54	.38	.60	.45
IN.	.79	.98	2.15	1.95	1.22	1.37	1.96	.66	.60	.44	.69	.50
AC-FT	653	804	1760	1600	1000	1120	1610	543	491	359	565	413

CAL YR 1975 TOTAL 5195.2 MEAN 14.2 MAX 48 MIN 5.4 CFSM .92 IN 12.55 AC-FT 10300
WTR YR 1976 TOTAL 5508.6 MEAN 15.1 MAX 52 MIN 5.2 CFSM .98 IN 13.31 AC-FT 10930

Site 20. Tulalip Creek at Tulalip (station 12158040)--continued

	1976			1977								
Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	5.9	7.8	6.7	6.7	7.8	13	22	6.6	27	6.8	7.7	6.4
2	7.4	7.8	6.7	6.7	7.4	15	13	8.9	14	11	5.4	6.5
3	7.8	7.1	7.1	6.7	7.1	28	11	15	11	7.8	4.3	7.2
4	6.7	7.4	6.7	6.7	6.7	15	10	24	11	7.4	4.1	7.3
5	6.7	7.8	6.7	6.3	6.4	11	10	23	10	5.9	4.6	6.9
6	6.3	7.8	8.6	6.1	6.3	10	9.5	12	9.5	5.9	4.3	6.1
7	5.5	7.8	19	6.0	6.2	12	8.6	9.1	8.5	5.5	4.4	5.8
8	5.9	7.8	14	5.8	6.0	16	8.6	7.9	7.7	5.7	4.3	5.8
9	6.3	7.8	10	5.6	5.8	22	9.1	7.3	7.3	5.4	4.6	5.4
10	7.4	7.8	8.6	5.4	7.7	13	8.2	7.6	6.7	5.7	4.2	5.4
11	7.1	8.2	8.2	5.8	8.5	11	8.2	22	6.4	6.0	4.3	5.4
12	6.7	7.8	7.8	11	9.1	10	7.8	14	6.3	7.1	3.7	5.3
13	6.3	7.8	7.4	11	8.1	10	8.2	9.6	6.3	6.2	4.0	5.3
14	5.9	7.8	7.4	13	7.9	10	7.4	9.5	6.4	5.8	4.0	5.4
15	6.3	11	7.1	11	7.6	12	7.4	15	6.5	5.6	4.4	5.5
16	7.1	10	7.4	10	7.3	11	7.1	21	6.4	6.4	4.5	5.7
17	6.7	11	8.2	11	7.1	10	7.4	17	6.5	8.3	4.2	5.5
18	6.7	11	9.1	16	7.1	11	8.6	16	6.0	6.1	4.2	5.6
19	6.7	9.5	7.8	13	7.1	14	7.8	13	6.1	5.7	4.6	6.0
20	7.1	9.5	7.1	10	7.4	12	7.4	10	6.5	5.6	4.7	6.6
21	6.7	9.5	7.4	8.2	10	11	7.1	9.8	6.6	5.6	4.8	9.3
22	7.4	9.1	7.4	7.4	9.1	11	7.1	9.6	6.9	5.6	5.1	6.9
23	7.1	8.6	16	7.4	8.2	10	9.1	11	6.3	5.6	9.9	11
24	8.6	10	12	7.1	7.4	10	12	14	6.1	5.4	16	22
25	12	13	10	6.7	7.4	9.5	13	11	6.5	5.3	13	11
26	13	10	13	6.3	8.2	13	39	12	6.2	5.4	14	7.7
27	10	7.1	11	6.3	7.8	16	15	9.7	6.0	5.3	9.8	6.5
28	15	6.7	8.6	6.3	11	12	10	9.0	6.3	5.3	8.4	8.2
29	15	6.7	7.8	6.7	--	11	8.8	8.3	6.8	6.4	9.2	9.1
30	11	6.7	8.6	6.7	--	10	7.6	8.0	6.7	6.0	9.5	7.4
31	8.2	--	7.1	7.1	--	15	--	18	--	5.4	7.3	--
TOTAL	246.5	257.9	280.5	250.0	213.7	394.5	316.0	388.9	240.5	191.2	197.5	218.2
MEAN	7.95	8.60	9.05	8.06	7.63	12.7	10.5	12.5	8.02	6.17	6.37	7.27
MAX	15	13	19	16	11	28	39	24	27	11	16	22
MIN	5.5	6.7	6.7	5.4	5.8	9.5	7.1	6.6	6.0	5.3	3.7	5.3
CFSM	.52	.56	.59	.52	.50	.83	.68	.81	.52	.40	.41	.47
IN.	.60	.62	.68	.60	.52	.95	.76	.94	.58	.46	.48	.53
AC-FT	489	512	556	496	424	782	627	771	477	379	392	433

CAL YR 1976 TOTAL 4670.2 MEAN 12.8 MAX 52 MIN 5.2 CFSM .83 IN 11.28 AC-FT 9260
WTR YR 1977 TOTAL 3195.4 MEAN 8.75 MAX 39 MIN 3.7 CFSM .57 IN 7.72 AC-FT 6340

CFSM - cubic feet per second per square mile [$(ft^3/s)/mi^2$] of basin area.
IN. - inches of water if spread evenly over the entire basin.
AC-FT - acre-feet of water.
CAL YR - calendar year.
WTR YR - Water year.

TABLE 11.--Daily maximum and minimum water temperatures at Mission and Tulalip Creek gaging stations during October 1974-September 1976

[All values in degrees Celsius]

Site 12. Mission Creek near Tulalip (station 12157250)

	1974						1975					
	October		November		December		January		February		March	
Day	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
1	--	--	8.5	8.5	--	--	4.0	3.0	2.0	1.0	8.0	6.5
2	--	--	8.5	6.5	6.0	5.0	4.0	3.5	3.0	2.0	8.5	8.0
3	--	--	6.5	6.5	6.5	6.0	4.5	4.0	3.5	3.0	--	--
4	--	--	8.0	6.5	7.0	6.5	5.0	4.5	3.5	3.0	--	--
5	--	--	8.5	8.0	8.0	7.0	5.0	4.0	3.0	2.0	--	--
6	--	--	9.0	8.5	7.0	6.5	4.5	4.5	3.0	1.5	5.5	4.0
7	--	--	--	--	6.5	6.5	4.5	4.0	3.5	3.0	6.5	3.5
8	--	--	--	--	6.5	6.0	4.5	3.5	3.5	2.0	8.0	5.5
9	--	--	--	--	7.0	6.5	3.5	2.0	4.5	3.0	8.0	6.0
10	--	--	--	--	7.0	6.5	2.0	2.0	4.5	4.5	6.5	5.5
11	--	--	--	--	7.0	6.0	2.0	1.0	4.5	3.5	6.5	4.5
12	--	--	--	--	6.0	5.5	3.5	1.0	6.5	3.5	6.0	5.5
13	--	--	----	--	5.5	5.0	3.5	3.5	6.0	5.0	6.5	5.5
14	--	--	--	--	5.5	5.5	3.5	3.5	5.0	3.5	6.0	5.5
15	--	--	--	--	6.0	5.5	4.0	3.5	3.5	3.0	6.5	5.5
16	9.0	8.0	--	--	8.0	6.0	5.0	4.0	4.0	3.0	7.0	5.5
17	9.0	8.0	--	--	8.0	6.5	6.5	5.0	4.5	3.5	6.5	6.0
18	9.0	8.0	--	--	6.5	6.0	6.5	6.5	5.5	4.5	6.5	6.0
19	9.0	8.0	--	--	6.5	6.0	6.5	6.0	5.5	5.0	8.0	6.0
20	9.5	9.0	--	--	8.0	6.5	6.0	5.0	5.5	3.5	8.0	6.5
21	9.0	8.0	--	--	8.5	6.0	5.0	4.0	3.5	2.0	6.5	6.5
22	8.0	7.0	--	--	6.0	4.5	5.0	4.5	5.5	3.5	7.0	5.5
23	7.0	6.5	--	--	4.5	3.0	6.5	4.5	6.0	4.5	8.0	6.5
24	7.0	6.5	--	--	3.5	3.0	6.5	5.5	6.5	5.0	8.0	5.5
25	6.5	6.0	--	--	4.5	3.5	6.0	5.5	5.5	3.5	8.0	4.5
26	8.5	6.5	--	--	4.5	4.0	5.5	3.5	5.5	4.0	7.0	5.0
27	9.0	8.5	--	--	4.5	3.5	3.5	2.0	5.5	4.5	6.5	4.0
28	9.0	8.5	--	--	3.5	3.0	3.0	2.0	6.5	5.5	8.0	4.5
29	9.0	8.0	--	--	4.0	3.5	2.0	1.5	--	--	8.0	5.5
30	8.0	8.0	--	--	4.0	3.5	2.0	2.0	--	--	9.0	6.5
31	9.0	8.0	--	--	4.0	2.0	2.0	1.5	--	--	9.5	6.0
MONTH	--	--	--	--	8.5	2.0	6.5	1.0	6.5	1.0	9.5	3.5

TABLE 11.--Continued

Site 12. Mission Creek near Tulalip (station 12157250)--continued

1975

	April		May		June		July		August		September	
	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
1	9.0	5.5	14.5	10.0	20.0	15.5	18.5	15.0	17.0	16.0	15.0	14.5
2	8.0	6.5	13.5	11.0	19.5	16.0	18.5	15.5	18.0	15.5	15.0	14.0
3	8.5	5.5	11.0	10.0	16.5	14.5	18.5	15.5	19.0	16.5	14.5	13.5
4	8.0	6.0	11.0	9.5	15.5	14.5	20.5	15.5	19.5	16.0	15.0	13.0
5	8.5	5.5	11.0	9.5	16.5	14.5	21.0	17.0	18.5	16.5	15.5	13.5
6	10.0	5.0	11.5	10.0	17.0	14.5	21.0	18.5	18.0	15.0	16.0	14.0
7	10.0	6.0	14.5	9.5	16.5	14.0	21.0	18.5	16.0	15.5	15.0	14.5
8	11.0	6.0	15.5	10.0	16.0	13.5	20.5	19.0	17.0	15.0	15.5	14.5
9	11.0	8.0	16.5	11.5	18.0	13.0	20.5	18.5	17.0	14.0	15.5	14.0
10	12.0	7.0	15.5	13.5	18.0	15.0	20.0	18.5	17.0	15.0	15.5	13.5
11	13.0	5.0	14.5	13.0	19.5	15.0	19.0	18.0	18.0	14.5	15.5	13.5
12	11.5	8.5	16.0	12.0	20.0	15.5	18.5	16.0	18.0	14.5	16.0	13.5
13	10.0	9.0	16.5	11.5	18.5	16.5	19.0	16.0	18.0	15.0	16.0	14.0
14	10.5	7.0	16.5	13.0	17.0	16.0	18.5	16.5	18.5	15.0	15.5	14.0
15	11.0	8.5	15.5	13.5	16.0	14.5	19.0	16.5	17.0	15.5	14.5	14.0
16	10.5	10.0	15.5	13.0	14.5	13.5	18.0	16.5	16.0	15.0	14.0	13.5
17	10.5	9.0	16.0	13.0	14.5	13.0	17.0	16.0	18.0	15.5	14.5	13.5
18	10.5	9.5	15.0	12.0	15.5	13.0	17.0	16.0	17.0	16.0	14.0	11.5
19	10.0	9.0	13.0	10.5	17.0	14.0	18.5	16.0	16.0	15.5	13.5	11.0
20	11.0	8.0	15.0	9.5	16.5	15.0	18.5	16.0	17.0	15.5	13.5	11.0
21	12.0	7.0	14.5	11.0	15.0	14.5	19.0	15.5	17.0	16.0	13.5	11.0
22	10.5	9.0	14.0	12.0	15.0	13.5	19.0	15.5	16.0	14.5	14.0	11.5
23	11.0	9.0	13.5	11.5	18.0	14.0	19.5	15.5	14.5	14.0	13.5	12.0
24	10.0	9.0	14.5	13.0	16.5	14.5	19.5	16.5	14.5	14.0	14.0	12.0
25	9.5	8.5	15.5	10.5	14.5	14.0	20.5	17.0	15.5	14.0	14.0	13.0
26	9.5	8.0	15.0	13.0	15.5	13.0	20.5	16.5	16.5	15.0	13.5	11.5
27	10.5	8.0	16.0	12.0	14.5	13.5	21.0	17.0	16.5	16.0	13.0	11.0
28	12.0	8.5	16.5	13.0	14.5	13.5	19.0	17.0	16.0	15.5	13.0	11.5
29	13.5	8.5	18.0	14.0	16.5	12.0	17.0	16.0	15.5	14.5	13.0	11.0
30	14.0	9.0	19.0	14.5	18.5	13.5	18.0	15.5	16.0	15.0	12.0	11.0
31	--	--	19.5	14.5	--	--	18.0	15.5	16.0	15.0	--	--
MONTH	14.0	5.0	19.5	9.5	20.0	12.0	21.0	15.0	19.5	14.0	16.0	11.0

1975 water year	Max	Min
	21.0	1.0

TABLE 11.--Continued

Site 12. Mission Creek near Tulalip (station 12157250)--continued

	1975						1976					
	October		November		December		January		February		March	
Day	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
1	12.0	10.5	9.0	8.5	3.5	2.0	3.0	1.5	5.0	4.5	4.0	3.0
2	13.0	11.5	9.5	9.0	7.0	3.5	1.5	1.5	4.5	4.5	3.5	2.0
3	13.5	13.0	11.0	9.5	8.5	7.0	3.0	1.5	5.0	4.5	3.0	1.5
4	13.0	12.0	11.5	10.5	8.5	6.0	4.5	3.0	4.5	3.0	3.0	1.5
5	13.0	12.0	11.0	10.0	6.0	4.5	5.0	4.5	3.0	1.0	3.0	1.5
6	12.0	11.0	10.0	9.0	4.5	3.0	4.5	4.5	1.5	0.5	4.0	1.5
7	11.0	10.5	9.0	8.0	4.0	3.0	4.5	4.5	2.0	1.0	4.5	3.5
8	11.0	10.5	8.0	6.5	6.0	4.0	5.0	4.5	3.0	1.5	4.5	3.0
9	11.5	11.0	6.5	6.0	7.0	6.0	5.0	5.0	3.5	2.0	5.5	4.0
10	12.0	11.0	6.0	6.0	6.5	5.0	5.0	5.0	4.0	3.0	5.5	5.0
11	11.0	10.5	6.5	6.0	5.0	4.0	5.0	3.5	4.5	4.0	5.5	4.0
12	11.0	10.0	6.5	6.0	4.0	2.0	4.5	4.0	5.0	4.5	5.0	4.0
13	11.0	10.5	7.0	6.5	2.0	1.5	4.0	3.5	6.0	4.5	5.5	4.0
14	11.0	10.5	9.0	7.0	--	--	5.0	4.0	6.0	5.5	6.0	4.5
15	11.5	11.0	9.0	8.0	--	--	6.5	5.0	5.5	5.0	6.0	4.0
16	11.5	11.0	8.0	6.5	--	--	8.0	6.5	6.0	5.0	7.0	5.0
17	11.5	11.0	6.5	5.0	--	--	8.0	7.0	6.0	5.5	8.0	6.5
18	11.0	10.5	5.0	3.5	1.0	1.0	7.0	6.0	5.5	5.0	8.5	7.0
19	11.0	10.5	3.5	3.0	1.0	0.5	6.0	4.0	5.5	4.5	8.0	6.5
20	11.0	10.5	3.5	3.0	1.0	1.0	4.0	3.0	5.0	4.0	8.0	6.0
21	10.5	10.0	4.5	3.0	1.0	0.5	3.0	2.0	5.0	4.0	8.0	6.5
22	10.0	9.5	5.0	4.5	2.0	1.0	4.0	3.0	6.0	4.0	7.0	6.0
23	9.5	8.5	6.5	5.0	3.5	2.0	4.5	4.0	6.0	5.5	6.0	6.0
24	8.5	7.0	8.0	6.5	5.0	3.5	4.0	3.5	6.0	5.0	6.5	6.0
25	8.0	8.0	6.5	6.0	5.0	4.5	4.0	3.5	5.5	4.5	7.0	5.5
26	8.0	7.0	6.5	6.0	6.5	5.0	4.5	3.5	5.5	4.5	8.0	6.0
27	8.5	8.0	6.5	5.0	6.0	5.0	6.0	4.5	5.0	4.5	7.0	6.0
28	8.5	8.0	5.0	3.0	5.5	5.0	7.0	5.5	4.5	4.0	8.0	6.0
29	8.5	8.0	3.0	0.5	6.5	5.5	6.5	6.0	4.0	3.5	7.0	6.0
30	9.0	8.5	2.0	1.0	6.5	5.0	6.5	6.0	--	--	8.5	6.5
31	8.5	8.5	--	--	5.0	3.0	6.0	5.0	--	--	8.0	6.5
MONTH	13.5	7.0	11.5	0.5	8.5	0.5	8.0	1.5	6.0	0.5	8.5	1.5

TABLE 11.--Continued

Site 12. Mission Creek near Tulalip (station 12157250)--continued

1976

	April		May		June		July		August		September	
	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
1	9.0	5.5	16.5	13.5	14.0	10.5	18.0	15.5	18.5	15.5	16.0	15.5
2	9.5	6.0	15.0	13.0	14.0	11.0	19.0	14.5	19.0	15.5	16.5	14.5
3	10.5	7.0	14.0	12.0	16.0	11.5	17.0	16.0	18.5	16.5	16.0	14.5
4	11.0	8.0	13.0	11.5	15.0	13.0	18.5	16.0	17.0	16.0	16.0	15.0
5	11.0	8.0	14.0	11.0	16.5	13.0	20.5	16.5	17.0	16.0	16.0	15.5
6	11.0	9.0	14.5	11.0	16.0	14.0	20.0	18.5	17.0	16.0	15.5	14.0
7	10.0	8.0	16.0	11.0	16.0	14.0	19.5	18.0	16.5	15.5	15.0	13.5
8	10.0	9.5	17.0	13.0	16.0	14.5	19.5	17.0	16.0	15.5	14.5	12.0
9	12.0	9.0	18.0	13.0	16.5	14.5	19.0	17.0	17.0	15.5	14.0	12.0
10	13.5	10.0	18.0	14.0	15.5	15.0	18.0	15.5	17.0	15.0	13.5	12.0
11	12.0	10.5	15.5	13.0	15.0	13.5	18.0	16.0	17.0	15.0	13.5	12.0
12	10.5	9.0	15.0	12.0	14.0	13.0	17.0	16.0	17.0	15.5	14.5	13.0
13	11.5	8.5	14.5	12.0	14.5	12.0	18.5	15.0	16.5	15.5	14.5	13.0
14	9.5	8.0	14.5	10.5	16.5	12.0	19.5	15.5	17.0	15.5	14.5	14.0
15	8.0	6.5	16.5	11.0	16.0	14.5	20.0	15.5	17.0	15.5	14.0	12.0
16	10.0	6.5	16.0	13.0	15.0	13.5	20.0	16.5	16.0	15.0	13.5	12.0
17	9.0	8.0	14.5	12.0	18.5	13.5	19.0	16.0	16.5	14.5	14.5	13.5
18	10.0	7.0	15.0	11.5	19.5	15.0	19.0	15.0	16.5	15.0	14.5	13.5
19	10.5	8.5	15.0	13.0	19.0	15.5	19.0	15.0	16.0	14.5	14.5	13.5
20	10.5	8.5	14.5	13.5	17.0	14.0	19.5	17.0	16.0	14.5	15.0	13.5
21	11.0	8.5	16.0	12.0	17.0	15.0	18.5	16.5	16.5	14.0	14.5	13.5
22	11.5	9.0	15.0	13.5	17.0	15.0	17.0	15.0	15.5	14.5	15.0	14.5
23	10.5	9.5	15.0	13.0	16.0	14.5	19.0	15.0	15.5	15.0	15.0	14.5
24	10.0	9.0	14.5	13.0	15.0	13.5	19.5	16.5	16.5	15.0	14.5	13.5
25	11.5	8.5	14.5	11.5	15.5	13.0	19.5	15.5	16.5	14.5	14.5	13.5
26	13.0	9.0	15.0	13.0	17.0	13.5	18.0	16.0	15.5	14.0	14.5	13.5
27	14.0	9.5	15.0	12.0	18.0	14.0	18.5	14.0	15.5	14.5	14.5	13.5
28	14.5	10.5	13.0	11.0	19.0	15.0	18.5	14.0	17.0	15.5	15.0	13.5
29	15.0	11.0	13.0	11.5	17.0	16.0	18.0	16.0	16.5	15.5	14.5	13.5
30	15.5	12.0	13.0	10.5	18.0	15.5	19.0	15.0	16.5	15.0	14.0	12.0
31	--	--	12.0	11.0	--	--	19.5	16.5	16.5	15.5	--	--
MONTH	15.5	5.5	18.0	10.5	19.5	10.5	20.5	14.0	19.0	14.0	16.5	12.0

1976 water year	Max	Min
	20.5	0.5

TABLE 11.--Continued

Site 20. Tulalip Creek at Tulalip (station 12158040)

	1974						1975					
	October		November		December		January		February		March	
Day	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
1	--	--	9.0	8.5	6.0	4.5	5.0	4.5	2.5	1.5	8.5	7.0
2	--	--	9.5	7.0	7.5	6.0	5.0	4.5	3.5	2.5	9.5	7.5
3	--	--	7.0	6.5	7.5	6.0	5.0	4.5	4.5	3.5	9.0	5.5
4	--	--	8.0	7.0	8.0	7.5	4.5	4.0	4.0	3.0	7.5	3.5
5	--	--	9.5	8.0	8.5	7.0	--	--	3.0	2.0	7.5	3.0
6	--	--	10.0	9.5	7.0	6.0	--	--	3.0	1.5	7.0	2.5
7	--	--	10.0	9.0	7.5	6.0	--	--	3.5	3.0	8.0	3.0
8	--	--	9.0	8.0	7.5	6.0	--	--	3.5	2.0	9.5	7.0
9	--	--	9.5	8.5	6.0	5.5	3.0	2.5	5.0	3.0	9.0	7.0
10	--	--	9.0	8.0	5.5	5.0	2.5	2.0	4.5	3.5	7.0	4.5
11	--	--	8.5	8.0	5.5	5.0	2.0	2.0	3.5	2.5	8.5	3.5
12	--	--	10.0	8.5	7.0	5.5	3.0	2.0	7.0	3.5	6.5	5.5
13	--	--	10.5	9.0	8.0	7.0	3.5	3.0	6.5	5.0	8.5	5.0
14	--	--	9.0	8.5	7.5	6.5	4.0	3.5	5.0	3.0	7.5	6.0
15	--	--	9.0	8.5	6.5	6.5	4.0	3.0	3.0	2.5	7.0	6.0
16	9.5	--	9.0	8.0	7.0	6.5	5.5	4.0	4.5	3.0	7.5	5.5
17	9.0	7.5	8.0	7.5	8.5	7.0	7.0	5.5	4.5	3.5	7.5	5.5
18	9.0	8.0	8.5	7.5	8.0	5.5	7.5	7.0	5.0	4.5	7.5	6.5
19	9.5	8.0	8.0	8.0	5.5	2.5	7.0	6.0	5.5	5.0	8.5	6.5
20	10.5	9.5	9.5	8.0	3.0	2.5	6.5	5.0	5.0	3.0	8.5	6.5
21	10.0	9.0	9.5	8.0	3.5	2.5	5.0	3.5	4.5	1.5	7.5	6.0
22	9.0	7.5	8.0	7.0	5.0	3.5	4.5	4.5	6.5	3.0	9.0	5.0
23	8.0	7.0	8.0	7.0	4.5	3.0	7.0	4.5	6.5	4.5	8.5	6.5
24	7.5	6.5	9.0	7.5	3.5	3.0	6.0	6.0	6.5	4.0	8.0	5.5
25	7.5	6.5	9.0	6.5	3.0	3.0	6.0	5.0	5.5	2.5	8.5	4.5
26	8.5	7.0	6.5	5.5	3.5	3.0	5.0	3.0	5.5	4.0	9.0	5.5
27	9.5	8.0	6.5	5.0	4.5	3.0	3.0	1.5	6.0	5.0	9.0	4.0
28	9.5	9.0	5.0	3.5	3.0	2.5	2.5	2.0	7.5	6.0	10.5	5.0
29	9.0	8.5	9.5	3.5	4.0	2.5	3.0	1.5	--	--	10.5	7.0
30	8.5	7.5	5.0	3.0	4.5	4.0	2.5	2.5	--	--	12.5	8.0
31	9.0	8.5	--	--	5.0	4.0	2.5	2.0	--	--	12.5	6.5
MONTH	--	--	10.5	3.0	8.5	2.5	7.5	1.5	7.5	1.5	12.5	2.5

TABLE 11.--Continued

Site 20. Tulalip Creek at Tulalip (station 12158040)--continued

1975

	April		May		June		July		August		September	
	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
1	10.5	6.0	17.0	9.5	21.5	15.0	--	--	18.0	15.0	15.0	13.0
2	9.5	8.0	13.0	10.5	18.0	15.5	--	--	18.5	14.5	15.0	12.5
3	8.5	6.0	11.5	9.0	16.5	13.5	--	--	19.5	15.5	15.0	11.5
4	8.5	7.0	12.0	8.5	15.0	13.5	--	--	20.0	15.0	16.0	11.0
5	10.5	6.0	11.5	9.0	16.5	13.5	--	--	18.0	16.0	16.5	12.0
6	12.0	6.0	13.5	9.5	18.0	13.0	--	--	18.0	13.5	17.0	12.5
7	13.0	7.0	17.0	8.5	17.0	12.5	--	--	15.0	14.0	15.0	14.0
8	11.5	7.0	18.0	9.5	16.5	11.5	--	--	17.5	13.5	16.0	13.0
9	12.5	9.0	20.0	11.5	19.0	11.0	--	--	17.5	12.5	16.0	12.5
10	14.0	7.0	17.5	13.5	17.5	13.0	--	--	17.0	14.0	16.0	12.0
11	14.5	7.5	15.5	12.5	20.5	13.0	18.0	16.0	18.0	13.0	16.5	12.0
12	13.0	8.5	18.0	11.5	21.0	14.0	--	15.0	18.5	13.0	17.0	12.5
13	11.0	9.0	19.0	11.5	17.5	15.0	--	14.5	19.0	13.5	17.0	11.5
14	11.0	6.5	19.0	13.0	17.5	15.0	17.0	15.0	19.0	14.0	16.0	13.0
15	12.0	8.0	16.5	13.5	15.5	13.5	19.5	15.5	18.0	15.0	14.5	13.0
16	11.0	9.0	17.5	13.0	13.5	12.5	17.0	15.5	17.0	15.0	13.5	13.0
17	11.0	8.5	17.5	12.5	15.0	11.5	17.0	15.0	19.0	15.0	14.5	12.5
18	11.0	9.0	14.5	11.5	15.5	11.0	17.0	14.5	18.0	15.5	14.5	10.5
19	10.5	9.0	13.5	10.0	18.5	12.5	20.0	14.5	16.0	15.0	14.5	10.5
20	12.5	7.0	17.0	9.0	15.0	13.5	19.0	14.5	17.5	14.0	14.5	10.5
21	14.0	6.5	14.5	10.5	14.0	12.5	19.0	13.5	17.0	15.0	14.5	10.5
22	12.0	8.0	15.5	11.5	17.0	12.0	19.5	14.0	15.5	13.5	15.0	11.0
23	12.5	8.5	14.0	10.0	20.0	12.0	20.0	14.0	14.0	13.0	13.5	12.0
24	10.5	9.0	16.0	9.5	14.5	12.0	19.5	15.0	14.0	13.0	14.0	11.5
25	10.5	8.0	17.0	9.5	14.0	12.0	--	16.5	16.0	12.5	14.0	12.0
26	10.5	7.0	14.0	11.5	15.0	11.5	21.5	15.5	18.0	14.0	14.0	11.0
27	12.0	7.5	18.0	12.0	17.0	11.5	21.5	16.0	16.5	15.5	13.5	10.5
28	14.5	8.5	19.0	12.0	--	--	19.0	16.0	15.5	14.5	12.5	11.0
29	15.5	7.5	20.0	12.5	--	--	18.0	15.0	16.0	14.0	13.0	10.0
30	16.5	8.5	21.0	13.5	--	--	18.5	14.0	16.0	14.0	13.0	10.0
31	--	--	21.0	14.0	--	--	18.5	14.0	16.5	14.0	--	--
MONTH	16.5	6.0	21.0	8.5	21.5	11.0	--	--	20.0	12.5	17.0	10.0

1975 water year	Max	Min
	21.5	1.5

TABLE 11.--Continued

Site 20. Tulalip Creek at Tulalip (station 12158040)--continued

	1975						1976					
	October		November		December		January		February		March	
Day	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
1	13.5	10.0	9.0	8.0	5.0	1.5	2.5	1.5	4.5	4.0	5.5	3.0
2	13.5	11.5	9.5	8.5	8.0	5.0	2.0	1.5	4.5	4.5	4.5	1.5
3	13.0	12.5	13.0	9.5	8.5	8.0	3.5	2.0	6.0	4.0	3.5	0.5
4	13.5	11.0	12.5	11.0	8.0	5.0	5.5	3.5	4.0	1.0	4.0	1.0
5	13.5	11.0	12.0	9.0	5.0	2.0	5.5	5.0	2.0	0.0	5.0	1.0
6	12.0	10.0	9.0	8.0	2.5	2.0	5.0	4.5	2.0	0.0	5.5	1.5
7	10.0	9.0	8.0	7.0	5.0	2.5	5.0	4.5	3.0	1.0	6.0	3.0
8	11.5	9.5	7.0	6.0	7.0	5.0	6.0	5.0	3.5	2.0	6.5	2.5
9	11.0	10.5	6.5	5.5	7.0	6.0	5.0	4.5	4.0	2.5	6.5	4.5
10	12.0	10.5	6.0	5.0	6.0	4.0	5.0	4.5	4.0	3.0	6.0	5.0
11	11.0	10.0	6.0	5.0	--	--	5.0	4.0	4.5	4.0	8.0	3.0
12	10.0	9.0	6.5	6.0	--	--	4.0	3.0	6.0	4.5	4.5	3.5
13	11.0	10.0	7.5	6.0	--	--	3.0	3.0	7.5	4.0	6.0	3.5
14	10.5	10.0	9.5	7.5	--	--	5.0	3.0	6.0	5.0	8.5	4.0
15	12.0	10.0	8.0	7.0	--	--	7.0	5.0	5.0	4.5	7.5	3.5
16	11.0	10.0	7.0	6.0	--	--	8.0	7.0	6.5	5.0	9.0	5.0
17	12.0	11.0	6.0	3.5	--	--	7.5	6.5	6.0	5.0	9.0	6.5
18	11.0	9.5	3.5	2.0	1.5	0.5	6.5	5.0	5.5	4.5	10.0	7.0
19	11.0	10.0	2.0	1.5	1.5	0.5	5.0	3.5	5.0	3.5	8.0	7.0
20	11.0	9.5	3.0	2.0	1.5	1.0	4.0	2.5	6.0	3.0	7.5	5.0
21	10.0	9.0	4.5	2.5	2.0	0.5	3.5	1.5	5.0	3.0	8.0	6.0
22	9.5	8.5	5.0	4.0	3.5	2.0	4.0	3.5	7.5	3.5	7.0	5.0
23	9.0	7.0	7.0	5.0	4.0	3.5	5.0	3.0	7.0	6.0	6.0	5.0
24	7.0	5.5	8.0	5.5	6.5	4.0	3.0	2.5	6.0	4.5	6.5	5.0
25	7.5	7.0	6.0	4.0	6.0	5.0	4.0	3.0	6.5	4.0	9.0	4.5
26	7.0	7.0	6.5	6.0	8.0	5.5	5.0	4.0	6.0	3.5	8.5	5.5
27	8.0	7.0	6.5	3.5	6.5	4.5	7.0	5.0	5.5	3.5	8.0	5.5
28	8.0	7.0	3.5	1.0	6.0	5.0	8.0	6.0	4.5	3.0	9.0	5.5
29	8.5	7.5	1.0	0.0	8.0	6.0	7.0	5.5	4.5	3.0	8.0	5.5
30	9.0	8.0	1.5	0.5	7.0	5.0	7.0	6.0	--	--	9.0	6.5
31	8.0	8.5	--	--	5.0	2.5	6.5	4.5	--	--	10.0	5.5
MONTH	13.5	5.5	13.0	0.0	--	--	8.0	1.5	7.5	0.0	10.0	0.5

TABLE 11.--Continued

Site 20. Tulalip Creek at Tulalip (station 12158040)--continued

1976

	April		May		June		July		August		September	
	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
1	11.0	4.5	20.0	13.5	15.0	9.5	17.5	14.5	17.5	15.0	17.5	15.0
2	11.5	4.5	16.0	13.0	14.5	10.5	19.5	14.0	18.5	15.0	17.5	14.0
3	13.0	6.0	14.5	12.0	15.5	9.5	17.5	15.5	17.0	16.0	17.0	13.5
4	12.5	6.5	13.0	11.0	16.5	10.0	19.0	15.0	16.5	14.5	16.5	14.5
5	13.5	6.5	16.0	10.5	17.0	10.0	--	--	17.0	15.0	16.0	14.5
6	13.0	9.0	17.0	10.0	16.0	11.5	--	--	17.0	15.0	15.0	13.0
7	11.5	7.0	18.0	10.5	16.5	11.0	--	--	16.5	15.5	15.0	12.0
8	10.5	9.5	19.0	12.0	15.5	12.5	--	--	16.0	15.0	15.0	11.0
9	15.0	8.0	20.0	12.0	17.0	12.5	--	--	17.5	15.0	15.0	11.0
10	16.0	10.0	17.5	13.0	16.0	13.0	--	--	18.5	14.5	14.0	11.5
11	13.5	10.0	17.0	11.5	14.0	12.0	--	--	18.5	15.0	13.5	11.5
12	12.0	8.0	15.0	11.5	12.5	11.5	--	--	18.5	15.0	15.5	12.5
13	13.5	8.0	13.5	11.0	16.0	10.5	18.5	13.5	17.5	16.0	15.0	12.0
14	9.5	7.0	15.5	9.0	17.0	10.0	19.5	14.0	18.5	15.0	14.5	14.0
15	8.5	6.0	18.0	10.0	15.0	13.0	20.5	14.5	17.5	15.0	14.0	11.5
16	11.5	5.5	16.0	11.5	15.0	12.5	20.0	15.0	16.0	14.5	14.0	12.0
17	9.0	7.5	16.5	10.5	19.0	11.5	18.5	15.0	17.5	14.5	14.0	13.5
18	11.5	7.0	17.0	9.5	20.0	13.0	18.5	13.5	17.5	14.5	16.0	13.5
19	11.5	8.5	15.5	11.0	17.5	13.5	19.0	13.5	16.5	14.0	16.5	13.0
20	12.0	8.0	15.5	11.5	17.5	12.0	18.5	16.0	17.0	14.0	16.5	13.0
21	13.0	7.5	17.5	10.5	16.0	13.0	16.5	15.0	17.0	13.0	15.5	13.5
22	13.5	8.0	15.5	11.5	18.0	13.0	15.5	13.5	15.0	13.5	15.0	14.5
23	10.5	8.5	16.5	11.5	15.5	13.5	19.0	14.0	15.0	14.0	14.5	14.0
24	11.0	9.0	14.5	12.0	15.0	13.0	19.5	15.5	16.5	14.5	15.5	13.0
25	14.0	8.0	15.0	10.5	17.0	11.5	19.5	14.5	16.0	14.0	15.5	12.5
26	14.5	8.0	16.0	11.5	18.0	12.5	16.5	15.0	16.5	13.0	15.5	12.5
27	15.5	9.0	15.0	11.0	19.0	12.5	18.0	13.0	15.5	14.5	15.5	12.5
28	17.0	10.5	13.0	10.0	19.0	13.5	18.5	13.5	19.0	15.0	16.0	13.5
29	18.5	11.5	11.5	10.0	17.0	15.0	17.0	15.5	18.0	15.0	15.5	13.0
30	18.5	12.5	13.5	9.0	18.0	14.5	18.5	14.0	18.0	14.5	14.0	12.5
31	--	--	11.5	9.5	--	--	19.5	15.5	18.0	15.0	--	--
MONTH	18.5	4.5	20.0	9.0	20.0	9.5	--	--	19.0	13.0	17.5	11.0

1976 water year	Max	Min
	20.5	0.0

TABLE 12.--Discharges and water temperatures at periodic-measurement sites

Quilceda Creek Basin

Date	Site 1 Drainage area = 15.4 mi²		Site 2 Drainage area = 9.41 mi²		Site 3 Drainage area = 2.88 mi²		Site 4 Drainage area = 1.87 mi²	
	Discharge (ft^3/s)	Water temperature (°C)	Discharge (ft^3/s)	Water temperature (°C)	Discharge (ft^3/s)	Water temperature (°C)	Discharge (ft^3/s)	Water temperature (°C)
1974								
Oct. 8	4.96	8.9	1.79	11.1	0.65	9.4	--	--
16	--	--	--	--	--	--	0.75	12.2
Nov. 6	6.08	9.6	1.97	10.1	1.18	9.0	--	--
Dec. 5	12.2	8.2	5.27	8.8	1.21	8.0	--	--
1975								
Jan. 7	63.5	5.2	30.3	5.2	5.63	4.6	--	--
Feb. 4	18.2	4.7	12.6	5.5	--	--	--	--
5	--	--	--	--	1.87	3.2	--	--
Mar. 4	63.3	5.6	35.9	6.4	6.30	5.2	--	--
Apr. 9	17.8	6.9	11.9	8.0	2.90	8.4	1.65	10.3
May 7	18.9	9.5	9.43	9.4	2.43	10.2	--	--
8	17.4	--	--	--	--	--	1.49	--
June 3	9.01	12.0	4.27	12.8	1.46	12.5	--	--
4	--	--	--	--	--	--	1.30	12.6
July 9	6.27	14.8	--	--	--	--	--	--
10	5.88	--	2.34	15.6	.72	16.7	1.14	19.9
Aug. 5	4.46	13.5	2.00	13.5	.65	15.0	--	--
6	--	--	--	--	--	--	.65	15.0
Sept. 2	6.05	12.7	2.29	13.8	.91	14.3	--	--
3	--	--	--	--	--	--	.72	13.8
Oct. 7	6.26	9.0	1.91	10.0	.73	9.0	--	--
Nov. 4	25.1	12.1	9.95	11.9	1.88	11.7	1.51	10.3
Dec. 11	50.5	5.6	27.2	6.1	6.36	5.2	2.90	4.6
17	31.1	3.5	--	--	--	--	--	--
1976								
Jan. 7	46.5	6.0	31.2	6.0	4.83	6.0	--	--
8	--	--	--	--	--	--	3.14	5.4
Feb. 3	24.3	6.1	14.0	6.6	3.28	6.0	2.14	6.0
Mar. 3	32.0	--	16.5	4.2	3.96	3.2	2.10	5.0
Apr. 7	23.4	9.5	13.8	10.0	3.62	10.0	2.18	11.4
May 3	19.1	11.0	9.76	12.2	3.69	12.8	2.94	14.0
June 2	18.5	10.4	11.5	11.0	3.78	11.0	2.50	--
July 12	7.95	12.8	2.06	12.8	.75	13.4	--	--
13	--	--	--	--	--	--	.85	20.0
Aug. 3	5.76	13.5	2.24	13.0	.85	15.0	--	--
5	--	--	--	--	--	--	.46	15.0
Sept. 8	6.56	11.0	2.42	12.0	.99	12.2	.88	--
Oct. 5	6.57	10.6	2.08	10.5	.76	10.8	--	--
6	--	--	--	--	--	--	.73	12.2
Nov. 3	8.02	8.4	2.75	8.0	.79	6.9	--	--
4	--	--	--	--	--	--	.85	6.8
Dec. 6	7.95	5.8	3.01	6.2	1.20	4.3	--	--
1977								
Jan. 4	10.7	3.8	5.14	4.2	1.27	2.2	--	--
Feb. 15	12.2	5.4	4.97	6.2	1.35	4.6	--	--
Mar. 7	36.4	7.0	21.0	7.2	4.06	--	--	--
Apr. 4	24.6	7.3	11.3	8.4	2.89	--	--	--
May 4	44.3	10.4	20.1	10.6	4.16	10.0	--	--
June 1	50.8	11.6	43.7	13.6	5.89	13.2	--	--
July 6	7.26	11.4	2.38	11.8	.62	11.6	--	--
Aug. 3	4.40	14.6	1.88	15.0	.72	17.4	--	--
Sept. 6	6.30	12.6	2.11	13.8	.87	14.6	--	--

TABLE 12.--Discharges and water temperatures at periodic-measurement sites--Con.

Mission Creek Basin

Date		Site 5 Drainage area = 0.33 mi²		Site 6 Drainage area = 1.34 mi²		Site 7 Drainage area = 1.33 mi²	
		Discharge (ft^3/s)	Water temperature (°C)	Discharge (ft^3/s)	Water temperature (°C)	Discharge (ft^3/s)	Water temperature (°C)
1974							
Sept.	17	0	--	--	--	--	--
	24	--	--	--	--	--	--
Oct.	8	0	--	--	--	--	--
	9	--	--	--	--	--	--
	16	--	--	--	--	--	--
Nov.	6	0	--	--	--	--	--
	7	--	--	1.07	9.0	0.01	8.8
Dec.	5	--	--	--	--	--	--
	6	0	--	.70	7.7	.34	7.3
1975							
Jan.	7	0	--	--	--	--	--
	8	--	--	1.24	4.3	1.67	4.1
Feb.	4	--	--	.66	4.5	.54	4.0
	5	e.01	2.9	--	--	--	--
Mar.	4	1.06	6.8	--	--	--	--
	5	--	--	3.06	4.5	1.68	3.6
Apr.	9	.14	10.3	--	--	--	--
	10	--	--	1.63	11.9	.48	9.0
May	7	.23	--	.95	14.0	1.12	12.6
June	3	0	--	.97	15.2	.57	14.2
	4	--	--	--	--	--	--
July	9	0	--	.74	19.4	.19	19.8
	10	--	--	--	--	--	--
Aug.	5	0	--	--	--	.07	17.5
	6	--	--	.45	14.4	--	--
Sept.	2	0	--	--	--	--	--
	3	--	--	.48	13.0	.06	15.7
	18	--	--	--	--	--	--
Oct.	7	0	--	.97	11.1	.05	11.5
Nov.	4	--	--	--	--	--	--
	5	T	10.6	.88	10.6	.28	10.2
Dec.	11	.44	5.4	--	--	--	--
	12	--	--	2.12	3.9	2.11	4.1
1976							
Jan.	7	.13	4.0	1.75	4.6	2.33	5.0
Feb.	3	.34	6.4	1.48	5.2	.84	5.0
Mar.	2	--	--	1.48	5.2	1.14	3.8
	3	0	--	--	--	--	--
Apr.	7	.38	8.9	1.53	11.0	.94	8.4
May	3	.08	16.7	1.22	13.4	.95	10.6
June	2	.04	15.0	--	--	.74	--
	3	--	--	.98	11.8	--	--
July	12	.05	--	.65	15.0	.03	13.8
Aug.	3	0	--	--	--	--	--
	4	--	--	.76	14.5	.01	12.1
Sept.	8	0	--	--	--	.06	--
	9	--	--	.77	14.5	--	--
Oct.	5	0	--	.67	12.2	.02	11.6
	6	--	--	--	--	--	--
Nov.	3	0	--	--	--	--	--
	4	--	--	.74	8.0	.10	7.6
Dec.	6	0	--	.81	5.0	--	--
1977							
Jan.	4	0	--	--	--	--	--
	5	--	--	.57	3.0	--	--
Feb.	15	0	--	--	--	--	--
	16	--	--	.64	5.6	--	--
Mar.	7	0	--	1.02	7.2	--	--
Apr.	4	T	--	--	--	--	--
	5	--	--	.69	11.4	--	--
May	4	0	--	--	--	--	--
	5	--	--	1.41	10.2	--	--
June	1	T	--	--	--	--	--
	2	--	--	.87	12.5	--	--
July	6	0	--	.64	15.0	--	--
Aug.	3	0	--	.60	18.6	--	--
Sept.	6	0	--	--	--	--	--
	7	--	--	.68	13.3	--	--

TABLE 12.--Discharges and water temperatures at periodic-measurement sites-- Con.

Mission Creek Basin--Continued

Date	Site 8 Drainage area = 0.74 mi²		Site 9 Drainage area = 1.57 mi²		Site 10 Drainage area = 0.08 mi²		Site 11 Drainage area = 6.58 mi²	
	Discharge (ft^3/s)	Water temperature (°C)	Discharge (ft^3/s)	Water temperature (°C)	Discharge (ft^3/s)	Water temperature (°C)	Discharge (ft^3/s)	Water temperature (°C)
1974								
Sept. 17	--	--	--	--	--	--	--	--
24	0	--	--	--	--	--	--	--
Oct. 8	--	--	0.32	10.0	0.20	8.9	--	--
9	0	--	--	--	--	--	--	--
16	--	--	--	--	--	--	1.99	9.1
Nov. 6	0	--	--	--	--	--	2.52	8.5
7	--	--	1.28	8.8	--	--	--	--
Dec. 5	0	--	--	--	--	--	5.08	7.4
6	--	--	.62	7.9	--	--	--	--
1975								
Jan. 7	T	4.0	--	--	--	--	--	--
8	--	--	.68	5.0	--	--	9.11	4.5
Feb. 4	.07	2.0	.68	5.0	--	--	4.43	3.5
5	--	--	--	--	--	--	--	--
Mar. 4	1.30	4.2	--	--	--	--	--	--
5	--	--	2.24	4.0	--	--	14.1	--
Apr. 9	.12	6.0	--	--	--	--	4.58	9.4
10	--	--	.55	10.0	--	--	--	--
May 7	.16	8.8	.60	12.2	--	--	5.19	--
June 3	T	11.4	.50	12.6	--	--	--	--
4	--	--	--	--	--	--	2.41	14.2
July 9	--	--	.32	16.7	--	--	1.22	19.0
10	0	--	--	--	--	--	--	--
Aug. 5	0	--	.22	14.5	--	--	--	--
6	--	--	--	--	--	--	1.00	15.7
Sept. 2	0	--	--	--	--	--	--	--
3	--	--	.38	11.8	--	--	2.07	14.2
18	--	--	--	--	.15	12.4	--	--
Oct. 7	0	--	.39	9.9	--	--	3.13	11.0
Nov. 4	0	--	--	--	--	--	--	--
5	--	--	.38	10.4	--	--	4.06	10.4
Dec. 11	.72	4.1	--	--	--	--	--	--
12	--	--	1.51	4.2	--	--	11.5	2.6
1976								
Jan. 7	.51	3.8	1.16	5.0	--	--	8.60	4.0
Feb. 3	.26	3.8	.86	5.0	--	--	6.95	4.2
Mar. 2	--	--	.91	4.6	--	--	8.19	3.4
3	.34	1.3	--	--	--	--	--	--
Apr. 7	.31	8.9	1.04	8.2	--	--	7.33	--
May 3	.24	11.1	.93	10.8	--	--	7.01	12.8
June 2	.03	8.4	.73	--	--	--	--	--
3	--	--	--	--	--	--	7.38	--
July 12	0	--	.34	12.4	.08	15.4	1.21	16.4
Aug. 3	0	--	--	--	--	--	--	--
4	--	--	.30	12.1	0	--	2.36	16.5
Sept. 8	--	--	.33	11.7	--	--	2.83	13.3
9	0	--	--	--	--	--	--	--
Oct. 5	0	--	.33	11.1	--	--	--	--
6	--	--	--	--	--	--	1.02	11.8
Nov. 3	0	--	--	--	--	--	--	--
4	--	--	.36	7.5	--	--	1.98	6.8
Dec. 6	0	--	.35	5.5	--	--	--	--

TABLE 12.--Discharges and water temperatures at periodic-measurement sites--Con.

Mission Creek Basin--Continued

Date		Site 8, Drainage area = 0.74 mi² Discharge (ft³/s)	Site 8 Water temperature (°C)	Site 9, Drainage area = 1.57 mi² Discharge (ft³/s)	Site 9 Water temperature (°C)	Site 10, Drainage area = 0.08 mi² Discharge (ft³/s)	Site 10 Water temperature (°C)	Site 11, Drainage area = 6.58 mi² Discharge (ft³/s)	Site 11 Water temperature (°C)
1977									
Jan.	4	0	--	--	--	--	--	--	--
	5	--	--	.34	2.4	--	--	2.54	3.0
Feb.	15	0	--	.42	6.8	--	--	--	--
	16	--	--	--	--	--	--	--	--
Mar.	7	0	--	.53	6.8	--	--	--	--
Apr.	4	.07	7.3	--	--	--	--	--	--
	5	--	--	.40	8.8	--	--	--	--
May	4	.06	8.6	--	--	--	--	--	--
	5	--	--	.89	9.0	--	--	--	--
June	1	.14	13.6	--	--	--	--	--	--
	2	--	--	.62	10.6	--	--	--	--
July	6	0	--	.30	13.6	--	--	--	--
Aug.	3	0	--	.24	16.4	--	--	--	--
Sept.	6	0	--	--	--	--	--	--	--
	7	--	--	.34	11.4	--	--	--	--

Tulalip Creek Basin

Date		Site 13, Drainage area = 6.12 mi² Discharge (ft³/s)	Site 13 Water temperature (°C)	Site 14, Drainage area = 2.19 mi² Discharge (ft³/s)	Site 14 Water temperature (°C)	Site 15, Drainage area = 9.74 mi² Discharge (ft³/s)	Site 15 Water temperature (°C)	Site 16, Drainage area = 0.80 mi² Discharge (ft³/s)	Site 16 Water temperature (°C)
1974									
Sept.	17	--	--	--	--	--	--	0	--
	24	0	--	0	--	--	--	--	--
Oct.	8	0	--	--	--	--	--	0	--
	9	--	--	T	9.4	4.52	9.4	--	--
Nov.	6	0	--	--	--	--	--	0	--
	7	--	--	.01	9.1	7.14	9.1	--	--
Dec.	5	--	--	.01	8.0	4.89	8.4	--	--
	6	e.01	7.5	--	--	--	--	0	--
1975									
Jan.	7	.02	4.2	.09	4.6	5.33	5.0	.01	5.0
	8	--	--	--	--	--	--	--	--
Feb.	4	--	--	--	--	--	--	--	--
	5	3.20	2.5	4.02	3.0	9.52	3.2	.03	2.0
Mar.	4	11.0	6.0	14.8	6.6	20.5	7.2	1.98	6.2
	5	--	--	--	--	--	--	--	--
Apr.	9	3.88	9.8	--	--	8.00	11.0	.21	8.0
	10	--	--	4.19	9.9	--	--	--	--
May	7	1.26	10.0	.93	13.0	5.80	--	.25	--
	8	--	--	--	--	--	--	--	--
June	3	.05	--	.39	18.1	4.69	13.9	0	--
	4	--	--	--	--	--	--	--	--
July	9	--	--	--	--	--	--	--	--
	10	<.01	--	.12	19.2	4.68	14.7	0	--
Aug.	5	T	--	--	--	--	--	0	--
	6	--	--	e.02	16.0	3.75	15.0	--	--
	7	--	--	--	--	--	--	--	--
Sept.	2	e.01	--	.03	14.4	--	--	0	--
	3	--	--	--	--	--	--	--	--
	4	--	--	--	--	4.26	10.9	--	--
	18	--	--	--	--	--	--	--	--
Oct.	7	<.01	--	.05	11.6	4.46	9.6	0	--
	8	--	--	--	--	--	--	--	--
Nov.	5	T	--	.05	11.8	4.23	10.2	0	--
Dec.	11	13.2	5.6	18.9	5.2	--	--	1.98	4.6
	12	--	--	--	--	20.0	3.9	--	--

TABLE 12.--Discharges and water temperatures at periodic-measurement sites--Con.

Tulalip Creek Basin--Continued

Date		Site 13 Drainage area = 6.12 mi² Discharge (ft³/s)	Water temperature (°C)	Site 14 Drainage area = 2.19 mi² Discharge (ft³/s)	Water temperature (°C)	Site 15 Drainage area = 9.74 mi² Discharge (ft³/s)	Water temperature (°C)	Site 16 Drainage area = 0.80 mi² Discharge (ft³/s)	Water temperature (°C)
1976									
Jan.	7	--	--	--	--	--	--	--	--
	8	9.36	4.8	9.98	4.5	16.9	4.4	1.69	5.0
Feb.	3	6.26	6.0	8.94	5.6	--	--	--	--
	4	--	--	--	--	12.5	3.4	.27	3.0
Mar.	2	--	--	--	--	--	--	--	--
	3	5.25	4.8	6.72	4.4	10.8	4.8	.28	3.0
Apr.	7	--	--	--	--	17.3	11.4	.49	9.4
	8	10.3	10.0	14.0	10.8	--	--	--	--
	19	e6.4	10.9	e5.2	10.3	e12.0	11.3	--	--
May	3	.06	13.3	1.16	16.0	6.70	12.9	.17	12.2
June	2	.10	11.2	.19	13.8	--	--	0	--
	3	--	--	--	--	4.59	14.4	--	--
July	12	e.01	12.2	.04	15.6	--	--	0	--
	13	--	--	--	--	4.45	12.0	--	--
Aug.	3	.03	--	--	--	--	--	0	--
	4	--	--	.05	15.0	4.22	13.9	--	--
	5	--	--	--	--	--	--	--	--
Sept.	8	.02	--	e.01	--	--	--	0	--
	9	--	--	--	--	3.81	11.2	--	--
Oct.	5	.01	10.6	.01	11.4	4.52	11.1	0	--
Nov.	3	T	--	.01	--	3.80	8.3	0	--
	4	--	--	--	--	--	--	--	--
Dec.	6	0	--	0	--	5.37	5.8	0	--
1977									
Jan.	4	0	--	0	--	--	--	0	--
	5	--	--	--	--	3.96	1.6	--	--
Feb.	15	.10	6.0	.01	5.6	4.15	7.2	0	--
Mar.	7	1.38	7.0	.17	7.2	4.53	7.6	0	--
Apr.	4	2.24	12.2	2.44	12.3	--	--	0	--
	5	--	--	--	--	6.03	12.3	--	--
May	4	--	--	.64	13.8	--	--	--	--
	5	2.16	13.4	--	--	8.03	10.0	0	--
June	1	2.84	16.1	3.20	15.8	8.55	14.7	.11	10.6
	2	--	--	--	--	--	--	--	--
July	6	.02	12.4	.29	16.0	4.17	15.6	0	--
Aug.	3	.03	18.2	.17	20.2	3.76	18.8	0	--
Sept.	6	0	--	.09	15.0	--	--	0	--
	7	--	--	--	--	4.00	13.3	--	--

Tulalip Creek Basin--Continued

Date		Site 17 Drainage area = 1.50 mi² Discharge (ft³/s)	Water temperature (°C)	Site 18 Drainage area = 1.75 mi² Discharge (ft³/s)	Water temperature (°C)	Site 19 Drainage area = 0.04 mi² Discharge (ft³/s)	Water temperature (°C)
1974							
Sept.	17	--	--	--	--	--	--
	24	--	--	--	--	--	--
Oct.	8	1.30	9.5	1.67	10.0	0.13	10.0
	9	--	--	--	--	--	--
Nov.	6	1.25	9.0	1.73	9.5	.12	9.5
	7	--	--	--	--	--	--
Dec.	5	--	--	--	--	--	--
	6	1.66	8.8	2.12	7.9	--	--
1975							
Jan	7	--	--	--	--	--	--
	8	1.69	6.5	2.86	5.5	--	--
Feb.	4	1.65	6.5	2.12	5.4	--	--
	5	--	--	--	--	--	--
Mar.	4	--	--	--	--	--	--
	5	3.64	5.4	4.55	4.8	--	--

TABLE 12.--Discharges and water temperatures at periodic-measurement sites--Con.

Tulalip Creek Basin--Continued

Date		Site 17 Drainage area = 1.50 mi^2 Discharge (ft^3/s)	Site 17 Water temperature (°C)	Site 18 Drainage area = 1.75 mi^2 Discharge (ft^3/s)	Site 18 Water temperature (°C)	Site 19 Drainage area = 0.04 mi^2 Discharge (ft^3/s)	Site 19 Water temperature (°C)
1975--Continued							
Apr.	9	--	--	--	--	--	--
	10	1.76	8.3	2.38	7.0	--	--
May	7	--	--	--	--	--	--
	8	1.55	9.0	1.56	9.6	--	--
June	3	--	--	--	--	--	--
	4	1.38	9.7	2.07	10.8	--	--
July	9	1.18	11.6	1.46	15.8	--	--
	10	--	--	--	--	--	--
Aug.	5	--	--	--	--	--	--
	6	--	--	2.03	12.5	--	--
	7	1.12	10.0	--	--	--	--
Sept.	2	--	--	--	--	--	--
	3	1.23	10.8	2.27	12.6	--	--
	4	--	--	--	--	--	--
	18	--	--	--	--	.13	12.0
Oct.	7	--	--	2.11	9.9	--	--
	8	1.29	8.5	--	--	--	--
Nov.	5	1.42	9.4	2.19	10.0	--	--
Dec.	11	--	--	--	--	--	--
	12	3.03	5.1	4.58	4.6	--	--
1976							
Jan.	7	--	--	4.37	5.8	--	--
	8	2.58	--	--	--	--	--
Feb.	3	1.88	6.2	2.75	6.0	--	--
	4	--	--	--	--	--	--
Mar.	2	--	--	2.80	5.4	--	--
	3	1.75	5.2	--	--	--	--
Apr.	7	1.95	9.8	4.90	9.6	--	--
	8	--	--	--	--	--	--
	19	--	--	--	--	--	--
May	3	2.27	10.6	2.65	10.6	--	--
June	2	--	--	2.79	--	--	--
	3	1.80	--	--	--	--	--
July	12	--	--	2.19	11.8	.13	11.8
	13	1.50	9.8	--	--	--	--
Aug.	3	--	--	--	--	--	--
	4	--	--	2.01	11.2	.10	11.9
	5	1.77	10.2	--	--	--	--
Sept.	8	--	--	--	--	--	--
	9	--	--	2.28	11.0	--	--
Oct.	5	1.07	10.0	2.13	10.6	--	--
Nov.	3	--	--	--	--	--	--
	4	1.22	7.8	2.19	7.9	--	--
Dec.	6	--	--	2.23	5.8	--	--
1977							
Jan.	4	--	--	--	--	--	--
	5	1.34	5.2	2.02	3.4	--	--
Feb.	15	--	--	2.17	6.6	--	--
Mar.	7	--	--	2.78	7.2	--	--
Apr.	4	--	--	--	--	--	--
	5	--	--	2.22	8.0	--	--
May	4	--	--	--	--	--	--
	5	--	--	3.88	8.4	--	--
June	1	--	--	--	--	--	--
	2	--	--	2.52	9.7	--	--
July	6	--	--	2.12	12.8	--	--
Aug.	3	--	--	2.03	16.0	--	--
Sept.	6	--	--	--	--	--	--
	7	--	--	1.97	11.1	--	--

e - estimated
T - less than 0.005 ft^3/s

TABLE 13.--Chemical quality of surface water from selected sites

Date of collection 1/	Stream discharge (ft^3/s) 2/	Milligrams per liter												
		Dis-solved cal-cium (Ca)	Dis-solved magnes-ium (Mg)	Dis-solved sodium (Na)	Dis-solved potas-sium (K)	Bicar-bonate (HCO_3)	Alka linity as $CaCO_3$	Dis-solved sul-fate (SO_4)	Dis-solved chlor-ide (Cl)	Dis-solved fluor-ide (F)	Total nitrate (N)	Total nitrite N)	Total ammon-ia (N)	Nitro-gen total organic (N)
Site 2. West Fork of Quilceda Creek near Marysville (USGS station 12157020)														
11- 6-74	2.0	--	--	--	--	--	--	--	--	--	0.25	0.01	0.03	0.25
2- 4-75	13.	--	--	--	--	--	--	--	--	--	1.2	.02	.17	.33
9-18-75	2.1E	--	--	--	--	--	--	--	--	--	.20	.01	.06	.14
12-18-75	28.E	--	--	--	--	--	--	--	--	--	1.2	.00	.21	.48
3- 4-76	16.*	--	--	--	--	--	--	--	--	--	1.1	.01	.26	.39
6- 3-76	12.*	--	--	--	--	--	--	--	--	--	.40	.02	.25	.35
9- 9-76	2.4*	16.	7.2	8.1	2.6	78	64	14.	6.9	--	.23	.01	.06	.18
Site 3. Quilceda Creek tributary near Marysville (USGS station 12157030)														
9- 9-76	.99*	9.6	8.6	6.0	1.7	69	57	7.4	3.7	--	1.2	.02	.12	.39
Site 4. Sturgeon Creek at Marysville (USGS station 12157035)														
9- 9-76	.88*	9.0	9.8	36.	2.9	68	56	8.5	58.	--	.04	.01	.13	.37
Site 6. Mission Creek near Marysville (USGS station 12157150)														
11 -7-74	1.1	--	--	--	--	--	--	--	--	--	.69	.01	.06	.22
2- 4-75	.66	--	--	--	--	--	--	--	--	--	1.9	.00	.04	.28
9-18-75	.70E	--	--	--	--	--	--	--	--	--	.32	.01	.10	.26
12-18-75	2.0E	--	--	--	--	--	--	--	--	--	2.0	.01	.05	.22
3- 4-76	1.5*	--	--	--	--	--	--	--	--	--	2.1	.01	.06	.24
6- 3-76	.98	--	--	--	--	--	--	--	--	--	.65	.01	.22	1.1
9- 9-76	.77	--	--	--	--	--	--	--	--	--	.38	.01	.08	.31
3- 8-77	.80	--	--	--	--	--	--	--	--	--	1.3	.01	.07	.33
Site 7. Mission Creek tributary near Tulalip (USGS station 12157170)														
11 -7-74	.01	--	--	--	--	--	--	--	--	--	.37	.01	.05	.23
2- 4-75	.54	--	--	--	--	--	--	--	--	--	2.1	.00	.05	.46
9-18-75	.06E	--	--	--	--	--	--	--	--	--	.22	.01	.11	.25
12-18-75	2.2E	--	--	--	--	--	--	--	--	--	1.5	.00	.05	.46
3- 4-76	1.1*	--	--	--	--	--	--	--	--	--	1.4	.00	.06	.39
6- 3-76	.74*	--	--	--	--	--	--	--	--	--	.23	.01	.10	.57
Ross Lake														
2- 4-75A	--	7.0	1.9	2.5	0.8	17	14	4.3	3.3	--	1.7	.01	.06	.38
2- 4-75C	--	--	--	--	--	--	--	--	--	--	1.7	.01	.07	.32
4- 9-75A	--	--	--	--	--	14	12	--	--	--	2.5	.01	.04	.40
4- 9-75D	--	--	--	--	--	--	--	--	--	--	2.0	.01	.07	.33
7-14-75A	--	--	--	--	--	14	12	--	--	--	2.0	.02	.05	.43
7-14-75E	--	--	--	--	--	--	--	--	--	--	1.3	.01	.04	.20
9-18-75A	--	6.6	2.1	2.6	.5	16	13	5.6	3.4	--	1.7	.01	.04	.34
9-18-75F	--	--	--	--	--	--	--	--	--	--	.87	.01	.12	.19
Site 9. Mission Creek tributary No. 2 near Tulalip (USGS station 12157210)														
11- 7-74	1.3	--	--	--	--	--	--	--	--	--	.79	.01	.05	.22
2- 4-75	.68	--	--	--	--	--	--	--	--	--	2.0	.01	.05	.37
9-18-75	.38E	--	--	--	--	--	--	--	--	--	.70	.01	.07	.29
12-18-75	1.4E	--	--	--	--	--	--	--	--	--	2.3	.00	.04	.32
3- 4-76	.91*	--	--	--	--	--	--	--	--	--	1.7	.01	.05	.29
6- 3-76	.73*	--	--	--	--	--	--	--	--	--	.73	.00	.07	.21
9- 9-76	.33*	--	--	--	--	--	--	--	--	--	.75	.01	.04	.26
3- 8-77	.60	--	--	--	--	--	--	--	--	--	1.6	.00	.06	.44

Milligrams per liters												
Total Kjeldahl nitrogen (N)	Nitrogen, total (N)	Total phosphorus (P)	Dissolved orthophosphorus (P)	Hardness (Ca, Mg)	Noncarbonate hardness	Specific conductance (micromhos)	pH (units)	Water temperature (°C)	Turbidity (JTU)	Dissolved oxygen (mg/L)	Total coliform (col. per 100 mL) 3/	Fecal coliform (col. per 100 mL)
0.28	0.54	0.07	0.05	--	--	142	--	10.1	5	--	220	--
.50	1.7	.06	.02	--	--	150	--	5.5	2	--	2,300	--
.20	.41	.09	.08	--	--	161	7.3	11.9	7	--	900	--
.69	1.9	.08	.03	--	--	143	7.1	3.5	3	--	250	--
.65	1.8	.08	.02	--	--	147	7.2	3.0	6	--	930	--
.60	1.0	.13	.05	--	--	138	7.1	11.8	4	--	4,400	--
.24	.48	.08	.02	70	6	184	--	10.7	--	--	1,000	130
.51	1.7	.06	.02	59	3	146	--	10.4	--	--	1,000	84
.50	.55	.12	.06	63	7	312	--	18.2	--	--	1,600	340
.28	.98	.02	.02	--	--	107	--	9.0	1	--	69	--
.32	2.2	.02	.02	--	--	105	--	4.5	0	--	220	--
.36	.69	.04	.04	--	--	99	7.3	12.0	1	--	1,100	--
.27	2.3	.02	.02	--	--	85	7.1	4.0	0	--	780	--
.30	2.4	.02	.01	--	--	84	7.0	5.2	0	--	130	--
1.3	2.0	.07	.02	--	--	78	6.8	11.8	6	--	1,600	--
.39	.78	.05	.03	--	--	103	--	14.5	--	--	1,500	120
.40	1.7	.04	.02	--	--	94	--	7.1	--	--	100	<1
.28	.66	.01	.00	--	--	115	--	8.8	1	--	31	--
.51	2.6	.01	.00	--	--	80	--	4.0	0	--	97	--
.36	.59	.04	.01	--	--	93	6.9	15.9	1	--	TNTC	--
.51	2.0	.01	.01	--	--	57	7.2	2.5	0	--	130	--
.45	1.8	.01	.01	--	--	53	7.0	3.4	0	--	150	--
.67	.91	.03	.01	--	--	49	6.1	8.3	2	--	1,400	--
--	--	.01	.00	25	--	57	6.9	4.2	--	10.3	--	--
--	--	.01	.00	--	--	55	6.9	4.1	--	9.8	--	--
--	--	.02	.00	--	--	61	6.8	9.3	--	11.0	--	--
--	--	.01	.00	--	--	56	7.0	4.2	--	7.9	--	--
--	--	.00	.00	--	--	60	8.0	21.2	--	10.3	--	--
--	--	.00	.00	--	--	55	6.2	4.1	--	1.3	--	--
--	--	.00	.00	25	--	60	6.6	18.1	--	9.4	--	--
--	--	.01	.00	--	--	54	6.2	4.2	--	.1	--	--
.27	1.1	.02	.01	--	--	112	--	8.8	1	--	180	--
.42	2.4	.04	.01	--	--	108	--	5.0	1	--	170	--
.36	1.1	.03	.02	--	--	107	7.3	--	1	--	1,800	--
.36	2.7	.01	.01	--	--	80	7.3	4.0	0	--	38	--
.34	2.0	.02	.01	--	--	60	6.8	4.2	0	--	83	--
.28	1.0	.02	.01	--	--	81	7.1	--	1	--	110	--
.30	1.1	.03	.02	--	--	115	--	11.0	--	--	540	8
.50	2.1	.02	.02	--	--	100	--	7.0	--	--	230	<1

TABLE 13.--Chemical quality of surface water from selected sites--Continued

Date of collection 1/	Stream discharge (ft^3/s) 2/	Milligrams per liter: Dissolved calcium (Ca)	Dissolved magnesium (Mg)	Dissolved sodium (Na)	Dissolved potassium (K)	Bicarbonate (HCO_3)	Alkalinity as $CaCO_3$	Dissolved sulfate (SO_4)	Dissolved chloride (Cl)	Dissolved fluoride (F)	Total nitrate (N)	Total nitrite N)	Total ammonia (N)	Nitrogen total organic (N)
Site 11. Mission Creek near Mission Beach (USGS station 12157247)														
11- 6-74	2.5	--	--	--	--	--	--	--	--	--	0.01	0.01	0.14	0.29
2- 4-75	4.4	--	--	--	--	--	--	--	--	--	.87	.01	.07	.36
9-18-75	2.5E	--	--	--	--	--	--	--	--	--	.02	.01	.22	.50
12-18-75	11.E	--	--	--	--	--	--	--	--	--	.97	.01	.11	.36
3- 4-76	8.2*	--	--	--	--	--	--	--	--	--	.83	.01	.12	.34
6- 3-76	7.4	--	--	--	--	--	--	--	--	--	.02	.01	.13	.33
Site 12. Mission Creek near Tulalip (USGS station 12157250)														
11- 6-74	2.3	10.	5.7	5.9	1.1	45	37	5.1	6.4	--	0.03	0.01	0.11	0.49
12- 6-74	5.3G	--	--	--	-	--	--	--	--	--	--	--	--	--
1- 8-75	13.	--	--	--	--	--	--	--	--	--	--	--	--	--
2- 5-75	4.7G	5.2	4.2	4.6	.8	29	24	7.8	6.1	0.0	.76	.01	.10	.40
3- 5-75	17.	--	--	--	--	--	--	--	--	--	--	--	--	--
4-10-75	5.3G	--	--	--	--	--	--	--	--	--	--	--	--	--
5- 8-75	5.9	--	--	--	--	--	--	--	--	--	.19	.01	.08	.36
7-14-75	2.0G	--	--	--	--	--	--	--	--	--	--	--	--	--
8- 7-75	.91	--	--	--	--	--	--	--	--	--	--	--	--	--
9- 4-75	2.0G	--	--	--	--	--	--	--	--	--	--	--	--	--
9-18-75	1.8G	7.2	6.3	5.5	.9	56	46	3.4	3.4	--	.02	.01	.14	.31
10- 8-75	3.0	--	--	--	--	--	--	--	--	--	--	--	--	--
11- 6-75	7.8	--	--	--	--	--	--	--	--	--	--	--	--	--
12-18-75	8.2G	5.3	4.2	4.0	1.0	26	21	8.8	5.3	.1	.77	.01	.09	.37
1- 8-76	12.G	--	--	--	--	--	--	--	--	--	--	--	--	--
2- 4-76	7.0	--	--	--	--	--	--	--	--	--	--	--	--	--
3- 4-76	6.7G	5.5	4.3	4.0	1.0	29	24	7.2	4.3	.1	.75	.01	.11	.27
4- 8-76	7.8	--	--	--	--	--	--	--	--	--	--	--	--	--
5- 4-76	6.7	--	--	--	--	--	--	--	--	--	--	--	--	--
6- 3-76	8.8G	5.4	5.4	4.0	.5	37	30	7.1	3.4	.1	.04	.01	.15	.39
7-13-76	1.4G	--	--	--	--	--	--	--	--	--	--	--	--	--
8- 5-76	1.8	--	--	--	--	--	--	--	--	--	--	--	--	--
9- 9-76	2.5G	--	--	--	--	--	--	--	--	--	.02	.01	.15	.50
10- 6-76	1.6	--	--	--	--	--	--	--	--	--	--	--	--	--
11- 3-76	2.3G	--	--	--	--	--	--	--	--	--	--	--	--	--
3- 8-77	7.7	--	--	--	--	--	--	--	--	--	.44	.01	.17	.38
Site 13. Lake Shoecraft Outlet near Tulalip (USGS station 12158001)														
2- 5-75	3.2	6.0	3.1	2.2	1.0	24	20	6.3	6.4	.0	.12	.00	.06	.29
12-18-75	12.E	8.1	3.7	4.1	1.0	30	25	5.0	5.2	.1	.10	.02	.03	.35
3- 4-76	5.2*	4.8	3.1	4.3	1.1	25	21	6.3	4.7	.1	.20	.00	.06	.24
6- 3-76	.10*	3.8	3.2	4.0	.9	24	20	6.3	5.2	.1	.13	.00	.05	.31
3- 8-77	1.4	--	--	--	--	--	--	--	--	--	.11	.00	.04	.38
Weallup Lake														
7-26-73A	--	--	--	--	--	--	--	--	--	--	.02	.00	.14	.37
7-26-73B	--	--	--	--	--	--	--	--	--	--	.02	.00	.18	.92
Site 14. Tulalip Creek below Weallup Lake near Tulalip (USGS station 12158008)														
3- 8-77	.20	3.7	2.6	4.0	1.0	20	16	4.9	5.4	--	.07	.00	.08	.39
Site 15. Tulalip Creek above East Branch near Tulalip (USGS station 12158010)														
9- 9-76	3.8	--	--	--	--	--	--	--	--	--	.53	.01	.05	.23
3- 8-77	4.6	8.1	7.3	5.8	1.4	54	44	7.9	5.1	--	1.1	.01	.07	.34

Milligrams per liter												
Total Kjeldahl nitrogen (N)	Nitrogen, total (N)	Total phosphorus (P)	Dissolved orthophosphorus (P)	Hardness (Ca, Mg)	Noncarbonate hardness	Specific conductance (micromhos)	pH (units)	Water temperature (ºC)	Turbidity (JTU)	Dissolved oxygen (mg/L)	Total coliform (col. per 100 mL) 3/	Fecal coliform (col. per 100 mL)
0.43	0.45	0.02	0.01	--	--	110	--	8.5	0	--	480	--
.43	1.3	.02	.01	--	--	95	--	3.5	0	--	360	--
.72	.75	.04	.02	--	--	97	6.4	13.8	1	--	110	--
.47	1.4	.02	.01	--	--	81	7.4	2.0	0	--	44	--
.46	1.3	.02	.00	--	--	55	6.8	2.0	0	--	170	--
.46	.49	.03	.01	--	--	78	6.4	11.0	1	--	610	--
.60	.64	.03	.02	48	12	110	--	9.0	1	--	56	--
--	--	--	--	--	--	--	--	6.9	--	--	35	--
--	--	--	--	--	--	--	--	3.6	--	--	710	--
.50	1.3	.02	.01	30	6	100	--	2.1	1	--	170	--
--	--	--	--	--	--	--	--	4.7	--	--	31	--
--	--	--	--	--	--	--	--	9.0	--	--	90	--
.44	.64	.03	.02	--	--	--	--	11.2	1	--	10	--
--	--	--	--	--	--	--	--	17.2	--	--	200	--
--	--	--	--	--	--	--	--	15.6	--	--	800	--
--	--	--	--	--	--	--	--	12.7	--	--	80	--
.45	.48	.04	.03	44	0	95	7.2	13.0	1	--	400	--
--	--	--	--	--	--	--	--	11.1	--	--	145	--
--	--	--	--	--	--	--	--	9.0	--	--	>1,000	--
.46	1.2	.02	.01	31	9	85	7.3	2.0	1	--	34	--
--	--	--	--	--	--	--	--	--	--	--	80	--
--	--	--	--	--	--	--	--	2.7	--	--	50	--
.38	1.1	.02	.01	31	8	83	7.0	2.0	1	--	96	--
--	--	--	--	--	--	--	--	4.9	--	--	90	--
--	--	--	--	--	--	--	--	11.7	--	--	140	--
.54	.59	.04	.02	36	5	77	6.8	11.0	1	--	230	--
--	--	--	--	--	--	--	--	16.6	--	--	1,600	--
--	--	--	--	--	--	--	--	16.0	--	--	100	--
.65	.68	.06	.03	--	--	101	--	13.6	--	9.4	570	29
--	--	--	--	--	--	--	--	11.7	--	--	300	10
--	--	--	--	--	--	--	--	8.9	--	--	1,030	<1
.55	1.0	.04	.03	--	--	83	--	6.6	--	11.1	94	6
.35	.47	.01	.01	28	8	72	--	2.5	0	--	14	--
.38	.50	.02	.00	35	11	82	7.0	3.0	0	--	20	--
.30	.50	.01	.00	25	4	43	7.2	3.5	1	--	25	--
.36	.49	.01	.00	23	3	70	6.8	11.6	0	--	220	--
.42	.53	.01	.00	--	--	72	--	6.4	--	--	88	3
.51	.53	.02	.01	--	--	70	--	20.3	--	8.8	--	7
1.1	1.1	.06	.01	--	--	77	--	18.5	--	3.6	--	--
.47	.54	.01	.00	20	4	60	--	6.6	--	--	100	26
.28	.82	.04	.03	--	--	128	--	11.2	--	--	340	3
.41	1.5	.04	.04	50	6	118	--	6.6	--	--	69	11

TABLE 13.--Chemical quality of surface water from selected sites--Continued

Date of collection 1/	Stream discharge (ft^3/s) 2/	Milligrams per liter: Dissolved calcium (Ca)	Dissolved magnesium (Mg)	Dissolved sodium (Na)	Dissolved potassium (K)	Bicarbonate (HCO_3)	Alkalinity as $CaCO_3$	Dissolved sulfate (SO_4)	Dissolved chloride (Cl)	Dissolved fluoride (F)	Total nitrate (N)	Total nitrite N)	Total ammonia (N)	Nitrogen total organic (N)
Site 17. East Branch of Tulalip Creek near Tulalip (USGS station 12158030)														
11- 6-74	1.2	--	--	--	--	--	--	--	--	--	0.98	0.00	0.04	0.14
12- 6-74	1.7	--	--	--	--	--	--	--	--	--	--	--	--	--
1- 8-75	1.7	--	--	--	--	--	--	--	--	--	--	--	--	--
2- 4-75	1.6	--	--	--	--	--	--	--	--	--	1.2	.00	.04	.16
3- 5-75	3.6	--	--	--	--	--	--	--	--	--	--	--	--	--
4-10-75	1.8	--	--	--	--	--	--	--	--	--	--	--	--	--
5- 8-75	1.6	--	--	--	--	--	--	--	--	--	--	--	--	--
7-14-75	1.2E	--	--	--	--	--	--	--	--	--	--	--	--	--
8- 7-75	1.1	--	--	--	--	--	--	--	--	--	--	--	--	--
9- 4-75	1.2*	--	--	--	--	--	--	--	--	--	--	--	--	--
9-18-75	1.3E	--	--	--	--	--	--	--	--	--	.92	.00	.05	.15
10- 8-75	1.3	--	--	--	--	--	--	--	--	--	--	--	--	--
11- 6-75	1.4*	--	--	--	--	--	--	--	--	--	--	--	--	--
12-18-75	2.9E	--	--	--	--	--	--	--	--	--	1.2	.00	.04	.32
1- 8-76	2.6	--	--	--	--	--	--	--	--	--	--	--	--	--
2- 4-76	2.0*	--	--	--	--	--	--	--	--	--	--	--	--	--
3- 4-76	1.8*	--	--	--	--	--	--	--	--	--	1.5	.00	.03	.22
4- 8-76	2.0*	--	--	--	--	--	--	--	--	--	--	--	--	--
5- 4-76	2.3*	--	--	--	--	--	--	--	--	--	--	--	--	--
6- 3-76	1.8	--	--	--	--	--	--	--	--	--	1.1	.00	.03	.21
7-13-76	1.5	--	--	--	--	--	--	--	--	--	--	--	--	--
8- 5-76	1.8	--	--	--	--	--	--	--	--	--	--	--	--	--
Site 18. East Branch of Tulalip Creek near mouth near Tulalip (USGS station 12158032)														
9- 9-76	2.3	--	--	--	--	--	--	--	--	--	.60	.01	.03	.19
3- 8-77	2.8	7.2	6.3	5.7	1.5	49	40	5.6	4.7	--	1.0	.01	.06	.28
Site 20. Tulalip Creek at Tulalip (USGS station 12158040)														
11- 6-74	6.1	7.8	6.7	6.2	1.8	58	48	4.8	5.5	--	.24	.01	.07	.22
12- 6-74	13.	--	--	--	--	--	--	--	--	--	--	--	--	--
1- 8-75	17.	--	--	--	--	--	--	--	--	--	--	--	--	--
2- 5-75	14.G	12.	5.2	5.2	1.0	41	34	10.	6.9	0.0	.59	.01	.10	.33
3- 5-75	29.	--	--	--	--	--	--	--	--	--	--	--	--	--
4-10-75	13.G	--	--	--	--	--	--	--	--	--	--	--	--	--
5- 8-75	10.	9.2	5.8	5.4	1.3	50	41	4.0	5.1	--	.24	.01	.09	.38
7-14-75	6.4G	--	--	--	--	--	--	--	--	--	--	--	--	--
8- 7-75	4.9	--	--	--	--	--	--	--	--	--	--	--	--	--
9- 4-75	6.7	--	--	--	--	--	--	--	--	--	--	--	--	--
9-18-75	6.6G	10.	6.8	6.4	1.6	62	51	3.9	5.2	--	.08	.01	.09	.25
10- 8-75	6.7G	--	--	--	--	--	--	--	--	--	--	--	--	--
11- 6-75	20.	--	--	--	--	--	--	--	--	--	--	--	--	--
12-18-75	23.G	5.8	4.8	4.7	1.2	38	31	6.6	5.5	.1	.58	.01	.07	.39
1- 8-76	25.	--	--	--	--	--	--	--	--	--	--	--	--	--
2- 4-76	17.	--	--	--	--	--	--	--	--	--	--	--	--	--
3- 4-76	15.G	6.5	5.0	5.3	1.3	40	33	5.2	4.0	.1	.67	.01	.10	.33
4- 8-76	25.	--	--	--	--	--	--	--	--	--	--	--	--	--
5- 4-76	10.	--	--	--	--	--	--	--	--	--	--	--	--	--
6- 3-76	10.G	6.9	5.6	5.0	.7	49	40	6.7	3.8	.1	.12	.01	.20	.39
7-13-76	6.3G	--	--	--	--	--	--	--	--	--	--	--	--	--
8- 5-76	6.2	--	--	--	--	--	--	--	--	--	--	--	--	--
9- 9-76	6.3G	--	--	--	--	--	--	--	--	--	.17	.01	.13	.43
10- 6-76	6.2	--	--	--	--	--	--	--	--	--	--	--	--	--
11- 3-76	7.1G	--	--	--	--	--	--	--	--	--	--	--	--	--
3- 8-77	12.	7.2	5.7	5.9	1.5	44	36	7.9	5.7	--	.69	.01	.16	.41

[1] Letters following the date of collection of lake samples indicate the depths sampled: A = 3 ft, B = 11 ft, C = 50 ft, D = 52 ft, E = 60 ft, F = 64 ft.

[2] E = estimated discharge; * = discharge measured on day before sample was collected; G = discharge from gaging station records.

[3] TNTC = Too numerous to count.

Milligrams per liter												
Total Kjeldahl nitrogen (N)	Nitrogen, total (N)	Total phosphorus (P)	Dissolved orthophosphorus (P)	Hardness (Ca, Mg)	Noncarbonate hardness	Specific conductance (micromhos)	pH (units)	Water temperature (°C)	Turbidity (JTU)	Dissolved oxygen (mg/L)	Total coliform (col. per 100 mL) 3/	Fecal coliform (col. per 100 mL)
0.18	1.2	0.05	0.04	--	--	101	--	9.0	0	--	7	--
--	--	--	--	--	--	--	--	8.8	--	--	27	--
--	--	--	--	--	--	--	--	6.5	--	--	270	--
.20	1.4	.04	.04	--	--	117	--	6.5	0	--	370	--
--	--	--	--	--	--	--	--	5.4	--	--	21	--
--	--	--	--	--	--	--	--	8.3	--	--	25	--
--	--	--	--	--	--	--	--	9.0	--	--	7	--
--	--	--	--	--	--	--	--	10.6	--	--	100	--
--	--	--	--	--	--	--	--	10.0	--	--	210	--
--	--	--	--	--	--	--	--	10.0	--	--	36	--
.20	1.1	.06	.05	--	--	110	7.3	10.9	0	--	300	--
--	--	--	--	--	--	--	--	--	--	--	18	--
--	--	--	--	--	--	--	--	9.4	--	--	240	--
.36	1.6	.04	.03	--	--	68	7.0	4.5	0	--	98	--
--	--	--	--	--	--	--	--	--	--	--	70	--
--	--	--	--	--	--	--	--	3.4	--	--	80	--
.25	1.8	.04	.01	--	--	98	7.2	6.0	0	--	120	--
--	--	--	--	--	--	--	--	8.6	--	--	10	--
--	--	--	--	--	--	--	--	9.8	--	--	67	--
.24	1.3	.05	.04	--	--	101	7.2	8.7	0	--	210	--
--	--	--	--	--	--	--	--	9.8	--	--	100	--
--	--	--	--	--	--	--	--	10.2	--	--	110	--
.22	.83	.07	.06	--	--	121	--	11.0	--	--	510	11
.34	1.3	.05	.05	44	4	109	--	6.8	--	--	130	11
.29	.54	.04	.03	47	0	106	--	9.5	1	--	48	--
--	--	--	--	--	--	--	--	7.0	--	--	85	--
--	---	--	--	--	--	--	--	4.2	--	--	830	--
.43	1.0	.05	.03	51	18	99	--	3.0	1	--	320	--
--	--	--	--	--	--	--	--	4.0	--	--	75	--
--	--	--	--	--	--	--	--	9.9	--	--	40	--
.47	.72	.06	.04	47	6	104	--	13.5	1	--	73	--
--	--	--	--	--	--	--	--	16.0	--	--	700	--
--	--	--	--	--	--	--	--	14.0	--	--	500	--
--	--	--	--	--	--	--	--	11.1	--	--	200	--
.34	.43	.06	.02	53	2	114	7.3	14.0	2	--	760	--
--	--	--	--	--	--	--	--	11.3	--	--	750	--
--	--	--	--	--	--	--	--	8.4	--	--	1,500	--
.46	1.0	.04	.03	34	3	101	7.0	2.0	1	--	150	--
--	--	--	--	--	--	--	--	5.0	--	--	36	--
--	--	--	--	--	--	--	--	2.8	--	--	80	--
.43	1.1	.05	.02	37	4	79	7.1	1.6	1	--	110	--
--	--	--	--	--	--	--	--	--	--	--	60	--
--	--	--	--	--	--	--	--	11.4	--	--	410	--
.59	.72	.07	.05	40	0	85	6.9	12.0	1	--	270	--
--	--	--	--	--	--	--	--	12.0	--	--	220	--
--	--	--	--	--	--	--	--	15.0	--	--	170	--
.56	.74	.11	.07	--	--	121	--	11.8	--	9.7	4,100	1,500
--	--	--	--	--	--	--	--	--	--	10.6	600	38
--	--	--	--	--	--	--	--	7.2	--	--	1,400	17
.57	1.3	.08	.06	41	5	100	--	6.2	--	10.8	260	11

TABLE 14.--Drillers' logs of selected wells in the Tulalip Indian Reservation

Material	Thickness (feet)	Depth (feet)
29/4-1A1 Priest Point Water Co. Altitude 122 ft. Drilled by C.E. Miller, 1941. Casing: 8-inch to 58 ft; 6-inch to 159 ft. Screen: 159-172 ft.		
Soil	2	2
Sand, dry	30	32
Clay, blue	10	42
Hardpan	6	48
Sand	4	52
Clay and hardpan	23	75
Sand and gravel, dry	15	90
Sand, tight	40	130
Sand, fine, silty, some water	15	145
Sand, clay, and wood	12	157
Sand, coarse, water-bearing	6	163
Clay	1	164
Sand, coarse, with 10 percent pea gravel and 5 percent heavy gravel, water-bearing	8	172
Sand, fine, and clay	2	174
29/4-1A2. Priest Point Water Co. Altitude 122 ft. Drilled by H.E. Deckmann, April 1964. Casing: 8-inch to 141 ft. Screen: 141-146 ft. Slot size: 0.030 in.		
Sand, gravel, and clay	20	20
Sand and clay	80	100
Gravel and clay	24	124
Sand, gravel, and clay, water-bearing	16	140
Sand, coarse, water-bearing	6	146
29/4-1A3. Priest Point Water Co. Altitude 122 ft. Drilled by H.E. Deckmann, April 1964. Casing: 8-inch to 141 ft. Screen: 141-146 ft. Slot size: 0.030 in.		
Sand, gravel, and clay	20	20
Sand and clay, tight	80	100
Clay and gravel, hard-packed	24	124
Sand, gravel, and clay, hard-packed, with water-bearing streaks	16	140
Sand, coarse, clean, water-bearing	6	146

TABLE 14.--Drillers' logs of selected wells in the Tulalip Indian Reservation--continued

Material	Thickness (feet)	Depth (feet)
29/4-1A4. Jack Denginen. Altitude 125 ft. Drilled by H.E. Deckmann. Casing: 6-inch. Screened. Slot size: 0.030 in.		
Sand and gravel	20	20
Clay, blue	20	40
Sand, dirty	60	100
Sand and gravel, hard-packed, dirty	20	120
Sand, dry	4	124
Sand, water-bearing	22	146
29/4-1B1. Norman G. Kleisath, Altitude 95 ft. Drilled by Hilton Hayes, 1964. Casing: 6-inch to 100.5 ft. Screen: 100.5-105.5.		
Unknown	60	60
Hardpan	--	at 60
Unknown	25	85
Hardpan	15	100
Gravel and sand	5	105
Unknown	105	105½
29/4-1B2. Meridian Water Supply, Inc. Altitude 108 ft. Drilled by H.E. Deckmann, April 1965. Casing: 8-inch to 40 ft, 6-inch to 150 ft. Screen: 150-160 ft. Slot size: 0.035 in.		
Sand, gravel, and clay	15	15
Sand and gravel, water-bearing	10	25
Sand, gravel, and clay, firm	5	30
Sand, gravel, and clay, hard, dry	20	50
Sand and clay, dry	25	75
Sand, coarse, gravel, and clay, hard-packed	22	97
Sand and clay firm	9	106
Clay and sand, some water	14	120
Sand, medium, water-bearing	7	127
Sand and clay, hard-packed, little water	18	145
Sand, coarse, and fine gravel, water-bearing	15	160

TABLE 14.--Drillers' logs of selected wells in the Tulalip Indian Reservation--continued

Material	Thickness (feet)	Depth (feet)
29/4-1B3. Chealco Community Association, Inc. Altitude 122 ft. Drilled by C.E. Miller, July 1947. Casing: 6-inch. Screened		
Sand and gravel	85	85
Sand and gravel, dry, tight	40	125
Sand, some water	17	142
Sand, medium	18	160
Sand, coarse, with 10 percent fine gravel, water-bearing	10	170
Sand, tight	2	172
29/4-1B5. Little & Daniels. Altitude 102 ft. Drilled by H.E. Deckmann, August 1963. Casing: 6-inch to 123 ft. Screen : 123-128 ft. Slot size: 0.020 in.		
Sand and gravel, loose	60	60
Sand, gravel, and clay, hard-packed, some water	15	75
Sand, gravel, and clay, hard-packed, dry	29	104
Sand, water-bearing	24	128
29/4-1C1. Gays Water District. Altitude 125 ft. Drilled by C.E. Miller, December 1958. Casing: 6-inch to 155 ft; perforated 155-165 ft.		
Unknown	--	--
Hardpan	--	70
Sand and gravel, tight, dry	66	136
Sand, medium, some water	10	146
Sand, with 10 percent fine gravel, water-bearing	5	151
Sand, coarse, with 10 percent fine gravel	13	164
Clay, blue	1	165
29/4-1C2. Skokia Water Co. Altitude 125 ft. Drilled by H.E. Deckmann, June 1971. Casing: 6-inch to 150 ft. Screen: 150-160 ft. Slot size: 0.025 in.		
Sand, gravel, and clay	20	20
Sand and clay, dry	30	50
Sand, hard	25	75
Sand, gravel, and clay	25	100

(continued)

TABLE 14.--Drillers' logs of selected wells in the Tulalip Indian Reservation--continued

Material	Thickness (feet)	Depth (feet)
29/4-1C2.--continued		
Sand and clay, dry	20	120
Sand and clay, water-bearing	28	148
Sand, coarse, water-bearing	12	160
29/4-1C3. H.C. Holscher. Altitude 102 ft. Drilled by H.E. Deckmann, June 1967. Casing: 6-inch to 130 ft; perforated 124-130 ft.		
Sand and clay, with gravel streaks	98	98
Sand, coarse, with some gravel, water-bearing	15	113
Clay and sand	2	115
Sand, coarse, with some gravel, water-bearing	15	130
29/4-1G4. Sam Wilson and Ralph Smith. Altitude 90 ft. Drilled by R.E. Freeman, December 1963. Casing: 6-inch to 120 ft. Screen: 120-125 ft. Slot size: 0.040 in.		
Soil, sandy	4	4
Sand, fine	31	35
Sand, fine, with clay streaks	10	45
Sand and gravel, tight, cemented	50	95
Sand, medium to coarse, loose, water-bearing	3	98
Sand, fine, with silt	19	117
Sand and gravel, loose, water-bearing	10	127
29/4-1G6. Ronninigen. Altitude 50 ft. Drilled by H.E. Deckmann, June 1971. Casing: 6-inch to 66 ft. Screen: 66-71 ft. Slot size: 0.017 in.		
Sand and clay, firm	6	6
Sand and clay, water-bearing	1	7
Sand and clay, firm	3	10
Sand, with some clay, wet	2	12
Sand, gravel, and clay, firm, dry	18	30
Sand, gravel, and clay, hard-packed, dry	15	45
Sand and gravel, water-bearing	5	50
Sand, fine, with thin, clay streaks, water-bearing	17	67
Sand, coarse, water-bearing	4	71

TABLE 14.--Drillers' logs of selected wells in the Tulalip Indian Reservation--continued

Material	Thickness (feet)	Depth (feet)
29/4-1G7. Robert C. Ackerman. Altitude 55 ft. Drilled by Ace Drilling and Pump Service, 1965 Casing: 6-inch.		
Unknown	21½	21½
Sand and gravel, tight, dry	28½	50
Sand, wet	25	75
Sand, clean, and fine gravel	5	80
30/4-1B1. Richard Huggins, Altitude 480 ft. Drilled by J & S Drilling Co., Inc, May 1977. Casing: 6-inch to 193 ft. Screen: 193-198 ft. Slot size: 0.018		
Topsoil	3	3
Till, brown	96	99
Till, sandy	69	168
Till, blue	17	185
Sand, fine	6	191
Sand, coarse	7	198
30/4-1C1. Tulalip Tribe. Altitude 590 ft. Drilled by C.D. Marks, 1940. Casing: 6-inch Perforated: 23-28 ft and 35-39 ft.		
Soil	2	2
Hardpan, gray	38	40
Hardpan, blue, with boulders	68	108
Unknown	17	125
30/4-1M1. Sam Lake Improvement, Inc. Altitude 545 ft. Drilled by R.E. Freeman, 1965. Casing: 6-inch to 421 ft. Screen: 421-426 ft.		
Soil, sandy	3	3
Till	44	47
Gravel, tight, dry	13	60
Gravel, coarse, loose, dry	42	102
Sand, coarse, dry	18	120
Sand, medium, dry	30	150
Gravel and sand, coarse	30	180

(continued)

TABLE 14.--Drillers' logs of selected wells in the Tulalip Indian Reservation--continued

Material	Thickness (feet)	Depth (feet)
30/4-1M1.--continued		
Sand, with silt, dry	30	210
Sand, with silt, wet	25	235
Clay, yellow, with sand and silt layers	5	240
Sand, fine to medium	5	245
Clay, blue, with silt layers	21	266
Sand, crusty, with clay layers	8	274
Clay, blue	14	288
Clay, blue, with sand and silt layers	8	296
Hardpan	74	370
Unknown	3	373
Sand	50	423
Clay, blue	1	424
Sand, coarse, and fine gravel, water-bearing	4	428
Clay or shale, blue, hard	30	458
30/4-1N1. Lands and Water, Inc. Altitude 520 ft. Drilled by G.L. Calvin, February 1970. Casing: 8-inch to 247 ft. Screen: 247-257. Slot size: 0.025 in.		
Gravel, dirty	10	10
Gravel, compact, and boulders	10	20
Clay, brown, and gravel	15	35
Clay, blue, and gravel	37	72
Sand	46	118
Sand and gravel	38	156
Sand	12	168
Sand and silt	32	200
Sand and gravel	18	218
Sand and clay	4	222
Sand and gravel, water-bearing	6	228
Sand, and brown clay	3	231
Sand, and blue clay	3	234
Sand, clay, and silt, blue	9	243
Sand and gravel, water-bearing	14	257

TABLE 14.--Drillers' logs of selected wells in the Tulalip Indian Reservation--continued

Material	Thickness (feet)	Depth (feet)
30/4-3A1. S.L. Meyer. Altitude 453 ft. Drilled by H.E. Deckmann, August 1970. Casing: 6-inch to 163 ft. Screen: 163-168 ft. Slot size: 0.023 in.		
Soil	2	2
Clay, firm, with some gravel	6	8
Hardpan	42	50
Clay, firm, with some sand and gravel	45	95
Sand, medium to fine, and clay, dry	35	130
Sand, fine, and clay wet	14	144
Sand, water-bearing	24	168
30/4-3A2. J.E. Johnson. Altitude 444 ft. Drilled by H.E. Deckmann, August 1970. Casing: 6-inch to 163 ft. Screen: 163-168 ft. Slot size: 0.020 in.		
Soil, clayey	10	10
Hardpan	40	50
Clay, hard-packed, with some sand and gravel	25	75
Clay, with some sand, dry	60	135
Sand, water-bearing	33	168
30/4-3A3. Martin Andersen. Altitude 448 ft. Drilled by H. E. Deckmann, April 1970. Casing 6-inch to 146 ft. Screen: 146-151 ft. Slot size: 0.025 in.		
Clay and sand, firm	15	15
Hardpan	25	40
Clay, firm, with coarse sand and small gravel	35	75
Clay and sand, dry	52	127
Clay and sand, water-bearing streaks	13	140
Sand, fairly clean, coarse	11	151
30/4-3A4. George Rolph. Altitude 425 ft. Drilled by H.E. Deckmann, February 1970. Casing: 6-inch to 131 ft. Screen: 131-136 ft. Slot size: 0.020 in.		
Clay, firm	10	10
Hardpan	40	50
Clay, sand, and gravel, hard	20	70

(continued)

TABLE 14.--Drillers' logs of selected wells in the Tulalip Indian Reservation--continued

Material	Thickness (feet)	Depth (feet)
30/4-3A4.--continued		
Sand, with some clay, and gravel streaks, dry	40	110
Sand, with some clay, wet	21	131
Sand, medium, water-bearing	5	136
30/4-3A5. Bill Christian. Altitude 417 ft. Drilled by J & S Drilling Co. Inc. April 1976. Casing: 6-inch to 127 ft. Screen: 127-132 ft. Slot size: 0.020 in.		
Loam	4	4
Gravel	2	6
Clay	8	14
Till, gray	41	55
Sand, fine	55	110
Sand, coarse, water-bearing	22	132
30/4-3B1. Rowe. Altitude 407. Drilled by H.E. Deckmann, April 1968. Casing: 6-inch to 151 ft; perforated 118-135 ft. Screen: 151-156 ft. Slot size: 0.025 in.		
Hardpan	50	50
Sand, gravel, and clay, firm, dry	60	110
Sand, gravel, and clay, firm, wet	10	120
Sand, water-bearing	36	156
30/4-3B3. O.D. Burright. Altitude 412 ft. Drilled by H.E. Deckmann, December 1968. Casing: 6-inch to 132 ft. Screen: 132-137 ft. Slot size: 0.020 in.		
Clay, sand, and gravel, hard	50	50
Clay, sand, and gravel, softer	50	100
Clay, sand, and gravel	10	110
Sand, and clay, wet	15	125
Sand, coarse, and clay, water-bearing	12	137

TABLE 14.--Drillers' logs of selected wells in the Tulalip Indian Reservation--continued

Material	Thickness (feet)	Depth (feet)
30/4-3B4. James Hoffman, Altitude 450 ft. Drilled by Hitt Well Drilling, May 1978. Casing: 6-inch to 183 ft. Screen: 183-187 ft. Slot size: 0.010 in.		
Topsoil	4	4
Hardpan	66	70
Gravel	13	83
Sand and gravel, dry	5	88
Clay, sandy	17	105
Hardpan	27	132
Sand, dry	34	166
Clay, brown	16	182
Sand, water-bearing	5	187
30/4-3B5. Kiven Millar. Altitude 420 ft. Drilled by Countryman Well Drilling, April 1978. Casing: 6-inch to 128 ft. Screen: 128-135 ft. Slot size: 0.020 in.		
Hardpan, brown	12	12
Gravel, hard, brown, dry	18	30
Gravel, dirty, packed, dry	28	58
Sand, fine, brown	30	88
Sand, fine, and clay, yellow-brown	5	93
Sand and clay	5	98
Sand, fine, and some clay	22	120
Sand, fine-coarse, gray	4	124
Sand, coarse, and some gravel, some water	10	134
Sand, water-bearing	1	135
30/4-3C1. Kathann Estates. Altitude 450 ft. Drilled by H.E. Deckmann, September 1969. Casing: 6-inch to 169 ft. Screen: 169-179 ft. Slot size: 0.020 in., 169-174 ft; 0.025 in., 174-179 ft.		
Clay, sandy	20	20
Hardpan	30	50
Clay, blue, with some sand and gravel	25	75
Clay and sand, yellow-brown, dry	55	130
Clay, firm, with water-bearing streaks	20	150
Sand and gravel, with a little clay, water-bearing	4	154
Sand, with some gravel, water-bearing	25	179

TABLE 14.--Drillers' logs of selected wells in the Tulalip Indian Reservation--continued

Material	Thickness (feet)	Depth (feet)
30/4-3D1. J.F. Doleshel. Altitude 457 ft. Drilled by J & S Drilling Co., October 1973. Casing: 6-inch to 165 ft. Screen: 165-170 ft. Slot size: 0.017 in.		
Soil	2	2
Clay	19	21
Till, gray	31	52
Till, brown	45	97
Silt and clay	7	104
Silt, tan	40	144
Silt and clay, brown	5	149
Sand, coarse, with some clay, water-bearing	21	170
30/4-3G1. Grubb. Altitude 402 ft. Drilled by H.E. Deckmann, September 1968. Casing: 6-inch to 123 ft. Screen: 123-128 ft. Slot size: 0.025 in.		
Sand, gravel, and clay, hard-packed	50	50
Sand and clay, firm, dry	55	105
Clay and sand, with thin, water-bearing streaks	14	119
Sand, coarse, with some gravel, water-bearing	9	128
30/4-3H2. D.L. Larson. Altitude 395 ft. Drilled by H.E. Deckmann, January 1970. Casing: 6-inch to 115 ft. Screen: 115-120 ft. Slot size: 0.020 in.		
Clay, firm	15	15
Sand, gravel, and clay, hard-packed	35	50
Clay and sand, firm	48	98
Sand, with some clay, wet	17	115
Sand, medium, water-bearing	5	120
30/4-3H3. Doud. Altitude 390 ft. Drilled by H.E. Deckmann, August 1966. Casing: 6-inch to 102 ft. Screen: 102-107 ft. Slot size: 0.020 in.		
Soil	3	3
Sand, gravel, and clay, hard-packed	8	11
Sand and gravel, with a little clay, dry	49	60
Sand, fine, with a little clay	30	90
Sand and clay, with water-bearing streaks	10	100
Sand and clay, water-bearing	7	107

TABLE 14.--Drillers' logs of selected wells in the Tulalip Indian Reservation--continued

Material	Thickness (feet)	Depth (feet)
30/4-3H4. Ravender. Altitude 400 ft. Drilled by H.E. Deckmann, March 1970. Casing: 6-inch to 138 ft. Screen: 138-143 ft. Slot size: 0.020 in.		
Clay, sandy	10	10
Hardpan	30	40
Sand and clay, with a few, thin, gravel streaks	80	120
Sand, water-bearing	23	143
30/4-3H5. Tucker. Altitude 390 ft. Drilled by H.E. Deckmann, September 1969. Casing: 6-inch to 96 ft. Screen: 96-101 ft. Slot size: 0.020 in.		
Clay	10	10
Clay, hard, and gravel	45	55
Clay and sand, firm	30	85
Clay and sand, firm, with thin, water-bearing streaks	3	88
Sand, medium, with streaks of fine sand, water-bearing	4	92
Sand, medium, with thin gravel streaks, water-bearing	9	101
30/4-6F1. D.P. Newland. Altitude 305 ft. Drilled by Ace Drilling and Pump Service, May 1976. Casing: 6-inch to 311 ft; open end.		
Fill, gravel	3	3
Gravel, coarse, loose	11	14
Hardpan, with boulders	56	70
Gravel, loose, dry	22	92
Clay, brown, with thin sand layers	52	144
Hardpan	21	165
Clay, with thin sand layers	24	189
Clay, blue	17	206
Gravel, loose, dry	83	289
Gravel, loose, water-bearing	22	311

TABLE 14.--Drillers' logs of selected wells in the Tulalip Indian Reservation--continued

Material	Thickness (feet)	Depth (feet)
30/4-6L1. W.L. Pape. Altitude 205 ft. Drilled by H.E. Deckmann, August 1957. Casing: 6-inch to 226 ft. Screen: 226-231 ft. Slot size: 0.020 in.		
Gravel, hard	26	26
Gravel, sand, and clay, soft, with some water	2	28
Gravel, hard-packed with a little clay	2	30
Clay, hard, with sand and gravel	10	40
Sand, fine, and clay	20	60
Clay and sand, firm	10	70
Clay, hard, with sand and gravel	20	90
Hardpan	14	104
Clay, blue-gray	66	170
Sand and clay	40	210
Sand, water-bearing	21	231
30/4-6P1. Sunny Shores. Altitude 85 ft. Drilled by H.E. Deckmann, May 1955. Casing: 6-inch to 180 ft. Screen: 180-190 ft. Slot size: 0.010 in.		
Sand and gravel, loose, dirty	20	20
Gravel and brown clay, hard	40	60
Clay, blue-gray	65	125
Sand, fine, with some water	1	126
Clay	39	165
Sand, fine, dirty, firm, water-bearing	18	183
Sand, fine, loose, water-bearing	10	193
Sand, finer, hard-packed	7	200
30/-6R2. Dorothy Cashen. Altitude 410 ft. Drilled by J & S Drilling. Co., Inc., March 1975. Casing: 6-inch to 405 ft. Screen: 405-410 ft.		
Gravel	8	8
Till, tan	23	31
Till, brown	48	79
Sand	64	143
Silt	82	225
Sand	39	264
Clay	11	275

(continued)

TABLE 14.--Drillers' logs of selected wells in the Tulalip Indian Reservation--continued

Material	Thickness (feet)	Depth (feet)
30/-6R2.--continued		
Silt	21	296
Clay	39	335
Silt	45	380
Sand, fine	20	400
Sand, coarse	10	410
30/4-7G1. Tulare Beach Association. Altitude 30 ft. Drilled by C.D. Marks and Son, December 1946. Casing pulled.		
Sand, fine, with some clay	36	36
Clay, blue	8	44
Gravel and sand, water-bearing	23	67
Silt and clay	24	91
Clay, blue	30	121
Clay, with some gravel	55	176
Clay, sandy	34	210
Sand, silty	37	247
Sand, blue, very fine, hard	13	260
Sand, blue, fine, water-bearing	61	321
Clay, blue, hard	4	325
30/4-7G2. Tulare Beach Association. Altitude 30 ft. Drilled by H.E. Deckmann, July 1956. Casing: 8-inch to 55 ft. Screen: 55-60 ft. Slot size: 0.030 in.		
Sand, dirty	50	50
Clay, blue, and gravel, hard, wet	4	54
Sand, coarse, and gravel, water-bearing	6	60
Clay and gravel, dry	12	72
Clay and fine sand	18	90
30/4-7H1. Tulare Beach Association. Altitude 450 ft. Drilled by C.D. Marks & Son, 1946. Casing pulled.		
Soil	2	2
Till	83	85
Gravel	1	86
Clay, yellow	7	93

(continued)

TABLE 14.--Drillers' logs of selected wells in the Tulalip Indian Reservation--continued

Material	Thickness (feet)	Depth (feet)
30/4-7H1.--continued		
Sand, fine, with some clay	7	100
Sand, with gravel streaks	35	135
Sand, yellow	183	318
Clay, yellow	28	346
Sand, yellow, fine, dry	34	380
Clay, yellow	3	383
Clay, with fine sand	17	400
Sand, fine, clayey	31	431
30/4-8A1. Port Susan Nature Trails. Altitude 410 ft. Drilled by Hayes Well Drilling & Pumps, Inc., June 1978. Casing: 6-inch to 385 ft. Screens: 385-395 ft. Slot size: 0.018 in., 385-388 ft; 0.025 in., 388-395 ft.		
Clay, tan, and some gravel	18	18
Gravel, dry	102	120
Sand, dry	45	165
Sand and gravel, dry	45	210
Sand, dry	81	291
Clay, gray	1	292
Sand, fine, "dirty," gray	14	306
Clay, gray	45	351
Clay, sandy, gray	34	385
Sand, coarse, and some gravel, water-bearing	10	395
Sand, fine, and some clay	4	399
30/4-8P1. Bodeen and Lohr. Altitude 140 ft. Drilled by H.E. Deckmann, April 1967. Casings: 6-inch to 297 ft; perforated 297-302 ft. Screen (inside casing): 297-302 ft. Slot size: 0.014 in.		
Sand, gravel, and clay	9	9
Sand, medium, and clay	21	30
Sand, fine, and clay, dry	70	100
Unknown, water-bearing seams	90	190
Clay and sand, with streaks of heavy, blue clay	74	264
Sand, fine and clay, water-bearing	16	280
Sand and clay, firm, with very little water	17	297
Sand, medium, with thin, clay streaks, water-bearing	5	302
Sand, fine, and clay	28	330

TABLE 14.--Drillers' logs of selected wells in the Tulalip Indian Reservation--continued

Material	Thickness (feet)	Depth (feet)
30/4-8Q1. Unknown. Altitude 140 ft. Drilled by H.E. Deckmann, August 1953. Casing: 6-inch to 138 ft. Screen: 138-143 ft. Slot size: 0.030 in.		
Sand, silt, and clay	55	55
Sand, silt, and clay, wet	35	90
Sand and gravel, hard-packed	22	112
Sand and gravel, some water	1	113
Unknown, hard-packed	10	123
Sand, silt and clay, with some water	15	138
Sand, water-bearing	5	143
30/4-10F1. Tulalip Tribe. Altitude 235 ft. Drilled by Dahlman Pump and Drilling, 1974. Casing: 8-inch to 98 ft.		
Soil	4	4
Clay and gravel	16	20
Clay, brown, and gravel	11	31
Clay, sandy	3	34
Sand, fine, and clay	11	45
Sand, brown, fine to medium	5	50
Sand, brown, medium	15	65
Sand, medium to coarse	2	67
Clay, brown	3	70
Clay, blue	1	71
Sand, coarse	1	72
Clay, brown	1	73
Sand, fine to medium	13	86
Clay, gray	12	98
30/4-10G1. Tulalip Tribe. Altitude 230 ft. Drilled by Dahlman Pump and Drilling, 1974. Casing pulled.		
Clay, sandy	5	5
Sand and gravel	15	20
Clay, brown, and sand	10	30
Sand, fine, and some silt	15	45
Sand, fine to medium	9	54
Clay, gray	9	63
Clay, sand, and wood	1	64
Sand, medium, artesian flow	11	75
Clay, brown, silty	50	125
Clay, brown, some gravel	45	170

TABLE 14.--Drillers' logs of selected wells in the Tulalip Indian Reservation--continued

Material	Thickness (feet)	Depth (feet)
30/4-10L1. Tulalip Tribe. Altitude 224 ft. Drilled by Dahlman Pump and Drilling, 1974. Casing: 8-inch to 65 ft. Screen: 60-65 ft. Slot size: 0.020 in.		
Clay and gravel	14	14
Clay and sand	19	33
Sand, fine-medium, some water	9	42
Sand, coarse, and fine gravel, some water	15	57
Clay, silty, and gray sand	2	59
Sand, gray, and blue clay, artesian flow	7	66
Clay, brown, and wood	2	68
Clay, gray	12	80
30/4-10L2. Tulalip Tribe. Altitude 230 ft. Drilled by Dahlman Pump and Drilling, 1974. Casing: 8-inch to 84 ft. Screen: 84-94 ft. Slot size: 0.020 in.		
Clay, brown, and gravel	28	28
Clay and sand	19	47
Sand, medium	12	59
Sand and gravel	9	68
Sand and gravel, medium-coarse	22	90
Clay, brown	5	95
30/4-10L3. Tulalip Tribe. Altitude 215 ft. Drilled by Dahlman Pump and Drilling, 1974. Casing: 8-inch to 80 ft. Screen: 80-95 ft. Slot size: 0.040 in.		
Sand and gravel	25	25
Sand, silty, and clay	20	45
Sand, brown	3	48
Sand, medium to coarse	6	54
Sand, coarse	11	65
Sand, medium	6	71
Sand, coarse	4	75
Sand, medium to coarse	7	82
Sand, fine to medium	3	85
Sand, medium to coarse	13	98
Sand, fine to medium	18	116
Sand, fine to medium, and some gravel	1	117
Clay, brown	1	118

TABLE 14.--Drillers' logs of selected wells in the Tulalip Indian Reservation--continued

Material	Thickness (feet)	Depth (feet)
30/4-10L4. Tulalip Tribe. Altitude 190 ft. Drilled by Dahlman Pump and Drilling, 1974. Casing: 8-inch to 88 ft. Screen: 88-95 ft. Slot size: 0.050 in., 88-90 ft; 0.060 in., 90-95 ft.		
Sand and gravel	30	30
Sand, silty, and clay	5	35
Sand, brown	12	47
Sand, coarse, and gravel	17	64
Sand, fine to medium	17	81
Sand, fine, artesian flow	6	87
Sand, medium to coarse, artesian flow	8	95
Clay	1	96
30/4-10L5. Tulalip Tribe. Altitude 199 ft. Drilled by Dahlman Pump and Drilling, September 1974. Casing: 8-inch to 86 ft. Screen: 86-101 ft. Slot size: 0.040 in.		
Clay and gravel, with some sand	20	20
Clay, blue, sand and gravel	8	28
Sand and gravel	7	35
Unknown	7	42
Sand and gravel	12	54
Sand and gravel, fine to medium, water-bearing	48	102
Clay	1	103
30/4-17B2. Ochs Brothers. Altitude 135 ft. Drilled by H.E. Deckmann, February 1968. Casing: 6-inch to 127 ft. Screen: 127-142 ft. Slot size: 0.025 in, 127-132 ft; 0.020 in, 132-137 ft; 0.010 in, 137-142 ft.		
Sand, gravel, and clay	50	50
Sand, gravel, and clay, with water-bearing streaks	10	60
Sand, gravel, and clay, firm, dry	20	80
Sand and clay	45	125
Sand, medium, and clay, water-bearing	10	135
Sand, fine, and clay, water-bearing	7	142

TABLE 14.--Drillers' logs of selected wells in the Tulalip Indian Reservation--continued

Material	Thickness (feet)	Depth (feet)
30/4-17B3. Donald Senter. Altitude 125 ft. Drilled by H.E. Deckmann, June 1960. Casing: 6-inch to 123 ft. Screen: 123-128 ft. Slot size: 0.014 in.		
Sand and clay	115	115
Sand, with clay streaks, water-bearing	8	123
Sand, medium, water-bearing	5	128
30/4-17B4. Ernie Santi. Altitude 120 ft. Drilled by H.E. Deckmann, August 1955. Casing: 6-inch to 114 ft; perforated 70-73 ft. Screen: 114-119 ft. Slot size: 0.040 in.		
Sand and clay	64	64
Sand, coarse, loose	1	65
Sand and gravel, hard-packed	20	85
Sand and gravel, loose, with some silt and clay, water-bearing	34	119
30/4-17B5. A.W. Nylander. Altitude 110 ft. Drilled by H.E. Deckmann, May 1949. Casing: 6-inch to 100 ft; Screen: 100-105 ft. Slot size: 0.030 in.		
Sand and clay	12	12
Hardpan	4	16
Sand, gravel and clay, with thin water-bearing streaks	14	30
Sand, hard, dry	50	80
Sand, water-bearing	25	105
Sand, with clay, hard	7	112
30/4-17B6. C. Fairchild. Altitude 110 ft. Drilled by H.E. Deckmann, July 1953. Casing: 6-inch to 90 ft. Screen 90-95 ft. Slot size: 0.020 in.		
Sand and gravel, loose	8	8
Unknown	16	24
Gravel and clay, cemented	16	40
Sand and silt, dry	35	75
Sand, water-bearing	20	95

TABLE 14.--Drillers' logs of selected wells in the Tulalip Indian Reservation--continued

Material	Thickness (feet)	Depth (feet)
30/4-17B9. Clyde Lashua. Altitude 90 ft. Drilled by H.E. Deckmann, February 1969. Casing: 6-inch to 178 ft; perforated 89-90, 100-103 ft.		
Sand, gravel, and clay, firm	20	20
Sand, gravel, and clay, with thin water-bearing streaks	70	90
Sand, gravel, and clay, hard-packed, little water	10	100
Sand and gravel, water-bearing	3	103
Sand, fine, and clay	75	178
30/4-17B11. Waldo Wickstrom. Altitude 112 ft. Drilled by H.E. Deckmann, April 1960. Casing: 6-inch to 49 ft. Screen: 48-54 ft. Slot size: 0.010 in.		
Clay, sand, and gravel, hard-packed	10	10
Clay, sand, and gravel, soft	15	25
Sand and clay, wet	23	48
Sand, water-bearing	3	51
Sand, fine, clay and gravel	4	55
30/4-17B12. Leonard Hansen. Altitude 100 ft. Drilled by H.E. Deckmann, February 1968. Casing: 6-inch to 143 ft; perforated 125-135 ft.		
Sand, gravel, and clay	44	44
Sand, fine, and clay, water-bearing	11	55
Sand, gravel, and clay, dry	25	80
Sand, gravel, and clay, water-bearing	7	87
Sand, gravel, and clay, dry	10	97
Sand, gravel, and clay, water-bearing	4	101
Sand, gravel, and clay, thin water-bearing streaks	24	125
Sand, gravel, and clay, water-bearing	10	135
Unknown	8	143

TABLE 14.--Drillers' logs of selected wells in the Tulalip Indian Reservation--continued

Material	Thickness (feet)	Depth (feet)
30/4-17B13. Fahlstrom. Altitude 105 ft. Drilled by H.E. Deckmann, July 1965. Casing: 6-inch to 181 ft. Screen: 181-186 ft. Slot size: 0.020 in.		
Soil, sandy	6	6
Clay, sand, and gravel	52	58
Clay, and water-bearing sand and gravel streaks	10	68
Sand, coarse, and clay, water-bearing	5	73
Clay, sandy, and gravel, hard, dry	39	112
Clay, sand, and some gravel, dry	23	135
Sand and clay, wet	45	180
Sand, medium to coarse, and clay, water-bearing	6	186
30/4-17B14. Veenhuizen. Altitude 115 ft. Drilled by H.E. Deckmann, April 1962. Casing: 6-inch to 105 ft. Screen 105-110 ft. Slot size: 0.020 in.		
Gravel, sand, and clay	30	30
Sand, fine, and clay, soft	25	55
Clay, gray, with some gravel	15	70
Clay, brown sand, and gravel	15	85
Clay, brown, with water-bearing sand streaks	15	100
Sand, water-bearing	10	110
30/4-17B15. Dishnow. Altitude 90 ft. Drilled by H.E, Deckmann, September 1965. Casing: 6-inch to 146 ft. Screen: 146-151 ft. Slot size: 0.010 in.		
Sand and gravel	28	28
Sand and gravel, some water	2	30
Sand and clay	8	38
Sand and clay, some water	2	40
Sand, fine, and clay	49	89
Sand, fine, water-bearing	3	92
Sand, fine, and clay	54	146
Sand, fine, water-bearing	5	151

TABLE 14.--Drillers' logs of selected wells in the Tulalip Indian Reservation--continued

Material	Thickness (feet)	Depth (feet)
30/4-17B16. Garvey. Altitude 95 ft. Drilled by H.E. Deckmann. Casing: 6-inch to 115 ft. Screen: 115-120 ft. Slot size: 0.030 in.		
Sand, silt and some gravel, hard-packed	89	89
Unknown, water-bearing	31	120
30/4-17B17. Anderson. Altitude 80 ft. Drilled by H.E. Deckmann, July 1954. Casing: 6-inch to 122 ft. Screen: 122-127 ft. Slot size: 0.025 in.		
Gravel, coarse sand, and clay, hard	70	70
Sand, dirty, wet	20	90
Sand, coarse, with gravel streaks, water-bearing	20	110
Sand with gravel streaks, loose, water-bearing	17	127
30/4-17C1. Spee-Bi-Dah Community Water Co. Altitude 110 ft. Drilled by C.E. Miller, 1946. Casing: 6-inch to 372 ft; perforated 366-372 ft.		
Sand and gravel, dry	102	102
Sand, fine, with some clay	2	104
Gravel, fine	2	106
Clay, yellow, sandy	3	109
Sand, silty, some water	5	114
Clay, gray	5	119
Clay, blue	13	132
Clay, sandy	17	149
Sand, gray, some water	4	153
Clay, gray	6	159
Sand, dark gray, fine, water-bearing	101	260
Sand, hard	9	269
Sand, fine	21	290
Sand, hard, some water	4	294
Sand, fine to medium	4	298
Clay and fine sand	7	305
Sand, fine	9	314
Sand, fine, with clay layers	29	343
Sand, partially consolidated	1	344
Sand, medium, with 15 percent fine gravel	9	353
Sand, medium	5	358
Sand, partially consolidated	4	362
Sand, coarse, with fine gravel	5	367
Gravel, coarse, and coarse sand	5	372
Unknown	5	377

TABLE 14.--Drillers' logs of selected wells in the Tulalip Indian Reservation--continued

Material	Thickness (feet)	Depth (feet)
30/4-17J1. David Miller. Altitude 270 ft. Drilled by Hayes Well Drilling, April 1977. Casing: 6-inch to 220 ft. Screens: 220-223 ft and 225-228 ft. Slot size: 0.020 in, 220-223 ft, 0.018 in, 225-228 ft.		
Topsoil, gravelly	3	3
Gravel, with some brown clay	29	32
Clay, brown, and gravel	78	110
Gravel and sand	85	195
Clay, brown	6	201
Sand, fine, brown, water-bearing	29	230
Clay, gray	--	at 230
30/4-17J2. Don Pardee. Altitude 270 ft. Drilled by J & S Drilling Co., November 1977. Casing: 6-inch to 202 ft. Screen: 202-207 ft. Slot size: 0.012 in.		
Topsoil	1	1
Till, brown	107	108
Sand, fine, and till	94	202
Sand, fine, water-bearing	5	207
30/4-17K1. Tulalip Shores, Inc. Altitude 190 ft. Drilled by C.E. Miller, December 1946. Casing: 8-inch to 303 ft, 6-inch to 507 ft; perforated 497-504 ft.		
Soil, sand, and gravel	10	10
Hardpan	5	15
Sand, dry	50	65
Sand and gravel	20	85
Sand, tight	42	127
Sand, fine, some water	5	132
Sand, yellow and gray, tight	9	141
Clay, sandy	9	150
Sand, gray, fine	5	155
Clay, sandy	2	157
Clay, blue	47	204
Sand, black, with fine gravel, some water	2	206
Sand, gray, with some clay	3	209

(continued)

TABLE 14.--Drillers' logs of selected wells in the Tulalip Indian Reservation--continued

Material	Thickness (feet)	Depth (feet)
30/4-17K1.--continued		
Sand, fine and fine gravel, water-bearing	9	218
Sand, with some clay	2	220
Sand, fine, and wood	5	225
Sand, soft, clayey	5	230
Sand, fine, with some water	70	300
Sand, gray	20	320
Sand, fine, silty	43	363
Sand, tight, with clay layers	62	425
Sand, fine, tight	20	445
Sand, tight, with clay layers	30	475
Sand, fine	7	482
Clay	1	483
Sand, gray, coarse, with 25 percent fine gravel, water bearing	17	500
Sand, coarse, and gravel	6	506
Unknown	12	518
30/4-21G1. Arcadia Water District. Altitude 175 ft. Drilled by Williams Well Drilling, Inc., October 1969. Casing: 6-inch to 365 ft. Screen: 365-375 ft. Slot size: 0.012 in.		
Sand and gravel	93	93
Clay	90	183
Sand and silt	170	353
Sand, water-bearing	22	375
30/4-21J1. Upper Tulalip Heights. Altitude 160 ft. Drilled by Williams Well Drilling, 1971. Casing: 6-inch to 365 ft. Screen: 365-380 ft. Slot size: 0.012 in, 365-375 ft; 0.010 in, 375-380 ft.		
Soil, gravelly	7	7
Gravel and clay, compact	53	60
Clay, blue, and sand	60	120
Sand and silt	235	355
Sand, fine	5	360
Sand, water-bearing	20	380

TABLE 14.--Drillers' logs of selected wells in the Tulalip Indian Reservation--continued

Material	Thickness (feet)	Depth (feet)
30/4-21J2. Whyte. Altitude 182 ft. Drilled by H.E. Deckmann, September 1967. Casing: 6-inch to 231 ft. Screen: 231-241 ft. Slot size:0.014 in. 231-236 ft; 0.012 in., 236-241 ft.		
Sand, gravel, and clay, hard-packed	120	120
Clay, with some gravel, hard	10	130
Clay, gravel, and sand	5	135
Sand and clay	25	160
Clay, blue-gray	20	180
Clay and gravel, hard, with thin water-bearing streaks	8	188
Clay	7	195
Clay, with thin water-bearing steaks	17	212
Sand, water-bearing	4	216
Sand, silt, and wood chips, water-bearing	4	220
Sand, fine, and clay, soft	8	228
Sand, fine, with some clay, water-bearing	13	241
30/4-21Q1. Edmund H. Lindstrom. Altitude 20 ft. Dug by owner, August 1944. Casing: 48-inch to 20 ft. Open end.		
Clay, gray-blue	19	19
Sand, coarse	1	20
30/4-22L1. Paul Hesby. Altitude 100 ft. Drilled by Ace Drilling and Pump Service, May 1974. Casing: 6-inch to 106 ft; open end.		
Soil, sandy	3	3
Gravel, coarse, cemented	87	90
Gravel, coarse, loosely cemented	12	102
Clay, blue	3	105
Sand and gravel, loose, water-bearing	2	107
30/4-23H1. Marvin Turk. Altitude 195 ft. Dug by Al Torie Well Digging, February 1974. Casing: 36-inch to 23 ft; perforated 21 -23 ft.		
Soil	2	2
Sand	8	10
Gravel and clay, compact	11	21
Hardpan	2½	23½

TABLE 14.--Drillers' logs of selected wells in the Tulalip Indian Reservation--continued

Material	Thickness (feet)	Depth (feet)
30/4-23Q1. Ed Sebers. Altitude 220 ft. Drilled by J & S Drilling Co., Inc., May 1977. Casing: 6-inch to 70 ft. Screen: 70-75 ft. Slot size: 0.018 in.		
Soil	4	4
Till, gray	47	51
Sand	11	62
Sand, medium-coarse	13	75
30/4-25K1. Marysville Test Hole No. 4. Altitude 180 ft. Drilled by Northwest Pump and Drilling Co., February 1969. Casing: 12-inch to 344 ft.		
Soil	4	4
Sand, brown, with silt and coarse gravel	20	24
Till, brown	3	27
Silt, blue, with sand and gravel, and layers of brown silt	49	76
Silt, brown, with thin lenses of water-bearing sand and gravel and some organic matter	15	91
Silt, blue, with thin lenses of water-bearing sand and gravel, and some organic matter	29	120
Sand, blue, fine, and silt	25	145
Clay, blue	40	185
Sand, blue, fine, and silt, water-bearing	103	288
Clay, blue, with compacted layers	55	343
Sand, fine, and silt, water-bearing	1	344
30/4-26G1. Bert Wooding. Altitude 92 ft. Drilled by J & S Drilling Co., Inc., November 1978. Casing: 6-inch to 140 ft. Open end.		
Topsoil	6	6
Till	88	94
Silt	30	124
Sand	12	136
Gravel	4	140

TABLE 14.--Drillers' logs of selected wells in the Tulalip Indian Reservation--continued

Material	Thickness (feet)	Depth (feet)
30/4-26N1. Tulalip Tribe. Altitude 140 ft. Drilled by C.E. Miller. Casing pulled.		
Clay, yellow, soft	15	15
Clay, blue	20	35
Clay, sandy	25	60
Clay, blue, tight	50	110
Sand, tight	7	117
Sand, loose, wet	3	120
Sand, gray, tight, dry	4	124
Clay, blue	8	132
Clay, sandy, and peat, in alternating layers	34	166
30/4-28A1. Hermosa Point Dock and Water Association. Altitude 60 ft. Drilled by R.E. Freeman, 1966. Casing: 6-inch to 159 ft. Screen: 159-163.		
Hardpan	55	55
Clay, silt, and wood	97	152
Sand, fine	3	155
Sand, medium to coarse, and gravel	8	163
30/4-35R1. Potlatch Beach Water District. Altitude 128 ft. Drilled by C.E. Miller, September 1945. Casing: 6-inch to 155 ft. Screen 155-171 ft. Slot size: 0.070 in.		
Hardpan	40	40
Sand and gravel, tight	20	60
Clay, sand, and gravel, tight	20	80
Sand and gravel, dry	60	140
Sand, some water	15	155
Sand, medium, water-bearing	17	172
Clay and fine sand	--	--

TABLE 14.---Drillers' logs of selected wells in the Tulalip Indian Reservation--continued

Material	Thickness (feet)	Depth (feet)
30/4-35R2. Clayton Olson, Altitude 117 ft. Drilled by R.E. Freeman, October 1963. Casing: 6-inch to 156 ft. Screen: 156-161 ft. Slot size: 0.025 in.		
Soil	3	3
Sand and gravel, cemented	29	32
Sand, tight, dry	15	47
Silt, with clay streaks	13	60
Sand and gravel, tight, dry	74	134
Sand, brown, medium, and loose, wet	8	142
Sand, brown, medium, with clay streaks	5	147
Sand, gray, fine to mdedium	10	157
Sand, fine, water-bearing	10	167
30/4-36F5. F. Witchey. Altitude 220 ft. Dug, 1944. Open hole.		
Hardpan and clay	34	34
30/4-36F12. Monte Murphy. Altitude 220 ft. Drilled by Ralph Medlen Well Drilling, November 1975. Casing: 6-inch to 136 ft. Screen: 136-139 ft. Slot size: 0.012 in.		
Soil	1	1
Clay, sandy	14	15
Sand, coarse, some water	2	17
Clay, sandy, blue	11	28
Clay, blue, with some gravel	13	41
Clay, red, sand, and gravel, water-bearing	1	42
Sand, with red and gray clay	81	123
Sand and gravel	4	127
Sand, fine-coarse, and gravel, water-bearing	11	138
Unknown	1	139
30/4-36J11. Priest Point Grocery. Altitude 135 ft. Drilled by H.E. Deckmann, August 1949. Casing: 4-inch to 157 ft. Screen: 157-162 ft. Slot size: 0.020 in.		
Sand, gravel, and clay, hard	30	30
Sand, fine, and silt	40	70
Sand and fine gravel, hard-packed	20	90
Sand	50	140

(continued)

TABLE 14.---Drillers' logs of selected wells in the Tulalip Indian Reservation--continued

Material	Thickness (feet)	Depth (feet)
30/4-36J11.--continued		
Sand, wet	13	153
Sand, coarse, with some gravel, silt, and fine sand, water-bearing	10	163
30/4-36J12. Robert E. Cress. Altitude 140 ft. Drilled by Ace Drilling and Pump Service, July 1977. Casing: 6-inch to 173 ft. Screen: 173-178 ft. Slot size: 0.030 in.		
Soil, sandy	3	3
Hardpan, gravelly	20	23
Sand and gravel, loose, dry	119	142
Clay, silty, blue	24	166
Sand, medium, loose, wet	12	178
30/4-36J13. Con Brade. Altitude 140 ft. Drilled by Ace Drilling and Pump Service, May 1978 Casing: 6-inch to 151 ft. Screen: 151-156 ft. Slot size: 0.030 in.		
Soil	3	3
Hardpan	27	30
Sand and gravel, loose, dry	105	135
Sand and gravel, silty, loose, wet	21	156
Clay, silty, loose, wet	40	196
30/4-36K1. L. James. Altitude 155 ft. Drilled by H.E. Deckmann, February 1967. Casing: 6-inch to 160 ft. Screen: 160-165 ft. Slot size: 0.014 in.		
Clay, sand, and gravel, solid	14	14
Sand and gravel, some clay	21	35
Sand, some clay	55	90
Sand and gravel, some clay	30	120
Sand and gravel, some clay, with water-bearing streaks	23	143
Sand, fine, water-bearing	22	165

TABLE 14.--Drillers' logs of selected wells in the Tulalip Indian Reservation--continued

Material	Thickness (feet)	Depth (feet)
30/4-36N1. Egon Bauer. Altitude 105 ft. Drilled by Ace Drilling and Pump Service, October 1973. Casing: 6-inch to 130 ft. Screen: 130-135 ft. Slot size: 0.030 in.		
Soil, brown, sandy	2	2
Sand, with clay layers, brown	20	22
Gravel, coarse, tightly cemented, brown	7	29
Sand, loosely cemented, brown, dry	76	105
Sand, fine, brown, wet	17	122
Sand, medium, brown	13	135
30/4-36N3. Delbert Morden. Altitude 95 ft. Drilled by R.E. Freeman, October 1974. Casing: 6-inch to 120 ft. Screen: 120-125 ft. Slot size: 0.030 in.		
Soil, sandy	3	3
Clay, blue	23	26
Sand and gravel, cemented, dry	69	95
Sand, loose, water-bearing	30	125
30/4-36N4. Morris Brown. Altitude 98 ft. Drilled by Ace Drilling and Pump Service, October 1976. Casing: 6-inch to 120 ft. Screen: 120-125 ft.		
Soil, sandy	2	2
Clay, sandy	28	30
Sand, with clay layers	5	35
Sand and gravel, dry	62	97
Sand, fine-medium, loose, water-bearing	28	125
30/4-36P4. W. Crawford, Altitude 118 ft. Drilled by H.E. Deckmann, February 1953. Casing: 6-inch to 141 ft. Screen: 141-146 ft. Slot size: 0.030 in.		
Sand and silt	118	118
Sand, wet	13	131
Sand, water-bearing	15	146

TABLE 14.--Drillers' logs of selected wells in the Tulalip Indian Reservation--continued

Material	Thickness (feet)	Depth (feet)
30/4-36P6. Grant E. Hall. Altitude 125 ft. Drilled by Hitt Well Drilling, May 1972. Casing: 6-inch to 143 ft. Screen 143-148 ft. Slot size: 0.010 in.		
Sand	114	114
Silt	3	117
Clay	6	123
Sand	13	136
Sand and gravel	4	140
Sand, water-bearing	8	148
30/4-36P12. Johnason. Altitude 135 ft. Drilled by H.E. Deckmann, November 1948. Casing: 6-inch to 167 ft. Screen: 167-172 ft.		
Hardpan, with sand and gravel streaks	50	50
Sand, silt, and clay	10	60
Gravel, hard-packed, and some hardpan	10	70
Sand, silt, and clay	65	135
Sand, fine	30	165
Clay, blue	1	166
Sand, blue, water-bearing	6	172
Clay, with some fine sand	--	--
30/4-36P13. W. Perkins. Altitude 126 ft. Drilled by Ace Drilling and Pump Service, September 1976. Casing: 6-inch to 148 ft. Screen: 148-153 ft. Slot size: 0.035 in.		
Soil, sandy	5	5
Hardpan, gravelly, coarse, brown	18	23
Boulder	2	25
Hardpan, gravelly, coarse, brown	7	32
Gravel, dry	93	125
Sand and gravel, medium, loose, water-bearing	28	153

TABLE 14.--Drillers' logs of selected wells in the Tulalip Indian Reservation--continued

Material	Thickness (feet)	Depth (feet)
30/4-36Q4. Larry Knowles. Altitude 130 ft. Drilled by Ace Drilling and Pump Service, July 1975. Casing: 6-inch to 153 ft. Screen: 153-158 ft. Slot size: 0.040 in.		
Soil, sandy	5	5
Clay, blue	35	40
Clay and boulders	39	79
Sand, some gravel, cemented, dry	63	142
Clay, with thin sand layers, wet	9	151
Sand, medium, with thin clay layers, loose, water-bearing	7	158
30/4-36R1. Snug Harbor Mobile Home Park. Altitude 135 ft. Drilled by H.E. Deckmann, February 1970. Casing: 10-inch to 138 ft. Screen: 138-154 ft. Slot size: 0.025 in., 138-148 ft; 0.012 in., 148-154 ft.		
Soil, sandy	--	--
Clay, blue	--	30
Sand and clay, with gravel streaks, firm	56	86
Sand, coarse, and gravel, some clay, hard-packed, dry	29	115
Sand, and clay, some gravel, dry	11	126
Sand, and some gravel, water-bearing	28	154
30/4-36R2. Snug Harbor Mobile Home Park. Altitude 135 ft. Drilled by H.E. Deckmann, May 1967. Casing: 10-inch to 138 ft. Screen: 138-155 ft.		
Clay, blue	30	30
Clay, blue, with some sand	56	86
Clay and gravel, hard packed	29	115
Sand and clay, dry	21	136
Sand, water-bearing	19	155

TABLE 14.--Drillers' logs of selected wells in the Tulalip Indian Reservation--continued

Material	Thickness (feet)	Depth (feet)
30/4-36R3. Chuck Korff. Altitude 125 ft. Drilled by J & S Drilling Co., Inc., March 1977. Casing: 6-inch to 135 ft. Screen: 135-140 ft. Slot size: 0.016 in.		
Soil	7	7
Till, brown	82	89
Sand	22	111
Till, blue	24	135
Sand and gravel	5	140
30/5-5C2. Hugo Johnson. Altitude 89 ft. Dug by A.W. Johnson, August 1960. Casing: 42-inch to 29 ft; perforated 10-12½ ft, and 24-29 ft.		
Soil	6	6
Gravel	8	14
Sand	15	29
30/5-5E2. J.T. More. Altitude 93 ft. Dug by G. Torie, September 1951. Casing: 36-inch to 27 ft; perforated 22-27 ft.		
Soil	3	3
Sand, gray, dry	5	8
Sand, gray, water-bearing	19	27
30/5-6B1. W. Hilde. Altitude 208 ft. Dug by owner, April 1974. Casing 42-inch; open end.		
Hardpan, very hard	10	10
Gravel, some sand	6	16
30/5-6B3. Carol Smith. Altitude 205 ft. Drilled by Ace Drilling and Pump Service, June 1977. Casing: 6-inch to 80 ft.; open end.		
Soil, sandy	3	3
Hardpan, gravelly	22	25
Clay, blue, with thin sand layers	9	34
Sand and gravel, loose, dry	25	59
Gravel, loose, water-bearing	21	80

TABLE 14.--Drillers' logs of selected wells in the Tulalip Indian Reservation--continued

Material	Thickness (feet)	Depth (feet)
30/5-6B4. Richard L. Lilienthal. Altitude 208 ft. Drilled by Ace Drilling and Pump Service, May 1977. Casing: 6-inch to 97 ft.; open end.		
Soil, sandy	3	3
Hardpan, coarse	32	35
Gravel, loose, dry	8	43
Sand, with thin clay layers, dry	3	46
Sand, loose, dry	3	49
Gravel, loose, dry	28	77
Gravel, loose, water-bearing	20	97
30/5-6B5. Paul Needham. Altitude 140 ft. Drilled by Ace Drilling and Pump Service, December 1978. Casing: 6-inch to 76 ft. Open end.		
Soil, sandy	3	3
Sand, fine, brown	5	8
Hardpan, gravelly	52	60
Sand and gravel, silty, wet	12	72
Sand and gravel, coarse, loose, wet	4	76
30/5-6H2. Jerry Carter. Altitude 96 ft. Drilled by Ace Drilling and Pump Service, August 1974. Casing: 6-inch to 109 ft; open end.		
Soil, sandy	2	2
Sand, brown, cemented	6	8
Sand and gravel, loose, some water, high in iron	6	14
Clay and cemented gravel	16	30
Sand and gravel, gray, cemented	34	64
Clay, silty	14	78
Clay, blue, and boulders	3	81
Gravel, gray, coarse, cemented	7	88
Clay, blue	3	91
Gravel, cemented	7	98
Sand and gravel, loose	10	108
Gravel, coarse, loose	1	109

TABLE 14.--Drillers' logs of selected wells in the Tulalip Indian Reservation--continued

Material	Thickness (feet)	Depth (feet)
30/5-6H3. K. Alexander. Altitude 96 ft. Drilled by Ace Drilling and Pump Service, August 1969. Casing: 6-inch to 131 ft; perforated 115-128 ft, plugged 129-131 ft.		
Soil, brown, sandy	2	2
Sand and gravel, brown cemented	23	25
Sand and silt, gray	35	60
Clay, blue	7	67
Sand and gravel, gray, cemented, wet	44	111
Sand and gravel, gray, artesian flow	20	131
30/5-6J4. G. Gesme. Altitude 95 ft. Drilled by Ace Drilling and Pump Service, 1966. Casing: 6-inch to 107 ft; open end.		
Soil	3	3
Sand, gray, wet	47	50
Silt and fine sand, gray	27	77
Clay, blue	20	97
Sand and gravel, loose	8	105
Gravel, artesian flow	2	107
30/5-6K1. William Schmidt. Altitude 192 ft. Drilled by Ace Drilling and Pump Service, March 1977. Casing: 6-inch to 49 ft; open end.		
Soil, sandy	2	2
Boulder, granite	2	4
Hardpan, with coarse gravel	33	37
Gravel, sand, and silt	10	47
Gravel, coarse, loose, water-bearing	2	49
30/5-6Q1. Paul Watson. Altitude 215 ft. Drilled by H.E. Deckmann, April 1969. Casing: 6-inch to 107 ft. Screen: 107-112 ft. Slot size: 0.020 in.		
Sand and clay, firm	47	47
Sand, clay, and gravel, hard	13	60
Sand, gravel, and clay, hard-packed, with thin water-bearing streaks	27	87
Clay, gray, firm	18	105
Sand and gravel, water-bearing	7	112

TABLE 14.--Drillers' logs of selected wells in the Tulalip Indian Reservation--continued

Material	Thickness (feet)	Depth (feet)
30/5-6Q2. Jean Raymond. Altitude 225 ft. Drilled by H.E. Deckmann, April 1971. Casing: 6-inch to 100 ft. Screen: 100-105 ft. Slot size: 0.020 in		
Sand and clay, firm	48	48
Clay and sand, hard-packed, dry	12	60
Clay, sand, and fine gravel, hard-packed	30	90
Clay, gray	10	100
Sand, with some clay, water-bearing	5	105
30/5-7F1. A.D. Neal. Altitude 275 ft. Drilled by Ace Drilling and Pump Service, 1970. Casing: 6-inch to 175 ft. Screen 175-180 ft. Slot size: 0.040 in.		
Soil	3	3
Clay, with some silt	12	15
Till	25	40
Sand and gravel, dry	98	138
Clay, blue	3	141
Clay, with sand layers, wet	29	170
Sand and gravel, loose, water-bearing	10	180
30/5-7F2. Ralph Peterson. Altitude 270 ft. Drilled by H.E. Deckmann, October 1966. Casing: 6-inch to 174 ft. Screen: 174-179 ft. Slot size: 0.020 in.		
Soil	4	4
Clay, solid	8	12
Clay, sand, and gravel	26	38
Sand, gravel, and clay, hard-packed, dry	52	90
Sand, some gravel and clay, soft	40	130
Clay and sand	17	147
Clay, firm, with streaks of water-bearing sand and gravel	6	153
Clay, with water-bearing gravel streaks	4	157
Clay and sand	10	167
Clay, with water-bearing streaks	3	170
Sand, with a little gravel, water-bearing	9	179

TABLE 14.--Drillers' logs of selected wells in the Tulalip Indian Reservation--continued

Material	Thickness (feet)	Depth (feet)
30/5-7G5. Norman Des Rosiers. Altitude 240 ft. Drilled by Ace Drilling and Pump Service, March 1975. Casing: 6-inch to 130 ft. Screen: 130-135ft. Slot size: 0.030 in.		
Soil, sandy	3	3
Clay, brown, with sand streaks	11	14
Gravel, brown, coarse, and cemented	89	103
Gravel, gray, coarse, cemented, with some water	25	128
Gravel, loose, with sand streaks, water-bearing	7	135
30/5-7G6. Goen. Altitude 150 ft. Drilled by Ace Drilling and Pump Service, December 1977. Casing: 6-inch to 70 ft. Open end.		
Sand and gravel, coarse, loose	4	4
Hardpan, gravelly, coarse	16	20
Gravel, coarse, loose, dry	14	34
Clay, with peat layers, dark brown	5	39
Sand, with thin clay layers	5	44
Gravel, coarse, loose	3	47
Sand, with clay layers	4	51
Sand and gravel, very fine to coarse, wet	16	67
Gravel, coarse, loose, wet	3	70
30/5-7G7. Don Bates. Altitude 255 ft. Drilled by Ace Drilling and Pump Service, December 1977. Casing: 6-inch to 147 ft. Open end.		
Soil	2	2
Hardpan, gravelly	72	74
Gravel, loose, dry	60	134
Clay, blue	6	140
Gravel, coarse, wet	7	147
30/5-7G8. Denny Morgan. Altitude 240 ft. Drilled by Hayes Well Drilling, August 1978. Casing: 6-inch to 102 ft. Open end.		
Topsoil	2	2
Gravel, brown, and cobbles	28	30
Clay, sandy, brown	5	35
Gravel and clay, brown	64	99
Gravel, water-bearing	--	at 99
Unknown	--	102

TABLE 14.--Drillers' logs of selected wells in the Tulalip Indian Reservation--continued

Material	Thickness (feet)	Depth (feet)
30/5-7R1. Tulalip Tribe. Altitude 75 ft. Drilled by Dahlman Pump and Drilling, Inc., June 1976. Casing: 6-inch to 137 ft. Open end.		
Sand, silt, and clay, with some gravel	25	25
Sand, fine, water-bearing	39	64
Sand, silt, and clay, gray	14½	78½
Clay, blue-gray	18½	97
Clay, hard, gray	7½	104½
Sand and clay	5½	110
Clay, with sand streaks, gray	8	118
Clay, blue-gray	47	165
30/5-18Q1. Tulalip Tribe. Altitude 80 ft. Drilled by Dahlman Pump and Drilling, Inc., June 1976. Casing: 6-inch to 88.2 ft. Open end.		
Topsoil	2	2
Sand and gravel, with silt and clay, brown	17	19
Sand and gravel, water-bearing	5	24
Sand, fine	4	28
Silt and sand	37	65
Sand and clay	20	85
Clay, gray, with sand streaks	22	107
30/5-19M1. Marysville Test Hole No. 1. Altitude 510 ft. Drilled by Northwest Pump and Drilling Co., May 1968. Casing pulled.		
Sand and gravel, silty, brown	3	3
Sand, gravel, and boulders, brown, cemented	24	27
Sand and gravel, silty, blue-gray	41	68
Sand, silty, blue-gray	22	90
Sand, brown, cemented	67	157
Sand and gravel, brown, cemented	11	168
Sand, brown, cemented	37	205
Sand, brown, fine, with silt streaks, water-bearing	23	228
Sand and gravel, brown, cemented	42	270
Sand, fine to coarse, water-bearing	3	273
Sand, brown, cemented	17	290
Sand, brown, fine, water-bearing	12	302

(continued)

TABLE 14.--Drillers' logs of selected wells in the Tulalip Indian Reservation--continued

Material	Thickness (feet)	Depth (feet)
30/5-19M1.--continued		
Clay, greenish-gray	15	317
Sand and gravel, silty, greenish-gray, with lenses of water-bearing sand	35	352
Silt, blue-gray, with lenses of water-bearing sand	38	390
Clay, blue, with lenses of water-bearing sand	60	450
Sand, fine to medium, water-bearing	14	464
Sand, silty, water-bearing	18	482
30/5-20B1. Tulalip Tribe. Altitude 45 ft. Drilled November 1943. Casing: 6-inch to 40 ft. Screened.		
Sand, brown	7	7
Clay, sandy, and hardpan	10	17
Sand, water-bearing	13	30
Clay, sandy	10	40
30/5-20G4. Arnold McKay. Altitude 44 ft. Drilled by Dahlman Pump and Drilling, Inc., December 1975. Casing: 6-inch to 51 ft. Screen: 51-61 ft. Slot size: 0.010 in., 51-56 ft; 0.008 in., 56-61 ft.		
Soil	2	2
Sand, fine, brown	12	14
Sand, gray, some water	16	30
Sand, fine, and silt, gray, some water	32	62
Sand, fine, and clay	48	110
Clay	90	200
30/5-20K2. Tulalip Tribe. Altitude 38 ft. Dug by Ward Sharp, Inc., May 1963. Casing: 42-inch to 31 feet; open end.		
Loam, sandy	2	2
Sand	15	17
Clay	3	20
Sand	11	31

TABLE 14.--Drillers' logs of selected wells in the Tulalip Indian Reservation--continued

Material	Thickness (feet)	Depth (feet)
30/5-20Q2. R. Burri. Altitude 33 ft. Dug by Ward Sharp, Inc., May 1963. Casing: 42-inch to 26 feet; open end.		
Loam, sandy	2	2
Sand	24	26
30/5-29B3. Robert Moses. Altitude 26 ft. Dug by Ward Sharp, Inc., May 1963. Casing: 42-inch to 24 ft; open end.		
Loam, sandy	2	2
Sand	16	18
Unknown	6	24
30/5-29B5. A. Hatch. Altitude 25 ft. Dug by Ward Sharp, Inc., May 1963. Casing: 42-inch to 26 ft; open end.		
Loam, sandy	2	2
Sand	24	26
30/5-29B9. Viola Topash. Altitude 28 ft. Dug by Ward Sharp, Inc., May 1963. Casing: 42-inch to 28½ ft; open end.		
Loam, sandy	2	2
Sand	26½	28½
30/5-29B10. Arnold Cheer. Altitude 31 ft. Dug by Ward Sharp, Inc., May 1963. Casing: 42-inch to 19 ft; open end.		
Loam, sandy	2	2
Sand	15	17
Clay	2	19

TABLE 14.--Drillers' logs of selected wells in the Tulalip Indian Reservation--continued

Material	Thickness (ft)	Depth (ft)
30/5-29C2. Donald T. Sherlock. Altitude 28 ft. Dug by A.W. Johnson, April 1962. Casing: 36-inch to 40 ft; perforated 35-40 ft.		
Sand	40	40
30/5-29C6. H. Turner. Altitude 29 ft. Dug by Ward Sharp, Inc., May 1963. Casing: 42-inch to 28½ ft; open end		
Loam, sandy	2	2
Sand	26½	28½
30/5-29F3. George G. Gregg. Altitude 21 ft. Dug by Pearson Well Drilling, July 1974. Casing: 42-inch to 21 ft; perforated.		
Sand, brown, fine	20½	20½
Unknown	½	21
30/5-29G2. Maria Moses. Altitude 20 ft. Dug by Ward Sharp, Inc., May 1963. Casing: 42-inch to 33 ft; open end.		
Loam, sandy	2	2
Sand	31	33
30/5-29G3. Maria Moses. Altitude 21 ft. Dug by Ward Sharp, Inc., May 1963. Casing: 42-inch to 33 ft; open end.		
Loam, sandy	2	2
Sand	31	33
30/5-29G4. Lawrence Charley. Altitude 21 ft. Dug by Ward Sharp, Inc., May 1963. Casing: 42-inch to 28½ ft; open end.		
Loam, sandy	2	2
Sand	26½	28½

TABLE 14.--Drillers' logs of selected wells in the Tulalip Indian Reservation--continued

Material	Thickness (feet)	Depth (feet)
30/5-29G6. Lucille Hatch. Altitude 21 ft. Dug by Ward Sharp, Inc., May 1963. Casing: 42-inch to 21 ft; open end.		
Loam, sandy	2	2
Sand	9	11
Clay	2	13
Sand	6	19
Clay	2	21
30/5-29J2. Alfred Sam. Altitude 19 ft. Dug by Ward Sharp, Inc., May 1963. Casing: 42-inch to 19 ft; open end.		
Loam, sandy	2	2
Sand	13	15
Clay	2	17
Sand	2	19
30/5-29K1. Richard Spencer. Altitude 17 ft. Dug by Ward Sharp, Inc., May 1963. Casing: 42-inch to 28½ ft; open end.		
Loam, sandy	2	2
Sand	26½	28½
30/5-30B1. Pete Dillon. Altitude 145 ft. Dug by Ward Sharp, Inc., July 1963. Casing: 42-inch to 33 ft; open end.		
Loam, sandy	2	2
Gravel	30	32
Hardpan	1	33
30/5-30B2. Nora Dillon. Altitude 140 ft. Dug by Ward Sharp, Inc., August 1963. Casing: 42-inch to 24 ft; open end.		
Gravel	6	6
Clay	1	7
Gravel	12	19
Sand	5	24

TABLE 14.--Drillers' logs of selected wells in the Tulalip Indian Reservation--continued

Material	Thickness (feet)	Depth (feet)
30/5-30B4. Dallas Taylor. Altitude 115 ft. Dug by Ward Sharp, Inc., August 1963. Casing: 42-inch to 19 ft; open end.		
Loam, sandy	2	2
Gravel	17	19
30/5-30B5. Tom Reeves. Altitude 155 ft. Dug by Ward Sharp, Inc., August 1963. Casing: 42-inch to 14 ft; open end.		
Gravel	2	2
Sand	3	5
Gravel	5	10
Clay	4	14
30/5-30G1. R. Kona. Altitude 112 ft. Dug by Ward Sharp, Inc., July 1963. Casing: 42-inch to 17 ft; open end.		
Loam, sandy	2	2
Gravel	12	14
Hardpan	3	17
30/5-30G2. Louise Ledford. Altitude 160 ft. Dug by Ward Sharp, Inc., August 1963. Casing: 42-inch to 66½ ft; open end.		
Loam, sandy	3	3
Hardpan	31	34
Sand and gravel	5	39
Hardpan and cobbles	14	53
Gravel	13½	66½
30/5-30G3. Bernice Parks. Altitude 160 ft. Dug by Ward Sharp, Inc., July 1963. Casing: 42-inch to 64ft; open end.		
Gravel	1	1
Hardpan	45	46
Gravel	18	64

TABLE 14.--Drillers' logs of selected wells in the Tulalip Indian Reservation--continued

Material	Thickness (feet)	Depth (feet)
30/5-31A1. S. Philipp. Altitude 12 ft. Dug 1927. Casing: 42-inch		
Clay and hardpan	23	23
Sand	3	26
30/5-31B4. Fred Saunders. Altitude 55 ft. Dug by G. Torie, 1943. Casing: 36-inch to 54 ft; open end.		
Till	47½	47½
Sand	6½	54
30/5-31B5. Fred Saunders. Altitude 55 ft. Dug 1953. Casing: 36-inch to 56 ft; open end.		
Till	49½	49½
Sand	6½	56
30/5-31B6. E.M. Johnson. Altitude 30 ft. Drilled by H.E. Deckman, August 1957. Filled in.		
Unknown	25	25
Clay and sand, with some water	17	42
Clay, hard, and gravel	10	52
Clay, with water-bearing gravel streaks	3	55
Sand and gravel, coarse, with some clay, water-bearing	2	57
30/5-31B7. W.C. Morgan. Altitude 19 ft. Drilled by H.E. Deckmann, August 1957. Casing: 6-inch to 57 ft. Screen: 57-60 ft. Slot size: 0.025 in.		
Hardpan	18	18
Clay and sand, firm	22	40
Clay and sand, some water	8	48
Sand, gravel, and clay, hard-packed	7	55
Sand, water-bearing	5	60

TABLE 14.--Drillers' logs of selected wells in the Tulalip Indian Reservation--continued

Material	Thickness (feet)	Depth (feet)
30/5-31B8. Edwin M. Johnson. Altitude 30 ft. Drilled by H.E. Deckmann, March 1958. Casing: 6-inch to 52½ ft. Screen 52½-55 ft. Slot size: 0.030 in.		
Clay, hard	8	8
Hardpan	12	20
Clay, hard	5	25
Clay and sand, firm	10	35
Clay and sand, some water	15	50
Sand, water-bearing	5	55
30/5-31E1. Stan Jones, Sr. Altitude 130 ft. Drilled by H.E. Deckmann, May 1967. Casing: 6-inch to 131 ft. Screen: 131-136 ft. Slot size: 0.020 in.		
Clay and gravel, hard	20	20
Sand, coarse, and clay, hard	30	50
Clay, sand, and gravel, some water	10	60
Sand, gravel, and clay, dry	50	110
Sand and some gravel, water-bearing	26	136
30/5-31F1. D. Jones. Altitude 80 ft. Drilled by R.E. Freeman, February 1964. Casing: 6-inch to 85 ft; perforated 78-83 ft; plugged 83-85 ft.		
Sand, loose, dry	14	14
Sand, with clay layers, dry	3	17
Sand and gravel, cemented	5	22
Sand and gravel, dry	43	65
Sand and medium gravel	8	73
Sand and coarse gravel	12	85
30/5-31F2. Hill. Altitude 85 ft. Drilled by R.E. Freeman, February 1964. Casing: 6-inch to 87 ft. Screen: 87-92 ft. Slot size: 0.030 in.		
Gravel, coarse, cemented	14	14
Sand and gravel, tight	51	65
Boulder	2	67
Sand, medium, tight, dry	9	76
Sand, with 5 percent fine gravel, water-bearing	16	92

TABLE 14.--Drillers' logs of selected wells in the Tulalip Indian Reservation--continued

Material	Thickness (feet)	Depth (feet)
30/5-31F3. G.E. Carpenter. Altitude 110 ft. Dug by Ward Sharp, Inc., July 1963. Casing: 42-inch to 97 ft; open end.		
Loam, sandy	4	4
Hardpan	48	52
Sand and gravel	45	97
30/5-31F5. D. Jones. Altitude 80 ft. Dug by Ward Sharp, Inc., June 1963. Casing: 42-inch to 21 ft.		
Loam, sandy	1	1
Hardpan	13	14
Gravel, water-bearing	7	21
30/5-31G2. Glen Parks. Altitude 38 ft. Dug by Ward Sharp, Inc., June 1963. Casing: 42-inch to 38 ft; open end.		
Loam, sandy	1	1
Hardpan	37	38
30/5-31G3. Wesley Patrick. Altitude 57 ft. Dug by Ward Sharp, Inc., June 1963. Casing: 42-inch to 31 ft; open end.		
Loam, sandy	1	1
Clay, gray	12	13
Hardpan	18	31
30/5-31G5. Lena Cladoosby. Altitude 17 ft. Dug by Ward Sharp, Inc., June 1963. Casing: 42-inch to 21 ft; open end.		
Loam, sandy	1	1
Hardpan	15	16
Gravel	4	20
Hardpan	1	21

TABLE 14.--Drillers' logs of selected wells in the Tulalip Indian Reservation--continued

Material	Thickness (feet)	Depth (feet)
30/5-31M1. E. Price. Altitude 120 ft. Dug by Ward Sharp, Inc., June 1963. Casing: 42-inch to 17 ft; open end.		
Loam, sandy	1	1
Sand and gravel	2	3
Clay	2	5
Sand	3	8
Clay	6	14
Hardpan	3	17
30/5-31M4. Madeline James. Altitude 130 ft. Dug by Ward Sharp, Inc., May 1963. Casing: 42-inch to 21 ft; open end.		
Loam, sandy	1	1
Sand	11	12
Hardpan	9	21
30/5-31M6. Ray Price. Altitude 122 ft. Dug by Ward Sharp, Inc., June 1963. Casing: 42-inch to 19 ft.		
Gravel	4	4
Sand	13	17
Clay	2	19

TABLE 15.--Records of selected wells in the Tulalip Indian Reservation

EXPLANATION

Local well number: Numbered by township, range, section, and 40-acre subdivision, as described on page vi.

Owner: Name of owner or tenant.

Water use: H, domestic supply; I, irrigation; P, public supply, U, unused; Z, well destroyed.

Altitude of land surface (ft): Altitude of land-surface datum, in feet, with reference to mean sea level (National Geodetic Vertical Datum of 1929).

Well depth (ft): As measured, in feet below land-surface datum, by Geological Survey personnel or other agencies or as reported by well drillers or owners.

Casing diameter (in.): At point, or interval, where well is finished.

Well finish: F, perforated and gravel-packed; O, open end; P, perforated; S, screen; T, sand point; W, walled; X, open hole; Z, brick-lined.

Water level (ft): Water level of well, in feet above or below land-surface datum as measured by Geological Survey personnel or other agencies or as reported by well drillers as owners; F, flows, with head unknown; +12, flows, head 12 ft.

Specific capacity (gpm/ft): The yield of the well, in gallons per minute, divided by the drawdown of the water level, in feet. Data usually from short-term (1-4 hour) bailer test by driller at time well was constructed.

Aquifer: Water-bearing unit(s) tapped by well. See figures 12-18.

Log available: G, driller's geologic log in table 14.

Data reliability: C, well location checked in the field; U, well location not checked.

TABLE 15.--Records of selected wells in the Tulalip Indian Reservation--Continued

Local well number	Owner	Water use	Altitude of land surface (ft)	Depth of well (ft)	Casing diam-eter (in.)	Well finish	Water level (ft)	Date water level measured	Spacific capacity (gpm/ft)	Aquifer	Logs avail-able	Data relia-bility
29/4-1A1	Priest Point Water Co.	U	122	172	6	S	121.00	4- -41	--	5	G	C
-1A2	---do---------------	P	122	146	8	S	121.33	4-19-67	8.0	5	G	C
-1A3	---do---------------	P	122	146	8	S	117.73	4-19-67	10.0	5	G	C
-1A4	Jack Denginen	H	125	146	6	S	124.00	2- -65	--	5	G	U
-1B1	Norman G. Kleisath	H	95	106	6	S	94.32	4-19-67	--	5	G	C
-1B2	Meridian Water Supply, Inc.	P	108	160	6	S	105.00	4- 5-65	9.1	5	G	C
-1B3	Chealco Community Association, Inc.	P	122	172	6	S	--	--	--	5	G	C
-1B5	Little & Daniels	H	102	128	6	S	--	--	10.0	5	G	U
-1B6	Chealco Community Association, Inc.	U	122	196	8	S	116.50	10-21-75	--	6	--	C
-1C1	Gays Water District	P	125	165	6	P	119.17	10-21-75	--	5	G	C
-1C2	Skokia Water Co.	P	125	160	6	S	120.00	6- 1-71	--	5	G	C
-1C3	H. C. Holscher	H	102	130	6	P	--	--	--	5	G	C
-1D1	E. W. Geddes	H	85	120	6	--	85.00	4-19-47	--	5	--	C
-1D2	Foster Stanton	H	5	4	96	0	2.00	10- 7-74	--	5	--	C
-1D3	A. M. Vanderstay	H	5	6	72	0	2.00	10- 7-74	--	5	--	C
-1D4	James Nowak	H	20	25	42	0	--	--	--	5	--	U
-1D5	M. Brown	H	10	--	42	0	--	--	--	5	--	U
-1G1	Dr. L. B. Marquiss	H	60	11	54	W	7.12	11- 6-74	--	2	--	C
-1G2	Earl Edgar	H	85	132	6	--	--	--	--	5	--	C
-1G3	J. E. Weeks	H	85	130	6	--	--	--	--	5	--	C
-1G4	Sam Wilson and Ralph Smith	H	90	125	6	S	86.67	12-24-63	--	5	G	C
-1G5	Ralph Smith	U	90	32	32	Z	28.70	3-19-75	--	2	--	C
-1G6	Ronninigen	H	50	71	6	S	45.00	6-10-71	10.0	5	G	C
-1G7	Robert C. Ackerman	H	55	80	6	--	49.00	1965	--	5	G	U
30/4-1B1	Richard Huggins	H	480	198	6	S	174.	5-11-77	13.0	5	G	C
-1C1	Tulalip Tribe	U	590	125	6	P	6.20	2-15-77	--	4	G	C
-1M1	Sam Lake Improvement, Inc.	P	545	426	6	S	336.70	10-27-77	--	6	G	C
-1M2	Agnes Smith	H	542	234	6	S	214.00	9- -77	--	5	--	C
-1N1	Lands and Water, Inc.	P	520	257	8	S	199.50	11-14-74	9.5	5	G	C
-2H1	John Heller	H	550	285	6	S	232.70	8-31-76	--	5	--	C
-3A1	S. L. Meyer	H	453	168	6	S	135.00	8-17-70	8.0	5	G	C
-3A2	J. E. Johnson	H	444	168	6	S	133.00	9-10-70	8.0	5	G	C
-3A3	Martin Andersen	H	448	151	6	S	127.50	4-17-70	--	5	G	C
-3A4	George Rolph	H	425	136	6	S	110.00	2-12-70	20.0	5	G	U
-3A5	Bill Christian	H	417	132	6	S	104.00	4-14-76	1.5	5	G	C
-3B1	Rowe	H	407	156	6	S	106.92	10- 2-74	.5	5	G	C
-3B2	--	H	415	--	6	--	115.86	10-18-74	--	5	--	C
-3B3	O. D. Burright	H	412	137	6	S	110.00	1-11-69	8.0	5	G	C
-3B4	James Hoffman	H	450	187	6	S	160.00	5-31-78	10.0	5	G	U
-3B5	Kiven Millar	H	420	135	6	S	113.00	4-26-78	2.5	5	G	U
-3C1	Kathann Estates	P	450	179	6	S	137.00	9-26-69	--	5	G	C
-3D1	J. F. Doleshel	H	457	170	6	S	141.67	10-28-73	8.6	5	G	C
-3G1	Grubb	H	402	128	6	S	101.00	9-26-68	--	5	G	U
-3H1	D. Falkner	H	394	105	8	--	80.30	12-12-74	--	5	--	C
-3H2	D. L. Larson	H	395	120	6	S	98.00	1-31-70	10.0	5	G	C

TABLE 15.--Records of selected wells in the Tulalip Indian Reservation--Continued

Local well number	Owner	Water use	Altitude of land surface (ft)	Depth of well (ft)	Casing diam-eter (in.)	Well finish	Water level (ft)	Date water level measured	Spacific capacity (gpm/ft)	Aquifer	Logs avail-able	Data relia-bility
30/4-3H3	Doud	H	390	107	6	S	--	--	--	5	G	U
-3H4	Ravender	U	400	143	6	S	118.00	3-26-70	--	5	G	U
-3H5	Tucker	H	390	101	6	S	80.00	10- 4-69	9.3	5	G	U
-5N1	Adams	H	415	350	6	--	--	--	--	6	--	C
-5N2	--	H	420	--	42	--	--	--	--	4	--	C
-6F1	D. P. Newland	H	305	311	6	O	289.00	5-22-76	1.5	6	G	U
-6L1	W. L. Pape	H	205	231	6	S	202.80	4- 7-67	--	6	G	C
-6P1	Sunny Shores	P	85	190	6	S	80.00	6- 7-55	2.0	6	G	C
-6Q1	G. Greyerbiehl	H	411	405	6	--	385.00	11- 6-74	--	6	--	C
-6Q2	P. Winters	H	400	437	6	--	380.00	11- 6-74	--	6	--	C
-6R1	L. E. Bath	H	425	7	42	--	--	--	--	4	--	C
-6R2	Dorothy Cashen	H	410	410	6	S	378.00	3-14-75	1.1	6	G	C
-7G1	Tulare Beach Association	Z	30	--	--	--	22.00	12- -46	--	6	G	C
-7G2	---do-------------------	P	30	60	8	S	26.81	4- 7-67	--	6	G	C
-7G3	---do-------------------	P	30	45	42	--	19.37	10-16-74	--	6	--	C
-7H1	---do-------------------	Z	450	--	--	--	--	--	--	--	G	C
-7K1	---do-------------------	P	30	62	--	--	--	--	--	6	--	U
-8A1	Port Susan Nature Trails	P	410	399	6	S	370.	6- 1-78	--	6	G	U
-8C1	---do-------------------	P	395	399	6	--	--	--	--	6	--	U
-8D1	D. C. Dabbs	U	395	23	42	X	22.60	10 1-74	--	4	--	C
-8P1	Bodeen and Lohr	H	140	302	6	P	--	--	.3	6	G	U
-8Q1	Unknown	H	140	143	6	S	88.00	9-19-53	.6	6	G	U
-10F1	Tulalip Tribe	U	235	98	8	O	F	5- 2-74	--	5	G	C
-10G1	---do--------	Z	230	170	--	O	F	1974	--	5	G	C
-10L1	---do--------	U	224	65	8	S	+7.10	12-12-74	--	5	G	C
-10L2	---do--------	P	230	94	8	S	22.24	11-26-74	2.6	5	G	C
-10L3	---do--------	P	215	95	8	S	9.07	11-26-74	6.1	5	G	C
-10L4	---do--------	P	190	96	8	S	+10.60	12-12-74	--	5	G	C
-10L5	---do--------	P	199	101	8	S	+10.20	12-12-74	4.6	5	G	C
-14J1	R. H. Guertin	H	210	4	46	O	.74	12- 6-74	--	2	--	C
-17B1	J. Koons	H	70	45	2	T	--	--	--	5	--	C
-17B2	Ochs Brothers	H	135	142	6	S	79.20	3- 5-75	.4	6	G	C
-17B3	Donald Senter	H	125	128	6	S	72.46	3- 5-75	.4	6	G	C
-17B4	Ernie Santi	H	120	119	6	S	--	--	.8	4	G	C
-17B5	A. W. Nylander	H	110	105	6	S	--	--	--	6	G	C
-17B6	C. Fairchild	H	110	95	6	S	--	--	--	6	G	C
-17B7	Spee-Bi-Dah 8	P	65	44	32	Z	33.73	3- 5-75	--	4	--	C
-17B8	L. G. Greyerbiehl	H	50	18	2	T	13.00	3- 5-75	--	4	G	C
-17B9	Clyde Lashua	H	90	178	6	P	40.00	3-12-69	.2	4+6	G	C
-17B10	Bell	H	40	--	--	--	--	--	--	--	--	U
-17B11	Waldo Wickstrom	H	112	54	6	S	--	--	--	4	G	C
-17B12	Leonard Hanson	H	100	143	6	P	48.06	3-14-75	.5	4	G	C
-17B13	Fahlstrom	H	105	186	6	S	77.60	5-18-76	.2	6	G	C
-17B14	Veenhuizen	H	115	110	6	S	59.70	5-18-76	--	6	G	C
-17B15	Dishnow	H	90	151	6	S	65.00	9-30-65	.2	6	G	U

TABLE 15.--Records of selected wells in the Tulalip Indian Reservation--Continued

Local well number	Owner	Water use	Altitude of land surface (ft)	Depth of well (ft)	Casing diam- eter (in.)	Well finish	Water level (ft)	Date water level measured	Spacific capacity (gpm/ft)	Aquifer	Logs avail- able	Data relia- bility
30/4-17B16	Garvey	H	95	120	6	S	--	--	2.2	4	G	C
-17B17	Anderson	H	80	127	6	S	--	--	--	4	G	C
-17C1	Spee-Bi-Dah Community Water Co.	P	110	372	6	P	64.85	8-30-74	6.0	7	G	C
-17J1	David Miller	H	270	228	6	S	189.00	5-25-78	2.0	5	G	C
-17J2	Don Pardee	H	270	207	6	S	184.00	11-29-77	1.3	5	G	U
-17K1	Tulalip Shores, Inc.	P	190	507	6	P	186.80	12-15-75	--	7	G	C
-21G1	Arcadia Water District	P	175	375	6	S	151.90	8-30-74	1.0	6	G	C
-21G1S	Ed Pool	U	50	--	--	--	--	--	--	6	--	C
-21J1	Upper Tulalip Heights	P	160	380	6	S	150.00	1971	2.0	6	G	C
-21J2	Whyte	U	182	241	6	S	156.20	8-13-75	.9	6	G	C
-21K1S	Tulalip Heights Inc.	P	130	--	--	--	--	--	--	5	--	C
-21Q1	Edmund H. Lindstrom	H	20	20	48	--	13.00	8- 1-73	1.4	6	G	U
-22L1	Paul Hesby	H	100	107	6	O	60.00	5-15-74	.5	4	G	C
-23H1	Marvin Turk	H	195	24	36	F	17.00	2-22-74	--	4	G	U
-23J1	--	H	170	12	42	--	8.40	10-27-77	--	4	--	C
-23Q1	Ed Sebers	H	220	75	6	S	51.00	5-19-77	4.3	5	G	C
-25K1	Marysville Test Hole No. 4	U	180	344	12	O	--	--	--	6	G	U
-26G1	Bert Wooding	H	92	140	6	O	2.00	11-15-78	.8	6	G	U
-26N1	Tulalip Tribe	Z	140	166	--	--	--	--	--	--	G	U
-28A1	Hermosa Point Dock and Water Assoc.	P	60	163	6	S	44.70	4-18-67	1.2	6	G	C
-35R1	Potlatch Beach Water District	P	128	171	6	S	123.60	4-20-67	--	5	G	C
-35R2	Clayton Olson	H	117	161	6	S	112.62	11-26-74	2.5	5	G	C
-36A1	Victor Moses	H	180	190	6	--	--	--	--	5	--	C
-36B1	David Spencer	H	160	--	6	--	64.59	9-19-74	--	5	--	C
-36F1	Palmer	H	225	45	36	--	--	--		4	--	C
-36F2	M. Murphy	U	215	16	36	--	9.97	9-20-74	--	4	--	C
-36F3	R. Rasmussen	H	230	12	42	--	7.00	9-20-74	--	4	--	C
-36F4	A. J. Fisher	H	210	35	42	--	15.82	9-20-74	--	4	--	C
-36F5	F. Witchey	H	220	34	--	X	--	--	--	4	G	C
-36F6	J. R. Kelly	H	210	155	--	--	--	--	--	5	--	C
-36F7	F. Hulet	H	190	148	6	--	75.00	1970	--	5	--	C
-36F8	--do----	H	205	172	6	--	97.00	1970	--	5	--	C
-36F9	J. R. Kelly	U	210	25	42	--	Dry	9-20-74	--	4	--	C
-36F10	--do----	U	210	65	42	--	--	--	--	4	--	C
-36F11	R. L. Fraser	H	220	23	42	--	9.64	11- 8-74	--	4	--	C
-36F12	Monte Murphy	H	220	139	6	S	113.00	11-11-75	--	5	G	C
-36H1	Gilbert Moses	H	165	192	--	--	--	--	--	5	--	C
-36J1	H. Mencke	U	136	11	30	--	7.70	11- 6-74	--	2	--	C
-36J2	W. Colfelt	H	135	--	6	--	122.50	9-19-74	--	2	--	C
-36J3	J. I. Paul	H	145	70	10	S	--	--	--	4	--	C
-36J4	J. Bynam	H	140	70	10	--	--	--	--	4	--	C
-36J5	Porter, A.	H	145	35	42	--	--	--	--	2	--	C
-36J6	--	H	135	--	--	--	130.69	9-19-74	--	5	--	C
-36J7	Buell Mulkey	H	135	8	42	--	2.13	1-14-75	--	2	--	C
-36J8	American Indian Mission	U	140	--	42	--	--	--	--	2	--	C
-36J9	W. Whitlinger	H	140	165	6	--	--	--	--	5	--	C

TABLE 15.--Records of selected wells in the Tulalip Indian Reservation--Continued

Local well number	Owner	Water use	Altitude of land surface (ft)	Depth of well (ft)	Casing diam-eter (in.)	Well finish	Water level (ft)	Date water level measured	Spacific capacity (gpm/ft)	Aquifer	Logs avail-able	Data relia-bility
30/4-36J10	H. Mencke	H	135	15	36	--	12.00	11- 5-74	--	2	--	C
-36J11	Priest Point Grocery	U	135	162	4	S	--	--	--	5	G	C
-36J12	Robert E. Cress	H	140	178	6	S	132.00	7-18-77	1.5	5	G	C
-36J13	Con Brade	H	140	156	6	S	135.00	5-23-78	2.0	5	G	U
-36K1	L. James	H	155	165	6	S	127.00	2- 2-67	--	5	G	C
-36K2	M. Hutchinson	H	140	--	42	--	--	--	--	2	--	C
-36L1	G. Degroot	H	200	15	36	--	2.00	9-20-74	--	4	--	C
-36L2	F. Smathers	H	190	60	42	--	--	--	--	4	--	C
-36L3	F. Osburn	H	160	--	--	--	--	--	--	4	--	C
-36L4	W. L. Floch	H	195	38	48	--	--	--	--	4	--	C
-36N1	Egon Bauer	H	105	135	6	S	105.00	10- 5-73	1.5	5	G	C
-36N2	Ben Williams, Sr.	H	110	10	36	--	6.55	10- 7-74	--	4	--	C
-36N3	Delbert Morden	H	95	125	6	S	93.70	11-18-75	4.0	5	G	C
-36N4	Morris Brown	H	98	125	6	S	97.00	10- 7-76	3.8	5	G	U
-36P1	M. E. Vanderpol	H	118	152	6	0	113.61	9-20-74	--	5	--	C
-36P2	E. Myers	H	155	35	42	--	--	--	--	4	--	C
-36P3	Priest Point Grange	H	140	36	44	--	13.56	11- 8-74	--	4	--	C
-36P4	W. Crawford	H	118	146	6	S	115.50	9-20-74	--	5	G	C
-36P5	Adeline Johnson	H	130	25	42	--	--	--	--	2	--	C
-36P6	Grant E. Hall	H	125	148	6	S	124.90	9-24-74	--	5	G	C
-36P7	---do-------	U	125	17	36	--	8.00	9-24-74	--	2	--	C
-36P8	Anglin	H	120	--	42	--	--	--	--	2	--	C
-36P9	Karl A. Lambert	H	115	15	42	0	12.50	7- -74	--	2	--	C
-36P10	E. Myers	I	155	20	42	--	--	--	--	4	--	C
-36P11	Anglin	U	120	--	42	--	--	--	--	2	--	C
-36P12	Johnason	U	135	172	6	S	130.00	1- 8-49	--	5	G	U
-36P13	W. Perkins	H	126	153	6	S	125.00	9-28-76	3.0	5	G	U
-36Q1	Milton Hutchinson	H	140	32	42	--	8.30	8- 2-44	--	2	--	C
-36Q2	R. Kluin	H	135	8	36	--	--	--	--	2	--	C
-36Q3	T. Winchell	H	130	34	46	--	18.60	9-20-74	--	2	--	C
-36Q4	Larry Knowles	H	130	158	6	S	129.07	10-21-75	1.5	5	G	C
-36R1	Snug Harbor Mobile Home Park	P	135	154	10	S	126.00	3-14-70	--	5	G	C
-36R2	---do------------------	P	135	155	10	S	131.00	9-24-74	--	5	G	C
-36R3	Chuck Korff	H	125	140	6	S	121.00	3-31-77	5.0	5	G	U
30/5-5C1	Hugo A. Johnson	U	92	9	--	T	--	--	--	3	--	C
-5C2	---do----------	U	89	29	42	P	4.60	11- 5-74	26.0	3	G	C
-5D1	E. Burran	H	98	22	42	--	--	--	--	3	--	C
-5D2	B. Burns	H	98	24	42	--	11.98	11- 5-74	--	3	--	C
-5D3	--	H	103	23	42	--	14.93	11- 5-74	--	3	--	C
-5E1	Robert Darney	H	94	10	23	0	7.97	10-18-74	--	3	--	C
-5E2	J. T. More	U	93	27	36	P	6.14	10-18-74	6.6	3	G	C
-5E3	---do-----	U	93	17	42	--	--	--	--	3	--	C
-5E4	F. Campbell	H	94	123	6	--	F	11- 5-74	--	5	--	C
-5E5	M. Yandle	U	95	15	--	T	--	--	--	3	--	C

TABLE 15.--Records of selected wells in the Tulalip Indian Reservation--Continued

Local well number	Owner	Water use	Altitude of land surface (ft)	Depth of well (ft)	Casing diam-eter (in.)	Well finish	Water level (ft)	Date water level measured	Spacific capacity (gpm/ft)	Aquifer	Logs avail-able	Data relia-bility
30/5-7G2	Goen	H	140	26	42	--	22.20	10-15-74	--	4	--	C
-7G3	G. Felgar	H	150	23	42	--	19.60	10-16-74	--	4	--	C
-7G4	Fred Moe	H	125	9	42	--	7.01	10-16-74	--	4	--	C
-7G5	Norman Des Rosiers	U	240	135	6	S	102.10	12-15-76	3.0	5	G	C
-7G6	Goen	H	150	70	6	0	33.00	12-23-77	1.3	5	G	U
-7G7	Don Bates	H	255	147	6	0	132.00	12- 7-77	1.7	5	G	U
-7G8	Denny Morgan	H	240	102	6	0	91.	8-28-78	--	5	G	U
-7H1	Dale Bantam	H	105	19	42	--	8.16	10-16-74	--	4	--	C
-7K1	J. Clevenger	H	160	60	42	--	55.06	10- 9-74	--	5	--	C
-7K2	G. Bartholomew	H	120	68	6	--	23.00	1970	--	5	--	C
-7K3	H. Wilkens	H	130	20	36	--	6.00	10-15-74	--	5	--	C
-7L1S	R. Staples	H	320	--	--	--	--	-	--	4	--	C
-7R1	Tulalip Tribe	U	75	137	6	0	30.00	10-12-76	--	6	G	C
-8E1	J. Chrisman	H	76	--	--	T	--	--	--	3	--	C
-8E2	R. Hartman	H	76	11	42	--	6.79	10-29-74	--	3	--	C
-8E3	--	U	77	--	--	T	--	--	--	3	--	C
-8E4	D. Olson	H	77	--	42	--	--	--	--	3	--	C
-8F1	Charles Anabel	H	73	15	--	T	--	--	--	3	--	C
-8F2	D. W. Hall	U	74	8	42	--	7.20	10-29-74	--	3	--	C
-8F3	---do-----	H	74	19	42	--	13.00	10-29-74	--	3	--	C
-8F4	J. Womack	H	75	12	42	--	6.68	10-29-74	--	3	--	C
-8J1	Richard Snapps	H	63	27	42	--	16.15	10- 9-74	--	3	--	C
-8L1	B. M. Harrison	H	75	12	28	--	6.37	10-16-74	--	3	--	C
-8L2	P. Flood	H	74	16	42	--	5.63	10- 9-74	--	3	--	C
-8L3	S. Hodgson	H	74	14	42	--	--	--	--	3	--	C
-8M1	E. Berg	H	75	13	42	--	5.48	10- 9-74	--	3	--	C
-8M2	M. Johnson	H	76	15	42	--	6.00	10- 9-74	--	3	--	C
-8M3	R. Lagerwey	H	76	16	42	--	5.00	10 -9-74	--	3	--	C
-8M4	R. Stordal	H	76	10	42	--	2.00	10- 9-74	--	3	--	C
-8M5	---do-----	H	76	10	42	--	2.00	10- 9-74	--	3	--	C
-8M6	R. Hartman	H	77	9	42	--	8.00	10- 9-74	--	3	--	C
-8M7	E. C. Smith	H	78	8	42	--	5.80	10- 9-74	--	3	--	C
-18Q1	Tulalip Tribe	U	80	88	6	0	+9.60	8-31-76	--	6	G	C
-19M1	Marysville Test Hole No. 1	Z	510	482	--	--	--	--	--	--	G	C
-20B1	Tulalip Tribe	U	45	40	6	S	7.75	10- 9-74	--	3	G	C
-20F1	R. L. Harrison	H	43	28	36	--	10.40	9- 9-74	--	3	--	C
-20G1	Sheldon	H	45	12	24	--	9.76	9- 6-74	--	3	--	C
-20G2	E. Williams	H	44	22	42	--	10.00	9- 6-74	--	3	--	C
-20G3	---do------	U	44	--	42	--	--	--	--	3	--	C
-20G4	Arnold McKay	H	44	61	6	S	6.40	1-19-76	.1	3	G	C
-20G5	---do-------	H	45	13	42	--	4.34	5-17-76	--	3	--	C
-20K1	G. Williams	H	43	22	36	--	13.98	1-14-75	--	3	--	C
-20K2	Tulalip Tribe	U	38	31	42	0	15.95	3- 7-75	--	3	G	C
-20K3	Martin Williams	H	42	--	42	--	--	--	--	3	--	U
-20K4	---do----------	H	42	--	--	--	--	--	--	3	--	U

Local well number	Owner	Water use	Altitude of land surface (ft)	Depth of well (ft)	Casing diam-eter (in.)	Well finish	Water level (ft)	Date water level measured	Spacific capacity (gpm/ft)	Aquifer	Logs avail-able	Data relia-bility
30/5-5E6	A. Searles	H	95	10	39	--	7.70	11- 5-74	--	3	--	C
-5J1	R. Campbell	H	81	20	42	--	5.01	11- 5-74	--	3	--	C
-5J2	E. Vanwinkle	H	80	25	42	--	5.93	11- 5-74	--	3	--	C
-5J3	Frank Schueller	H	75	6	54	--	3.10	7-14-44	--	3	--	C
-5K2	Doremus	H	74	--	--	--	--	--	--	3	--	C
-5K3	A. Torie	H	77	11	36	--	3.93	1-15-75	--	3	--	C
-5L2	L. N. Loudenburg	H	85	11	24	--	6.52	10-29-74	--	3	--	C
-5M1	L. M. Lester	H	75	12	--	--	--	--	--	3	--	C
-5M2	L. N. Loudenburg	H	86	10	24	--	--	--	--	3	--	C
-5M3	D. R. Craig	H	92	14	42	--	6.61	11- 1-74	--	3	--	C
-5M4	---do------	U	93	11	42	--	6.50	11- 1-74	--	3	--	C
-5M5	B. Porter	H	93	120	6	0	+28.00	11- 1-74	--	5	--	C
-5N1	L. N. Loudenburg	U	84	26	42	--	6.38	10-29-74	--	3	--	C
-5P1	A. R. Curnutt	H	83	--	42	--	--	--	--	3	--	C
-5P2	D. Lingel	H	85	12	36	--	4.00	10-29-74	--	3	--	C
-5R1	H. Hensley	H	78	--	42	--	--	--	--	3	--	C
-5R2	Pargas	H	78	18	42	--	--	--	--	3	--	C
-6A1	R. Jennings	H	128	17	42	--	1.22	11- 5-74	--	3	--	C
-6A2	K. Stavert	H	98	12	30	--	--	--	--	3	--	C
-6A3	A. Miller	H	97	11	32	--	8.80	11- 5-74	--	3	--	C
-6B1	W. Hilde	H	208	16	42	0	11.27	11- 1-74	--	4	G	C
-6B2	R. Burgen	H	192	3	42	--	2.00	11- 5-74	--	4	--	C
-6B3	Carol Smith	H	205	80	6	0	59.00	6-21-77	2.5	5	G	U
-6B4	Richard L. Lilienthal	H	208	97	6	0	77.00	5-10-77	4.0	5	G	C
-6B5	Paul Needham	H	140	76	6	0	15.00	12-12-78	1.0	5	G	U
-6F1	O. H. Otto	H	200	60	8	--	--	--	--	5	--	C
-6F2	V. Todd	H	210	20	20	--	--	--	--	4	--	C
-6H1	H. C. Yandle	H	96	85	6	0	+31.00	11-26-74	2.5	5	--	C
-6H2	Jerry Carter	H	96	109	8	0	+29.90	11-26-74	--	5	G	C
-6H3	K. Alexander	H	96	129	10	P	+50.82	8- 2-69	2.6	5	G	C
-6J1	Shuhart	H	91	--	30	--	--	--	--	3	--	C
-6J2	B. G. Hadwin	H	92	10	42	--	6.99	11- 1-74	--	3	--	C
-6J3	F. Johnson	H	94	7	36	--	1.88	11- 1-74	--	3	--	C
-6J4	G. Gesme	H	95	107	6	0	+20.79	10-21-75	--	5	G	C
-6J5	--	H	95	20	42	--	5.51	11- 1-74	--	3	--	C
-6K1	William Schmidt	H	192	49	6	0	25.80	5-20-77	1.0	5	G	C
-6P1	J. F. Grow	H	215	82	4	--	57.77	11- 1-74	--	5	--	C
-6P2	---do-----	H	235	7	42	--	4.10	11- 1-74	--	4	--	C
-6P3	---do-----	H	235	7	42	--	4.03	11- 1-74	--	4	--	C
-6Q1	Paul Watson	H	215	112	6	S	75.00	5- 2-69	--	5	G	C
-6Q2	Jean Raymond	H	225	105	6	S	74.00	4-17-71	--	5	G	C
-6R1	E. Flick	H	90	14	42	--	7.14	10-29-74	--	3	--	C
-7F1	A. D. Neal	H	275	180	6	S	142.00	1970	5.2	5	G	C
-7F2	Ralph Peterson	H	270	179	6	S	145.00	11- 3-66	--	5	G	C
-7G1	G. E. Macquarry	H	160	26	42	--	6.25	10-15-74	--	4	--	C

TABLE 15.--Records of selected wells in the Tulalip Indian Reservation--Continued

Local well number	Owner	Water use	Altitude of land surface (ft)	Depth of well (ft)	Casing diam-eter (in.)	Well finish	Water level (ft)	Date water level measured	Spacific capacity (gpm/ft)	Aquifer	Logs avail-able	Data relia-bility
30/5-29L1	G. Stevenson	H	14	--	--	--	--	--	--	1	--	C
-29L2	E. Thompson	H	13	17	42	--	--	--	--	1	--	C
-29L3	R. D. Morgan	H	12	16	42	--	8.00	9-11-74	--	1	--	C
-29L4	---do-------	H	17	14	42	--	8.00	9-11-74	--	1	--	C
-29L5	H. C. Hegnes	H	12	8	43	--	6.00	11-26-74	--	1	--	C
-29L6	Ella Corse	H	12	13	36	--	5.00	9-18-74	--	1	--	C
-29L7	T. Jacklin	H	13	11	42	--	7.77	9-18-74	--	1	--	C
-29L8	J. Breckwell	H	16	12	44	--	7.50	9-18-74	--	1	--	C
-29L9	L. J. Christiansen	H	11	10	42	--	4.59	3-14-75	--	1	--	C
-29M1	--	U	16	--	42	--	9.00	12-12-74	--	1	--	C
-29N1	E. Balam	H	14	9	42	--	7.39	11-26-74	--	1	--	C
-29P1	Ace J. Wester	H	10	24	42	--	6.00	9-18-74	--	1	--	C
-29P2	---do--------	H	5	14	42	--	--	--	--	1	--	C
-29P3	C. Hart	H	11	--	42	--	--	--	--	1	--	C
-30B1	Pete Dillon	U	145	33	42	0	20.80	9-11-74	--	4	G	C
-30B2	Nora Dillon	U	140	24	42	0	9.84	9-11-74	--	4	G	C
-30B3	R. Kona	U	120	15	42	--	--	--	--	4	--	C
-30B4	Dallas Taylor	U	115	19	42	0	12.00	8- 2-63	--	4	G	C
-30B5	Tom Reeves	U	155	14	42	0	5.00	8- 9-63	--	4	G	U
-30C1S	--	U	210	--	--	--	--	--	--	4	--	C
-30G1	R. Kona	U	112	17	42	0	10.45	9-11-74	--	4	G	C
-30G2	Louise Ledford	U	160	67	42	0	53.65	9-12-74	--	4	G	C
-30G3	Bernice Parks	U	160	64	42	0	56.00	7-23-63	--	4	G	C
-30H1	H. McAll	H	26	8	42	--	5.11	9-10-74	--	3	--	C
-30H2	Gregory	H	27	--	42	--	--	--	--	3	--	C
-30H3	Ponciano	H	29	18	42	--	--	--	--	3	--	C
-30H6	J. M. Dawson	H	31	22	42	--	--	--	--	3	--	C
-30H7	--	H	32	--	42	--	--	--	--	3	--	C
-30H8	H. Turk	H	33	15	42	--	6.46	11-22-74	--	3	--	C
-30H9	H. McAll	I	26	6	42	--	--	--	--	3	--	C
-30J1	Van Dyke	H	21	--	42	--	--	--	--	3	--	C
-30J2	Cal Slater	H	23	6	42	--	3.00	9-10-74	--	3	--	C
-30J3	L. R. Damish	H	21	18	42	--	--	--	--	3	--	C
-30Q1	M. Bartlett	H	35	38	42	--	17.76	9-12-74	--	5	--	C
-30R1	L. Jensen	H	22	13	36	--	5.71	11-26-74	--	3	--	C
-30R2	G. A. Erickson	H	23	14	42	--	4.00	9-11-74	--	3	--	C
-30R3	---do---------	H	20	18	42	--	4.00	9-11-74	--	3	--	C
-30R4	F. Solomen	H	20	18	42	--	--	--	--	3	--	C
-30R5	A. Moe	H	22	11	--	--	--	--	--	3	--	C
-30R6	Waldo R. Wickstrom	H	23	22	36	0	--	--	--	3	--	C
-30R7	E. Meier	H	26	25	40	--	14.00	9-18-74	--	3	--	C
-30R8	Gary Stanton	H	22	16	42	--	2.31	3- 7-75	--	3	G	C
-31A1	S. Philipp	H	12	26	42	--	8.00	9-12-74	--	5	--	C
-31A2	L. R. Sorenson	H	14	--	42	--	--	--	--	5	--	C

TABLE 15.--Records of selected wells in the Tulalip Indian Reservation--Continued

Local well number	Owner	Water use	Altitude of land surface (ft)	Depth of well (ft)	Casing diameter (in.)	Well finish	Water level (ft)	Date water level measured	Spacific capacity (gpm/ft)	Aquifer	Logs available	Data reliability
30/5-20L1	C. D. Anderson	H	43	28	36	--	12.00	9- 6-74	--	3	--	C
-20L2	H. Tryon	H	41	23	42	--	12.00	3- 7-75	--	3	--	C
-20Q1	R. Burri	H	27	20	42	--	15.35	9- 6-74	--	3	--	C
-20Q2	---do---	H	33	26	42	0	18.50	3- 7-75	--	3	G	C
-29B1	C. A. Emory	H	19	19	42	--	11.69	9- 6-74	--	3	--	C
-29B2	Jim Brady	H	24	24	42	--	10.43	9- 6-74	--	3	--	C
-29B3	Robert Moses	H	26	24	42	0	9.22	9- 6-74	10.0	3	G	C
-29B4	B. Gobin	H	25	20	36	--	11.29	9- 9-74	--	3	--	C
-29B5	A. Hatch	H	25	26	42	0	11.27	3- 7-75	6.7	3	G	C
-29B6	Quil Ceda Kennel	H	18	--	42	--	6.00	9- 9-74	--	3	--	C
-29B7	---do-----------	H	24	--	--	--	--	--	--	3	--	C
-29B8	A. Cheer	H	28	21	42	--	8.28	9- 6-74	--	3	--	C
-29B9	Viola Topash	H	28	29	42	0	8.21	3-14-75	4.4	3	G	C
-29B10	Arnold Cheer	H	31	19	42	0	12.00	5-16-63	--	3	G	U
-29C1	F. Sheldon	H	29	17	48	--	14.40	7-13-44	--	3	--	C
-29C2	Donald T. Sherlock	H	28	40	42	P	12.00	4-13-62	2.1	3	G	C
-29C3	C. W. Moen	H	37	11	42	--	9.00	11-22-74	--	3	--	C
-29C4	D. Laddusaw	H	26	19	42	--	--	--	--	3	--	C
-29C5	D. Broderson	H	30	19	36	--	10.40	9- 6-74	--	3	--	C
-29C6	H. Turner	H	29	29	42	0	10.00	5-15-63	4.2	3	G	C
-29C7	C. Phillips	H	26	--	42	--	--	--	--	3	--	C
-29C8	H. Yockey	H	28	--	42	--	--	--	--	3	--	C
-29F1	S. Dorsey	H	22	19	42	--	6.84	11-22-74	--	3	--	C
-29F2	L. E. Wilkins	H	22	26	42	--	10.00	9-10-74	--	3	--	C
-29F3	George G. Gregg	H	21	21	42	P	12.00	7- 2-74	21.4	3	G	C
-29F4	--	I	10	--	--	--	--	--	--	3	--	C
-29F5	Martin Williams	H	22	18	42	--	10.63	3- 7-75	--	3	--	C
-29F6	C. L. Davis	H	21	--	--	--	--	--	--	3	--	C
-29G1	R. Grenier	H	12	16	42	--	10.29	9- 9-74	--	3	--	C
-29G2	Maria Moses	H	20	33	42	0	16.40	9- 9-74	2.5	3	G	C
-29G3	---do------	H	21	33	42	0	17.23	9- 9-74	2.5	3	G	C
-29G4	Lawrence Charley	H	21	29	42	0	15.00	5- 8-63	4.0	3	G	C
-29G5	M. Sheldon	H	19	17	42	--	12.25	9- 9-74	--	3	--	C
-29G6	Lucille Hatch	H	21	21	42	0	11.08	1-14-75	--	3	G	C
-29G7	Verl Hatch	U	22	18	42	--	10.10	9-10-74	--	3	--	C
-29G8	Owen Hatch	H	21	17	36	--	10.50	3- 7-75	--	3	--	C
-29H1	T. Lehn	H	22	--	42	--	13.00	9-10-74	--	3	--	C
-29H2	J. King	H	22	18	42	--	11.22	9-10-74	--	3	--	C
-29J1	--do---	H	23	--	--	--	--	--	--	3	--	C
-29J2	Alfred Sam	U	19	19	42	0	9.72	10-20-75	--	3	G	C
-29K1	Richard Spencer	H	17	29	42	0	10.89	9-10-74	5.0	3	G	C
-29K2	J. Breckwald	H	9	--	--	--	--	--	--	1	--	C
-29K3	Goedel	H	9	--	--	--	--	--	--	1	--	C
-29K4	--	H	10	--	--	--	10.00	9-18-74	--	1	--	C
-29K5	--	H	13	--	--	--	--	--	--	1	--	C

TABLE 15.--Records of selected wells in the Tulalip Indian Reservation--Continued

Local well number	Owner	Water use	Altitude of land surface (ft)	Depth of well (ft)	Casing diam-eter (in.)	Well finish	Water level (ft)	Date water level measured	Spacific capacity (gpm/ft)	Aquifer	Logs avail-able	Data relia-bility
30/5-31B1	Dean Shaffer	H	15	26	30	0	1.00	9- -63	--	5	--	C
-31B2	W. C. Morgan	H	19	19	--	--	11.00	9-18-74	--	5	--	C
-31B3	Humphrey, G.	H	19	11	40	0	8.00	9-18-74	--	5	--	C
-31B4	Fred Saunders	H	55	54	36	0	46.00	3-14-75	--	5	G	C
-31B5	---do--------	I	55	56	36	0	46.00	3-14-75	--	5	G	C
-31B6	E. M. Johnson	Z	30	57	--	0	22.00	8- 9-57	8.3	5	G	C
-31B7	W. C. Morgan	U	19	60	6	S	--	--	2.0	5	G	C
-31B8	Edwin M. Johnson	H	30	55	6	S	24.49	11-17-75	--	5	G	C
-31E1	Stan Jones, Sr.	U	130	136	6	S	--	--	--	5	G	C
-31F1	D. Jones	U	80	83	6	P	63.75	2-28-64	20.0	5	G	C
-31F2	Hill	U	85	92	6	S	65.37	11-17-75	--	5	G	C
-31F3	G. E. Carpenter	U	110	97	42	0	90.13	11-17-75	--	5	G	C
-31F4	Tulalip Jesus House	H	95	41	42	--	32.35	11- 8-74	1.6	4	--	C
-31F5	D. Jones	U	80	17	42	0	12.00	6-28-63	--	2	G	C
-31F6	Hill	U	90	21	42	0	16.00	6-20-63	--	4	G	C
-31G1	L. D. Cladoosby	U	14	20	42	--	6.77	9-12-74	--	4	--	C
-31G2	Glen Parks	U	38	38	42	0	15.41	9-12-74	--	4	G	C
-31G3	Wesley Patrick	U	57	31	42	0	13.38	9-12-74	--	4	G	C
-31G4	Buckner	H	14	21	42	--	9.48	11-22-74	--	5	--	C
-31G5	Lena Cladoosby	U	17	21	42	0	10.00	6-11-63	--	4	G	C
-31G6	J. L. Crawley	H	11	29	42	0	1.00	3-14-75	--	5	--	C
-31M1	E. Price	U	120	17	42	0	8.36	9-12-74	--	4	G	C
-31M2	E. Parks	U	100	6	--	--	--	--	--	4	--	C
-31M3	G. Parks	U	130	25	42	--	20.67	9-18-74	--	2	--	C
-31M4	Madeline James	U	130	21	42	0	11.00	5-29-63	--	4	G	C
-31M5	Tulalip Jesus House	U	130	--	42	--	--	--	--	2	--	C
-31M6	Ray Price	U	122	19	42	0	12.00	6- 6-63	--	2	G	C
-31M7	Charles Hill	U	118	19	42	0	3.01	3-14-75	--	2	--	C
-31M8	Marie George	Z	130	70	--	--	Dry	7-19-63	--	2	--	U

TABLE 16.--Water levels in selected wells

P, well being pumped; R, well pumped recently;
S, nearby well being pumped; T, nearby well pumped recently

Well 29/4-1B2

Highest water level: 103.75 feet below land surface datum Oct. 20, 1975.
Lowest water level: 104.89 feet below land surface datum Feb. 11, 1975.
Water levels in feet below land surface datum.

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Dec 12, 1974	103.80 R	Sep 22, 1975	104.50 R	Jun 29, 1976	104.00 R	Apr 19, 1977	104.50
Jan 14, 1975	104.72 R	Oct 20	103.75 R	Jul 16	104.00 R	May 20	104.30
Feb 11	104.89 R	Nov 17	104.65 R	Aug 31	104.20 R	Jun 21	104.30 R
Feb 27	104.22 R	Dec 15	104.40 R	Sep 21	104.20	Jul 14	104.50
Mar 14	104.29 R	Jan 19, 1976	103.90 R	Oct 12	104.10 R	Aug 18	104.50 R
Apr 16	104.36 R	Jan 26	104.10 R	Nov 15	104.30	Sep 15	104.30
May 13	104.00 R	Feb 17	103.80 R	Dec 15	104.20	Oct 27	104.10
Jun 13	104.20 R	Mar 16	104.10 R	Jan 18, 1977	104.10		
Jul 21	104.30 R	Apr 19	103.80 R	Feb 15	104.20 R		
Aug 13	104.40 R	May 17	104.00 R	Mar 14	104.10 R		

Well 30/4-1C1

Highest water level: 1.70 feet below land surface datum May 20, 1977.
Lowest water level: 9.60 feet below land surface datum Oct 8, 1974.
Water levels in feet below land surface datum.

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Oct 8, 1974	9.60	Apr 19, 1977	2.10	Jul 14, 1977	5.90	Nov 21, 1977	6.70
Feb 15, 1977	6.20	May 20	1.70	Aug 18	7.70		
Mar 14	2.10	Jun 21	4.40	Sep 15	8.10		

Well 30/4-1N1

Highest water level: 199.10 feet below land surface datum May 17, 1976.
Lowest water level: 201.20 feet below land surface datum Aug 18, 1977.
Water levels in feet below land surface datum.

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Nov 14, 1974	199.50	Sep 22, 1975	200.11	Jun 22, 1976	199.20	Apr 19, 1977	200.40
Dec 12	200.30	Oct 21	200.17	Jul 16	199.20	May 20	200.40
Jan 15, 1975	200.92	Nov 18	200.65	Aug 31	199.50	Jun 21	200.70
Feb 11	200.75	Dec 16	200.60	Sep 21	199.50	Jul 14	200.70
Mar 14	199.87	Jan 20, 1976	199.60	Oct 12	199.80	Aug 18	201.20
May 13	199.30	Feb 17	199.20	Dec 15	199.90	Sep 15	201.00
Jun 13	199.40	Mar 16	199.66	Jan 18, 1977	200.20		
Jul 21	199.70	Apr 19	199.40	Feb 15	200.10		
Aug 19	199.90	May 17	199.10	Mar 14	200.10		

Well 30/4-3H1

Highest water level: 79.80 feet below land surface datum Jun 22, 1976.
Lowest water level: 82.30 feet below land surface datum Nov 21, 1977.
Water levels in feet below land surface datum.

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Dec 12, 1974	80.30	Oct 21, 1975	80.93	Aug 31, 1976	80.00	Jun 21, 1977	81.70
Jan 15, 1975	81.01	Nov 18	81.23	Sep 21	80.10	Jul 14	81.80
Feb 11	81.10	Dec 16	81.20	Oct 12	80.3	Aug 18	82.00
Mar 14	80.70	Jan 20, 1976	80.80	Nov 15	80.6	Sep 15	82.00
Apr 16	80.44	Feb 17	80.30	Dec 15	80.6	Nov 21	82.30
May 13	80.00	Mar 16	80.42	Jan 18, 1977	80.9	Feb 23, 1978	82.30
Jun 13	80.10	Apr 19	80.10	Feb 15	81.	Jun 22	82.2
Jul 21	80.30	May 17	79.90 R	May 14	81.2		
Aug 19	80.40	Jun 22	79.80	Apr 19	81.4		
Sep 22	80.70	Jul 16	79.80	May 20	81.40		

TABLE 16.--Water levels in selected wells--continued

Well 30/4-7G2

Highest water level: 20.86 feet below land surface datum Feb 11, 1975.
Lowest water level: 28.56 feet below land surface datum Jul 21, 1975.
Water levels in feet below land surface datum.

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Apr 7, 1967	26.81	Jul 21, 1975	28.56	May 18, 1976	25.80	Mar 14, 1977	25.30
Oct 16, 1974	26.96	Aug 19	28.36	Jul 16	27.80	Apr 19	27.70
Nov 14	25.63	Oct 21	26.01	Aug 31	26.60	May 20	28.00
Dec 12	24.09	Nov 18	25.86	Sep 21	27.10	Jun 21	28.00
Feb 11, 1975	20.86	Dec 16	25.30	Oct 12	25.40	Jul 14	27.40
Mar 14	27.22	Jan 20, 1976	24.40	Nov 15	24.50	Aug 18	27.10
Apr 16	27.74	Feb 17	26.10	Dec 15	24.00	Sep 15	27.00
May 13	28.30	Mar 16	26.20	Jan 18, 1977	25.50		
Jun 13	28.48	Apr 19	28.00	Feb 15	25.50		

Well 30/4-7G3

Highest water level: 19.37 feet below land surface datum Oct 16, 1974.
Lowest water level: 21.85 feet below land surface datum Feb 11, 1975.
Water levels in feet below land surface datum.

Date	Water level	Date	Water level	Date	Water level	Date	Water level
May 18, 1970	20.10	Jun 13, 1975	20.40	Apr 19, 1976	20.00	Feb 15, 1977	20.00
Oct 16, 1974	19.37	Jul 21	19.45	May 18	20.10	Mar 14	19.90
Nov 14	20.15	Aug 19	20.48	Jul 16	20.20	Apr 19	20.20
Dec 12	20.13	Oct 21	20.28	Aug 31	20.20	May 20	20.10
Jan 15, 1975	20.08	Nov 18	20.12	Sep 21	20.20	Jun 21	20.10
Feb 11	21.85	Dec 16	20.20	Oct 12	20.20	Jul 14	20.30
Mar 14	19.99	Jan 20, 1976	20.00	Nov 15	20.10	Aug 18	20.40
Apr 16	20.17	Feb 17	19.90	Dec 15	20.00	Sep 15	20.20
May 13	20.20	Mar 16	20.20	Jan 18, 1977	20.00		

Well 30/4-10L1

Highest water level: 9.50 feet above land surface datum Oct 27, 1977.
Lowest water level: 6.50 feet above land surface datum Aug 25, 1975.
Water levels in feet above land surface datum.

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Dec 12, 1974	7.1	Aug 19, 1975	7.0	Feb.18, 1976	8.6	Jan 18, 1977	7.7
Jan 14, 1975	7.0	Aug 25	6.5	Mar 16	8.4	Feb 15	7.9
Feb 11	8.6	Sep 8	7.5	May 17	8.6	Mar 14	8.6
Mar 14	8.8	Sep 22	7.0	Jun 29	8.2	Apr 19	8.8
Apr 16	9.0	Oct 20	7.0	Jul 16	7.9	May 20	8.6
Apr 24	9.0	Nov 17	6.8	Aug 31	7.7	Jun 21	8.6
May 13	8.8	Dec 16	6.8	Sep 21	7.7	Jul 14	8.4
Jun 13	9.1	Jan 13, 1976	6.8	Oct 12	7.9	Aug 18	8.2
Jul 21	8.4	Jan 19	8.1	Nov 15	8.2	Sep 15	8.8
Aug 13	7.0	Feb 17	8.6	Dec 15	7.7	Oct 27	9.5
						Jun 22, 1978	8.2

Well 30/4-10L2

Highest water level: 21.04 feet below land surface datum Mar 14, 1975.
Lowest water level: 30.30 feet below land surface datum Aug 8, 1977.
Water levels in feet below land surface datum.

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Nov 26, 1974	22.24	Sep 22, 1975	26.20	Aug 31, 1976	26.3 T	Jun 21, 1977	25.80
Dec 12	22.12	Oct 20	25.08	Sep 21	27.0 R	Jul 14	26.50
Jan 14, 1975	21.66	Dec 16	24.40	Oct 12	27.00 T	Aug 8	30.30 T
Feb 11	21.31	Jan 19, 1976	24.30 T	Nov 15	25.50 T	Sep 15	27.30 T
Mar 14	21.04	Feb 18	24.10	Dec 15	26.00	Oct 27	26.70 T
Apr 16	21.34	Mar 16	24.25	Jan 18, 1977	25.50 T	Nov 21	26.70 T
Aug 13	27.80	Apr 19	23.90	Feb 15	26.10 R	Feb 23, 1978	25.80
Aug 19	25.40	May 17	24.05	Mar 14	25.30	Jun 22	28.5 T
Sep 8	24.90	Jun 29	25.9	Apr 19	26.10		
Sep 9	24.00	Jul 16	27.1 R	May 20	24.70 T		

TABLE 16.--Water levels in selected wells--continued

Well 30/4-10L3

Highest water level: 7.97 feet below land surface datum Mar 14, 1975.
Lowest water level: 19.40 feet below land surface datum Aug 13, 1975.
Water levels in feet below land surface datum.

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Nov 26, 1974	9.07	Oct 20, 1975	13.28	Aug 31, 1976	16.1 T	May 20, 1977	12.00 T
Dec 12	9.11	Dec 16	12.80 R	Sep 21	15.1 R	Jun 21	13.40 T
Jan 14, 1975	8.52	Jan 19, 1976	12.80 T	Oct 12	15.20 R	Jul 14	14.30 R
Feb 11	8.43	Feb 18	10.70	Nov 15	14.80 T	Aug 18	18.60 R
Mar 14	7.97	Mar 16	11.06	Dec 15	13.10	Sep 15	16.20 R
Apr 16	8.25	Apr 19	11.20	Jan 18, 1977	12.30	Oct 27	16.50 T
Aug 13	19.40 R	May 17	11.01	Feb 15	12.70 T	Nov 21	15.80 T
Aug 19	13.21 R	Jun 29	14.2	Mar 14	12.20	Jun 22, 1978	16. T
Sep 9	10.50	Jul 16	15.5 R	Apr 19	14.00		

Well 30/4-10L4

Highest water level: 12.10 feet above land surface datum Mar 14, 1975.
Lowest water level: 0.6 feet below land surface datum Aug 31, 1976.
Water levels in feet above or below (-) land surface datum.

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Dec 12, 1974	10.60	Aug 25, 1975	6.40 T	Jul 16, 1976	3.0	Feb 15, 1977	6.30 R
Jan 14, 1975	11.30	Sep 9	10.40	Aug 31	-0.6 R	Mar 14	5.60
Feb 11	11.40	Oct 21	7.40	Sep 21	4.2 T	Apr 19	2.60
Feb 27	11.40	Nov 17	3.30 S	Oct 12	3.70 T	May 20	5.30 R
Mar 14	12.10	Dec 16	4.40 R	Nov 15	1.00 R	Jun 21	3.50 R
Apr 16	11.60	Feb 18, 1976	9.00	Dec 15	4.40	Jun 22, 1978	-0.15 R
Apr 24	11.40	Mar 16	8.60	Jan 18, 1977	6.70		

Well 30/4-10L5

Highest water level: 12.20 feet above land surface datum Mar 14, 1975.
Lowest water level: 1.0 feet below land surface datum Aug. 31, 1976.
Water levels in feet above or below (-) land surface datum.

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Dec 12, 1974	10.20	Sep 9, 1975	8.70	Mar 16, 1976	6.00	Dec 15, 1977	3.50
Jan 14, 1975	10.80	Oct 21	5.80	Jul 16	2.8 R	Jan 18, 1977	4.80
Feb 11	11.70	Nov 17	3.70 S	Aug 31	-1.0 R	Feb 15	4.60 T
Mar 14	12.20	Dec 16	3.50 R	Sep 21	2.8 T	Mar 14	4.80
Apr 16	12.20	Jan 19, 1976	2.50 R	Oct 12	3.50 T	Apr 19	2.10
Aug 25	4.00 T	Feb 18	7.40	Nov 15	1.20 R	May 20	4.20 R
						Jun 21	3.20 T

Well 30/4-17B2

Highest water level: 79.80 feet below land surface datum Oct 12, 1976.
Lowest water level: 83.60 feet below land surface datum Nov 21, 1977.
Water levels in feet below land surface datum.

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Oct 12, 1976	79.80	Feb 15, 1977	81.60	Jun 21, 1977	82.40	Nov 21, 1977	83.60
Nov 15	80.40	Mar 14	81.90	Jul 14	82.60	Feb 23, 1978	83.10
Dec 15	80.90	Apr 19	82.00	Aug 18	83.00	Jun 22	81.9
Jan 18, 1977	81.50	May 20	82.30	Sep 15	83.00		

TABLE 16.--Water levels in selected wells--continued

Well 30/4-17C1

Highest water level: 63.40 feet below land surface datum Dec 15, 1976.
Lowest water level: 65.90 feet below land surface datum May 13, 1975.
Water levels in feet below land surface datum.

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Aug 30, 1974	64.85	Apr 16, 1975	65.88	Jan 20, 1976	64.10	Nov 15	63.50
Oct 15	64.24	May 13	65.90	Feb 17	64.40 R	Dec 15	63.40
Nov 14	64.71	Jun 13	65.90	Mar 16	64.10	Jan 18, 1977	64.40
Dec 12	64.10	Jul 21	65.50	Apr 19	65.60	Feb 15	64.00
Jan 15, 1975	64.77	Aug 19	64.90	May 18	65.20 R	Mar 14, 1977	64.30
Feb 11	64.28	Sep 22	64.90	Jul 16	65.20 R	Apr 19	64.60
Feb 27	65.10	Oct 20	64.11	Aug 31	64.50	May 20	65.50
Mar 5	64.39	Nov 14	64.50	Sep 21	64.30	Jun 21	65.30
Mar 14	65.67	Dec 15	64.50	Oct 12	64.30	Jul 14	64.40
						Sep 15	64.00

Well 30/4-21J2

Highest water level: 155.30 feet below land surface datum Jan 18, 1977.
Lowest water level: 157.80 feet below land surface datum Jul 14, 1977.
Water levels in feet below land surface datum.

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Aug 13, 1975	156.20	Feb. 17, 1976	156.10	Sep 21, 1976	157.40	Apr 19, 1977	157.70
Aug 25	156.40	Mar 16	156.50	Oct 12	155.90	May 20	156.40
Sep 22	156.60	Apr 19	156.20	Nov 15	156.20	Jun 21	156.30
Oct 20	156.50	May 17	156.70	Dec 15	155.90	Jul 14	157.80
Nov 17	156.10	Jun 29	156.50	Jan 18, 1977	155.30	Aug 18	155.90
Dec 15	156.20	Jul 16	156.10	Feb 15	156.10		
Jan 19, 1976	156.90	Aug 31	156.40	Mar 14	155.80		

Well 30/4-36P1

Highest water level: 113.00 feet below land surface datum Feb 17, 1976.
Lowest water level: 114.40 feet below land surface datum Aug 13, 1975.
Water levels in feet below land surface datum.

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Sep 20, 1974	113.61	Feb 11, 1975	114.30	Jul 21, 1975	113.60	Jan 19, 1976	113.50
Oct 18	113.68	Mar 14	113.88	Aug 13	114.40	Feb 17	113.00
Nov 14	114.20	Apr 16	113.79	Sep 22	113.60	Mar 16	113.40
Dec 12	113.60	May 13	113.30	Nov 17	114.10		
Jan 15, 1975	114.10	Jun 13	113.40	Dec 15	113.70		

Well 30/4-36P3

Highest water level: 6.79 feet below land surface datum Jan 19, 1976.
Lowest water level: 16.80 feet below land surface datum Apr 19, 1977.
Water levels in feet below land surface datum.

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Nov 8, 1974	13.56	Aug 13, 1975	13.59	May 17, 1976	11.30	Feb 15, 1977	13.70
Dec 12	13.22	Sep 22	14.30	Jun 29	12.50	Mar 14	11.80
Jan 15, 1975	9.58	Oct 20	10.96	Jul 16	12.90	Apr 19	16.80
Feb 11	8.83	Nov 17	6.97	Aug 31	13.50	May 20	10.10
Mar 14	7.89	Dec 15	8.85	Sep 21	13.60	Jun 21	12.50
Apr 16	11.49	Jan 19, 1976	6.79	Oct 12	13.80	Jul 14	13.80
May 13	8.90	Feb 17	9.90	Nov 15	14.30	Aug 18	14.70
Jun 13	12.41	Mar 16	10.10	Dec 15	14.20	Sep 15	13.90
Jul 21	13.22	Apr 19	7.36	Jan 18, 1977	12.60		

TABLE 16.--Water levels in selected wells--continued

Well 30/5-5E2

Highest water level: 2.07 feet below land surface datum Jan 20, 1976.
Lowest water level: 6.25 feet below land surface datum Nov 14, 1974.
Water levels in feet below land surface datum.

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Oct 18, 1974	6.14	Jul 21, 1975	5.38	Jun 22, 1976	4.50	Mar 14, 1977	3.10
Nov 14	6.25	Aug 19	5.68	Jul 16	5.00	Apr 19	3.70
Dec 12	5.66	Oct 21	5.15	Aug 31	5.00	May 20	3.00
Jan 15, 1975	2.43	Dec 16	2.30	Sep 21	5.20	Jun 21	4.40
Feb 11	2.45	Jan 20, 1976	2.07	Oct 12	5.40	Jul 14	5.00
Mar 19	2.11	Feb 17	3.00	Nov 15	5.20	Aug 18	5.60
Apr 24	3.63	Mar 16	3.40	Dec 15	4.60	Sep 15	5.60
May 13	3.22	Apr 19	2.40	Jan 18, 1977	3.80		
Jun 13	4.79	May 18	4.00	Feb 15	4.30		

Well 30/5-5E3

Highest water level: 2.29 feet below land surface datum Mar 19, 1975.
Lowest water level: 6.37 feet below land surface datum Nov 14, 1974.
Water levels in feet below land surface datum.

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Oct 18, 1974	6.29	Feb 11, 1975	2.56	Jun 13, 1975	4.92	Dec 16, 1975	2.42
Nov 14	6.37	Mar 19	2.29	Jul 21	5.50		
Dec 12	5.07	Apr 24	3.75	Aug 19	5.98		
Jan 15, 1975	2.55	May 13	3.34	Oct 21	5.28		

Well 30/5-6B1

Highest water level: 5.30 feet below land surface datum Apr 19, 1976.
Lowest water level: 12.94 feet below land surface datum Nov 20, 1974.
Water levels in feet below land surface datum.

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Nov 1, 1974	11.27	Apr 24, 1975	6.06	Sep 22, 1975	11.93	Feb 17, 1976	6.30
Nov 20	12.94	May 13	6.28	Oct 21	12.20	Mar 16	6.13
Jan 15, 1975	11.50	Jun 13	9.61	Nov 18	11.59	Apr 19	5.30
Feb 11	10.13	Jul 21	10.06	Dec 16	8.91	May 18	6.30
Mar 19	6.60	Aug 19	11.12	Jan 20, 1976	5.94	Jun 22	8.20
						Aug 31	11.20

Well 30/5-6H1

Highest water level: 33.10 feet above land surface datum Jun 22, 1976.
Lowest water level: 29.90 feet above land surface datum Feb 11, 1975.
Water levels in feet above land surface datum.

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Nov 26, 1974	31.00 R	Jul 21, 1975	31.00 R	Apr 19, 1976	32.60	Jan 18, 1977	32.20
Dec 12	30.40 R	Aug 19	31.00 R	May 18	32.90	Feb 15	32.20
Jan 15, 1975	32.00 R	Sep 22	31.00 R	Jun 22	33.10	Mar 14	31.00
Feb 11	29.90 R	Oct 20	32.00	Jul 16	32.40	Apr 19	32.20
Feb 27	32.40 R	Nov 18	32.20	Aug 31	31.50	May 20	32.20
Mar 19	31.50 R	Dec 16	32.20	Sep 21	32.00	Jun 21	32.20
Apr 16	30.10 R	Jan 20, 1976	32.20	Oct 12	31.70	Jul 14	31.50
May 13	31.00 R	Feb 17	32.60	Nov 15	32.20	Aug 18	31.00
Jun 13	31.00 R	Mar 16	32.60	Dec 15	31.50	Sep 15	31.30

TABLE 16.--Water levels in selected wells--continued

Well 30/5-7G2

Highest water level: 5.62 feet below land surface datum Jan 20, 1976.
Lowest water level: 22.70 feet below land surface datum Nov 20, 1974.
Water levels in feet below land surface datum.

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Oct 15, 1974	22.20	Aug 19, 1975	20.87 P	May 18, 1976	10.70	Feb 15, 1977	18.60 R
Nov 20	22.70 P	Sep 22	21.05 P	Jun 22	16.40	Mar 14	13.80
Jan 15, 1975	11.92	Oct 21	16.33	Jul 16	18.40	Apr 19	14.80
Feb 11	10.50	Nov 18	13.01 P	Aug 31	18.70	May 20	13.10 P
Mar 19	6.02	Dec 16	7.59	Sep 21	20.00	Jun 21	15.40
Apr 24	12.06	Jan 20, 1976	5.62	Oct 12	22.10	Jul 14	18.50
May 13	12.55 P	Feb 17	9.90	Nov 15	22.30	Aug 18	20.60 R
Jun 13	16.85	Mar 16	11.81	Dec 15	18.90	Sep 15	20.50
Jul 21	21.04 P	Apr 19	8.10	Jan 18, 1977	18.30		

Well 30/5-7G5

Highest water level: 102.10 feet below land surface datum Dec 15, 1976.
Lowest water level: 103.40 feet below land surface datum Nov 21, 1977.
Water levels in feet below land surface datum.

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Dec 15, 1976	102.10	Mar 14, 1977	102.70	Jun 21, 1977	103.00	Sep 15, 1977	103.20
Jan 18, 1977	102.50	Apr 19	102.90	Jul 14	103.00	Nov 21	103.40
Feb 15	102.50	May 20	102.90	Aug 18	103.30	Jun 22, 1978	102.5

Well 30/5-8L1

Highest water level: 0.35 feet below land surface datum Feb 11, 1975.
Lowest water level: 8.08 feet below land surface datum Sep 12, 1945.
Water levels in feet below land surface datum.

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Sep 12, 1945	8.08	Aug 10, 1946	6.63	Jun 4, 1947	5.63	Jan 15, 1975	2.86
Dec 28	3.20	Oct 2	8.03	Oct 16, 1974	6.37	Feb 11	0.35
Mar 1, 1946	2.39	Dec 9	5.59	Nov 14	6.82		
Apr 16	3.07	Feb 13, 1947	2.32	Nov 20	6.79		
Jun 25	4.54	Apr 18	2.73	Dec 12	7.16		

Well 30/5-20G1

Highest water level: 7.25 feet below land surface datum Mar 14, 1975.
Lowest water level: 10.70 feet below land surface datum Dec 15, 1976.
Water levels in feet below land surface datum.

Date	Water level	Date	Water level	Date	Water Level	Date	Water level
Sep 6, 1974	9.76	Jun 13, 1975	8.60	Apr 19, 1976	7.60 R	Feb 15, 1977	10.10
Nov 14	10.63	Jul 21	9.63	May 17	7.70 R	Mar 14	9.70
Nov 22	10.45	Aug 13	10.44	Jun 23	8.70 R	Apr 19	9.60 P
Dec 12	10.61	Sep 22	10.38	Jul 16	9.10 R	May 20	9.30 P
Jan 14, 1975	9.07	Oct 20	10.46	Aug 31	9.90 R	Jun 21	9.50
Feb 11	8.50	Nov 17	9.72	Sep 21	10.20 R	Jul 14	9.90 P
Mar 14	7.25	Dec 15	7.72	Oct 12	10.20	Aug 18	10.50
Apr 16	7.76	Jan 19, 1976	7.31	Nov 15	10.50	Sep 15	10.70
Apr 24	7.95	Feb 17	7.90	Dec 15	10.70	Nov 21	10.30
May 13	7.95	Mar 16	7.96	Jan 18, 1977	10.40		

TABLE 16.--Water levels in selected wells--continued

Well 30/5-29G7

Highest water level: 8.64 feet below land surface datum Mar 14, 1975.
Lowest water level: 11.50 feet below land surface datum Dec 15, 1976.
Water levels in feet below land surface datum.

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Sep 10, 1974	10.10	Jul 21, 1975	10.22	May 17, 1976	8.80	Mar 14, 1977	11.3
Oct 15	10.81	Aug 13	10.63	Jun 23	9.50	Apr 19	10.7
Nov 14	10.07	Sep 22	11.11	Jul 16	10.00	May 20	10.5
Dec 12	9.68	Oct 20	11.27	Aug 31	10.60	Jun 21	10.2
Jan 14, 1975	10.82	Nov 17	11.01	Sep 21	10.80	Jul 14	10.6
Feb 11	9.93	Dec 15	9.75	Oct 12	11.	Aug 18	11.1
Mar 14	8.64	Jan 19, 1976	9.16	Nov 15	11.3	Sep 15	11.3
Apr 16	8.79	Feb 17	8.90	Dec 15	11.5	Nov 21	11.3
May 13	9.17	Mar 16	9.32	Jan 18, 1977	11.5		
Jun 13	9.63	Apr 19	8.99	Feb 15	11.5		

Well 30/5-31G2

Highest water level: 1.47 feet below land surface datum Jan 19, 1976.
Lowest water level: 19.42 feet below land surface datum Dec 12, 1974.
Water levels in feet below land surface datum.

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Sep 12, 1974	15.41	Jun 13, 1975	15.46	Mar 16, 1976	3.40	Dec 15, 1976	19.00
Oct 18	16.60	Jul 21	16.20	Apr 19	1.55	Jan 18, 1977	19.00
Nov 14	18.77	Aug 13	16.89	May 17	10.40	Feb 15	19.40
Dec 12	19.42	Sep 22	18.15	Jun 23	14.00	Mar 14	11.20
Jan 14, 1975	5.24	Oct 20	19.01	Jul 16	14.60	Apr 19	11.80
Feb 11	3.83	Nov 17	16.89	Aug 13	16.10	May 20	3.50
Mar 14	2.89	Dec 15	2.97	Sep 21	16.70	Jun 21	6.60
Apr 16	11.56	Jan 19, 1976	1.47	Oct 12	17.40	Jul 14	17.30
May 13	1.97	Feb 17	7.00	Nov 15	18.30	Aug 18	17.90
						Sep 15	18.50

TABLE 17.--Chemical quality of ground water from selected wells

Site number	Source 1/	Well depth 2/	Date sample collected	Milligrams per liter													
				Dis-solved silica (SiO_2)	Dis-solved iron (Fe)	Dis-solved mangan-ese (Mn)	Dis-solved cal-cium (Ca)	Dis-solved mag-nesium (Mn)	Dis-solved sodium (Na)	Dis-solved potas-sium (K)	Bicar-bonate (HCO_3)	Alka-linity as $CaCO_3$	Dis-solved sul-fate (SO_4)	Dis-solved chlor-ide (Cl)	Dis-solved fluor-ide (F)	Total ni-trate (N)	Total ni-trite (N)
29/4-1A1	G	172	10-12-60	31	0.31	--	19	20	150	7.6	100	82	53	230	0.2	0.27	--
	G		4-24-61	30	--	--	22	19	140	7.4	100	82	53	210	.3	.18	--
	S		5- 3-65	--	.19	--	--	--	--	--	--	--	--	130	--	--	--
-1A2	G	146	4-19-67	--	--	--	--	--	--	--	--	--	--	22	--	--	--
	S		9-12-72	--	.10	0.012	--	--	--	--	--	--	--	--	--	--	--
	S		12- 4-74	14	.03	.01	23	12	19	8.0	168	138	45	18	.2	1.5	0.01
	G		6- 6-78	--	--	--	--	--	--	--	--	--	--	24	--	--	--
-1A3	S	146	9-12-72	--	.06	.003	--	--	--	--	--	--	--	--	--	--	--
-1B1	G	106	4-19-67	--	--	--	--	--	--	--	--	--	--	11	--	--	--
-1B2	G	160	4-19-67	--	--	--	--	--	--	--	--	--	--	120	--	--	--
	S		9-20-73	20	.34	.006	18	17	45	6	110	90	54	98	.1	6	.11
	G		2-27-75	--	--	--	--	--	--	--	--	--	--	110	--	--	--
	G		10-20-75	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	G		12-15-75	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	G		1-19-76	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	G		1-26-76	--	--	--	--	--	--	--	--	--	--	180	--	--	--
	G		2-17-76	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	G		3-16-76	--	--	--	--	--	--	--	--	--	--	110	--	--	--
	G		4-19-76	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	G		5-17-76	--	--	--	--	--	--	--	--	--	--	120	--	--	--
	G		6-29-76	--	--	--	--	--	--	--	--	--	--	120	--	--	--
	G		7-16-76	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	G		9-21-76	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	G		10-12-76	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	G		11-15-76	--	--	--	--	--	--	--	--	--	--	100	--	--	--
	G		12-15-76	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	G		10-27-77	--	--	--	--	--	--	--	--	--	--	--	--	--	--
-1B3	S	172	8- 1-72	28	.0	.001	17	8.3	11	4.4	96	79	22	12	.2	.62	.02
	S		1- 3-73	18	.16	.006	22	11	3.9	2.1	110	90	14	8.0	.1	.68	.03
	S		8-17-73	--	.07	.0	29	17	13	1.8	110	90	22	18	.2	9.0	.04
	S		10- 6-73	--	--	--	--	--	--	--	--	--	--	18	--	--	--
	G		10-21-75	--	--	--	--	--	--	--	--	--	--	--	--	--	--
-1B6	S	196	3-20-72	--	.16	.00	15	39	390	21	280	230	3.6	820	.4	3.1	.02
	S		4- 4-72	--	.24	.003	11	36	500	18	210	172	12	690	.3	2.9	.06
	S		4-17-72	35	.72	.024	9.2	34	400	18	170	139	27	620	.3	5.5	.02
	S		5-22-72	29	.14	.00	11	26	380	12	190	156	35	500	.3	5.0	.58
	S		7-17-72	34	.06	.00	36	11	340	12	160	131	33	480	.2	3.5	.28
	S		10-17-72	30	.26	.009	7.6	32	250	13	180	148	19	420	.2	2.2	.10
-1C1	G	165	4-19-67	--	--	--	--	--	--	--	--	--	--	11	--	--	--
	S		8- 3-72	15	.82	.006	18	27	12	3.1	98	80	22	10	.3	3.4	.01
	G		10-21-75	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	G		6- 6-78	--	--	--	--	--	--	--	--	--	--	9.6	--	--	--
-1C2	S	160	8-29-75	21	.06	.04	24	18	8.2	--	129	102	15	7.5	.1	3.2	.01
	S		11 -9-75	--	.26	.07	--	--	--	--	--	--	--	--	.2	1.8	--
-1C3	G	130	11-18-75	--	--	--	--	--	--	--	--	--	--	--	--	--	--
-1D1	G	120	4-19-47	--	--	--	--	--	--	--	--	--	--	7	--	--	--
	G		11-18-75	--	--	--	--	--	--	--	--	--	--	--	--	--	--
-1G2	G	132	4-19-47	--	--	--	--	--	--	--	--	--	--	19	--	--	--
	G		4-19-67	--	--	--	--	--	--	--	--	--	--	16	--	--	--
-1G3	G	130	4-19-47	--	--	--	--	--	--	--	--	--	--	9	--	--	--
	G		4-19-67	--	--	--	--	--	--	--	--	--	--	11	--	--	--
			6- 6-78	--	--	--	--	--	--	--	--	--	--	10	--	--	--
-1G6	S	71	12- 1-71	15	.20	.009	.6	4.9	9.4	1.0	37	30	17	4.0	.1	6.8	.01
30/4-1M1	S	426	5-28-65	110	8.8	.07	40	--	--	--	--	--	--	400	--	--	--
	S		6- 6-65	--	.09	--	--	--	--	--	--	--	--	100	--	1.3	.01
	S		2- 1-74	39	.05	.03	13	7.5	5.0	.5	94	77	0.	3.1	.1	.22	.01
	G		11-18-75	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	G		11-15-76	--	--	--	--	--	--	--	--	--	--	--	--	--	--
-1N1	S	257	7-15-70	14	.15	.003	16	5.8	5.3	3.7	61	50	11	4.3	.1	.0	.01
	G		11-15-76	--	--	--	--	--	--	--	--	--	--	--	--	--	--
-3C1	S	179	5-11-70	35	.0	.03	5.6	8.3	5.9	2.0	62	51	3.0	3.8	.1	1.1	.0
	S		7-27-72	14	.74	.05	16	9.7	5.0	1.5	98	80	5.6	6.5	.1	.01	.07
	S		11- 8-72	14	.12	.01	8.8	26	6.6	1.8	140	115	8.6	6.0	.1	.19	.03
	S		10-26-73	21	.44	.01	29	8.8	6.6	1.0	88	72	9.3	8.0	.2	.5	.01
-3H1	G	105	11-18-75	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	G		5-17-76	--	--	--	--	--	--	--	--	--	--	--	--	--	--
-6F1	G	311	6- 7-78	--	--	--	--	--	--	--	--	--	--	7.2	--	--	--
-6L1	G	231	4- 7-67	--	--	--	--	--	--	--	--	--	--	8.5	--	--	--
	G		6- 7-78	--	--	--	--	--	--	--	--	--	--	6.7	--	--	--
-6P1	S	190	3-12-72	50	.26	.043	14	13	10	2.6	92	75	3.7	6.5	.2	.88	.06
	S		9- 5-74	19	.05	.05	20	13	7	--	110	90	4.3	7.5	.2	.24	<.1
	G		6- 7-78	--	--	--	--	--	--	--	--	--	--	6.2	--	--	--
-7G2	G	60	4- 7-67	--	--	--	--	--	--	--	--	--	--	10	--	--	--
	S		1-24-74	44	.05	.00	16	13	12	2.8	120	98	0.	9.7	.3	.45	.01
	G		6- 7-78	--	--	--	--	--	--	--	--	--	--	14	--	--	--
-7G3	G	45	11-14-74	--	--	--	--	--	--	--	--	--	--	11	--	--	--
-10L1	S	65	7-11-74	--	.90	.07	16	12	3.6	--	95	78	1.9	5.0	.2	.15	.01
	G		4-24-75	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	G		1-19-76	--	--	--	--	--	--	--	--	--	--	--	--	--	--
-10L2	S	94	5- 2-74	36	.0	.01	8.8	10	3.2	--	68	56	3.5	4.3	.1	1.2	.01
-10L3	S	95	7-11-74	36	.20	.01	14	25	2.6	--	160	131	5.3	5.0	.2	.40	.01

Milligrams per liter												
Nitrogen, total (N)	Total phosphorus (P)	Dissolved solids (residue at 180°C)	Hardness (Ca, Mg)	Noncarbonate hardness	Sodium adsorption ratio	Specific conductance (micromhos)	pH (units)	Water temperature (°C)	Color (platinum-cobalt units)	Turbidity (JTU)	Total coliform (col. per 100 mL)	Remarks[3]
--	0.26	572	132	48	5.7	1,050	7.7	10.5	0	--	--	--
--	.17	552	132	47	5.3	954	7.9	10.0	5	--	--	15 mg/L total iron.
--	--	--	44	--	--	--	--	--	--	--	--	Reported seawater intrusion pre-1957?
--	--	--	--	--	--	302	--	--	--	--	--	--
--	--	--	--	--	--	--	7.9	--	--	--	--	Pb=none, Cu=none, Zn=none, Sb=none,
--	.19	212	107	--	.8	240	7.9	--	7	0	--	--
--	--	--	--	--	--	305	--	--	--	--	--	--
--	--	--	--	--	--	--	7.6	--	--	--	--	Pb=0.07, Cu=none, Zn=0.47, Sb=none
--	--	--	--	--	--	216	--	--	--	--	--	--
--	--	--	--	--	--	567	--	--	--	--	--	--
--	.20	318	110	22	1.8	440	7.8	--	4	0	--	--
--	--	--	--	--	--	--	--	9.5	--	--	--	--
--	--	--	--	--	--	390	--	--	--	--	--	Cl(field)=130 mg/L.
--	--	--	--	--	--	640	--	9.5	--	--	--	Cl(field)=181 mg/L.
--	--	--	--	--	--	--	--	--	--	--	--	Cl(field)=206 mg/L.
--	--	--	--	--	--	--	--	--	--	--	--	Cl(field)=206 mg/L.
--	--	--	--	--	--	--	--	--	--	--	--	Cl(field)=206 mg/L.
--	--	--	--	--	--	650	--	10.0	--	--	--	Cl rerun=120 mg/L; Cl(field)=219 mg/L.
--	--	--	--	--	--	750	--	9.9	--	--	--	Cl(field)=244 mg/L.
--	--	--	--	--	--	672	--	9.8	--	--	--	Cl(field)=231 mg/L.
--	--	--	--	--	--	660	7.1	9.8	--	--	--	Cl(field)=244 mg/L.
--	--	--	--	--	--	740	--	10.1	--	--	--	--
--	--	--	--	--	--	675	--	--	--	--	--	Cl(field)=238 mg/L.
--	--	--	--	--	--	630	--	--	--	--	--	Cl(field)=225 mg/L.
--	--	--	--	--	--	620	--	9.5	--	--	--	Cl(field)=225 mg/L.
--	--	--	--	--	--	635	--	--	--	--	--	--
--	--	--	--	--	--	630	--	--	--	--	--	--
--	.13	150	76	--	.5	210	7.0	--	5	0	--	--
--	.06	136	100	6	.2	200	7.3	--	4	1	--	--
--	.23	172	140	55	.5	220	7.6	--	5	0	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	215	--	--	--	--	--	Cl(field)=22 mg/L.
--	5.0	1,440	200	--	12	2,600	7.3	--	20	3	--	--
--	.29	1,380	180	4	16	2,380	8.3	--	14	1	--	--
--	2.0	1,240	160	22	22	2,000	7.1	--	13	1	--	Pumped continuously since 3/72.
--	2.3	1,100	140	--	14	1,680	7.5	--	11	1	--	--
--	3.1	1,040	140	1	18	1,720	8.1	10.0	20	0	--	--
--	1.9	873	150	6	8.9	1,400	7.5	--	10	2	--	--
--	--	--	--	--	--	312	--	--	--	--	--	--
--	.11	159	150	74	.4	240	7.4	--	7	1	--	--
--	--	--	--	--	--	230	--	--	--	--	--	Cl(field)=22 mg/L.
--	--	--	--	--	--	290	--	--	--	--	--	--
--	.22	162	136	--	--	286	6.3	--	2	0	--	--
--	--	--	136	--	--	297	--	--	--	--	--	As <0.01, Ba <0.04, Cd=0.003, Cr=0.00, Pb=0.01, Hg=0.000, Se <0.004, Ag=0.00.
--	--	--	--	--	--	230	7.6	--	--	--	--	Cl(field)=27 mg/L.
--	--	--	170	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	440	7.4	--	--	--	--	Cl(field)=22 mg/L.
--	--	--	75	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	269	--	--	--	--	--	--
--	--	--	100	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	218	--	--	--	--	--	--
--	--	--	--	--	--	196	--	10.6	--	--	--	--
--	.0	86	44	--	.6	150	7.0	10	2	0	--	--
--	--	--	160	--	--	--	--	--	--	--	--	--
--	--	--	56	--	--	--	--	--	19	40	--	Slight gas odor (sulfur?).
--	3.5	118	63	--	.3	136	7.5	--	8	0	--	--
--	--	--	--	--	--	170	7.5	--	--	--	--	--
--	--	--	--	--	--	179	--	--	--	--	--	--
--	.14	71	36	--	.3	123	7.4	--	5	0	--	--
--	--	--	--	--	--	127	--	--	--	--	--	--
--	.10	100	48	--	.4	152	7.4	--	5	0	--	--
--	.44	95	80	--	.2	138	7.0	--	7	0	--	--
--	.16	143	130	11	.3	140	7.3	--	6	1	--	--
--	.0	172	110	36	.3	130	7.3	--	5	1	--	--
--	--	--	--	--	--	122	7.6	--	--	--	--	Cl(field)=14 mg/L.
--	--	--	--	--	--	116	--	9.9	--	--	--	--
--	--	--	--	--	--	195	--	11.4	--	--	--	--
--	--	--	--	--	--	223	--	--	--	--	--	--
--	--	--	--	--	--	198	--	12.4	--	--	--	--
--	.60	146	86	11	.5	184	7.4	--	2	2	--	--
--	.63	125	100	16	.3	215	8.0	--	4	0	--	--
--	--	--	--	--	--	190	--	--	--	--	--	--
--	--	--	--	--	--	275	--	--	--	--	--	--
--	.49	156	92	--	.5	170	7.8	--	5	0	--	Sample is from 30/4-7G2+3.
--	--	--	--	--	--	246	--	--	--	--	--	Sample is from 30/4-7G2+3, +K1.
--	--	--	--	--	--	275	--	9.5	--	--	--	--
--	.08	87	88	10	.2	118	7.6	--	7	1	--	--
--	--	--	--	--	--	--	--	--	--	--	<1	1 col/100 mL unidentified bacteria.
--	--	--	--	--	--	148	--	--	--	--	--	Cl(field)= 12 mg/L.
--	.0	101	64	8	.2	114	7.4	--	4	1	--	--
--	.06	168	140	10	.1	106	7.6	--	6	0	--	--

TABLE 17.--Chemical quality of ground water from selected wells--Continued

				Milligrams per liter													
Site number	Source 1/	Well depth 2/	Date sample collected	Dis-solved silica (SiO_2)	Dis-solved iron (Fe)	Dis-solved mangan-ese (Mn)	Dis-solved cal-cium (Ca)	Dis-solved mag-nesium (Mn)	Dis-solved sodium (Na)	Dis-solved potas-sium (K)	Bicar-bonate (HCO_3)	Alka-linity as $CaCO_3$	Dis-solved sul-fate (SO_4)	Dis-solved chlor-ide (Cl)	Dis-solved fluor-ide (F)	Total ni-trate (N)	Total ni-trite (N)
30/4-10L4	S	96	7-11-74	32	1.2	0.06	37	7.8	3.8	--	110	90	13	5.5	0.2	0.14	0.02
	S		7-20-74	21	.12	.05	14	14	1.8	--	66	54	10	6.0	.1	.3	.00
	G		2-27-75	42	2.3	.07	9.1	6.3	6.4	1.9	61	50	7.8	3.6	.1	--	--
	G		4-24-75	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	G		12-16-75	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	G		3-16-76	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	G		7-16-76	--	--	--	--	--	--	--	--	--	--	--	--	--	--
-10L5	S	101	9-19-74	22	.04	.04	17	14	4.0	--	110	90	5.0	4.5	.1	.2	.01
	G		12-16-75	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	G		1-19-76	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	G		3-16-76	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	G		7-16-76	--	--	--	--	--	--	--	--	--	--	--	--	--	--
-17B2	G	142	5-18-76	--	--	--	--	--	--	--	--	--	--	--	--	--	--
-17B13	G	186	5-18-76	--	--	--	--	--	--	--	--	--	--	--	--	--	--
-17B14	G	110	5-18-76	--	--	--	--	--	--	--	--	--	--	--	--	--	--
-17B16	G	120	5-18-76	--	--	--	--	--	--	--	--	--	--	--	--	--	--
-17B17	G	127	5-18-76	--	--	--	--	--	--	--	--	--	--	--	--	--	--
-17C1	G	372	10-12-60	39	.98	--	12	11	7.9	2.2	100	82	4.2	6.0	.1	.02	--
	G		4-24-61	--	--	--	--	--	--	--	97	80	--	--	--	--	--
	G		4- 7-67	--	--	--	--	--	--	--	--	--	--	8.0	--	--	--
	G		11-14-74	--	--	--	--	--	--	--	--	--	--	5.8	--	--	--
	G		2-27-75	40	1.3	.15	13	12	8.2	2.4	100	82	5.8	6.6	.1	--	--
	G		10-20-75	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	G		3-16-76	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	G		5-18-76	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	G		7-16-76	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	S		4- 9-78	--	1.2	.115	--	--	--	--	--	--	--	--	--	--	--
	G		6- 7-78	--	--	--	--	--	--	--	--	--	--	6.7	--	--	--
-17K1	G	507	4-18-67	--	--	--	--	--	--	--	--	--	--	8.0	--	--	--
	S		2-16-72	--	.50	.00	14	30	7.8	2.5	180	148	5.4	8.0	.1	.15	.72
	S		7-13-72	--	.54	.009	8.8	15	9.5	2.5	81	66	7.2	12	.2	.12	.03
	S		1-24-74	39	.5	.03	12	10	11	2.2	100	82	.0	5.1	.3	.35	.01
	G		11-14-74	--	--	--	--	--	--	--	--	--	--	5.0	--	--	--
	G		12-15-75	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	G		1-20-76	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	G		10-27-77	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	G		6- 7-78	--	--	--	--	--	--	--	--	--	--	5.7	--	--	--
-21G1	S	375	2-16-72	--	.16	.23	14	19	7.8	4.2	150	123	.0	5.0	.1	.14	.12
	S		9- 7-72	--	.02	.009	8.4	15	9.4	1.9	98	80	2.8	7.2	.1	.01	.01
	G		6- 7-78	--	--	--	--	--	--	--	--	--	--	4.7	--	--	--
-21J1	S	380	1- 4-71	--	.04	.14	12	9.5	6.9	1.6	100	82	10	2.5	.1	1.9	.0
	S		2- 8-73	21	.48	.015	24	11	9.2	1.6	190	156	3.9	6.5	.2	.01	.00
	S		9-12-74	26	.0	.18	19	14	6.0	--	130	107	.0	4.0	.2	.2	.01
-21J2	S	241	10- 8-67	42	7.0	.016	40	17	50	6.6	--	--	--	--	--	--	--
	S		11-12-67	--	1.4	--	--	--	--	--	--	--	--	--	--	--	--
	S		11-12-67	--	1.4	--	--	--	--	--	--	--	--	--	--	--	--
-21K1	S	SP	2-16-72	--	.0	.0	16	8.8	10	1.5	66	54	4.7	13	.1	1.1	.03
-21Q1	G	20	6- 7-78	--	--	--	--	--	--	--	--	--	--	17	--	--	--
-28A1	G	163	4-18-67	--	--	--	--	--	--	--	--	--	--	6.5	--	--	--
	S		7- 8-74	--	.04	.22	17	8.3	3.8	--	94	77	.0	5.5	.3	.40	.03
	G		6- 6-78	--	--	--	--	--	--	--	--	--	--	4.7	--	--	--
-35R1	G	171	10- 5-60	40	.89	--	36	19	11	3.4	224	184	1.2	6.0	.2	.46	--
	G		5-24-61	--	--	--	--	--	--	--	228	187	--	--	--	--	--
	G		4-20-67	--	--	--	--	--	--	--	--	--	--	7.5	--	--	--
	S		8- 3-72	37	.48	.23	30	18	12	3.5	205	168	1.3	14	.1	.08	.05
	S		11-17-72	33	.12	.22	36	19	12	2.9	198	162	.0	7.5	.2	.01	.18
	S		11-16-73	38	.01	.05	32	27	9.6	4.0	226	185	.0	5.9	.2	.2	.03
	G		6- 6-78	--	--	--	--	--	--	--	--	--	--	12	--	--	--
-35R2	G	161	11-26-74	--	1.0	--	--	--	--	--	--	--	--	--	--	--	--
	G		2-27-75	--	--	--	--	--	--	--	--	--	--	--	--	--	--
-36F4	G	35	11-26-74	--	.04	--	--	--	--	--	--	--	--	--	--	--	--
-36H1	S	192	1-29-70	--	1.3	.079	11	5.3	7.0	3.7	130	107	14	4.0	.1	.04	.00
-36J7	G	8	1-14-75	--	.04	--	--	--	--	--	--	--	--	--	--	--	--
-36N3	G	125	11-18-75	--	--	--	--	--	--	--	--	--	--	--	--	--	--
-36P1	G	152	11-17-75	--	--	--	--	--	--	--	--	--	--	--	--	--	--
-36P3	G	36	1-15-75	--	.10	--	--	--	--	--	--	--	--	--	--	--	--
-36Q1	G	32	8- 2-44	--	--	--	--	--	--	--	--	--	--	--	--	--	--
-36Q3	G	34	11-26-74	--	.10	--	--	--	--	--	--	--	--	--	--	--	--
-36R1	S	154	6-28-72	13	.0	.02	33	7.3	8.1	1.8	63	52	25	10	.1	1.6	.09
30/5-5D2	G	24	11-20-74	--	.07	--	--	--	--	--	--	--	--	--	--	--	--
-5E6	G	10	11-20-74	--	.04	--	--	--	--	--	--	--	--	--	--	--	--
	G	--	4-24-75	--	--	--	--	--	--	--	--	--	--	--	--	--	--
-5J1	G	20	1-15-75	--	3.0	--	--	--	--	--	--	--	--	--	--	--	--
	G		3- 7-75	--	.46	--	--	--	--	--	--	--	--	--	--	--	--
	G		4-24-75	--	--	--	--	--	--	--	--	--	--	--	--	--	--
-5J2	G	25	11-20-74	--	.01	--	--	--	--	--	--	--	--	--	--	--	--
	G		1-15-75	--	.04	--	--	--	--	--	--	--	--	--	--	--	--
	G		3- 7-75	--	.07	--	--	--	--	--	--	--	--	--	--	--	--
-5K3	G	11	1-15-75	--	1.3	--	--	--	--	--	--	--	--	--	--	--	--
	G		3- 7-75	--	.5	--	--	--	--	--	--	--	--	--	--	--	--
-5L1	G	11	1-12-74	--	.04	--	--	--	--	--	--	--	--	--	--	--	--
-5M3	G	14	1-15-75	--	.04	--	--	--	--	--	--	--	--	--	--	--	--

Milligrams per liter												
Nitrogen, total (N)	Total phosphorus (P)	Dissolved solids (residue at 180°C)	Hardness (Ca, Mg)	Noncarbonate hardness	Sodium adsorption ratio	Specific conductance (micromhos)	pH (units)	Water temperature (°C)	Color (platinum-cobalt units)	Turbidity (JTU)	Total coliform (col. per 100 mL)	Remarks[3]
--	0.03	157	120	31	0.1	106	7.6	--	25	2	--	--
--	.01	106	92	38	.1	138	8.0	--	5	0	--	--
0.09	--	119	49	0	.4	126	7.7	--	20	--	--	--
--	--	--	--	--	--	--	--	--	--	--	<1	
--	--	--	--	--	--	130	--	--	--	--	--	--
--	--	--	--	--	--	132	--	9.0	--	--	--	--
--	--	--	--	--	--	133	--	10.0	--	--	--	--
--	.0	121	100	9	.2	148	7.7	--	7	0	--	--
--	--	--	--	--	--	140	--	--	--	--	--	--
--	--	--	--	--	--	144	--	8.5	--	--	--	--
--	--	--	--	--	--	132	--	9.2	--	--	--	--
--	--	--	--	--	--	120	--	9.4	--	--	--	--
--	--	--	--	--	--	192	--	--	--	--	--	--
--	--	--	--	--	--	234	--	--	--	--	--	--
--	--	--	--	--	--	235	--	--	--	--	--	--
--	--	--	--	--	--	233	--	--	--	--	--	--
--	--	--	--	--	--	264	--	--	--	--	--	--
--	.15	130	75	0	.4	182	7.7	11.0	15	--	--	--
--	--	--	75	0	--	178	7.7	10.0	--	--	--	--
--	--	--	--	--	--	181	--	--	--	--	--	--
--	--	--	--	--	--	188	--	9.5	--	--	--	--
.00	--	132	82	0	.4	189	7.8	9.5	10	--	--	--
--	--	--	--	--	--	200	--	10.2	--	--	--	Cl(field)=14 mg/L.
--	--	--	--	--	--	156	--	9.6	--	--	--	Cl(field)=19 mg/L.
--	--	--	--	--	--	202	--	9.9	--	--	--	--
--	--	--	--	--	--	202	--	9.5	--	--	--	Cl(field)=19 mg/L.
--	--	--	--	--	--	--	--	--	--	--	--	As <0.01, Ba<0.01, Cd <0.005, Cr <0.01, Pb <0.01, Hg <0.001, Se<0.005, Ag<0.01.
--	--	--	--	--	--	180	--	--	--	--	--	--
--	--	--	--	--	--	184	--	--	--	--	--	--
--	.30	163	160	12	.3	180	7.5	--	7	7	--	--
--	.20	96	84	18	.5	174	7.3	--	7	2	--	--
--	.0	131	73	--	.6	160	7.9	--	9	0	--	--
--	--	--	--	--	--	182	--	--	--	--	--	--
--	--	--	--	--	--	170	--	--	--	--	--	Cl(field)=19 mg/L.
--	--	--	--	--	--	187	--	9.6	--	--	--	--
--	--	--	--	--	--	187	--	--	--	--	--	--
--	--	--	--	--	--	172	--	--	--	--	--	--
--	.45	125	120	--	.3	160	7.4	--	6	1	--	--
--	.40	101	82	2	.4	160	7.1	--	8	0	--	--
--	--	--	--	--	--	159	--	12.4	--	--	--	--
--	.45	97	68	--	.4	140	7.4	10	40	7	--	--
--	.37	172	100	--	.4	160	7.5	--	7	1	--	--
--	.64	136	108	--	.3	195	8.0	--	4	0	--	--
--	--	--	170	--	1.7	660	6.5	--	10	75	--	--
--	--	--	--	--	--	--	6.7	--	--	72	--	--
--	--	--	--	--	--	--	7.0	--	--	69	--	--
--	.30	88	76	12	.5	120	7.6	--	11	1	--	--
--	--	--	--	--	--	409	--	10.6	--	--	--	--
--	--	--	--	--	--	167	--	--	--	--	--	--
--	.12	91	76	--	.2	130	7.9	--	4	0	--	--
--	--	--	--	--	--	161	--	--	--	--	--	--
--	.43	229	170	0	.4	364	7.4	9.5	5	--	--	--
--	--	--	171	0	--	369	7.7	10.0	--	--	--	--
--	--	--	--	--	--	355	--	--	--	--	--	--
--	.60	217	148	--	.4	350	7.8	--	7	1	--	--
--	.22	209	168	6	.4	340	7.8	--	5	2	--	--
--	.04	229	192	7	.3	340	8.2	--	4	0	--	--
--	--	--	--	--	--	366	--	--	--	--	--	--
--	--	--	--	--	--	--	--	9.5	--	--	<1	--
--	--	--	--	--	--	--	--	10.6	--	--	--	--
--	.20	117	50	--	.4	166	7.2	10	30	3	--	--
--	--	--	--	--	--	--	--	8.0	--	--	--	--
--	--	--	--	--	--	286	7.4	--	--	--	--	Cl(field)=22 mg/L.
--	--	--	--	--	--	490	7.7	--	--	--	--	Cl(field)=18 mg/L.
--	--	--	--	--	--	--	--	9.5	--	--	--	--
--	--	--	120	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	9.4	--	--	--	--
--	.09	132	112	60	.3	174	7.6	--	0	1	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	10.5	--	--	--	--
--	--	--	--	--	--	--	--	8.1	--	--	1	>2,000 col/100 mL unidentified bacteria.
--	--	--	--	--	--	--	--	9.0	--	--	--	--
--	--	--	--	--	--	--	--	9.0	--	--	--	4.3 mg/L total iron.
--	--	--	--	--	--	--	--	8.9	--	--	<1	>2,000 col/100 mL unidentified bacteria.
--	--	--	--	--	--	--	--	11.0	--	--	--	--
--	--	--	--	--	--	--	--	9.0	--	--	--	--
--	--	--	--	--	--	--	--	9.0	--	--	--	0.83 mg/L total iron.
--	--	--	--	--	--	--	--	8.5	--	--	--	--
--	--	--	--	--	--	--	--	8.0	--	--	--	2.4 mg/L total iron.
--	--	--	--	--	--	--	--	11.5	--	--	--	--
--	--	--	--	--	--	--	--	7.5	--	--	--	--

TABLE 17.--Chemical quality of ground water from selected wells--Continued

Site number	Source 1/	Well depth 2/	Date sample collected	Milligrams per liter													
				Dissolved silica (SiO_2)	Dissolved iron (Fe)	Dissolved manganese (Mn)	Dissolved calcium (Ca)	Dissolved magnesium (Mn)	Dissolved sodium (Na)	Dissolved potassium (K)	Bicarbonate (HCO_3)	Alkalinity as $CaCO_3$	Dissolved sulfate (SO_4)	Dissolved chloride (Cl)	Dissolved fluoride (F)	Total nitrate (N)	Total nitrite (N)
30/5-5M3	G		2-27-75	16	0.06	0.00	12	2.0	3.1	1.0	37	30	4.9	2.B	0.0	--	--
-6B1	G	16	1-12-74	--	.04	--	--	--	--	--	--	--	--	--	--	--	--
	G		4-24-75	--	--	--	--	--	--	--	--	--	--	--	--	--	--
-6B4	G	97	10-27-77	--	--	--	--	--	--	--	--	--	--	--	--	--	--
-6H1	G	85	2-27-75	34	.05	.08	18	9.0	6.3	2.0	106	87	5.2	2.4	.1	--	--
	G		12-16-75	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	G		1-20-76	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	G		3-16-76	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	G		4-19-76	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	G		5-18-76	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	G		7-16-76	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	G		9-21-76	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	G		10-12-76	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	G		12-15-76	--	--	--	--	--	--	--	--	--	--	--	--	--	--
-6R1	G	14	11-20-74	--	.03	--	--	--	--	--	--	--	--	--	--	--	--
-7G2	G	26	11-20-74	--	.13	--	--	--	--	--	--	--	--	--	--	--	--
	G		01-15-75	--	.03	--	--	--	--	--	--	--	--	--	--	--	--
	G		4-24-75	--	--	--	--	--	--	--	--	--	--	--	--	--	--
-8E2	G	11	1-15-75	--	.03	--	--	--	--	--	--	--	--	--	--	--	--
-8F4	G	12	11-20-74	--	.06	--	--	--	--	--	--	--	--	--	--	--	--
-8J1	G	27	11-20-74	--	.02	--	--	--	--	--	--	--	--	--	--	--	--
-8L1	G	12	11-20-74	--	.07	--	--	--	--	--	--	--	--	--	--	--	--
-BM1	G	13	1-15-75	--	.02	--	--	--	--	--	--	--	--	--	--	--	--
-8M7	G	B	11-20-74	--	2.9	--	--	--	--	--	--	--	--	--	--	--	--
	G		1-15-75	--	.19	--	--	--	--	--	--	--	--	--	--	--	--
	G		3- 7-75	--	.27	--	--	--	--	--	--	--	--	--	--	--	--
-20F1	G	28	11-22-74	--	.76	--	--	--	--	--	--	--	--	--	--	--	--
	G		1-14-75	--	3.9	--	--	--	--	--	--	--	--	--	--	--	--
	G		03- 7-75	--	9.4	--	--	--	--	--	--	--	--	--	--	--	--
	G		4-24-75	--	--	--	--	--	--	--	--	--	--	--	--	--	--
-20G1	G	12	11-22-74	--	.06	--	--	--	--	--	--	--	--	--	--	--	--
	G		4-24-75	--	--	--	--	--	--	--	--	--	--	--	--	--	--
-20K1	G	22	11-14-75	--	.03	--	--	--	--	--	--	--	--	--	--	--	--
	G		2-27-75	--	--	--	--	--	--	--	--	--	--	--	--	--	--
-20K2	S	31	9-20-73	--	--	--	--	--	--	--	--	--	--	8.0	--	4.5	0.04
-20K3	S	--	9-20-73	--	--	--	--	--	--	--	--	--	--	6.5	--	6.2	.10
-20K4	S	--	9-20-73	--	--	--	--	--	--	--	--	--	--	4.0	--	3.7	.08
-20L1	C	28	7-29-74	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	C		8-26-74	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	C		9-16-74	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	C		11-26-74	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	C		11-26-74	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	G		1-14-75	--	3.2	--	--	--	--	--	--	--	--	--	--	--	--
	G		3- 7-75	--	.81	--	--	--	--	--	--	--	--	--	--	--	--
-20Q1	G	20	11-22-74	--	.04	--	--	--	--	--	--	--	--	--	--	--	--
-20Q2	G	26	3- 7-75	--	.00	--	--	--	--	--	--	--	--	--	--	--	--
-29B3	G	24	1-14-75	--	.03	--	--	--	--	--	--	--	--	--	--	--	--
-29B4	G	20	3- 7-75	--	.03	--	--	--	--	--	--	--	--	--	--	--	--
-29B5	G	26	3- 7-75	--	.04	--	--	--	--	--	--	--	--	--	--	--	--
	G		4-24-75	--	--	--	--	--	--	--	--	--	--	--	--	--	--
-29B8	G	21	2-27-75	14	.04	.01	8.0	3.7	5.9	2.4	24	20	11	5.2	.0	--	--
-29C3	G	11	11-22-74	--	.05	--	--	--	--	--	--	--	--	--	--	--	--
-29F1	G	19	11-22-74	--	.05	--	--	--	--	--	--	--	--	--	--	--	--
-29F5	G	18	3- 7-75	--	.01	--	--	--	--	--	--	--	--	--	--	--	--
	G		4-24-75	--	--	--	--	--	--	--	--	--	--	--	--	--	--
-29G2	G	33	11-22-74	--	.01	--	--	--	--	--	--	--	--	--	--	--	--
-29G3	G	33	3- 7-75	--	.02	--	--	--	--	--	--	--	--	--	--	--	--
-29G6	G	21	1-14-75	--	.04	--	--	--	--	--	--	--	--	--	--	--	--
	G		4-24-75	--	--	--	--	--	--	--	--	--	--	--	--	--	--
-29G8	G	17	3- 7-75	--	.01	--	--	--	--	--	--	--	--	--	--	--	--
-29L5	G	8	11-26-74	--	.01	--	--	--	--	--	--	--	--	--	--	--	--
-29N1	G	9	11-26-74	--	.04	--	--	--	--	--	--	--	--	--	--	--	--
-30B1	G	33	11-22-74	--	.09	--	--	--	--	--	--	--	--	--	--	--	--
	G		2-27-75	--	--	--	--	--	--	--	--	--	--	--	--	--	--
-30B2	G	24	1-14-75	--	.07	--	--	--	--	--	--	--	--	--	--	--	--
-30C1	G	SP	12-15-75	--	--	--	--	--	--	--	--	--	--	--	--	--	--
-30G2	G	67	11-22-74	--	.03	--	--	--	--	--	--	--	--	--	--	--	--
	G		2-27-75	18	.36	.01	11	4.2	5.3	.8	23	19	8.2	4.2	.0	--	--
-30H1	G	8	11-22-74	--	2.2	--	--	--	--	--	--	--	--	--	--	--	--
	G		1-14-75	--	.18	--	--	--	--	--	--	--	--	--	--	--	--
	G		3- 7-75	--	.15	--	--	--	--	--	--	--	--	--	--	--	--
	G		4-24-75	--	--	--	--	--	--	--	--	--	--	--	--	--	--
-30HB	G	15	11-22-74	--	.07	--	--	--	--	--	--	--	--	--	--	--	--
-30R1	G	13	11-26-74	--	.03	--	--	--	--	--	--	--	--	--	--	--	--
-30R8	G	16	3- 7-75	--	.02	--	--	--	--	--	--	--	--	--	--	--	--
-31B1	G	26	4-20-67	--	--	--	--	--	--	--	--	--	--	8.5	--	--	--
-31F1	G	83	4-20-67	--	--	--	--	--	--	--	--	--	--	6.5	--	--	--
-31F3	G	97	11-17-75	--	--	--	--	--	--	--	--	--	--	--	--	--	--
-31G3	G	31	11-22-74	--	.03	--	--	--	--	--	--	--	--	--	--	--	--
	G		4-24-75	--	--	--	--	--	--	--	--	--	--	--	--	--	--
-31G4	G	21	11-22-74	--	.09	--	--	--	--	--	--	--	--	--	--	--	--
-31M1	G	17	11-22-74	--	.02	--	--	--	--	--	--	--	--	--	--	--	--

[1] Source of data: C, Snohomish County Health Dept.; G, U.S. Geological Survey; S, Washington State Dept.of Social and Health Services.
[2] SP, spring.
[3] All unitless values under remarks are in milligrams per liter.

Milligrams per liter												
Nitrogen, total (N)	Total phosphorus (P)	Dissolved solids (residue at 180°C)	Hardness (Ca, Mg)	Noncarbonate hardness	Sodium adsorption ratio	Specific conductance (micromhos)	pH (units)	Water temperature (°C)	Color (platinum-cobalt units)	Turbidity (JTU)	Total coliform (col. per 100 mL)	Remarks[3]
0.38	--	67	38	8	0.2	86	7.1	7.5	5	--	80	--
--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	8.6	--	--	<1	125 col/100 mL unidentified bacteria.
--	--	--	--	--	--	189	--	--	--	--	--	--
.00	--	129	82	0	.3	186	8.3	9.5	3	--	--	--
--	--	--	--	--	--	226	--	9.6	--	--	--	--
--	--	--	--	--	--	197	--	9.8	--	--	--	--
--	--	--	--	--	--	191	--	10.1	--	--	--	--
--	--	--	--	--	--	199	--	--	--	--	--	--
--	--	--	--	--	--	200	--	10.0	--	--	--	--
--	--	--	--	--	--	190	--	10.2	--	--	--	--
--	--	--	--	--	--	200	--	--	--	--	--	--
--	--	--	--	--	--	207	--	--	--	--	--	--
--	--	--	--	--	--	198	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	7.5	--	--	--	--
--	--	--	--	--	--	--	--	7.8	--	--	9	>2,000 col/100 mL unidentified bacteria.
--	--	--	--	--	--	--	--	8.5	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	9.5	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	8.0	--	--	--	--
--	--	--	--	--	--	--	--	8.5	--	--	--	6.2 mg/L total iron.
--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	9.5	--	--	--	--
--	--	--	--	--	--	--	--	9.5	--	--	--	17 mg/L total iron.
--	--	--	--	--	--	--	--	9.4	--	--	<1	>2,000 col/100 mL unidentified bacteria.
--	--	--	--	--	--	--	--	10.4	--	--	--	--
--	--	--	--	--	--	--	--	8.6	--	--	1	>2,000 col/100 mL unidentified bacteria.
--	--	--	--	--	--	--	--	9.5	--	--	--	--
--	--	--	--	--	--	--	--	9.0	--	--	800	--
--	--	90	--	--	--	--	--	--	5	0	--	--
--	--	56	--	--	--	--	--	--	5	0	--	--
--	--	45	--	--	--	--	--	--	5	1	--	--
--	--	--	--	--	--	--	--	--	--	--	58	--
--	--	--	--	--	--	--	--	--	--	--	110	Well disinfected on 8/9/74.
--	--	--	--	--	--	--	--	--	--	--	10	Well disinfected on 9/1/74.
--	--	--	--	--	--	--	--	--	--	--	160	Sample taken at 7:30.
--	--	--	--	--	--	--	--	--	--	--	140	Sample taken at 10:00.
--	--	--	--	--	--	--	--	9.5	--	--	--	--
--	--	--	--	--	--	--	--	9.5	--	--	--	4.8 mg/L total iron.
--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	9.0	--	--	--	--
--	--	--	--	--	--	--	--	9.0	--	--	--	--
--	--	--	--	--	--	--	--	9.5	--	--	--	--
--	--	--	--	--	--	--	--	10.5	--	--	--	--
--	--	--	--	--	--	--	--	10.0	--	--	<1	320 col/100 mL unidentified bacteria.
2.7	--	78	35	16	.4	110	6.7	8.5	0	--	<1	--
--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	9.0	--	--	--	--
--	--	--	--	--	--	--	--	8.9	--	--	<1	42 col/100 mL unidentified bacteria.
--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	8.5	--	--	--	--
--	--	--	--	--	--	--	--	9.5	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	8.9	--	--	5	>2,000 col/100 mL unidentified bacteria.
--	--	--	--	--	--	--	--	9.0	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	9.4	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	9.5	--	--	<1	--
--	--	--	--	--	--	--	--	9.0	--	--	--	--
--	--	--	--	--	--	140	7.8	7.5	--	--	--	Cl(field)=19 mg/L.
--	--	--	--	--	--	--	--	--	--	--	--	--
6.4	--	104	45	26	.3	128	7.1	8.0	3	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	7.0	--	--	--	--
--	--	--	--	--	--	--	--	9.0	--	--	--	0.35 mg/L total iron.
--	--	--	--	--	--	--	--	8.1	--	--	<1	150 col/100 mL unidentified bacteria.
--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	10.6	--	--	--	--
--	--	--	--	--	--	--	--	8.5	--	--	--	--
--	--	--	--	--	--	236	--	--	--	--	--	--
--	--	--	--	--	--	157	--	--	--	--	--	Reported gas odor in summer.
--	--	--	--	--	--	165	7.2	--	--	--	--	Cl(field)=14 mg/L.
--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	8.9	--	--	<1	>2,000 col/100 mL unidentified bacteria.
--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--