UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

RECONNAISSANCE OF THE WATER RESOURCES OF THE HOH INDIAN RESERVATION AND THE HOH RIVER BASIN, WASHINGTON

By W. E. Lum II

With a Section on Fluvial Sediment Transport in the Hoh River by L. M. Nelson

U.S. GEOLOGICAL SURVEY

Water-Resources Investigations Report 85-4018

Prepared in cooperation with the

HOH INDIAN TRIBE

Tacoma, Washington
1986

UNITED STATES DEPARTMENT OF THE INTERIOR

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CONVERSION FACTORS, INCH-POUND TO METRIC

Multiply inch-pound units	By	To obtain SI units
inch (in.)	25.4	millimeter (mm)
foot (ft)	0.3048	meter (m)
mile (mi)	1.609	kilometer (km)
acre	4,047	square meter (m^2)
	0.4047	hectare
square mile (mi^2)	2.590	square kilometer (km^2)
gallon (gal)	3.785	liter (L)
	0.003785	cubic meter (m^3)
million gallons (Mgal)	3,785	cubic meter (m^3)
cubic foot per second (ft^3/s)	0.02832	cubic meter per second (m^3/s)
gallon per minute (gal/min)	0.06308	liters per second (L/s)
ton, short	0.9072	megagram (Mg)
micromhos per centimeter at 25°Celsius (umhos/cm at 25°C)	1.000	microsiemen per centimeter at 25°Celsius (uS/cm at 25°C)
degree Fahrenheit (°F)	(°C = 5/9 (°F -32)	degree 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.

RECONNAISSANCE OF THE WATER RESOURCES OF THE HOH INDIAN RESERVATION AND THE HOH RIVER BASIN, WASHINGTON

With a Section on Fluvial Sediment Transport in the Hoh River—by L. M. Nelson

By W. E. Lum II

ABSTRACT

The Hoh Indian Reservation lies on the Pacific Ocean coast at the mouth of the Hoh River, a generally westward-flowing river draining the west slope of the Olympic Mountains in western Washington. Ground- and surface-water resources of the reservation and the Hoh River basin were studied during 1977-80, under a cooperative agreement between the U.S. Geological Survey and the Hoh Indian Tribe.

Moderate quantities of ground water can be obtained from near-surface, river-deposited sands and gravels on the northeastern part of the reservation. Wells drilled to a depth of about 20 to 30 feet near a pond in an oxbow lake on the Hoh River flood plain would probably yield 25 to 50 gallons per minute. Several wells could be pumped at this rate, probably indefinitely. The source of well water would be ground-water recharge from the pond, induced by pumping. Geologic units in other areas of the reservation appear to have a low hydraulic conductivity and would yield little, if any, water to wells.

Soils on the reservation were tested to determine infiltration rates at seven sites where housing construction is planned. On the basis of test results, the soils are considered adequate for waste disposal in septic tanks and associated drain fields.

The chemical and bacteriological quality of the Hoh River and its major tributaries downstream from the Olympic National Park boundary is good. With minor exceptions, no unusual or harmful levels of chemical constituents or physical characteristics of the water were detected. Small increases in concentrations of sodium, chloride, silica, nitrite-plus-nitrate, and turbidity were measured in water samples collected from the Hoh River. The increase in a downstream direction is probably the result of natural weathering of rocks and soils in the basin.

Fluvial-sediment transport of the Hoh River was 82,000 tons from March 1978 to February 1979 and 1,510,000 tons from March 1979 to February 1980. Mean annual transport was estimated to be 630,000 tons. About 60 percent of the sediment transported by the Hoh River originates from within the boundaries of the Olympic National Park, which includes about 70 percent of the Hoh River drainage basin.

Chemical and bacteriological quality of Chalaat Creek, which flows across the reservation, is good, although fecal-coliform bacteria concentrations as high as 33 colonies per 100 milliliters were found during this study.

INTRODUCTION

Purpose and Scope of the Study

Under a cooperative agreement with the Hoh Indian Tribe, the U.S. Geological Survey made a reconnaissance of the ground- and surface-water resources of the Hoh Indian Reservation and the surface-water resources of the Hoh River basin. Specifically, data were needed for planning and management purposes concerning the following.

1. A qualitative evaluation of ground-water occurrence on the reservation.

2. The suitability of soils for waste-water disposal in septic tanks and drain fields in selected areas on the reservation.

3. Chemical and bacteriological quality during summertime low-flow conditions of the Hoh River and its downstream tributaries.

4. Fluvial-sediment transport of the Hoh River at various streamflow rates.

5. Quality and quantity of water available from Chalaat Creek, a small stream draining part of the reservation.

For the ground-water phase of the investigation, a reconnaissance of the surficial geology was made. Two large trenches were dug to investigate the occurrence of ground water near the Hoh River, and test wells were drilled to investigate the occurrence of ground water at two other sites. To determine the suitability of soils for waste-water disposal, rates of percolation were determined at selected sites.

The quality of water in the Hoh River and some of its downstream tributaries was assessed from a comprehensive set of water samples collected during September 1978. Samples from 12 tributaries and from the Hoh River at 13 sites (all sites downstream of river mile 30.0) were collected and analyzed for selected chemical constituents and physical properties. The fluvial-sediment transport of the Hoh River was studied at three sites (river mile 0.6, 15.4, and 25.8) by obtaining and analyzing more than 300 samples of river water from 1978 to 1980. The quantity and quality of water in Chalaat Creek were investigated at two sites on the reservation to assess the potential use of water from the creek for fisheries programs. A continuous recorder was installed and operated to gage the flow of the stream at one site and miscellaneous measurements of streamflow were made at another site during 1977 to 1979. Water-quality samples were collected periodically during 1978 to 1979 at these two sites.

Description of the Study Area

The Hoh Indian Reservation is in western Washington, on the west coast of the Olympic Peninsula, at the mouth of the Hoh River (fig. 1). The reservation, 60 miles north of Aberdeen, Wash., and 100 miles west of Seattle, Wash., covers approximately 450 acres and is about 1 mile north to south and 0.75 mile east to west (fig. 2). One-half the reservation ranges from sea level to an altitude of 40 feet; this is the area inhabited by residents of the reservation, about 60 people in 1978. The remainder of the reservation, logged in 1960, ranges in altitude from 40 to 160 feet above sea level. Chalaat Creek (drainage basin approximately 1 square mile) flows north and west across the reservation. Artificial impoundments in Chalaat Creek are currently used for fisheries programs including fish rearing.

The Hoh River basin (area 299 square miles) lies on the western slopes of the Olympic Mountains. This glacier-fed river has its headwaters on Mount Olympus, altitude 7,956 feet above sea level. Most of the basin is forested uplands. Extensive commercial logging has continued for more than 80 years in the basin.

Climate of the Hoh River Basin

The wet, mild climate of the Hoh River basin is dominated by the influence of offshore marine air. Average annual precipitation ranges from about 90 inches near the Pacific coast, including the Hoh Indian Reservation, to 240 inches per year on the upper slopes of the Olympic Mountains (U.S. Weather Bureau, 1965). A weather observation station at Quillayute, Wash., 15 miles north of the reservation, has provided a long-term record of precipitation and average temperature (U.S. National Oceanic and Atmospheric Administration, 1981) to determine a representative monthly distribution of these climatic factors for the reservation and the Hoh River basin. The average annual precipitation at Quillayute for the period 1966 to 1980 is 104.99 inches, and the average annual temperature is 48.7°F. Average monthly precipitation (fig. 3) ranges from 2.36 inches in July to 15.60 inches in December. About 75 percent of the average annual precipitation occurs in the 6-month period from October to March. Average monthly temperature (fig. 3) ranges from 38.7°F in January to 59.0°F in July.

There are no weather observation stations in the Olympic Mountains; however, it is known that most precipitation occurring during November through April (when average monthly temperatures remain below 32°F at higher altitudes) accumulates as snow. Total snowfall is as much as 30 feet. Most snowmelt occurs from May to August, but glaciers and perennial snowfields also exist at the headwaters of the Hoh River and other nearby areas in the Olympic Mountains.

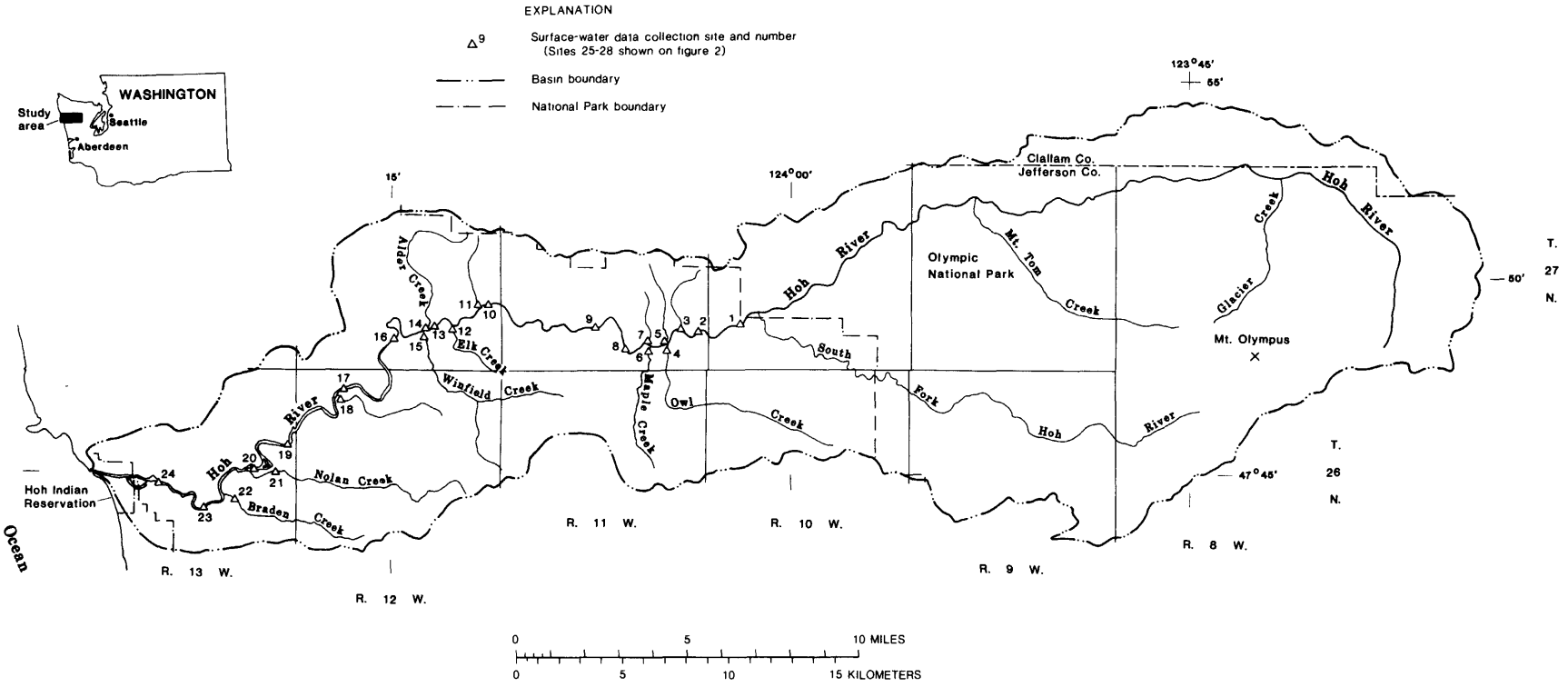


FIGURE 1.--The Hoh River basin and the Hoh Indian Reservation, Washington.

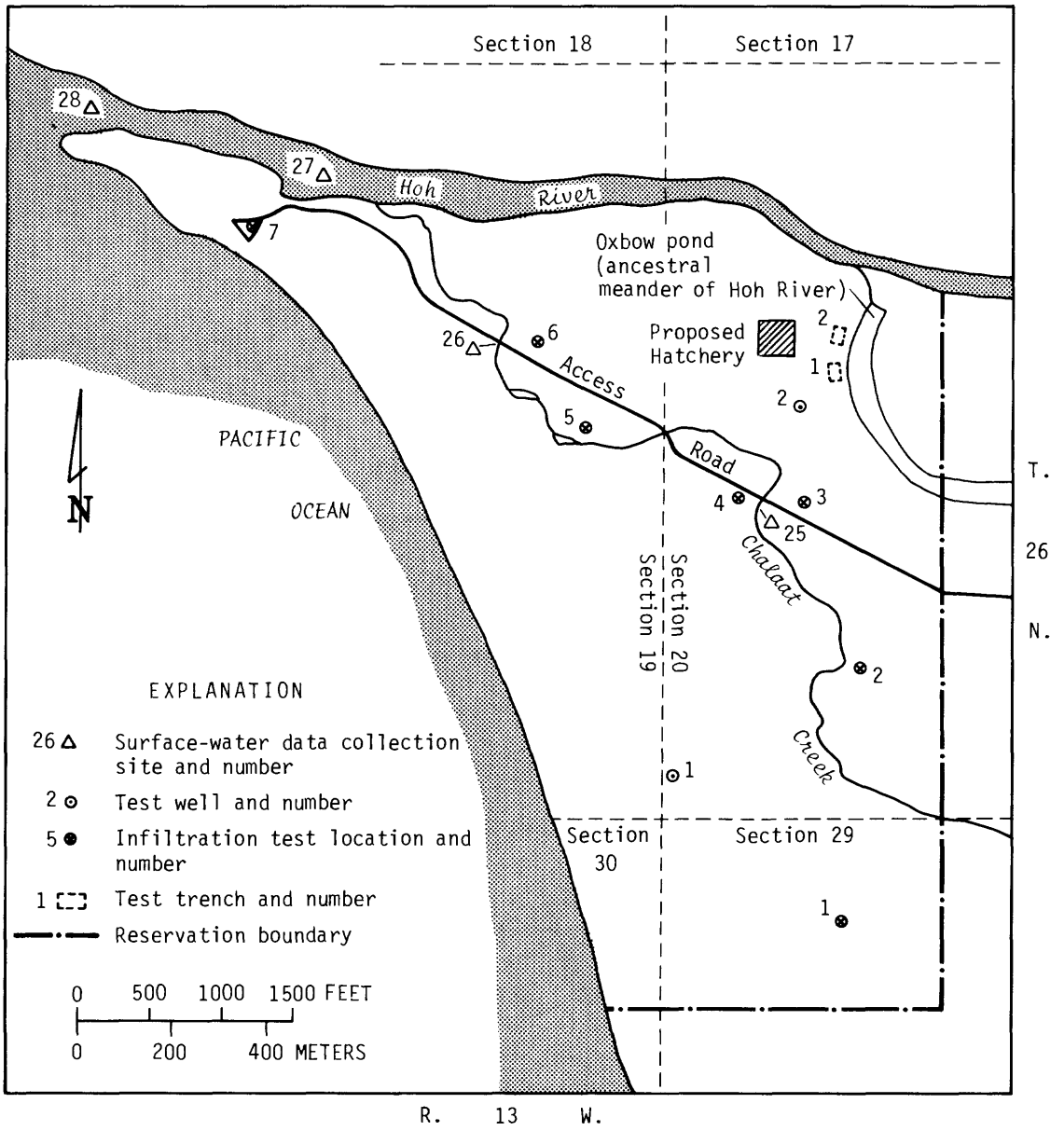


FIGURE 2.--The Hoh Indian Reservation, showing data-collection sites.

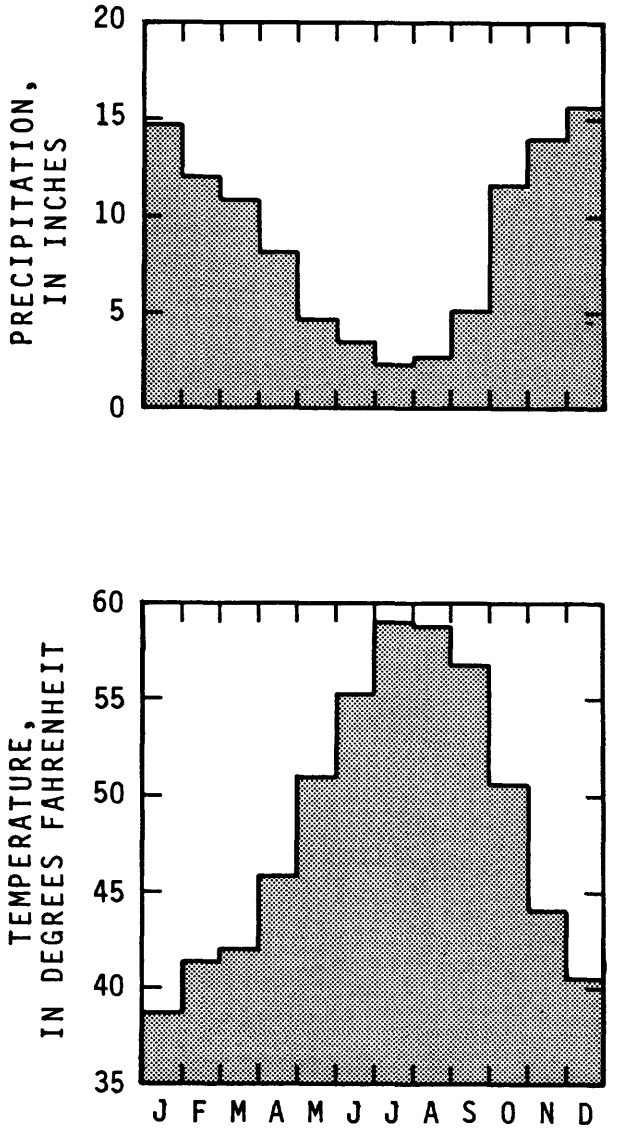


FIGURE 3.--Average monthly precipitation and temperature at Quillayute, Wash.

The Hydrologic Cycle

The hydrologic cycle is the pattern of water movement as it circulates through the natural system. Figure 4 diagrammatically illustrates the hydrologic cycle as it generally applies to the study area. Precipitation as rain and snow is the source of all freshwater. Part of the precipitation runs off rapidly to streams, part is evaporated directly back to the atmosphere from the ground and from lakes, streams, and plant surfaces, and part is soaked into the soil where some is drawn up by plants and returns to the atmosphere by transpiration from the leaves. Some precipitation, temporarily stored during winter in glaciers and snowfields, is released to streams during warmer months. The remainder percolates downward to a zone of saturation to become ground water. In time, ground water returns to the surface-water system by seepage to springs, lakes, streams, and the sea.

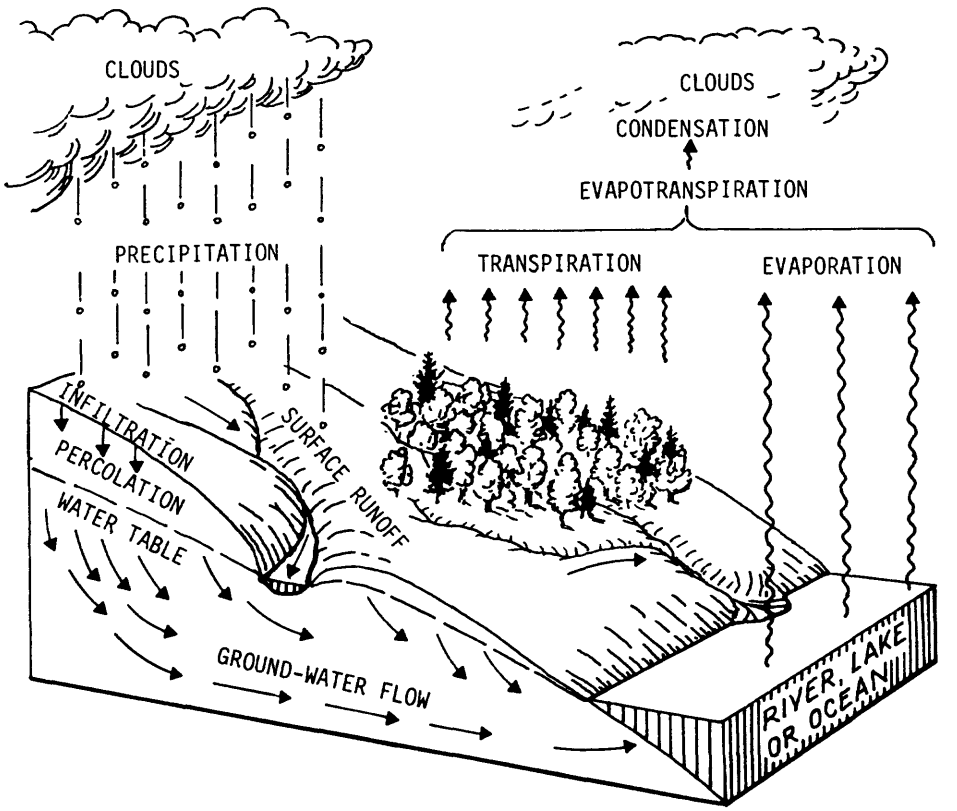


FIGURE 4.--The hydrologic cycle.

Previous Investigations

The geology of the Olympic Peninsula has been the subject of numerous investigations. Reconnaissance mapping began as early as the 1890's. Systematic mapping of the peninsula began in the 1930's and is continuing. A comprehensive geologic map published in 1978 (Tabor and others, 1978) includes references to most historic studies. No studies have dealt specifically with geology or water resources of the Hoh Indian Reservation or the water resources of the Hoh River basin.

GEOLOGY AND GROUND-WATER RESOURCES

Geology of the Hoh River Basin

The Hoh River basin is underlain by bedrock composed of consolidated sedimentary and metamorphic rocks, including sandstone, siltstone, conglomerate, slate, and tectonic breccia (metamorphic rocks consisting of broken pieces of older sedimentary rocks). Quaternary surficial deposits consisting of glacial and non-glacial sedimentary rocks cover the Tertiary bedrock in about 35 percent, or 104 square miles, of the basin. They are commonly 20 to 100 feet in thickness, but locally may be as much as several hundred feet thick. The surficial deposits consist of a variety of mixtures of gravel, sand, clay, and silt. Beach deposits on the ocean coast, landslide materials, and river-deposited alluvium, which include broken and weathered pieces of older rock, are the most recent deposits in the basin.

All geologic units discussed above also occur on the reservation. The bedrock, which is siltstone and sandstone on the reservation, is overlain by various unconsolidated deposits whose composition and distribution are described and shown in figure 5. A typical geologic section across the reservation is shown in figure 6.

Ground-Water Occurrence

Ground water can be found in virtually all the glacial and nonglacial, unconsolidated deposits that occur in the Hoh River basin. The quantity of ground water available for withdrawal varies greatly from one location to another because of the different hydraulic characteristics of the unconsolidated materials present.

The consolidated sedimentary and metamorphic rocks that underlie the unconsolidated deposits are exposed in places and may contain some ground water, but the quantity of water that could be withdrawn is probably small because of the low permeability of these deposits. The occurrence of ground water in the consolidated deposits was not investigated for this study.

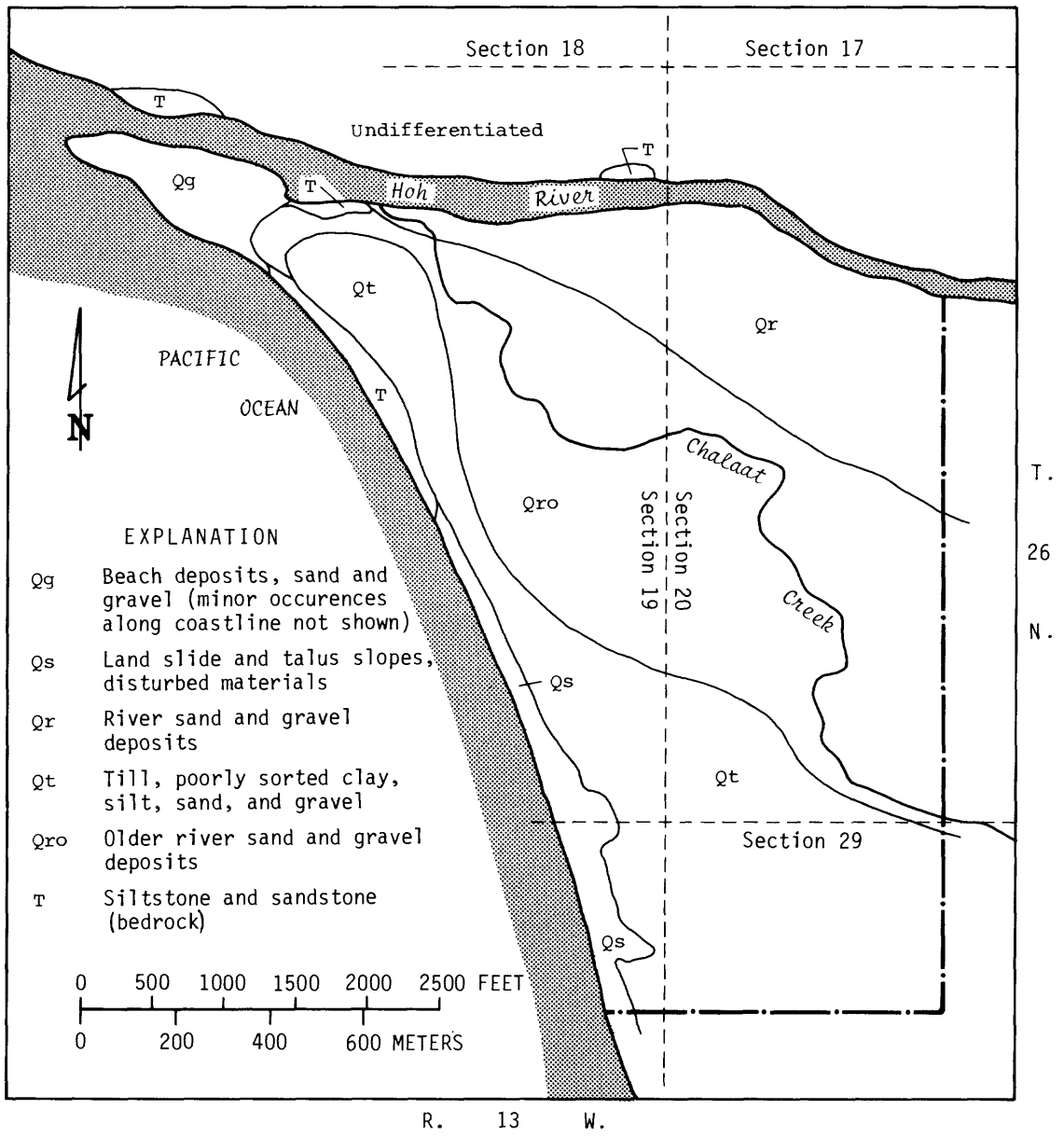
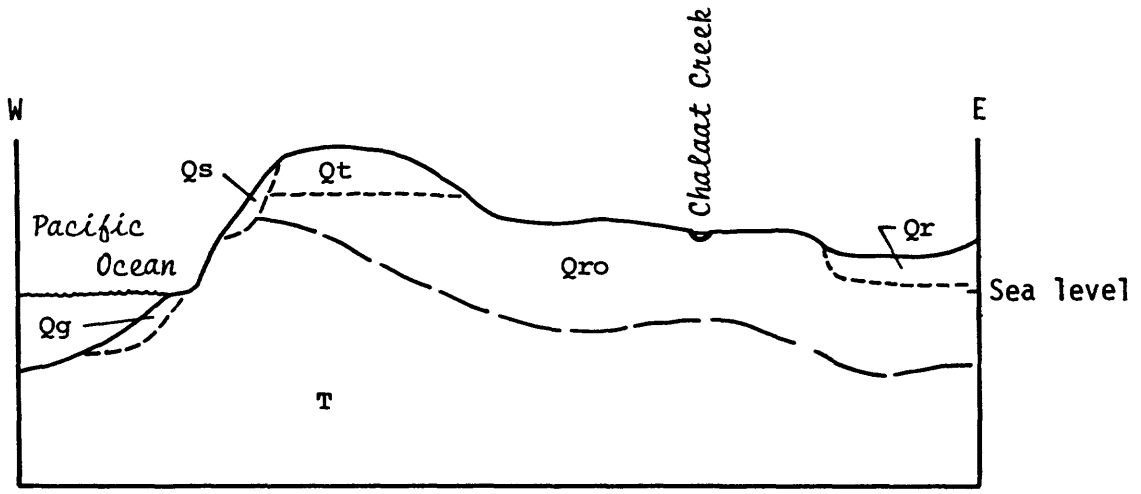


FIGURE 5.--The generalized surficial geology of the Hoh Indian Reservation, Wash.



EXPLANATION

Qg	Beach deposits, sand and gravel
Qs	Land slide and talus slopes, disturbed materials
Qr	River sand and gravel deposits
Qt	Till, poorly sorted clay, silt, sand, and gravel
Qro	Older river sand and gravel deposits
T	Siltstone and sandstone (bedrock)

FIGURE 6.--Generalized geologic section of the Hoh Indian Reservation, Wash.

Hydrologic Testing on the Hoh Indian Reservation

Two trenches were dug and two test wells were drilled in 1978 to investigate the occurrence of ground water in the unconsolidated deposits underlying the reservation. During digging and drilling operations and after completion of the structures, pertinent tests were performed to determine potential short-term yield of ground water at selected sites (fig. 2).

Test Trenches

Two trenches were dug near a pond occupying an oxbow of the Hoh River (fig. 2) to determine the availability of ground water to supply a proposed fish hatchery. Lithologic logs of the trenches are shown in table 1, end of report. Trench 1 was 15 by 15 feet and 23 feet deep. Ground water was found in a sand-and-gravel layer 8 to 13 feet below land surface. Ground-water inflow to the trench during the digging operations was about 30 to 50 gal/min from the sand-and-gravel unit. Materials below the sand and gravel consisted of clay and silt, which are generally porous materials but yield only small quantities of water. Trench 2, which was 20 by 20 feet and 30 feet deep, revealed a similar sequence of units. Inflow to the trench from the sand-and-gravel unit (8 to 17 feet below land surface at this location) was about 100 gal/min. Equipment used to dig the trenches was not capable of digging deep enough to penetrate the clay-and-silt layer in either trench.

Test Wells

The occurrence of ground water in deeper unconsolidated deposits on the reservation was investigated by drilling two test wells, one on the southern upland area of the reservation, where additional housing may be located, and one near the proposed hatchery location just west of the oxbow pond and test trenches previously discussed (fig. 2). Lithologic logs of the wells are presented in table 1 (end of report).

Well 1, at the upland site, was drilled to a depth of 394 feet below land surface. A shallow water table was found at a depth of about 20 feet; however, the hydraulic conductivity of the materials was low, and water could not be withdrawn from this well in significant quantities.

Well 2, near the proposed hatchery, was drilled to a depth of 94 feet. To a depth of 30 feet, materials penetrated in this well were similar to those found in the nearby trenches. The gravel-and-sand layer found between 18 and 21 feet below land surface, is probably the same unit found in trench 1 between 8 and 13 feet and in trench 2 between 8 and 17 feet below land surface. Bailer testing of well 2 indicated a short-term yield of about 15 to 25 gal/min from the sand-and-gravel unit.

The clay-and-silt unit (below 13 feet in trench 1 and below 17 feet in trench 2) was determined to extend to 36 feet below land surface in well 2. Below this unit, a fine sand, silt, and clay unit was penetrated. These materials were saturated with ground water, but had a low hydraulic conductivity and yielded only small quantities of water (less than 5 gal/min) when preliminary bailer testing was done. A pumping test of this well was attempted after installing a well screen between 48 and 87 feet below land surface, but all the water in the well casing could be pumped out at a pumping rate of less than 30 gal/min. No further testing of this well was attempted.

Potential for Development of Ground-Water Supplies

Nearly all the unconsolidated deposits that underlie the reservation are saturated with ground water. To develop ground-water supplies from these materials, however, a well must be open to deposits that have a saturated thickness of materials sufficiently permeable to make it feasible to pump the water.

The results of drilling test wells 1 and 2 suggest that the till unit and the unit of older river deposits (units Qt and Qro, respectively, on fig. 5) probably do not include such materials. However, the older river deposits may contain coarser materials locally that were not present at any of the test well or test trench locations. These coarser materials, if they are found, may have sufficient permeability to yield water to wells penetrating them. Although the locations of these materials could not be determined from available data, additional test drilling may be successful in locating water supplies from the older river deposits.

The river-deposited sand and gravel (unit Qro, fig. 5) is penetrated by well 2 and trenches 1 and 2 (fig. 2). Individual wells (each 20 to 30 feet deep) tapping this unit could probably be pumped at a rate of 25 to 50 gal/min. By placing several wells in a line parallel to the oxbow pond (near well 2 and the two trenches), a moderately large supply of ground water could be obtained. Pumping at the specified rate (or greater rate if testing shows the wells capable) could probably be continued indefinitely. After some ground water was initially removed from storage within the aquifer, the wells would cause water from the pond in the cutoff meander to infiltrate to the sand-and-gravel layer. This water, now ground water, would move quickly to the pumping wells, where it would be removed for use. The pond, which drains into the Hoh River about 500 feet north of trench 2, is fed by spring discharge that occurs primarily from an area 2,000 to 4,000 feet east of the eastern reservation boundary. Flow out of the pond varies greatly, but the observed minimum was estimated to be 1,300 to 2,200 gal/min (3 to 5 ft^3/s).

The quality of surface and ground water and the suitability for any specific use was not investigated for this study.

SOIL INFILTRATION TESTS

Successful disposal of sewage waste by means of septic tanks and drain fields requires that the soil present be capable of accepting the amount of anticipated waste water. This capacity to accept the waste is usually determined by a soil infiltration test. To determine the suitability of soils for sewage waste disposal at selected locations on the reservation, holes were augered into the soil profile (depth of holes 3 to 5 ft) at seven locations (fig. 2) in areas where the construction of homes has been proposed.

A standard soil infiltration test (U.S. Public Health Service, 1967; Washington State Department of Social and Health Services, 1974) was performed at each site, and on this basis the soils were rated as to suitability for disposal of sewage waste. The results are listed below. Soil infiltration rate is the rate of water-level fall in a test hole filled with water, and is expressed in terms of the number of minutes it took for the water level to fall 1 inch. The ratings given are based on standards established by the U.S. Public Health Service (1967).

Site (see fig. 2)	Infiltration rate (minutes per inch of water-level fall)	Rating of soil for waste disposal
1	2	Good
2	3	Good
3	19	Poor
4	6	Fair
5	8	Fair
6	10	Poor
7	8	Fair

Although two sites were rated as "poor," this rating is considered acceptable for waste disposal by the references cited above. The design and size of the drain fields should be based on the quantity of waste to be disposed of and the soil type and capacity to accept waste water. On the basis of similarity of observed soil types throughout the reservation, all areas of the reservation are considered to be adequate for on-site sewage waste disposal. Further testing should be conducted to determine the suitability of soils and the size of the drain field needed at each particular site.

SURFACE-WATER RESOURCES OF THE HOH RIVER BASIN

Hoh River and its Tributaries

The Hoh River flows generally westward from the Olympic Mountains across glaciated lowland coastal terraces and into the Pacific Ocean. Significant tributaries draining primarily mountainous areas include Glacier Creek, Mount Tom Creek, and the South Fork Hoh River. Tributaries draining lowland areas include Owl, Maple, Winfield, Alder, Nolan, and Braden Creeks. Many of these streams are used by a variety of fish species for migration, spawning, and residence.

Streamflow Characteristics

Throughout the Hoh River basin, streamflow is not artificially stored or diverted, and is the result of rainfall, snowmelt, and ground-water discharge. The flow of the Hoh River (fig. 7 and table 2, end of report) generally (1) increases from October through January due to heavy rainfall over the basin, (2) decreases from February through March when most precipitation at higher altitudes is temporarily stored as snow, (3) increases (or remains nearly constant) from May through June due to snowmelt, and (4) decreases from July through September when precipitation is lowest and flow is sustained mostly by ground water discharging into the river and its tributary streams.

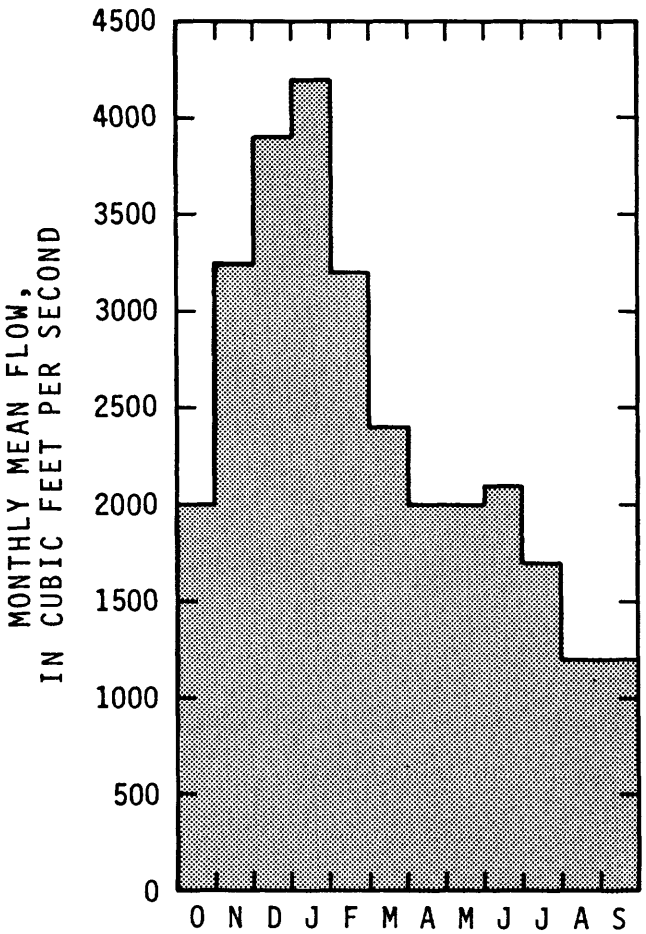


FIGURE 7.--Average mean monthly flow of the Hoh River (site 16) for 1962-73.

Quality of Water

Water samples have been taken from selected sites in the Hoh River basin at irregular intervals since before 1960. Annual summaries of water-quality data collected by the U.S. Geological Survey are published in the Water Data for Washington series (U.S. Geological Survey, 1964-81). Currently (1983), the Hoh River at U.S. Highway 101 near Forks, Wash. (site 16, fig. 1, USGS station 12041200) is sampled at regular intervals as part of the National Stream Quality Accounting Network (NASQAN).

For this report in the Hoh River basin, a comprehensive set of water-quality samples was collected on September 19 and 20, 1978, at 13 sites on the Hoh River and from 12 tributaries. (All sites are listed in table 3, at the end of the report, and shown on figure 1 and (or) figure 2.) All sites were downstream of river mile 30.0 (downstream of the Olympic National Park boundary). The samples were analyzed for a variety of common chemical constituents, nutrients, bacteria concentration, and selected physical characteristics. Data are presented in table 4 (end of report), which documents the quality of water in the Hoh River during late summer when low-flow conditions prevail. Samples were collected over a short period to identify any downstream changes in water quality of the Hoh River that may be related to the quality of water from particular tributary streams.

In a study by Dethier (1982), stream water-quality data (collected from 1961 to 1980) were compiled for the Hoh, Humptulips, North Fork Quinault, Queets, Elwha, and Dungeness Rivers, all of which drain the Olympic Mountains. Dethier determined mean concentration values of selected dissolved constituents and the pH in these rivers. As shown by selected constituents and pH values in the table below, the water quality of the Hoh River on September 19 and 20, 1978, was similar to the mean values for rivers in the region. Small differences between concentrations for the Hoh River and for the regionwide mean may be due in part to correction of the regionwide mean to reflect mean annual flow of all the rivers; the Hoh River was sampled during a low summer flow period (flow less than mean annual value).

Chemical constituent or pH	Mean concentration, in milligrams per liter unless otherwise noted: Dethier, 1982	Hoh River at site 16 on September 20, 1978
Calcium	10.4	13
Magnesium	1.2	1.3
Sodium	2.2	2.3
Potassium	.3	.2
Bicarbonate	36.4	33
Sulfate	6.8	11
Chloride	1.6	1.8
Silica	5.9	5.5
pH, in pH units	7.4	7.2

Downstream changes in the water quality of the Hoh River were indicated only by the constituents (and turbidity) shown in the table below. Other constituents and properties for which data are available showed no detectable trend in a downstream direction.

Sampling site (see fig. 1)	River mile (upstream of mouth)	Constituent concentration, in milligrams per liter				Turbidity (JTU)*
		Sodium	Chloride	Silica	Nitrite-plus-nitrate	
1	30	1.9	1.4	4.9	0.05	1
2	28.4	--	--	--	.06	1
9	24	--	--	--	.07	2
10	20	2.0	1.5	5.3	.08	2
13	18	--	--	--	.10	2
17	12	2.2	1.8	5.5	.10	2
19	8.9	--	--	--	.10	2
20	6.7	2.1	1.9	5.5	.10	3
23	4.3	2.3	2.0	5.6	.11	3
24	2.3	--	--	--	.11	3
27	0.6	2.6	2.2	5.6	.11	3

*JTU is Jackson Turbidity Units, a measure of the clarity of water, primarily influenced by suspended material in the water.

Concentration of sodium, chloride, silica, and nitrite plus nitrate dissolved in river water and the turbidity of the river water are probably related to natural weathering of the rocks and soils of the basin. The products of weathering are transported by ground water and overland runoff to the tributary streams and then to the Hoh River. The continuously increasing concentrations in a downstream direction are probably the result of downstream increases in the part of the tributary streamflow that is of ground water, which commonly has higher concentrations of minerals.

A comparison of the results of the water-quality analysis of the sampled tributaries to the Hoh River revealed certain isolated, anomalous values. These, in downstream order, include: a high nitrite-plus-nitrate concentration (0.32 mg/L as N) in Canyon Creek (site 3); a low pH (6.1 units) and dissolved-oxygen concentration (7.9 mg/L) with high nitrite-plus-nitrate concentration (0.48 mg/L as N) in Elk Creek (site 12); a high fecal-coliform concentration in Winfield (38 col/100 mL), Lost (87 col/100 mL), and Nolan (40 col/100 mL) Creeks; and high turbidity (7 JTU) in Braden Creek. Without further study, no explanation of the values can be formulated.

Fluvial Sediment in the Hoh River - By L. M. Nelson

Data collected at three sites on the Hoh River from 1978 to 1980 were used to estimate its fluvial-sediment transport. At site 16 (fig. 1), fluvial suspended-sediment samples were obtained daily during high flows and two to three times weekly at other flows. Additional periodic samples were obtained at site 27 (fig. 2) and site 8 (fig. 1). A gaging station on the Hoh River (site 16, fig. 1) provided a continuous stage record from March 1978 to February 1980.

During the 2-year period March 1978 to February 1980, 280 samples were collected at site 16. The suspended-sediment concentrations ranged from 1 to 1,950 mg/L. The streamflow and sediment discharge are closely related at high flows (fig. 8) when most of the streamflow originates from heavy rainfall. At medium and low flows this relation changes considerably, depending upon the source of the water: snowmelt, rainfall, or glacial melt. A suspended-sediment transport record (table 5, end of report) was obtained from these samples. The suspended-sediment concentration generally increases rapidly with the rapidly increasing water discharge. However, the suspended-sediment concentrations are highly dependent upon the rate of change and the magnitude of the water discharge and on other variables such as temperature.

The Hoh River transports highly varying amounts of sediment from year to year, as shown by the difference in total transport during the period March 1978 to February 1979, when 82,000 tons of sediment were transported, and March 1979 to February 1980, when 1,510,000 tons of sediment were transported. Because of the great difference in sediment transport, the problem of estimating the mean annual sediment transport of the Hoh River was approached by assuming that the sediment-transport characteristics are largely unchanged during the much longer period of streamflow records (1960 to 1980). Using the method described by Nelson (1970), the Hoh River transports an estimated mean of 630,000 tons of sediment annually.

Suspended-sediment samples collected at the periodic sites (at mouth, site 27, and near the National Park boundary, site 8) were used to estimate the quantity of sediment originating in the mountains and the quantity originating between the mountains and the river mouth. Analysis of the data indicates that about 60 percent of the sediment transported by the Hoh River at its mouth originates upstream of the sampling site near the park boundary and has its source in the mountainous area of the basin. Drainage area above this site is 208 square miles, or about 70 percent of the total drainage area of the Hoh River.

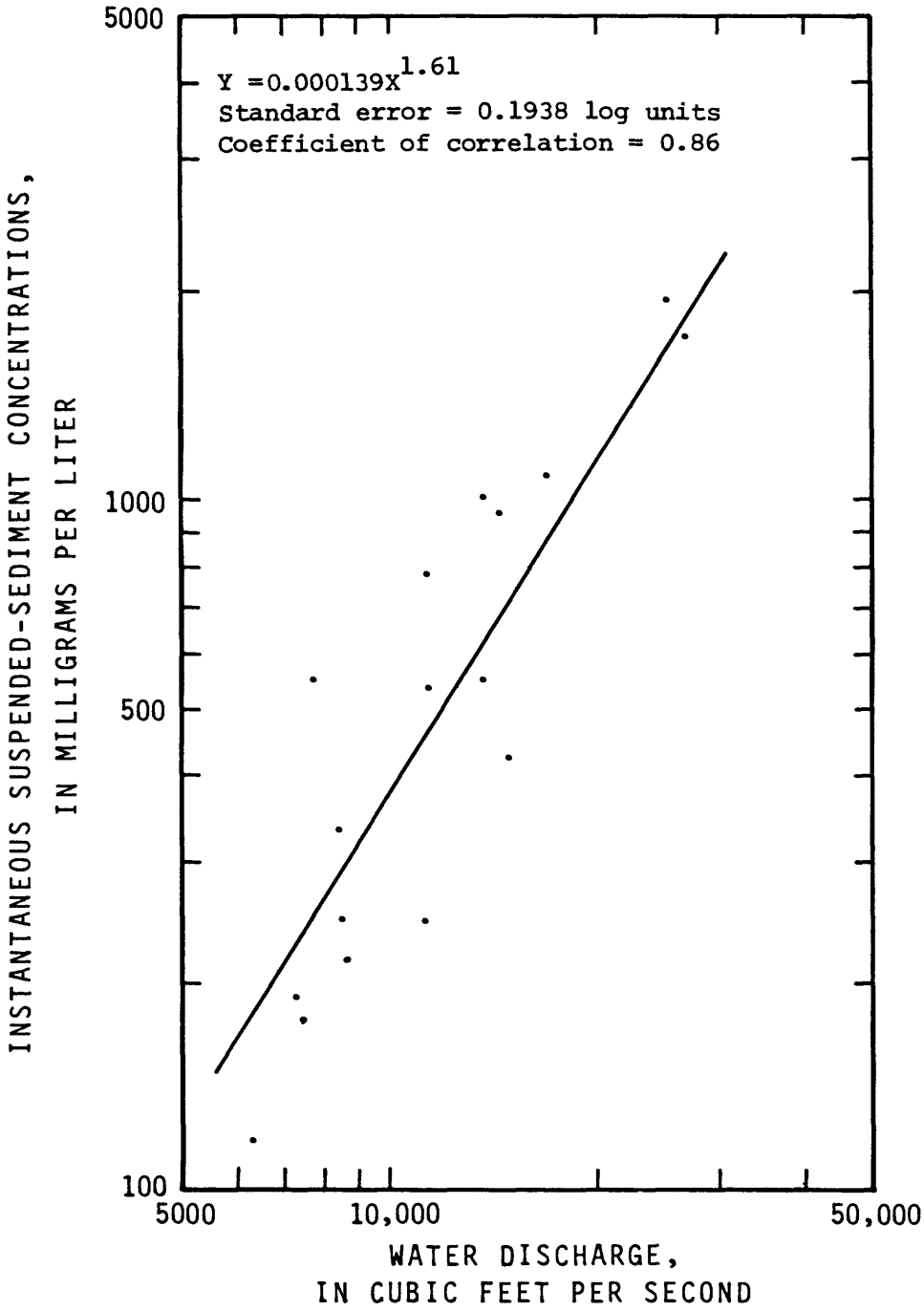


FIGURE 8.--Relation of instantaneous suspended-sediment concentration to concurrent water discharge (site 16).

Chalaat Creek

The Chalaat Creek drainage basin covers an area of 0.94 square mile above site 26 (fig. 2) in Jefferson County, Washington. The entire drainage basin is underlain by older, river deposited, sands and gravels (unit Qro in fig. 5). Thick underbrush covers much of the basin as a result of logging operations about 1960, and some parts of the basin have since been reforested. Precipitation over the basin is about 90 inches per year (U.S. Weather Bureau, 1965). Chalaat Creek provides water for salmon-rearing ponds (artificial impoundments between sites 25 and 26 in figure 2), and before 1975 provided water for domestic use on the reservation.

Streamflow Characteristics

Streamflow in Chalaat Creek is influenced by trends in precipitation. Maximum flows generally occur from December through February, and minimum flows from August through September (tables 6 and 7, end of report). The response of streamflow at site 26 to precipitation is shown in figure 9. Rains on September 8 and 9, 1978, caused a substantial increase in streamflow in Chalaat Creek on those days. Other periods of rain (of lesser intensity or duration or both) in the same month caused similar but less drastic changes in streamflow. Mean annual streamflow of Chalaat Creek at the community center (site 26, fig. 2) is about 2.4 ft^3/s (based on data for 1977-79).

Quality of Water

During the period of 1978-79, water-quality samples were collected seven times at two sites on Chalaat Creek (sites 25 and 26, fig. 2) and analyzed for a variety of chemical constituents and physical properties. Except for moderately high bacteria concentration, results of the analyses (shown in table 8, end of report) indicate no unusual or harmful concentrations of any chemical constituent or unusual physical properties of the water that would restrict its use for most purposes.

Because the water in any stream is subject to contamination from a variety of sources, periodic sampling of Chalaat Creek is suggested as long as it is used for fish rearing. The frequency of sampling and the chemicals and physical properties to be analyzed would depend on the use of the water.

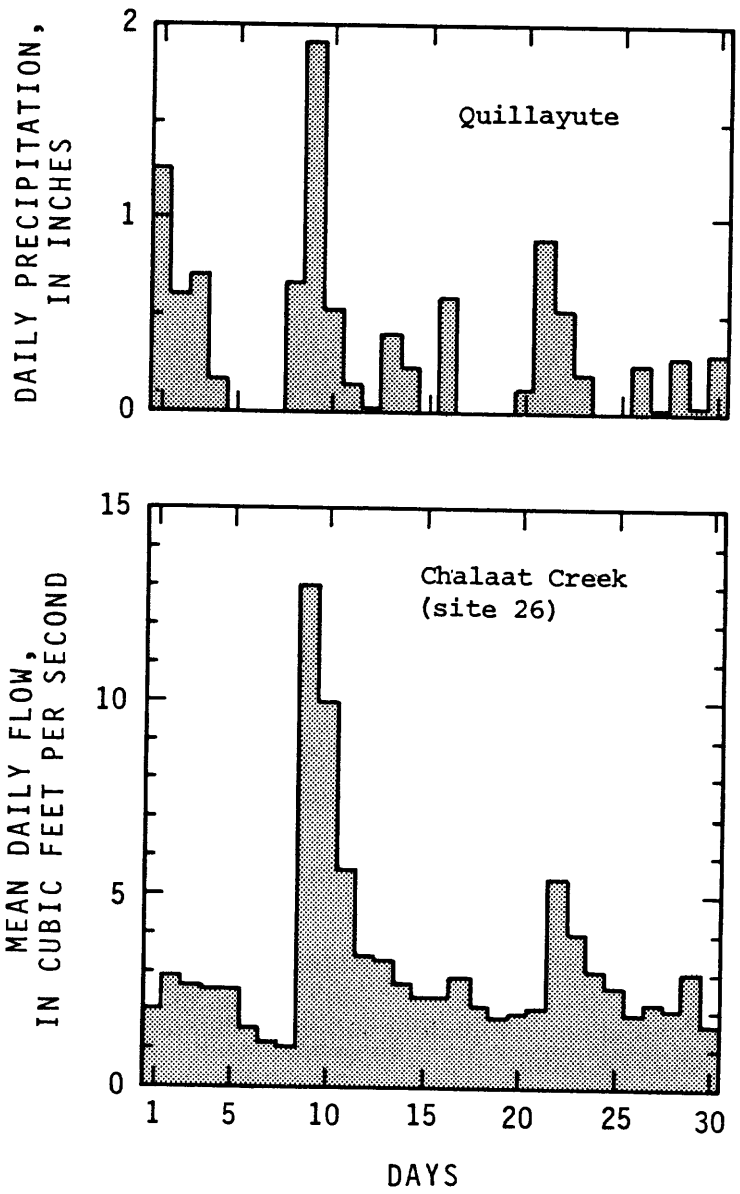


FIGURE 9.--Daily precipitation at Quillayute, Wash., and mean daily streamflow of Chalaat Creek (site 26).

SUMMARY AND CONCLUSIONS

Poorly permeable consolidated sedimentary and metamorphic rocks underlie the entire Hoh River basin. Quaternary surficial deposits of widely ranging permeability consisting of unconsolidated glacial and nonglacial gravel, sand, silt, and clay in a wide variety of mixtures, overlie the Tertiary bedrock in about 35 percent of the basin. These deposits, commonly 20 to 100 feet thick, locally may be as much as several hundred feet in thickness. On the Hoh Indian Reservation permeable sand-and-gravel deposits near the Hoh River may yield 25 to 50 gal/min of water to a well. Several wells 20 to 30 feet deep, placed near a pond occupying an oxbow of the Hoh River, could probably be pumped at this rate indefinitely. The source of the water would be induced recharge from the river or pond into the ground-water system. Other unconsolidated deposits and the bedrock occurring on the reservation have a poor potential for use as water supplies.

Soil infiltration tests were conducted at seven locations where housing may be constructed on the reservation. Rates of infiltration ranged from 2 to 19 minutes per inch of water-level fall. All sites are considered acceptable for disposal of single-family sewage waste through drainfields. Specific sites should be tested further and drainfields designed according to local conditions.

Generally, the quality of water in the Hoh River and its major tributaries was determined to be good and similar to other rivers draining the Olympic Mountains. However, a few anomalous water-quality analyses were noted in samples collected on September 19 and 20, 1978: a high nitrite-plus-nitrate concentration in Canyon Creek; a low pH and dissolved-oxygen concentration with high nitrite-plus-nitrate concentration in Elk Creek; a high fecal-coliform concentration in Winfield, Lost, and Nolan Creeks; and high turbidity in Braden Creek. Downstream increases in concentrations of sodium, chloride, silica, nitrite-plus-nitrate and in turbidity were noted in analyses of water from the Hoh River. The increases in dissolved minerals are probably related to natural weathering of the rocks and soils in the basin. Without further investigation, the anomalously high turbidity and fecal coliform concentrations cannot be explained.

Fluvial-sediment transport data were collected at three sites on the Hoh River. Mean annual transport of the Hoh River was estimated to be 630,000 tons. About 60 percent of the sediment transported by the river originates from within the Olympic National Park, which covers about 70 percent of the total drainage area of the Hoh River.

Chalaat Creek drains about 1 square mile, mostly within the Hoh Indian Reservation. The Hoh Indians use artificial impoundments of Chalaat Creek for fish rearing. The mean annual flow of the creek is about 2.4 ft^3/s, and measured mean monthly flows ranged from 0.7 ft^3/s in August 1979 to 7.2 ft^3/s in March 1979. Streamflow is the result of rainfall, overland runoff, and ground-water discharge to the stream channel. Stream water quality is good, and except for moderately high fecal-coliform bacteria concentrations, no unusual or harmful properties or constituents were noted in the results from seven water-quality analyses taken at each of two sites on the stream from 1978 to 1979.

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TABLE 1.--Lithologic logs of test trenches and wells on the Hoh Indian Reservation, Washington

Geologic unit (fig.5)	Materials	Thickness (ft)	Depth (ft)
	Trench #1		
	Silt and clay, gray	8	8
Qr	Sand and gravel	5	13
Qro?	Clay and silt, gray to blue-gray	7	20
	Trench #2		
	Silt and clay, gray	8	8
Qv	Gravel and sand, poorly sorted	9	17
Qro?	Silt and clay, blue-gray	11	28
	Well #1		
	Fill (road bed)	1	1
	Silt, silt with sand, brown	2	4
Qt	Till, brown to gray	11	15
Qro	Clay, gray, with thin sand and gravel layers	12	27
	Sand and gravel, with some gray clay	2	30
	Clay, brown, with thin sand and gravel layers	18	48
	Sand and gravel	4	52
	Clay, brown, with some sand, gravel, and cobbles	27	80
	Sand, fine, with brown clay and some gravel	10	90
	Sand, fine, and silt, brown	27	117
	Clay, brown, with fine sand and silt	33	151
	Sand, very fine, with gray clay and silt, some thin layers of sand and small gravel	79	230
	Clay and silt, gray	120	350
	Clay and silt, gray, with some thin layers of fine sand and small gravel	44	394
	Well #2		
	Gravel, with sand and clay	14	14
	Silt, gray	3	18
Qr	Gravel and sand	3	21
Qro?	Clay and silt, gray with some thin layers of fine sand and small gravel	15	36
	Sand, very fine, with gray clay and silt and some thin layers of fine sand	54	90

TABLE 2.--Mean daily discharge of the Hoh River (site 16) for water years 1977-80

12041200 HOH RIVER AT U.S. HIGHWAY 101, NEAR FORKS, WA

LOCATION.--Lat 47°48'25", long 124°14'59", in NE¼NE¼ sec.33, T.27 N., R.12 W., Jefferson County, Hydrologic Unit 17100101, on left bank 250 ft (76 m) downstream from U.S. Highway 101, 1.0 mi (1.6 km) downstream from Hell Roaring Creek, 11.5 mi (18.5 km) southeast of Forks, and at mile 15.4 (24.8 km).

DRAINAGE AREA.--253 mi^2 (655 km^2).

PERIOD OF RECORD.--October 1960 to current year. Chemical analyses July 1960 to September 1961, November 1961, to September 1970 (partial-record station), October 1971 to September 1974. Prior to November 1961, published as 12041000, water temperatures: November 1970 to April 1971.

GAGE.--Water-stage recorder. Datum of gage is 163.64 ft (49.877 m) above mean sea level.

REMARKS.--Records good. No regulation or diversion above station.

AVERAGE DISCHARGE.--17 years, 2,566 ft^3/s (72.67 m^3/s), 137.73 in/yr (3,498 mm/yr), 1,859,000 acre-ft/yr (2,290 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 46,000 ft^3/s (1,300 m^3/s) Jan. 15, 1961, gage height, 17.74 ft (5.407 m); minimum, 396 ft^3/s (11.2 m^3/s) Nov. 4, 1974; minimum gage height, 2.40 ft (0.732 m) Sept. 27, 1961.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 16,000 ft^3/s (453 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Jan. 18	0800	*11,700	331	*9.69	2.954

Minimum discharge, 450 ft^3/s (12.7 m^3/s) Oct. 23, gage height, 3.02 ft (0.920 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	917	2100	819	1700	1470	2270	1420	1880	2920	1440	1230	1050
2	882	1490	770	1630	1180	2060	1340	2070	2300	1370	1290	1090
3	896	1280	740	1500	1060	2090	1310	2930	1960	1290	1380	1770
4	758	1130	710	1390	1120	1790	1360	2460	2600	1200	1420	1930
5	710	1000	680	1300	1050	1640	1520	2110	2330	1130	1430	1750
6	746	924	698	1230	962	2650	1820	1820	2500	1040	1370	1370
7	746	875	1130	1160	914	6330	2020	1670	2800	978	1330	1160
8	791	854	2510	1110	866	7010	2240	1640	2400	986	1250	1010
9	833	861	2010	1060	962	5680	2650	1620	2100	1010	1210	914
10	1040	819	1530	1000	3070	3770	2110	1680	1900	970	1190	874
11	1060	764	1660	1040	2790	2990	1820	1620	1800	1160	1190	829
12	903	728	1450	1450	3730	2810	1630	1450	1900	1300	1290	822
13	840	692	1430	1230	2930	2250	1750	1520	1800	1150	1360	850
14	752	680	1280	1120	2120	2000	1590	1590	1800	1080	1320	866
15	680	996	1700	1270	1810	1780	1580	1520	1700	1100	1290	794
16	626	2650	1850	1420	1730	1610	1610	1390	1700	1180	1310	731
17	580	3770	2260	3430	2320	1470	1520	1330	1700	1400	1290	698
18	550	2510	2050	9020	2810	1390	1460	1310	1700	1180	1270	794
19	525	1970	1650	3940	2060	1330	1350	1290	1600	1040	1140	1950
20	505	1640	1480	2710	2650	1250	1270	1350	1600	986	1150	2980
21	485	1470	1390	2180	3860	1380	1210	1760	1500	986	1220	2170
22	470	1300	1270	1870	5870	1430	1490	1710	1500	1010	1120	1530
23	455	1150	1330	1670	3410	1700	1710	1530	1500	1040	1240	1480
24	630	1270	1190	1510	2540	1820	1940	1450	1600	1070	1520	1530
25	2710	1650	1790	1390	2490	1610	2190	1380	1760	1180	2530	1710
26	1940	1230	9560	1290	2270	1780	2390	1960	1510	1290	2150	1430
27	1320	1070	5550	1200	2640	2530	2020	2120	1410	1350	1450	1210
28	1350	980	3190	1120	2510	2090	1810	2170	1410	1270	1420	1150
29	1250	924	2550	1050	---	1780	1810	1790	1460	1190	1780	1140
30	1010	868	2140	994	---	1590	1790	1610	1350	1090	1480	1000
31	2510	---	1890	1790	---	1480	---	2130	---	1150	1210	---
TOTAL	29470	39645	60257	55774	63194	73360	51730	53860	56110	35616	42830	38582
MEAN	951	1322	1944	1799	2257	2366	1724	1737	1870	1149	1382	1286
MAX	2710	3770	9560	9020	5870	7010	2650	2930	2920	1440	2530	2980
MIN	455	680	680	994	866	1250	1210	1290	1350	970	1120	698
CFSM	3.76	5.23	7.68	7.11	8.92	9.35	6.81	6.87	7.39	4.54	5.46	5.08
IN.	4.33	5.83	8.86	8.20	9.29	10.79	7.61	7.92	8.25	5.24	6.30	5.67
AC-FT	58450	78640	119500	110600	125300	145500	102600	106800	111300	70640	84950	76530

CAL YR 1976	TOTAL	756408	MEAN	2067	MAX	13200	MIN 455	CFSM 8.17	IN 111.22	AC-FT	1500000	
WTR YR 1977	TOTAL	600428	MEAN	1645	MAX	9560	MIN 455	CFSM 6.50	IN 88.28	AC-FT	1191000	

12041200 HOH RIVER AT U.S. HIGHWAY 101, NEAR FORKS, WA

LOCATION.--Lat 47°48'25", long 124°14'59", in NE¼NE¼ sec.33, T.27 N., R.12 W., Jefferson County, Hydrologic Unit 17100101, on left bank 250 ft (76 m) downstream from U.S. Highway 101, 1.0 mi (1.6 km) downstream from Hell Roaring Creek, 11.5 mi (18.5 km) southeast of Forks, and at mile 15.4 (24.8 km).

DRAINAGE AREA.--253 mi^2 (655 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1960 to current year.

GAGE.--Water-stage recorder. Datum of gage is 163.64 ft (49.877 m) National Geodetic Vertical Datum of 1929.

REMARKS.--Water-discharge records excellent except those above 20,000 ft^3/s (566 m^3/s) and those for periods Feb. 20 to Mar. 8, Aug. 11-22, and Aug. 27 to Sept. 29; which are fair. No regulation or diversion above station.

AVERAGE DISCHARGE.--18 years, 2,551 ft^3/s (72.24 m^3/s), 136.93 in/yr (3,478 mm/yr), 1,848,000 acre-ft/yr (2,280 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 46,000 ft^3/s (1,300 m^3/s) Jan. 15, 1961, gage height, 17.74 ft (5.407 m); minimum, 396 ft^3/s (11.2 m^3/s) Nov. 4, 1974; minimum gage height, 2.40 ft (0.732 m) Sept. 27, 1961.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 16,000 ft^3/s (453 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Nov. 1	2200	*44,800	1,270	*17.73	5.404	Dec. 2	1000	27,600	782	14.07	4.289
Nov. 14	0600	16,100	456	11.03	3,362	Dec. 11	0400	16,800	476	11.25	3.429
Nov. 25	2200	17,700	501	11.49	3.502						

Minimum discharge, 580 ft^3/s (16.4 m^3/s) Oct. 20, 21, gage height, 3.48 ft (1.061 m).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	914	17800	9050	1480	1380	1000	1580	1090	1460	1510	1010	3000
2	850	13400	20600	1410	1940	940	1480	1090	1620	1490	1060	4000
3	787	5750	10800	1950	2840	910	1410	1100	1830	1410	1130	2500
4	738	4110	6330	3530	2270	870	1420	1060	2010	1420	1230	2700
5	698	3320	4500	3620	2010	840	1470	970	2170	1330	1130	2000
6	692	3200	5150	2780	2560	900	1710	940	2090	1350	1050	1600
7	766	3610	4950	3330	3650	3300	1610	930	1870	1410	1060	1400
8	717	2820	3610	6970	3830	2800	1380	930	1770	1440	1100	1300
9	724	3940	3050	3930	3200	1760	1280	1100	1900	1430	1200	3300
10	656	6770	6430	2990	2490	1450	1210	1200	1880	1290	1120	6100
11	626	4810	14100	2540	2080	1320	1160	1430	1620	1190	1200	3300
12	650	4540	9830	2210	1820	1220	1200	1490	1790	1110	1500	2600
13	843	5350	10300	2030	1660	1220	1130	1790	2120	1200	1100	2300
14	724	10900	11500	2470	1620	1180	1100	4020	1940	1320	1000	2000
15	724	5430	6870	2380	1660	1120	1110	3410	1680	1380	1600	1900
16	766	4290	5130	2070	1470	1050	1110	2300	1520	1420	1200	2000
17	692	3530	3960	1930	1350	1000	1280	1850	1430	1350	1000	1700
18	650	2920	3270	1710	1290	978	1220	1640	1490	1230	900	1500
19	632	2540	2810	1600	1290	962	1310	1580	1600	1200	1200	1300
20	596	2270	2490	1500	1250	930	1380	1700	1550	1200	1000	1200
21	585	2080	2300	2190	1200	914	1670	1820	1560	1230	900	1500
22	650	1930	2140	2320	1200	938	1560	1580	1580	1290	800	2300
23	3030	1850	1970	1880	1200	1240	1940	1390	1450	1400	858	3400
24	3260	1960	1840	1670	1150	2080	1630	1270	1340	1370	2250	2100
25	3720	6870	1720	1600	1200	5710	1380	1210	1300	1310	3130	1800
26	3000	9050	1630	1610	1180	3170	1350	1340	1310	1440	3050	1700
27	2190	5110	1550	1480	1100	2680	1350	1820	1410	1510	2400	1900
28	3170	5110	1560	1400	1050	2670	1310	1990	1580	1270	2000	1600
29	4950	7800	2150	1320	---	2200	1240	1620	1750	1160	1800	1700
30	7350	4340	1830	1260	---	1900	1160	1420	1670	1100	1600	1500
31	4500	---	1610	1220	---	1720	---	1350	---	1060	1500	---
TOTAL	50850	157400	165030	70380	50940	50972	41140	48430	50290	40820	43078	67200
MEAN	1640	5247	5324	2270	1819	1644	1371	1562	1676	1317	1390	2240
MAX	7350	17800	20600	6970	3830	5710	1940	4020	2170	1510	3130	6100
MIN	585	1850	1550	1220	1050	840	1100	930	1300	1060	800	1200
CFSM	6.48	20.7	21.0	8.97	7.19	6.50	5.42	6.17	6.63	5.21	5.49	8.85
IN.	7.48	23.14	24.27	10.35	7.49	7.49	6.05	7.12	7.39	6.00	6.33	9.88
AC-FT	100900	312200	327300	139600	101000	101100	81600	96060	99750	80970	85450	133300

CAL YR 1977 TOTAL 844336 MEAN 2313 MAX 20600 MIN 585 CFSM 9.14 IN 124.15 AC-FT 1675000
WTR YR 1978 TOTAL 836530 MEAN 2292 MAX 20600 MIN 585 CFSM 9.06 IN 123.00 AC-FT 1659000

TABLE 2.--Continued

12041200 HOH RIVER AT U.S. HIGHWAY 101, NEAR FORKS, WA

LOCATION.--Lat 47°48'25", long 124°14'59", in NE¼NE¼ sec.33, T.27 N., R.12 W., Jefferson County, Hydrologic Unit 17100101, on left bank 250 ft (76 m) downstream from U.S. Highway 101, 1.0 mi (1.6 km) downstream from Hell Roaring Creek, 11.5 mi (18.5 km) southeast of Forks, and at mile 15.4 (24.8 km).

DRAINAGE AREA.--253 mi^2 (655 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1960 to current year.

GAGE.--Water-stage recorder. Datum of gage is 163.64 ft (49.877 m) National Geodetic Vertical Datum of 1929.

REMARKS.--Water-discharge records good. No regulation or diversion above station.

AVERAGE DISCHARGE.--19 years, 2,505 ft^3/s (70.94 m^3/s), 134.46 in/yr (3,415 mm/yr), 1,815,000 acre-ft/yr (2,240 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 46,000 ft^3/s (1,300 m^3/s) Jan. 15, 1961, gage height, 17.74 ft (5.407 m); minimum, 396 ft^3/s (11.2 m^3/s) Nov. 4, 1974; minimum gage height, 2.40 ft (0.732 m) Sept. 27, 1961.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 16,000 ft^3/s (453 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Mar. 4	2100	*16,500	467	*11.15	3.399

Minimum discharge, 680 ft^3/s (19.3 m^3/s) Feb. 2.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1978 TO SEPTEMBER 1979
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1390	724	1780	1020	704	2750	958	1520	1310	1660	1140	967
2	1240	780	1450	986	686	2310	1000	1440	1680	1240	1060	2030
3	1160	1170	1770	946	710	2090	958	1400	1850	1020	967	2950
4	1140	5350	1970	898	801	7620	1060	2010	1820	985	892	2250
5	1040	2060	1560	858	2010	10100	1090	3250	2060	1070	940	2640
6	1020	1590	1370	808	3780	8800	1090	3520	1920	1070	876	1690
7	1030	2750	1250	759	3700	6970	1040	2750	1450	1110	804	1540
8	1050	4210	1170	731	3170	4670	1140	2140	1300	2730	868	4170
9	1120	2300	1340	717	4830	3500	1270	1790	1320	2290	839	5190
10	1380	1820	1480	978	2980	2910	1230	1580	1430	3810	932	2540
11	1410	1550	3070	1020	2710	2670	1130	1430	1550	3540	900	1720
12	1090	1380	2060	986	3910	2430	1760	1370	1500	2610	908	1380
13	978	1250	1670	994	8170	2170	4280	1400	1330	1890	949	1260
14	986	1150	2380	898	4230	2060	2850	1520	1180	1550	994	1270
15	978	1100	2090	866	2880	2400	2130	1580	1110	1510	985	1300
16	986	1680	2300	815	2390	2090	1730	1590	1140	1650	967	1170
17	930	1780	2250	787	4090	1790	1610	1540	1150	1810	967	1030
18	906	1500	1950	766	4300	1620	2000	1430	1090	1930	967	1070
19	890	1430	1630	922	3090	1480	1750	1440	1130	1890	1050	1090
20	954	1260	1530	2000	2430	1370	1520	1430	1100	1840	949	1140
21	858	1150	1470	1950	2050	1320	1380	1520	1070	1660	967	994
22	766	1080	1940	1410	1780	1260	1310	1660	1040	1350	1080	832
23	829	1020	2030	1250	1620	1240	1300	1920	1020	1210	1030	804
24	1440	994	2890	1150	2920	1240	1270	1810	1060	1240	860	790
25	1040	986	2130	1030	13300	1200	1250	1720	1200	1120	832	825
26	890	930	1770	978	7700	1140	1250	2050	1360	1200	853	900
27	822	970	1570	962	5080	1080	1370	2030	1400	1330	884	924
28	801	1430	1390	890	3620	1030	1510	1610	1290	1120	916	1130
29	970	1190	1250	836	---	1030	1480	1310	1350	1050	940	860
30	850	1750	1160	801	---	1040	1510	1170	1400	1130	839	908
31	773	---	1090	731	---	985	---	1150	---	1230	797	---
TOTAL	31717	48334	54760	30743	99641	84365	45226	54080	40610	50845	28952	47364
MEAN	1023	1611	1766	992	3559	2721	1508	1745	1354	1640	934	1579
MAX	1440	5350	3070	2000	13300	10100	4280	3520	2060	3810	1140	5190
MIN	766	724	1090	717	686	985	958	1150	1020	985	797	790
CFSM	4.04	6.37	6.98	3.92	14.1	10.8	5.96	6.90	5.35	6.48	3.69	6.24
IN.	4.66	7.11	8.05	4.52	14.65	12.40	6.65	7.95	5.97	7.48	4.26	6.96
AC-FT	62910	95870	108600	60980	197600	167300	89710	107300	80550	100900	57430	93950

CAL YR 1978 TOTAL 598061 MEAN 1639 MAX 6970 MIN 724 CFSM 6.48 IN 87.94 AC-FT 1186000
WTR YR 1979 TOTAL 616637 MEAN 1689 MAX 13300 MIN 686 CFSM 6.68 IN 90.67 AC-FT 1223000

TABLE 2.--Continued

12041200 HOH RIVER AT U.S. HIGHWAY 101, NEAR FORKS, WA

LOCATION.--Lat 47°48'25", long 124°14'59", in NE¼NE¼ sec. 33, T.27 N., R.12 W., Jefferson County, Hydrologic Unit 17100101, on left bank 250 ft (76 m) downstream from U.S. Highway 101, 1.0 mi (1.6 km) downstream from Hell Roaring Creek, 11.5 mi (18.5 km) southeast of Forks, and at mile 15.4 (24.8 km).

DRAINAGE AREA.--253 mi^2 (655 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1960 to current year.

GAGE.--Water-stage recorder. Datum of gage is 163.64 ft (49.877 m) National Geodetic Vertical Datum of 1929.

REMARKS.--Water-discharge records good except those for period of no gage-height record, Aug. 16 to Sept. 30, which are poor. No regulation or diversion above station.

AVERAGE DISCHARGE.--20 years, 2,515 ft^3/s (71.22 m^3/s), 134.99 in/yr (3,429 mm/yr), 1,822,000 acre-ft/yr (2,250 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 51,600 ft^3/s (1,460 m^3/s) Dec. 17, 1979, gage height, 19.08 ft (5.816 m) from rating curve extended above 30,100 ft^3/s (852 m^3/s) on basis of slope-area measurement at gage height 17.74 (5.407 m); minimum, 396 ft^3/s (11.2 m^3/s) Nov. 4, 1974; minimum gage height, 2.40 ft (0.732 m) Sept. 27, 1961.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 16,000 ft^3/s (453 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
December 4	0600	32,300	915	15.12	4.609
December 14	2000	40,600	1,150	16.89	5.148
December 17	2000	*51,600	1,460	*19.08	5.816
January 12	1300	20,200	572	11.82	3.603
February 16	2100	26,800	759	13.60	4.145

Minimum discharge, 618 ft^3/s (17.5 m^3/s) Oct. 16, 18, 21, 22.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	818	1820	1200	4250	3080	5120	1520	1680	1860	1570	1190	3000
2	846	1610	3320	3870	8190	3890	1420	1830	1790	1640	1180	4000
3	811	1790	3470	3250	6680	3370	1360	1730	1530	2870	1120	2600
4	892	1690	17000	2610	4310	2900	1360	1650	1400	2800	1080	1900
5	755	1510	5210	2220	3300	2500	1800	1940	1330	1900	1000	1500
6	748	1300	3950	1970	5080	2100	2370	2020	1360	1630	918	2000
7	804	1170	3270	1790	3850	1800	1950	1750	1420	1690	945	2500
8	797	1080	2690	1700	2900	1600	1760	1600	1790	1730	981	2200
9	825	1000	4430	1600	2450	1500	4130	1590	2320	1770	1060	2000
10	860	949	4100	1480	2110	2500	3210	1510	2050	1730	1090	1800
11	734	908	3000	1590	1870	3300	2400	1480	1860	1740	1190	1600
12	690	868	3380	12800	1690	2800	2080	1640	1780	1570	1220	1500
13	678	839	11700	6110	1550	3900	2220	1550	1730	1510	1210	1400
14	642	804	37700	3750	1430	3100	3150	1510	1950	1550	1140	1300
15	660	783	18800	3440	1330	2700	4450	1410	2040	1520	990	1200
16	654	839	8320	3070	1280	2300	2890	1290	2120	1510	900	1100
17	714	1180	35500	2590	1300	3900	2560	1180	1920	1430	950	1050
18	678	1150	24500	2240	3320	3400	3070	1250	1870	1450	1000	1000
19	825	1070	17000	1990	4490	3000	5930	1380	1820	1470	900	2000
20	790	916	11400	1820	2760	3100	5000	2430	1900	1500	840	3500
21	648	853	9440	1690	2120	2800	3300	2980	1830	1720	800	2800
22	1140	1760	6400	1630	1790	2500	2670	2180	1780	1600	780	2400
23	2490	2410	4810	1650	1580	2300	2380	1780	1650	1500	780	2100
24	1890	1760	4510	1600	1490	2100	2220	1510	1630	1410	770	1900
25	8470	1610	4730	1510	1630	1900	2020	1390	1830	1380	760	1700
26	12000	1360	4630	1390	16600	1890	1880	1360	1590	1390	800	1600
27	8620	1140	3730	1280	23300	1860	1880	1400	1480	1430	1000	1500
28	5130	1040	3080	1200	13200	1860	2060	1490	1490	1430	940	1800
29	3580	985	2650	1150	7880	1990	2030	1460	1450	1310	880	2500
30	2700	1180	2450	1100	---	1790	1750	1550	1470	1200	860	3500
31	2190	---	3350	1170	---	1640	---	1700	---	1200	1500	---
TOTAL	64079	37374	269720	79510	132560	81410	76820	51220	52040	50150	30774	60950
MEAN	2067	1246	8701	2565	4571	2626	2561	1652	1735	1618	993	2032
MAX	12000	2410	37700	12800	23300	5120	5930	2980	2320	2870	1500	4000
MIN	642	783	1200	1100	1280	1500	1360	1180	1330	1200	760	1000
CFSM	8.17	4.93	34.4	10.1	18.1	10.4	10.1	6.53	6.86	6.40	3.93	8.03
IN.	9.42	5.50	39.66	11.69	19.49	11.97	11.30	7.53	7.65	7.37	4.52	8.96
AC-FT	127100	74130	535000	157700	262900	161500	152400	101600	103200	99470	61040	120900

CAL YR 1979 TOTAL 852999 MEAN 2337 MAX 37700 MIN 642 CFSM 9.24 IN 125.42 AC-FT 1692000
WTR YR 1980 TOTAL 986607 MEAN 2696 MAX 37700 MIN 642 CFSM 10.7 IN 145.07 AC-FT 1957000

TABLE 3.--Water-quality sampling sites in the Hoh River basin, Washington

Site No. (see figs. 1 and 2)	Site description (and USGS station No., if available)	River mile on Hoh River at tributary mouth	Drainage area, if calculated (mi^2)
1	Hoh R at mile 30.0 (12040910)	--	179
2	Hoh R at mile 28.4 (12040930)	--	--
3	Canyon Cr (12040940)	27.6	
4	Owl Cr (12040960)	27.1	9.63
5	Spruce Cr (12040965)	26.9	--
6	Maple Cr (12040985	26.6	--
7	Dismal Cr (12040990)	26.5	--
8	Hoh R at mile 25.8 (12041000)	--	208
9	Hoh R at mile 24.0 (12041040)	--	--
10	Hoh R at mile 20.0 (12041100)	--	--
11	Willoughby Cr (12041110)	19.8	--
12	Elk Cr (12041120)	18.5	--
13	Hoh R at mile 18.0 (12041130)	--	--
14	Alder Cr (12041140)	17.8	--
15	Winfield Cr (12041170)	17.7	11.8
16	Hoh R at mile 15.4 (12041200)	--	253
17	Hoh R at mile 12.0 (12041206)	--	--
18	Lost Cr (12041209)	11.7	--
19	Hoh R at mile 8.9 (12041212)	--	--
20	Hoh R at mile 6.7 (12041214)	--	--
21	Nolan Cr (12041217)	6.5	8.35
22	Braden Cr (12041220)	5.0	--
23	Hoh R at mile 4.3 (12041223)	--	288
24	Hoh R at mile 2.3 (12041226)	--	--
25	Chalaat Cr at treatment plant (12041230)	.9	--
26	Chalaat Cr at community center (12041234)	.9	.94
27	Hoh R at mile 0.6 (12041250)	--	--
28	Hoh R at the Pacific Ocean	--	299

Note: "--" Not determined.
"River mile" or "mile" is distance upstream from mouth of Hoh River at the Pacific Ocean.

TABLE 4.--Water-quality data for the Hoh River at selected sites and for selected tributaries to the Hoh River, 1977-80

SITE 1,(12040910)- HOH RIVER AT RIVER MILE 30.0, NEAR FORKS, WA (LAT 47 48 56 LONG 124 01 50)

DATE	TIME	SPECIFIC CONDUCTANCE (MICROMHOS)	TEMPERATURE (DEG C)	TURBIDITY (JTU)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	OXYGEN DEMAND, BIOCHEMICAL, 5 DAY (MG/L)	HARDNESS (MG/L AS CACO3)	HARDNESS, NONCARBONATE (MG/L CACO3)	CALCIUM DISSOLVED (MG/L AS CA)
SEP , 1978										
19...	1200	83	9.9	1	11.2	97	.8	40	11	14

DATE	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	ALKALINITY (MG/L AS CACO3)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	SILICA, DISSOLVED (MG/L AS SIO2)
SEP , 1978									
19...	1.1	1.9	9	.1	.2	29	11	1.4	4.9

DATE	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS NO3)	PHOSPHORUS, TOTAL (MG/L AS P)
SEP , 1978									
19...	52	.07	.05	.02	.06	.08	.13	.60	.00

TABLE 4.--Continued

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	TUR-BID-ITY (JTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)
SITE 2, (12040930) - HOH RIVER AT MILE 28.4 NR FORKS, WASH (LAT 47 48 37 LONG 124 03 33)									
SEP , 1978 19...	1255	--	82	--	8.7	1	10.1	86	--
SITE 3, (12040940) - CANYON CREEK AT MOUTH NR FORKS, WASH (LAT 47 48 44 LONG 124 04 12)									
SEP , 1978 19...	1445	E3.0	75	--	11.0	1	10.2	93	.3
SITE 4, (12040960) - OWL CREEK AT MOUTH NR FORKS, WASH (LAT 47 48 17 LONG 124 04 39)									
SEP , 1978 19...	1530	E25	80	--	9.8	0	11.1	97	.3
SITE 5, (12040965) - SPRUCE CREEK AT MOUTH NR FORKS, WASH (LAT 47 48 19 LONG 124 04 48)									
SEP , 1978 19...	1545	E2.4	78	--	14.8	0	11.7	114	.6
SITE 6, (12040985) - MAPLE CREEK AT MOUTH NR FORKS, WASH (LAT 47 48 14 LONG 124 05 17)									
SEP , 1978 19...	1600	E100	60	--	9.6	0	10.8	97	.4

DATE	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS NO3)	PHOS-PHORUS, TOTAL (MG/L AS P)
12040930 - HOH RIVER AT MILE 28.4 NR FORKS, WASH (LAT 47 48 37 LONG 124 03 33)								
SEP , 1978 19...	--	.06	.07	.14	.21	.27	1.2	.01
12040940 - CANYON CREEK AT MOUTH NR FORKS, WASH (LAT 47 48 44 LONG 124 04 12)								
SEP , 1978 19...	--	.32	.02	.00	.02	.34	1.5	.01
12040960 - OWL CREEK AT MOUTH NR FORKS, WASH (LAT 47 48 17 LONG 124 04 39)								
SEP , 1978 19...	--	.16	.02	.04	.06	.22	1.0	.01
12040965 - SPRUCE CREEK AT MOUTH NR FORKS, WASH (LAT 47 48 19 LONG 124 04 48)								
SEP , 1978 19...	--	.07	.01	.03	.04	.11	.50	.00
12040985 - MAPLE CREEK AT MOUTH NR FORKS, WASH (LAT 47 48 14 LONG 124 05 17)								
SEP , 1978 19...	--	.17	.02	.03	.05	.22	1.0	.01

TABLE 4.--Continued

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	TUR-BID-ITY (JTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)
SITE 7, (12040990) - DISMAL CREEK AT MOUTH NR FORKS, WASH (LAT 47 48 21 LONG 124 05 25)									
SEP , 1978 19...	1625	E2.6	90	--	12.0	0	9.1	84	.3
SITE 9, (12041040) - HOH RIVER AT RIVER MILE 24.0 NR FORKS, WASH (LAT 47 48 44 LONG 124 07 28)									
SEP , 1978 19...	1745	--	78	--	11.4	2	10.6	96	--

DATE	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS NO3)	PHOS-PHORUS, TOTAL (MG/L AS P)
12040990 - DISMAL CREEK AT MOUTH NR FORKS, WASH (LAT 47 48 21 LONG 124 05 25)								
SEP , 1978 19...	--	.19	.03	.00	.03	.22	1.0	.01
12041040 - HOH RIVER AT RIVER MILE 24.0 NR FORKS, WASH (LAT 47 48 44 LONG 124 07 28)								
SEP , 1978 19...	--	.07	.02	.00	.02	.09	.40	--

SITE 10, (12041100) - HOH RIVER AT RIVER MILE 20.0, NEAR FORKS, WASH (Lat 47 48 44 LONG 124 07 28)

DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	TEMPER-ATURE (DEG C)	TUR-BID-ITY (JTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	HARD-NESS (MG/L AS CACO3)	HARD-NESS, NONCAR-BONATE (MG/L CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)
SEP , 1978 19...	1900	78	11.4	2	10.4	95	35	7	12

DATE	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY (MG/L AS CACO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	SILICA, DIS-SOLVED (MG/L AS SIO2)
SEP , 1978 19...	1.2	2.0	11	.1	.2	28	10	1.5	5.3

DATE	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS NO3)	PHOS-PHORUS, TOTAL (MG/L AS P)
SEP , 1978 19...	49	.07	.08	.03	.01	.04	.12	.50	.01

TABLE 4.--Continued

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	TUR-BID-ITY (JTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)
SITE 11, (12041110) - WILLOUGHBY CREEK AT MOUTH NR FORKS, WASH (LAT 47 49 19 LONG 124 11 46)									
SEP , 1978									
19...	1940	E12	80	--	11.0	0	10.6	96	.2
SITE 12, (12041120) - ELK CREEK AT MOUTH NR FORKS, WASH (LAT 47 48 56 LONG 124 12 54)									
SEP , 1978									
20...	0905	E3.8	67	6.1	11.1	0	7.9	72	.8
SITE 13, (12041130) - HOH RIVER AT MILE 18.0 NR FORKS, WASH (LAT 47 48 43 LONG 124 13 29)									
SEP , 1978									
20...	0945	--	84	7.2	9.6	2	11.1	98	--
SITE 14, (12041140) - ALDER CREEK AT MOUTH NR FORKS, WASH (LAT 47 48 43 LONG 124 13 42)									
SEP , 1978									
20...	1000	E17	43	6.7	10.4	1	10.7	96	.9
SITE 15, (12041170) - WINFIELD CREEK AT MOUTH NR FORKS, WASH (LAT 47 48 36 LONG 124 13 50)									
SEP , 1978									
20...	1030	E15	35	6.9	9.8	1	10.2	90	.6

DATE	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS NO3)	PHOS-PHORUS, TOTAL (MG/L AS P)
12041110 - WILLOUGHBY CREEK AT MOUTH NR FORKS, WASH (LAT 47 49 19 LONG 124 11 46)								
SEP , 1978								
19...	--	.16	.02	.01	.03	.19	.80	.01
12041120 - ELK CREEK AT MOUTH NR FORKS, WASH (LAT 47 48 56 LONG 124 12 54)								
SEP , 1978								
20...	19	.48	.01	.02	.03	.51	2.3	.01
12041130 - HOH RIVER AT MILE 18.0 NR FORKS, WASH (LAT 47 48 43 LONG 124 13 29)								
SEP , 1978								
20...	30	.10	.02	.00	.02	.12	.50	.01
12041140 - ALDER CREEK AT MOUTH NR FORKS, WASH (LAT 47 48 43 LONG 124 13 42)								
SEP , 1978								
20...	25	.13	.02	.01	.03	.16	.70	.01
12041170 - WINFIELD CREEK AT MOUTH NR FORKS, WASH (LAT 47 48 36 LONG 124 13 50)								
SEP , 1978								
20...	38	.11	.02	.06	.08	.19	.80	.01

TABLE 4.--Continued

HOH RIVER BASIN

SITE 16,(12041200) HOH RIVER AT U.S. HIGHWAY 101 NEAR FORKS, WA

WATER QUALITY RECORDS

PERIOD OF RECORD.--Water years 1960-61, 1962-74, 1977 to current year.

PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: November 1970 to April 1971.

REMARKS.--Records published as 12041000 July 1960 to September 1961.

WATER QUALITY DATA

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (JTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	HARD-NESS (MG/L AS CACO3)	HARD-NESS, NONCAR-BONATE (MG/L CACO3)
NOV , 1977												
15...	1530	5040	63	7.2	7.2	10	45	11.7	--	12	30	8
JAN , 1978												
25...	1100	1590	71	7.2	6.6	5	2	12.1	--	4	34	11
MAR												
23...	1430	1210	78	7.6	9.5	5	2	11.2	--	8	35	7
MAY												
18...	1500	1640	77	7.6	11.7	5	--	11.2	--	2	33	7
JUL												
25...	1000	1330	68	7.4	11.2	5	4	10.6	--	26	29	7
SEP												
20...	1125	1200	82	7.2	9.6	--	2	11.2	98	27	38	11
29...	1500	1530	80	7.8	11.6	10	8	10.6	--	4	34	8

DATE	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	BICAR-BONATE (MG/L AS HCO3)	CAR-BONATE (MG/L AS CO3)	ALKA-LINITY (MG/L AS CACO3)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2)	SULFATE DIS-SOLVED (MG/L AS SO4)
NOV , 1977											
15...	10	1.1	1.9	12	.2	.2	27	0	22	2.7	7.1
JAN , 1978											
25...	12	1.0	2.0	11	.2	.2	28	0	23	2.8	8.7
MAR											
23...	12	1.1	1.5	9	.1	.2	34	0	28	1.4	8.0
MAY											
18...	11	1.3	2.0	12	.2	.2	32	0	26	1.3	9.2
JUL											
25...	10	.9	1.3	9	.1	.1	26	0	21	1.7	8.2
SEP											
20...	13	1.3	2.3	12	.2	.2	--	--	27	--	11
29...	12	.9	1.9	11	.1	.2	31	0	25	.8	10

DATE	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS NO3)	PHOS-PHORUS, TOTAL (MG/L AS P)
NOV , 1977											
15...	2.8	--	--	--	.13	.16	--	--	--	--	.10
JAN , 1978											
25...	2.4	--	--	--	.09	.03	--	--	--	--	.01
MAR											
23...	2.5	--	--	--	.03	.02	--	--	--	--	.01
MAY											
18...	2.1	--	--	--	.05	.02	--	--	--	--	.01
JUL											
25...	.9	--	--	--	.02	.06	--	--	--	--	.02
SEP											
20...	1.8	5.5	51	.07	.10	.02	.05	.07	.17	.80	.01
29...	1.7	--	--	--	.07	.04	--	--	--	--	.03

DATE	PHOS-PHORUS, ORTHO, DIS-SOLVED (MG/L AS P)	PHOS-PHATE, ORTHO, DIS-SOLVED (MG/L AS PO4)	ARSENIC DIS-SOLVED (UG/L AS AS)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COPPER, DIS-SOLVED (UG/L AS CU)	LEAD, DIS-SOLVED (UG/L AS PB)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, DIS-SOLVED (UG/L AS AG)	ZINC, DIS-SOLVED (UG/L AS ZN)
NOV , 1977											
15...	.00	.00	1	1	0	2	2	.0	0	0	40
JAN , 1978											
25...	.00	.00	2	2	0	4	9	.0	0	1	20
MAR											
23...	.00	.00	1	0	0	4	7	.0	0	0	10
MAY											
18...	.00	.00	0	1	10	4	2	.0	0	0	10
JUL											
25...	.00	.00	1	5	10	4	4	.0	0	0	<3
SEP											
20...	--	--	--	--	--	--	--	--	--	--	--
29...	.01	.03	0	<1	0	14	0	.0	0	0	20

TABLE 4.--Continued

SITE 16,(12041200) HOH RIVER AT U.S. HIGHWAY 101 NEAR FORKS, WA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1960-61, 1962-74, 1977 to current year.

PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: November 1970 to April 1971.

REMARKS.--Records published as 12041000 July 1960 to September 1961.

WATER QUALITY DATA

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	COLOR (PLAT-INUM COBALT UNITS)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	HARD-NESS (MG/L AS CACO3)
NOV , 1978										
15...	1100	1080	74	7.6	4.2	5	1.0	12.4	9	37
JAN , 1979										
17...	1300	752	82	7.5	4.8	5	.00	12.5	K2	35
MAR										
20...	1400	1370	82	7.5	8.2	10	1.0	12.0	<1	34
MAY										
15...	0800	1640	82	7.0	8.5	5	1.0	11.3	2	37
JUL										
18...	1030	2000	70	7.3	11.0	20	13	10.8	57	28
SEP										
11...	1130	1720	59	7.3	10.8	10	8.0	11.0	36	31

DATE	HARD-NESS, NONCAR-BONATE (MG/L CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	BICAR-BONATE (MG/L AS HCO3)	CAR-BONATE (MG/L AS CO3)	ALKA-LINITY (MG/L AS CACO3)
NOV , 1978										
15...	10	13	1.1	2.0	10	.1	.2	33	0	27
JAN , 1979										
17...	9	12	1.1	2.5	14	.2	.1	31	0	25
MAR										
20...	7	12	1.0	2.8	14	.2	1.9	33	0	27
MAY										
15...	12	13	1.0	2.2	11	.2	.4	--	--	25
JUL										
18...	9	10	.7	1.2	8	.1	.4	23	0	19
SEP										
11...	8	11	.9	2.0	12	.2	.2	--	--	23

DATE	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, ORTHO, DIS-SOLVED (MG/L AS P)	PHOS-PHATE, ORTHO, DIS-SOLVED (MG/L AS PO4)	ARSENIC DIS-SOLVED (UG/L AS AS)
NOV , 1978									
15...	1.3	9.2	1.7	.14	.05	.010	.00	.00	0
JAN , 1979									
17...	1.6	11	2.2	.09	.00	.010	.00	.00	0
MAR									
20...	1.7	8.6	2.0	.11	.01	.010	.02	.06	2
MAY									
15...	--	12	1.7	.10	.04	.030	.01	.03	0
JUL									
18...	1.8	8.3	1.0	.10	.02	.040	.00	.00	0
SEP									
11...	--	12	1.6	.13	.01	.010	.04	.12	0

DATE	BARIUM, DIS-SOLVED (UG/L AS BA)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COPPER, DIS-SOLVED (UG/L AS CU)	LEAD, DIS-SOLVED (UG/L AS PB)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, DIS-SOLVED (UG/L AS AG)	ZINC, DIS-SOLVED (UG/L AS ZN)
NOV , 1978									
15...	0	0	0	2	0	.0	2	0	0
JAN , 1979									
17...	10	<1	0	2	3	.0	0	1	<3
MAR									
20...	0	0	0	44	0	.0	0	0	40
MAY									
15...	0	1	0	0	0	.2	0	0	10
JUL									
18...	10	<1	0	0	0	.1	0	0	<3
SEP									
11...	20	<1	10	3	0	.0	0	0	8

TABLE 4.--Continued

SITE 16,(12041200) HOH RIVER AT U.S. HIGHWAY 101 NEAR FORKS, WA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1960-61, 1962-74, 1977 to June 1980 (discontinued).

PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: November 1970 to April 1971.

REMARKS.--Records published as 12041000 July 1960 to September 1961.

WATER QUALITY DATA OCTOBER 1979 TO JUNE 1980

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	HARD-NESS (MG/L AS CACO3)
NOV , 1979										
15...	0845	783	86	7.3	4.4	5	.00	12.0	29	37
JAN , 1980										
16...	1100	3100	63	6.7	5.4	10	15	11.6	3	32
MAR										
26...	0830	1820	72	7.2	5.8	10	2.0	11.5	11	29
MAY										
01...	1200	1730	78	7.1	8.6	5	3.0	11.6	2	37

DATE	HARD-NESS, NONCAR-BONATE (MG/L CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY FIELD (MG/L AS CACO3)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2)
NOV , 1979									
15...	9	13	1.1	2.4	12	.2	.2	28	2.2
JAN , 1980									
16...	5	11	1.0	2.1	13	.2	.2	27	8.6
MAR									
26...	8	10	.9	2.1	14	.2	.2	21	2.1
MAY									
01...	12	13	1.0	2.0	11	.2	.2	25	3.2

DATE	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS NH4)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS TOTAL (MG/L AS PO4)	PHOS-PHORUS, ORTHO, DIS-SOLVED (MG/L AS P)	PHOS-PHATE, ORTHO, DIS-SOLVED (MG/L AS PO4)
NOV , 1979									
15...	11	1.7	.17	.050	.06	.010	.03	.000	.00
JAN , 1980									
16...	7.1	2.3	.13	.000	.00	.010	.03	.000	.00
MAR									
26...	8.0	1.8	.08	.000	.00	.010	.03	.000	.00
MAY									
01...	9.4	1.4	.02	.020	.02	.010	.03	.010	.03

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	HARD-NESS (MG/L AS CACO3)	HARD-NESS, NONCAR-BONATE (MG/L CACO3)	ACIDITY (MG/L AS CACO3)
JUN , 1980											
04...	0930	1450	83	7.3	9.0	5	2.1	11.9	37	37	9.9

DATE	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY FIELD (MG/L AS CACO3)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	SILICA, DIS-SOLVED (MG/L AS SIO2)
JUN , 1980											
04...	13	1.1	2.0	10	.1	.2	16	.0	16	2.7	4.6

DATE	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	SOLIDS, DIS-SOLVED (TONS PER DAY)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS NH4)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS NH4)
JUN , 1980										
04...	49	40	.07	192	.13	.05	.070	.060	.08	.08

TABLE 4.--Continued

SITE 16,(12041200) HOH RIVER AT U.S. HIGHWAY 101 NEAR FORKS, WA--Continued

WATER QUALITY DATA OCTOBER 1979 TO JUNE 1980

DATE	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC DIS-SOLVED (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, NH4 + ORG, SUSP. TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC DIS. (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS NO3)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS TOTAL (MG/L AS PO4)	PHOS-PHORUS, DIS-SOLVED (MG/L AS P)
JUN , 1980										
04...	.49	.43	.56	.07	.49	.69	3.1	.470	1.4	.010

DATE	TIME	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COPPER, DIS-SOLVED (UG/L AS CU)	LEAD, DIS-SOLVED (UG/L AS PB)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, DIS-SOLVED (UG/L AS AG)	ZINC, DIS-SOLVED (UG/L AS ZN)
NOV , 1979											
15...	0845	0	5	<1	0	0	0	.1	0	0	10
JAN , 1980											
16...	1100	0	4	3	0	0	1	.1	0	0	10
MAR											
26...	0830	0	4	<1	0	4	0	.0	0	0	8
MAY											
01...	1200	0	9	<1	0	3	2	.0	0	0	<3

DATE	TIME	ALUM-INUM, TOTAL RECOV-ERABLE (UG/L AS AL)	ALUM-INUM, SUS-PENDED RECOV. (UG/L AS AL)	ALUM-INUM, DIS-SOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	ARSENIC SUS-PENDED TOTAL (UG/L AS AS)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, TOTAL RECOV-ERABLE (UG/L AS BA)	BARIUM, SUS-PENDED RECOV-ERABLE (UG/L AS BA)	BARIUM, DIS-SOLVED (UG/L AS BA)
JUN , 1980										
04...	0930	480	390	90	1	0	1	0	0	20

DATE	BORON, TOTAL RECOV-ERABLE (UG/L AS B)	BORON, SUS-PENDED RECOV-ERABLE (UG/L AS B)	BORON, DIS-SOLVED (UG/L AS B)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR)	CHRO-MIUM, SUS-PENDED RECOV. (UG/L AS CR)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, TOTAL RECOV-ERABLE (UG/L AS CO)	COBALT, DIS-SOLVED (UG/L AS CO)
JUN , 1980										
04...	20	10	9	0	<1	0	0	0	2	<3

DATE	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU)	COPPER, SUS-PENDED RECOV-ERABLE (UG/L AS CU)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE)	IRON, SUS-PENDED RECOV-ERABLE (UG/L AS FE)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)	LEAD, SUS-PENDED RECOV-ERABLE (UG/L AS PB)	LEAD, DIS-SOLVED (UG/L AS PB)	LITHIUM TOTAL RECOV-ERABLE (UG/L AS LI)
JUN , 1980										
04...	25	17	8	520	500	20	35	30	5	0

DATE	LITHIUM SUS-PENDED RECOV-ERABLE (UG/L AS LI)	LITHIUM DIS-SOLVED (UG/L AS LI)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN)	MANGA-NESE, SUS-PENDED RECOV. (UG/L AS MN)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	MERCURY SUS-PENDED RECOV-ERABLE (UG/L AS HG)	MERCURY DIS-SOLVED (UG/L AS HG)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI)	NICKEL, SUS-PENDED RECOV-ERABLE (UG/L AS NI)
JUN , 1980										
04...	0	0	20	20	4	.0	.0	.0	5	0

DATE	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, TOTAL (UG/L AS SE)	SELE-NIUM, SUS-PENDED TOTAL (UG/L AS SE)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG)	SILVER, SUS-PENDED RECOV-ERABLE (UG/L AS AG)	SILVER, DIS-SOLVED (UG/L AS AG)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)	ZINC, SUS-PENDED RECOV-ERABLE (UG/L AS ZN)	ZINC, DIS-SOLVED (UG/L AS ZN)
JUN , 1980										
04...	6	0	0	0	0	0	0	40	30	10

TABLE 4.--Continued

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

SITE 17,(12041206) - HOH RIVER AT RIVER MILE 12.0, NEAR FORKS, WASH (LAT 47 47 12 LONG 124 16 47)

DATE	TIME	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	TURBIDITY (JTU)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)	HARDNESS (MG/L AS CACO3)	HARDNESS, NONCARBONATE (MG/L CACO3)
SEP , 1978										
20...	1235	81	7.0	9.8	2	11.0	97	34	37	11

DATE	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	ALKALINITY (MG/L AS CACO3)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	SILICA, DISSOLVED (MG/L AS SIO2)
SEP , 1978										
20...	13	1.2	2.2	11	.2	.2	26	11	1.8	5.5

DATE	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS NO3)	PHOSPHORUS, TOTAL (MG/L AS P)
SEP , 1978									
20...	51	.07	.10	.02	.02	.04	.14	.60	.01

DATE	TIME	STREAMFLOW, INSTANTANEOUS (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	TURBIDITY (JTU)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	OXYGEN DEMAND, BIOCHEMICAL, 5 DAY (MG/L)

SITE 18,(12041209) - LOST CREEK AT MOUTH NR FORKS, WASH (LAT 47 47 01 LONG 124 17 02)

SEP , 1978									
20...	1315	6.8	36	6.6	10.6	2	10.4	94	.7

SITE 19,(12041212) - HOH RIVER AT MILE 8.9 NR FORKS, WASH (LAT 47 45 45 LONG 124 18 51)

SEP , 1978									
20...	1415	--	78	6.7	9.9	2	11.2	99	--

DATE	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)	NITROGEN, ND2+ND3 TOTAL (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS NO3)	PHOSPHORUS, TOTAL (MG/L AS P)
12041209 - LOST CREEK AT MOUTH NR FORKS, WASH (LAT 47 47 01 LONG 124 17 02)								
SEP , 1978								
20...	67	.05	.01	.07	.08	.13	.60	.02
12041212 - HOH RIVER AT MILE 8.9 NR FORKS, WASH (LAT 47 45 45 LONG 124 18 51)								
SEP , 1978								
20...	22	.10	.02	.02	.04	.14	.60	.01

TABLE 4.--Continued

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

SITE 20, (12041214) - HOH RIVER AT RIVER MILE 6.7, NEAR FORKS, WASH (LAT 47 45 07 LONG 124 20 05)

DATE	TIME	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	TURBIDITY (JTU)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)	HARDNESS (MG/L AS CACO3)	HARDNESS, NONCARBONATE (MG/L CACO3)
SEP, 1978										
20...	1505	79	7.0	10.2	3	10.9	97	18	35	8

DATE	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	ALKALINITY (MG/L AS CACO3)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	SILICA, DISSOLVED (MG/L AS SIO2)
SEP, 1978										
20...	12	1.2	2.1	12	.2	.2	27	10	1.9	5.5

DATE	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS NO3)	PHOSPHORUS, TOTAL (MG/L AS P)
SEP, 1978									
20...	49	.07	.10	.02	.04	.06	.16	.70	.01

DATE	TIME	STREAMFLOW, INSTANTANEOUS (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	TURBIDITY (JTU)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	OXYGEN DEMAND, BIOCHEMICAL, 5 DAY (MG/L)
SITE 21, (12041217) - NOLAN CREEK AT HWY 101 BRIDGE NR FORKS, WASH (LAT 47 45 07 LONG 124 19 16)									
SEP, 1978									
20...	1905	--	30	6.6	12.0	1	9.7	90	.8
SITE 22, (12041220) - BRADEN CREEK AT HWY 101 BRIDGE NR FORKS, WASH (LAT 47 44 22 LONG 124 20 51)									
SEP, 1978									
20...	1855	--	26	6.4	11.4	7	9.7	88	.5

DATE	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS NO3)	PHOSPHORUS, TOTAL (MG/L AS P)
12041217 - NOLAN CREEK AT HWY 101 BRIDGE NR FORKS, WASH (LAT 47 45 07 LONG 124 19 16)								
SEP, 1978								
20...	40	.02	.03	.05	.08	.10	.40	.02
12041220 - BRADEN CREEK AT HWY 101 BRIDGE NR FORKS, WASH (LAT 47 44 22 LONG 124 20 51)								
SEP, 1978								
20...	11	.08	.01	.11	.12	.20	.90	.02

TABLE 4.--Continued

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

SITE 23, (12041223) - HOH RIVER AT RIVER MILE 4.3, NEAR FORKS, WASH (LAT 47 44 10 LONG 124 21 59)

DATE	TIME	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	TURBIDITY (JTU)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)	HARDNESS (MG/L AS CACO3)	HARDNESS, NONCARBONATE (MG/L CACO3)
SEP , 1978										
20...	1635	78	7.2	10.8	3	10.8	97	13	37	12

DATE	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	ALKALINITY (MG/L AS CACO3)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	SILICA, DISSOLVED (MG/L AS SIO2)
SEP , 1978										
20...	13	1.2	2.3	12	.2	.2	25	10	2.0	5.6

DATE	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS NO3)	PHOSPHORUS, TOTAL (MG/L AS P)
SEP , 1978									
20...	49	.07	.11	.02	.05	.07	.18	.80	.01

DATE	TIME	STREAMFLOW, INSTANTANEOUS (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	TURBIDITY (JTU)	OXYGEN, DISSOLVED (MG/L)	OXYGEN DISSOLVED (PERCENT SATURATION)	OXYGEN DEMAND, BIOCHEMICAL, 5 DAY (MG/L)
SEP , 1978									
20...	1725	--	80	7.0	11.2	3	11.1	100	--

DATE	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS NO3)	PHOSPHORUS, TOTAL (MG/L AS P)
SEP , 1978								
20...	15	.11	.03	.00	.03	.14	.60	.01

TABLE 4.--Continued

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

SITE 27, (12041250) - HOH RIVER AT RIVER MILE 0.6, NEAR FORKS, WASH (LAT 47 44 58 LONG 124 25 43)

DATE	TIME	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	TURBIDITY (JTU)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	OXYGEN DEMAND, BIOCHEMICAL, 5 DAY (MG/L)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)	HARDNESS (MG/L AS CACO3)
SEP , 1978										
20...	1805	83	7.2	11.2	3	10.9	98	.4	15	37

DATE	HARDNESS, NONCARBONATE (MG/L CACO3)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	ALKALINITY (MG/L AS CACO3)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)
SEP , 1978										
20...	11	13	1.2	2.6	13	.2	.2	26	11	2.2

DATE	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS NO3)	PHOSPHORUS, TOTAL (MG/L AS P)
SEP , 1978										
20...	5.6	51	.07	.11	.04	.02	.06	.17	.80	.01

TABLE 5.--Daily suspended-sediment data for the Hoh River (site 16), March 1, 1978-February 1980

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY
		MARCH, 1978			APRIL, 1978			MAY, 1978	
1	1000	5	13	1580	4	17	1090	1	2.9
2	940	5	13	1480	4	16	1090	2	5.9
3	910	5	12	1410	4	15	1100	3	8.9
4	870	5	12	1420	4	15	1060	4	11
5	840	5	11	1470	5	20	970	3	7.9
6	900	5	12	1710	6	28	940	2	5.1
7	3300	35	312	1610	8	35	930	1	2.5
8	2800	20	151	1380	6	22	930	1	2.5
9	1760	10	48	1280	4	14	1100	1	3.0
10	1450	5	20	1210	3	9.8	1200	1	3.2
11	1320	5	18	1160	2	6.3	1430	1	3.9
12	1220	5	16	1200	1	3.2	1490	1	4.0
13	1220	5	16	1130	1	3.1	1790	1	4.8
14	1180	5	16	1100	2	5.9	4020	1	11
15	1120	5	15	1110	5	15	3410	2	18
16	1050	5	14	1110	10	30	2300	3	19
17	1000	5	13	1280	9	31	1850	4	20
18	978	5	13	1220	9	30	1640	4	18
19	962	5	13	1310	8	28	1580	4	17
20	930	5	13	1380	8	30	1700	4	18
21	914	5	12	1670	7	32	1820	3	15
22	938	5	13	1560	7	29	1580	3	13
23	1240	5	17	1940	7	37	1390	3	11
24	2080	10	56	1630	6	26	1270	2	6.9
25	5710	270	4160	1380	6	22	1210	2	6.5
26	3170	35	300	1350	6	22	1340	3	11
27	2680	10	72	1350	5	18	1820	5	25
28	2670	5	36	1310	5	18	1990	8	43
29	2200	5	30	1240	3	10	1620	4	17
30	1900	5	26	1160	2	6.3	1420	2	7.7
31	1720	4	19	---	---	---	1350	1	3.6
TOTAL	50972	---	5492	41140	---	594.6	48430	---	346.3

TABLE 5.--Continued

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
		JUNE, 1978			JULY, 1978			AUGUST, 1978	
1	1460	2	7.9	1510	19	77	1010	9	25
2	1620	6	26	1490	13	52	1060	8	23
3	1830	13	64	1410	9	34	1130	8	24
4	2010	19	103	1420	7	27	1230	9	30
5	2170	29	170	1330	6	22	1130	11	34
6	2090	24	135	1350	5	18	1050	12	34
7	1870	20	101	1410	5	19	1060	14	40
8	1770	17	81	1440	5	19	1100	14	42
9	1900	14	72	1430	5	19	1200	14	45
10	1880	12	61	1290	5	17	1120	15	45
11	1620	11	48	1190	6	19	1200	15	49
12	1790	11	53	1110	8	24	1500	13	53
13	2120	12	69	1200	10	32	1100	11	33
14	1940	12	63	1320	10	36	1000	9	24
15	1680	10	45	1380	11	41	1600	9	39
16	1520	9	37	1420	11	42	1200	8	26
17	1430	8	31	1350	9	33	1000	8	22
18	1490	7	28	1230	7	23	900	8	19
19	1600	8	35	1200	6	19	1200	7	23
20	1550	9	38	1200	5	16	1000	7	19
21	1560	10	42	1230	8	27	900	6	15
22	1580	8	34	1290	11	38	800	5	11
23	1450	6	23	1400	17	64	858	4	9.3
24	1340	5	18	1370	26	96	2250	894	5430
25	1300	9	32	1310	32	113	3130	235	1990
26	1310	16	57	1440	40	156	3050	100	823
27	1410	4	15	1510	49	200	2400	48	311
28	1580	8	34	1270	32	110	2000	24	130
29	1750	15	71	1160	21	66	1800	15	73
30	1670	28	126	1100	14	42	1600	15	65
31	---	---	---	1060	9	26	1500	16	65
TOTAL	50290	---	1719.9	40820	---	1527	43078	---	9571.3

TABLE 5.--Continued

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
		SEPTEMBER, 1978			OCTOBER, 1978			NOVEMBER, 1978	
1	3000	77	624	1390	15	56	724	1	2.0
2	4000	24	259	1240	7	23	780	4	8.4
3	2500	23	155	1160	6	19	1170	8	25
4	2700	21	153	1140	6	18	5350	521	7530
5	2000	20	108	1040	5	14	2060	63	350
6	1600	12	52	1020	5	14	1590	25	107
7	1400	7	26	1030	4	11	2750	41	304
8	1300	4	14	1050	6	17	4210	37	421
9	3300	70	624	1120	6	18	2300	34	211
10	6100	210	3460	1380	20	75	1820	8	39
11	3300	25	223	1410	9	34	1550	11	46
12	2600	15	105	1090	4	12	1380	13	48
13	2300	12	75	978	5	13	1250	8	27
14	2000	12	65	986	6	16	1150	5	16
15	1900	11	56	978	5	13	1100	3	8.9
16	2000	11	59	986	5	13	1680	22	100
17	1700	9	41	930	5	13	1780	10	48
18	1500	7	28	906	4	9.8	1500	5	20
19	1300	6	21	890	4	9.6	1430	4	15
20	1200	5	16	954	6	15	1260	5	17
21	1500	9	36	858	8	19	1150	5	16
22	2300	16	99	766	10	21	1080	5	15
23	3400	17	156	829	12	27	1020	5	14
24	2100	18	102	1440	57	222	994	7	19
25	1800	13	63	1040	12	34	986	4	11
26	1700	10	46	890	8	19	930	8	20
27	1900	18	92	822	5	11	970	4	10
28	1600	6	26	801	4	8.7	1430	6	23
29	1700	12	55	970	4	10	1190	8	26
30	1500	11	45	850	3	6.9	1750	12	57
31	---	---	---	773	2	4.2	---	---	---
TOTAL	67200	---	6884	31717	---	796.2	48334	---	9554.3

TABLE 5.--Continued

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
		DECEMBER, 1978			JANUARY, 1979			FEBRUARY, 1979	
1	1780	8	38	1020	1	2.8	704	10	19
2	1450	10	39	986	1	2.7	686	12	22
3	1770	9	43	946	1	2.6	710	15	29
4	1970	9	48	898	1	2.4	801	19	41
5	1560	6	25	858	1	2.3	2010	23	125
6	1370	4	15	808	1	2.2	3780	120	1220
7	1250	3	10	759	1	2.0	3700	27	270
8	1170	8	25	731	1	2.0	3170	52	445
9	1340	19	69	717	1	1.9	4830	130	1700
10	1480	20	80	978	3	7.9	2980	17	137
11	3070	118	978	1020	10	28	2710	14	102
12	2060	17	95	986	2	5.3	3910	182	1920
13	1670	8	36	994	9	24	8170	453	9990
14	2380	23	148	898	5	12	4230	54	617
15	2090	8	45	866	3	7.0	2880	9	70
16	2300	10	62	815	2	4.4	2390	10	65
17	2250	5	30	787	2	4.2	4090	12	133
18	1950	9	47	766	2	4.1	4300	14	163
19	1630	4	18	922	7	17	3090	28	234
20	1530	2	8.3	2000	3	16	2430	17	112
21	1470	2	7.9	1950	1	5.3	2050	10	55
22	1940	2	10	1410	4	15	1780	5	24
23	2030	2	11	1250	4	13	1620	3	13
24	2890	2	16	1150	4	12	2920	402	3170
25	2130	2	12	1030	3	8.3	13300	481	17300
26	1770	1	4.8	978	3	7.9	7700	178	3700
27	1570	1	4.2	962	3	7.8	5080	52	713
28	1390	1	3.8	890	3	7.2	3620	38	371
29	1250	1	3.4	836	4	9.0	---	---	---
30	1160	1	3.1	801	54	117	---	---	---
31	1090	1	2.9	731	23	45	---	---	---
TOTAL	54760	---	1938.4	30743	---	398.3	99641	---	42760

TABLE 5.--Continued

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
		MARCH, 1979			APRIL, 1979			MAY, 1979	
1	2750	12	89	958	7	18	1520	5	21
2	2310	4	25	1000	7	19	1440	5	19
3	2090	18	102	958	7	18	1400	6	23
4	7620	488	10000	1060	7	20	2010	7	38
5	10100	382	10400	1090	7	21	3250	8	70
6	8800	295	7010	1090	7	21	3520	10	95
7	6970	167	3140	1040	7	20	2750	12	89
8	4670	44	555	1140	7	22	2140	8	46
9	3500	33	312	1270	7	24	1790	5	24
10	2910	23	181	1230	4	13	1580	5	21
11	2670	16	115	1130	4	12	1430	5	19
12	2430	11	72	1760	5	24	1370	5	18
13	2170	8	47	4280	5	58	1400	5	19
14	2060	6	33	2850	6	46	1520	5	21
15	2400	59	382	2130	6	35	1580	5	21
16	2090	15	85	1730	7	33	1590	6	26
17	1790	10	48	1610	9	39	1540	6	25
18	1620	7	31	2000	12	65	1430	7	27
19	1480	5	20	1750	10	47	1440	7	27
20	1370	8	30	1520	9	37	1430	7	27
21	1320	14	50	1380	8	30	1520	8	33
22	1260	4	14	1310	7	25	1660	8	36
23	1240	1	3.3	1300	6	21	1920	7	36
24	1240	2	6.7	1270	4	14	1810	7	34
25	1200	6	19	1250	3	10	1720	7	33
26	1140	13	40	1250	3	10	2050	7	39
27	1080	11	32	1370	3	11	2030	6	33
28	1030	10	28	1510	4	16	1610	6	26
29	1030	8	22	1480	4	16	1310	6	21
30	1040	7	20	1510	4	16	1170	6	19
31	985	7	19	---	---	---	1150	7	22
TOTAL	84365	---	32931.0	45226	---	761	54080	---	1008

TABLE 5.--Continued

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
		JUNE, 1979			JULY, 1979			AUGUST, 1979	
1	1310	7	25	1660	23	103	1140	11	34
2	1680	11	50	1240	22	74	1060	8	23
3	1850	19	95	1020	21	58	967	11	29
4	1820	31	152	985	20	53	892	11	26
5	2060	24	133	1070	19	55	940	10	25
6	1920	18	93	1070	18	52	876	10	24
7	1450	10	39	1110	35	105	804	8	17
8	1300	6	21	2730	176	1300	868	7	16
9	1320	9	32	2290	115	711	839	12	27
10	1430	12	46	3810	248	2550	932	9	23
11	1550	18	75	3540	160	1530	900	8	19
12	1500	13	53	2610	56	395	908	7	17
13	1330	9	32	1890	28	143	949	6	15
14	1180	7	22	1550	25	105	994	5	13
15	1110	5	15	1510	22	90	985	4	11
16	1140	6	18	1650	20	89	967	8	21
17	1150	7	22	1810	37	181	967	15	39
18	1090	8	24	1930	67	349	967	15	39
19	1130	10	31	1890	59	301	1050	14	40
20	1100	12	36	1840	52	258	949	14	36
21	1070	6	17	1660	39	175	967	14	37
22	1040	3	8.4	1350	29	106	1080	16	47
23	1020	5	14	1210	22	72	1030	15	42
24	1060	7	20	1240	16	54	860	15	35
25	1200	11	36	1120	12	36	832	15	34
26	1360	15	55	1200	12	39	853	14	32
27	1400	20	76	1330	13	47	884	14	33
28	1290	23	80	1120	13	39	916	13	32
29	1350	26	95	1050	13	37	940	13	33
30	1400	25	94	1130	14	43	839	12	27
31	---	---	---	1230	14	46	797	12	26
TOTAL	40610	---	1509.4	50845	---	9196	28952	---	872

TABLE 5.--Continued

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
	SEPTEMBER, 1979			OCTOBER, 1979			NOVEMBER, 1979		
1	967	20	52	818	20	44	1820	18	88
2	2030	35	192	846	16	37	1610	13	57
3	2950	60	478	811	10	22	1790	12	58
4	2250	102	620	892	6	14	1690	12	55
5	2640	83	592	755	13	27	1510	11	45
6	1690	67	306	748	13	26	1300	9	32
7	1540	55	229	804	12	26	1170	8	25
8	4170	45	507	797	12	26	1080	7	20
9	5190	36	504	825	11	25	1000	11	30
10	2540	30	206	860	11	26	949	11	28
11	1720	24	111	734	11	22	908	11	27
12	1380	22	82	690	12	22	868	11	26
13	1260	21	71	678	10	18	839	11	25
14	1270	19	65	642	9	16	804	11	24
15	1300	18	63	660	8	14	783	11	23
16	1170	16	51	654	7	12	839	12	27
17	1030	15	42	714	6	12	1180	13	41
18	1070	14	40	678	6	11	1150	14	43
19	1090	14	41	825	5	11	1070	15	43
20	1140	14	43	790	6	13	916	16	40
21	994	14	38	648	8	14	853	17	39
22	832	10	22	1140	10	31	1760	19	90
23	804	7	15	2490	12	81	2410	20	130
24	790	5	11	1890	50	255	1760	17	81
25	825	8	18	8470	600	13700	1610	14	61
26	900	12	29	12000	793	25700	1360	12	44
27	924	21	52	8620	425	9890	1140	10	31
28	1130	37	113	5130	145	2010	1040	8	22
29	860	30	70	3580	61	590	985	7	19
30	908	24	59	2700	47	343	1180	12	38
31	---	---	---	2190	24	142	---	---	---
TOTAL	47364	---	4722	64079	---	53180	37374	---	1312

TABLE 5.--Continued

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMEN DISCHA (TONS/
		DECEMBER, 1979			JANUARY, 1980			FEBRUARY, 1980	
1	1200	21	68	4250	56	643	3080	20	166
2	3320	37	332	3870	59	616	8190	300	6630
3	3470	242	2270	3250	26	228	6680	125	2250
4	17000	1930	88600	2610	23	162	4310	19	221
5	5210	250	3520	2220	20	120	3300	19	169
6	3950	94	1000	1970	18	96	5080	18	247
7	3270	48	424	1790	16	77	3850	18	187
8	2690	46	334	1700	14	64	2900	18	141
9	4430	43	514	1600	15	65	2450	17	112
10	4100	41	454	1480	17	68	2110	17	97
11	3000	39	316	1590	25	107	1870	17	86
12	3380	39	356	12800	496	17100	1690	17	78
13	11700	1540	48600	6110	210	3460	1550	16	67
14	37700	2930	298000	3750	102	1030	1430	16	62
15	18800	1260	64000	3440	60	557	1330	16	57
16	8320	790	17700	3070	52	431	1280	15	52
17	35500	4140	397000	2590	44	308	1300	15	53
18	24500	2250	149000	2240	38	230	3320	15	134
19	17000	1160	53200	1990	33	177	4490	15	182
20	11400	763	23500	1820	28	138	2760	14	104
21	9440	534	13600	1690	24	110	2120	14	80
22	6400	374	6460	1630	24	106	1790	14	68
23	4810	262	3400	1650	23	102	1580	20	85
24	4510	183	2230	1600	23	99	1490	20	80
25	4730	128	1630	1510	22	90	1630	20	88
26	4630	90	1130	1390	22	83	16600	1590	71300
27	3730	63	634	1280	22	76	23300	1470	92500
28	3080	44	366	1200	21	68	13200	560	20000
29	2650	47	336	1150	21	65	7880	140	2980
30	2450	49	324	1100	21	62	---	---	---
31	3350	52	470	1170	20	63	---	---	---
TOTAL	269720	---	1179768	79510	---	26601	132560	---	198276

TABLE 6.--Mean daily discharge, in cubic feet per second, for Chalaat Creek (site 26) for water years 1977-79

	1977		1978											
Day	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.3	1.0	1.3	9.4	--	--	--	3.3	3.4	2.2	1.9	1.1	0.66	2.0
2	1.3	1.4	1.2	11.4	--	--	--	3.3	3.6	2.5	1.9	1.0	.97	2.8
3	1.2	2.0	1.2	--	--	--	6.4	3.2	3.5	2.4	1.3	1.0	.90	2.6
4	1.2	2.0	1.2	4.8	--	7.2	--	3.0	3.8	2.3	1.4	.96	.80	2.5
5	1.2	1.6	1.2	--	--	--	--	2.8	5.0	2.3	1.6	.96	.77	2.5
6	1.2	1.4	1.2	--	--	--	--	2.7	5.9	2.1	1.4	1.0	.74	1.5
7	1.2	1.2	1.3	11.2	--	--	--	7.0	5.0	1.9	1.0	1.0	.74	1.2
8	1.1	1.2	1.3	12.5	--	--	12.3	8.1	4.3	1.9	1.3	1.0	.74	1.1
9	1.1	1.1	1.3	--	--	--	10.1	6.2	4.0	2.2	1.9	1.0	.71	13
10	1.0	1.0	1.3	--	--	--	8.0	4.5	3.5	2.0	2.3	1.1	.80	10
11	.97	.97	1.2	--	--	--	5.5	3.6	3.5	3.0	1.9	1.1	1.0	5.7
12	.94	.90	1.2	--	--	--	5.4	3.6	3.2	2.9	1.4	1.0	.97	3.4
13	.90	.97	1.5	--	--	--	5.6	3.6	3.5	3.1	1.7	1.0	.94	3.3
14	.90	.94	1.3	27.0	19.2	6.2	5.4	4.0	3.3	3.5	1.5	1.0	.87	2.7
15	.87	.90	1.2	14.8	--	--	5.9	4.3	4.2	7.2	1.4	.97	8.3	2.3
16	.87	.87	1.1	--	--	--	5.2	3.8	4.4	5.0	1.2	.97	1.7	2.3
17	.87	.87	1.0	--	--	5.5	4.8	3.6	4.0	3.5	1.2	.90	1.2	2.8
18	.87	1.4	1.0	--	--	5.0	4.6	3.1	4.5	2.4	1.4	.94	1.0	2.2
19	.87	2.5	1.0	--	--	5.2	4.3	2.7	5.1	2.6	1.4	.90	.71	1.8
20	.84	5.1	1.1	--	--	--	4.3	2.4	4.5	2.3	1.4	.90	1.0	1.9
21	.84	2.8	1.2	4.1	--	6.3	4.3	2.1	4.0	2.0	1.4	.84	.97	2.1
22	.80	1.8	1.3	--	--	--	3.7	2.3	4.1	1.9	1.3	.84	.84	5.4
23	1.8	1.9	1.7	--	--	--	4.0	2.9	3.9	1.9	1.3	.78	1.0	4.0
24	2.1	3.0	2.4	--	--	--	4.0	3.2	4.1	1.9	1.3	.74	3.0	3.0
25	2.1	6.0	3.2	--	--	--	4.5	5.1	3.6	1.9	1.3	.70	1.9	2.6
26	1.6	2.5	3.6	12.9	--	--	3.8	5.1	3.3	2.7	1.2	.66	1.6	1.9
27	1.4	1.8	2.5	--	--	--	3.6	5.6	3.2	3.8	1.2	.77	1.4	2.2
28	1.4	1.7	2.5	10.9	--	--	3.5	6.2	2.9	2.9	1.1	.74	1.2	2.0
29	1.5	1.6	3.5	--	--	--	--	4.0	2.5	2.3	1.1	.72	1.0	3.0
30	1.5	1.5	5.0	9.3	--	--		3.8	2.3	2.1	1.1	.70	.92	1.7
31	1.2		5.9		--	--		3.6		2.0		.66	1.2	
Mean	1.2	1.8	1.8	--	--	--	--	4.0	3.9	2.7	1.5	0.90	1.3	3.2
Average runoff (inches per month)	1.4	2.2	2.2	--	--	--	--	4.8	4.7	3.2	1.8	1.1	1.6	3.8

TABLE 6.--Mean daily discharge, in cubic feet per second, for Chalaat Creek (site 26), for water years 1977-79--Continued

	1979											
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.6	1.3	5.4	2.5	2.1	10	4.8	2.8	2.1	3.5	0.84	0.62
2	1.7	1.5	4.0	2.4	--	7.0	6.4	2.8	2.0	2.3	.84	.70
3	1.7	1.8	--	2.3	--	9.6	6.0	2.8	2.0	1.9	.82	.77
4	1.7	2.9	7.8	2.2	--	13	5.9	5.4	1.9	1.7	.80	1.5
5	1.5	2.1	5.3	2.2	5.9	24	7.5	8.9	2.8	1.5	.77	3.4
6	1.6	1.6	3.3	2.2	9.6	22	5.7	6.6	2.7	1.4	.74	2.0
7	1.5	2.2	2.6	2.2	9.4	16	5.1	5.8	2.4	1.3	.71	1.5
8	1.5	3.5	2.7	2.1	7.5	11	6.1	4.1	2.2	1.5	.71	1.7
9	1.8	3.0	2.7	2.1	8.0	7.5	7.4	3.2	2.1	1.7	.70	2.2
10	1.8	2.3	3.5	3.5	--	6.4	7.4	3.0	1.9	2.1	.66	2.3
11	1.9	2.0	4.4	2.9	7.3	6.0	6.9	2.9	1.8	2.8	.64	1.5
12	1.6	1.6	3.6	2.7	--	5.7	6.5	2.8	1.7	1.8	.62	1.2
13	1.6	1.6	3.1	3.0	13	5.5	12	2.7	1.7	1.7	.60	.92
14	1.5	1.7	4.2	2.8	--	4.1	5.9	2.6	1.6	1.7	.66	.77
15	1.4	1.6	6.3	2.5	6.7	6.3	6.0	2.6	1.8	1.6	.66	.76
16	1.4	2.6	8.8	2.3	5.7	5.8	6.4	2.3	1.6	1.5	.71	.73
17	1.5	3.6	7.0	2.2	--	5.4	6.0	2.3	1.6	.94	.70	.71
18	1.2	3.0	4.6	2.2	--	5.1	4.3	2.3	1.6	.97	.74	.68
19	1.3	3.4	3.6	2.6	--	4.5	4.0	2.1	1.9	.84	.80	.60
20	1.9	2.2	3.3	--	--	4.5	3.7	2.0	1.7	.74	.78	.60
21	1.5	2.0	--	--	--	4.4	3.4	1.9	1.5	.66	.77	.71
22	1.4	1.9	--	3.0	5.4	4.4	3.2	1.9	1.3	.62	.94	.67
23	1.4	1.9	--	2.8	4.8	3.9	2.9	1.9	1.4	1.6	.71	.62
24	1.6	1.8	--	2.6	14	4.1	2.6	2.1	1.4	.94	.63	.58
25	1.5	1.7	3.3	2.4	--	3.6	2.5	2.1	1.5	1.1	.60	.55
26	1.3	1.8	3.2	2.7	21	3.9	2.6	2.2	1.6	.87	.60	.58
27	1.2	1.8	3.1	3.0	17	3.9	2.5	2.3	1.4	.71	.60	.97
28	1.3	2.3	2.9	2.7	16	3.9	2.5	2.4	1.5	.97	.60	1.4
29	2.0	4.0	2.8	2.5		4.1	2.6	2.3	1.5	.90	.60	1.2
30	1.6	5.5	2.7	2.4		4.6	2.8	2.2	2.2	.94	.58	1.3
31	1.5		2.6	3.0		3.7		2.1		.90	.58	
Mean	1.5	2.3	--	--	--	7.2	5.1	3.0	1.8	1.4	0.70	1.1
Average runoff (inches per month)	1.9	2.8	--	--	--	8.7	6.1	3.6	2.2	1.7	.84	1.4

TABLE 7.--Miscellaneous streamflow measurements of Chalaat Creek (site 25) for 1977-79

Stream	Tributary to:	Location	Measurement	
			Date	Discharge (ft^3/s)
12041230 Chalaat Creek	Hoh River	Lat 47°44'33", long 124°24'58", in NW¼SW¼ sec.20, T.26 N., R.13 W., Jefferson County, Hoh Indian Reservation, at road crossing near treatment plant, 0.8 mi (1.3 km) upstream from mouth, and 9.9 mi (15.9 km) northwest of Kalalock.	8-11-77	0.52
			2-10-78	6.02
			3-10-78	3.67
			3-29-78	3.66
			5-10-78	1.99
			5-17-78	2.40
			8-23-78	.84
			10-11-78	1.75
			12- 9-78	1.80
			1-31-79	1.48
			4- 2-79	3.84
			6- 4-79	1.84
			8- 6-79	.47
			10- 4-79	.41

TABLE 8.--Water-quality data for two sites on Chalaat Creek for 1978-79

SITE 25, (12041230) - CHALAAT CREEK AT TREATMENT PLANT, HOH RESERVATION, WASH (LAT 47 44 32 LONG 124 24 58)

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	TUR-BID-ITY (JTU)	OXYGEN, DIS-SOLVED (MG/L)	COLI-FORM, TOTAL, IMMED. (COLS. PER 100 ML)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	HARD-NESS (MG/L AS CACO3)	HARD-NESS, NONCAR-BONATE (MG/L CACO3)
MAR . 1978											
29...	1150	4.0	41	7.0	11.2	1	10.5	260	3	10	1
MAY											
17...	1000	2.9	50	--	10.8	--	9.8	--	14	--	--
AUG											
02...	1100	1.0	64	7.2	12.8	--	9.7	--	10	--	--

DATE	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	BICAR-BONATE (MG/L AS HCO3)	CAR-BONATE (MG/L AS CO3)	ALKA-LINITY (MG/L AS CACO3)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2)
MAR . 1978										
29...	2.3	1.1	4.9	50	.7	.2	11	0	9	1.8
MAY										
17...	--	--	--	--	--	--	--	--	--	--
AUG										
02...	--	--	--	--	--	--	--	--	--	--

TABLE 8.--Continued

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

SITE 25, (12041230) - CHALAAT CREEK AT TREATMENT PLANT, HOH RESERVATION, WASH --Continued

DATE	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS NO3)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, ORTHO, DIS-SOLVED (MG/L AS P)
MAR, 1978										
29...	8.2	7.7	.02	.07	.29	.36	.38	1.7	.02	.00
MAY										
17...	--	--	--	--	--	--	--	--	--	--
AUG										
02...	--	--	--	--	--	--	--	--	--	--

DATE	PHOS-PHATE, ORTHO, DIS-SOLVED (MG/L AS PO4)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COPPER, DIS-SOLVED (UG/L AS CU)	LEAD, DIS-SOLVED (UG/L AS PB)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	SILVER, DIS-SOLVED (UG/L AS AG)	ZINC, DIS-SOLVED (UG/L AS ZN)
MAR, 1978										
29...	.00	0	0	0	0	0	2	.0	0	0
MAY										
17...	--	--	--	--	--	--	--	--	--	--
AUG										
02...	--	--	--	--	--	--	--	--	--	--

SITE 26, (12041234) - CHALAAT CREEK AT COMMUNITY CENTER, HOH RESERVATION, WASH (LAT 47 44 45 LONG 124 25 20)

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	TUR-BID-ITY (JTU)	OXYGEN, DIS-SOLVED (MG/L)	COLI-FORM, TOTAL, IMMED. (COLS. PER 100 ML)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	HARD-NESS (MG/L AS CACO3)	HARD-NESS, NONCAR-BONATE (MG/L CACO3)
MAR, 1978											
29...	1040	4.0	57	7.0	10.0	1	8.9	140	2	13	2
MAY											
17...	1105	3.5	62	--	11.4	--	9.6	--	6	--	--
AUG											
02...	1145	1.0	77	6.2	14.0	--	6.4	--	K33	--	--

DATE	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	BICAR-BONATE (MG/L AS HCO3)	CAR-BONATE (MG/L AS CO3)	ALKA-LINITY (MG/L AS CACO3)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2)
MAR, 1978										
29...	2.9	1.4	6.1	50	.7	.3	14	0	11	2.2
MAY										
17...	--	--	--	--	--	--	--	--	--	--
AUG										
02...	--	--	--	--	--	--	--	--	--	--

DATE	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS NO3)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, ORTHO, DIS-SOLVED (MG/L AS P)
MAR, 1978										
29...	3.3	9.6	.05	.11	.34	.45	.50	2.2	.04	.01
MAY										
17...	--	--	--	--	--	--	--	--	--	--
AUG										
02...	--	--	--	--	--	--	--	--	--	--

DATE	PHOS-PHATE, ORTHO, DIS-SOLVED (MG/L AS PO4)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COPPER, DIS-SOLVED (UG/L AS CU)	LEAD, DIS-SOLVED (UG/L AS PB)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	SILVER, DIS-SOLVED (UG/L AS AG)	ZINC, DIS-SOLVED (UG/L AS ZN)
MAR, 1978										
29...	.03	0	0	1	0	0	3	.0	0	0
MAY										
17...	--	--	--	--	--	--	--	--	--	--
AUG										
02...	--	--	--	--	--	--	--	--	--	--

TABLE 8.--Continued

SITE 25,(12041230) CHALAAT CREEK AT TREATMENT PLANT, HOH RESERVATION, WA

LOCATION.--Lat 47°44'33", long 124°24'58", in NW¼SW¼ sec.20, T.26 N., R.13 E., Jefferson County, Hoh Indian Reservation, at road crossing near treatment plant, 0.8 mi (1.3 km) upstream from mouth, and 9.9 mi (15.9 km) northwest of Kalaloch.

PERIOD OF RECORD.--August 1977 to May 1979 (discontinued).

WATER QUALITY NOVEMBER 1978 TO MAY 1979

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)
NOV , 1978							
28...	1025	1.9	55	6.7	6.2	11.0	1
JAN , 1979							
30...	1015	1.5	53	7.0	1.0	13.1	<1
MAR							
27...	1105	3.4	53	7.1	7.6	10.8	2
MAY							
22...	1050	1.7	52	6.7	13.0	9.7	8

DATE	TIME	HARD-NESS (MG/L AS CACO3)	HARD-NESS, NONCAR-BONATE (MG/L CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD-SORP-TION RATIO
NOV , 1978								
28...	1025	13	1	2.8	1.4	5.7	48	.7
JAN , 1979								
30...	1015	13	2	2.5	1.6	6.9	53	.8
MAY								
22...	1050	15	4	3.9	1.3	6.1	46	.7

DATE	BICAR-BONATE (MG/L AS HCO3)	CAR-BONATE (MG/L AS CO3)	ALKA-LINITY (MG/L AS CACO3)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)
NOV , 1978								
28...	--	--	12	--	4.9	8.3	--	--
JAN , 1979								
30...	--	--	11	--	3.5	8.5	--	--
MAY								
22...	13	0	11	4.2	4.7	8.8	32	.04

DATE	TIME	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)
NOV , 1978							
28...	1025	.03	.01	.04	.01	.13	.14
MAY , 1979							
22...	1050	.02	.00	.02	.03	.07	.10

DATE	NITRO-GEN, TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS NO3)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, DIS-SOLVED (MG/L AS P)	PHOS-PHORUS, ORTHO, DIS-SOLVED (MG/L AS P)	PHOS-PHATE, ORTHO, DIS-SOLVED (MG/L AS PO4)
NOV , 1978						
28...	.18	.80	.020	--	.01	.03
MAY , 1979						
22...	.12	.53	.010	.010	.03	.09

DATE	TIME	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COPPER, DIS-SOLVED (UG/L AS CU)	LEAD, DIS-SOLVED (UG/L AS PB)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	MERCURY DIS-SOLVED (UG/L AS HG)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, DIS-SOLVED (UG/L AS AG)	ZINC, DIS-SOLVED (UG/L AS ZN)
MAR , 1979												
27...	1105	0	0	0	10	0	0	--	.1	0	0	20
MAY												
22...	1050	1	0	1	0	0	0	.1	--	0	0	10

TABLE 8.--Continued

SITE 26, (12041234) CHALAAT CREEK AT COMMUNITY CENTER, HOH RESERVATION, WA

LOCATION.--Lat 47°44'45", long 124°25'20", in SE¼NE¼ sec.19, T.26 N., R.13 W., Jefferson County, Hoh Indian Reservation, at road crossing near Community Reservation, 0.3 mi (0.5 km) upstream from mouth, and 10.2 mi (16.4 km) northwest of Kalaloch.

PERIOD OF RECORD.--August 1977 to May 1979 (discontinued).

WATER QUALITY DATA

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)
NOV , 1978							
28...	1135	2.3	65	6.5	6.6	10.0	16
JAN , 1979							
30...	1115	2.6	65	6.5	2.2	12.2	<1
MAR							
27...	1150	3.9	60	6.8	8.6	9.8	5
MAY							
22...	1200	1.8	61	6.5	12.2	10.1	22

DATE	TIME	HARD-NESS (MG/L AS CACO3)	HARD-NESS, NONCAR-BONATE (MG/L CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD-SORP-TION RATIO	BICAR-BONATE (MG/L AS HCO3)
NOV , 1978									
28...	1135	16	0	3.4	1.8	7.2	49	.8	--
JAN , 1979									
30...	1115	14	5	3.2	1.5	7.9	54	.9	--
MAY									
22...	1200	17	8	4.5	1.5	6.6	44	.7	11

DATE	CAR-BONATE (MG/L AS CO3)	ALKA-LINITY (MG/L AS CACO3)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	SOLIDS, DIS-SOLVED (TONS PER DAY)
NOV , 1978								
28...	--	16	--	4.5	9.0	--	--	--
JAN , 1979								
30...	--	9	--	3.5	10	--	--	--
MAY								
22...	0	9	5.6	7.7	10	36	.05	.17

DATE	TIME	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS NO3)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, ORTHO, DIS-SOLVED (MG/L AS P)	PHOS-PHATE, ORTHO, DIS-SOLVED (MG/L AS PO4)
NOV , 1978												
28...	1135	.04	.01	.05	.01	.08	.09	.14	.62	.020	.01	.03
MAY , 1979												
22...	1200	.04	.00	.04	.03	.15	.18	.22	.97	.020	.03	.09

DATE	TIME	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COPPER, DIS-SOLVED (UG/L AS CU)	LEAD, DIS-SOLVED (UG/L AS PB)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	MERCURY DIS-SOLVED (UG/L AS HG)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, DIS-SOLVED (UG/L AS AG)	ZINC, DIS-SOLVED (UG/L AS ZN)
MAR , 1979												
27...	1150	0	0	0	0	0	1	--	.2	0	0	20
MAY												
22...	1200	1	0	1	0	0	0	.1	--	0	0	10