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STATE OF WASHINGTON
Albert D. Rosellini, Governor

DEPARTMENT OF CONSERVATION
Earl Coe, Director

DIVISION OF WATER RESOURCES
Murray G. Walker, Supervisor

Water Supply Bulletin No. 16

**FLOWING ARTESIAN WELLS
IN WASHINGTON STATE**

By
Dee Molenaar



Olympia, Washington
1961

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wells in Washington
State

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FLOWING ARTESIAN WELLS IN WASHINGTON STATE

By

Dee Molenaar

INTRODUCTION

Purpose and Scope of Report

This report was made by the Division of Water Resources of the Washington State Department of Conservation as part of a continuing program for the collection and interpretation of basic data concerning the ground-water conditions and resources of the State of Washington. The compilation of informative data on flowing artesian wells was initiated at this time in order to determine the availability of uncontaminated ground-water supplies in the event that local or State-wide power failures preclude the use of water obtainable only by electrically-operated pumping facilities.

Owing also to the special problems encountered in the control of artesian flow at the time of drilling it is believed that this report will be of assistance to drillers by pointing out those areas where they might anticipate penetration of artesian zones. Through the information presented here on the artesian zones and depths at which they are likely to be encountered, the driller can make preparations before drilling to cap the well and to perform any sealing operations which may be necessary to prevent the free flow of water from around the well casing.

The report was prepared under the general direction of Murray G. Walker, Supervisor, Division of Water Resources, Department of Conservation, and under the direct supervision of Robert H. Russell, Assistant Supervisor. The tabulation of wells is composed of data obtained from existing publications and open-file reports on ground-water conditions throughout the State, studies of which were conducted by the Division of Water Resources in cooperation with the Ground Water Branch, U.S. Geological Survey. Data are obtained also from well drillers' logs filed with this office in conjunction with the processing of ground-water rights. The data were assembled chiefly from the foregoing sources and no field work was conducted to quantitatively determine the present-day flows of artesian wells listed in earlier reports. In many cases, and contrary to data recorded with this office, wells have in subsequent years been altered or plugged and no longer exist, or their flows have either diminished considerably or have ceased entirely over the years. Conversely, many new wells have been drilled which tap artesian zones and obtain free-flowing water, but which have never been reported for recording with this office.

Also, since the existing reports deal primarily with those areas of the State where agricultural, industrial and municipal growth have accentuated the need for information on local ground-water conditions and supply, there exist large, sparsely-populated, portions of the State where no detailed studies have yet been made, and upon which little information is available.

Well-Numbering System

In this report wells are designated by symbols that indicate their location according to the official rectangular public-land survey. For example, in the symbol 24/1E-33K1, representing one of the City of Bremerton's wells, the part preceding the hyphen indicates successively the township and range (T. 24 N., R. 1 E.) north and east of the Willamette Meridian and Baseline. Because the State lies entirely north of the Willamette Baseline the letter indicating the direction north is omitted, but the letters "E" or "W" are included to describe the range's position east or west of the Willamette Meridian. The first number following the hyphen indicates the section (Sec. 33), and the letter "K" gives the 40-acre subdivision of the section, as shown in Figure 1.

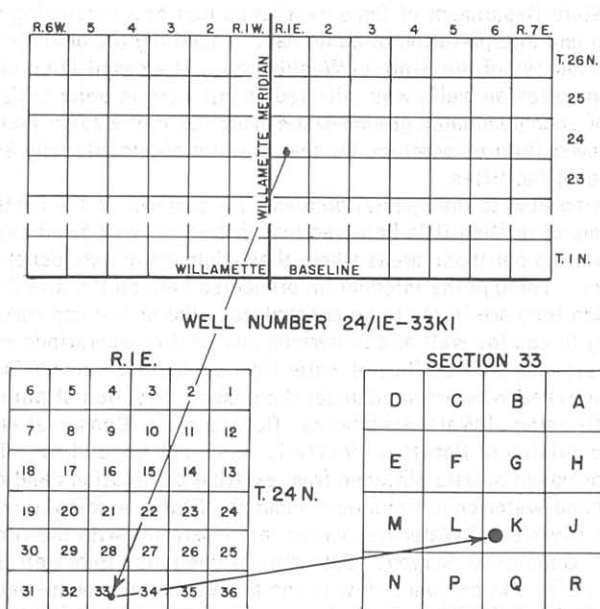


Figure 1. Diagram showing well-numbering system.

The last number is the serial number of the well in the particular 40-acre tract. Thus, well 24/1E-33K1 is in the NW $\frac{1}{4}$ SE $\frac{1}{4}$, Sec. 33, T. 24 N., R. 1 E., and is the first well in the tract to be listed.

Acknowledgments

The writer wishes to acknowledge the assistance rendered by Robert H. Russell, Assistant Supervisor, and Eugene F. Wallace and John B. Noble, Geologists, of the Division of Water Resources, in both the preparation and editing of this report.

GROUND WATER*

General Features of Ground-Water Occurrence

The interstices or spaces in rock materials below a certain depth are usually saturated with water under hydrostatic pressure, the property of water by means of which pressure is transmitted equally throughout it in all directions almost instantly. Water within this zone of saturation is termed ground water. The water above this zone, but below the ground surface, and not saturating the rock materials is termed vadose water.

In many places an impermeable stratum will impede the downward percolation of vadose water and cause it to accumulate and form a local zone of saturation, or zone of perched ground water.

An aquifer is a water-bearing formation that is capable of yielding water to a well or spring.

In permeable materials the top of the zone of saturation is the water table. This is the static water level, or the level at which water will stand in a well that penetrates the zone of saturation. The water surface of a perched zone of saturation is termed the perched water table, while the surface of the zone below which all permeable materials are saturated on a regional extent is termed the regional water table.

The water table is generally a sloping surface, having a gradient in the direction of ground-water movement. Movement is from points or areas of recharge, where water is added to the ground-water body, to points or areas of discharge. The gradient of the water table is dependent upon the thickness and permeability of the rock materials below the water table and the amount of water moving through the materials. In materials of low permeability such as fine silt or clay, the gradient is greater than in materials of high permeability, such as coarse sand and gravel, hence the presence of many different areas of recharge and discharge, and variable permeabilities of rock materials, tend to make the water table an irregular surface.

The water table fluctuates, owing generally to seasonal changes in the amounts of recharge and discharge. A rise in the water table, generally accompanied by a steepening of the water-table gradient, occurs during periods of recharge; a lowering of the water table, accompanied by a reduction of the water-table gradient, occurs in periods of little or no recharge, or during periods of heavy pumping by wells in a given area.

*Sceva, J. E., 1957, p. 30-34.

In an area where only permeable materials exist there will be but one water table. All wells drilled in the area will encounter water when the water table is reached and water levels in the wells will define that surface. Water occurring under such water-table conditions is termed unconfined ground water.

Artesian Ground Water

Where ground water moves beneath some impermeable stratum which confines its upward movement under pressure it is termed confined or artesian ground water. If the material above the impermeable stratum is not saturated, a water table condition would not exist and a well will not encounter water until it has been drilled through the confining stratum. The water then encountered will rise in the casing to a height corresponding to the pressure head of the confined ground water. A well tapping a confined aquifer is termed an artesian well. Where the pressure is sufficient to raise the water above the adjacent land surface, a well will flow and is termed a flowing artesian well. When such a well is capped or valved, the confined water exerts a shut-in pressure which is usually recorded as pounds per square inch.

Confined ground water has a pressure surface, termed a piezometric surface, which is analogous to the water table but whose level may be greatly different from that of an overlying or adjacent water table. This is usually true when the recharge to the confined aquifer occurs some distance away and is not related to the local water table. Like the water table, the piezometric surface fluctuates in response to recharge and discharge. Numerous impermeable and permeable zones may exist one above the other. The water-pressure surface may be different for each of these permeable zones, so that, during drilling operations, a well may experience several water levels as different zones are penetrated.

Ground-Water Recharge

The chief source of ground-water recharge is precipitation. Part of the precipitation falling on an area will generally flow off as surface runoff, part will evaporate, and part will percolate downward into the soil. As precipitation enters the soil it will be absorbed in part to replace depleted soil moisture or be drawn up by plants and transpired back into the atmosphere. The balance will continue to percolate downward as vadose water and will eventually reach the water table to become ground water. Often there is a noticeable lag in time between periods of high precipitation and the resulting rise of the water table. Such lag is dependent upon the depth to the water table and the permeability of the intervening rock materials.

Ground water is recharged naturally also by both downward percolation and lateral seepage from surface ponds, lakes, and rivers that are located above the water table.

As part of the water spread over the ground surface will generally percolate to the underlying aquifers, irrigation can be considered as a form of artificial recharge. In some areas of the United States, where local water tables have

experienced gradual declines as a result of many years of excessive pumping, artificial recharge programs have been carried out. Depleted ground water zones have been recharged by introducing surface water into the aquifers either directly through well casings or by spreading the water across permeable materials overlying the aquifers. An experimental program of artificial recharge is being carried out today in the basalt aquifers of the Walla Walla Basin, Washington (Price, 1960).

Ground-Water Discharge

Ground-water discharge is the outflow of water from the ground-water body and is accomplished naturally by flow onto the land surface or directly into lakes, streams, or into the sea, or artificially by discharge from wells.

Natural discharge to the surface usually occurs through springs or seeps where the land surface intersects the water-bearing zones. In many places such discharge will take place beneath the surface of streams, lakes, or marine water bodies where its occurrence is not discernible. Under normal climatic conditions within a given area natural discharge will be balanced each year by natural recharge as described above, and the fluctuation of the water table will follow a similar pattern from year to year.

Pumping a well, or permitting an artesian well to flow, is an artificial discharge. In most areas of western Washington where annual precipitation is high, the water table will not be seriously affected by the normal artificial discharge from widely-spaced wells and the discharge will be balanced each year by natural recharge. However, where wells are concentrated in one area, or pumped excessively throughout the year, the water table may show a gradual decline through many years. In the more arid portions of eastern Washington, particularly in a ground-water basin of limited extent such as the Walla Walla Basin, artificial discharge from wells is not always balanced by annual natural recharge and the water table will experience a decline over a period of years.

GEOLOGIC-GEOGRAPHIC OCCURRENCE OF FLOWING WELLS

In the State of Washington artesian wells occur under the following four general geologic conditions: (1) water-bearing beds of unconsolidated sands and gravels confined beneath impermeable layers of clay or "hardpan" (glacial till or cemented gravel); (2) Water-bearing fracture zones within single basalt flow units which are confined beneath the dense or "tight" impermeable portions of overlying flow units; (3) a combination of the aforementioned two--water-bearing sands and gravels confined beneath impermeable basalt flow units; and (4) water-bearing sands and gravels in which the water table is affected by immediately adjacent tidal fluctuations of higher density salt water, causing wells at or near sea level to flow at high tide.

For convenience in this report the State has been divided into five provinces as shown in Figure 2. The provinces, each comprised of two or more counties, are discussed in the following order: Straits-Puget Basin Province, Southern Coastal Province, Lower Columbia Province, Northeastern Province, and Columbia Plateau Province.

Straits-Puget Basin Province

Lying west of the Cascade Range crest and comprising the lowlands of the Puget Sound Basin and the north and east slopes of the Olympic Mountains, this province has been outlined to include all of the following counties: Whatcom, San Juan, Skagit, Island, Snohomish, King, Pierce, Thurston, Mason, Kitsap, Jefferson, and Clallam.

General Geology

The primary aquifers in the Straits-Puget Basin Province occur in glacially-deposited unconsolidated sand, gravel, clay and till materials that occupy the lowlands as far south as southern Thurston County. During Pleistocene time (the "Ice Age") a fluctuating climate caused the area several times in the past million years to be covered by vast ice sheets originating in Canada. Although the inter-glacial cycles predominated during Pleistocene time, most of the present-day materials found filling the lowlands are of glacial origin. From the front of each major glacial ice sheet issued numerous large streams which carried and deposited sands and gravels in depressions and across the topography existing at the time, and in many places cut new channels and valleys for later filling by such sediments. Fine silts and clays were carried in suspension by the active streams until eventually deposited in slack-water lakes formed in ice-dammed drainages. Accompanying periodic warming climatic cycles came large scale melting and recession of the ice from the area, and climates similar to that of today several times brought on the growth of vegetation and forest cover between such glacial periods. As the climate periodically cooled and the ice again entered the area, these forest and swamp materials were buried under more glacial and stream deposits. Today these organic materials are found as beds of peat and woody fragments compacted beneath, or within clay and silt beds.

Another primary deposit associated with each ice advance is the glacial till or "hardpan", normally a gray to bluish-gray, compact mixture of cobbles and gravel in a binder of silt and clay. This material was "smeared" along as a basal deposit of the moving ice sheet and hence normally covers the pre-existing topography over which the ice advanced. The hard compact nature of glacial till has given to it the local name of "hardpan".

Following the last disappearance of the ice from the province lowland about 11,000 years ago, the topography was modified into its present day form. The deep, glacier-cut valleys were either filled by the encroachment of sea waters to form today's Strait of Juan de Fuca and embayments of Puget Sound, or were filled slowly by stream-laid silts and sands which were eroded and carried from adjoining uplands and mountains. Where filled to above sea level, they today form



Figure 2. Geologic-geographic provinces as discussed in report.

the broad river bottomlands which head many of the marine water embayments. The processes of erosion of uplands, and deposition of river silts and sands into the headwaters of these Puget Sound inlets continue through the present day.

Occurrence of Artesian Wells

Artesian ground water within the Straits-Puget Basin Province occurs in saturated sand and gravel beds confined under several conditions as shown in Figure 3.

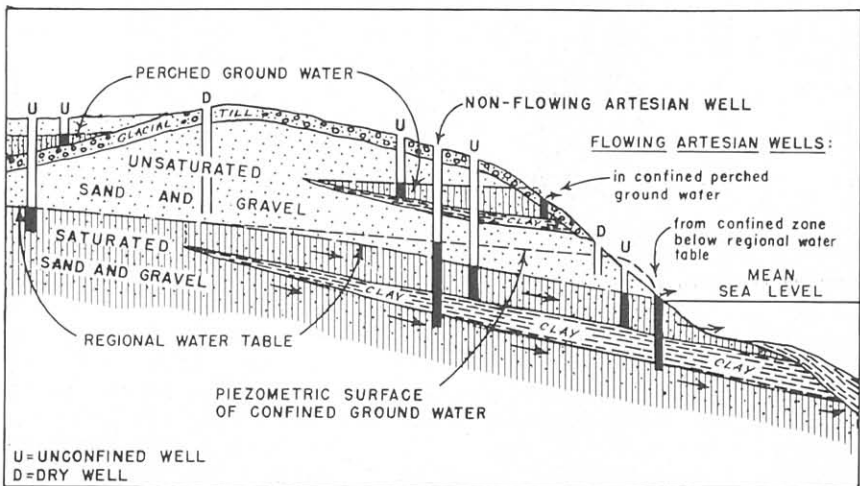


Figure 3. Diagrammatic geologic section showing general conditions of groundwater occurrence in the Straits-Puget Basin Province, western Washington. Arrows show direction of ground-water movement.

Under conditions where perched ground water is confined beneath the impermeable till (hardpan) which so widely mantles the upland areas, numerous domestic wells are found that obtain flows from shallow depths adequate for household and stock supplies. Such wells are usually located along the lower slopes of hills and in areas characterized by numerous hillside springs which in themselves may be generally depended upon for uncontaminated water supplies. However, as these perched ground-water zones are not extensive in area and are usually limited in storage capacity, flows are normally small and frequently only seasonal. Many of these wells and springs cease flowing during the late summer and fall months.

Some of the wells of largest flow in the State are found in this province and are those which obtain water from aquifers confined beneath the regional water table. Since the water table surface follows the general configuration of the land surface, broad upland areas form highs and lowland areas form lows in the regional water table. It may thus be seen that those wells located near the base of upland slopes and beach bluffs or along valley margins have the advantage of an adjacent rising of the water table which permits a similar rise in the piezometric surface

favorable to the occurrence of artesian flow. Such hydrologic conditions have provided large flows from wells located along the beach bluffs north of Steilacoom in Pierce County and in the Bremerton-Port Orchard area in Kitsap County, while the margins of the broad Puyallup River floodplain east of Tacoma have yielded several large artesian flows to industrial wells. Most of these large flows (300 to 1500 g.p.m.) have been obtained from wells drilled to great depths (600 to 1200 feet). These wells have penetrated several artesian zones in order to obtain the greatest economically feasible yields.

Farther inland, in the Duwamish River valley north of Kent, a well drilled to a depth of only 210 feet along the valley margin for J. W. Wilson (22/5E-6N1) had a measured flow of 1730 g.p.m. at the time of drilling in October of 1955 (Figures 4 and 5). The recharge area for this artesian zone lies in the extensive upland east of the Duwamish Valley.

Immediately west of the Town of Ferndale in Whatcom County the Mountain View upland has provided the topographic-geologic setting favorable for the occurrence of ground water under artesian conditions in the adjacent lowlands. Notable among the flowing wells here is that of C. H. Harlan (39/2E-30L1) which for many years has had an uncontrolled free flow of 80 to 130 g.p.m. in spite of several unsuccessful efforts to cap the well.

Although few flowing wells are reported to have obtained water from bed-rock aquifers within this province, one of particular note is that of W. E. Russell (24/5E-24R1) located on the upper north slope of Cougar Mountain southeast of Eastgate in King County. Here a flow of 450 g.p.m. was obtained from an artesian zone in sandstone and gravel lying beneath surficial glacial deposits.

Among the conditions causing wells to flow is that produced as a result of tidal fluctuations along the Puget Sound shoreline. Here the fresh water table near beach level will rise and fall with the tide, causing wells located near sea level to flow or increase flow during high tide and, conversely, to cease or decrease flow during low tide. These wells usually have very little pressure head and the flow is small in most cases. In some shoreline localities where the adjacent water table is very nearly at sea level, or has been caused to drop slightly below sea level by excessive pumping of the aquifer, wells may be subject to salt-water encroachment and contamination to the extent of making the water unsuitable for normal uses.

A flowing well of particular note relative to high salinity, with a chloride content of 4,500 parts per million (as compared to sea water chloride content of about 32,000 p.p.m.), is that of Kenneth Vander Griend (40/3E-28M1) south of Lynden in Whatcom County. Located far enough inland to be beyond the influence of saline contamination by Puget Sound waters, this 375-ft. deep well probably obtained its salinity from diluted marine waters trapped within the deeper Tertiary or early Pleistocene sediments underlying that area. The initial flow of the well when drilled in 1910 was about 50 g.p.m., but later plugging has reduced the flow to about 3 g.p.m.

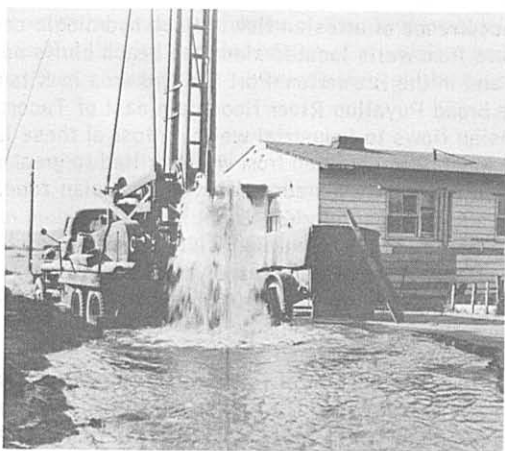


Figure 4. The J. W. Wilson well located north of Kent, King County, showing free flow of 1730 g.p.m. just after the artesian zone was penetrated.



Figure 5. The J. W. Wilson well (same as Figure 4 above), showing nozzled flow after the well was capped and valved.

Notable among the flowing artesian wells of the Straits-Puget Basin Province are those listed below, with owner's name, estimated or measured flow (or shut-in pressure in lbs./sq. in.), and date.

Whatcom County:

- 39/2E-30L1: C. H. Harlan, 80 to 150 g.p.m., 1942 and 1950.
39/4E-32M2: Mt. Baker School District No. 507, 500 g.p.m.,
Sept., 1933.
41/1E-31Q1: City of Blaine, 8 lbs. pressure, June, 1948.
41/4E-33H1: City of Sumas, 500 g.p.m., 5 lbs. pressure, May, 1959.

San Juan County:

- 37/2W-13B1: East Sound Water District, 90 g.p.m., April, 1955.

Skagit County:

- 36/4E-8M1: Alger Community Club, 75 g.p.m., Sept., 1960.

Snohomish County:

- 27/5E-30H1: Lloyd Weber, 500 g.p.m., May, 1953.

King County:

- 22/5E-6N1: J. W. Wilson, 1730 g.p.m., October, 1955.
24/5E-24R1: W. E. Russell, 450 g.p.m., June, 1958.
25/7E-6R1: Carnation Farms, 284 g.p.m., August, 1951.

Pierce County:

- 20/2E-20P1: Pioneer Sand and Gravel Co., 1000 g.p.m., March, 1947.
20/2E-29Q2: West Tacoma Newsprint Co., 580 g.p.m., date not known.
20/2E-32B2: West Tacoma Newsprint Co., 1500 g.p.m., July, 1938.
(Several other wells in this area flow 200 to 500 g.p.m.)
20/5E-7D1: Dieringer School District No. 343, 180 g.p.m., Sept.,
1954.
21/3E-35B1: Buffelen Lumber and Manufacturing Co., 350 g.p.m.,
1927.
21/3E-36P4: Kaiser Aluminum and Chemical Corp., 300 g.p.m., Nov.,
1954. (Several wells in lower Puyallup-Stuck valleys
flow 100 to 200 g.p.m.)

Thurston County:

- 18/2W-23J1: City of Olympia, 50 g.p.m., date not known. (Several
wells in this area have reported flows of 40 to 50 g.p.m.)
18/1E-5M1: Brown Farms, Inc., 360 g.p.m., Nov., 1957.

- 18/1E-18A1: E. Deck, Jr., 250 g.p.m., Feb., 1953.
 19/2W-9R2: Coopers Point Water Co., 110 g.p.m., Sept., 1939
 (tidal influenced).
 19/2W-33Q1: Butler's Cove Water Co., 200 g.p.m., 6½ lbs. pressure,
 date not known.

Mason County:

- 20/3W-20D2: Rayonier, Inc., 125 g.p.m., Sept., 1951.

Kitsap County:

- 24/1E-25E2: Annapolis Water District, 750 g.p.m., Oct., 1949.
 24/1E-25M1: City of Port Orchard, 400 g.p.m., 9 lbs. pressure,
 date not known.
 24/1E-33L1: City of Bremerton, 450 g.p.m., June, 1945.
 26/1E-10N1: U.S. Army NIKE Base, "exceptionally large flow"
 reported, 1958.
 26/1E-36N4: N.S. Navy, 300 g.p.m., date not known.

Clallam County:

- 30/3W-15G1: Coulter and Scott, 100 g.p.m., April, 1951.

Southern Coastal Province

The smallest of the designated provinces and including only Grays Harbor and Pacific Counties the Southern Coastal Province is comprised of the ground-water basins of the Willapa River and Willapa Bay and the lower Chehalis River-Grays Harbor areas. Also included are the major longshore spits and sand dunes bordering the Pacific Ocean on the west. The lowland ground-water areas of the province are underlain primarily by river-deposited sands, silts, and gravels eroded from adjacent uplands and re-worked glacial materials found as terrace deposits on the southern slopes of the Olympic Mountains.

The few flowing wells found in this province are those drilled or driven (sand points) along the coastal dune area north and south of the entrance to Grays Harbor, and at Tokeland and Bay Center on the shoreline of Willapa Bay, with one shallow 12-foot flowing well recorded as far inland as South Bend. These 2 to 6-inch wells penetrate to depths of 100 to 652 feet and flow only 5 to 15 g.p.m. The only flowing well of particular note here is that of Mr. Kite (16/11W-21D1) at Bay City which at high tide had a measured flow of 200 g.p.m.

Lower Columbia Province

This province includes Lewis, Cowlitz, Wahkiakum and Skamania Counties and encompasses the ground-water basins of the major valleys tributary to the lower

Columbia River. Since much of the province is characterized by rolling forested hills composed of dense, impermeable basalt, shale, and sandstone, ground-water supply is restricted primarily to the floodplains of the Columbia River and the lower valleys of the Cowlitz, Toutle, Coweman, Kalama, and Lewis Rivers, and the upper Chehalis watershed in the Chehalis-Centralia area.

One of the largest artesian basins in the State is found in the Newaukum River basin of Lewis County in the northern part of this province. Here several wells, including oil test wells, have been drilled to depths of up to 1580 feet and artesian flows of 400 to 600 g.p.m. are reported. Notable among the flowing wells of Lewis County are those listed below, with owner's name, estimated or measured flow (or shut-in pressure in lbs./sq. in.), and date.

- 13/1W-17K1: Ted Teitzel, 400 g.p.m., March, 1955.
- 13/1W-18K1: Inez Teitzel, 400 g.p.m., Feb., 1955.
- 13/1W-20C1: Ted Teitzel, 400 g.p.m., July, 1947.
- 13/2W-13H1: I. D. Gratiias, 500 g.p.m., 60-100 lbs. pressure, March, 1955.
- 13/2W-15K1: S. C. Breen, 525 g.p.m., Feb., 1952.
- 13/2W-16H1: Mollie Hamilton, 600 g.p.m., Sept., 1951.

Only a few flowing wells have been reported in the southern part of the Lower Columbia Province, and these have flows usually of only 2 to 10 g.p.m. with the largest flow being 50 g.p.m. reported in 1940 for the well of the Battle-ground School District No. 115 (4/2E-34R1) in Clark County. Cowlitz and Skamania Counties report no flowing wells, while Wahkiakum County reports only the well of Frank Schuster (8/6W-2B1) with a flow of 1 g.p.m.

Northeastern Province

Comprised of the mountainous watersheds of the Wenatchee, Entiat, Stehekin (Lake Chelan), Methow, Okanogan, Sanpoil, upper Columbia (Lake Roosevelt), Colville, Pend Oreille, and Spokane Rivers, the Northeastern Province covers Chelan, Okanogan, Ferry, Stevens, Pend Oreille, and Spokane Counties.

As most of the province is geologically composed of dense granites, gneisses, schists and dolomite-limestone, with some basalt flows impinging upon the southern margins, very little ground water has been found except in the bottoms and terrace slopes of the several major river valleys that transect the province in a north-south direction. Although covered by continental glaciers during parts of Pleistocene time, most of the glacial materials were deposited in the lower valleys and along valley sides, with the mountainous areas being primarily subject to erosion rather than to deposition of these sediments. The valley deposits of silt, sand and gravel provide the chief aquifers where they occur below the water table and adjacent to the rivers, and in those areas where bedrock does not immediately underlie the surface. Of the limited number of flowing artesian wells reported for this province

only a few have flows exceeding 50 g.p.m. Notable among the flowing wells of the province are those listed below, with owner's name, estimated or measured flow, and date.

Okanogan County:

- 31/24E-35L1: Town of Brewster, 100-400 g.p.m., date not known, (combination of well and tunnel).
34/26E-27R1: John Kermel, 75 g.p.m., June, 1947.

Stevens County:

- 32/40E-23R1: Northwest Magnesite Co., 180 g.p.m., July, 1953.
35/39E-10B1: City of Colville, 300 g.p.m., date not known.
35/39E-11K1: City of Colville, 120 g.p.m., 1938.
35/39E-11R2: City of Colville, 100 g.p.m., date not known.

Spokane County:

- 28/42E-28B1: L. M. Roberts, 60 g.p.m., May, 1952.

Columbia Plateau Province

This province, the largest of the five designated areas, includes the Washington portions of the Columbia Plateau and covers the principle drainage basins of the Yakima, central Columbia, Snake, and Walla Walla Rivers. The province includes Douglas, Grant, Lincoln, Adams, Whitman, Kittitas, Yakima, Klickitat, Benton, Franklin, Walla Walla, Columbia, Garfield, and Asotin Counties.

General Geology

Below surficial wind-blown deposits of loess and silt, and water laid sands, gravels, and clays, the Columbia Plateau Province is composed almost entirely of the Columbia River basalt. During Tertiary time (Eocene, Miocene, and probably Pliocene epochs) the basalt was extruded from numerous fissures and formed a thick sequence of lava flows which are widespread over large parts of eastern Washington, eastern Oregon, and western Idaho. The accumulated thickness of the basalt has never been completely penetrated, although test holes have been drilled to depths of over 10,000 feet in central portions of the area. In Idaho, the Snake River has cut a canyon over a mile deep exposing only basalt for the entire depth. Individual flows vary in thickness from a few feet to over a hundred feet, dependent upon their individual viscosities at the time of extrusion and their distances from points of fissure origin.

Occurring with the later stages of lava extrusion, particularly along the borders of the flow area where the lavas blocked existing river drainages, was the deposition of the Ellensburg formation which is composed of lake and river laid silts, clays, sands and gravels. In places these sedimentary materials are found inter-fingering with basalt flows.

After the basalt was extruded, and during the later stages of extrusion, the region was warped into the form of a broad basin, with the center of the basin located in the vicinity of Pasco, Washington. Several subbasins and synclinal depressions, separated by anticlinal ridges and plateaus, were formed by locally steeper folding and faulting of the basalt. Such elevated areas and intervening downwarped depressions are particularly noticeable in the western portion of the province and include, from north to south, the following major structures: Waterville Plateau, Quincey Basin, Frenchman Hills, Royal Slope-lower Crab Creek valley (separated by the Columbia River from the Ellensburg Basin farther west), Saddle Mountains (Manastash Ridge on west), Squaw Creek Basin, Umptanum Ridge, Wahluke Slope-Priest Rapids depression, Yakima Ridge, Rattlesnake Basin (Moxee-Ahtanum Basin on west), Rattlesnake Ridge (Ahtanum Ridge on west), lower Yakima Valley (White Swan valley on west), and Horseheaven Hills. The central portion of the Columbia Plateau Province encompasses the Columbia Basin Project area and has only a few minor folds, with the predominating structure being a gradual southward dip toward the Pasco Basin. The only other major structural basin beside the above mentioned is the Walla Walla Basin in the southern part of Walla Walla County, Washington, and the northern part of Umatilla County, Oregon. Although it is possible that the folding of the Columbia River basalt is still going on today at a greatly reduced rate, the major structures outlined above were apparently formed during the later stages of basalt extrusion in Miocene and Pliocene time.

During Pleistocene time, and with the advent of continental glaciers which occasionally covered the northern fringes of the Columbia Plateau Province, the Columbia River was forced from its course along the northern edge of the province and cut such large channels as today's Moses Coulee and Grand Coulee before returning to its earlier course upon the retreat of the ice front. The glacier terminus gave birth to numerous other large streams which, heavily loaded with sand and gravel, scoured channels across the surface of the basalt in the central part of the province. Occasional floods of large magnitude, resulting from the sudden release of ice-dammed lakes in the valleys of northeastern Washington and northern Idaho, have been postulated (Bretz, 1959) as being responsible for cutting the numerous shallow coulees which form today's "scablands" of eastern Washington.

Occurring during late Pliocene or early Pleistocene time was the deposition of the Ringold formation chiefly in the structural basins already described. These deposits consist primarily of fine sand, silt, and clay, with local beds of conglomerate. Where this formation occurs below the water table it yields meager supplies of ground water. Following this deposition was the mantling of much of the area by loess of the Palouse formation. This massive, structureless silt is believed to be wind-deposited material derived largely from clays and silts of glacial origin, and in part from the older Ringold formation. In most areas the Palouse formation is above the water table, but where saturated it yields small amounts of water to wells.

Occurrence of Artesian Wells

A primary characteristic of the basalt, and important to the accumulation of ground water, is the much fractured upper few feet of some flow units. This is caused by the differential cooling, shrinking and cracking of the surface of each flow as it

was extruded across the land surface. As succeeding flows covered older flows these fracture zones, along with the interbedded sedimentary materials, were covered by the impermeable basal portions of later, younger flows, thereby forming a condition favorable to the occurrence of artesian water where this condition occurs below the regional water table (Figure 6). Like all aquifers of the State, the basalt and interbedded sedimentary aquifers are recharged annually by seasonal precipitation and, in the vicinity of irrigation projects are artificially recharged by return irrigation waters. The water percolates downward to the aquifers via vertical joints which frequently characterize the otherwise impermeable portions of the basalt. Where several flows and fracture zones occur beneath the regional water table, and where lateral extent of separate flows result in some flows being supplied by recharge areas of different altitudes, a variance in pressure head may be obtained from two or more artesian depth zones. Wells drilled to depths which penetrate several such zones will frequently experience a rising water level or an increase in artesian flow as different aquifers are tapped.

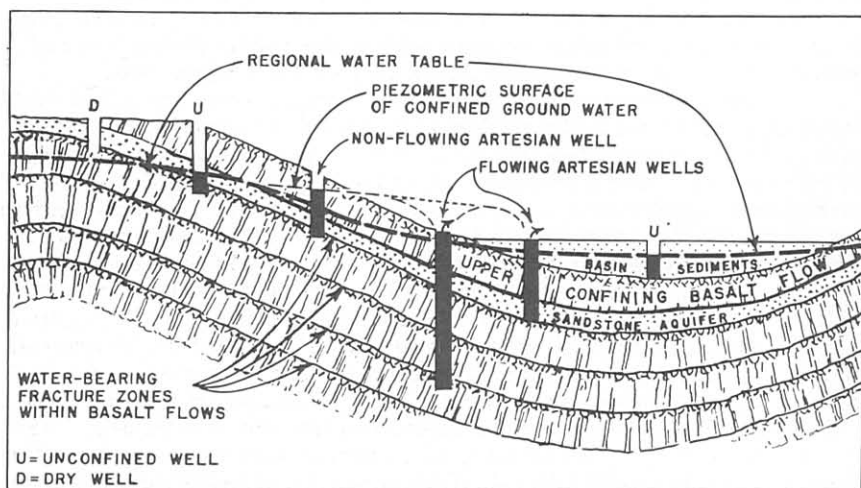


Figure 6. Diagrammatic geologic section showing general conditions of groundwater occurrence in the Columbia Plateau Province, eastern Washington.

As may be expected, the wells with the largest flows in the Columbia Plateau Province are those which occur in the structural basins. As shown in Plate I (in pocket), the greatest concentrations of flowing wells are those found in the Ellensburg Basin, Ahtanum-Moxee Basin, and the Walla Walla Basin. The largest producers are found in the latter two areas.

In the Ahtanum-Moxee Basin, a 1901 report by G. O. Smith records over 25 flowing artesian wells located in the vicinity of Moxee City. However, as only one or two of these original wells have been noted in more recent studies, it is not known whether or not the earlier wells have ceased flowing or have since been

abandoned. A notable characteristic of the earlier reported artesian water was the relatively high temperatures (66 to 80-degrees Fahrenheit). Today in the Moxee City area there are several wells with flows ranging from 500 to 875 g.p.m., while farther west in the Ahtanum Creek valley many wells have flows of 150 to 400 g.p.m.

In the lower Yakima Valley the City of Toppenish has a well with a flow of 660 g.p.m. reported in 1959. Farther west in the White Swan valley near Fort Simcoe, a well drilled by the Simcoe Oil Company (11/17E-24D1) had an estimated flow of 2000 g.p.m. and a water temperature of 72° F.

In northern Benton County, in Cold Creek valley, are found several wells which have flows ranging from 1500 to 2000 g.p.m. Most of these wells are now owned by the U.S. Atomic Energy Commission at the Hanford Project.



Figure 7. Irrigation of asparagus without use of pump, by the Baker and Baker Sweazy quarter well, Walla Walla County. At the time of completion in February, 1945, the well had a measured artesian flow of 2390 g.p.m. and a shut-in pressure of 74 lbs./sq. in. The well has been used to sprinkler-irrigate 467 acres of peas, asparagus, and other seed and row crops without requiring a pump.

In the Walla Walla Basin are many wells with flows in the range of 300 to 500 g.p.m. The largest flow so far reported in the State is that of the Baker and Baker Sweazy quarter well (6/37E-5F1) east of Walla Walla. In February of 1945 this well had a reported flow of 2390 g.p.m. Subsequently this well has been capable of irrigating over 450 acres without the use of a pump (Figure 7). Other

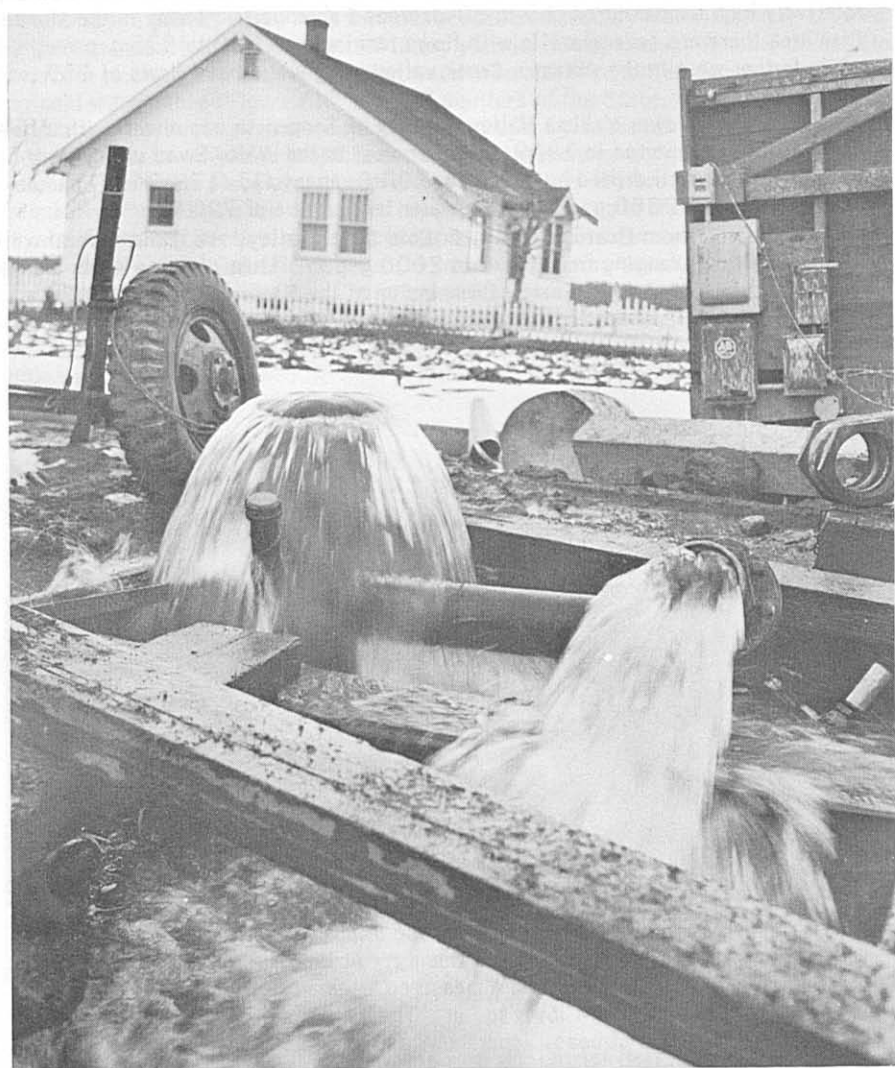


Figure 8. The Hydro District No. 12 well, Walla Walla County, showing the free flow of artesian ground water at the time of drilling (note flow from both main well and lateral extension pipe). When capped the well had a shut-in pressure of 20 lbs./sq. in. in March, 1948.

exceptionally large flows reported for the Walla Walla Basin are from the College Place Water Co. well (7/35E-36F5), with a flow of 2000 g.p.m. in 1947, and from the Hydro District No. 12 well (7/35-26F1), with a shut-in pressure of 20 lbs./sq. in. in 1948 (Figure 8).

In other parts of the Columbia Plateau Province a few large flows are recorded. In Whitman County several wells have been drilled near Glenwood which supply part of the municipal requirements of the City of Colfax. One of these wells (17/44E-32A2) had a flow of 1554 g.p.m. in 1927, although the shut-in pressure has since dropped to 2 lbs./sq. in. by 1945. In Lincoln County the largest producer is that of L. J. Bonney (22/33E-4F1) which had a flow of 570 g.p.m. in 1956.

Since so many wells in the Columbia Plateau Province have flows exceeding 100 g.p.m., only those with flows of 300 g.p.m. or more are listed below, with owner's name, estimated or measured flow (or shut-in pressure in lbs./sq. in.), and date.

Yakima County:

- 10/20E-9A1: City of Toppenish, 660 g.p.m., Dec., 1959.
- 11/17E-24D1: Simcoe Oil Co., 2000 g.p.m., date not know, water temperature 72° F.
- 12/17E-16D1: J. C. Schreiner, 640 g.p.m., June, 1952.
- 12/18E-1M1: Yakima Farm Labor Camp, 560 g.p.m., Nov., 1939.
- 12/19E-1Q1: Town of Moxee City, 875 g.p.m., Jan., 1943.
- 13/17E-26J1: H. E. Mason, 329 g.p.m., Feb., 1959.
- 13/18E-29Q1: George Wilson, 336 g.p.m., 1901.
- 15/17E-13C1: G. E. Cameron, 450 g.p.m., March, 1945.

Benton County:

- 13/24E-25E1: Jerry Ford, 2000 g.p.m., date not known.
- 13/24E-25E2: U.S. Atomic Energy Commission, 1700 g.p.m., 1950.
- 13/24E-26M1: Archie Brown, 2000 g.p.m., 1919 (1270 g.p.m., 1924).

Adams County:

- 15/37E-34C1: Oregon-Washington Railroad and Navigation Co., 300 g.p.m., Dec. 1949.

Lincoln County:

- 22/33E-4F1: L. J. Bonney, 570 g.p.m., Sept., 1956.

Whitman County:

- 17/44E-32A2: City of Colfax, 1554, 1927 (2 lbs. pressure, 1945).

Walla Walla County:

- 6/37E-5F1: Baker and Baker Sweazy Quarter, 2390 g.p.m., Feb., 1945.
 7/35E-36F5: College Place Water Co., 2000 g.p.m., July, 1947.
 (Numerous wells in College Place area flow 300 to 500 gpm)
 7/35-26F1: Hydro District No. 12, 20 lbs. pressure, March, 1948.

EXPLANATION OF TABULATED DATA

The data collected for this report are presented chiefly in tabular form on the pages that follow. The table contains records of all flowing artesian wells thus far recorded and reported to this office through well drillers' logs, existing publications and open-file reports, and miscellaneous records filed in this office.

Location of Wells

The location of all wells tabulated are shown on Plate 1 (in pocket). The wells are listed by county, with counties being listed alphabetically. Within each county the wells are listed in order of their locations northward from the Willamette Baseline and westward and eastward, respectively, from the Willamette Meridian, and within each township they are listed in numerical order of sections, and alphabetical order of 40-acre tracts (see Figure 1).

Well Records

Owner (or Tenant) and Location

The name of owner (or tenant) of the property upon which the well is located is accurate only so far as they existed at the time the well data was obtained, hence in subsequent years ownership or tenancy of the property may have changed and this information may no longer be in effect. The general location of the well is given relative to approximate road-mileage distances from nearby towns or road intersections.

Altitude

Altitude of land surface at the well is given in feet above mean sea level. As these were obtained primarily by interpolation between contour intervals shown on topographic maps, the degree of accuracy necessarily varies with the contour intervals that are available on the various quadrangle sheets. Most altitudes probably are accurate to 50 percent of the contour interval.

Water-Bearing Zone

The description of some materials penetrated varies considerably with the background of the driller or owner of the well. For example, glacial till has been variously referred to as "hardpan", "cemented gravel", or "bedrock"; fine silt has been called "clay"; compacted sand has been called "sandstone"; cobbles and boulders have been referred to as "rock"; water-bearing sand has been called "quicksand"; and the color, hardness and softness, and particle-size descriptions are frequently relative only and vary among individuals. However, in this tabulation only the water-bearing materials are described. In some cases the writer has found it necessary to re-define reported materials to a general standard nomenclature.

The depth interval of the water-bearing material gives the distance in feet from ground surface to the top and bottom of each aquifer reported. Although no detailed drillers' logs of the tabulated wells are given in this report, complete logs are on file with this office for most of those wells for which water-bearing material and depth interval are shown.

Flow, Shut-in Pressure, and Date

The amount of flow (gallons per minute) or shut-in pressure (pounds per square inch) was obtained from measurement or estimate on the date indicated and does not necessarily reflect the present artesian flow or pressure. The letter "F" indicates that the well flows but the quantity of flow is not known from existing records. Where no figure is entered in either of these two columns, the water level has been reported as either "0" or "at the surface." In such cases it is not known whether or not the well actually flows, and these wells are listed in this report on the presumption that during periods of high water table these wells may supply flowing water.

Remarks

Under "Remarks" are noted any additional pertinent information not listed elsewhere, such as the water-level drawdown (Dd) for a known pumping rate, effects of tidal fluctuation if known, depths of casing perforations or screens, water temperature, odor, and chemical hardness and chloride content in parts per million (ppm).

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FLOWING ARTESIAN WELLS IN WASHINGTON STATE

Well Number	Owner (or Tenant) and Location	Altitude (feet)	Dimensions		Depth of Casing (feet)
			Depth (feet)	Diam. (inches)	
ADAMS COUNTY:					
15/37E-34C1	Oregon-Washington RR & Navig. Co. --at Hooper Jct., 2½ mi. E of Palouse Falls.	1040	194	10	-----
ASOTIN COUNTY:					
	None recorded				
BENTON COUNTY:					
5/28E-8D1	Spokane, Portland & Seattle RR Co. --at Plymouth, 2 mi. W of McNary Dam.	275	629	12	-----
9/27E-6R1	O. J. Massingill --2 mi. N of Benton City.	460	20	48	20
13/24E-25E1	Jerry Ford --outside NW boundary of restricted area, Hanford Project.	900	777	-----	-----
25E2	U.S. Atomic Energy Commission --outside NW boundary of restricted area, Hanford Project.	900	----	10	-----
26G1	E. E. Meeker --outside NW boundary of restricted area, Hanford Project.	975	606 or 900?	-----	-----
26G2	U.S. Atomic Energy Commission --outside NW boundary of restricted area, Hanford Project.	975	----	10	-----
26M1	Archie Brown --outside NW boundary of restricted area, Hanford Project.	1030	668	6	-----
27J1	H. M. Lemcke --outside NW boundary of restricted area, Hanford Project.	1060	625	8-6	-----
13/24E-36D1	Cold Creek Development Co. --outside NW boundary of restricted area, Hanford Project.	910	1092	5	936
13/25E-30G1	U.S. Atomic Energy Commission --outside NW boundary of restricted area, Hanford Project.	820	1110	8	-----

Water-bearing Zone		Flow (gpm)	Shut-in Pressure (lbs./sq.in.)	Date	Remarks
Material	Depth Interval (feet)				
-----	-----	300	-----	12/28/49	Domestic & railroad supply.
basalt	-----	---	-----	-----	SWL: "at surface," may flow in winter & spring.
-----	-----	---	-----	4/--/47	SWL: "at surface," may flow in winter & spring; pumps 350 gpm.
basalt	-----	2000 R	85	-----	
basalt	-----	1700	-----	8/8/50	Valved.
basalt	595--- 760---	2000	71	-----	"Five artesian depth zones found in this district." --N. C. Janssen
basalt	-----	150	-----	8/4/50	Valved.
basalt	668---	2000 1270	-----	1919 1924	Temperature 77° F.
basalt	555-625	1600	22	1922	
basalt	855-868 923-926 954-961 973-1056 1059-1060 1082-1084 1088-1092	--- 4 50 50+ 50+ 1350	----- ----- ----- ----- ----- ----- 93	----- ----- ----- ----- ----- ----- 1924	Drilled 1922; 7 distinct artesian depth intervals (flow increase with depths penetrated shown opposite depth intervals); temperature 73° F.; valved.
basalt	680-824 860-990 998-1100	1375	75	1927	Valved.

FLOWING ARTESIAN WELLS IN WASHINGTON STATE

Well Number	Owner (or Tenant) and Location	Altitude (feet)	Dimensions		Depth of Casing (feet)
			Depth (feet)	Diam. (inches)	
<u>CHELAN COUNTY:</u>					
23/20E-21H1	H. F. Ohme --Ohme Gardens, N edge of Wenatchee.	850	28	35	18
<u>CLALLAM COUNTY:</u>					
30/3W-5B1	U.S. Government --3½ mi. N of Sequim.	50	265	6	-----
9K1	Grays Marsh Farms --2½ mi. NE of Sequim.	100	40	6	-----
15G1	Coulter & Scott --4 mi. NE of Sequim, 500' N of Gibson Spit.	30±	574	16-8	574
30/4W-21B1	Charles Spencer --4 mi. W of Sequim, N of U.S. 101.	230	38	6	-----
30/6W-11B1	Rayonier, Inc. --on Port Angeles waterfront.	10	500	10-8	-----
31/3W-18F1	Dungeness Lighthouse (U.S.D.C.) --end of Dungeness Spit.	5	667	----	-----
31/4W-26G1	San Juan Farms --on spit, 7 mi. N of Sequim.	5	98	6	-----
<u>CLARK COUNTY:</u>					
2/3E-25R1	J. B. Fields --2½ mi. NE of Camas.	190	213	6	208
25R2	M. G. Dole --2½ mi. NE of Camas.	210	208	6	203
3/1E-24K1	R. H. Todd --8 mi. N of Vancouver.	140	85	6	85
4/2E-34R1	Battleground School Dist. #115 --at Battleground.	295	301	12	300
4/3E-18N1	C. R. Horsch --at Heisson.	415	580	6	-----
19L1	E. E. Toivonen --1 mi. SE of Heisson, 4½ mi. NE of Battleground.	400	65	8	-----
19R1	Glenn Heagy --2 mi. SE of Heisson, 4½ mi. NE of Battleground.	450	45	6	-----
5/2E-35C1	E. D. Hazen --8 mi. E of LaCenter.	740	102	6	-----

Water-bearing Zone		Flow (gpm)	Shut-in Pressure (lbs./sq. in.)	Date	Remarks
Material	Depth Interval (feet)				
gravel	24-28	60	-----	10/5/53	Infiltration trench dug to develop spring flow, near base of hill.
-----	-----	64	-----	7/27/50	Hardness 112 ppm.
-----	-----	---	17	-----	"Flows".
gravel	515-554	100	-----	4/13/51	Perf: 523-569.
-----	-----	---	-----	6/16/60	Flows, "will pump dry."
-----	at 30	15	-----	6/--/41	Chloride 5 ppm (June, 1941), 550 ppm (July, 1947); flows from 30' depth, none below.
sand, gravel	-----	80	12	9/14/30	Originally flowed 80 gpm, later pumped 50 gpm.
sand	-----	2-3	-----	6/16/60	Hardness 126 ppm.
-----	-----	1½	20	-----	Flows 1½ gpm into tank 25' above ground surface.
"volcanic rock"	203-208	5	11	-----	Temp. 54° F.
red sand	84-85	15	-----	-----	
gravel	140-165	50	-----	8/14/40	Dd 70' at 200 gpm; Perf. at 100, 200, 140-180'.
-----	-----	F	-----	8/2/49	
gravel boulders	15-40 55-65	3-4	-----	12/16/58	Dd 15' at 200 gpm; Perf. 13-48; temp. 50° F.
-----	-----	9	-----	2/--/55	
sand, gravel	-----	1	-----	8/22/49	Flows 1 gpm ½' above land surface.

FLOWING ARTESIAN WELLS IN WASHINGTON STATE

Well Number	Owner (or Tenant) and Location	Altitude (feet)	Dimensions		Depth of Casing (feet)
			Depth (feet)	Diam. (inches)	
COLUMBIA COUNTY:					
	None recorded				
COWLITZ COUNTY:					
	None recorded				
DOUGLAS COUNTY:					
27/24E-1G1	Vernon McGrath --8 mi. NW of Mansfield.	-----	50	5	50
28/25E-26	G. A. Murrison --6 mi. N of Mansfield.	-----	210	12	-----
FERRY COUNTY:					
36/33E-184	Knob Hill Mines, Inc. --1 mi. S of Republic.	2290	60	6	60
GARFIELD COUNTY:					
12/42E-33P1	Raymond Gentry --1½ mi. E of Pomeroy.	1950	134	8	17
GRANT COUNTY:					
19/28E-11R1	C. F. Simons --1 mi. NE of Moses Lake.	1074	175	10	-----
11R2	Homer Osborn --1 mi. NE of Moses Lake.	1070	115	6	21
24/28E-3K1	Northern Pacific RR Co. --½ mi. S of Coulee City.	-----	7	80	-----
25/28E-34Q1	R. F. Drake --Coulee City.	-----	112	8	12
GRAYS HARBOR COUNTY:					
15/11W-5N1	Grays Harbor County --½ mi. E of Grayland, end of Smith Rd.	160	652	10-6	-----
16/11W-19K1	C. H. Roberts --¼ mi. W of South Bay, across bridge from Bay City.	5	180	2	-----
21D1	----- Kite --at Bay City.	20	525	-----	-----
16/12W-24G1	Tony Cufula --¼ mi. N of Twin Harbors State Park.	10	95	6	-----

Water-bearing Zone		Flow (gpm)	Shut-in Pressure (lbs/sq.in.)	Date	Remarks
Material	Depth Interval (feet)				
sand	40-50	5½	-----	2/9/53	Perf. 0-50', 10 holes/ft.
"shale"	187-200	100	-----	5/2/57	Exact location within section not determined.
gravel	56-60	----	-----	1940	SWL at surface may flow in winter season; Perf. 56-60.
sandstone(?) below basalt	45-134	----	-----	-----	SWL at surface may flow in winter season; Dd 24' at 115 gpm; Perf. 0-17'.
basalt	-----	F 4½	-----	5/4/56 5/1/58	
basalt	-----	F	-----	4/21/55	
-----	-----	F	-----	-----	Sump.
basalt	-----	10	-----	1923	4' Dd at 9 gpm (?).
-----	-----	8	-----	5/21/56	Hardness 75 ppm, chloride 12 ppm.
-----	-----	15	-----	11/20/47	Flows at high tide only.
gravel	-----	200	-----	-----	Flows at high tide; hardness 50 ppm, chloride 12 ppm.
sand	-----	F	-----	1945	Hardness 35 ppm, chloride 16 ppm.

FLOWING ARTESIAN WELLS IN WASHINGTON STATE

Well Number	Owner (or Tenant) and Location	Altitude (feet)	Dimensions		Depth of Casing (feet)
			Depth (feet)	Diam. (inches)	
<u>GRAYS HARBOR COUNTY (Continued):</u>					
18/12W-27F1	Ralph Minard -- $\frac{1}{2}$ mi. N of Pt. Brown on peninsula.	12	358	6	358
<u>ISLAND COUNTY:</u>					
29/2E-9E1	E. F. Sawyer -- $\frac{1}{2}$ mi. W of Freeland.	15	60	6	-----
-----	Sea Products Co. --location not determined.	-----	403	-----	-----
32/2E-22H1	C. W. Brokaw --on Camano Island, $1\frac{1}{2}$ mi. W of Utsa- laddy.	80	178	8	-----
32/3E-19G1	Marten Melum --on Camano Island, $1\frac{1}{2}$ mi. E of Utsa- laddy.	200	15	60	-----
33/1E-32P1	T. E. Ostrom --3 mi. W of Oak Harbor.	160	75	14	75
<u>JEFFERSON COUNTY:</u>					
29/1W-22R1	N. W. Short --2 mi. S of Chimacum.	130	105	12	105
<u>KING COUNTY:</u>					
20/6E-8J1	J. G. Puls --4 mi. NW of Enumclaw	600	17	6	0
21/4E-1Q1	Mrs. F. Schnider -- $\frac{1}{2}$ mi. N of Auburn.	55	179	8	-----
35R1	T. T. Shigio -- $4\frac{1}{2}$ mi. S of Auburn.	80	257	6	257
22/4E-1A1	Fritz Leisinger --1 mi. N of O'Brien, $3\frac{1}{2}$ mi. S of Renton.	20	260	3	260
4F1	King Co. Water Dist. No. 75 -- $\frac{1}{2}$ mi. S of Seattle-Tacoma Airport.	250	545	18- 12- 8	545
12H1	J. T. & G. Komoto --at O'Brien, 2 mi. N of Kent.	30	321	6	321
16N1	King Co. Water Dist No. 75 --1 mi. SW of Midway, 1 mi. SE of Des Moines.	150	145	12	124

Water-bearing Zone		Flow (gpm)	Shut-in Pressure (lbs/sq. in.)	Date	Remarks
Material	Depth Interval (feet)				
gravel	350-358	F	-----	-----	Dd 120' at 50 gpm.
-----	30-60	20	-----	1/4/47	
sand, gravel	354-358 375-401	35	-----	3/12/32	Drilled by N. C. Janssen in 1932; data on this well obtained from N. C. Janssen's booklet <u>Ground Water Conditions in the State of Washington</u> ; well described as on "south end of Whidbey Island."
coarse sand, gravel	170-178	4	-----	9/24/49	Screen 170-178'.
sand	4-15	----	40	2/17/61	Pressure at 1½" pipe.
sand	50-75	----	-----	-----	SWL at surface, could flow during winter season; Perf. 50-75'.
coarse sand, gravel	50-60 75-88 95-100	F	-----	8/28/56	Dd 11' at 250 gpm; Perf. 50-60, 75-80, 88-95, 100-105'; temp. 49° F.
sand	16-17	----	-----	-----	SWL at surface, may flow during winter season; "yields 36 gpm."
sand, gravel	146-165	25	-----	4/15/53	Dd 16' at 250 gpm; Perf. 160-165'.
sand	-----	F	-----	3/26/51	Dd 65' at 150 gpm; Perf. 150-250'.
gravel	255-260	55	28	1921	Perf. 255-260'.
sand, gravel	83-150 210-243 510-545	----	-----	-----	SWL at surface, may flow during winter season; Perf. 72-160, 190-243, 511-541'.
sand, gravel	210-218	75	34	-----	Perf. 313-321'.
gravel	101-145	75	2	3/26/57	Dd 91' at 725 gpm; screened 125-145'; temp. 56° F.

FLOWING ARTESIAN WELLS IN WASHINGTON STATE

Well Number	Owner (or Tenant) and Location	Altitude (feet)	Dimensions		Depth of Casing (feet)
			Depth (feet)	Diam. (inches)	
<u>KING COUNTY: (Continued)</u>					
22/4E-24N1	Pictsweet Foods, Inc. --SW edge of Kent.	25	287	10	287
22/5E-6N1	J. W. Wilson -- $\frac{1}{4}$ mi. N of O'Brien, 2 mi. N of Kent.	30	210	6	202
7M1	R. R. Reiter -- $\frac{1}{4}$ mi. S of O'Brien, $1\frac{1}{2}$ mi. N of Kent.	30	180	6	180
22/5E-7P1	D. D. Lewis -- $1\frac{1}{2}$ mi. N of Kent.	32	149	6	149
7P2	O'Brien Water Users Assn., Inc. -- $1\frac{1}{2}$ mi. N of Kent.	32	170	8	150
23/4E-4A1	Boeing Airplane Co. (formerly Acme Packing Co. well) -- $\frac{1}{2}$ mi. N of Renton cutoff, W side of U.S. 99.	10	686	12-8	686
23/6E-22Q1	W. H. Haviland --5 mi. S of Issaquah.	290	250	8	183
24/4E-5E1	Pacific Fruit & Produce Co. --Seattle: Occidental Ave. & King St.	10	----	3	-----
5F1	Rainier Heat & Power Co. --Seattle, 512 - 5th Ave. So.	25	350	10	-----
24/5E-4D1	City of Bellevue (King Co. Water Dist. No. 68) --1 mi. SE of Bellevue.	56	610	12-8	600
10D1	L. R. Capper --3 mi. SE of Bellevue.	65	15	36	-----
10D2	L. R. Capper --3 mi. SE of Bellevue.	65	72	6	70
13H1	L. C. Gibson --4 mi. NW of Issaquah, near Vasa Park, L. Sammamish.	150	300	8	300
14R1	G. W. Bondo --on N slope Cougar Mtn., $1\frac{1}{2}$ mi. SE of Eastgate.	700	123	6	60
24/5E-16H1	C. D. Smith (formerly J. Hudack) -- $1\frac{1}{2}$ mi. SE of Eastgate.	230	88	6	86

Water-bearing Zone		Flow (gpm)	Shut-in Pressure (lbs/sq.in.)	Date	Remarks
Material	Depth Interval (feet)				
sand, gravel	-----	---	-----	-----	SWL at surface, may flow during winter season; screened 230-284.
sand	166-169	1730	-----	10/--/55	
sand, gravel	170-180	30	12	5/9/59 7/4/59	Dd 2' at 40 gpm; Perf. 170-180'; temp. 42° F.
-----	-----	F	-----	-----	Water right for 100 gpm.
sand, gravel	46-51 69-80 150-152	60	-----	4/14/51	Dd 18' at 100 gpm.
sand	500-590 650-680	90 30	----- -----	1947 1956	Dd 80' at 180 gpm; Perf. 500-590, 650-680'; temp. 53° F., plugged and buried beneath building in 1956.
sand, gravel	10-20 32-50 90-93 106-111	1	-----	12/23/51	Dd 105' at 30 gpm; Perf. 105-118'.
-----	-----	F	-----	9/18/53	"Yields" 42 gpm.
-----	-----	F	-----	9/17/53	"Yields" 150 gpm.
sand, gravel	-----	F	-----	3/14/51	
-----	-----	F	-----	2/12/51	
-----	-----	1½	-----	9/21/51	
gravel	-----	3-4	-----	8/9/51	
sandstone	-----	---	0.04	2/6/51	
-----	-----	1	-----	9/21/58	Odor of H ₂ S.

FLOWING ARTESIAN WELLS IN WASHINGTON STATE

Well Number	Owner (or Tenant) and Location	Altitude (feet)	Dimensions		Depth of Casing (feet)
			Depth (feet)	Diam. (inches)	
<u>KING COUNTY: (Continued)</u>					
24/5E-16M1	J. R. Cluck --3 mi. SW of Eastgate.	65	277	6	277
23C1	Hilltop Community, Inc. --N slope of Cougar Mtn., 1½ mi. S of Eastgate.	880	312	12-8	312
24R1	W. E. Russell --S slope of Cougar Mtn., 4 mi. SE of Eastgate.	1200	265	10-8	47
29K1	J. Chideak --3½ mi. N of Renton.	30	400	6	-----
29Q1	J. L. Shaw --3½ mi. N of Renton.	50	72	6	72
24/6E-6A1	M. A. Obermarck --E shore L. Sammamish, 7 mi. NW of Issaquah.	40	94	6	-----
6A2	T. Mason --E shore L. Sammamish, 7 mi. NW of Issaquah.	40	103	6	103
6H1	Mint Grove Community --E shore L. Sammamish, 7 mi. NW of Issaquah.	40	50	8	-----
16L1	R. A. Maugan --2 mi. N of Issaquah.	60	72	2	72
19P1	Edgehill Water Assn. --S slope of Cougar Mtn., 4½ mi. SE of Eastgate.	750	255	8	62
21J1	Al Peters --1 mi. N of Issaquah.	50	150	6	150
21N1	Pickering Bros. --1 mi. NW of Issaquah.	51	76	6	71
21R1	I. Tibbetts --½ mi. N of Issaquah.	50	60	1½	60
21R2	I. Tibbetts --½ mi. N of Issaquah.	70	70	1½	70
27Q1	City of Issaquah --E edge of Issaquah.	225	45	8	45
24/7E-11L1	Fall City Water Co. --½ mi. N of Fall City.	330	-----	-----	-----

Water-bearing Zone		Flow (gpm)	Shut-in Pressure (lbs/sq.in.)	Date	Remarks
Material	Depth Interval (feet)				
sand	274-277	2½	-----	2/6/51	Dd 38' at 9 gpm; clay 9'-274'.
gravel, sand- stone	52-312	65	-----	6/--/48	Dd 7' at 50 gpm.
sandstone, gravel	at 118	450	12	6/28/58	Temp. 48° F.
-----	-----	F	-----	6/14/57	
-----	-----	9	-----	8/2/51	Odor of H ₂ S.
sand	-----	F	-----	10/23/51	
coarse sand	68-103	F	-----	10/20/57	'3" pipe flows full'; Perf. at 68'.
sand	-----	F	-----	10/23/51	Supplies 19 families.
sand, gravel	-----	F	-----	10/19/51	Flows less than 1 gpm.
sandstone	70-145	----	-----	1/29/53	SWL at surface, may flow in winter season; Dd 115' at 7 gpm, 230' at 30 gpm.
sand, gravel	70-120	10	-----	1957	Dd 125' at 290 gpm, flowed 20 gpm when drilled.
sand, gravel	-----	8	-----	6/15/57	
-----	-----	1½	-----	10/19/51	Odor of H ₂ S, contains iron
-----	-----	3½	-----	10/19/51	
-----	-----	80	-----	8/20/51	
-----	-----	50	-----	8/20/51	Depth & diameter not determined; may be a developed spring zone.

FLOWING ARTESIAN WELLS IN WASHINGTON STATE

Well Number	Owner (or Tenant) and Location	Altitude (feet)	Dimensions		Depth of Casing (feet)
			Depth (feet)	Diam. (inches)	
KING COUNTY: (Continued)					
25/4E-31E1	Booth Fisheries Corp. --Seattle waterfront, foot of Wall St.	10	785	12	785
31E2	Booth Fisheries Corp. --Seattle waterfront, foot of Wall St.	10	120	7	110
31F1	Port of Seattle --Seattle waterfront.	0	732	12-8	732
31R1	Olympic Warehouse & Cold Storage Co. --Seattle waterfront.	10	190	8	-----
25/5E-2N1	L. L. Jones --1 mi. W of Redmond.	135	-----	6	-----
24L1	W. Gragg --3 mi. S of Redmond.	290	8	36	8
32N1	King Co. Water Dist. No. 68 --at Bellevue.	25	1056	24-12	485
25/6E-18Q1	W. Quackenbush --5 mi. NE of Redmond.	75	286	4	-----
19A1	Weber Point Community --E shore L. Sammamish, 3 mi. SE of Redmond.	40	200	6	200
31R1	M. R. Sipherd --E shore L. Sammamish, 6½ mi. SE of Redmond.	40	58	8-6	58
31R2	Clyde Risk --E shore L. Sammamish, 6½ mi. SE of Redmond.	40	128	10-6	-----
31R3	Ed Still --E shore L. Sammamish, 6½ mi. SE of Redmond.	40	73	8	-----
32F1	James Hart --E shore L. Sammamish, 6 mi. SE of Redmond.	60	96	6	-----
25/7E-6R1	Carnation Farms --6 mi. S of Duvall, W side of Snoqual- mie River.	63	630	16- 12- 10- 8	630
26/4E-1E1	Henry LaFond --1 mi. N of Kenmore, 2 mi. E of Bothell.	100	119	6	119

Water-bearing Zone		Flow (gpm)	Shut-in Pressure (lbs./sq.in.)	Date	Remarks
Material	Depth Interval (feet)				
		F		9/11/53	"Yields 120 gpm"; high chloride content.
		F		9/11/53	"Yields 250 gpm"; high chloride content.
		F		1933	May no longer flow. Dd 100' at 65 gpm from SWL of 8' on 9/11/53.
sand, gravel		F		9/11/53	
		2		4/11/51	Hardness 112 ppm, chloride 18 ppm.
		F		3/29/51	
sand, gravel		60		7/27/47	Dd 57' at 900 gpm, Perf. 270-475; plugged back to 475.
		7		5/22/51	Supplies 5 families; odor of H ₂ S; hardness 72 ppm, chloride 16 ppm.
sand		10		5/22/51	Dd 15' at 40 gpm; hardness 62 ppm, chloride 14 ppm; serves 17 families.
sand, gravel	55-58	30		1/6/56	
silt gravel	50-69 127-128	100		7/1/61	"Gravel shot 20' straight out" at time of drilling, July 1961.
coarse gravel	70-73	15		11/10/60	Faucet-valve slightly open to decrease pressure which would otherwise cause springs to flow around well casing.
sand		2		7/5/51	Hardness 76 ppm, chloride 12 ppm.
gravel, sand	567-592	284	6	8/10/51	
gravel, sand		F		6/7/51	Flows less than 1 gpm.

Well Number	Owner (or Tenant) and Location	Altitude (feet)	Dimensions		Depth of Casing (feet)
			Depth (feet)	Diam. (inches)	
KING COUNTY: (Continued)					
26/4E-3J1	P. E. Proctor --1 mi. NW of Kenmore.	280	84	6	-----
3Q1	King Co. Water Dist. No. 83 --1 mi. W of Kenmore.	280	186	8	-----
10J1	O. Hoganson --at Lake Forest Park.	20	65	6	-----
13L1	F. L. Gochanour --1½ mi. S of Kenmore.	400	31	30	15
16Q1	Acacia Memorial Park --W shore L. Washington, 1½ mi. N of Lake City.	250	287	10	287
36C1	King Co. Water Dist. No. 40 --½ mi. W of Juanita.	80	73	6	73
26/5E-1R1	S. C. Calkins --3½ mi. E of Woodinville on old Duvall highway.	260	97	6	-----
7F1	D. K. Graham --¼ mi. W of Bothell.	200	6	48	6
7J1	M. E. Haller --¼ mi. S of Bothell.	40	84	6	84
8M1	Bothell Water District --at Bothell.	50	56	8	56
9G1	North Creek Oil & Gas Co. --at Woodinville.	25	1208	12-5	-----
12A1	Chester Vert --3½ mi. E of Woodinville on old Duvall highway.	265	34	6	34
18A1	C. W. Ostorm --2/3 mi. S of Bothell, on Juanita road.	175	115	6	115
23E1	George Campi --2½ mi. SE of Woodinville, 4½ mi. N of Redmond.	45	45	8	45
23F1	Church of Latter Day Saints --3 mi. SE of Woodinville, 4 mi. N of Redmond.	50	237	6	237
23P1	Bert Meyers --3 mi. SE of Woodinville, 3½ mi. N of Redmond.	45	50	6	50

Water-bearing Zone		Flow (gpm)	Shut-in Pressure (lbs/sq. in.)	Date	Remarks
Material	Depth Interval (feet)				
sand	-----	F	-----	6/7/51	Supplies 3 families.
gravel	-----	F	-----	12/16/59	Dd 65' at 500 gpm in 4 hrs.
sand, gravel	-----	F	-----	10/14/53	
sand	-----	F	-----	1958	Temp. 50° F.
sand, gravel	-----	F	-----	3/12/44	
sand	-----	F	0.25	7/12/51	
-----	-----	F	-----	10/7/52	Hardness 42 ppm, chloride 12 ppm.
-----	-----	F	-----	7/30/51	
sand	-----	F	-----	7/30/51	Dd 14' at 10 gpm; odor of H ₂ S; high iron content.
sand, gravel	-----	F	-----	6/22/51	May no longer flow.
sand, gravel	-----	10	-----	8/29/51	
sand, gravel	-----	3	-----	10/7/52	Flowed 9 gpm, with 7' head (3# pressure) when first drilled; hardness 44 ppm, chloride 10 ppm.
gravel	at 115	F	-----	8/28/51	Hardness 54 ppm, chloride 20 ppm.
sand	-----	F	-----	8/3/51	Odor of H ₂ S; hardness 60 ppm, chloride 12 ppm.
sand, gravel	-----	F	-----	7/30/51	Odor of H ₂ S; hardness 80 ppm, chloride 12 ppm.
-----	-----	F	-----	8/3/51	Hardness 46 ppm, chloride 14 ppm.

Well Number	Owner (or Tenant) and Location	Altitude (feet)	Dimensions		Depth of Casing (feet)
			Depth (feet)	Diam. (inches)	
<u>KING COUNTY: (Continued)</u>					
26/5E-23E1	K. Abe --3 mi. SE of Woodinville, 3½ mi. N of Redmond.	100	82	6	82
26C1	H. Schiessl --3 mi. N of Redmond on Woodinville highway.	75	169	6	168
26H1	A. H. Kemp --3 mi. N of Redmond, ½ mi. E of Wood- inville highway.	100	225	6	-----
26L1	L. Ulrich --2½ mi. N of Redmond.	50	218	6	-----
26/6E-7G1	Norm Fragner --4½ mi. E of Woodinville.	255	44	6	44
12C1	Elsie Chapman --1 mi. N of Duvall.	40	290	6	-----
12E1	James Wallace --1 mi. N of Duvall.	35	305	6	-----
13D1	Art Herman --at Duvall.	45	206	6	-----
19Q1	A. C. Rubens --4½ mi. NE of Redmond.	125	51	30-2	51
20M1	C. M. Welch --5 mi. NE of Redmond.	140	65	6	65
20M2	C. H. Fordney --5 mi. NE of Redmond.	145	72	6	72
26/7E-6D1	W. Roetcisoender --3 mi. N of Duvall.	30	340	6	-----
<u>KITSAP COUNTY:</u>					
22/1E-1M1	E. P. Eberle --½ mi. N of Burley.	40	62	6	62
1P1	B. Flanders --at Burley.	80	337	2	337
2R1	R. Stevens --at Burley.	30	387	2	200
11A1	Burley Improvement Club --at Burley.	50	404	2	404
12D1	E. Knapp --at Burley.	25	353	2	343

Water-bearing Zone		Flow (gpm)	Shut-in Pressure (lbs/sq.in.)	Date	Remarks
Material	Depth Interval (feet)				
sand	-----	F	-----	9/21/51	Hardness 54 ppm, chloride 10 ppm.
gravel	163-169	4	-----	11/6/58	Dd 15' at 20 gpm.
silt	-----	2	-----	10/22/52	Dd 10' at 20 gpm.
-----	-----	F	-----	9/21/51	
sand	-----	F	-----	11/9/51	Hardness 36 ppm, chloride 14 ppm.
-----	-----	F	-----	11/20/52	Hardness 106 ppm, chloride 40 ppm.
sand	-----	F	-----	11/20/52	Dd 75' at 30 gpm, hardness 92 ppm, chloride 32 ppm.
-----	-----	F	-----	11/20/52	Hardness 96 ppm, chloride 16 ppm.
sand	at 51	20	8.6	9/25/52	
sand	-----	3	-----	9/24/52	Hardness 46 ppm, chloride 8 ppm.
sand	-----	F	-----	9/24/52	
sand	308-311	F	-----	12/30/59	
sand, gravel	55-62	F	-----	7/15/49	Hardness 50 ppm, chloride 5 ppm.
-----	-----	F	-----	-----	Odor of H ₂ S.
fine sand	-----	----	40	12/14/49	Odor of H ₂ S.
-----	-----	----	38	-----	Supplies 18 families. Hardness 45 ppm, chloride 3 ppm.
sand	343-353	----	44	-----	Temp. 51° F; odor of H ₂ S; hardness 40 ppm, chloride 3 ppm.

FLOWING ARTESIAN WELLS IN WASHINGTON STATE

Well Number	Owner (or Tenant) and Location	Altitude (feet)	Dimensions		Depth of Casing (feet)
			Depth (feet)	Diam. (inches)	
<u>KITSAP COUNTY: (Continued)</u>					
22/1E-12D2	E. C. Hatch --at Burley.	25	485	6	-----
12N1	E. Black --½ mi. S of Burley.	20	220	6	220
23/1E-36E1	K. Price --2 mi. N of Burley.	135	197	8	-----
36M1	K. Price --1½ mi. N of Burley.	130	205	6	205
24/1E-5D1	A. O. Olson --½ mi. S of Chico, 6½ mi. NW of Bremerton.	40	1840	6	-----
5E1	Erland's Point Water Co., Inc. --1 mi. S of Chico, 6 mi. NW of Bremerton.	100	251	12	251
5N1	D. C. Rockwell --1½ mi. S of Chico, 5½ mi. NW of Bremerton.	65	127	6	-----
23B1	U.S. Navy --Bremerton Navy Yard.	20	748	6-4½	-----
25C1	--- Smith --at Annapolis.	10	160	3	30
25E1	Silver Springs Brewing Co. (leased by Port Orchard Water Dept.) --at Port Orchard.	10	314	6	314
25E2	Annapolis Water District --at Annapolis.	35	1133	20- 12- 10	1133
25G1	U.S. Federal Housing Authority --½ mi. S of Annapolis.	140	1005	24- 12- 10	1005
25M1	City of Port Orchard --at Port Orchard.	17	806	16- 12- 10	806
26K1	City of Port Orchard --at Port Orchard.	17	422	6	422
26K2	Callison's Evergreen Co. --at Port Orchard.	17	285	4	272
26K3	J. W. Huth --at Port Orchard.	10	88	4	88

Water-bearing Zone		Flow (gpm)	Shut-in Pressure (lbs./sq. in.)	Date	Remarks
Material	Depth Interval (feet)				
sand	at 385	----	38	4/10/50	Odor of H ₂ S; hardness 45 ppm, chloride 3ppm.
sand	-----	600	-----	1944	Odor of H ₂ S.
sand, gravel	-----	5	-----	8/1/49	Dairy supply.
fine gravel	198-200	F	-----	4/24/50	Hardness 52 ppm, chloride 5 ppm.
-----	-----	F	-----	7/26/50	Oil test well drilled to 1840 ft; supplies 5 families; hardness 46 ppm, chloride 7 ppm.
sand, gravel	30-47 95-100 117-224 230-243	30	-----	3/23/55	Dd 40' at 500 gpm; Perf. 140-224, 238-243.
-----	-----	F	-----	7/26/50	Hardness 42 ppm, chloride 10 ppm. Supplies 2 families.
sand	-----	F	-----	-----	-----
gravel	-----	F	-----	6/20/50	Not used; odor of H ₂ S; hardness 78 ppm, chloride 8 ppm.
sand	-----	130	-----	-----	Odor of H ₂ S.
sand, gravel	437-548	750	1.2	10/--/49	Dd 55' at 1700 gpm in 45 hrs; Perf. 437-548; slight odor of H ₂ S; backfilled to 600 ft.
gravel sand	785-900 980-1005	F	-----	4/2/45	Dd 114' at 350 gpm; Perf. 785-900, 980-1005.
sand, gravel	-----	400	9	-----	-----
sand, gravel	257-267	F	-----	-----	City well #3.
sand	278-285	----	13	3/23/40	Odor of H ₂ S; temp. 49° F.
sand, gravel	80-88	F	-----	3/4/40	Hardness 60 ppm, chloride 5 ppm.

FLOWING ARTESIAN WELLS IN WASHINGTON STATE

Well Number	Owner (or Tenant) and Location	Altitude (feet)	Dimensions		Depth of Casing (feet)
			Depth (feet)	Diam. (inches)	
<u>KITSAP COUNTY: (Continued)</u>					
24/1E-26N1	Wilkins District Co. --at Port Orchard.	20	197	3	197
26P1	E. Curfman --at Port Orchard.	10	150	1½	-----
27J1	J. H. Gibbs --½ mi. W of Port Orchard.	10	156	1½	-----
27J2	R. M. Stevenson --½ mi. W of Port Orchard.	10	118	1½	25
27R1	W. L. Wheeler --½ mi. W of Port Orchard.	15	150	3-2	-----
27R2	D. B. Rodepouch --½ mi. W of Port Orchard.	15	165	1½	-----
32J1	G. M. Dickenson --at Gorst.	30	400	6	-----
32K1	P. L. Hudson --at Gorst.	15	206	6	206
33H1	A. Van Hee --1 mi. E of Gorst.	10	76	-----	-----
33H2	H. Cohen --1 mi. E of Gorst.	10	65	3	-----
33H3	E. Johnson --1 mi. E of Gorst.	10	65	3	65
33H4	C. M. Richards --1 mi. E of Gorst.	10	80	3	80
33H5	R. E. Gormely --1 mi. E of Gorst.	10	67	2½	-----
33K1	City of Bremerton --1 mi. E of Gorst.	45	275	8-6	275
33K2	City of Bremerton --1 mi. E of Gorst.	45	245	30-22	245
33K3	City of Bremerton --1 mi. E of Gorst.	55	538	16-8	538
33K4	City of Bremerton --1 mi. E of Gorst.	60	401	12-8	401
33K5	City of Bremerton --1 mi. E of Gorst.	35	587	16	589

Water-bearing Zone		Flow (gpm)	Shut-in Pressure (lbs/sq.in.)	Date	Remarks
Material	Depth Interval (feet)				
sand, gravel	188-190½	F	-----	6/20/50	Hardness 62 ppm, chloride 7 ppm; odor of H ₂ S.
sand	-----	F	-----	6/20/50	Hardness 66 ppm, chloride 6 ppm.
gravel	-----	F	-----	6/20/50	Hardness 62 ppm, chloride 7 ppm.
gravel	-----	5	-----	8/--/39	Hardness 46 ppm, chloride 7 ppm.
gravel	-----	F	-----	6/20/59	Supplies several families.
sand	-----	F	-----	10/--/39	Hardness 74 ppm, chloride 7 ppm.
sand	-----	F	-----	-----	Hardness 64 ppm, chloride 9 ppm.
-----	-----	F	-----	12/--/39	
sand, gravel	-----	F	-----	4/16/40	
gravel	-----	F	-----	5/19/50	Supplies 2 families.
sand	-----	F	-----	5/19/50	Supplies 2 families.
sand	-----	F	-----	5/20/50	
-----	-----	F	-----	5/19/50	Supplies 3 families.
sand, gravel	190-275	F	31.5	9/--/41	City well #1, (test well).
sand, gravel	160-240	F	-----	1949	City well #2; Dd 128' at 1400 gpm; hardness 48 ppm, chloride 8 ppm.
sand, gravel	-----	F	-----	1949	City well #3; Dd 101' at 750 gpm; hardness 64 ppm, chloride 7 ppm.
sand, gravel	-----	F	-----	1949	City well #4.
sand, gravel	-----	F	21.5	1949	City well #5; Dd 245' at 500 gpm; hardness 50 ppm, chloride 7 ppm.

Well Number	Owner (or Tenant) and Location	Altitude (feet)	Dimensions		Depth of Casing (feet)
			Depth (feet)	Diam. (inches)	
<u>KITSAP COUNTY: (Continued)</u>					
24/1E-33K6	City of Bremerton --1 mi. E of Gorst.	45	562	12	562
33L1	City of Bremerton --1 mi. E of Gorst.	25	627	16	627
24/2E-9L1	Watauga Beach Community --5 mi. NE of Annapolis.	35	184	12	-----
17B1	--- Van Dyke --3½ mi. NE of Annapolis.	15	103	6	-----
17M1	L. R. Cowan --3 mi. NE of Annapolis.	15	290	6-4	290
19L1	F. Wilson --1 mi. NE of Annapolis.	20	257	6	-----
22M1	Town of Manchester --at Manchester.	25	100	10	100
27M1	G. M. Sullivan --1 mi. S of Manchester.	30	65	6	65
27M2	B. A. Linvog --1 mi. S of Manchester.	20	-----	6	-----
27M3	P. M. Jensen --1 mi. S of Manchester.	40	100	6	-----
27M4	D. Duncan --1 mi. S of Manchester.	40	66	6	-----
33C1	L. W. Cole --2 mi. S of Manchester.	210	70	6	70
33H1	L. Cheney --2 mi. S of Manchester.	20	134	-----	-----
33J1	Manchester Water District --2½ mi. S of Manchester, ½ mi. NW of South Colby.	50	185	12- 8- 6	182
34N1	R. Wilkens --at South Colby.	30	40	6	40
34P1	Jack Anderson --at South Colby.	50	141	6	141
25/1W-14E2	W. W. Wade --3 mi. NE of Seabeck.	40	199	6	199
15H1	--- Foster --2½ mi. NE of Seabeck.	15	55	6	55

Water-bearing Zone		Flow (gpm)	Shut-in Pressure (lbs/sq.in.)	Date	Remarks
Material	Depth Interval (feet)				
sand, gravel	-----	F	-----	1949	City well #6; Dd 200' at 850 gpm; temp. 52° F; hardness 48 ppm, chloride 7 ppm.
sand, gravel	-----	450	-----	6/22/45	City well #7; Dd 68' at 1080 gpm; Perf 465-627.
-----	-----	F	-----	11/16/49	Hardness 226 ppm, chloride 897 ppm; Tertiary rocks at shallow depth.
-----	-----	F	-----	5/11/50	Hardness 58 ppm, chloride 4 ppm; odor of H ₂ S.
fine gravel	-----	F	14	1935	Hardness 66 ppm, chloride 5 ppm; odor of H ₂ S.
-----	-----	F	-----	5/11/50	Hardness 106 ppm, chloride 4 ppm.
sand, gravel	-----	F	-----	10/6/49	Town well #2, not used to 1949.
gravel	62-65	F	-----	10/2/49	Flows at high tide.
-----	-----	F	-----	5/10/50	Hardness 62 ppm, chloride 4 ppm.
sand, gravel	-----	F	-----	12/5/49	Dd 25' at 48 gpm.
-----	-----	F	-----	12/5/49	
sand	-----	F	-----	5/1/50	Hardness 30 ppm, chloride 7 ppm.
sand, gravel	133-134	400	12	1952	
-----	151-176	110	6.3	8/10/60	Dd 43' at 420 gpm; Perf. 151-176; temp, 50° F.
sand	-----	F	-----	4/26/50	
gravel	-----	10	-----	6/30/51	Dd 8' at 16 gpm.
gravel	196-199+	F	-----	7/12/50	Hardness 62 ppm, chloride 11 ppm.
sand, gravel	-----	F	-----	6/28/50	Hardness 60 ppm, chloride 9 ppm.

Well Number	Owner (or Tenant) and Location	Altitude (feet)	Dimensions		Depth of Casing (feet)
			Depth (feet)	Diam. (inches)	
KITSAP COUNTY: (Continued)					
25/1W-15H2	--- McKay --2½ mi. NE of Seabeck.	15	57	6	57
17N1	Miami Beach Resort --1½ mi. N of Seabeck.	10	190	6	-----
20J1	R. E. Hadley --at Seabeck.	20	68	6	68
21E1	L. Boyce --¼ mi. NE of Seabeck.	40	14	6	-----
21M1	B. Bennick --¼ mi. NE of Seabeck.	40	53	6	52
25/1E-16N1	F. R. Gerjets --at Silverdale.	25	52	6	-----
16Q1	S. A. Sangsland --½ mi. E of Silverdale.	50	69	10	-----
17J1	Mrs. Watson --¼ mi. N of Silverdale.	65	-----	6	-----
17R1	B. W. Hanberg --at Silverdale.	40	62	6	-----
21C1	H. S. Bartlett --¼ mi. E of Silverdale.	25	65	6	-----
21C2	E. Vetter --¼ mi. E of Silverdale.	15	43	6	-----
24H1	Frank Strand --½ mi. NW of Gilberton.	20	274	8	274
25/2E-9E1	Lodin & Bergstrom --at Manzanita.	10	168	8	-----
25N1	--- Taft --at Wing Point, 1½ mi. E of Winslow.	10	85	6	-----
26N1	U.S. Federal Housing Authority --at Winslow.	40	163	12-8	163
26P1	Commercial Ship Repair --at Winslow.	10	761	8-4½	-----
27L1	J. R. Book --1 mi. W of Winslow.	10	103	8	-----
27M1	W. Walberg --1 mi. W of Winslow.	10	55	6	-----

Water-bearing Zone		Flow (gpm)	Shut-in Pressure (lbs./sq. in.)	Date	Remarks
Material	Depth Interval (feet)				
sand, gravel	-----	F	-----	7/12/50	Flows at high tide; hardness 78 ppm, chloride 9 ppm.
gravel	-----	F	-----	8/2/50	Supplies 20 families.
sand, gravel	63-68	F	8.6	7/12/50	Hardness 62 ppm, chloride 7 ppm.
sand	-----	F	-----	8/2/50	
-----	-----	F	-----	8/2/50	
sand, gravel	-----	F	-----	8/7/50	Hardness 66 ppm, chloride 6 ppm.
-----	-----	F	-----	-----	Reportedly flows in winter.
-----	-----	F	7.3	8/7/50	Hardness 70 ppm, chloride 5 ppm.
-----	-----	F	-----	10/5/50	
-----	-----	1	-----	8/4/50	Hardness 86 ppm, chloride 5 ppm.
gravel	-----	F	35	8/7/50	Hardness 62 ppm, chloride 9 ppm; odor of H ₂ S.
gravel	at 274	F	-----	1/29/56	Dd 20' at 250 gpm; temp. 48° F.
fine sand	-----	F	-----	-----	
sand	82-85	F	-----	9/8/45	
gravel	152-163	-----	-----	-----	SWL at surface, may flow during winter, Dd 100' at 40 gpm; Perf. 143-163.
-----	-----	F	-----	11/4/49	Plugged off at 580 ft; chloride 9 ppm.
sand	-----	F	-----	5/23/50	
gravel	-----	1	-----	5/23/50	Hardness 110 ppm, chloride 10 ppm.

FLOWING ARTESIAN WELLS IN WASHINGTON STATE

Well Number	Owner (or Tenant) and Location	Altitude (feet)	Dimensions		Depth of Casing (feet)
			Depth (feet)	Diam. (inches)	
<u>KITSAP COUNTY: (Continued)</u>					
25/2E-27M2	J. R. Book --1 mi. W of Winslow.	20	40	6	-----
31P1	R. Schutt --at Illahee, 4 mi. NE of Bremerton.	80	278	6	278
35H1	West Coast Wood Preserving Co. --at Creosote.	20	500	-----	-----
35H2	West Coast Wood Preserving Co. --at Creosote.	10	813	10-8	-----
36N1	--- Hoodenpyle -- $\frac{1}{2}$ mi. S of Creosote.	15	604	6	-----
36N2	U.S. Navy -- $\frac{1}{2}$ mi. S of Creosote.	15	1403	18-8	-----
26/1E-10N1	U.S. Army N.I.K.E. Base, (equipment shed) -- $\frac{1}{2}$ mi. NW of Poulsbo.	280	107	8	-----
14G1	Peter Hatta -- $\frac{1}{2}$ mi. NE of Poulsbo.	60	102	6	-----
15K1	Nels Tornensis -- $\frac{1}{2}$ mi. W of Poulsbo, W side of Liberty Bay.	50	203	8	191
22F1	G. L. Olson -- $\frac{1}{2}$ mi. SW of Poulsbo, W side of Liberty Bay.	25	67	6	67
26A1	C. W. Higby --1 mi. SE of Poulsbo.	40	107	6	107
26A2	W. W. Scott --1 mi. SE of Poulsbo.	40	96	8	96
27J1	W. H. Wilson --4 mi. S of Poulsbo, on W side of Liberty Bay.	30	86	6	-----
36N1	U.S. Navy -- $\frac{1}{2}$ mi. SW of Keyport.	14	380	6-4	355
36N2	U.S. Navy -- $\frac{1}{2}$ mi. SW of Keyport.	14	705	6-4	-----
36N3	U.S. Navy -- $\frac{1}{2}$ mi. SW of Keyport.	19	535	8	-----
36N4	U.S. Navy -- $\frac{1}{2}$ mi. SW of Keyport.	21	1036	22-12	1036

Water-bearing Zone		Flow (gpm)	Shut-in Pressure (lbs/sq.in.)	Date	Remarks
Material	Depth Interval (feet)				
-----	-----	F	-----	5/24/50	Supplies 2 families.
gravel	275-278	F	-----	9/1/50	Hardness 36 ppm, chloride 9 ppm.
-----	-----	F	-----	-----	"Well B."
sand	697-780	F	-----	-----	-----
sand	530-604	F	-----	-----	-----
-----	-----	4-15	-----	-----	"Poor quality water."
-----	-----	F	5	1958	Exceptionally large artesian flow(quantity not determined at this writing).
-----	98-102	60	-----	8/7/61	-----
sand, gravel	189-203	F	-----	-----	Perf. 191-201.
-----	-----	F	-----	-----	Hardness 50 ppm, chloride 5 ppm.
gravel	-----	F	-----	-----	-----
sand	-----	F	-----	-----	-----
sand gravel	20-28 50-54	F	-----	-----	Flows 2 gpm at high tide; Dd 5' at 30 gpm.
-----	-----	50	-----	-----	Well #1.
-----	-----	50	-----	-----	Well #2.
-----	-----	85	-----	-----	Well #3.
-----	-----	300	-----	-----	Well #4, Dd 50' at 1750 gpm.

Well Number	Owner (or Tenant) and Location	Altitude (feet)	Dimensions		Depth of Casing (feet)
			Depth (feet)	Diam. (inches)	
<u>KITSAP COUNTY: (Continued)</u>					
26/2E-10R1	O. C. Gray -- $\frac{1}{4}$ mi. N of Indianola.	120	70	8	0
34L1	O. B. Sperlin -- $1\frac{1}{2}$ mi. SE of Agate Pass Bridge.	8	1005	-----	-----
27/2E-25D1	Kingston Water Users Corp. -- $\frac{1}{2}$ mi. N of Kingston.	200	60	24-16	60
<u>KITTITAS COUNTY:</u>					
17/18E-1D1	City of Ellensburg (formerly W. T. Hofmann well) --at Ellensburg.	1525	307	10	282
2C1	Pictsweet Foods, Inc. --at Ellensburg, on West 5th St.	1525	50	3 $\frac{1}{2}$	50
2F1	Kittitas County Dairymens Assn. --at Ellensburg.	1550	420	12	-----
17/19E-29M1	Gordon Prentice --6 mi. SE of Ellensburg.	1540	318	12-6	213
18/18E-32D1	J. A. Shaw -- $3\frac{1}{2}$ mi. W of Ellensburg.	1620	455	6	380
35K1	City of Ellensburg --N edge of Ellensburg.	1570	400	14- 12- 10	400
<u>KLICKITAT COUNTY:</u>					
3/11E-30F1	Underwood Fruit & Warehouse Co. -- $\frac{1}{2}$ mi. W of Bingen.	460	265	14- 12- 10- 8	256
4/16E-17R1	Guy Glenn & Sarah J. Brock --NW edge of Goldendale.	1620	155	5	60
20M1	C. L. Storkel --1 mi. W of Goldendale.	1550	88	8	13
21F1	Goldendale School Dist. No. 404 --at Goldendale.	1650	90	8	26

Water-bearing Zone		Flow (gpm)	Shut-in Pressure (lbs/sq. in.)	Date	Remarks
Material	Depth Interval (feet)				
sand	62-70	-----	-----	-----	SWL at surface, may flow during winter season; Dd 35' at 35 gpm; screened 60'-70'.
sand	-----	25	-----	-----	Flow fluctuates with tide.
sand	-----	-----	-----	-----	SWL at surface, may flow during winter season; Dd 16½' at 65 gpm; Perf. 38'-58'.
gravel, sand	115-134 182-188 255-307	10	1	1/1/32	
gravel, sand, sandstone	-----	6	-----	3/6/48	
-----	-----	F	-----	4/23/48	Dd 35' at 185 gpm.
sand, gravel, and sandstone	7-56 100-106 165-170 200-205 220-230 296-318	-----	-----	-----	SWL at surface, may flow during winter season; Dd 38' at 360 gpm.
-----	-----	10	-----	8/20/57	
-----	-----	80	3	8/--/31	
basalt	-----	30	-----	9/8/55	Dd 88' at 525 gpm.
basalt	60-155	10	-----	8/1/49	
gravel basalt gravel and sandstone	4-12 84-85 85-88	15	-----	5/13/60	Dd 75' at 90 gpm.
"brown clay rock"	82-90	F	-----	12/3/52	Dd 70' at 110 gpm.

Well Number	Owner (or Tenant) and Location	Altitude (feet)	Dimensions		Depth of Casing (feet)
			Depth (feet)	Diam. (inches)	
<u>LEWIS COUNTY:</u>					
11/2W-5A1	Curtiss Bowan -- $1\frac{1}{2}$ mi. SW of Winlock.	258	217	6	176
24Q1	E. Ritzman -- $2\frac{1}{2}$ mi. SW of Toledo.	110	-----	6	-----
24Q2	E. Ritzman -- $2\frac{1}{2}$ mi. SW of Toledo.	110	568	-----	-----
25P1	Vasilie Dobosh -- $3\frac{1}{2}$ mi. SW of Toledo.	195	35	6	-----
12/1W-9D1	G. C. Gruel --at Marys Corner.	521	32	6	32
12/3E-26D1	Wallace Osborne -- $1\frac{1}{2}$ mi. SW of Ajlune.	800	246	6	37
13/1W-1D1	Ed Pfirter -- $6\frac{1}{2}$ mi. NE of Forest.	393	124	21-3	60
16F1	James Tauscher --2 mi. NE of Forest.	313	500	$5\frac{1}{2}$	200
17H1	F. Hamilton -- $1\frac{1}{2}$ mi. NE of Forest	305	150	-----	-----
17K1	Ted Teitzel -- $1\frac{1}{2}$ mi. NE of Forest.	298	1580	5	200
17N1	Ted Teitzel --1 mi. NE of Forest.	288	70	4	70
18K1	Inez Teitzel --1 mi. N of Forest.	310	545	$5\frac{1}{2}$	80
18R1	Inez Teitzel --1 mi. NE of Forest.	300	541	$5\frac{1}{2}$	28
19F1	Inez Teitzel --at Forest.	300	820	$5\frac{1}{2}$	86
20C1	Ted Teitzel --1 mi. NE of Forest.	280	75	4	75
20E1	A. B. Isberg --1 mi. NE of Forest.	320	2000	6	200
28P1	R. L. Wade -- $3\frac{1}{2}$ mi. SE of Forest.	360	135	6	135

Water-bearing Zone		Flow (gpm)	Shut-in Pressure (lbs/sq. in.)	Date	Remarks
Material	Depth Interval (feet)				
-----	-----	F	-----	-----	"Leaves yellow stain."
-----	-----	1	-----	2/27/53	Springs on nearby hillside; well water salty, contains gas bubbles.
-----	-----	F	8.6	-----	U.S.G.S. test hole.
-----	-----	F	-----	-----	Dd 5' at 90 gpm; temp. 43° F.
-----	-----	F	-----	-----	Restaurant supply.
sand	-----	F	-----	8/20/54	Some gas in water; bottom 200' in siltstone with sand interbeds.
cobbles	-----	F	6.5	1945	Well not used; contains "bits of charcoal."
-----	-----	35	-----	4/7/55	Continental Oil Co. test well; not used; original depth of 1500' filled back to 500'.
sand	-----	19	-----	4/7/55	Not used.
-----	-----	400	-----	3/15/55	Continental Oil Co. test well.
sand	-----	F	-----	7/--/47	"Flow not vigorous." Continental Oil Co. test well.
sandstone coarse sand- stone, gravel	435- at 545	400+	-----	2/10/55	Contains gas bubbles, temp. 56° F.
shale	350-375	370	-----	1/16/55	Continental Oil Co. test well, plugged top to bottom with cement.
sandstone basalt	-----	F	-----	1/25/55	"Small flow"; Continental Oil Co. test well.
sand	-----	400	-----	7/--/47	Continental Oil Co. test well.
fine gravel	-----	---	42	4/7/55	Continental Oil Co. test well.
sand	132-135	150	-----	7/15/45 4/17/55	
			16.4		

FLOWING ARTESIAN WELLS IN WASHINGTON STATE

Well Number	Owner (or Tenant) and Location	Altitude (feet)	Dimensions		Depth of Casing (feet)
			Depth (feet)	Diam. (inches)	
<u>LEWIS COUNTY: (Continued)</u>					
13/1W-29A1	Harry Wulz --1½ mi. E of Forest.	438	530	13	515
29R1	J. E. Deniston --2½ mi. SE of Forest.	347	250	-----	233
33D1	Jim Hamilton --2½ mi. SE of Forest.	345	70	6	-----
35A1	L. S. Godsey --2 mi. W of Onalaska.	418	185	6	178
35B1	Carden Qualls --2½ mi. W of Onalaska.	406	183	6	180
13/2W-5B1	City of Chehalis --½ mi. S of Chehalis.	175	111	4	50
5H1	City of Chehalis --1 mi. S of Chehalis.	183	280	18- 12- 8	322
8F1	A. R. Dahl --2 mi. S of Chehalis.	220	38	4	38
13H1	I. D. Gratias --1½ mi. NW of Forest.	280	-----	5	200
14N1	Frank Hamilton --2 mi. N of Napavine.	228	295	4	290
15K1	S. C. Breen --2½ mi. NW of Napavine.	222	306	6	33
15M1	D. C. Hamilton --4 mi. S of Chehalis, 3 mi. NW of Napavine.	220	244	6	212
15R1	Frank Hamilton --2 mi. N of Napavine.	248	435	4-3	260
15R2	Frank Hamilton --2 mi. N of Napavine.	225	400	6-4	290
16F1	Marvin Hamilton --3½ mi. NW of Napavine, 3½ mi. S of Chehalis.	210	260	6	240
16H1	Mollie Hamilton --3 mi. S of Chehalis, 3 mi. NW of Napavine.	211	210	8-6	196

Water-bearing Zone		Flow (gpm)	Shut-in Pressure (lbs/sq. in.)	Date	Remarks
Material	Depth Interval (feet)				
-----	-----	50	4	5/25/55	Washington Oil Co. test well, drilled to 6500', plugged back to 530'.
sandstone, sand, pumice	215-245	300	28	8/27/53	
fine gravel	-----	50 25 ---	----- ----- 11	1948 1952 1953	All noted measurements made in spring.
sand, pumice	-----	---	12	7/7/55	Contains iron; temp. 51° F.
sand	-----	2½	5	1950	
silt	-----	F	-----	9/12/55	Test well.
sand, gravel	23-39 95-108 290-314	8-10	-----	9/12/52	
sand	31-38	F	-----	7/13/52	Dd 27' at 12 gpm.
-----	-----	500	60-100	3/--/55	Continental Oil Co. test well, possibly 2000' deep.
sand	-----	---	6	4/8/53	"Mineral taste."
sand, gravel	239-251	525	26 15.5	2/1/52 4/18/53	
sand, coarse	229-244	233	----- 16-18	11/30/51 4/8/53	
sand	270-300	30	5	4/8/53	Struck basalt at 435'.
gravel, fine	280-300	50	12	4/8/53	Struck basalt at 400'.
sand	-----	F	-----	-----	"Flat mineral taste."
sand	208-210	600	23 16	9/4/51 5/2/54	

FLOWING ARTESIAN WELLS IN WASHINGTON STATE

Well Number	Owner (or Tenant) and Location	Altitude (feet)	Dimensions		Depth of Casing (feet)
			Depth (feet)	Diam. (inches)	
<u>LEWIS COUNTY: (Continued)</u>					
13/2W-16J1	Ralph Hearn --3 mi. S of Chehalis, 3 mi. NW of Napavine.	214	105	6	105
31C	Grover Mullins --3½ mi. W of Napavine.	220	50	6	50
13/3W-3Q1	Thomas Cole --at Littel, 4½ mi. W of Chehalis.	200	73	16-8	8
6J1	William Walch --2 mi. W of Adna, 8 mi. W of Chehalis.	215	97	6	-----
6R1	--- Raschke --2 mi. W of Adna, 8 mi. W of Chehalis.	214	230	6	230
8C1	A. H. Anderson --1½ mi. W of Adna, 7½ mi. W of Chehalis.	215	152	6	148
8E1	E. Zandecki --1½ mi. W of Adna, 7½ mi. W of Chehalis.	254	83	6	-----
8F1	C. S. Santee --1½ mi. W of Adna, 7½ mi. W of Chehalis.	240	150	6	80
13/4W-23J1	L. B. Spinning --5½ mi. SW of Adna, 11½ mi. SW of Chehalis.	233	130	6	130
13/1E-22R1	C. E. Green --3 mi. NE of Onalaska.	600	150	8	150(?)
22R2	C. E. Green --3 mi. NE of Onalaska.	600	149	8	113
28N1	Delmar Woods --1 mi. E of Onalaska.	518	97	6	30
29P1	Charles Hendrickson --¼ mi. E of Onalaska.	490	110	8	-----
31P1	D. C. Jensen --1½ mi. SW of Onalaska.	470	128	6	90
32B1	C. A. Jorgensen --½ mi. E of Onalaska.	505	130	6	122
32M1	Ed Guiberson --½ mi. S of Onalaska.	485	210	6	108

Water-bearing Zone		Flow (gpm)	Shut-in Pressure (lbs/sq. in.)	Date	Remarks
Material	Depth Interval (feet)				
sand, fine	-----	15	-----	1946	"Mineral taste."
sand	-----	---	-----	-----	SWL at surface, may flow during winter season.
basalt	at 100 at 350 at 750	F	-----	6/19/53	Not in use; basalt 0'-70'; bubbles in water; originally drilled to depth of 1492'.
-----	-----	F	-----	1950	
sandstone	-----	15	-----	12/23/53	
sand, white	-----	F	-----	1947	
gravel	-----	F	-----	1949	
-----	-----	F	-----	12/24/53	"Rock at 80'."
-----	-----	F	-----	8/11/54	Supplies 2 families.
sand	-----	F	-----	6/22/53	Original flow of 200 gpm decreased.
sand	120-122 145-150	---- ---	11 7.5	1/--/54 5/27/54	Odor and taste of sulphur.
gravel	-----	F	-----	9/15/53	
-----	-----	F	-----	1931	"Old town well"; condemned in 1939 after earthquake, location not certain.
sand	-----	3	-----	8/27/54	
sand	-----	3	-----	7/8/55	
sand, fine	-----	F	-----	8/17/55	

Well Number	Owner (or Tenant) and Location	Altitude (feet)	Dimensions		Depth of Casing (feet)
			Depth (feet)	Diam. (inches)	
<u>LEWIS COUNTY: (Continued)</u>					
13/1E-33A1	W. E. Woods --2 mi. E of Onalaska.	559	125	8	65
14/3W-13G2	Harold Barnes --3½ mi. SW of Centralia.	200	84	6	-----
15/1W-28F1	M. Beuchard --5 mi. SE of Bucoda, 10 mi. NE of Centralia.	255	----	----	-----
15/2W-29Q1	F. Williams --2 mi. N of Centralia.	195	52	6	52
<u>LINCOLN COUNTY:</u>					
22/33E-4F1	L. J. Bonney --7 mi. N of Odessa.	-----	246	12-8	246
27E1	M. C. Weber --4 mi. NE of Odessa.	-----	300	12-10	240
23/37E-29F1	Herbert Armstrong --4½ mi. SE of Harrington.	-----	213	8	90
23/38E-12A1	Great Northern RR Co. --at Edwall.	2320	82	12	15
12H1	Great Northern RR Co. --at Edwall.	2320	100	12-6	5
26/31E-29Q1	Clarence Zimmerman --at Almira.	-----	165	6	-----
26/33E-19D1	Andy McInroy --1½ mi. S of Wilbur.	-----	232	12-10	233
<u>MASON COUNTY:</u>					
20/3W-19F1	Rayonier, Inc. --at Shelton.	40	735	26	735
20D1	Rayonier, Inc. --at Shelton.	10	252	20-18	270

Water-bearing Zone		Flow (gpm)	Shut-in Pressure (lbs/sq.in.)	Date	Remarks
Material	Depth Interval (feet)				
clay	-----	F	-----	-----	Lower 50' in blue clay.
-----	-----	F	-----	7/21/54	Contains iron, water soft.
-----	-----	F	-----	6/23/54	Supplies 4 families.
sand	-----	F	-----	-----	Water "rusty and hard."
basalt	241-246	570	-----	9/8/56	
basalt	17- 100-129 283-300	75	-----	12/3/52	Dd 216' at 670 gpm.
basalt	at 213	----	-----	5/30/44	SWL at surface, may flow during winter season; Dd 35' at 560 gpm; temp. 47° F.
basalt	62-76	50	4.5	9/30/44	Dd 15' at 190 gpm.
basalt	85-100	33	-----	8/20/39	Dd 55' at 130 gpm.
basalt	-----	----	7	1910	Old well.
basalt	223-233	150	10	12/--/59	
sand, gravel	202-263 316-396 436-457 492-538 585-641 673-735	----	-----	2/21/42	SWL at surface, may flow during winter season.
sand, gravel	4-10 20-50 93-106 109-112 123-127 180-189 226-	90	-----	8/22/51	Perf. 180-189, 227-238.

Well Number	Owner (or Tenant) and Location	Altitude (feet)	Dimensions		Depth of Casing (feet)
			Depth (feet)	Diam. (inches)	
<u>MASON COUNTY: (Continued)</u>					
20/3W-20D2	Rayonier, Inc. --at Shelton.	10	301	12-8	287
20/4W-24G1	Rayonier, Inc. -- $\frac{1}{2}$ mi. W of Shelton.	40	742	26	742
22/1W-6B1	Max Reynolds (formerly Celina R. Gallow) --2 mi. SW of Belfair.	5	263	6	-----
22/2W-14N1	A. S. Miller -- $5\frac{1}{2}$ mi. SW of Belfair.	20	43	6	43
20J1	G. T. Belland --8 mi. SW of Belfair.	-----	107	6	107
21H1	R. T. Brinson --7 mi. SW of Belfair.	8	100	-----	-----
21H2	--- Cherry --7 mi. SW of Belfair.	15	76	6	70
22/4W-23K1	Potlatch Beach Mutual Water Co. --at Potlatch.	20	105	6	105
26L1	W. C. Asen --1 mi. S of Potlatch.	20	61	8	61
<u>OKANOGAN COUNTY:</u>					
30/25E-6E1	Emery Crandall --3 mi. NE of Brewster.	1225	227	6	-----
6P1	--- Divis --2 mi. NE of Brewster.	1125	180	6	-----
31/24E-35L1	Town of Brewster --3 mi. N of Brewster.	1360	50	36	50
36R1	--- Curtis -- $2\frac{1}{2}$ mi. N of Brewster.	1212	190	6	-----
31/31E-23B1	Unknown --5 mi. E of Nespelem.	2430	310	-----	-----
24B1	--- Harvey --6 mi. E of Nespelem.	2450	321	-----	-----
34/26E-27R1	John Kermel --at Omak.	1050	10	96	96
36/26E-28E1	O. E. Smith --8 mi. NW of Riverside.	1600	80	8	-----

Water-bearing Zone		Flow (gpm)	Shut-in Pressure (lbs/sq.in.)	Date	Remarks
Material	Depth Interval (feet)				
sand, gravel	289-300	125	-----	9/11/51	Perf. 286-301.
sand, gravel	-----	F	-----	7/22/46	
gravel	260-263	17	-----	2/10/46	Water-bearing gravels at 37'-47' depth reportedly "polluted."
sand, gravel	-----	F	-----	-----	Dd 6' at 30 gpm; temp. 47° F.
gravel, coarse	at 107	F	-----	-----	Dd 40' at 25 gpm.
gravel	at 100	2	-----	1955	
gravel	72-76	---	-----	1955	SWL at surface, may flow at high tide during winter season.
-----	-----	13	5.2	5/19/47	
gravel	29-58	10- 25	-----	11/10/48	
basalt (?)	-----	19	-----	1948	
basalt (?)	50-180	8	-----	1955	
-----	-----	100- 400	-----	-----	Combination of well and tunnel.
-----	-----	10	-----	1946	
-----	-----	F	-----	1960	
gravel	315-321	F	-----	1960	
-----	-----	75	-----	6/30/47	Open-bottom concrete casing.
gravel	-----	F	-----	-----	Claimed yield 100 gpm.

Well Number	Owner (or Tenant) and Location	Altitude (feet)	Dimensions		Depth of Casing (feet)
			Depth (feet)	Diam. (inches)	
<u>PACIFIC COUNTY:</u>					
13/10W-8G1	Arnold Waring --at Bay Center, 15 mi. SW of South Bend.	5	585	6	-----
14/9W-33D1	Johanna Wennberg --at South Bend.	-----	12	10	-----
14/10W-18C1	U.S. Coast Guard --at Toke Point, Tokeland.	5	221	2	-----
14/11W-13B1	E. Anderson --at Tokeland.	5	210	2	-----
13B2	Fred Martin --at Tokeland.	5	150	2	-----
15/11W-20K1	Emil Heggre --3 mi. S of Grayland, near jct. of Lingren & Smith-Anderson Rd.	15	186	2	36
20M1	Twin Harbors Community --2½ mi. S of Grayland, on Lingren Rd.	15	304	6	304
20Q1	Uno Wiley --3½ mi. S of Grayland, on Anderson Rd, between Lingren and Udall Hansen Rds.	15	105	2	105
29C1	C. W. Richardson --3½ mi. S of Grayland, on Udall Hansen Rd.	12	96	2	-----
<u>PEND ORIELLE COUNTY:</u>					
	None recorded				
<u>PIERCE COUNTY:</u>					
17/3E-8E1	A. Wymer --5½ mi. SE of Roy, on Christensen- Muck Rd.	410	71	6	-----
8R1	H. G. Amundsen --7½ mi. SE of Roy, on Harts Lake Loop Road.	450	99	8	-----
18N1	A. Redburg --4½ mi. NE of McKenna, on Tisch Rd.	425	83	6	83
20A1	C. O. Robinson --6½ mi. E of McKenna, on Harts Lake Loop Rd.	480	67	6	67
20C1	H. LaFontayne --6 mi. E of McKenna, on Tisch Rd.	455	70	8	70

Water-bearing Zone		Flow (gpm)	Shut-in Pressure (lbs/sq.in.)	Date	Remarks
Material	Depth Interval (feet)				
sand, gravel	-----	F	-----	6/20/46	Dd 18' at 35 gpm.
-----	-----	13	-----	-----	-----
sand	205-221	8	-----	5/10/56	Hardness 76 ppm, chloride 16 ppm, alkalinity 116 ppm, iron less than 0.1 ppm.
-----	-----	10	-----	-----	Jetted, driven well.
-----	-----	5	-----	-----	Jetted, driven well.
gravel	at 186	12	-----	5/10/56	Hardness 56 ppm, chloride 26 ppm, alkalinity 85 ppm, iron less than 0.1 ppm.
-----	-----	7	-----	5/10/56	Supplies 16 families; hardness 64 ppm, chloride 26 ppm.
gravel	at 105	1	-----	5/23/56	-----
-----	-----	F	-----	-----	Not used.
-----	-----	F	-----	-----	-----
-----	-----	F	-----	10/9/59	-----
-----	-----	F	-----	-----	-----
gravel	66-67	20	-----	7/19/51	-----
-----	-----	20	-----	1953	-----

Well Number	Owner (or Tenant) and Location	Altitude (feet)	Dimensions		Depth of Casing (feet)
			Depth (feet)	Diam. (inches)	
PIERCE COUNTY: (Continued)					
17/3E-21D1	John Kizer --6½ mi. E of McKenna, on Tisch Rd.	480	66	10	66
31K1	J. Russell --5 mi. E of McKenna, on Harts Lake Loop Rd.	475	15	42	-----
17/4E-23E1	R. M. King --1 mi. N of Clear Lake, 3½ mi. SE of Benson.	620	52	6	52
23E2	L. Reardon --1 mi. N of Clear Lake, 3½ mi. SE of Benson.	610	52	6	52
19/3E-26A1	R. L. Smith --2½ mi. E of Spanaway, on Greiler Rd.	325	5	48	-----
19/4E-25G1	C. Silvernail --2 mi. W of Orting.	160	59	6	59
20/2E-3M1	E. A. Randrup --1 mi. S of SE end of Tacoma Narrows Bridge.	134	45	6	-----
3N1	A. Johnson --1 mi. S of SE end of Tacoma Narrows Bridge.	140	50	-----	50
9C1	Day Island Club --on Day Island.	10	481	4½	481
9C2	Day Island Club --on Day Island.	10	606	8	606
11J1	Town of Fircrest --SE edge of Fircrest.	234	280	10	280
11J2	Town of Fircrest --SE edge of Fircrest.	227	200	10	200
11J3	Town of Fircrest --SE edge of Fircrest.	29 328	397	12-8	-----
20P1	Pioneer Sand & Gravel Co. --2½ mi. NE of Steilacoom.	25	1025	16-12	1025
29Q1	West Tacoma Newsprint Co. --1 mi. NE of Steilacoom.	19	548	34- 26- 24- 10	550
29Q2	West Tacoma Newsprint Co. --1 mi. NE of Steilacoom.	14	854	18-12	788

Water-bearing Zone		Flow (gpm)	Shut-in Pressure (lbs./sq. in.)	Date	Remarks
Material	Depth Interval (feet)				
gravel	56-66	----	0.43	8/--/56	Dd 10' at 110 gpm.
-----	-----	F	-----	-----	
-----	-----	5	-----	10/26/54	
-----	-----	5	-----	10/26/54	
-----	-----	F	7	1932	
gravel	-----	F	-----	1/--/54	
sand	41-45	2	-----	5/20/40	
-----	-----	5	-----	-----	
-----	-----	25	3.4	-----	Filled with sand to 325'.
-----	-----	F	-----	-----	
-----	-----	2	-----	-----	
-----	-----	F	-----	-----	
-----	-----	F	-----	-----	Abandoned well.
gravel	940-1015	1000	-----	3/--/47	Dd 28' at 2800 gpm; Perf. 500-853.
sand, gravel	several	215	-----	-----	Dd 65' at 675 gpm; Perf. 189-219, 240-270; well rehabilitated in 1952, to depth of 275'.
sand, gravel	several	580	-----	-----	

FLOWING ARTESIAN WELLS IN WASHINGTON STATE

Well Number	Owner (or Tenant) and Location	Altitude (feet)	Dimensions		Depth of Casing (feet)
			Depth (feet)	Diam. (inches)	
<u>PIERCE COUNTY: (Continued)</u>					
20/2E-32B1	West Tacoma Newsprint Co. --1 mi. NE of Steilacoom.	200	796	20- 16- 8	744
32B2	West Tacoma Newsprint Co. --1 mi. NE of Steilacoom.	20	1172	18-12	1172
20/3E-1L1	Kazue Yotsuuye --1 mi. NW of Fife.	15	182	10	157
1R1	Poodledog Restaurant (formerly Century Amusement Co.) --at Fife, on U.S. 99.	20	253	2	250
3M1	Washington Gas & Electric Co. --Tacoma factory area, $\frac{1}{2}$ mi. N of U.S. 99.	12	450	-----	-----
3R1	Federal Meat Co. --Tacoma factory area, off of U.S. 99.	15	-----	3	-----
4G1	Northwest Door Co. --Tacoma factory area, SE of 11th St. Bridge.	10	640	8	620
4H1	Wheeler-Osgood Co. --Tacoma factory area, SE of 11th St. Bridge.	12	392	10-8	-----
4H2	St. Paul & Tacoma Lumber Co. --Tacoma factory area, SE of 11th St. Bridge.	12	1501	16-12	1501
4J1	Carstens Packing Co. --Tacoma factory area.	12	547	12-10	547
4J2	Carstens Packing Co. --Tacoma factory area.	12	705	10-8	640
4P1	Washington Gas & Electric Co. --Tacoma factory area.	21	385	12	-----
4P2	Northwest Woodenware Co. --Tacoma factory area.	20	250	-----	-----
4Q1	Wheeler-Osgood Co. --Tacoma factory area.	8	492	8	490
9A1	Container Corporation of America --Tacoma factory area, off Puyallup Ave.	20	175	8	171

Water-bearing Zone		Flow (gpm)	Shut-in Pressure (lbs/sq.in.)	Date	Remarks
Material	Depth Interval (feet)				
sand, gravel	737-794	150	2.5	3/5/59	Perf. 744-794'.
gravel	560-568 643-664 807-840 957-1020 1033-1112	1500	-----	7/--/38	Dd 50' at 4200 gpm in 4 hrs., Perf. 550-860, 1000-1090.
sand, gravel	-----	----	0.43	7/25/52	
sand, gravel	223-253	45	-----	-----	Screened 238'-250'.
-----	-----	200	-----	8/--/39	Flow diminished due to sand in well.
-----	-----	3	1.6	-----	
sand, gravel	580-600	50	2	1941	Perf. 580'-600'.
-----	-----	F	-----	-----	
-----	-----	570	-----	3/--/51	Dd 11' at 775 gpm; 7 perf. zones 655-1486'.
-----	-----	550	9	3/21/58	Abandoned 1939, re-drilled 1958; Perf. 500-530; temp 54° F.
gravel	625-640	40	-----	1939	
-----	-----	F	-----	1939	
-----	-----	135	-----	1940	Chloride 7 ppm.
gravel, coarse	489-492	30	-----	1939	
gravel, sand	50-60 170-175	F	-----	7/--/48	Perf. 171-175.

Well Number	Owner (or Tenant) and Location	Altitude (feet)	Dimensions		Depth of Casing (feet)
			Depth (feet)	Diam. (inches)	
<u>PIERCE COUNTY: (Continued)</u>					
20/3E-9A2	Container Corporation of America --Tacoma factory area, off Puyallup Ave.	20	117	6	117
9A3	Container Corporation of America --Tacoma factory area, off Puyallup Ave.	20	320	12	320
9C1	Cammarano Brothers --Tacoma, S end of City Waterway.	25	301	6	290
9F1	Silver Springs Brewing Co. --Tacoma, S of City Waterway.	40	618	8-6	618
10G1	Meadosweet Dairies --Tacoma, W of U.S. Indian Hospital.	20	275	10	275
11C1	Milwaukee RR Co. --Tacoma, $\frac{1}{2}$ mi. E and S of Puyallup R. Bridge (U.S. 99).	20	160	3	-----
12C1	Colonial Gardens -- $\frac{3}{4}$ mi. W of Fife, on Valley Highway.	25	277	3	277
13G1	L. P. Zabroski --S of Puyallup River, 5 mi. NW of Puyallup.	20	98	8	98
14C1	E. Barker -- $1\frac{1}{2}$ mi. SE of Puyallup River Bridge (U.S. 99).	25	90	6	85
20/4E-5E1	Fusfield & Oppheim --W of Milton, just E of U.S. 99.	30	350	4	-----
5Q1	Town of Milton --at Milton.	35	200	8	-----
7Q1	V. L. Ambuehl -- $2\frac{1}{2}$ mi. SW of Milton.	25	190	8	170
8M1	Akinobu Yotsuuye --2 mi. SW of Milton.	25	168	8	168
12A1	--- Cartwright --3 mi. N of Sumner, E of Stuck River.	55	308	-----	-----
16M1	Sanitary Infant Dairy --3 mi. NW of Puyallup.	30	250	6	250

Water-bearing Zone		Flow (gpm)	Shut-in Pressure (lbs./sq. in.)	Date	Remarks
Material	Depth Interval (feet)				
-----	-----	F	-----	-----	
sand, gravel	-----	150	-----	7/13/54	Perf. 199-200, 230-244.
-----	-----	---	-----	4/10/59	SWL at surface, may flow during winter season; Dd 152' at 101 gpm; screened 290-300'.
gravel, sand	597-609	25	-----	5/15/50	Dd 25' at 150 gpm.
sand, gravel	35-44 57-59 78-96 100-103 126-136 235-248 253-263	100	-----	7/3/51	Perf. 247-264.
sand	125-152	30	-----	-----	
sand, coarse	-----	27	-----	-----	
sand	72-98	12	-----	5/25/51	
gravel	12-36	3	-----	1952	
-----	-----	2½	1	6/13/40	
-----	-----	F	-----	-----	
sand, gravel	24-40 81-120 163-190	20	3	6/1/60	Screened 170-190.
sand	80-96 146-168	30	1	5/2/59	Dd 16' at 120 gpm; screened 153-168.
sand	305-306	100	-----	3/--/54	
gravel	-----	F	-----	3/2/51	

FLOWING ARTESIAN WELLS IN WASHINGTON STATE

Well Number	Owner (or Tenant) and Location	Altitude (feet)	Dimensions		Depth of Casing (feet)
			Depth (feet)	Diam. (inches)	
PIERCE COUNTY: (Continued)					
20/4E-16P1	F. Blaser --2½ mi. N of Puyallup.	30	175	-----	-----
17C1	Western Washington Experiment Sta. --4½ mi. NW of Puyallup.	25	500	18-10	475
17K1	J. P. Kennedy --4 mi. NW of Puyallup.	30	267	2	-----
17M1	Western Washington Experiment Sta. --4½ mi. NW of Puyallup.	25	390	18	390
18H1	Valley Packing Co. --2 mi. SE of Fife.	20	315	6	315
18J1	C. W. Kreise --2 mi. SE of Fife.	20	200	6	200
18K1	F. W. Carlson --2 mi. SE of Fife.	25	308	6	-----
18K2	A. N. Olsen --2 mi. SE of Fife.	25	296	2	-----
18N1	J. S. Sasaki --4½ mi. NW of Puyallup.	15	173	8	158
18P1	George Richen --4½ mi. NW of Puyallup.	15	366	6	366
19F1	L. Steiner --3 mi. NW of Puyallup.	20	110	2	110
19M1	Anton Schuler --3 mi. NW of Puyallup.	25	155	5½	155
20C1	S. Sulkosky --3½ mi. SE of Fife.	30	802	6-4	802
20K1	J. Lounhardt --2½ mi. NW of Puyallup.	30	267	6	267
21N1	J. C. Franzen --1 mi. NW of Puyallup.	40	298	6	298
21P1	Louisa Henry --1 mi. NW of Puyallup.	40	230	6	230
23N1	A. G. Stone --1½ mi. W of Sumner, N of Puyallup River.	50	222	6	222
24B1	Fibreboard Products, Inc. --at Sumner.	60	462	16	-----

Water-bearing Zone		Flow (gpm)	Shut-in Pressure (lbs/sq.in.)	Date	Remarks
Material	Depth Interval (feet)				
-----	-----	F	-----	3/2/51	
-----	-----	35	-----	8/--/50	Perf. 390-458.
sand, silt	182-195	8	-----	1932	
sand	-----	100	-----	10/--/49	Perf. 280-380.
sand	-----	30	20	12/31/47	Perf. 260-315.
sand	-----	20	20	1947	Dd 14' at 75 gpm; Perf. 175-185.
-----	-----	F	-----	-----	
sand, gravel	-----	3	-----	-----	
sand, silt	19-45 139-146 162-173	30	-----	3/29/60	Screened 158-173.
sand	-----	25	-----	3/15/46	Dd 22' at 60 gpm.
gravel	-----	F	-----	-----	
gravel	-----	F	-----	-----	Depth may be only 86', and well may not flow.
-----	-----	F	-----	2/--/52	
sand, gravel	246-267	---	-----	3/--/48	SWL at surface, may flow.
gravel	296-298	30	-----	3/15/46	
sand, gravel	223-230	40	3	4/9/46	
sand, gravel	95-107 185-206 218-222	40	2	9/1/46	Principle aquifer 220-222'.
sand, gravel	372-440	---	2	2/16/38	

FLOWING ARTESIAN WELLS IN WASHINGTON STATE

Well Number	Owner (or Tenant) and Location	Altitude (feet)	Dimensions		Depth of Casing (feet)
			Depth (feet)	Diam. (inches)	
<u>PIERCE COUNTY: (Continued)</u>					
20/4E-24C1	Fibreboard Products, Inc. --at Sumner.	60	575	16-8	-----
24F1	Standard Brands of California, Inc. --at Sumner.	61	168	8	-----
24F2	Standard Brands of California, Inc. --at Sumner.	61	572	18	562
24G1	Fibreboard Products, Inc. --at Sumner.	60	456	18	456
24G2	Standard Brands of California, Inc. --at Sumner.	61	480	16-12	-----
24G3	Standard Brands of California, Inc. --at Sumner.	60	300	6	-----
26D1	C. E. Shoe --1½ mi. W of Sumner, N of Puyallup River.	50	218	6	218
26G1	Mrs. R. Nix --1 mi. SW of Sumner.	50	169	8	169
27J1	Puyallup Ice & Cold Storage Co. --at Puyallup.	50	233	12	-----
27L1	Farmers Union Berry Cooperative --at Puyallup.	45	285	8	285
28H1	Brew Manufacturing Co. --at Puyallup.	43	200	12	-----
28H2	Hunt Bros. Packing Co. --at Puyallup.	46	140	8	-----
28H3	Hunt Bros. Packing Co. --at Puyallup.	46	165	4	-----
28K1	City Ice Co. --at Puyallup.	45	253	5½	253
29D1	F. T. Smith --2 mi. W of Puyallup.	30	108	2	108
32J1	City of Puyallup --1 mi. SW of Puyallup.	32	164	16-12	162
34F1	Lutheran Welfare Society --½ mi. SE of Puyallup.	65	264	6	264
34H1	Aves Blueberry Farm --1 mi. SE of Puyallup.	75	105	8	105

Water-bearing Zone		Flow (gpm)	Shut-in Pressure (lbs/sq.in.)	Date	Remarks
Material	Depth Interval (feet)				
gravel, boulders gravel sand	90-115 350-425 500-575	F	-----	1915	
-----	-----	----	5.5	3/10/47	Test well.
sand, gravel	207-410 462-508	----	1.1	3/27/48	Dd 4' at 1000 gpm, Dd 8' at 2400 gpm, in November, 1926.
gravel, sand	456-	----	1.7	2/--/38	Perf. 376-426.
-----	-----	----	0.5	7/5/38	
-----	-----	F	1.1	-----	
sand	-----	20	-----	6/11/47	
gravel	150-169	35	35	10/25/51	
-----	-----	70	-----	12/14/53	Dd 40' at 500 gpm.
gravel	248-285	100	30	2/27/46	Dd 35' at 300 gpm.
-----	-----	F	-----	1940	
-----	-----	15-20	-----	6/--/40	Pumps sand.
-----	-----	----	3.5	-----	Temp. 52° F.
sand, gravel	-----	F	-----	8/28/48	Dd 11' at 60 gpm.
-----	-----	F	-----	-----	
gravel	-----	F	-----	1945	
sand, gravel	-----	20-25	-----	8/--/47	
-----	-----	F	-----	9/15/54	

FLOWING ARTESIAN WELLS IN WASHINGTON STATE

Well Number	Owner (or Tenant) and Location	Altitude (feet)	Dimensions		Depth of Casing (feet)
			Depth (feet)	Diam. (inches)	
PIERCE COUNTY: (Continued)					
20/4E-35F1	C. R. Johnson -- $1\frac{1}{2}$ mi. SE of Puyallup.	140	38	8	38
20/5E-7D1	Dieringer School Dist. No. 343 --at Dieringer.	55	408	12-10	408
19E1	R. J. Hill --1 mi. E of Sumner.	60	230	3	230
21/1W-24F1	--- Ellingson -- $1\frac{1}{2}$ mi. N of Home, Longbranch Peninsula.	38	62	6	-----
24F2	--- McCamant -- $1\frac{1}{2}$ mi. N of Home, Longbranch Peninsula.	40	68	6	-----
24F3	Jack Rogers -- $1\frac{1}{2}$ mi. N of Home, Longbranch Peninsula.	40	38	6	-----
25M1	Miss Carlson -- $\frac{1}{2}$ mi. NE of Home.	20	55	6	-----
25M2	--- Mueller -- $\frac{1}{2}$ mi. NE of Home.	40	49	6	-----
21/1E-16Q1	--- Busch --2 mi. NW of Arletta, on Horsehead Bay.	15	60	6	-----
24J1	--- Bennett -- $\frac{1}{2}$ mi. S of Artondale, on Wollochet Bay.	10	124	6	-----
24J2	Sam Crooks -- $\frac{1}{2}$ mi. S of Artondale, on Wollochet Bay, W shore.	10	35	6	-----
21/2E-19P1	--- Arneson --1 mi. SE of Artondale, on Wollochet Bay, E shore.	20	112	6	-----
21/3E-15K1	Dash Point Coop. Water Assn. --on hill 1 mi. SE of Dash Point.	425	80	8	80
15K2	Dash Point Coop. Water Assn. --on hill 1 mi. SE of Dash Point.	400	67	8	67
15K3	Dash Point Coop. Water Assn. --on hill 1 mi. SE of Dash Point.	425	64	8	64
15K4	Dash Point Coop. Water Assn. --on hill 1 mi. SE of Dash Point.	425	58	6	58
15K5	Dash Point Coop Water Assn. --on hill 1 mi. SE of Dash Point.	425	66	12	66

Water-bearing Zone		Flow (gpm)	Shut-in Pressure (lbs/sq.in.)	Date	Remarks
Material	Depth Interval (feet)				
-----	-----	F	-----	-----	
gravel, clay	225-286	180	-----	9/23/54	Perf. 215-236, 245-386.
-----	-----	40	-----	9/--/40	Perf. 190-230.
-----	-----	F	-----	9/23/59	
sand, gravel	at 68	10	-----	8/1/60	
-----	-----	F	-----	-----	
-----	at 55	F	-----	9/2/59	
-----	-----	F	-----	7/26/58	
sand	at 60	F	-----	6/22/53	
sand	at 124	F	-----	7/27/59	
sand	at 35	F	-----	8/10/60	Flows at high tide.
-----	-----	F	-----	10/3/60	Tide influences flow.
sand, gravel	-----	25	-----	11/7/45	
sand, gravel	10-15	25	-----	11/7/45	Perf. 0-67'.
sand	10-15	25	-----	-----	Perf. 0-64'.
sand, gravel	10-15	5	-----	11/7/45	Perf. 0-58'.
sand, gravel	-----	60	-----	5/14/48	

FLOWING ARTESIAN WELLS IN WASHINGTON STATE

Well Number	Owner (or Tenant) and Location	Altitude (feet)	Dimensions		Depth of Casing (feet)
			Depth (feet)	Diam. (inches)	
<u>PIERCE COUNTY: (Continued)</u>					
21/3E-16G1	F. C. Hofstetter --on hill $\frac{1}{2}$ mi. S of Dash Point.	400	40	6	40
26N1	City of Tacoma --Tacoma factory area, off Hylebos Waterway.	13	785	18-12	778
26Q1	Buffelen Lumber & Mfg. Co. --Tacoma factory area, off Hylebos Waterway.	7	450	12	450
27G1	Hooker Electrochemical Co. --Tacoma factory area, off Hylebos Waterway.	10	1216	12-10	1209
29N1	General Mills, Inc. --Tacoma waterfront, W shore Commence- ment Bay.	15	150	-----	-----
29P1	General Mills, Inc. --Tacoma waterfront, W shore Commence- ment Bay.	15	350	12-8	-----
29P2	General Mills, Inc. --Tacoma Waterfront, W shore Commence- ment Bay.	15	540	12-8	-----
35B1	Buffelen Lumber & Mfg. Co --Tacoma factory area, off Hylebos Waterway.	7	856	18-12	856
36P1	Kaiser Aluminum & Chemical Corp. --Tacoma factory area, off Taylor Way.	15	824	18	824
36P2	Kaiser Aluminum & Chemical Corp. --Tacoma factory area, off Taylor Way.	15	836	18	836
36P3	Kaiser Aluminum & Chemical Corp. --Tacoma factory area, off Taylor Way.	15	955	12	950
36P4	Kaiser Aluminum & Chemical Corp. --Tacoma factory area, off Taylor Way.	15	901	16- 12- 8	867
22/1W-17B1	Sargent's Oyster House --1 mi. N of Allyn, near head of North Bay.	5	91	6	-----
22/1E-13P1	--- Gamer --at Purdy.	60	90	6	-----
24C1	Hank Pederson --at Purdy.	35	105	6	-----

Water-bearing Zone		Flow (gpm)	Shut-in Pressure (lbs/sq.in.)	Date	Remarks
Material	Depth Interval (feet)				
sand	-----	---	-----	5/2/47	SWL at surface, may flow during winter season.
-----	-----	---	1	6/4/42	Originally flowed 300 gpm; Dd 95' at 1050 gpm; Perf. 467-581, 657-737.
-----	-----	---	2	1939	
sand, gravel	-----	250	-----	-----	Dd 76' at 933 gpm; Perf. 757-763, 792-810, 960-972, 1008-1023, 1065-1093, 1125-1146.
-----	-----	---	5	-----	Well #1, tidal fluctuations.
-----	-----	---	5	-----	Well #2.
-----	-----	---	5	-----	Well #3.
-----	-----	350	-----	1927	
-----	-----	---	-----	1952	SWL at surface, may flow; Dd 60' at 800 gpm; perf. 624-664, 704-814.
-----	-----	F	-----	1952	Abandoned.
sand	-----	50	6	10/15/52	Well #3; screened 925-955'
sand	-----	300	-----	11/19/54	Dd 14' at 600 gpm; Perf. 863-899.
sand, gravel	90-91	F	-----	5/28/59	
-----	-----	20	-----	10/8/56	
-----	-----	60	-----	11/4/57	

FLOWING ARTESIAN WELLS IN WASHINGTON STATE

Well Number	Owner (or Tenant) and Location	Altitude (feet)	Dimensions		Depth of Casing (feet)
			Depth (feet)	Diam. (inches)	
<u>PIERCE COUNTY: (Continued)</u>					
22/1E-24F1	Heaton, Pederson & Johnson --at Purdy.	40	151	6	-----
25K1	Ralph Quistorff --1½ mi. S of Purdy, at nursery.	60	53	6	-----
26R1	Len Higgins --2 mi. S of Purdy, on Carr Inlet.	5	102	6	-----
26R2	J. B. Heltman --2 mi. S of Purdy, on Carr Inlet.	10	100	6	-----
36/4W-13G1	Maynard McDuffie --1 mi. NE of Roche Harbor.	100	6	72	-----
37/2W-13B1	East Sound Water District --1½ mi. NE of Eastsound.	50	50	8	-----
13B2	East Sound Water District --1½ mi. NE of Eastsound.	50	50	8	50
<u>SKAGIT COUNTY:</u>					
34/2E-8B1	R. D. Turner --½ mi. N of Similk Beach, Fidalgo Island.	30	113	6	-----
8B2	Wes Laniger --½ mi. N of Similk Beach, Fidalgo Island.	30	211	6	-----
19C1	Frank Kilpatrick --at Dewey Beach, Fidalgo Island.	15(?)	287	6	-----
22N4	W. F. Grobschmitt --1 mi. W of Dewey Beach, ½ mi. NE of Deception Pass Bridge.	40	78	-----	-----
27D1	P. F. Wagner --3½ mi. NW of LaConner.	40	108	8	-----
34H1	P. F. Wagner --1½ mi. W of LaConner.	30	53	8	-----
34/3E-8H1	P. E. Ball --6 mi. NW of Mount Vernon, ½ mi. NW of Fredonia.	10	137	1½	137
34/4E-14L1	C. D. Green --3 mi. N of Big Lake, 4½ mi. E of Mount Vernon.	140	97	8	97
33P1	M. C. Holmgren --3 mi. SE of Mount Vernon.	65	103	4	-----

Water-bearing Zone		Flow (gpm)	Shut-in Pressure (lbs/sq.in.)	Date	Remarks
Material	Depth Interval (feet)				
sand, gravel	at 151	F	-----	6/18/60	
-----	52-53	5	-----	5/29/61	
-----	at 87 at 102	F	-----	6/13/58	"Just a trickle."
-----	-----	F	-----	2/1/55	
-----	-----	1	-----	9/30/58	
-----	-----	15 90	----- -----	7/--/54 8/10/55	Dd 30' at 50 gpm.
sand, gravel	30-50	15 90	----- -----	7/--/54 4/25/55	May be same well as 13B1 above.
boulders	100-113	F	-----	-----	Hardness 66 ppm, chloride 42 ppm; iron less than 0.1 ppm; blue clay to 100' depth.
-----	-----	F	-----	-----	Stops flowing when Turner well pumped.
-----	-----	1	-----	-----	Hardness 56 ppm, chloride 480 ppm.
-----	75-78	F	-----	-----	Chloride 26 ppm, iron less than 0.1 ppm.
-----	-----	F	-----	-----	Hardness 170 ppm, chloride 28 ppm. Iron less than 0.1 ppm.
-----	-----	F	-----	-----	Flows less than 1 gpm; hardness 150 ppm, chloride 20 ppm, iron less than 0.1 ppm.
sand	123-137	---	1.3	1949	Reportedly "hard water."
sand	77-97	6 25	----- -----	10/--/45 4/--/51	Dd 18' at 500 gpm; blue clay and hardpan to 77' depth.
sand, silt	-----	F	-----	-----	

FLOWING ARTESIAN WELLS IN WASHINGTON STATE

Well Number	Owner (or Tenant) and Location	Altitude (feet)	Dimensions		Depth of Casing (feet)
			Depth (feet)	Diam. (inches)	
<u>SKAGIT COUNTY: (Continued)</u>					
35/3E-8N1	E. S. Black --9 mi. NW of Burlington, 3 mi. SW of Edison.	5	42	8	42
35A1	J. A. Knutzen --2½ mi. W of Burlington.	10	56	8	56
35/5E-8D1	State Dept. of Institutions --3 mi. NE of Sedro Woolley.	200	148	10	148
8D2	State Dept. of Institutions --3 mi. NE of Sedro Woolley.	200	231	10	231
35/8E-4R1	Superior Portland Cement, Inc. --NW edge of Concrete.	800	-----	-----	-----
36/4E-8M1	Alger Community Club, Inc. --½ mi. SW of Alger.	300	51	6	51
<u>SKAMANIA COUNTY:</u>					
No flowing wells recorded in Skamamia Co.					
<u>SNOHOMISH COUNTY:</u>					
27/3E-24Q1	City of Edmonds --at Edmonds.	225	48	12	48
24Q2	City of Edmonds --at Edmonds.	225	40	-----	-----
27/4E-2N1	Layne Pacific, Inc. --2 mi. N of Alderwood Manor.	420	123	12-8	123
27/5E-7B1	W. N. Garhart --6 mi. N of Bothell.	285	89	6	89
19H1	L. F. Dolph --4 mi. N of Bothell.	160	43	5	43
26D1	Richard Layton --3 mi. N of Woodinville.	225	39	6	39
27C	E. R. Belmont --3 mi. N of Woodinville.	200	97	6	97
30H1	Lloyd Weber --3 mi. N of Bothell.	100	41	6	41
32R1	L. J. Mitchell --1½ mi. NE of Bothell.	50	498	8	261
27/7E-5J1	Don Smith --2 mi. E of Monroe.	70	378	6	370

Water-bearing Zone		Flow (gpm)	Shut-in Pressure (lbs/sq.in.)	Date	Remarks
Material	Depth Interval (feet)				
-----	-----	---	-----	3/30/53	SWL at surface, may flow during winter months; Dd 15' at 450 gpm; Perf. 32-42.
gravel	24-56	25	-----	7/4/51	Perf. 49-56'.
sand	74-148	30	-----	6/--/52	Well #1; Dd 75' at 350 gpm, Perf. 93-143.
sand, gravel	at 93	60	-----	11/--/52	Well #2; Dd 50' at 800 gpm; Perf. 133-226.
sand, gravel	-----	---	-----	-----	Well drilled 100' horizontally to develop spring zone.
gravel, coarse	41-51	75	-----	9/15/60	Perf. 35-46.
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sand	20-48	F	-----	1931	
sand	20-40	F	-----	1938	
sand, gravel	92-123	50	-----	11/7/56 and 6/17/58	Drilled to 438', filled back to 123'; Perf. 95-120.
sand	28-86	50	-----	-----	
sand, gravel	-----	130	8	7/25/47	
gravel	-----	---	6	1944	Supplies 2 families.
sand, gravel	96-97	50	-----	8/27/49	
sand, gravel	37-41	500	20	5/20/53	
sand, silt	217-241	1	-----	3/--/44	Odor of H ₂ S.
sand, fine	78-82	F	-----	3/--/45	Contains methane gas.

Well Number	Owner (or Tenant) and Location	Altitude (feet)	Dimensions		Depth of Casing (feet)
			Depth (feet)	Diam. (inches)	
<u>SNOHOMISH COUNTY: (Continued)</u>					
27/7E-5J2	Demar Flemming --2 mi. E of Monroe.	75	135	6-4	130
28/5E-13K1	E. W. Peacore --SW edge of Snohomish, N of river.	10	139	4	139
28/6E-22R1	J. G. Torvig --at Roosevelt, 4 mi. E of Snohomish.	30	32	2	32
23N1	L. H. Jones --at Roosevelt, 4 mi. E of Snohomish.	35	25	12-8	25
26D1	E. C. Medill --at Roosevelt, 4 mi. E of Snohomish.	40	32	8	32
27H1	Lars Lund --at Roosevelt, 4 mi. E of Snohomish.	35	50	2	50
35E1	Bozeman Canning Co. --2 mi. NW of Monroe.	25	127	6	127
35E2	Pictsweet Frozen Food, Inc. --2 mi. NW of Monroe.	25	180	12	-----
29/5E-29G1	Eclipse Mill Co. --E edge of Everett.	20	217	16-8	217
29/6E-5L1	G. W. Bryn --1 mi. N of town of Lake Stevens.	300	6	-----	-----
8L1	F. M. Taro --at town of Lake Stevens.	220	120	6	120
19P1	Frank Clark --5 mi. N of Snohomish.	300	54	6	54
30/5E-27K1	C. V. Irving --1 mi. E of Marysville.	55	105	6	105
31/3E-36B1	Elmer Jakeaway --at beach, 2 mi. S of Warm Beach.	10	100	8	95
31/4E-24N1	Town of Marysville --3 mi. W of Rex's Corner, off Warm Beach road.	240	358	10-8	208
24N2	Town of Marysville --3 mi. W of Rex's Corner, off Warm Beach road.	240	134	10-8	132
31/6E-3D1	George Wallitner --6 mi. E of Arlington, on Arlington Heights.	265	82	4	82

Water-bearing Zone		Flow (gpm)	Shut-in Pressure (lbs/sq. in.)	Date	Remarks
Material	Depth Interval (feet)				
sand gravel, sand	50-55 130-135	3	-----	3/--/45	Contains methane gas.
-----	at 139	5	-----	2/--/45	Does not flow when river low in late summer.
gravel	at 32	----	2.5	2/--/45	
gravel	at 25	----	1.3	2/--/45	
gravel	at 32	----	1	2/--/45	Pumps dry in 1 hr at 10 gpm.
gravel	-----	----	8.6	1925	
-----	-----	F	-----	3/21/45	Contains methane gas.
-----	-----	20	-----	5/2/46	Dd 137' at 500 gpm; several water-bearing zones.
sand, gravel	77-86	100	-----	3/--/44	
gravel	-----	F	-----	8/--/44	"May have been a spring," water-bearing gravel beneath hardpan.
sand	115-120	----	0.9	6/--/45	
sand, gravel	46-54	----	-----	-----	SWL at surface, may flow during winter season; Perf. 49-54.
sand, gravel	103-105	15	-----	11/9/60	
sand, gravel	85-100	F	-----	6/--/43	Flow tidal controlled.
sand, gravel	164-174	40	-----	-----	Dd 40' at 250 gpm; well plugged back to 203'.
sand, gravel	-----	75	-----	5/16/52	Dd 39' at 300 gpm; Perf. 105-132.
sand	at 82	3	3	8/14/44	Hardness 125 ppm.

FLOWING ARTESIAN WELLS IN WASHINGTON STATE

Well Number	Owner (or Tenant) and Location	Altitude (feet)	Dimensions		Depth of Casing (feet)
			Depth (feet)	Diam. (inches)	
<u>SNOHOMISH COUNTY: (Continued)</u>					
32/6E-18H1	A. L. Kester --5 mi. NE of Bryant, 9 mi. NE of Arlington.	440	110	6	110
<u>SPOKANE COUNTY:</u>					
27/44E-20B1	Lloyd & Fred Andrews --4 mi. E of Colbert.	2320	51	8	51
28/42E-28B1	L. M. Roberts --3½ mi. W of Denison, 4 mi. S of Deer Park.	2060	348	14- 10- 6	348
<u>STEVENS COUNTY:</u>					
28/39E-23R1	Dawn Mining Co. --2 mi. W of Ford.	1700	256	12	255
31/40E-23Q1	Lane Mountain Silica Co. --½ mi. S of Valley.	1700	75	12	75
32/40E-14J1	Town of Chewelah --at Chewelah.	1650	175	12	175
23J1	Northwest Magnesite Co. --1 mi. S of Chewelah.	1650	80	6	70
23R1	Northwest Magnesite Co. --1½ mi. S of Chewelah.	1650	197	6	197
26A1	Northwest Magnesite Co. --1½ mi. S of Chewelah.	1675	188	5	190
34/37E-24N1	D. W. Laughbon --1½ mi. SE of Arzina, 3½ mi. E of Rice.	2500	100	8	0
35/39E-5F1	Nelson Brothers --1½ mi. NW of Colville.	1580	80	8	80
10B1	City of Colville --1 mi. NE of Colville.	1950	212	12	210
11K1	City of Colville --2 mi. E of Colville.	2000	50	48	-----
11R1	City of Colville --2½ mi. E of Colville.	1960	12	48	-----
11R2	City of Colville --2½ mi. E of Colville.	1960	65	48	-----

Water-bearing Zone		Flow (gpm)	Shut-in Pressure (lbs/sq.in.)	Date	Remarks
Material	Depth Interval (feet)				
sand	100-110	----	0.4	5/23/46	
basalt and granite, de- composed	-----	----	-----	4/20/50	SWL at surface, may flow during winter months.
basalt and granite, de- composed	at 346	60	8	5/12/52	Dd 23' at 135 gpm; Perf. 338- 348.
sand	-----	10	1.7	7/11/56	
gravel	35-75	----	-----	9/13/60	SWL at surface, may flow during winter season; Perf. 40-46, 60-73; temp. 52° F.
sand, gravel	155-173	3	-----	12/18/54	Perf. 155-173.
-----	-----	F	-----	4/--/49	
sand, gravel	120-197	180	-----	7/31/53	
gravel, clay	-----	10	-----	6/30/53	Perf. 170-175, 180-190.
gravel	-----	----	-----	-----	SWL at surface, may flow during winter season; Perf. 20-35, 45-51.
gravel	55-80	30	10	3/12/53	Perf. 58-80.
gravel	-----	300	-----	-----	Perf. 35-40, 49-51, 76-80, 112- 114, 137-139, 155-160.
-----	-----	120	-----	1938	
-----	-----	10	-----	-----	May no longer flow; SWL of 16' reported.
-----	-----	100	-----	-----	

Well Number	Owner (or Tenant) and Location	Altitude (feet)	Dimensions		Depth of Casing (feet)
			Depth (feet)	Diam. (inches)	
<u>STEVENS COUNTY: (Continued)</u>					
35/39E-16F1	Hugh Heritage -- $\frac{1}{2}$ mi. S of Colville.	1600	196	6	196
20L1	P. R. Trunnell -- $3\frac{1}{2}$ mi. SW of Colville.	1600	110	12	110
35/40E-26M1	E. H. Sackman --10 mi. SE of Colville.	2450	10	-----	-----
36/39E-3A1	L. J. May --4 mi. E of Echo, 10 mi. N of Colville.	2850	4	48	4
<u>THURSTON COUNTY:</u>					
15/2W-21M1	William Kludt -- $5\frac{1}{2}$ mi. SW of Bucoda.	215	92	6	92
16/2E-5M1	W. N. Blair -- $4\frac{1}{2}$ mi. S of Yelm.	400	154	12	154
21L1	W. N. Goodwin --8 mi. S of Yelm, on E shore, Lawrence Lake.	500	74	8	72
17/1W-28C1	E. J. Watkins -- $1\frac{1}{2}$ mi. N of E end of Offut Lake.	255	52	6	52
18/2W-2C1	R. Shutt -- $\frac{1}{4}$ mi. N of Priest Point Park, on Budd Inlet.	5	28	4	-----
2E1	Calvin Lockwood --outside N edge of Priest Point Park, on Budd Inlet.	5	200	12	-----
4H1	H. C. Higgins -- $\frac{1}{4}$ mi. S of Butler Cove, 4 mi. NW of Olympia.	18	387	3	-----
14E1	Olympia Shingle Co. --Olympia Harbor area.	10	305	6	-----
14E2	Olympia Canning Co. --Olympia Harbor area.	10	250	3	250
14L1	Oregon-Washington RR & Navigation Co. --Olympia Harbor area.	10	196	3	196
14N1	Northern Pacific RR Co. --at Olympia.	10	180	3	180
23J1	City of Olympia --at Olympia.	30	333	14	-----

Water-bearing Zone		Flow (gpm)	Shut-in Pressure (lbs/sq.in.)	Date	Remarks
Material	Depth Interval (feet)				
sand	185-194	5	-----	9/6/54	
gravel	92-110	15	5	6/1/59	Perf. 92-108.
gravel	7-10	F	-----	7/18/53	Trenched sump; water-bearing gravel below peat and clay.
-----	-----	30	-----	10/--/58	
-----	-----	F	-----	12/1/59	Flow "small."
sand, gravel	65-70 101-106 140-152	2	-----	10/24/52	
gravel	55-72	50	-----	3/1/61	Dd 8' at 100 gpm; temp. 51° F.
-----	-----	F	-----	1/30/58	
-----	-----	F	-----	-----	Flows at high tide.
-----	-----	F	-----	-----	Flows at high tide.
sand	-----	30	-----	7/5/60	Supplies 7 families.
-----	-----	21	-----	3/2/51	
-----	-----	30	-----	-----	
-----	-----	7	-----	10/31/45	
sand, clay	-----	40	-----	7/--/30	Flow influenced by tide.
sand	-----	50	-----	-----	Well #6; Perf. 53-91, 109-128.

Well Number	Owner (or Tenant) and Location	Altitude (feet)	Dimensions		Depth of Casing (feet)
			Depth (feet)	Diam. (inches)	
<u>THURSTON COUNTY: (Continued)</u>					
18/3W-1C1	J. W. McKnight --on W shore of Mud Bay, 2 mi. N of Aberdeen-Shelton "Y".	5	50	3	50
1D1	L. C. Voight (R.D. Phillips & C. C. Brazel) --on W shore of Mud Bay, 2 mi. N of Aberdeen-Shelton "Y".	10	65	6	59
22H1	Roy Smith --8 mi. W of Olympia, N of Cedar Flats Creek.	320	198	6	-----
24H1	H. H. Hilling --5½ mi. W of Olympia, near entrance of McLean Creek into Mud Bay.	15	207	10	207
25A1	Walter Austin --on Delphi road, 1½ mi. S of U.S. 410 5 mi. W of Olympia.	25	131	6	131
18/1E-5M1	Brown Farms, Inc. --½ mi. W of Nisqually R. Bridge, ¼ mi. N of U.S. 99.	10	183	10	-----
6Q1	Brown Farms, Inc. --½ mi. W of Nisqually R. Bridge, ¼ mi. N of U.S. 99.	10	165	2	-----
7H1	West Coast Lumbermens Assn. --½ mi. W of Nisqually R. Bridge, 200' S of U.S. 99.	10	120	6	120
8C1	William Koenig --300' S of Nisqually R. Bridge.	10	75	4	-----
8D1	G. Schilter --300' S of Nisqually R. Bridge, W across road from Koenig well.	10	113	2	113
17C1	J. M. Webb --1 mi. S of U.S. 99, 1 mi. W of Nisqually River.	14	115	2	-----
18A1	E. Deck, Jr. --on old Olympia-Steilacoom Rd, 1 mi. S of U.S. 99, 1½ mi. SW of Nisqually R. Bridge.	20	120	8	120
19/1W-5J1	O. G. Buttons --on E shore Henderson Inlet, 1 mi. S of Johnson Point.	8	337	5	-----
17M1	Weyerhaeuser Timber Co. --on W shore Henderson Inlet, 1 mi. S of Dickerson Point.	12	1000	12- 8- 6	995

Water-bearing Zone		Flow (gpm)	Shut-in Pressure (lbs/sq. in.)	Date	Remarks
Material	Depth Interval (feet)				
sand, gravel	-----	F	-----	6/24/59	Flow influenced by tide.
-----	-----	30	-----	9/24/46	Flows at high tide; screened 59-64.
-----	-----	-----	0.22	-----	
sand, gravel	181-203 205-207	40	-----	1/30/53	
sand, gravel	-----	$\frac{1}{2}$	-----	7/15/59	
-----	-----	360	-----	11/13/57	Depth reported to be 200' to 900'; measured at 183'.
-----	-----	5	-----	11/13/57	
-----	-----	-----	0.9	-----	
-----	-----	5	-----	12/1/58	Flow measured monthly; varies from 2 gpm in summer to 10 gpm in winter.
-----	-----	F	-----	11/14/57	
-----	-----	F	-----	-----	
sand, gravel	111-120	250	-----	2/17/53	Flow submerged in slough, probably contaminated thereby.
-----	-----	F	-----	-----	
-----	-----	F	-----	-----	

Well Number	Owner (or Tenant) and Location	Altitude (feet)	Dimensions		Depth of Casing (feet)
			Depth (feet)	Diam. (inches)	
THURSTON COUNTY: (Continued)					
19/1W-23F1	William J. Butler --on shore of Nisqually Reach, 5 mi. SE of Johnson Point, 6 mi. N of U.S. 99.	2	180(?)	4	-----
29A1	--- Maynard --on E shore, 1 mi. N of head of Hender- son Inlet, off Johnson Point Rd.	12	225	2½	-----
33E1	E. M. Lohrer --at shoreline, at head of Henderson Inlet, off Johnson Point Rd.	2	150	3	150
19/2W-8M1	W. H. Trager --E shore, Totten Inlet, off Steamboat Island Rd, 7 mi. NE of jct. with U.S. 101.	10	80	6	-----
9R1	Coopers Point Water Co., Inc. --on W side of Cooper Point.	10	360	8	348
9R2	Coopers Point Water Co., Inc. --on W side of Cooper Point.	10	460	4	330
16A1	Huckleberry Road Water Co. --½ mi. S of Cooper Point, E shoreline of Eld Inlet.	10	552	6	552
16K1	James McAllister --1 mi. S of Cooper Point, E shoreline of Eld Inlet.	15	325	2	-----
23Q1	Olympia Canning Co. --on small peninsula N of Gull Harbor, 2 mi. S of Boston Harbor, on Budd Inlet, E shore.	15	385	6	373
26Q1	Maritime Administration --E shore of Budd Inlet, 2 mi. N of Priest Point Park.	15	-----	-----	-----
27D1	William Guffey --2½ mi. S of Cooper Point, on W shore Budd Inlet.	15	153	6	140
28J1	Fred Dunn --2½ mi. S of Cooper Point, on W shore Budd Inlet.	5	213	2½	213
28R1	C. J. Frank --3 mi. S of Cooper Point, on W shore Budd Inlet.	15	60	3	-----
31D1	A. H. Tornquist --W shore Mud Bay, 2½ mi. NE of jct. of U.S. 101 and Steamboat Island Rd.	50	14	32	14

Water-bearing Zone		Flow (gpm)	Shut-in Pressure (lbs/sq.in.)	Date	Remarks
Material	Depth Interval (feet)				
-----	-----	2	-----	2/5/58	Supplies 3 homes.
-----	-----	F	-----	-----	Flows at high tide.
-----	-----	6	-----	9/24/58	Flow influenced by tide.
-----	-----	F	-----	-----	Flows at high tide.
sand, gravel	-----	F	-----	-----	Supplies community; screened 343-360. Well #2.
sand	-----	110	-----	9/--/39	Measured at high tide, flows at half to full tide.
sand	-----	F	-----	-----	
-----	-----	F	-----	-----	
sand	-----	F	-----	-----	Flows at high tide.
-----	-----	F	-----	6/2/60	
-----	-----	F	-----	9/--/58	Flows at high tide, SWL 11' at low tide; screened 140-153.
sand, fine	-----	30	-----	-----	Flow measured at high tide; supplies 8 homes.
-----	-----	2	-----	8/7/59	Flow measured at low tide.
-----	-----	F	-----	-----	Well #1.

Well Number	Owner (or Tenant) and Location	Altitude (feet)	Dimensions		Depth of Casing (feet)
			Depth (feet)	Diam. (inches)	
<u>THURSTON COUNTY: (Continued).</u>					
19/2W-31D2	A. H. Tornquist --W shore Mud Bay, 2½ mi. NE of jct. of U.S. 101 and Steamboat Island Rd.	50	14	8	14
32B1	C. E. McArthur --E shore Mud Bay, 5½ mi. NW of Olympia.	10	62	6	-----
32B2	L. T. Webster --E shore Mud Bay, 5½ mi. NW of Olympia.	11	75	6	65
33Q1	Butler's Cove Water Co. --at Butler's Cove, W shore of Budd Inlet, 4½ mi. NW of Olympia.	10	363	8	333
33Q2	Butler's Cove Water Co. --at Butler's Cove, W shore of Budd Inlet, 4½ mi. NW of Olympia.	10	235	12	-----
19/3W-34B1	Ed. Fitzgerald --1 mi. N of U.S. 101, 4 mi. NW of Aberdeen-Shelton "Y".	80	53	6	-----
34M1	G. V. Thale --off of U.S. 101, 4 mi. NW of Aber- deen-Shelton "Y".	70	47	6	-----
36Q1	L. K. Couch --W shore of Mud Bay, 3½ mi. N of Aber- deen-Shelton "Y".	10	36	6	-----
36Q2	Albert Taylor --W shore of Mud Bay, 3½ mi. N of Aber- deen-Shelton "Y".	10	40	6	-----
19/1E-30E1	National Fish & Oyster Co. --½ mi. W of Luhr Beach, on Nisqually Reach, 3 mi. N of U.S. 99.	5	34	6	34
31H1	Brown Farms, Inc. --S of Nisqually Flats, 2 mi. NW of Nisqually R. Bridge.	5	165	2	165
20/1W-33L1	Dr. R. C. Brown --at Johnson Point.	5	500	5	485
20/2W-28P1	Steamboat Islanders, Inc. --on Steamboat Island, 12 mi. N of Aberdeen-Shelton "Y".	10	425	6	419
<u>WAHKIAKUM COUNTY:</u>					
8/6W-2B1	Frank Schuster --½ mi. N of Cathlamet.	160	-----	6	-----

Water-bearing Zone		Flow (gpm)	Shut-in Pressure (lbs/sq.in.)	Date	Remarks
Material	Depth Interval (feet)				
-----	-----	F	-----	-----	Well #2.
-----	-----	F	-----	-----	"Sulphur taste."
-----	-----	F	-----	-----	Screened 65'-75'.
sand, gravel	109-127 187-260 265-286 289-393	200	6.5	-----	Screened 324-358; well plugged below 353'.
-----	-----	F	-----	-----	
-----	-----	-----	0.43	6/25/59	
-----	-----	-----	0.43	6/25/59	
-----	-----	17	-----	-----	Measured at high tide.
-----	-----	F	-----	-----	Supplies 2 homes.
-----	-----	F	-----	11/--/46	
-----	-----	5	-----	-----	Two flowing wells, each 165' x 2".
-----	-----	2	-----	-----	Measured at high tide.
sand, gravel	415-425	5	-----	-----	Dd 2' at 100 gpm; screened 419-424.
-----	-----	1	-----	-----	

FLOWING ARTESIAN WELLS IN WASHINGTON STATE

Well Number	Owner (or Tenant) and Location	Altitude (feet)	Dimensions		Depth of Casing (feet)
			Depth (feet)	Diam. (inches)	
<u>WALLA WALLA COUNTY:</u>					
6/35E-1C1	Frank Deccio --1 mi. S of College Place.	810	535	8-6	535
1C3	L. F. Cavalli, et. al. --1 mi. S of College Place.	800	618	6	618
1E1	--- Criscola, et. al. --1½ mi. S of College Place.	800	640	6	-----
1M1	Harold Wagner --1½ mi. S of College Place.	805	703	6	600
1P1	D. A. McAuslan --2 mi. S of College Place.	780	610	6	-----
10P1	Jaussand Livestock Co. --4 mi. SW of College Place.	735	1145	8	1100
11J1	U.S. Dept. of Agriculture --2½ mi. S of College Place.	760	642	8-6	-----
12H1	D. A. McAuslan --3 mi. SE of College Place.	800	700	8	-----
12N1	A. A. Durand --3 mi. S of College Place.	775	590	8-6	535
12P1	G. H. Thomas --3 mi. S of College Place.	770	680	8-6	400
6/36E-6M1	Julius Jensen --4 mi. SW of Walla Walla.	806	590	8	300
7D1	L. B. Ruzicka --4 mi. SW of Walla Walla.	790	600	6-5	500
7M1	E. C. Prusia --4½ mi. SW of Walla Walla.	850	560	6	-----
7M2	Hancock & Yenny --4½ mi. SW of Walla Walla.	850	680	6	-----
13C1	C. E. Hargett --5½ mi. SE of Walla Walla, just N of Oregon line.	1320	65	10	64
6/37E-4B1	E. Pribilsky --8 mi. E of Walla Walla.	1700	200	8-6	118
5F1	Baker & Baker Sweazy quarter --7 mi. SE of Walla Walla.	1560	612	12	125
7Q1	Clyde Garland --7½ mi. SE of Walla Walla.	1620	200	8	100

Water-bearing Zone		Flow (gpm)	Shut-in Pressure (lbs/sq.in.)	Date	Remarks
Material	Depth Interval (feet)				
basalt	-----	----	13	1/--/48	Old Kelley well; hardness 60 ppm, chloride 4 ppm.
basalt	535-618	335	12.8	8/4/35	
basalt	-----	----	15	1/--/48	Old Harmon well.
basalt	at 540, 700-703	300- 500	-----	1/--/48	Hardness 60 ppm, chloride 4 ppm.
basalt	-----	F	-----	1/--/48	Old Russell well.
basalt	1120-1122	----	43	1948	Hardness 35 ppm, chloride 4 ppm.
basalt	630-642	60 (?)	8.6	1948	Hardness 47 ppm, chloride 6 ppm.
basalt	-----	F	-----	1948	Old McCall well; hardness 62 ppm chloride 4 ppm.
basalt	345-350 565-590	----	22	1913	Old Juvenal well.
"shale" basalt	177-312 425-427 566-575	175	-----	3/25/48	
basalt	565-590	F	70	3/25/48	SWL 11' on March 25, 1948; Dd 2' at 500 gpm; Hardness 60 ppm, chloride 4 ppm.
basalt	at 400 at 500	F	-----	7/19/33	Temp 72° F.
basalt	-----	300	15	4/1/46	
basalt	-----	F	-----	12/6/46	
sand, gravel	-----	200	-----	7/27/42	
basalt	194-200	45	20	7/16/47	Hardness 45 ppm, chloride 10 ppm.
basalt	417-612	2390	74	2/4/45	Hardness 45 ppm, chloride 6 ppm; temp. 54° F.
basalt	-----	30	-----	10/23/46	Hardness 45 ppm, chloride 4 ppm; Perf. 0-100'.

FLOWING ARTESIAN WELLS IN WASHINGTON STATE

Well Number	Owner (or Tenant) and Location	Altitude (feet)	Dimensions		Depth of Casing (feet)
			Depth (feet)	Diam. (inches)	
<u>WALLA WALLA COUNTY: (Continued)</u>					
7/33E-33N1	W. P. Workman -- $1\frac{1}{2}$ mi. W of Touchet.	430	275	5	-----
7/35E-23J1	Hydro-Irrigation Dist. No. 9 -- $1\frac{1}{2}$ mi. N of College Place.	810	640	6	600
25N1	College Place Water Co. --at College Place.	790	625	6	-----
25P1	Ponti & Columbo --at College Place.	820	618	6	-----
26F1	Hydro Dist. No. 12 (formerly Blaloch Irrigation Dist. No. 12) -- $\frac{1}{2}$ mi. NW of College Place.	780	650	8	-----
26P1	I. C. Ganni -- $\frac{1}{2}$ mi. W of College Place.	760	600	10-6	550
26Q1	College Place Irrigation Dist. No. 14 --at College Place.	780	570	6	540
33H1	Walla Walla College -- $2\frac{1}{2}$ mi. W of College Place.	690	710	6	-----
33L1	Frank Nelson --3 mi. W of College Place.	680	618	6	550
33L2	Frank Nelson --3 mi. W of College Place.	685	650	6	550
35A1	Walla Walla College --at College Place.	778	600	8	-----
35A2	Walla Walla College --at College Place.	780	1022	12- 8- 7	610
36C1	Giovanina Magnoni --at College Place.	810	640	6	640
36D1	College Place Water Co. --at College Place.	800	640	6	-----
36F1	College Place Water Co. --at College Place.	800	625	6	500
36F2	College Place Water Co. --at College Place.	800	708	16	554
36F3	A. Richards & C. Jones --at College Place.	805	535	8	535

Water-bearing Zone		Flow (gpm)	Shut-in Pressure (lbs/sq.in.)	Date	Remarks
Material	Depth Interval (feet)				
basalt	265-275	----	2	11/24/48	
basalt	-----	----	8.6	1948	Measured in winter; supplies 30 homes; hardness 45 ppm, chloride 5 ppm.
basalt	600-625	----	8.6	3/18/48	Hardness 60 ppm, chloride 4 ppm.
basalt	610-618	F	-----	-----	Hardness 60 ppm, chloride 4 ppm.
basalt	-----	----	20	3/--/48	Supplies 40 homes; hardness 55 ppm, chloride 4 ppm.
basalt	550-600	F	-----	1920	Measured in winter, 1920; casing has since been pulled and well covered over.
basalt	535-570	F	-----	3/--/48	Hardness 55 ppm, chloride 4 ppm.
basalt	535-710	F	-----	-----	
basalt	-----	F	-----	1/--/48	
basalt	-----	F	-----	1/--/48	
basalt	-----	F	20	12/--/46	Hardness 55 ppm, chloride 4 ppm.
basalt	-----	185	2.5	4/29/60	
basalt	-----	F	-----	1948	Hardness 62 ppm, chloride 4 ppm.
basalt	-----	----	8	7/--/46	Dd 24' at 450 gpm.
basalt	600-625	----	16	3/18/48	
basalt	620-700	740	2.5	7/28/47	One estimated flow is "2000 gpm, July, 1947."
basalt	-----	F	-----	3/19/48	Hardness 62 ppm, chloride 4 ppm.

Well Number	Owner (or Tenant) and Location	Altitude (feet)	Dimensions		Depth of Casing (feet)
			Depth (feet)	Diam. (inches)	
<u>WALLA WALLA COUNTY: (Continued)</u>					
7/35E-36F4	C. L. Deffenbaugh, A. Richards, C. Jones, et. al. --at College Place.	800	595 (610?)	8	100(?)
36F5	College Place Water Co. (Maple Cööp. Water Co. ?) --at College Place.	800	708	20- 12- 6(?)	552
36R1	Stone Creek Sanitarium --1½ mi. SE of College Place.	845	618	8-6	-----
7/36E-22N1	City of Walla Walla --at Walla Walla.	1050	789	30- 24- 20	400
27G1	Rudolph Depping --1 mi. E of Walla Walla.	1100	450	12- 10- 8	357
31N1	J. J. Chisholm --1½ mi. SE of College Place, 3 mi. SW of Walla Walla.	840	519	6	519
31N2	J. J. Chisholm --1½ mi. SE of College Place, 3 mi. SW of Walla Walla.	840	600	6	-----
35D1	Petrus DeBoer --2 mi. E of Walla Walla.	1080	240	6	-----
7/37E-31J1	T. E. Wilson --6 mi. E of Walla Walla.	1390	200	6	-----
31R1	H. T. McGuire --7 mi. E of Walla Walla.	1410	220	10-6	171
32E1	Maxson School --5½ mi. E of Walla Walla.	1390	200	6	-----
<u>WHATCOM COUNTY:</u>					
38/2E-6B1	Frank Imhof --3 mi. S of Ferndale.	12	535	-----	-----
38/3E-1D1	R. Morgenthaler --on Everson-Goshen Rd, 3/4 mi. N of Mt. Baker Highway.	260	83	4	83
1Q1	Henry Heidman --on Mt. Baker Highway, ½ mi. E of Everson-Goshen Rd.	430	125	3	-----
9B1	O. H. Olson --on Van Wyck Rd., ½ mi. E of Hannegan Road.	250	156	6	156

Water-bearing Zone		Flow (gpm)	Shut-in Pressure (lbs/sq.in.)	Date	Remarks
Material	Depth Interval (feet)				
basalt	-----	350	-----	6/1/47	Dd 18' at 350 gpm.
basalt	620-700	2000	----- 18	7/--/47 11/--/46	May be same well as 36F2; Dd 5' at 450 gpm.
basalt	500-	F	-----	3/24/48	
basalt	-----	400	-----	9/6/53	One flow report "2780 gpm".
gravel basalt	175-190 367-382, 410-420	----	-----	5/7/48	SWL at surface, may flow at times.
basalt	-----	F	-----	-----	Flows part time.
basalt	-----	F	-----	3/24/48	May be same well as 31N1.
basalt	230-240	F	-----	10/22/48	Hardness 50 ppm, chloride 3 ppm.
-----	-----	5	-----	-----	Hardness 50 ppm, chloride 3 ppm.
-----	-----	25	3.7	10/23/46	Hardness 45 ppm, chloride 3 ppm.
-----	-----	F	-----	-----	Hardness 55 ppm, chloride 3 ppm.
-----	515-535	7	-----	8/9/46	Reportedly saline.
gravel	80-83	----	0.43	7/21/47	Temp. 50° F; hardness 90 ppm, chloride 8 ppm.
-----	-----	----	0.25	7/19/47	
sand, gravel	147-156	4	-----	7/30/48	

Well Number	Owner (or Tenant) and Location	Altitude (feet)	Dimensions		Depth of Casing (feet)
			Depth (feet)	Diam. (inches)	
WHATCOM COUNTY: (Continued)					
38/4E-6C1	Peter Strutz --on Kelly Rd., $\frac{1}{2}$ mi. W of Sand Rd.	275	150	2	-----
6K1	C. S. Constant --on Mt. Baker Highway, $\frac{1}{4}$ mi. W of Sand Rd.	360	195	4	192
38/5E-18C1	F. Potter -- $1\frac{1}{2}$ mi. W of Van Zandt.	300	236	6	-----
29J1	P. Sygitowicz --1 mi. SE of Clipper.	280	60	$1\frac{1}{2}$	-----
29L1	--- Sygitowicz -- $\frac{1}{2}$ mi. S & E of Clipper.	265	84	$1\frac{1}{2}$	-----
39/1E-1E1	Custer Water Assn. -- $1\frac{1}{2}$ mi. S of Custer, on Olson Rd.	120	50	10	45
6E1	Unknown --1 mi. S of Birch Bay, on Jackson Rd.	22	146	4	146
6E2	Melvin Haugen --1 mi. S of Birch Bay, on Jackson Rd.	22	153	4	153
39/2E-19P1	H. E. Bohn --1 mi. W of Ferndale, on Mountain View Road.	50	69	4	69
20C1	Whatcom-Skagit Rendering Works --1 mi. N of Ferndale, on old Pacific Highway (U.S. 99).	40	142	8	135
20D1	Melvin Vilene --1 mi. N of Ferndale, on Thornton Rd.	55	141	6	140
28H1	Tom Bratt --2 mi. E of Ferndale, S of Barrett Lake.	70	500 \pm	-----	-----
29J1	Frank McKinnin -- $\frac{1}{2}$ mi. SE of Ferndale.	25	217	6	-----
30C1	Fertile Meadows Water Assn. -- $\frac{1}{2}$ mi. W of Ferndale, on Mountain View Rd.	55	75	4	70
30K1	Jonathan Manner --1 mi. SW of Ferndale, on Imhoff Rd.	15	136	6	133
30L1	C. H. Harlan --1 mi. SW of Ferndale, on Imhoff Rd.	15	237	6	195

Water-bearing Zone		Flow (gpm)	Shut-in Pressure (lbs/sq.in.)	Date	Remarks
Material	Depth Interval (feet)				
-----	-----	---	1.8	-----	
-----	154-156 194-195	---	3	7/19/47	
sand, gravel	at 60	F	-----	9/3/59	
-----	-----	1	-----	9/23/59	
-----	-----	F	-----	-----	
sand, gravel	17-50	12	1	10/7/58	Screened 35-50.
sand, fine	144-146	F	-----	-----	
-----	-----	0.05	-----	-----	"Just flows" continuously.
sand	66-69	3	4	8/8/47	
sand	135-142	----	3.5	8/27/48	Hardness 95 ppm, chloride 18 ppm.
sand, gravel	140-141	---	-----	-----	
-----	-----	100- 150	-----	1942±	
-----	-----	0.2	-----	8/4/47	Too saline for domestic use; hardness 30 ppm, chloride 1236 ppm.
-----	-----	25 12	-----	1944 1955	Supplies 9 homes.
sand	133-136	10	20 12	10/4/51 10/6/55	
-----	105-237	80- 130	-----	5/--/42	Not controlled, flows into Schell Ditch; now owned by Frank Imhoff for community supply; hardness 110 ppm, chloride 108 ppm.
		----	22	5/--/50	

Well Number	Owner (or Tenant) and Location	Altitude (feet)	Dimensions		Depth of Casing (feet)
			Depth (feet)	Diam. (inches)	
<u>WHATCOM COUNTY: (Continued)</u>					
39/2E-31C1	S. Hovander -- $1\frac{1}{2}$ mi. SW of Ferndale, at jct. Imhoff and Ulrich Rds.	15	240	4	-----
31C2	Alfred Ulrich -- $1\frac{1}{2}$ mi. SW of Ferndale, on Imhoff Rd.	15	245	4	-----
31H1	F. M. Peterson -- $1\frac{1}{2}$ mi. S of Ferndale, on River Rd.	20	175	6	175
33C1	Hans Olson -- $1\frac{1}{2}$ mi. SE of Ferndale, W of U.S. 99 on Smith Rd.	40	90	4	-----
39/3E-13M1	West Coast Oil & Gas Co. --on Everson-Goshen Rd., $4\frac{1}{2}$ mi. N of Mt. Baker Highway.	140	4175	-----	-----
13N1	J. Ulrich --on Everson-Goshen Rd., 4 mi. N of Mt. Baker Highway.	160	6	30	6
19E1	C. Dews, et. al. --at Laurel Rd. and Meridian Rd.	90	80	6	50
39/4E-31N1	Ed. Johnson --on Kelly Rd., $1\frac{1}{2}$ mi. W of Mt. Baker Highway.	270	80	4	-----
31Q1	J. R. Montgomery --on Kelly Rd., $\frac{1}{2}$ mi. W of Mt. Baker Highway.	260	100	4	99
32K1	O. Valum --on Mt. Baker Highway, $\frac{1}{2}$ mi. S of Smith Rd.	375	53	4	53
32M1	Earl Reamey --on Sand Rd., $\frac{1}{2}$ mi. N of Mt. Baker Highway.	260	89	4	88
32M2	Mt. Baker School Dist. No. 507 --on Sand Rd., $\frac{1}{2}$ mi. N of Mt. Baker Highway.	260	88	8-4	88
39/5E-9H1	D. W. Ginter --on Mt. Baker Highway, 3 mi. S of Kendall.	395	3	48	-----
40/3W-11E1	Unknown --on Point Roberts peninsula, $1\frac{1}{2}$ mi. E of Point Roberts.	18	40	-----	-----

Water-bearing Zone		Flow (gpm)	Shut-in Pressure (lbs/sq.in.)	Date	Remarks
Material	Depth Interval (feet)				
-----	-----	F	-----	8/7/47	Hardness 85 ppm, chloride 86 ppm.
-----	-----	---	10	8/7/47	Hardness 85 ppm, chloride 46 ppm.
sand	172-175	---	3	8/7/47	Hardness 70 ppm, chloride 640 ppm.
-----	-----	---	1	8/4/47	Hardness 45 ppm, chloride 1224 ppm.
-----	-----	F	-----	7/--/47	Oil test well; salt water flow from 500' depth; plugged off in 1948; hardness 45 ppm, chloride 2300 ppm.
sand	-----	---	0.2	7/24/47	Contains small amount of iron.
sand, fine	26-50	---	1	4/--/48	Supplies several homes; hardness 130 ppm, chloride 17 ppm.
-----	-----	---	5.5	7/21/47	Temp. 50° F.
sand, gravel	99-100	---	12	7/22/47	Hardness 15 ppm, chloride 43 ppm, contains iron.
gravel	51-53	---	1	7/19/47	Trace of iron.
gravel	88-89	---	10	9/--/34	Hardness 25 ppm, chloride 95 ppm.
gravel	88-89	500	12	9/21/33	May be same as 32M1; 18' concrete slab at 15' depth shuts off wild flow.
-----	-----	1.6	-----	10/7/59	
-----	-----	F	-----	-----	

FLOWING ARTESIAN WELLS IN WASHINGTON STATE

Well Number	Owner (or Tenant) and Location	Altitude (feet)	Dimensions		Depth of Casing (feet)
			Depth (feet)	Diam. (inches)	
<u>WHATCOM COUNTY: (Continued)</u>					
40/1E-1L1	R. S. Pendleton --on Stein Rd., 1 mi. N of Blaine-Lynden Road.	220	117	3	117
17H1	W. S. Loop --4 mi. SE of Blaine, off U.S. 99.	30	71	2	-----
17P1	Bernard Wiebe --4 mi. S of Blaine, on California Creek Road.	15	365	3	-----
40/2E-7H1	R. B. LeCocq --on Sunrise Rd., $\frac{1}{2}$ mi. N of Blaine- Lynden Rd.	140	31	7	31
40/3E-28M1	Kenneth VanderGriend --at Abbot Rd. and Hannegon Rd.	40	375	3	-----
40/4E-28D1	J. A. Quinn --1 mi. E of Nooksack, N of Telegraph Road.	130	20	36	12
41/1E-31Q1	City of Blaine --at Blaine.	75	247	12	247
41/4E-33H1	City of Sumas --W edge of Sumas.	50	58	8	58
<u>WHITMAN COUNTY:</u>					
14/44E-27P1	N. A. Hatley --9 mi. SW of Pullman.	2600	200	8	19
14/45E-5D1	City of Pullman --at Pullman.	2339	164	10	34
35N1	G. O. Swales --7 mi. S of Pullman, $1\frac{1}{2}$ mi. NE of Johnson.	2654	117	6	78
15/44E-1N1	Girard Clark -- $1\frac{1}{2}$ mi. NE of Albion, 8 mi. N of Pullman.	2481	73	6	35
17/44E-32A1	City of Colfax --at Glenwood, 6 mi. NE of Colfax.	2100	110	10	-----
32A2	City of Colfax --at Glenwood, 6 mi. NE of Colfax.	2100	106	12-10	80
32C1	E. W. Johnson --at Glenwood, 6 mi. NE of Colfax.	2100	-----	-----	-----

Water-bearing Zone		Flow (gpm)	Shut-in Pressure (lbs/sq.in.)	Date	Remarks
Material	Depth Interval (feet)				
sand	100-117	----	1.3	8/19/47	Hardness 75 ppm, chloride 6 ppm.
sand, gravel	70-71	----	7	-----	Hardness 60 ppm, chloride 12 ppm.
-----	-----	4	-----	8/14/47	Hardness 110 ppm, chloride 220 ppm.
sand	14-28	20	2.5	9/6/60	
-----	-----	3	-----	-----	Flowed 60 gpm when drilled in 1910, now flows 3 gpm after partial plugging.
-----	-----	-----	-----	10/5/51	Sump; SWL at surface, may flow, Dd 12' at 160 gpm.
gravel	-----	---	8	6/25/48	Hardness 60 ppm, chloride 6 ppm.
gravel	50-58	500	5	5/27/59	Screened 50-58'; large springs nearby.
sand	179-200	----	0.43	-----	
basalt	-----	----	2	3/--/33	Dd ½' at 600 gpm.
-----	-----	F	2.5	-----	
basalt	70-73	F	-----	-----	Flows, except during July through September.
-----	-----	106	-----	4/18/15	
"rock"	80-106	1554	-----	1927	
-----	-----	---	2	1945	
-----	-----	4	-----	-----	"Affected by Colfax well to east."

FLOWING ARTESIAN WELLS IN WASHINGTON STATE

Well Number	Owner (or Tenant) and Location	Altitude (feet)	Dimensions		Depth of Casing (feet)
			Depth (feet)	Diam. (inches)	
<u>WHITMAN COUNTY: (Continued)</u>					
19/40E-25C1	Harold Loomis -- $\frac{1}{2}$ mi. E of Ewan, 1 mi. S of Rock Lake.	-----	98	6	27
<u>YAKIMA COUNTY:</u>					
10/20E-9A1	City of Toppenish --at Toppenish.	750	863	24- 20- 16	783
10/22E-25E1	City of Sunnyside --at Sunnyside.	750	461	20-16	379
27C1	Seattle Packing Co. --2 mi. W of Sunnyside.	755	180	6	163
11/17E-24D1	Simcoe Oil Co. --4 mi. NW of Brownstown.	890	2760	20	-----
12/15E-13R1	William Mondor --1 mi. SW of Tampico, upper Ahtanum Valley.	2180	325	16	50
12/16E-8H1	Vernon Mondor --2 mi. NE of Tampico.	2250	380	10-8	380
18C1	M. P. Garrison --at Tampico.	2200	287	14	287
18K1	Herke Brothers -- $\frac{1}{2}$ mi. S of Tampico.	2110	343	8-5	311
12/17E-16D1	J. C. Schriener --4 mi. W of Wiley.	1460	384	10	384
16R1	B. S. Borton & Sons --3 mi. SW of Wiley.	1590	1078	12-6	940
17C1	Carl Sheneberger --4 mi. W of Wiley.	1573	242	8	242
17H1	J. R. Rutherford --4 mi. W of Wiley.	1540	8	1 $\frac{1}{2}$	-----
18B	Earl Dovel --5 mi. W of Wiley.	1800	12	-----	-----
18G	Earl Dovel --5 mi. W of Wiley.	1800	15	-----	-----
12/18E-1M1	Yakima Farm Labor Camp --2 mi. W of Union Gap, 3 mi. S of Yakima.	1020	620	10-8	555
2E1	LeRoy Schreiner --3 mi. W of Union Gap, 4 mi. S of Yakima.	1080	405	10-6	376

Water-bearing Zone		Flow (gpm)	Shut-in Pressure (lbs/sq. in.)	Date	Remarks
Material	Depth Interval (feet)				
basalt	90-98	80	-----	5/3/49	
sand, gravel	-----	660	12	12/--/59	Perf. 803-863.
sand, gravel	-----	F	-----	12/23/53	Dd 160' at 1400 gpm; Perf. 388-450.
sand	-----	150	12	5/31/61	
basalt	at 1700	2000	-----	-----	Oil test well; odor of H ₂ S, temp 72°F.
basalt	at 53	160	-----	5/1/51	Hardness 95 ppm, chloride 8 ppm, temp. 56°F.
basalt	-----	180	-----	10/31/45	Not flowing 6/13/51; Dd 20' at 540 gpm.
basalt	210-221 263-268	100	10	5/21/45	Dd 140' at 1260 gpm; Perf. 165-287.
basalt	320-343	90	-----	2/20/46	Dd 120' at 250 gpm, hardness 95 ppm, chloride 8 ppm.
basalt	312-384	640	25	6/6/52	
basalt	1035-1078	92	-----	12/29/44	
basalt	204-236	120	-----	10/5/48	Hardness 60 ppm, chloride 8 ppm, slight H ₂ S odor, temp. 46° F.
-----	-----	---	0.1	5/9/51	Not in use.
basalt	-----	200	-----	-----	
basalt	-----	250	-----	-----	
sand	600-620	560	-----	11/--/39	Supplies 300 cabins; hardness 82 ppm, chloride 10 ppm.
sand, gravel	at 370	---	0.7	7/26/51	

FLOWING ARTESIAN WELLS IN WASHINGTON STATE

Well Number	Owner (or Tenant) and Location	Altitude (feet)	Dimensions		Depth of Casing (feet)
			Depth (feet)	Diam. (inches)	
<u>YAKIMA COUNTY: (Continued)</u>					
12/19E-1Q1	Town of Moxee City --at Moxee City.	1060	1326	10	1326
2D1	J. R. Stapleton --1½ mi. W of Moxee.	1000	285	6	65
5N1	Town of Union Gap --at Union Gap.	975	370	12	370
6H1	Town of Union Gap --at Union Gap.	980	511	20-16	399
12/20E-6B1	R. A. Boss --1 mi. NE of Moxee City.	1160	950	10-6	950
8A1	V. A. Belaire --2½ mi. E of Moxee City.	1120	900	6	-----
8C1	V. A. Belaire --2 mi. E of Moxee City.	1120	900	6	470
13/17E-4D1	J. I. Haas, Inc. --1½ mi. S of Cowiche.	1700	201	8	200
11G1	Yakima Fruit Growers, Inc. --at Wiekel, 3½ mi. SE of Cowiche.	1600	197	12-10	44
26J1	H. E. Mason --½ mi. NW of Harwood, 2 mi. E of Gromore.	1400	153	10-8	77
26R1	Fred Hanses --at Harwood, 2 mi. E of Gromore.	1350	127	8	100
36A1	Orville Ormiston --1 mi. E of Harwood, 2 mi. W of Congdon.	1400	171	8	-----
13/18E-12J1	M. & R. Canning Co. --1½ mi. N of Yakima, off Ellensburg Highway.	1090	46	8	46
28L1	Congdon Orchards --at Congdon.	1160	1252	10-6	1220
29Q1	George Wilson --at Congdon.	1170	1267	6-4	-----
13/19E-18F1	Cascade Lumber Co. --NE edge of Yakima.	1050	2425	8-6	1992
21D1	Yakima County Horticultural Union --1 mi. NE of Yakima.	1040	264	12-10	264

Water-bearing Zone		Flow (gpm)	Shut-in Pressure (lbs/sq.in.)	Date	Remarks
Material	Depth Interval (feet)				
sandstone	-----	875	37	1/6/43	Perf. 1225-1280.
sand, gravel	-----	8	5	2/23/61	Dd 19' at 70 gpm, temp. 52° F.
sand, gravel, and basalt	130-137 181-360	62	-----	1950	Perf. 130-137, 181-360; hardness 31 ppm, pH 7.3.
-----	-----	150	5.2	6/23/59	Dd 170' at 1385 gpm; screened- 399-511.
-----	-----	60	3	4/10/48	
-----	-----	100	18	4/15/47	
-----	-----	200	4	2/15/47	Dd 16' at 650 gpm.
sand, gravel	12-60 90-160	---	-----	-----	SWL at surface, may flow; Dd 52' at 500 gpm; Perf. 12-60', 90-160'.
basalt	180-197	160	-----	7/24/51	
sandstone	148-153	329	-----	2/21/59	
sandstone, gravel	-----	150	-----	2/11/55	
-----	-----	20	-----	8/24/61	
sand, gravel	-----	20	1.5	7/25/53	Dd 25' at 100 gpm.
sandstone	837-933 and at 1220	50	-----	1956	
basalt	at 800 at 1000 at 1050	336	-----	4/--/01	
sand	1617-1635	150	-----	10/--/27	Temp. 70°-88° F.
sand, gravel, clay, sand- stone	several	20	-----	11/29/50	Perf. 244-264'.

FLOWING ARTESIAN WELLS IN WASHINGTON STATE

Well Number	Owner (or Tenant) and Location	Altitude (feet)	Dimensions		Depth of Casing (feet)
			Depth (feet)	Diam. (inches)	
<u>YAKIMA COUNTY: (Continued)</u>					
13/19E-21D2	Yakima County Horticultural Union --1 mi. NE of Yakima.	1040	16	12	16
14/17E-27N1	B. M. Inghram -- $\frac{1}{2}$ mi. E of Cowiche.	1700	78	6	78
28A1	G. V. Moore --1 mi. NE of Cowiche.	1750	140	10	30
31K1	Richey & Gilbert Co. --2 mi. W of Cowiche.	2100	351	10	150
14/18E-35Q1	Town of Selah -- $\frac{1}{2}$ mi. W of Selah.	1200	465	20-12	450
36N1	Town of Selah --at Selah.	1150	578	22	555
14/19E-32F1	R. S. Symonds --5 mi. N of Yakima, off Ellensburg Highway.	1250	494	8-6	210
15/17E-11A1	C. C. Hazen --up Wenas Valley, 7 mi. N of Naches.	1800	554	8	278
13C1	G. E. Cameron --up Wenas Valley, 6 mi. N of Naches.	1725	385	12-10	338
15/18E-15P1	High Valley Ranch --on old Burr Rd., 10 mi. N of Selah.	1800	-----	8	-----

Water-bearing Zone		Flow (gpm)	Shut-in Pressure (lbs./sq.in.)	Date	Remarks
Material	Depth Interval (feet)				
-----	-----	F	-----	-----	
sand, gravel	-----	30	-----	3/6/53	Dd 8' at 50 gpm; Perf. 0-78'.
gravel	-----	15	-----	2/7/57	Temp. 56° F.
basalt	133-351	143 100	----- -----	11/14/45 1951	Dd 105' at 380 gpm.
sand, gravel, and clay	several	---	-----	-----	SWL at surface, may flow; Perf. 327- 347, 383-393, 405-435.
sand, gravel, and clay	490-555	100	-----	8/18/51	Dd 70' at 700 gpm; Perf. 200- 220, 494-554.
sandstone, sand and gravel	40-60 359-454	43	-----	4/1/46	
sand, gravel, and basalt	-----	200	-----	4/21/50	
sandstone, shale, and basalt	-----	450	10	3/--/45	Hardness 55 ppm, chloride 5 ppm.
-----	-----	F	-----	-----	