STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

REPORT OF EXAMINATION

TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

☐ Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology.)

☒ Ground Water (Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

PRIORITY DATE	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
September 16, 1998	G2-29794		

NAME
Karl Herzog

ADDRESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
3839 11th Avenue NW	Olympia	Washington	98502-2516

PUBLIC WATERS TO BE APPROPRIATED

SOURCE
Well (AAF 373)

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE FEET PER YEAR
	30	3.1

QUANTITY, TYPE OF USE, PERIOD OF USE		
.5 Acre-feet per year	Single domestic supply	Year-round, as needed
2.6 Acre-feet per year	Irrigation (2 Acres)	Seasonal

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION--WITHDRAWAL
Approximately 1600 feet East and 60 feet South of the Northwest quarter corner of Section 17.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
NE¼ NW¼	17	18	2W	13	Thurston

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

The East three quarters of the North one-half of the North one-half of the Northeast one-quarter of the NW¼ Section 17, T. 18 N., R. 2 W.W.M., in Thurston County, Washington. Except the East 730 feet. Except also the North 30 feet for the County Road known as Mix Road.

DESCRIPTION OF PROPOSED WORKS

A submersible 1½ hp pump convey water to one pressure tank. Separate line feed the house and the irrigation season.

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE:	COMPLETE PROJECT BY THIS DATE:	WATER PUT TO FULL USE BY THIS DATE:
Started	Completed	In-use

REPORT

BACKGROUND:

On September 16, 1998, Karl F. Herzog applied for a permit to appropriate public water from a well at withdrawal rate of 30 gallons per minute (gpm) and 5 acre-feet (ac-ft) for year-round use for single domestic supply, stockwater, and seasonal use for irrigation of 2.5 acres of community garden. The project site is within the Deschutes River Watershed in Water Resources Inventory Area (WRIA) 13.

A legal notice of the proposed appropriation was published November 6 and 13, 1998. There were no protests to the application.

Based on the provisions of 90.03 and 90.44 Revised Code of Washington (RCW), I recommend approval of this application.

INVESTIGATION:

In response to this request, I reviewed the information submitted with the request, relevant reports, and Ecology records. I visited the project site on February 11, 2003. Other investigations included a review of recorded water rights, registered claims, water well reports, and information submitted with the application.

The project site is located on the southern portion of the Cooper Point Peninsula on property that is midway between Eld Inlet, to the west, and Budd Inlet, to the east. At the project site location, the approximate elevation is 180 feet above mean sea level (msl).

Land use surrounding the Herzog property is primarily semi-rural in nature. Development in the area consists of single family residences, with clusters of medium density developments and some limited agriculture, consisting mostly of vegetable gardens and pasture for livestock. Lots range in size from several acres to ½ acre. The area is generally wooded.

The Herzog property is a 3.77-acre parcel which is occupied by one single-family residence. The well is 6 inches in diameter, has an estimated depth of 108 feet, and currently is metered for water use. The residence and the garden are served by separate water lines.

A local group leases the garden, which is approximately 2 acres in size, to grow vegetables. The water system for the garden consists of buried 1-inch diameter PVC pipe with outlets located at individual garden plots. The garden is irrigated via soaker hoses and sprinklers. Three greenhouses, approximately 15 feet by 25 feet, are irrigated by drip irrigation. Buried water lines also surround the property to allow water usage throughout the 3.77-acre parcel.

General Area Hydrogeology

The presented geologic/ hydrogeologic information was extracted from a Department of Ecology Memorandum dated April 22, 2003, prepared by Tammy Hall, hydrogeologist at Department of Ecology's Southwest Regional Office.

The presented geologic/ hydrogeologic information was compiled from the following references:

- Drost, B.W., Turney, G.L., Dion, N.P., and Jones, M.A., 1999, *Conceptual Model and Numerical Simulation of the Ground-Water-Flow System in the Unconsolidated Sediments of Thurston County, Washington*: US Geological Survey Water Resources Investigations Report 99-4165.

- Drost, B.W., Turney, G.L., Dion, N.P., and Jones, M.A., 1998, *Hydrology and Quality of Ground Water in Northern Thurston County, Washington*: US Geological Survey Water-Resources Investigations Report 92-4109 (revised).

A series of glacial advances and retreats is largely responsible for the resulting landscape in the Puget Sound area. These episodes of glaciation have been marked by layers of unconsolidated deposits more than 2,000 feet deep in some areas of Thurston County. Unconsolidated deposits found on the Cooper Point Peninsula may be greater than 500 feet deep and generally become thicker northward towards Cooper Point.

The deposits are referred to as "geohydrologic" units because they were identified using a combination of geologic (primarily grain size and sorting) and hydrologic (hydraulic conductivity and hydraulic continuity) properties. These unconsolidated deposits may be glacial or non-glacial in origin. Glacial aquifers may be composed predominately of sand and (or) gravel, but may also contain relatively thin and discontinuous lenses of clay and (or) silt. In addition, confining layers composed predominately of silt and (or) clay, may also contain local lenses of coarse sand or gravel. Glacial deposits described as tills or hardpan were deposited directly by the glacier. The non-glacial deposits were left by streams carrying meltwater or by water that was impounded behind masses of ice. Recessional outwash, deposited by streams emanating from the melting and receding glacier, consists of poorly to moderately well-sorted sand and gravel.

Because of lithologic similarities, Vashon recessional outwash and Holocene alluvium are generally referred to as a single geohydrologic unit (Qvr). The Qvr is the hydrologic unit exposed at the ground surface in the project site area. This unit is the most widely exposed at the surface in Thurston County. Locally, perched groundwater may exist in this unit because of the low vertical permeability of the underlying glacial till. This unit is generally between 10 and 50 feet in thickness, but locally may be as thick as 150 feet.

Underlying the Qvr is the Qvt hydrologic unit. The Qvt is composed of Vashon-age till, and possibly some older tills. The Qvt is generally considered a poor source of water.

The Vashon advance outwash, represented as geohydrologic unit Qva, is an important aquifer in northern Thurston County. In the Cooper Point Peninsula area, the unit is relatively thin or absent, and has not been developed extensively. Where it is present, Qva is generally between 15 and 35 feet thick, but locally may exceed 150 feet in thickness. The top of the Qva generally occurs between 50 and 200 feet above sea level.

Underlying the Qvt, is the Kitsap Formation (Qf). The Qf is composed of predominately poorly permeable materials, but thin lenses of sand and gravel can yield relatively small quantities of water suitable for domestic use. The Qf is also effective in retarding the downward percolation of groundwater into the underlying units and has the ability to act as a confining layer to those materials lying below it. Qf is generally between 15 and 75 feet thick.

Groundwater generally moves toward marine water bodies and surface drainage channels. Water levels in upper aquifers are generally higher than in lower aquifers, indicating that water flows vertically downward, passing through units of lower permeability before discharging to either salt water or surface water drainages.

Hydrologic Conditions

A well report is not available for the Herzog well. A well test conducted in February 1997 measured the static water level (swl) of the well at 93 feet bgs and estimated the well capacity to be 30 gpm. The depth of the well was estimated at 108 feet. The well is equipped with a 1½ horse-power (h.p.) pump and one pressure tank serves to pressurize the system. The estimated elevation at the subject site is 180 feet above msl.

The Lena Beach (Beach) well, located within ¼ mile from the Herzog property, is completed at a similar depth (117 feet) and has a comparable static water level (swl 90 feet). The well log for the Beach well reports packed coarse sand and gravel to a depth of 97 feet below ground surface (bgs). This well draws water from a water bearing zone approximately 23 feet in thickness from a depth of 94 feet to 117 feet (bgs). This well appears to span the entire thickness of this water bearing zone. According to information in Drost (1998) a well at this completed depth at this location is likely drawing water from the Qva geohydrologic unit.

Affects to Surface Water

The subject well is completed in an aquifer approximately 90 feet above msl, the Qva geohydrologic unit (Drost, 1998). The Qva geohydrologic unit in the area of the subject site is discharging directly to Eld Inlet; therefore, groundwater withdrawals from the Herzog well are not expected to affect flow in surface waters within the Deschutes watershed.

Neighboring Water Rights

The following water right certificates, claims, and well reports are on file at Ecology within a one mile radius of the Herzog property:

- Sixteen ground water certificates have been issued authorizing a combined instantaneous withdrawal of 2,621 gpm and 2,025 acre-feet (ac-ft) per year. Water is used for irrigation, commercial irrigation, multiple domestic supply, single domestic supply, municipal, and stock watering.
- Fourteen surface water rights have been issued authorizing a combined instantaneous diversion of 6.83 cubic feet per second (cfs) and 65 ac-ft per year. Water is used mostly for domestic supply, irrigation, stock watering, and fire suppression.
- One surface water permit has been issued which authorizes a withdrawal rate of 0.020 cfs and 0.34 ac-ft of water of water per year. Water is used for single domestic supply.
- Two groundwater permits have been issued which authorize a withdrawal rate of 90 gpm and 17.5 ac-ft of water per year. Water is used for multiple domestic supply.
- One hundred fifty-one groundwater and surface water claims are registered for mostly single domestic uses.
- The Department of Ecology's well log data base listed approximately 76 wells within one-mile from the proposed withdrawal. Wells range in depth from 50 to 213 feet bgs.

In addition to the above, Ecology's data base lists four ground water certificates issued within ¼ mile of the Herzog well. Following is a summary of each of these four certificates:

- Groundwater Certificate No. G2-20607, issued to Frank Tobinski on November 21, 1975, authorizes the use of 50 gpm and 4.7 ac-ft per year for group domestic supply for continuous, year-round use. A well log for this well indicated a completed depth of 99 feet bgs and a static water level of 64 feet bgs.
- Groundwater Certificate No. G2-24052, issued to the City of Olympia on March 28, 1977, authorizes the use of 380 gpm and 450 ac-ft per year for municipal supply for continuous, year-round use. A well log for this well indicates a completed depth of 111 feet bgs and a static water level of 47 feet bgs.
- Groundwater Certificate No. G2-24250, issued to Mr. and Mrs. Roy Leicht on November 27, 1978, authorizes the use of 10 gpm and 1 ac-ft per year for domestic supply for continuous, year-round use. A well log is not available for this well.
- Groundwater Certificate No. G2-01140, issued to First City Development Corp on July 28, 1989 authorizes the use of 285 gpm and 75 ac-ft of water per year for recreation and beautification. The period of use is for 60 days per year. A well log indicates a completed depth of 74 feet bgs and a static water level of 49 feet bgs.

Based on the distribution of wells in the area and the relatively minimal water needs of the project, I do not anticipate well interference from the Herzog well with area users.

Water Demand/Annual Water Quantity Allocation

Water demand for year-round domestic use should not exceed 0.5 ac-ft per year.

According to *State of Washington Irrig[illegible] Guide* (US Department of Agriculture, US S[illegible]Conservation Service, and Washington State Cooperative Extension, Amended Nov 1, 1990), vegetable crops grown in the Olympia area range in water requirement from 0.72 inches per season (radishes and spinach) to 12 inches per season (corn). Using a maximum requirement of 12 inches of water per season, the total amount of water required can be estimated at 1 ac-ft per acre. Assuming an overall irrigation system efficiency of 70 percent and including these water losses in the overall estimate, the total amount of water that necessary to would be approximately 1.3 ac-ft per acre, or 2.6 ac-ft total for 2 acres.

FINDINGS AND CONCLUSIONS:

- Based on the hydrogeology of the area, this withdrawal will not impair surface water flows in the Deschutes River Watershed.
- Water is available for appropriation from this source, and the proposed use is for a beneficial purpose. Irrigation and domestic supply is a beneficial use under 90.54.020 (1).
- The issuance of this water right is not expected to be detrimental or impair any senior water right holders. I do not anticipate any adverse affects to result from this withdrawal.

RECCOMENDATIONS:

Based on the provisions of 90.03 and 90.44, I find that water is available for appropriation from the source in question and that the appropriation would not impair existing rights. I recommend the issuance of a water right permit in the amount of 30 gpm and 0.5 ac-ft per year for domestic purposes year round and 2.6 ac-ft for seasonal irrigation of 2 acres.

PROVISIONS:

The applicant is advised that the quantity of water allocated by this permit may be reduced at the time of final certification to reflect system capacity and actual usage.

The water user is advised that quantities recommended, and the number of acres to be irrigated, may be reduced at the time of issuance of a final water right commensurate with the capacity of the installed system, and the number of acres actually irrigated.

Water use data shall be recorded monthly. The maximum rate of diversion/withdrawal and the annual total volume shall be submitted to Ecology by January 31st of each calendar year.

Department of Ecology personnel, upon presentation of proper credentials, shall have access at reasonable times, to the records of water use that are kept to meet the above conditions, and to inspect at reasonable times any measuring device used to meet the above conditions.

Installation and maintenance of an access port as described in Chapter 173-160 is required. An air line and gauge may be installed in addition to the access port.

The subject well has been tagged with a well identification number. This unique well number shall remain attached to the well, please reference this number when submitting data.

The Water Resources Act of 1971, Chapter 90.54 RCW specifies certain criteria regarding utilization and management of the waters of the State in the best public interest. Favorable consideration of this application has been based on sufficient waters available, at least during portions of the year. However, it is pointed out to the applicant that this use of water may be subject to regulation at certain times, based on the necessity to maintain water quantities sufficient for preservation of the natural environment.

In order to help protect your water right from potential future impairment by junior water users, it is important that a record be established of accurate water-level measurements for your well. As such, it is recommended that you measure and record the water level in your well quarterly, using a consistent methodology. This information will be most useful if these measurements are taken after your well has returned to a static (recovered aquifer) condition. In the absence of this, then next best option is to maintain consistency regarding the length of the pumping and recovery period prior to each measurement. For maximum usefulness, data collected should include the following elements:

1. Unique Well ID Number (if available)
2. Description of the measuring point (top of casing, sounding tube, etc.)
3. Measuring point elevation above or below land surface to the nearest 0.1 foot
4. Land surface elevation at the well head to the nearest foot
5. Measurement date and time
6. Measurement method (air line, electric tape, pressure transducer, etc.)
7. Well status (pumping, recently pumped, etc.)
8. Water level accuracy (to nearest foot, tenth of foot, etc.)
9. Depth to static water level below measuring point to the nearest 0.1 foot.

The first four items listed should remain constant from one measurement to the next.

REPORTED BY: _____ Date: May 15, 2003

The statutory permit fee for this application is $20.00.

FINDINGS OF FACT AND DECISION

Upon reviewing the above report, I find all facts, relevant and material to the subject application, have been thoroughly investigated. Furthermore, I find water is available for appropriation and the appropriation as recommended is a beneficial use and will not be detrimental to existing rights or the public welfare.

Therefore, I ORDER a permit be issued under Ground Water Application Number G2-29794, subject to existing rights and indicated provisions, to allow appropriation of public ground water for the amount and uses specified in the foregoing report.

Signed at Olympia, Washington, this 15th day of May, 2003.

Thomas Loranger
Water Resources Supervisor
Southwest Regional Office