



STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

REPORT OF EXAMINATION
To Appropriate Public Waters of the State of Washington

PRIORITY DATE	APPLICATION NO.	PERMIT NO.	CERTIFICATE NO.
August 20, 2010	G1-28668		

NAME
Cayou Valley Homeowners Association (CVHA)

ADDRESS/STREET	CITY/STATE	ZIP CODE
P.O. Box 69	Deer Harbor, WA	98243

PUBLIC WATERS TO BE APPROPRIATED

SOURCE
Well

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND (cfs)	MAXIMUM GALLONS PER MINUTE (gpm)	MAXIMUM ACRE FEET PER YEAR (ac-ft/yr)
	0 (non-additive)	0 (non additive)

TYPE OF USE, PERIOD OF USE, QUANTITIES

This water right application is non-additive to CVHA existing water right, G1-00324C which is for 10 gpm and 15 ac-ft/yr. The water will be put to use as follows:
Municipal supply, year round, 8.8 gpm, 14 ac-ft/yr
Commercial (marina), 1.2 gpm, 1 ac-ft/yr

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION--WITHDRAWAL

The proposed well will be drilled in one of the following quarter-quarters of section 7, Township 36 North, Range 02 West: the NE1/4 of the NW1/4, the SE1/4 of the NW1/4, the NW1/4 of the NE1/4, and the SW1/4 of the NE1/4.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP	RANGE	WRIA	COUNTY
NE1/4 NW1/4, SE1/4 NW1/4, NW1/4 NE1/4 SW1/4 NE1/4	07	36 N	2W	2	San Juan
PARCEL NUMBER					

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

Government lots 2, 3, 7, and 8, Section 7, Township 36 North Range 02 West.
Attachment 1 shows the location of the authorized place of use.

DESCRIPTION OF PROPOSED WORKS

The CVHA water system currently consists of one 6 inch by 105 foot well (DOE well tag number AGK 192) just north of Channel Road on parcel # 26075022000 which provides water to a 20 connection community located in the Deer Harbor area of Orcas Island. The well is equipped with a 1hp pump and a .75 hp submersible booster pump that provides water through 2½ inch and 4 inch PVC lines to a 20,000 gallon concrete storage tank. Over the next 2 years, CVHA plans to upgrade its system by installing a new transmission line along the north side of Channel Road to the west side of Deer Harbor and installation of a master meter and flow restrictor. CVHA also plans to drill an additional well and expand its service area to include 30 connections.

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE	COMPLETE PROJECT BY THIS DATE	WATER PUT TO FULL USE BY THIS DATE
Already started	August 20, 2016	August 20, 2026

PROVISIONS

- All relevant information pertaining to the construction of the well, well and aquifer testing, water quality sampling, and infrastructure construction must be submitted to, and examined by Ecology upon completion of well construction and prior to final approval of a water right certificate.
- Due to the nature of the local geology, if more than one well is drilled before adequate water is located to fulfill CVHA's instantaneous and annual quantities, the unproductive well(s) will be properly decommissioned as per WAC 173-160-381.
- An approved measuring device shall be installed and maintained in the well identified by this water right in accordance with the rule "Requirements for Measuring and Reporting Water Use", WAC 173-173.
 - Water use data shall be recorded annually. Data shall be maintained by the property owner and promptly submitted to Ecology upon request. Recording and retention of data by the water right holder are required to inform the water users about how much water is used, when the water is used and to assist users in efficient water management.
 - WAC 173-173 describes the requirements for data accuracy, device installation and operation, and information reporting. It also allows a water user to petition Ecology for modifications to some of the requirements. Installation, operation and maintenance requirements are enclosed as a document entitled "Water Measurement Device Installation and Operation Requirements".
 - 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.
- All water wells constructed within the State shall meet the minimum standards for well construction and maintenance as provided under WAC 18.104, Washington Water Well Construction Act of 1971, and WAC 173-160, Minimum Standards for Construction and Maintenance of Wells.
- In accordance with WAC 173-160-205, wells shall not be located within certain minimum distances of potential sources of contamination. These minimum distances shall comply with local health regulations, as appropriate. In general, wells shall be located at least 100 feet from a sewer, septic tank, privy, or other source of contamination. Wells shall not be located within 1,000 feet of a solid waste landfill.
- Installation and maintenance of an access port as described in WAC 173-160-291 is required. An air line and gauge may be installed in addition to the access port.
- In order to protect the resource, static water level (SWL) shall be measured at least once a year. Measurements shall be taken after the pump has been shut off a reasonable time to allow water level to return to normal. Ecology's Water Resources section at the Northwest Regional Office (NWRO) shall be notified if a below normal seasonal drop is measured in SWL; otherwise this data shall be maintained and be made available to Ecology upon request. (See enclosed form.)
- Chloride sampling shall be performed once the well is completed and then on an annual basis. If the well(s) authorized by this water right causes chloride concentrations to increase, immediate action shall be required to prevent chlorides from increasing. This is required by the water quality anti-degradation policy WAC 173-200-030. Actions include, but are not limited to, reducing the instantaneous withdrawal rate (gpm) of the well, lowering the annual quantity removed from the well, altering pumping cycles, etc.
- A certificate of water right will issue for only that quantity of water that has been withdrawn and applied to actual beneficial use. Such quantity applied to actual beneficial use shall not exceed the quantity specified in this report of exam and will be calculated based on the best information available to Ecology, including metering data and/or water duty analysis.
- A certificate of water right will not be issued until a final investigation is made.

FINDINGS OF FACT AND ORDER

Upon reviewing the investigator’s report, I find all facts relevant and material to the subject application have been thoroughly investigated. Furthermore, I concur with the investigator that water is available from the source in question, the purpose of use is beneficial, there will be no impairment of existing rights, and there will be no detriment to the public interest.

Therefore, I ORDER approval of Application No. G1-28668, subject to existing rights and the provisions listed above.

You have a right to appeal this action to the Pollution Control Hearing Board (PCHB) within 30 days of the date of receipt of this document. The appeal process is governed by Chapter 43.21B RCW and Chapter 371-08 WAC. “Date of receipt” is defined in RCW 43.21B.001(2).

To appeal, you must do the following within 30 days of the date of receipt of this document:

File your appeal and a copy of this document with the PCHB (see addresses below). Filing means actual receipt by the PCHB during regular business hours.

Serve a copy of your appeal and this document on Ecology in paper form - by mail or in person. (See addresses below.) Email is not accepted.

You must also comply with other applicable requirements in Chapter 43.21B RCW and Chapter 371-08 WAC.

Street Addresses	Mailing Addresses
Department of Ecology Attn: Appeals Processing Desk 300 Desmond Drive SE Lacey, WA 98503	Department of Ecology Attn: Appeals Processing Desk P.O. Box 47608 Olympia, WA 98504-7608
Pollution Control Hearings Board Environmental Hearings Office 1111 Israel Road SW, Suite 301 Tumwater, WA 98501	Pollution Control Hearings Board P.O. Box 40903 Olympia, WA 98504-0903

Please also send a copy of your appeal to:

Jacqueline Klug
Department of Ecology
Northwest Regional Office
3190 160th Avenue SE
Bellevue, WA 98008

For additional information visit the Environmental Hearings Office Website: <http://www.eho.wa.gov>

*To find laws and agency rules visit the Washington State Legislature Website:
<http://www1.leg.wa.gov/CodeReviser>*

Signed at Bellevue, Washington, this _____ day of _____, 2011.

Jacqueline Klug
Section Manager
Northwest Regional Office
Water Resources Program

INVESTIGATOR'S REPORT

BACKGROUND

Description and Purpose of the Project

This new water right application is intended to allow Cayou Valley Homeowners Association to provide greater flexibility to their system by adding an additional well in the next 2 years. CVHA currently has water right G1-00324C that is for 10gpm and 15AFY. This new application is non-additive, and does not seek to increase the instantaneous or annual quantities of their existing water right. CVHA also plans to expand their service area to 30 connections over the next 2 years.

Legal Requirements for Application Processing

Chapters 90.03 and 90.44 RCW authorize the appropriation of public water for beneficial use and describe the process for obtaining water rights. Laws governing the water right permitting process are contained in RCW 90.03.250 through 90.03.340 and RCW 90.44.060. As per the changes to the water code due to the Municipal Water Bill, CVHA meets the definition of a municipality. Therefore CVHA does not need to seek approval for its proposed service area expansion from Ecology as long as they are in compliance with the terms of their small water system management plan (WAC 90.03.386). Consultation with Department of Health's Office of Drinking Water indicates that before CVHA can expand their service area, they will need to submit a planning document with Department of Health.

The following legal requirements must be met prior to processing a water right application:

- **Public Notice**
Public notice of the application was published in *The Islands' Sounder* on December 22 and December 29, 2010. There were no written protests during the statutory 30-day protest period.
- **State Environmental Policy Act (SEPA)**
The subject water right application is categorically exempt under SEPA WAC 197-11-305 and WAC 197-11-800(4) because the instantaneous quantity is less than the 2,250 gallons per minute threshold.

INVESTIGATION

In considering this application, my investigation included, but was not limited to, research and/or review of:

- USGS Eastsound, Wash. 7.5 minute topographic map
- Russell, Robert H. Department of Ecology (1975): Water Supply Bulletin No. 46, Geology and Water Resources of the San Juan Islands.
- Brandon et al. Geological Society of America Special Paper 221 (1988): The Late Cretaceous San Juan thrust system, San Juan Islands, Washington.
- Orr et al. U. S. Geological Survey Water-Resources Investigations Report 02-4114 (2002): Estimates of Ground-Water Recharge from Precipitation to Glacial-Deposit and Bedrock Aquifers on Lopez, San Juan, Orcas, and Shaw Islands, San Juan County, Washington.
- Whiteman et al. U.S. Geological Survey Water Resources Investigations Report 83-4019 (1983): Occurrence, Quality and Use of Groundwater in Orcas, San Juan, and Shaw Islands, San Juan County, Washington.
- Hydrogeologic Review for this application by John Rose, Department of Ecology
- Water well reports for Orcas Island
- Various Geologic, Hydrologic, and Topographic GIS layers, available through Department of Ecology GIS internet site
- Notes, photos and GPS data from my site visit with Jerry Lyszak, Technical Unit Supervisor-Water Resources on February 2, 2010
- Records of existing water rights in the vicinity
- The San Juan County Seawater Intrusion Protection map (Nov. 2005)
- Washington Department of Health's Office of Drinking Water's Sentry database.

Geographic Setting of the Place of Use and Point of Withdrawal

The Deer Harbor area is located on the southwestern end of Orcas Island in the San Juan Islands. The bay of Deer Harbor bisects the peninsula that separates West Sound and President Channel. The proposed place of use is

located to the west of West Sound itself. Generally this area consists of numerous steeply sided hills and low lying areas. Most of the hills have an elevation ranging from 300 to 400 feet. To the northeast is Turtleback Mountain with an elevation of 1519 feet. It must be noted that the San Juan Islands are in the rain shadow of the Olympic Mountains, which result in less precipitation than most of western Washington.

Geology of the San Juan Islands

The geology of the San Juan Islands is very complex. It consists of a series of allochthonous terranes mostly of island arc and shallow marine origin of early Paleozoic to middle Cretaceous age which were accreted onto the North American continent probably prior to subsequent compressional faulting. During the late Cretaceous, imbricate thrust faulting created a series of sub-parallel nappes which generally divide each of the five identified terranes. This faulting also resulted in pervasive high-pressure metamorphism and the creation of intermittent tectonic zones along fault contacts. These units were then tilted to the southeast, probably during the Tertiary period. Subsequent advance and retreat of continental glaciers of the Vashon Stade during the Fraser Glaciation approximately 10,000 years ago deposited sequences of intermixed clay, silt, sand and gravel in low lying areas. (Russell 1975) (Brandon et al.1988)

Of particular note is the Ordovician Turtleback formation that underlies the scattered glacial drift in the study area. The Turtleback is a heterogeneous formation consisting of coarse grained metamorphosed gabbros, diorite, quartz diorites, and trondjemite often intersected with younger finer grained dikes of varying igneous compositions. This rock unit is bounded by major faults to the northwest and southeast. Near the head of Deer Harbor is an outcrop of Turtleback formation that consists of serpentinite. Subsequent regional metamorphism of the greenschist and prehnite facies has obliterated nearly all primary igneous features, but most likely this formation is the remnant of deep continental crust. (Russell 1975)

Hydrogeology of the Deer Harbor Area, San Juan County, Washington

Despite the varied geology of the San Juan Islands, the geology within a mile radius of the proposed well site for CVHA is quite homogeneous, consisting of slabs of Turtleback formation with a relatively thin layer of glacial till partially covering most of the valley areas. A survey of well logs and water resources literature in the proposed service area of CVHA shows that glacial till in the area is no more than 40-50 feet deep and all production wells penetrate the non-porous Turtleback bedrock (Whiteman et al 1983). Since groundwater in such geologic environments is all contained in secondary fractures, it is expected that water availability for the CVHA will be low, and the instantaneous rate will likely be in the range of 3-10 gpm.

Aquifer Recharge and Groundwater Flow Directions

Russell (1975) reports that the source of groundwater in the San Juans is exclusively from precipitation. Precipitation in the area is between 28-32 inches per year and annual recharge occurs mostly during the wintertime, from September to April when precipitation is highest and evapotranspiration and artificial discharge is lowest. (Orr et al. 2002) Static water levels for wells in the immediate vicinity of the CVHA service area are in the range of 20-40 feet in depth, with most wells having a depth of 150-200 ft indicating there may be significant storage potential within CVHA's proposed well. The deep percolation model created by Orr et al. estimates the average annual recharge for this area to be 3-4 inches per year, but the data for Deer Harbor is limited in extent and appears to be highly variable. Quantifying recharge and ground water availability for bedrock with poorly documented secondary fractures is very difficult. Thin soils, high potential evapotranspiration, low porosity and permeability of bedrock, and steep surface slopes in the area can create areas with no significant recharge. Therefore, it is impossible to predict in any general way what the specific capacity of the proposed well will be. Only a proper pump test will reveal this.

Site Visit

On February 2, 2010, Jerry Liszak and I met with the applicant who gave us a tour of the water system. We observed the well, storage tank, meter and transmission line. We examined the records of water levels and chloride concentrations.

Potential Well Construction

CVHA is not planning to construct its new well for at least the next two years while they conduct an upgrade to their existing distribution system. Normally Ecology would only issue a permit when the applicant is ready to drill a well, however, it is expected that in the current economic and legislative environment, full cost recovery of water right processing will become required in a few months. This is something that CVHA would like to avoid, and considering that this application is non-additive and in a homogeneous geological environment, Ecology's staff feels it is acceptable to issue the permit now. As usual, all relevant information pertaining to the construction of the well, well testing, water quality sampling, and infrastructure construction must be submitted to, and examined by Ecology prior to final approval of a water right certificate.

Potential for Seawater Intrusion

Wells drilled to depths below sea level and located near the shoreline have a tendency to be subject to seawater intrusion because of their proximity to the freshwater-seawater interface (Whiteman et al. 1983). CVHA has indicated that the proposed well will be within their service area and therefore most likely within 1000 ft of Deer Harbor shoreline. With elevations in the area usually less than 200 ft, this means the well could penetrate below mean sea level (MSL). However chloride sampling since the 1980's from wells in the area which are drilled below MSL indicate low chloride levels and very little seasonal or long term variability (Whiteman et al. 1983). The San Juan County Seawater Intrusion Protection map (Nov. 2005) indicates at least one well with chloride levels around 200 mg/L farther south along the coast. At this time, there does not seem to be any data that would indicate that bedrock material dips or has any joints or fractures that trend in the direction of Deer Harbor, which would increase the potential for seawater intrusion. Sampling of the well for chloride levels must be made a condition of the permit to ensure that maximum contamination levels are not exceeded.

Other Water Rights in the Vicinity

There are 11 ground water rights and one ground water permit that have their points of withdrawal within a ½ mile radius from the area in which CVHA wants to drill their new well. (Fig. 3 from the Hydrogeologic Review for this water right, included in this report) Groundwater wells that are at greatest risk of potential impairment are those which are completed in the same aquifer zone as the subject well, located in close proximity to the subject well, and also located hydrogeologically down-gradient from the subject well. As water in the aquifer travels toward wells that are located down-gradient from the subject well, the subject well may potentially capture this water and impair the production of down-gradient wells. Also, surface water diversions located within a close proximity of the subject well may be impacted by the groundwater withdrawal, depending upon hydraulic continuity of the aquifer and surface water body. An arbitrarily, yet conservatively chosen area of one-half mile (1/2-mile) from the intended place where CVHA wants to place their well is used to define "close proximity." This value is justified experimentally based on current and historical pump test data that show negligible drawdown, and therefore unlikely impairment to wells or surface water diversions, induced by groundwater withdrawal at distances of 1000 ft in most cases.

The existing water rights within ½ mile of CVHA are summarized in Table 1.

Water Right	Type	Priority Date	Qi (GPM)	Qa (AFY)	Purpose
G1-24490CWRIS	Certificate	04/25/1984	3.3	2.89	Multiple Domestic
G1-*07815CWRIS	Certificate	10/06/1965	15	7.48	Multiple Domestic, Irrigation
G1-00131CWRIS	Certificate	06/25/1971	6	2	Domestic, Stock
G1-00695CWRIS	Certificate	06/25/1971	10	4	Multiple Domestic, Stock
G1-20616CWRIS	Certificate	05/14/73	5	15	Multiple Domestic
G1-*07719CWRIS	Certificate	07/29/65	4	3.92	Multiple Domestic, Recreation, Stock
G1-22977CWRIS	Certificate	10/07/71	12	3.2	Multiple Domestic
G1-00696CWRIS	Certificate	06/25/71	2.5		Fire Protection
G1-*07662CWRIS	Certificate	06/23/65	4	0.8	Domestic
G1-24492CWRIS	Certificate	04/25/84	1.6	1.4	Multiple Domestic
G1-*09634CWRIS	Certificate	08/05/68	2	1	Multiple Domestic
G1-27178	Permit	06/10/93	20	4.5	Multiple Domestic

There are 41 ground water claims and one surface water claim within the ½ mile radius of the prospective point of withdrawal. A water right claim is a statement of the beneficial use of water that occurred prior to the adoption of the water right codes and is not authorized by a state-issued permit or certificate. The Department of Ecology cannot verify the validity of these claims, as water right claims can only be confirmed in an adjudication by the Washington State Superior Court. Many of the claims represent use under the ground water exemption (RCW 90.44.050) for single domestic use.

FINDINGS

Under state law the following four criteria must be met for an application to be approved:

- Water must be available
- There must be no impairment of existing rights
- The water use must be beneficial
- The water use must not be detrimental to the public interest

Water Availability

There are no regulatory closures or restrictions affecting groundwater availability on Orcas Island, therefore I find water is legally available for this appropriation. Based on Ecology's water quantity allocation guidelines and previous metered use of water per connection regarding municipalities, I believe that 15 ac-ft/yr is more than adequate for the 30 connections that CVHA plans to serve in the future.

Impairment Considerations

Since this is a non-additive water right, the amount of water being withdrawn from the area will not change, and it is a reasonable assumption that there will be no impact unless CVHA drills their well very close to an existing one. CVHA can use Ecology's Water Resources Explorer webmap to help determine proximity to existing wells and have the well driller determine if monitoring water levels in nearby wells is necessary during construction and testing. If any impairment occurs in an existing well as a result of CVHA's new withdrawal, then CVHA's new well will be considered junior in right to the impacted well and CVHA will need to insure that the senior right receives its allocated water first.

Beneficial Use

Municipal supply and commercial use are considered to be beneficial under RCW 90.54.020(1).

Public Interest Considerations

No potential for detriment to the public interest could be identified during the investigation of this application.

RECOMMENDATIONS

Based on the above investigation and findings, I recommend the request for a groundwater permit be approved in the quantities and within the limitations listed below and subject to the provisions on page 2.

Purpose of Use and Authorized Quantities

The amount of water recommended is a maximum limit and the water user may only use that amount of water within the specified limit that is reasonable and beneficial:

10 gallons per minute and 15 acre-feet per year overall

- Community domestic supply, year round, 8.8 gpm, 14 acre feet per year
- Commercial (marina), 1.2 gpm, 1 acre feet per year

Points of Withdrawal

NE1/4 NW1/4, SE1/4 NW1/4, NW1/4 NE1/4, SW1/4 NE1/4, Section 07 Township 36 North, Range 2 West, W.M.

Place of Use

Government lots 2, 3, 7, and 8, Section 7, Township 36 North Range 02 West.

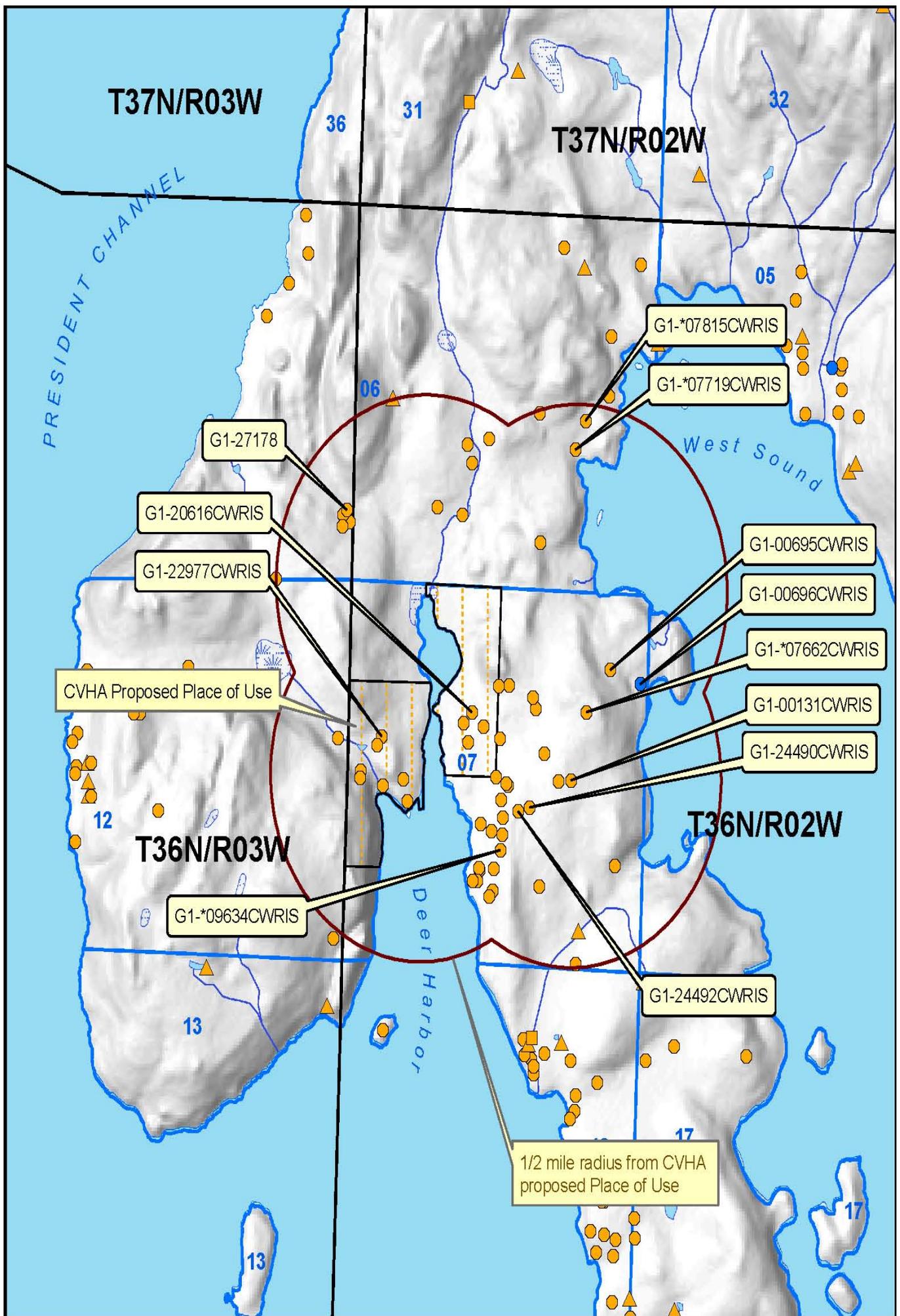
CONCLUSIONS

In accordance with chapters 90.03 and 90.44 RCW, I conclude there is water available from the source in question, the purpose of use is beneficial, there will be no impairment of existing rights, and there will be no detriment to the public interest.

Report by: _____, 2011
John M. Rose, LG Date
Water Resources Program

Licensed Geologist No. 2827

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4/5/2011



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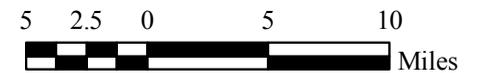
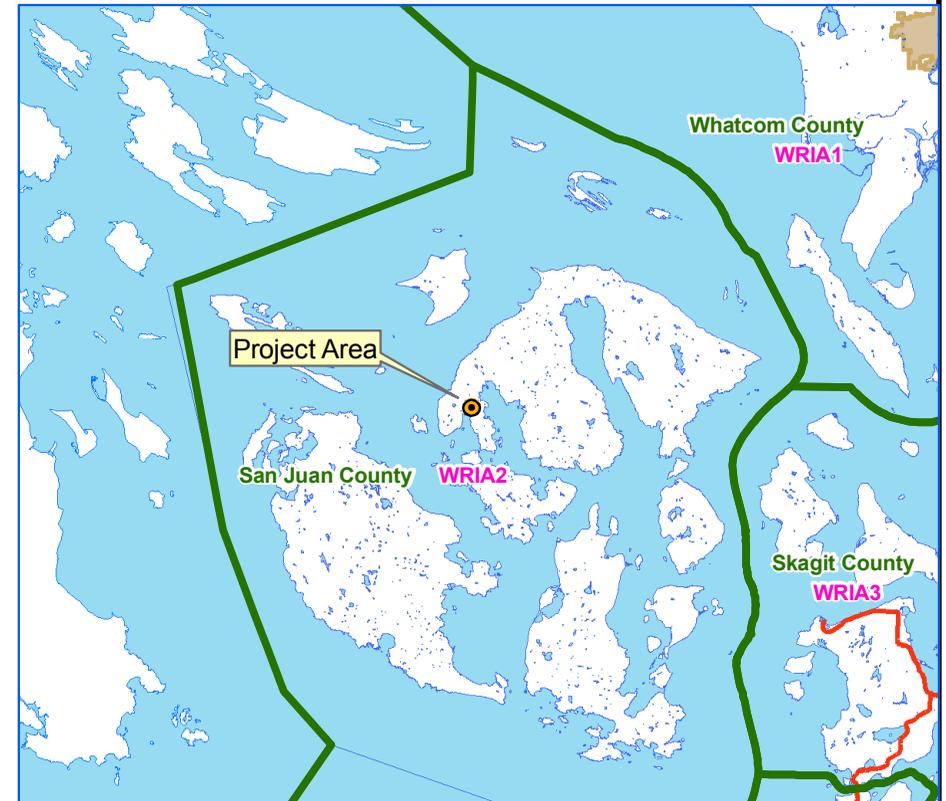
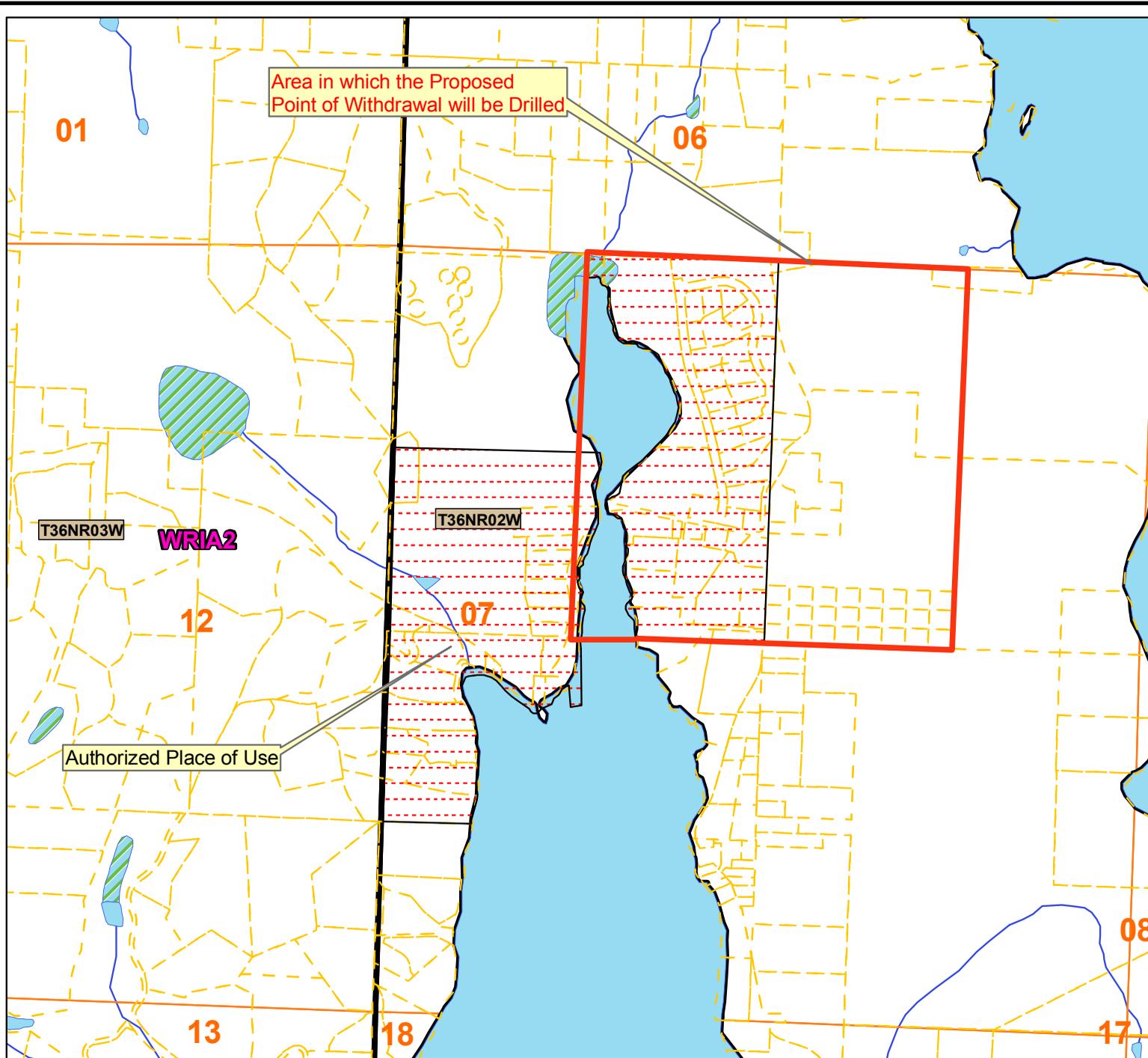
Feet

1:24,000

Fig. 3



**Impairment Analysis for
Water Right Application G1-28668
Cayou Valley Homeowners Assoc.**



Legend

- County
- WRIA
- Highways
- Townships
- cities
- Sections
- Authorized Place of Use



Place of use and point(s) of diversion/withdrawal are as defined on the cover sheet under the headings, 'LOCATION OF DIVERSION/WITHDRAWAL' and 'LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED.'