



State of Washington
**REPORT OF EXAMINATION
 FOR WATER RIGHT CHANGE**

File NR CG1-149277CL
 WR Doc ID 6043913

Changed Place of Use
 Added or Changed Point of Withdrawal

PRIORITY DATE JUNE 1944	WATER RIGHT NUMBER CG1-149277CL
-----------------------------------	---

MAILING ADDRESS LONESOME COVE RESORT INC POST OFFICE BOX 1607 BELLEVUE WA 98009	SITE ADDRESS (IF DIFFERENT) 416 LONESOME COVE RD FRIDAY HARBOR WA 98250
---	--

Total Quantity Authorized for Withdrawal*		
WITHDRAWAL RATE	UNITS	ANNUAL QUANTITY (AC-FT/YR)
20	GPM	1

Purpose						
PURPOSE	WITHDRAWAL RATE			ANNUAL QUANTITY (AC-FT/YR)		PERIOD OF USE (mm/dd)
	ADDITIVE	NON-ADDITIVE	UNITS	ADDITIVE	NON-ADDITIVE	
Domestic multiple	20		GPM	1		01/01 - 12/31

IRRIGATED ACRES		PUBLIC WATER SYSTEM INFORMATION	
ADDITIVE	NON-ADDITIVE	WATER SYSTEM ID	CONNECTIONS
0	0	479902	45

Source Location			
COUNTY	WATERBODY	TRIBUTARY TO	WATER RESOURCE INVENTORY AREA
SAN JUAN	GROUNDWATER	N/A	2-SAN JUAN

SOURCE FACILITY	PARCEL	WELL TAG	TOWNSHIP	RANGE	SECTION	QUARTER	LATITUDE	LONGITUDE
Well #1	361812001000	ABO-752	36N	03W	18	W½ NE¼	N 48.6196	123.1136 W
Well #3	361842003000	APR-200	36N	03W	18	NW¼ SE¼	N 48.6158	123.1125 W

Datum: NAD83/WGS84

Place of Use (See Map in Attachment 1)

PARCELS

San Juan County parcel numbers: 361812001000, 361842003000, 361813004000, 361813005000, 361813006000, 361813007000, and 361814001000

LEGAL DESCRIPTION OF AUTHORIZED PLACE OF USE

Those portions of Government Lots 5 and 6, and the Northwest quarter of the Southeast quarter of Section 18, Township 36 North, Range 3 West, more particularly described as follows:

Beginning on the shoreline at the Northeast corner of Government Lot 5, thence along Eastern boundary line of Government Lot 5 706.577 feet, more or less, to a point which is 1362.087 feet north of the Southeast Corner of Government Lot 5; thence leaving Eastern boundary line North 88°13'29" East 305.173 feet; thence South 51°0'56" East 94.457 feet; thence South 14°43'29" West 683.076 feet; thence North 88°7'14" West 228.276 feet to a point on the Eastern boundary line of Government lot 5; thence along Eastern Boundary Line 658.567 feet to Southeast corner Of Government Lot 5; thence along Southern boundary line of Government Lot 5 440.452 feet; thence leaving Southern boundary line of Government Lot 5 South 4°58'27" East 303.010 feet to the Northerly edge of Limestone Point Road; thence continuing along edge Northerly edge of Limestone Point Road South 74°34'24" West 274.734 feet to an intersection of the Northerly edge of Limestone Point Road and the Easterly Edge of Limestone Cove Road; thence continuing along the Easterly edge of Limestone Cove Road North 14°41'53" West 399.762 feet to a point on the Southern boundary line of Government Lot 5; thence continuing along Southern boundary line of Government Lot 5 East 107.653 feet; thence leaving Southern boundary line of Government Lot 5 North 17°37'0" West 42.094 feet; thence North 6°7'0" West 430.245 feet; thence North 23°3'36" West 610.066 feet; thence North 16°35'58" East 123.901 feet; thence North 50°42'51" East 169.197 feet; thence North 25°10'51" East 71.426 feet; thence South 85°47'13" West 34.962 feet; thence North 0°54'46" East 491.321 feet, more or less, to the shoreline and Northern meander line of Government Lot five; thence continuing Southeasterly and Northeasterly along shoreline to the point of beginning;

Situate within San Juan County, Washington.

Proposed Works

Two 6-inch wells – well #1 is drilled to a depth of 165 feet and fitted with a 1.5 HP pump and well #3 is drilled to a depth of 205 feet and the water system specifications are unknown. This water system will provide year-round multiple domestic supply water for Lonesome Cove Resort.

Development Schedule

BEGIN PROJECT	COMPLETE PROJECT	PUT WATER TO FULL USE
Complete	Complete	In Use

Provisions

Wells, Well Logs and Well Construction Standards

All wells constructed in the state must meet the construction requirements of WAC 173-160 titled "Minimum Standards for the Construction and Maintenance of Wells" and RCW 18.104 titled "Water Well Construction". Any well which is unusable, abandoned, or whose use has been permanently discontinued, or which is in such disrepair that its continued use is impractical or is an environmental, safety or public health hazard must be decommissioned.

All wells must be tagged with a Department of Ecology unique well identification number. If you have an existing well and it does not have a tag, please contact the well-drilling coordinator at the regional Department of Ecology office issuing this decision. This tag must remain attached to the well. If you are required to submit water measuring reports, reference this tag number.

Installation and maintenance of an access port as described in WAC 173-160- 291(3) is required.

Water Use Efficiency

The water right holder is required to maintain efficient water delivery systems and use of up-to-date water conservation practices consistent with RCW 90.03.005.

Department of Health Requirements

Prior to any new construction or alterations of a public water supply system, the State Board of Health rules require public water supply owners to obtain written approval from the Office of Drinking Water of the Washington State Department of Health. Please contact the Office of Drinking Water at Northwest Drinking Water Operations, 20435 72nd Ave S, Suite 200, K17-12, Kent, WA 98032-2358, 253-396-6750.

Schedule and Inspections

Department of Ecology personnel, upon presentation of proper credentials, shall have access at reasonable times, to the project location, and to inspect at reasonable times, records of water use, wells, diversions, measuring devices and associated distribution systems for compliance with water law.

Findings of Facts

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; that there will be no impairment of existing rights; that the purpose of use is beneficial; and that there will be no detriment to the public interest.

Therefore, I ORDER approval of Application No. CG1-149277CL, subject to existing rights and the provisions specified above.

Your Right To Appeal

You have a right to appeal this Order to the Pollution Control Hearings Board (PCHB) within 30 days of the date of receipt of this Order. 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 the Order:

- File your appeal and a copy of this Order 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 Order on Ecology in paper form - by mail or in person. (See addresses below.) E-mail 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 PO Box 47608 Olympia, WA 98504-7608
Pollution Control Hearings Board 1111 Israel RD SW Ste 301 Tumwater, WA 98501	Pollution Control Hearings Board PO Box 40903 Olympia, WA 98504-0903

Signed at Bellevue, Washington, this 27th day of January 2015.



Tom Buroker, Section Manager

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>.

INVESTIGATOR'S REPORT
 Ria Berns, Department of Ecology
 Water Right Control Number CG1-149277CL
 Lonesome Cove Resort, Inc

BACKGROUND

This report serves as the written findings of fact concerning Application for Change of Water Right Claim CG1-149277CL. The purpose of this application is to change the point of withdrawal from the originally claimed well location to two new points of withdrawal and to expand the place of use. The original long form water right claim was submitted by Allen D. Turnbull and the listed date of first use is June 1944, which predates RCW 90.44 (the groundwater code). The water is claimed for continuous year-round use, with a listed instantaneous quantity of 30 gpm (gallons per minute) and annual quantity of 4 acre-feet per year (ac-ft/yr). The point of withdrawal is within Government Lot 5 of Section 18, 36 North, 3 West.

Application CG1-149277CL was submitted along with partner water right application G1-28769 on December 12, 2013. The purpose of these applications is to serve the domestic water needs of a Lonesome Cove Resort (Lonesome Cove) expansion project. This claim is tentatively determined to be valid and eligible for change in accordance with state law.

Table 1. Summary of Existing Water Right Claim

Water Right Claim Owner:	Allen D. Turnbull
Priority Date	June 1944
Place of Use:	A portion of Government Lot 5, Section 18, Township 36 North, Range 3 West, W.M., in San Juan County, Washington, described as follows: Commencing at a point on the boundary between Government Lots 5 and 6 of said Section 18, said point being a concrete monument described as being 243.292 feet south and 509.965 feet west of the U.S. Coast and Geodetic Survey Station "Stoney" and shown on the face of the plat of Limestone Point, as recorded at Volume 2 of Plats, page 2, records of said county; thence from said point south 67°07' west 202.7 feet; thence south 80°51' west 125.6 feet to the true point of beginning; which point is marked by a 1 inch iron pipe on the bank above the beach; thence south 13°32' east 368.6 feet; thence south 64°46' 30" west 173.5 feet; thence south 478.7 feet; thence west 609.8 feet to a point in an existing road; thence along said road north 14°50' east 124.0 feet; thence north 48°39' east 169.1 feet; thence north 23°07' east 72.3 feet; thence leaving said road south 82°26' west 35.4 feet; thence north 0°34' west 457.2 feet to a point on the bank above the beach; thence continuing north 0°34' west 40 feet, more or less, to the line of ordinary high tide; thence southeasterly and northeasterly along said line of ordinary high tide to a point lying north 13°32' west of the true point of beginning; thence south 13°32 east 25 feet, more or less, to the true point of beginning.

County	Waterbody	Tributary To	WRIA
San Juan	Groundwater	N/A	2-San Juan

Purpose	Rate	Unit	Ac-ft/yr	Begin Season	End Season
Group Domestic	30	GPM	4	01/01	12/31

Source Name	Parcel	Well Tag	Township	Range	Section	QQ Q	Latitude	Longitude
Well	361812001000	N/A	36N	03W	18	NW NE	Unknown	

QQ Q = Quarter-quarter of a section; WRIA = Water Resource Inventory Area

Table 2. Summary of Requested Water Right Changes

Applicant Name:	Lonesome Cove Resort, Inc
Date of Application:	December 12, 2013
Place of Use:	<p>Those portions of Government Lots 5 and 6, and the Northwest quarter of the Southeast quarter of Section 18, Township 36 North, Range 3 West, more particularly described as follows:</p> <p>Beginning on the shoreline at the Northeast corner of Government Lot 5, thence along Eastern boundary line of Government Lot 5 706.577 feet, more or less, to a point which is 1362.087 feet north of the Southeast Corner of Government Lot 5; thence leaving Eastern boundary line North 88°13'29" East 305.173 feet; thence South 51°0'56" East 94.457 feet; thence South 14°43'29" West 683.076 feet; thence North 88°7'14" West 228.276 feet to a point on the Eastern boundary line of Government lot 5; thence along Eastern Boundary Line 658.567 feet to Southeast corner Of Government Lot 5; thence along Southern boundary line of Government Lot 5 440.452 feet; thence leaving Southern boundary line of Government Lot 5 South 4°58'27" East 303.010 feet to the Northerly edge of Limestone Point Road; thence continuing along edge Northerly edge of Limestone Point Road South 74°34'24" West 274.734 feet to an intersection of the Northerly edge of Limestone Point Road and the Easterly Edge of Limestone Cove Road; thence continuing along the Easterly edge of Limestone Cove Road North 14°41'53" West 399.762 feet to a point on the Southern boundary line of Government Lot 5; thence continuing along Southern boundary line of Government Lot 5 East 107.653 feet; thence leaving Southern boundary line of Government Lot 5 North 17°37'0" West 42.094 feet; thence North 6°7'0" West 430.245 feet; thence North 23°3'36" West 610.066 feet; thence North 16°35'58" East 123.901 feet; thence North 50°42'51" East 169.197 feet; thence North 25°10'51" East 71.426 feet; thence South 85°47'13" West 34.962 feet; thence North 0°54'46" East 491.321 feet, more or less, to the shoreline and Northern meander line of Government Lot five; thence continuing Southeasterly and Northeasterly along shoreline to the point of beginning;</p> <p>Situate within San Juan County, Washington.</p>

County	Waterbody	Tributary To	WRIA
San Juan	Groundwater	N/A	2-San Juan

Purpose	Rate	Unit	Acre-feet/yr	Begin Season	End Season
Domestic general	20	GPM	1	01/01	12/31

Source Name	Parcel	Well Tag	Township	Range	Section	QQ Q	Latitude	Longitude
Well #1	361812001000	ABO-752	36N	03W	18	W½ NE¼	N 48.6196	123.1136 W
Well #3	361842003000	APR-200	36N	03W	18	NW¼ SE¼	N 48.6158	123.1125 W

Legal Requirements for Requested Change

The following is a list of requirements that must be met prior to authorizing the proposed changes in the points of withdrawal and place of use.

Public Notice

RCW 90.03.280 requires that notice of a water right application be published once a week, for two consecutive weeks, in a newspaper of general circulation in the county or counties where the water is to be stored, diverted and used. Notice of this application was published in the *Journal of the San Juan Islands* on October 8, 2014 and October 15, 2014.

Consultation with the Washington Department of Fish and Wildlife

The Department must give notice to the Department of Fish and Wildlife of applications to divert, withdraw or store water. On February 11, 2014, Ecology provided notice to Mr. Stephen Boessow (WDFW). WDFW submitted no comments concerning the proposed withdrawal.

State Environmental Policy Act (SEPA)

Groundwater withdrawals are subject to a SEPA threshold determination (i.e., an evaluation of whether there are likely to be significant adverse environmental impacts) if the water right application proposes withdrawals greater than 2,250 GPM. Because this application does not meet this condition and because the application is not part of a larger project that would trigger SEPA, the application is considered to be categorically exempt from SEPA and a threshold determination is not required.

Water Resources Statutes and Case Law

RCW 90.03.380(1) states that a water right that has been put to beneficial use may be changed. The point of diversion (withdrawal), place of use, and purpose of use may be changed if it would not result in harm or injury to other water rights. Furthermore, RCW 90.14.065(2) states that any registered water right claims may be changed or transferred as provided under RCWs 90.03.380 and 90.44.100.

The Washington Supreme Court has held that Ecology, when processing an application for change to a water right, is required to make a tentative determination of extent and validity of the claim or right. This is necessary to establish whether the claim or right is eligible for change. For a groundwater claim to be considered to be a vested (pre-code) right it must have been put to beneficial use prior to the enactment of RCW 90.44 on June 6, 1945. *R.D. Merrill v. PCHB* and *Okanogan Wilderness League v. Town of Twisp*.

RCW 90.44.100 authorizes Ecology to amend a ground water right to allow the user to construct a replacement or additional well at a new location outside of the location of the original well and to change the manner or place of use of the water, if:

- The additional or replacement well taps the same body of public ground water as the original well. RCW 90.44.100(2)(a),
- Where a replacement well is approved, the user must discontinue use of the original well and properly decommission the original well. RCW 90.44.100(2)(b),
- Where an additional well is constructed, the user may continue to use the original well, but the combined total withdrawal from all wells shall not enlarge the right conveyed by the original permit or certificate. RCW 90.44.100(2)(c),
- Other existing rights shall not be impaired. RCW 90.44.100(2)(d).

When changing or adding points of withdrawal to groundwater rights (RCW 90.44.100), the wells must draw from the *same body of public groundwater*. Indicators that wells tap the *same body of public groundwater* include:

- Hydraulic connectivity.
- Common recharge (catchment) area.
- Common flow regime.
- Geologic materials that allow for storage and flow, with recognizable boundaries or effective barriers to flow.

The following investigation addresses how the proposed changes meets these requirements.

INVESTIGATION

This investigation is based on a March 5, 2014 site visit to Lonesome Cove with Water Resource Program senior hydrogeologist, Jerry Liszak, and several follow-up conversations with John Hart, the Resort's engineer. During the site visit we identified and took GPS measurements of the two proposed points of withdrawal, toured the existing resort infrastructure, and viewed the undeveloped area where the resort expansion will occur. The investigation also draws on: (1) well drilling reports, (2) water rights research, (3) hydrogeological analysis of the site, (4) historical water use data, and (5) references listed in the References section.

History of Water Use: Extent and Validity of Claim

Lonesome Cove Resort Historic Water Use

In the early 1940s, four cabins were built on what is now the Lonesome Cove Resort property. According to the San Juan County Assessor's Office, buildings 2 and 3 were built in 1943 and buildings 4 and 5 were built in 1940. Each building (cabin) is fully plumbed with a bathroom and kitchen. The Assessor's website and Lonesome Cove's historical records indicate that the resort has been in continuous use since the early to mid-1940s. Additional cabins were built in the late 1940s and early 1950s. Seven rental cabins and a caretaker's cabin currently make up the Resort. Most cabins, including the four pre-groundwater code cabins, were remodeled in 1979.

Three families have owned and operated Lonesome Cove Resort since the first four cabins were constructed. The resort operates year-round, with reduced occupancy during the winter months. Water has been used for domestic use purposes since the early 1940s. A meter was installed in December 2013; however, no historical water use records exist.

Extent and Validity of the Turnbull Claim

Continuous domestic use has remained within the place of use, but the source of the water has moved from the original point of withdrawal identified on the claim to a point of withdrawal on the property, now referred to as Well #1. This was a *de-facto* change. Ecology Water Resources Program Policy 1120 – "Water Resources Program Policy for Conducting Tentative Determinations of Water Rights" states the following related to *de-facto* changes:

When evaluating authorized changes to water rights, the department generally considers beneficial use to be the measure of the right, even if some attributes of the right may not be consistent with the current authorization.

There is no decommissioning report for the original point of withdrawal; however, the well is located in what is now a gravel parking area, so one can assume the well was decommissioned, whether legally or illegally. Neither the current owners nor the onsite caretaker have found evidence of the original well. The Department of Health (DOH) Sentry website lists Well #2 as inactive as of September 27, 2007. Well #2, thought to be the original well, is located within the same quarter-quarter section as the claimed point of withdrawal.

The annual quantity listed on the claim is 4 ac-ft/yr. There is no current or historical metering data to support this claimed annual quantity. Given that only four cabins were built prior to the adoption of the

groundwater code, 4 ac-ft/yr cannot be substantiated. Thus, a lesser annual use quantity must be assumed. For new San Juan County water rights, the Department of Ecology uses a .25 ac-ft/yr per connection calculation. Allocating this annual quantity for each of the four pre-code cabins is generous, but also accounts for the less-water conservation oriented behavior of vacationers and the less efficient water systems that have historically existed at Lonesome Cove.

There are no historical metering records to support the claimed instantaneous quantity of 30 gpm. The presumed original well, listed on DOH's Sentry site as well #2, was 24 feet deep. Given the proximity to the existing well #1, the hydrogeology is presumed to be the same. A 24 foot deep well would tap the unconfined aquifer in the overlaying glacial till substrate. With a higher transmissivity, it's likely that the instantaneous quantity of the original well was higher than existing well #1. However, with the *de facto* change, the capacity of the existing pump at well #1 is 20 gpm. With this limited historical record, we can assume that 20 gpm is an appropriate and justifiable instantaneous quantity for this claim.

Thus, the Department of Ecology tentatively determines that the claim is valid for year-round, continuous domestic use and tentatively determines that one 1 acre-foot/year and 20 gpm is considered to have been maintained and beneficially used since before the adoption of RCW 90.44 in 1945 and without any five year lapses of beneficial use as per RCW 90.14.160. Therefore, it appears CG1-149277CL is eligible for change.

Project Description

Lonesome Cove Resort has a phased expansion plan. Currently, a single well (well ID # ABO-752) serves the eight existing units (7 guest cabins and 1 caretaker home) on San Juan County parcel number 361812001000. This well is referred to as Well #1. The resort plans to expand onto six adjacent parcels owned by the applicants under the names Lonesome Cove Resort Inc and Steller Pop, LLC (San Juan County parcel numbers 361842003000, 361813004000, 361813005000, 361813006000, 361813007000, and 361814001000). The Phase I expansion includes 12 additional cabins and outbuildings serving the resort needs. Construction of Phase I is planned to begin within the next year or so. Phase II will be completed over a 10-year planning horizon and will include an additional 25 cabins and resort outbuildings. The maximum number of planned connections is 45. Lonesome Cove is working with the Department of Health to establish a Group A public water system.

Water System and Well Test Details

To meet the water needs of the resort expansion, Lonesome Cove drilled Well #3 upland of the existing Well #1. The expanded water system will draw from both wells; however, well #3 will be the primary source with well #1 serving mostly as an emergency backup supply.

Well #1

Well #1 (ID# ABO-752) is a 6-inch diameter well, located within the W½ NE¼ of Section 18, Township 36 North, Range 3 West (San Juan Parcel 361812001000). Drilled in September 2003, the well is 165 feet deep. An airtest yielded 20 gpm. The static water level was measured at 10.8 feet during the site visit. A ¾ HP Franklin Electric submersible pump directs water from the well to a 2,500 gallon storage tank several feet from the well head. A 1½ HP booster pump directs water through 1-2 inch PVC pipes to each of the eight connections served by the Group B system. In December 2013, the Lonesome Cove installed a master meter on the pump and individual meters at each cabin.

Well #3

Well #3 (ID# APR-200) is a 6-inch diameter well, located within the NW¼ SE¼ of Section 18, Township 36 North, Range 3 West (San Juan Parcel 361842003000). Drilled in June 2013, the well is 205 feet deep. A six-inch casing is completed to 91 feet below surface. The remainder of the well is uncased in bedrock. The top of the casing is 143.1 feet above sea level. A 238.7 hour (9.95 day) well test was completed October 5 – 14, 2013. The well reached 95% recovery in approximately 88 hours (see details below).

<i>Well Test Element</i>	<i>Duration</i>
Static Pre-Test	23:56 hours
Pumping	126:32 hours
Recovery Period	88:14 hours
Total	238.7 hours

The water level stabilized for the last 48:22 hours of pumping (i.e., the rate of drop fell below .4 feet per 4 hour period). During the Lonesome Cove Resort well test, a well on an adjacent parcel 450 feet west was monitored. Maximum drop in the monitoring well was 17.8 feet, which represents about 5 percent of the water column in the well. During the site visit, static water level was measured at 37.3 feet.

The engineering designs for the expanded system are not complete. However, the applicant is committed to designing a system that meets the storage needs of the proposed resort expansion and DOH's Group A water system requirements. The final system will include additional storage capacity, including a 47,000 gallon concrete storage tank for domestic use and commercial fire flow. Wells #1 and #3 may be intertied to provide pumping flexibility.

Hydrologic/Hydrogeologic Evaluation

Geological Overview of the San Juan Islands

Bounded by the Strait of Juan de Fuca to the south, Rosario Strait to the east, Haro Strait to the west, and Boundary Pass to the north, the San Juan Islands archipelago has a complex geologic history. Radiometric dating indicates that the San Juan Islands were accreted to North America sometime prior to the Late Jurassic Period. However, the Late Cretaceous period most dramatically shaped the Islands' bedrock geology. A major suture, known as the Haro Thrust zone, formed during the late Cretaceous Period and joined the Wrangellia terrane of Vancouver Island and the San Juan-Cascade nappes (Brandon, 1989). The San Juan Islands consist of a thick sequence of Late Cretaceous thrust faults, referred to as the San Juan thrust system, containing a diverse group of rocks (terranes) ranging from early Paleozoic to middle Cretaceous in age. A terrane is a fault-bounded package of rocks with a distinctive stratigraphy, structure and geologic history. Formed in compressed tectonic zones (e.g., subduction zones), a nappe is a large sheet of rock with a horizontal or sub-horizontal axial plane that has moved due to faulting or folding.

Wrangellia is a large allochthonous terrane that underlies most of Vancouver Island and parts of Alaska. On Vancouver Island it is characterized as a coherent Paleozoic-to-Lower Jurassic stratigraphic sequence that is dominantly volcanic. The thrust system straddles the southeastern edge of the Wrangellia terrane of Vancouver Island. The San Juan-Cascade nappes are northwest-trending belts that are bounded by the Skagit metamorphic core. In the San Juan Islands, five terranes (Haro, Turtleback, Deadman Bay, Garrison, and Decatur) were thrust and stacked upon each other and on top of the Wrangellia Terrane. The San Juan-Cascade nappes are thought to represent an old accretionary system formed by the successive arrival of these far-traveled terranes (Brandon, 1989).

The bedrock geology of the San Juan Islands has been greatly modified by the three major glacial advances, including the Double Bluff Glaciation (earliest), Possession Glaciation, and Fraser Glaciation (latest) (Russell et al, 1975). However, erosion beneath the glaciers was likely guided by the topography formed by the fracture and fault zones already in existence. It is probable that a fault of considerable magnitude occupies each of the major San Juan channels.

San Juan Island Hydrogeology

San Juan Island is the second largest of the San Juan Islands and has an aerial extent of about 55 square miles. About 40 percent of San Juan Island is overlain by Quaternary glacial deposits, but only as thin, discontinuous sheets, with thicknesses generally less than 30 feet. The glacial deposits, where saturated, generally yield large quantities of water to wells, but the bedrock is nonporous, and water occurs primarily in joints and fractures (Russell et al, 1975).

The geology in the vicinity of the Lonesome Cove wells is Orcas Chert, which is a Triassic-Jurassic formation composed of ribbon chert, with lesser pillow basalt, mudstone, and limestone (Brown et al, 2007). Orcas Chert and the Deadman Bay Volcanics found north of Lime Kiln Point are regarded as a single terrane based on similarity of age, lithology, and basalt chemical signatures (Brandon, et al, 1988). Orcas Chert is found along the eastern and northern coastline of San Juan Island (see Attachment 2). Pleistocene age glacial drift [Quaternary continental drift (Qcd)] overlies the bedrock at the site area (DNR Washington Interactive Geologic Maps, 2014). According to their respective well logs, the drift material is approximately 120 feet deep at well #1 and 88 feet deep at well #3.

Lonesome Cove Resort is located within the Lonesome Cove drainage basin, which encompasses the existing resort and proposed expansion. The drainage area contains two small unnamed ponds and a seasonal outlet stream that empties into Lonesome Cove. The outlet is located on the existing resort property. The drainage rises to a 266 foot rise located approximately a quarter mile from proposed well #3 and approximately a half mile from existing well #1 (see Attachment 3).

The mean annual precipitation for the Lonesome Cove site is 30-34 inches/year. Average annual recharge to the ground water system for this area ranges from .5 to 3 inches (USGS, 2002).

Same Body of Public Groundwater

The geography and hydrogeology of the site area indicates that:

- The existing and proposed well are located in the Lonesome Cove drainage basin
- Both wells are completed in the same bedrock formation
- Aquifer recharge is likely from infiltrated runoff and surface water body infiltration within the drainage area
- The water captured by both wells could likely naturally discharge into Lonesome Cove

Based on the above information, I determine that wells #1 and #3 tap the same body of public groundwater.

Other Rights Appurtenant to the Place of Use

The Department of Ecology has record of 13 water rights or water right claims within a half mile radius of the Lonesome Cove Resort proposed points of withdrawal (see Table 3 and Attachment 4). Of the

water rights considered for the impairment analysis, 4 are state-issued water right certificates (3 for groundwater, 1 for surface water) and 9 are claims (5 short-form claims and 4 long-form claims).

A water right claim is a *claim* to a water right for a beneficial use which predates the state water code (1917 for surface water and 1945 for groundwater) and is not authorized by a state-issued permit or certificate. Water right claims can only be confirmed through adjudication by the Washington State Superior Court. The Department of Ecology cannot verify a claim's validity. However, Ecology may tentatively determine the extent and validity of a claimed water right pursuant to RCW 90.14 (Ecology POL 1120). Many of the below-listed claims represent uses allowable under the groundwater permit exemption (RCW 90.44.050).

Table 3. Record of Water Rights within a Half Mile Radius from the Two Proposed Points of Withdrawal

<i>Control Number</i>	<i>Name on Document</i>	<i>Document Type</i>	<i>Priority Year</i>	<i>Purpose</i>	<i>Q_i</i>	<i>Q_a</i> <i>(ac-ft/yr)</i>
S1-23744CWRIS	Sanborn/Eaton	Cert	1981	DM	.03 CFS	1
G1-*05271CWRIS	Roche Harbor Lime & Cement Co	Cert	1959	DM	35 GPM	56
G1-24178CWRIS	Limestone Point Water	Cert	1982	DM	7.5 GPM	12
G1-*07363CWRIS	Roy P. Durhack	Cert	1964	DS	2 GPM	2
G1-301910CL	Franklin Lacy	Claim L	--	DG, IR	140	54
G1-301909CL	Franklin Lacy	Claim L	--	DG, IR	140	28
S1-041324CL	Roy P. Durhack	Claim L	--	DG	N/L	N/L
G1-149277CL	Allen D Turnbull	Claim L	--	DG	N/L	N/L
G1-104732CL	Robert W Collyer	Claim S	--	IR	N/L	N/L
G1-078783CL	Merle E. Boyce	Claim S	--	DG	N/L	N/L
G1-051186CL	James P. Dow	Claim S	--	DG	N/L	N/L
G1-041536CL	Gale M. Shinn	Claim S	--	DG	N/L	N/L
S1-051237CL	Lynn Hockens	Claim S	--	DG	N/L	N/L

Abbreviation Key: Q_i – instantaneous quantity, Q_a – annual quantity, CFS – cubic feet per second, GPM – gallons per minute, DG – domestic general, DM – domestic multiple, DS – domestic single, IR – Irrigation, S – Section, T – Township, R – Range, N/L – not listed

In addition to the above-listed water rights and water right claims, there are approximately 30 water wells located within a half mile radius of the Lonesome Cove Resort points of withdrawal. This information was obtained using the Department of Ecology's well log database. Several of these wells likely overlap with the above listed water rights.

Impairment Considerations

Impairment, Qualifying Ground Water Withdrawal Facilities, and Well Interference

There are three concepts that are important when considering whether a withdrawal of water from a well would impair another existing water right. The concepts are defined as follows:

1. **Impairment** is an adverse impact on the physical availability of water for a beneficial use that is entitled to protection (i.e., water rights that are both senior and junior in priority to the right the applicant seeks to change).
2. **Qualifying ground water withdrawal facilities** are defined as those wells which in the opinion of the Department are adequately constructed. An adequately constructed well is one that (a) is constructed in compliance with well construction requirements; (b) fully penetrates the saturated thickness of an aquifer or withdraws water from a reasonable and feasible pumping lift (WAC 173-

150); (c) the withdrawal facilities must be able to accommodate a reasonable variation in seasonal pumping water levels; and (d) the withdrawal facilities including pumping facilities must be properly sized to the ability of the aquifer to produce water.

3. Well interference may occur when several wells penetrate and withdraw ground water from the same aquifer. Each pumping well creates a drawdown cone. When several wells pump from the same aquifer, well density, aquifer characteristics, and pumping demand may result in individual drawdown cones that intersect and form a composite drawdown cone. At any point in an aquifer, the composite drawdown caused by pumping wells will be greatly influenced by the transmissivity (T) of the aquifer. In aquifers with high Ts, composite drawdown will generally be much less than in aquifers with similar properties but with low Ts. Transmissivity is related to hydraulic conductivity (K) and the saturated thickness (b) of an aquifer by the relationship $T=Kb$.

An aquifer's hydraulic conductivity (K) is derived from the physical properties of both the fluid and geologic materials that form an aquifer. Once formed, an aquifer's saturated thickness (b) becomes important in evaluating its transmissivity. For regions of similar K in an aquifer, a large saturated thickness will result in a much higher T than a small saturated thickness. As a result, regions of similar K in an aquifer with a large saturated thickness will experience less composite drawdown or well interference than with a small saturated thickness.

Some conditions, however, will increase or steepen composite drawdown in an aquifer. For instance, where characteristics (such as very fine, clay-rich, or poorly sorted sediments) of an unconfined aquifer cause significant drawdown relative to the saturated thickness, the composite drawdown will increase as saturated thickness is reduced and T becomes smaller. Additionally, in regions where negative or no-flow boundaries occur, such as near the edges of a valley fill aquifer where it is bounded by bedrock, composite drawdown will be steeper than in the central part (generally the greatest thickness region) of the aquifer. Consequently, it is commonly understood that the greatest composite drawdown or well interference is more likely to occur in regions of low transmissivities, thin saturated thicknesses and near negative or no-flow boundaries than in regions of high transmissivities, large saturated thicknesses, and away from negative or no-flow boundaries.

Ecology is not aware of any impairment issues associated with the *de facto* change from the original well site (DOH well #2) to the current well location (DOH well #1, Ecology ID# ABO-752). The applicant has requested that an additional well be added to the claim. A 10-day well test was conducted for the new well (DOH well #3, Ecology ID # APR-200) and an adjacent well was monitored. No impairment concerns were raised by neighboring well owners and the drawdown on the monitoring well was minimal (17 .8 feet or 5 percent of the well water column). The related depths of the two wells and the well log forms suggest that the wells are tapping the same body of public groundwater. Furthermore, the well test conducted on well #3 did not negatively impact the pumping rate or withdrawal capacity of well #1. The two proposed withdrawal points are qualifying groundwater withdrawal facilities under state code. Ecology finds that there is a low well interference risk posed by this change to a claim application given the lengthy pump test that was conducted.

In summary, Ecology finds that this water right change:

- Will not impact existing water right holders;
- Involves two wells that are qualifying groundwater withdrawal facilities under state law; and
- Poses minimal well interference risk with neighboring wells tapping the same aquifer.

Seawater Intrusion Potential

Seawater intrusion is the movement of seawater into fresh water due to natural processes or human activities. In order for seawater intrusion to occur, an aquifer must be in hydraulic connection with seawater and the hydraulic head of the fresh ground water must be reduced relative to that of the seawater. On an island, if a well withdraws water at a rate that sufficiently lowers the water table and disturbs the fresh-sea water balance, seawater will rise as a cone and move toward the well (Dion and Sumioka, 1978).

Accurately calculating seawater intrusion potential in a confined bedrock aquifer is difficult. Thus, chloride concentrations are often used as an indicator. Lonesome Cove has one chloride sample from well #1, which is at a higher risk for seawater intrusion than well #3 given its distance to the shoreline (427 ft) and drilled depth below sea level (112 ft). When chlorides were last measured for well #1 in October 2011, the chloride levels were 27 mg/L, which is significantly lower than the EPA regulated maximum contaminant level of 250 mg/L. With the resort expansion, Lonesome Cove plans to use well #1 as an emergency backup source and use well #3 as the primary source. Well #3 is 1,814 feet from the shoreline and has a low saltwater intrusion potential. There are no known seawater intrusion issues in the area. Based on the low chloride concentrations for well #1 and the lack of seawater intrusion issues within this geographic area, I find that the potential for degradation of the groundwater source from seawater is low.

Public Interest Considerations

No protests were filed against this application and no potential for detriment to the public interest was identified during the investigation of this application.

Conclusions

In accordance with RCW 90.44, I tentatively conclude that claim G1-149277CL is valid and eligible to be changed.

RECOMMENDATIONS

Based on the above investigation and conclusions, I recommend that this request for a water right be approved in the amounts and within the limitations listed below and subject to the provisions listed above.

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:

- 20 gpm
- 1 acre-feet per year
- Year-round multiple domestic supply

Points of Withdrawal

Well #1: W $\frac{1}{2}$, NE $\frac{1}{4}$, Section 18, Township 36 North, Range 3 West, W.M.

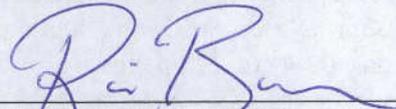
Well #3: NW $\frac{1}{4}$, SE $\frac{1}{4}$, Section 18, Township 36 North, Range 3 West, W.M.

Place of Use

Those portions of Government Lots 5 and 6, and the Northwest quarter of the Southeast quarter of Section 18, Township 36 North, Range 3 West, more particularly described as follows:

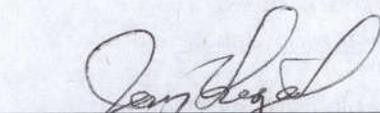
Beginning on the shoreline at the Northeast corner of Government Lot 5, thence along Eastern boundary line of Government Lot 5 706.577 feet, more or less, to a point which is 1362.087 feet north of the Southeast Corner of Government Lot 5; thence leaving Eastern boundary line North 88°13'29" East 305.173 feet; thence South 51°0'56" East 94.457 feet; thence South 14°43'29" West 683.076 feet; thence North 88°7'14" West 228.276 feet to a point on the Eastern boundary line of Government lot 5; thence along Eastern Boundary Line 658.567 feet to Southeast corner Of Government Lot 5; thence along Southern boundary line of Government Lot 5 440.452 feet; thence leaving Southern boundary line of Government Lot 5 South 4°58'27" East 303.010 feet to the Northerly edge of Limestone Point Road; thence continuing along edge Northerly edge of Limestone Point Road South 74°34'24" West 274.734 feet to an intersection of the Northerly edge of Limestone Point Road and the Easterly Edge of Limestone Cove Road; thence continuing along the Easterly edge of Limestone Cove Road North 14°41'53" West 399.762 feet to a point on the Southern boundary line of Government Lot 5; thence continuing along Southern boundary line of Government Lot 5 East 107.653 feet; thence leaving Southern boundary line of Government Lot 5 North 17°37'0" West 42.094 feet; thence North 6°7'0" West 430.245 feet; thence North 23°3'36" West 610.066 feet; thence North 16°35'58" East 123.901 feet; thence North 50°42'51" East 169.197 feet; thence North 25°10'51" East 71.426 feet; thence South 85°47'13" West 34.962 feet; thence North 0°54'46" East 491.321 feet, more or less, to the shoreline and Northern meander line of Government Lot five; thence continuing Southeasterly and Northeasterly along shoreline to the point of beginning;

Situate within San Juan County, Washington.


Ria Berns, Report Writer

1/21/2015
Date




Jerry Liszak, U.Hg, Reviewer

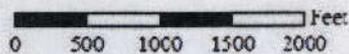
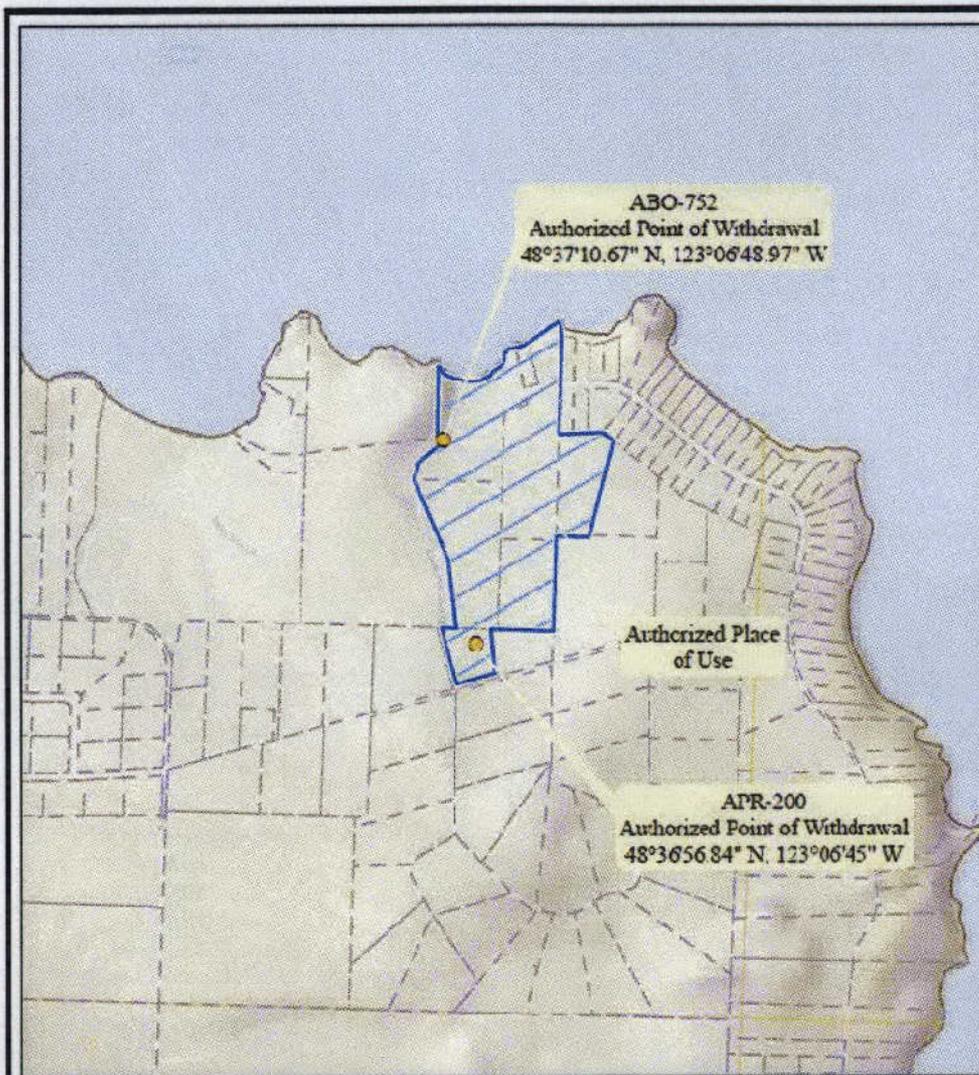
1/21/15
Date

JERRY LEE LISZAK

If you need this publication in an alternate format, please call Water Resources Program at (360) 407-6600. Persons with hearing loss can call 711 for Washington Relay Service. Persons with a speech disability can call 877-833-6341.

Selected References

- Brandon, M.T., 1989. *Geology of the San Juan-Cascade Nappes, Northwestern Cascade Range and San Juan Islands*. Geologic guidebook for Washington and adjacent areas: Washington Division of Geology and Earth Resources Information Circular 86, 26 pages.
http://earth.geology.yale.edu/~markb/Eprints/Brandon1989DGER_FieldGuide.pdf
- Brandon, M.T., et al, 1988. *The Late Cretaceous San Juan thrust system, San Juan Islands, Washington*. Geological Society of America Special Paper 221, 81 p.
http://earth.geology.yale.edu/~markb/Eprints/Brandon_etal1988.pdf
- Brown E.H., et al, 2007. *Tectonic Evolution of the San Juan Islands Thrust System, Washington*. The Geological Society of America, Field Guide 9, 35 pages.
<http://myweb.facstaff.wvu.edu/bernieh/reprints/brown-gsa-cord-07-san-juans.pdf>
- Dion, N.P., and Sumioka, S.S., 1984. *Seawater intrusion into coastal aquifers in Washington, 1978*. State of Washington Department of Ecology Water Supply Bulletin 56, 24 pages.
<https://fortress.wa.gov/ecy/publications/publications/wsb56.pdf>
- Kelly, Doug, 2005. *Seawater Intrusion Topic Paper, In Island County Water Resource Management Plan*.
- McLellan, R.D., 2006. *Geology of the San Juan Islands, University of Washington Publications in Geology*.
http://www.cr.nps.gov/history/online_books/geology/publications/state/wa/uw-1927-2/intro.htm
- Orr, L.A., Bauer, H.H. and Wayenberg, J.A. 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*. U.S. Geological Survey Water-Resources Investigations Report 02-4114, 114 pages.
- Russell, R.H. ed., 1975. *Geology and Water Resources of the San Juan Islands, San Juan County, Washington*. Washington Department of Ecology Water Supply Bulletin No 46, 171 pages.
- U.S. Environmental Protection Agency. Updated May 31, 2013. *Secondary Drinking Water Regulations: Guidance for Nuisance Chemicals*. <http://water.epa.gov/drink/contaminants/secondarystandards.cfm> (accessed 02/18/14)
- Washington Department of Natural Resources. *Geology of Washington: Puget Lowland*. Modified from: Lasmanis, R., 1991. *The Geology of Washington: Rocks and Minerals*, v.66, no. 4, P. 262-277.
<http://www.dnr.wa.gov/ResearchScience/Topics/GeologyofWashington/Pages/lowland.aspx>
- Washington Department of Natural Resources. Washington Interactive Geologic Maps, Division of Geology and Earth Resources – Washington Geologic Survey.
<https://fortress.wa.gov/dnr/geology/?Theme=wigm>. Accessed October 7, 2014.



Map Date: 4/10/2014



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

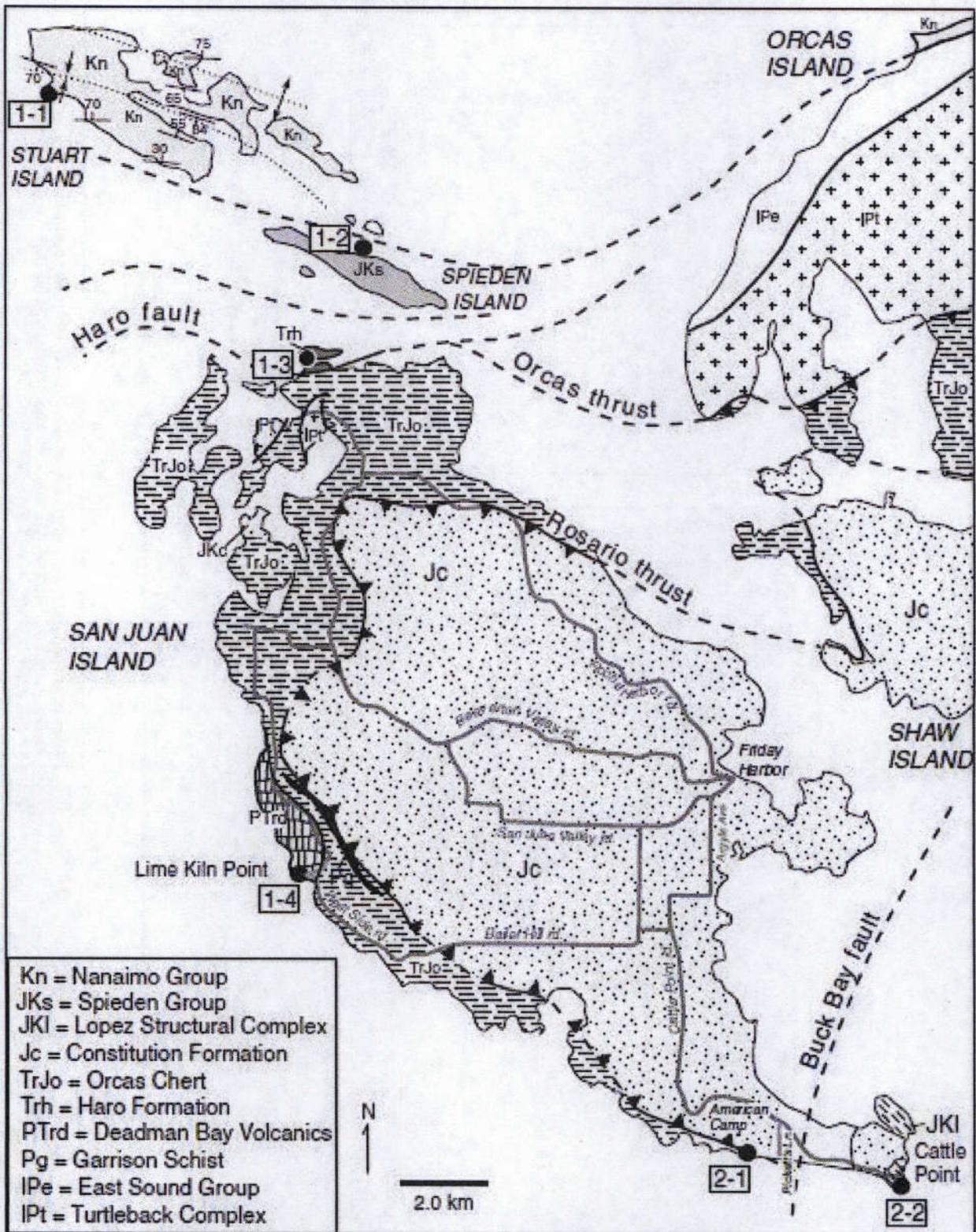
Lonesome Cove Resort Inc
Water Right CG1-149277CL
Section 18 T 36N R 03W W.M.
WR1A 2 - San Juan Island - San Juan County



Legend

-  Authorized Place of Use
-  Authorized Point of Withdrawal
-  Parcels
-  Water Body
-  Townships
-  Sections

Attachment 2: San Juan Island Bedrock Geology



Credit: Brown, E.H., et al, 2007. *Tectonic Evolution of the San Juan Islands Thrust System, Washington*. P. 157

Attachment 3: Lonesome Cove Surface Water Drainage Area

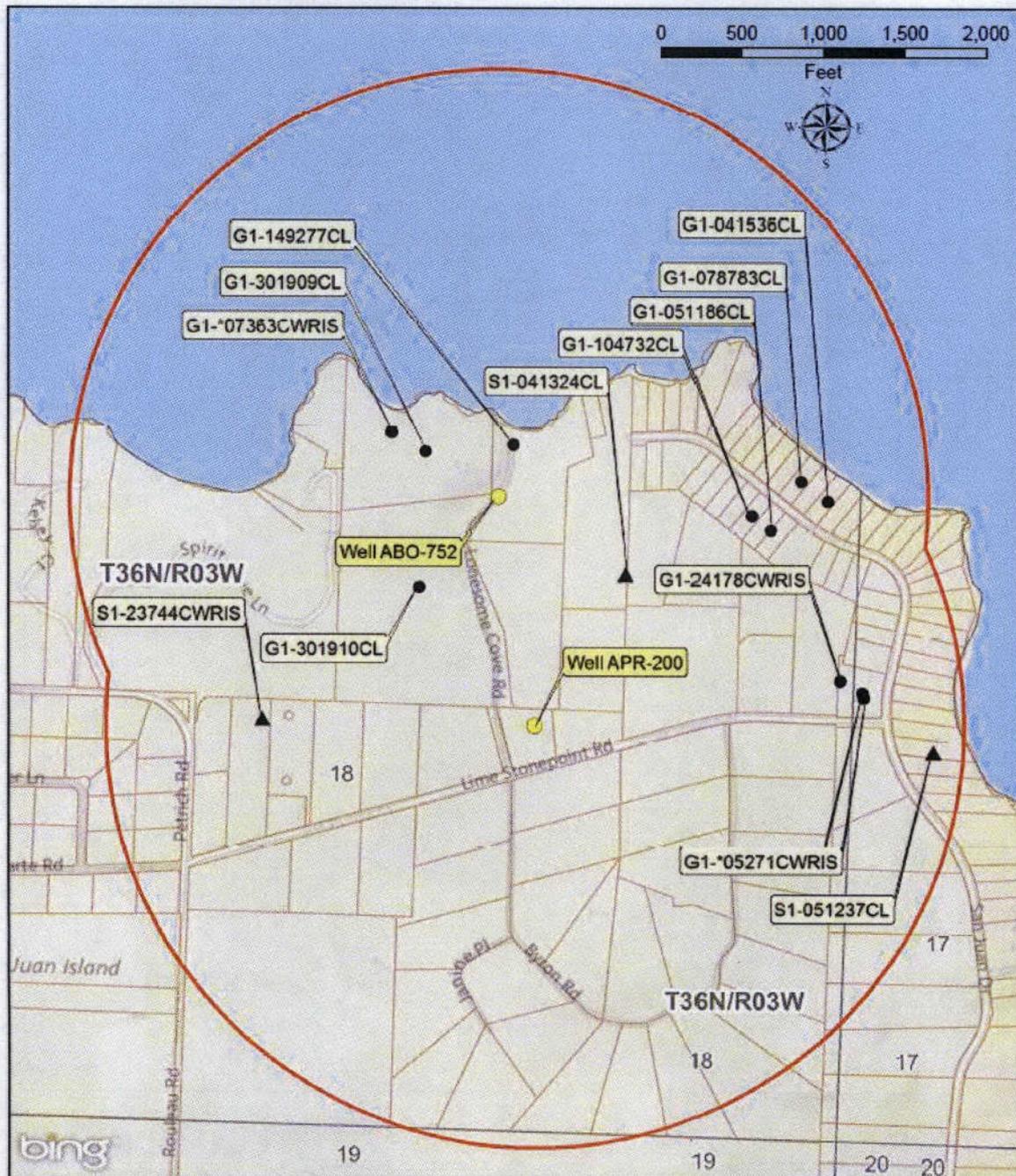


- ABO-752 and APR-200 (Lonesome Cove Wells)
- Drainage area delineated by topography (based on 2009 Bare Earth LiDAR, +/- 0.12 feet)

DEPARTMENT OF ECOLOGY
 State of Washington
 Surface Water Drainage Around ABO-752 and APR-200
 Water Right Document CG1-149277CL
 Lonesome Cove Resort
 Sec 18, T 36N, R 03W, W.M.
 WRIA 2, San Juan County, San Juan Island

The surface water drainage area around wells ABO-752 and APR-200 was delineated using Bare Earth LiDAR and ArchHydro for Surface Water. LiDAR is a kind of high-resolution elevation dataset. This data was obtained from the Puget Sound LiDAR Consortium (PSLC). The LiDAR data was a portion of the data collected by Watershed Sciences, INC., in 2009 for PSLC. The average vertical accuracy is plus or minus .12 feet. ArchHydro is data model developed by the University of Texas at Austin for water catchment delineation, and is an industry standard.

Attachment 4: Impairment Map



- ABO-752 and APR-200
Lonesome Cove Wells
- Half Mile Radius
- ▲ Surface Water Right Documents
- Ground Water Right Documents



DEPARTMENT OF
ECOLOGY
State of Washington

Water Right Documents within
One Half Mile of ABO-752 and APR-200
Water Right Document CG1-149277CL
Lonesome Cove Resort
Sec 18, T 36N, R 03W, W.M.
WRIA 2, San Juan County, San Juan Island