



STATE OF WASHINGTON  
DEPARTMENT OF ECOLOGY

**REPORT OF EXAMINATION**  
*Change of:* Point of Withdrawal and Point of Diversion  
**WRTS File # CS4-069703CL@4**

PRIORITY DATE	CLAIM NO.	PERMIT NO.	CERTIFICATE NO.
October 19, 1903	069703		

NAME Keystone Ranch c/o Dale and Gail Foreman		
ADDRESS/STREET	CITY/STATE	ZIP CODE
124 Wenatchee Ave, Suite A	Wenatchee, WA	98801

**PUBLIC WATERS TO BE APPROPRIATED**

SOURCE

- 1.) Entiat River
- 2.) Keystone Well No. 1
- 3.) Keystone Well No. 2

TRIBUTARY OF (IF SURFACE WATERS)

- 1.) Columbia River
- 2.) N/A
- 3.) N/A

MAXIMUM CUBIC FEET PER SECOND (cfs)	MAXIMUM GALLONS PER MINUTE (gpm)	MAXIMUM ACRE FEET PER YEAR (ac-ft/yr)
1.56	700	401.5

QUANTITY, TYPE OF USE, PERIOD OF USE

700 gallons per minute (1.56 cubic feet per second), 401.5 acre-feet per year, for the irrigation of 84 acres from April 1 through October 31

**Total withdrawals from all wells and the point of diversion on the Entiat River shall not exceed the maximum quantities authorized above.**

**LOCATION OF DIVERSION/WITHDRAWAL**

APPROXIMATE LOCATION OF DIVERSION--WITHDRAWAL

- 1.) POD: Entiat River POD – 2175 feet West and 2160 feet North of the SE corner of Section 18, T. 25 N., R. 21 E.W.M.
- 2.) POW: Keystone Well No. 1 - 1,890 feet East and 2,565 feet South of the NW corner of Section 18, T. 25 N., R. 21 E.W.M
- 3.) POW: Keystone Well No. 2 – 590 feet East and 1990 feet South of the NW corner of Section 18, T. 25 N., R. 21 E.W.M.

SOURCE	PARCEL	LATITUDE	LONGITUDE	QTR/QTR	SECTION	TOWNSHIP	RANGE
1.) Entiat River POD	252118230050	47.6622	-120.2487	NW¼SE¼	18	25 N.	21 E.W.M.
2.) Keystone Well No. 1	252118230050	47.6637	-120.2541	SE¼NW¼	18	25 N.	21 E.W.M.
3.) Keystone Well No. 2	252118230050	47.6653	-120.2594	SW¼NW¼	18	25 N.	21 E.W.M.

**LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED**

[Attachment 1 shows location of the authorized place of use and point(s) of diversion or withdrawal]

SW¼NE¼, SE¼NE¼, E½NW¼SE¼, NE¼SE¼ of Section 13, T. 25 N., R. 20 E.W.M., all lying South of the Entiat River; and S½SW¼NW¼, NW¼SW¼, S½SE¼NW¼, NE¼SW¼ of Section 18, T. 25 N., R. 21 E.W.M., all lying South of the Entiat River.

Chelan County Assessor Parcel No. 252118230050.

## DESCRIPTION OF PROPOSED WORKS

The POD will consist of a 50 horsepower pump intake from a 10-foot by 23-foot settling basin with a fish screen and a 10-inch diameter fish bypass. Keystone Well No. 1 is a well drilled 49 feet below ground surface, screened from 37 to 47 feet below ground surface, with a 7.5 horsepower Berkeley submersible pump. Both the POD and POWs will be connected to the Keystone Ranch irrigation system, consisting of undertree impact sprinklers throughout the orchard.

### DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE	COMPLETE PROJECT BY THIS DATE	WATER PUT TO FULL USE BY THIS DATE
Begun	October 31, 2014	October 31, 2014

### PROVISIONS

## **Provision 1 applies to the Entiat River point of diversion**

### **1. Department of Fish and Wildlife Requirement(s)**

The intake(s) shall be screened in accordance with Department of Fish and Wildlife screening criteria (pursuant to RCW 77.57.010, RCW 77.57.070, and RCW 77.57.040). If you have questions about screening criteria contact the Department of Fish and Wildlife at:

Department of Fish and Wildlife  
Attention: Habitat Program  
600 Capitol Way N

Phone: (360) 902-2534  
Email: [habitatprogram@dfw.wa.gov](mailto:habitatprogram@dfw.wa.gov)

Website:  
<http://wdfw.wa.gov/conservation/habitat/planning/screening/>

Olympia, WA 98501-1091

## **Provision 2 applies to Keystone Well No. 1 and No. 2**

### **2. Well, Well Logs and Well Construction Standards**

- 2.1. In accordance with Chapter 173-160 WAC, 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 sources of contamination. Wells shall not be located within 1,000 feet of the boundary of a solid waste landfill.
- 2.2. All wells constructed in the state shall meet the construction requirements of chapter 173-160 WAC titled "Minimum Standards for the Construction and Maintenance of Wells" and chapter 18.104 RCW 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 shall be decommissioned.
- 2.3. All wells shall 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 shall remain attached to the well. If you are required to submit water measuring reports, reference this tag number.
- 2.4. Required installation and maintenance of an access port as described in WAC 173-160- 291(3).

## **Provisions 3 through 7 apply to all water use under Keystone Ranch's portion of Claim No. 069703**

### **3. Measurements, Monitoring, Metering and Reporting**

- 3.1. An approved measuring device shall be installed and maintained for each of the sources authorized by this water right in accordance with the rule "Requirements for Measuring and Reporting Water Use", chapter 173-173 WAC. <http://www.ecy.wa.gov/programs/wr/measuring/measuringhome.html>
- 3.2. Water use data shall be recorded weekly and maintained by the property owner for a minimum of five years. The maximum rate of diversion/withdrawal and the annual total volume shall be submitted to the Department of Ecology by January 31<sup>st</sup> of each calendar year.
- 3.3. Chapter 173-173 WAC describes the requirements for data accuracy, device installation and operation, and information reporting. It also allows a water user to petition the Department of 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”. <http://www.ecy.wa.gov/programs/wr/measuring/measuringhome.html>

#### 4. 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.

#### 5. Project Completion

The water right holder shall file the notice of project completion when the permanent distribution system has been constructed and the quantity of water required by the project has been put to full beneficial use. The *Certificate of Change* will reflect the extent of beneficial use within the limitations of the change authorization. Elements of the project completion inspection may include, as appropriate, the source(s), system instantaneous capacity, beneficial use(s), annual quantity, place of use, and compliance with provisions.

#### 6. Water Use Efficiency

Use of water under this authorization shall be contingent upon the water right holder’s maintenance of efficient water delivery systems and use of up-to-date water conservation practices consistent with established regulation requirements and facility capabilities.

#### 7. Non-Additive to Confirmed Claims

The water use authorized under this filing shall be considered non-additive to any water rights confirmed for said claim as a result of a general adjudication through Superior Court, should adjudication be undertaken.

### 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 find the change of water right as recommended will not be detrimental to existing rights or the public welfare

Therefore, I ORDER approval of the recommended change of point of diversion and point of withdrawal under Change Application No. CS4-069703CL@4, subject to existing rights and the provisions listed above.

### YOUR RIGHT TO APPEAL

You have a right to appeal this ORDER. To appeal this you must:

- File your appeal with the Pollution Control Hearings Board within 30 days of the “date of receipt” of this document. Filing means actual receipt by the Board during regular office hours.
- Serve your appeal on the Department of Ecology within 30 days of the “date of receipt” of this document. Service may be accomplished by any of the procedures identified in WAC 371-08-305(10). “Date of receipt” is defined at RCW 43.21B.001(2).

Be sure to do the following:

- Include a copy of this document that you are appealing with your Notice of Appeal.
- Serve and file your appeal in paper form; electronic copies are not accepted.

#### 1. To file your appeal with the Pollution Control Hearings Board

Mail appeal to:

The Pollution Control Hearings Board OR  
PO Box 40903  
Olympia, WA 98504-0903

Deliver your appeal in person to:

The Pollution Control Hearings Board  
4224 – 6th Ave SE Rowe Six, Bldg 2  
Lacey, WA 98503

#### 2. To serve your appeal on the Department of Ecology

Mail appeal to:

The Department of Ecology OR  
Appeals Coordinator  
P.O. Box 47608  
Olympia, WA 98504-7608

Deliver your appeal in person to:

The Department of Ecology  
Appeals Coordinator  
300 Desmond Dr SE  
Lacey, WA 98503

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**3. And send a copy of your appeal to:**

Robert F. Barwin, P.E., Acting Section Manager  
Department of Ecology  
Central Region Office  
15 W Yakima Ave Ste 200  
Yakima WA 98902-3452

*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 Yakima, Washington, this \_\_\_\_\_ day of \_\_\_\_\_, 2014.

\_\_\_\_\_  
Robert F. Barwin, P.E., Acting Section Manager  
Water Resources Program/CRO

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**BACKGROUND**

**Description and Purpose of Proposed Change**

On May 23, 2008, Dale and Gail Foreman, representing Keystone Ranch, submitted to the Department of Ecology (Ecology) an *Application for Change/Transfer of Water Right*. The application was accepted and assigned the identifier Water Right Change Application No. CS4-069703CL@4. In the application, the Foremans proposed a change in point of diversion (POD) to five points of withdrawal (POWs). The application was later amended to propose a change from a POD to a different POD and two POWs, all located on the Keystone Ranch parcel (Parcel No. 25118230050). Dale and Gail Foreman have used the Detwiler Hanan Knapp Ditch, locally known as the “Hanan – Detwiler Ditch” (H-D Ditch), to divert the asserted portion of Claim No. 069703. The Foremans propose to cease all diversions from the H-D Ditch and use a separate diversion from the Entiat River and two wells to withdrawal all irrigation water for the Keystone Ranch orchard.

The proposed change in POD to a POD and two POWs is part of the “Knapp-Wham Hanan-Detwiler Irrigation System Consolidation” project. As stated in the application, “The objectives of the project include: 1) Eliminating the Hanan-Detwiler surface water diversion and associated unlined irrigation ditch to improve instream flow conditions in the lower river, particularly during the late-summer/fall period, and 2) Enhancement of the Knapp-Wham system and surface water diversion to eliminate low flow [fish] passage issues and provide additional large pool habitat complexity within the lower Entiat River.” Decommissioning the H-D Ditch by moving eleven users to the K-W Ditch and installing points of withdrawal for the remaining five users of the H-D Ditch is expected to result in the elimination of ditch losses and increase instream flows for a portion the Entiat River.

The proposed changes to a of POD and POW for Keystone Ranch as proposed in Water Right Change Application No. CS4-069703CL@4 are the subject of this report. This report application for change pertains solely to the portion of Claim No. 069703 appurtenant to the Keystone Ranch by Dale and Gale Foreman.

**Attributes of the Claim and Proposed Changes to a Portion of the Claim**

**Table 1:** Summary of Proposed Changes to Keystone Ranch’s Portion of Claim No. 069703

<i>Attributes</i>	<i>Existing</i>	<i>Proposed</i>
Name	Detwiler, Hanan, Knapp Ditch	Keystone Ranch, c/o Dale and Gail Foreman
Priority Date   Date of Application for Change	October 19, 1903	May 23, 2008
Instantaneous Quantity	900 cfs	700 gpm / 1.56 cfs
Annual Quantity	1,300 afy	Not Stated
Source	Entiat River	Entiat River and two wells
Point of Diversion/Withdrawal	Within the NW¼SE¼ of Section 10, T. 25 N., R 20. E.W.M.	POD: NW¼SE¼ POWs: SW¼NW¼;and SE¼NW¼;all in Section 18, T. 25 N., R. 21 E.W.M.
Purpose of Use	Irrigation	Irrigation of 84± acres
Period of Use	April through October	No Change
Place of Use	Lands within Section 15, Section 18, and the NE¼ of Section 14, all in T. 25 N., R. 21 E.W.M.	Parcel No. 252118230050

## Legal Requirements for Proposed Change

The following is a list of requirements that must be met prior to authorizing the proposed change in Water Right Application No. CS4-069703CL@4:

- **Public Notice**

A public notice was published in “The Wenatchee World” newspaper on December 23 and 30, 2008. No protests or comments were received by Ecology during the 30-day protest period.

- **State Environmental Policy Act (SEPA)**

A water right application is subject to a SEPA threshold determination (i.e., an evaluation whether there are likely to be significant adverse environmental impacts) if any one of the following conditions are met:

- It is a surface water right application for more than 1 cubic foot per second, unless that project is for agricultural irrigation, in which case the threshold is increased to 50 cubic feet per second<sup>1</sup>, so long as that irrigation project will not receive public subsidies.
- It is a groundwater right application for more than 2,250 gallons per minute.
- It is an application that, in combination with other water right applications for the same project, collectively exceed the amounts above.
- It is a part of a larger proposal that is subject to SEPA for other reasons (e.g., the need to obtain other permits that are not exempt from SEPA).
- It is part of a series of exempt actions that, together, trigger the need to do a threshold determination, as defined under chapter 197-11-305 WAC.

This water right application is for more than 1 cubic foot per second and public funds were used in this project. As a result, a SEPA review was done and no comments were received. Ecology, acting as the SEPA lead agency for this project, determined that it will not have significant adverse impact on the environment and issued a Determination of Nonsignificance on July 8, 2014.

- **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, place of use, and purpose of use may be changed if it would not result in harm or injury to other water rights.

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. *R.D. Merrill v. PCHB* and *Okanogan Wilderness League v. Town of Twisp*.

The actual extent and validity of a claim can only be determined by a Superior Court in an adjudication. Any tentative determination made on the extent and validity of a claim by Ecology as part of an application for change investigation is not an adjudication of the claim.

## INVESTIGATION

Information comprising this investigation was obtained during a site visit conducted on November 20, 2008. Present during the site visit were Ecology representatives Taylor Horne and Kurt Walker and applicant representative Rich Malinowski of Cascadia Conservation District. A second site visit was conducted on September 4, 2013, with David Holland from Ecology and representatives from Cascadia Conservation District, Mike Rickel and Kurt Hosman being present. On April 1, 2014 a final site visit was conducted with Ecology representative David Holland and the applicant Dale Foreman present.

Additional information was obtained from:

- Applicable RCW and WAC chapters.
- Conversations with Rich Malinowski of Cascadia Conservation District.
- Ecology records.
- Historical land and aerial photographs.
- Historical maps.
- Ecology’s Geographic Information System (GIS) data.
- Chelan County records.
- USGS streamflow records.
- Documents listed in the References section of this report.

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<sup>1</sup> Refer to the “Water Quantities” section of this report for a discussion of the actual, rather than claimed, instantaneous quantity of water diverted under Water Right Claim No. 069703.

## History of Water Use

The H-D Ditch is located in the Entiat River valley in Water Resource Inventory Area (WRIA) 46. The ditch runs from a POD at river mile five for about three miles paralleling the Entiat River in a southeasterly direction. Water from the H-D Ditch is used to irrigate orchards and turf south of the Entiat River from river mile four to river mile one.

In 1974, in accordance with chapter 90.14 RCW, a representative of the H-D Ditch users submitted to Ecology a claim to 900 cubic feet per second (cfs), 1,300 acre-feet per year (ac-ft/yr), for the irrigation of 325 acres from April through October from the Entiat River. Claim No. 069703 asserts that water was first put to use on October 19, 1903 from a POD 1,350 feet north and 1,500 feet west from the southeast corner of Section 10, within the NW¼SE¼ of Section 10, T. 25 N., R. 20 E.W.M. This point is approximately 850 feet south and 250 feet east of the currently used H-D Ditch POD. The claimed POD location may have been inaccurately described on the claim form submitted in 1974. The claimed place of use (POU) includes numerous parcels south of the Entiat River within Sections 13, 14, 15, and 18, all in T. 23 N., R. 21 E.W.M., Chelan County.

The “Notice of Appropriation of Water” No. 6836 dated October 19, 1903 in Chelan County Auditor’s General Records Volume 41 Page 240 states that S. R. Hannan, D. C. Wolf, and Frank E. Knapp:

“...have appropriated nine hundred (900) cubic feet of water per second of time, the same to be taken out of the Entiat River by ditch, ditches, flumes and other means at a point where the present ditch known as the Detwiler and Hanna [sic] Ditch is now taken out of the Entiat River, said point being near the north-west corner of the southeast corner of section 10, Township 25, North of Range 20 E.W.M., which ditch runs and has been constructed in a southeasterly direction running across the south-east quarter of section 10, and a portion of the north-east quarter of the north east quarter of Section 15 and crossing Section 14 and 13 in Township 25, North of Range 20 E.W.M., and ending on the north-west quarter of the south-west quarter of Section 19, Township 25, North of Range 21 E.W.M., Chelan County, State of Washington. Said water is [sic] appropriated for irrigation, stock and domestic purposes, and for mining and milling purposes and for the purposes of creating power. Notice is further given that said ditch was constructed by the undersigned and by their grantors and said water has been diverted and used upon the land belonging to the undersigned and their grantors since 1894, and has become appurtenant to said land.”

A separate “Agreement” document dated May 9, 1906, defines the shares of each member of the “Detwiler & Hannan Irrigation Ditch” as “S. R. Hannan 2/9; D. C. Wolf 2/9; Frank Knapp 5/9”. The “Agreement” also specifies that each user is responsible to maintain a portion of the ditch proportionate to each user’s share.

A review of aerial photographs from 1945, 1962, 1979, 1998, 2004, 2005, and 2006 indicates that approximately 194.6 acres of irrigation has occurred within the POU during each of those years. A detailed discussion of each user’s historic irrigation practices is included in the “Hanan-Detwiler Ditch Users” section of this report.

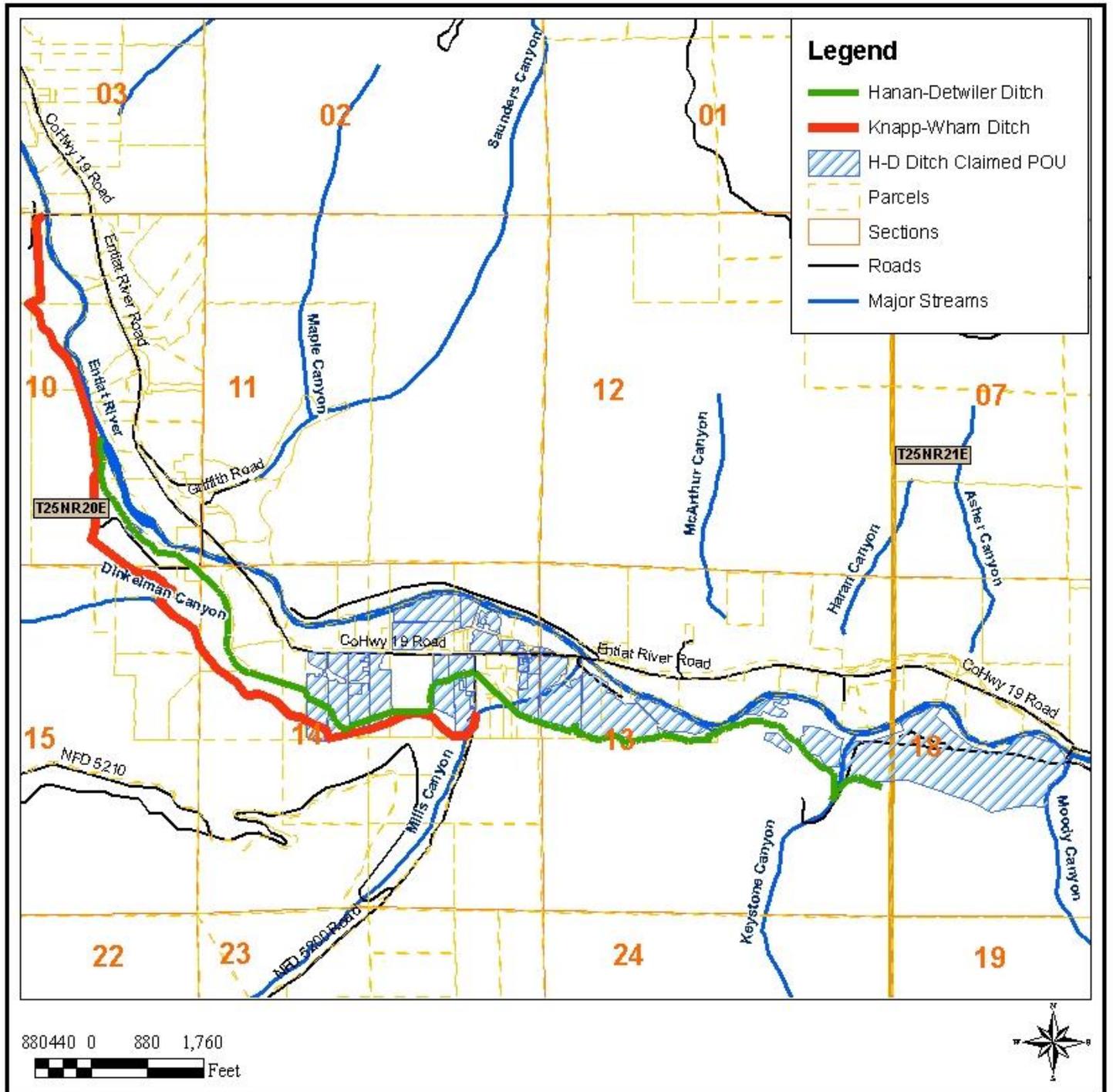


Figure 1. H-D Ditch and K-W Ditch Locations and H-D Ditch Claimed Place of Use

*Existing Point of Diversion -- Hanan-Detwiler Ditch Description*

A rock weir is constructed from the west bank of the Entiat River to convey water flow into a side channel at approximately Entiat River Mile five. The H-D Ditch POD headworks are immediately downstream of a wooden bifurcation structure that splits side channel flows between the bypass side channel and the H-D Ditch. The approximately 1,700-foot long bypass side channel functions to dampen canal flow and provide fish habitat. A rotary drum fish screen is installed at the H-D Ditch headworks along with a fish bypass that discharges directly to the bypass side channel (Reclamation 2006).

The H-D Ditch is approximately three miles long, running in a southeasterly direction for the first mile and turning eastward for the remaining length. The H-D Ditch is predominately an open, unlined earthen ditch; several short piped sections exist where the ditch crosses roads and traverses residential parcels. There are sixteen users that have historically used water from the H-D Ditch, listed in the “Hanan–Detwiler Ditch Users” section of this report. The H-D Ditch crosses multiple parcels owned by both ditch users and non-users, terminating on the Keystone Ranch, owned by Gale and Dale Foreman. Excess water is released into a spillway that crosses the Keystone Ranch (Chelan Co. Parcel No.252118230050) and converges with the Entiat River at approximate river mile 1.5, in the NW¼ of the SE¼ of Section 18, T. 25 N., R. 21 E.W.M.

At a point approximately 1.6 miles down the H-D Ditch on the Summerfield property (Chelan Co. Parcel No. 252014130050), a natural spring named Crystal Spring enters the ditch. Flow monitoring during the 2008 irrigation season indicated that flow into the H-D Ditch varies, ranging from approximately 1.1 cfs in mid-April to 0.5 cfs in July to no flow in October (CCD 2008). Crystal Spring has historically contributed to flows in the H-D Ditch since construction, and the flows are released into the Entiat River along with excess water from the H-D Ditch. Crystal Spring is not claimed as a source of water on Claim No. 069703.

### *Proposed Point of Diversion*

The proposed Keystone POD was not constructed at the time of the site visit. According to a February 2009 Design Report, the proposed Keystone POD “is designed to be a permanent structure that will replace a push-up berm that

currently requires reconstruction and maintenance each year.” The in-stream structure will consist of an engineered rock and wood feature that includes a sluiceway with a gate near the right bank of the Entiat River at the head of the diversion channel. The diversion structure will include a trash rack and gate at the head of the diversion channel, a 36-inch diameter diversion pipe to convey water into a 10-foot by 23-foot settling basin, a fish screen, and a 10-inch diameter fish bypass. The gate downstream of the trash rack will control flow into the diversion channel. A 50-horsepower pump will be installed in the settling basin to convey water into the irrigation system (Design Report 2009).

### *Proposed Points of Withdrawal*

Keystone Well No. 1 is located 1,890 feet East and 2,565 feet South of the NW corner of Section 18, within the SE $\frac{1}{4}$ NW $\frac{1}{4}$  of Section 18, T. 25 N., R. 21 E.W.M. The 8-inch diameter well (Well ID No. AEG 320) was completed to a depth of 45 feet below ground surface (bgs). Well construction was completed on May 25, 2008. A welded casing is installed to a depth of 30 feet bgs with a screen installed from 30 to 40 feet bgs. The pump was installed and connected to a residence and the irrigation system.

Keystone Well No. 2 is located 590 feet East and 1,990 feet South of the NW corner of Section 18, within the SW $\frac{1}{4}$ NW $\frac{1}{4}$  of Section 18, T. 25 N., R. 21 E.W.M. The 8-inch diameter well (Well ID No. AEG 321) was completed to a depth of 52 feet bgs. Well construction was completed on June 23, 2008. A welded casing is installed to a depth of 37 feet bgs with a screen installed from 37 to 47 feet bgs. A 7.5 horsepower Berkeley submersible pump is installed. The meter installed is a SeaMetrics full pipe model WMP-104 magnetic meter.

### **Measuring and Reporting Water Use**

RCW 90.03.360 requires that the owner of any water diversion maintain substantial controlling works and a measuring device. It must be constructed and maintained to permit accurate measurement and practical regulation of the flow of water diverted. The withdrawal of groundwater from the two wells must also be metered or measured. Technical requirements for the measuring and reporting of water use are described in chapter 173-173 WAC. If approved, this decision would contain provisions requiring the measuring and reporting of the quantities of water withdrawn from both wells and the POD.

### **Proposed Use**

Claim No. 069703 asserts a water right used for irrigation purposes. The Notice of Appropriation dated October 19<sup>th</sup>, 1903 states the water is used for “irrigation, stock and domestic purposes, and for mining and milling purposes and for the purpose of creating power.” The site investigation and conversations with applicants indicate that over recent history water has been used for irrigation purposes exclusively. No power generating facilities exist within the place of use, nor do any of the users conduct mining, milling, or stockwatering with the water purveyed by the H-D Ditch. All residences within the place of use withdraw domestic water from wells, rather than the H-D Ditch. No change in purpose of use is proposed in Change Application No. CS4-069703CL@4.

### **Reasonable Use and Efficiency**

The Washington State Supreme Court in *Ecology v. Grimes* has previously ruled on “reasonable” use of water. The question of reasonable use of water is germane to this application as the request is to change from an historic and relatively inefficient irrigation system to a new, far more efficient irrigation system. For example, the amounts of water reasonable for irrigating lands by way of an unlined earthen ditch and flood irrigation are greater than the amounts of water reasonably necessary for irrigating lands by pumping water through an enclosed pipe and then distributing it on the field with a center pivot sprinkler system. The use of water in excess of what is reasonable for the proposed beneficial use would constitute waste, which is prohibited by chapter 90.03.005 RCW.

During the late 19<sup>th</sup> century, lands were first irrigated in the Entiat River basin through the use of gravity-fed irrigation systems. Flood and rill irrigation were the primary methods of on-farm irrigation during this time period. As the availability of electricity spread in the 20<sup>th</sup> century, an increasing number of electric pumps were used to provide irrigation water. Today, the customary form of on-farm irrigation in the Entiat River consists of electric pumps delivering water to a combination of under-tree or over-tree impact sprinklers, or micro-spray undertree sprinklers. During the site visit, the applicants’ were observed using a combination of these types of on-farm irrigation systems. The age of applicants’ irrigation systems varies, depending on how recently new fruit trees were planted and irrigation upgrades occurred. Ecology Water Resources Guidance 1210 lists the range of efficiencies for the irrigation systems used by the applicants. A discussion of on-farm irrigation efficiency is included in *Annual Quantity (Qa)* section of this report.

## Water Quantities

No records of the annual quantity (Qa) or instantaneous quantity (Qi) of water diverted are available for the H-D Ditch POD. Additionally, turnouts from the H-D Ditch have never been metered; therefore, there is limited historical record of the instantaneous or annual quantities of water beneficially used by individual users.

The H-D Ditch is physically incapable of diverting the instantaneous diversion rate of 900 cfs as asserted by Claim No. 069703 and the 1903 Notice of Appropriation of Water. Flow measurements taken at Ardinvoir (USGS Gauge No. 12452800) indicate that flows in the Entiat River at the H-D Ditch POD do not exceed 900 cfs for a portion of the irrigation season.

As part of the change investigation process, a tentative determination of the extent and validity of the entire claim must be conducted to ensure the water right is not enlarged by the proposed change.<sup>2</sup> First, the instantaneous quantity and the annual quantity of water diverted under the entire claim must be established; these are the total water quantities used by all users of the H-D Ditch. Then, the instantaneous and annual quantities for the portion of Claim No. 069703 asserted by Keystone Ranch must be identified; these are the water quantities proposed for change in Change Application No. CS4-069703CL@4 – the subject of this report. Lastly, the remaining quantities of water must be identified that are appurtenant to the parcels owned by the H-D Ditch users that propose changing to a different POD – proposed in Change Application No. CS4-069703CL – and the H-D Ditch users that propose changing to POWs – proposed in Change Application Nos. CS4-069703CL@1 through @5. The findings of change investigations for each application will be the subject of separate reports.

### *Instantaneous Quantity (Qi)*

Several studies were conducted on the H-D Ditch during the design of the project:

- *2003 Entiat River Gain Loss Study*  
Measurements were conducted on September 25-28, 2002, at various locations on the Entiat River and the Mad River, a tributary of the Entiat River. The objective of the study was to determine the surface water contributions and losses to the mainstems of both rivers and to identify reaches where surface water/groundwater interchanges were taking place. A measurement taken at the H-D Ditch POD indicated that 2.51 cfs was diverted; a measurement of the H-D Ditch fish bypass indicated that 0.29 cfs was used for bypass flow. Diversions into the H-D Ditch system were calculated as 2.22 cfs at the time of measurement.
- *2006 Predesign Memorandum*  
In September 2006, the United State Bureau of Reclamation released a Predesign Memorandum for the Knapp-Wham/Hanan-Detwiler Consolidation Project. As part of that memorandum, the total amount of water turned out from the H-D Ditch system was calculated at 3.36 cfs, based on acreage and use. It is not clear in the memorandum whether this calculation was based on physical gauging or a paper calculation using water duty and irrigated acreage. Two “system measurements” are included in the report; however, the H-D POD diversion rate was not measured.
- *2008 Cascadia Conservation District (CCD) data*  
CCD Field staff conducted several measurements of the H-D Ditch throughout the 2008 irrigation season to estimate ditch losses due to in-ground seepage. During the five measurements all turnouts from the H-D Ditch were stopped. Ditch flow at H-D Ditch fish screen was recorded during each measurement; flows varied throughout the season between a low of 1.41 cfs and a high of 2.09 cfs.

At the time of the 2008 H-D Ditch measurement, several of the H-D Ditch users had modified their irrigation systems and begun diverting water solely from the K-W Ditch. In effect, these users (Conard Petersen, Mark Petersen, Belvin Gollaher, and Michael Hansen) conducted unauthorized, or *de facto*, changes from the H-D Ditch POD to the K-W Ditch POD. The 2008 H-D Ditch measurements may not have indicated the maximum rate of instantaneous diversion because these four users were irrigating their combined 26.7 acres of orchard with water diverted at the K-W Ditch POD. Irrigation is defined in statute as a beneficial use of water (RCW 90.54.020(1)).

Ecology Water Resources Program Policy No. 1120 states that in situations where *de facto* water right changes have occurred Ecology considers whether the unauthorized use of water is considered a beneficial use of water. The tentative determination of the validity and extent of a water right may find the portion, or entirety, of a right put to unauthorized use eligible for change if the water has been put to beneficial use, and other statutory requirements have been fulfilled.

The H-D Ditch flow data listed above does not adequately represent the total maximum instantaneous rate of diversion of the H-D Ditch; flow data was not continuously collected over multiple irrigation seasons and several users have conducted *de facto* changes in POD. Thus, the measurements of the instantaneous rate of

<sup>2</sup>RCW 90.03.380; Okanogan Wilderness v. Town of Twisp, 133 Wn.2d 769, 947 P.2d 732 (1997); R.D. Merrill Co. v. Pollution Bd., 137 Wn.2d 118, 969 P.2d 459 (1999).

diversion of the H-D Ditch POD are likely lower than the historically established instantaneous rate of diversion.

Based on historical data listed above and an evaluation of customary irrigation practices in the Entiat River valley<sup>3</sup>, a reasonable maximum Qi at the H-D POD is 4.1 cfs; this is an estimate of the maximum instantaneous diversion of water during peak irrigation season based on the total irrigated acreage and crop type irrigated by the users of the H-D Ditch. The 4.1 cfs Qi corresponds to an instantaneous water duty of 10 gallons per minute per acre.

For this investigation, it is necessary to quantify the Qi each user has historically put to beneficial use, to ensure the future use will not exceed the historical use. Proportionally dividing the maximum Qi based on the two user groups, based on irrigated acreage, results in use of 1.49 cfs by the eleven users proposing to change to the K-W POD and 2.61 cfs by the proposed POW users. Each asserted portion of the claim consists of annual and instantaneous quantities.

The proposal by Gale and Dale Foreman to change to two POWs and a POD asserts an interest in a portion of Claim No. 069703 consisting of 700 gpm (1.56 cfs), an unspecified annual quantity, as proposed in Change Application No. 069703CL@4. Accordingly, 700 gpm for the irrigation of 84 acres equates to an instantaneous water duty of approximately 8.3 gallons per minute per acre.

#### Annual Quantity (Qa)

Part of this investigation includes quantifying the historical annual beneficial use of the water right proposed for change. In the absence of water meter records, an investigator may use aerial photographs, irrigation system capacity, and crop irrigation requirements (CIRs) to make a tentative determination of beneficial use of the water right, based on types of activities for which the water was used and limited by reasonable use of water.<sup>4</sup> Amid a dearth of reliable water pumping data, CIR data from chapter 173-546 WAC is often used to make a tentative determination of the annual quantity of water used. The per-acre CIR for fruit trees in the Entiat region is 37.27 acre-inches per year, or 3.11 ac-ft/yr; the CIR for turf grass is 31.68 acre-inches per year, or 2.64 ac-ft/yr.

All sixteen historic H-D Ditch users irrigate a total of approximately 180.8 acres of orchard and 13.8 acres of turf, a total of 194.6 acres of irrigation. Solid-set undertree and overtree sprinklers predominantly are used to irrigate the parcels. A 65-percent application efficiency rate is reasonable based on the age and condition of this type of irrigation system, and this rate is included in the calculation of the total irrigation requirement (TIR). The TIR for the orchard is calculated by dividing the CIR by the 65-percent application efficiency of the irrigation systems. The TIR for the H-D Ditch orchards calculates to be 4.78 acre-feet per acre, or 864.2 ac-ft/yr for 180.8 acres of orchard. The TIR for the turf calculates to be 4.06 acre-feet per acre, or 56.0 ac-ft/yr for 13.8 acres of turf. The total TIR for the sixteen H-D Ditch users sums to be 920.4 ac-ft/yr (acreage and Qa quantities are rounded up to one decimal place to represent a practically measureable quantity).

The following tables show the historical beneficial use of water among the H-D users; Table 2 shows the eleven users that propose changing to the K-W POD (the subject of the investigation for Change Application No. CS4-069703CL) and Table 3 shows the five users that propose changing to separate POWs, including Keystone Ranch, and a total of all irrigation under Claim No. 069703.

<i>H-D User</i>	<i>Crop</i>	<i>Acres</i>	<i>Qa (ac-ft/yr)</i>	<i>Qi (cfs)</i>
Banks	Turf	0.5	2.0	*
Conard Petersen	Orchard	4.8	22.9	*
Dauer	Turf	0.7	2.8	*
Gollaher Family	Orchard	7.2	34.4	*
Hansen	Orchard	7.6	36.3	*
Harris	Orchard	3.0	14.3	*
Harrison	Orchard	15.9	76.0	*
	Turf	2.3	9.3	*
Martin Petersen	Orchard	7.9	37.8	*
Mullek	Turf	1.8	7.3	*
Peter	Turf	1.2	4.9	*
Summerfield	Orchard	7.5	35.9	*
	Turf	6.6	26.8	*
	<b>Sum</b>	<b>67.0</b>	<b>310.8</b>	<b>1.49 cfs<sup>5</sup></b>

<sup>3</sup> Described in the Reasonable Use and Efficiency section of this report.

<sup>4</sup> Ecology Water Resource Program Policies 1210, 1120, and 1200; see Ecology v. Grimes, 121 Wn.2d 459, 852 P.2d 1044 (1993)

<sup>5</sup> Table 2 – The eleven H-D Ditch users propose a combined diversion at the K-W Ditch POD. If approved, Ecology would likely regulate the instantaneous rate of diversion for all eleven users at the K-W Ditch POD, rather than each user's turnout from the K-W Ditch.

<b>Table 3 H-D POD to POW Changes</b>				
<b>H-D User</b>	<b>Crop</b>	<b>Acres</b>	<b>Qa (ac-ft/yr)</b>	<b>Qi<sup>6</sup> (gpm)</b>
Michael Grubbs	Orchard	13.6	65.0	133
Keystone Ranch <sup>7</sup>	Orchard	84	401.5	700
Small Bros Orchards, Inc.	Orchard	23.0	109.9	216
William Small	Orchard	6.3	30.1	63
Tyler	Turf	0.7	2.8	7
<b>Sum</b>		<b>127.6</b>	<b>609.4</b>	<b>1156.4 gpm</b>
<b>Table 1 &amp; 2 Sum<sup>8</sup></b>		<b>194.6</b>	<b>920.3</b>	<b>4.07 cfs</b>

Using the CIR and irrigation efficiency parameters described above, and based on estimates of the historic beneficial use of water on 84 acres of orchard, a reasonable TIR is 401.5 ac-ft/yr for the Keystone Ranch property.

#### *Development Scheduling*

The proposed POD has been constructed. The proposed POWs have been drilled. As of April 1, 2014 both well #1 and well #2 have been connected to the Keystone Ranch irrigation system. The H-D Ditch has not been operated from the 2010 irrigation season onward. The development schedule listed on the first page of this report accommodates the planned construction schedule.

#### **Other Rights Appurtenant to the Place of Use**

*WRC069698– Keystone Fruit Company, Inc.*

On June 30, 1974, Ecology assigned the above control number to a claim submitted by Keystone Fruit Company asserting a groundwater right to 10 gpm, no stated annual quantity, for continuous domestic use and lawn irrigation for one home. The claimed date of first putting water to use is 1910. This claim is likely associated with a residence on the Keystone Ranch.

*WRC069699 – Keystone Fruit Company, Inc.*

On June 30, 1974, Ecology assigned the above control number to a claim submitted by Keystone Fruit Company asserting a groundwater right for 15 gpm, no stated annual quantity, for continuous domestic stock and irrigation of 1 acre. The date of first putting water to use is 1940. The location of the POW is within SW¼NW¼ of Section 18, T. 25 N., R. 21 E.W.M. This claim may cover groundwater withdrawals for the residences on the Keystone Ranch.

*WRC069700 – Keystone Fruit Company Inc.*

On June 30, 1974, Ecology assigned the above control number to a claim submitted by Keystone Fruit Company asserting a groundwater right to 10 gpm, no stated afy, for continuous domestic use and lawn irrigation for one home. The claimed date of first putting water to use is 1907. This claim likely is associated with the residence on the Keystone Ranch.

*WRC069701 – Keystone Fruit Company Inc.*

On June 30, 1974, Ecology assigned the above control number to a claim submitted by Keystone Fruit Company asserting a groundwater right to 300 gpm, 120 afy, for the irrigation of 30 acres and stock watering April through October. The claim states that 300 gpm, 76 afy, and 19 acres were currently irrigated at the time of filing. The claimed date of first putting water to use is 1956. It appears that the right asserted under Claim No. 09700 may not be valid, since the date of first use is later than the enactment of the 1917 Water Code. Authorization through the state permit application process is required for all new appropriations of surface water after the enactment of the Water Code.

*WRC069702 – Keystone Fruit Company, Inc.*

On June 30, 1974, Ecology assigned the above control number to a claim submitted by Keystone Fruit Company asserting a surface water right to 2 cfs, no stated annual quantity, for irrigation of 10 acres, domestic, stock watering, and a labor camp, continuously from springs and natural drainages in the Hanan – Keystone Canyon. A water right based on the riparian doctrine based on a Notice of Appropriation of Water dated October 19, 1903 that references the “Hanan Ditch” that has been used since 1890. This claim may be duplicative of the Keystone Ranch’s portion of Claim No. 069703, the subject of this investigation.

<sup>6</sup> Table 3 - The specific instantaneous withdrawal rates (Qi) proposed in Change Application No. CS4-069703CL@1 through @5 are used when they do not exceed the historic average water duty of 10 gallons per minute per acre. If approved, the change authorizations for POWs would likely be in gallons per minute, following the convention for groundwater withdrawals.

<sup>7</sup> Change Application No. CS4-069703CL@4 was amended to propose a change to two POWs and a POD.

<sup>8</sup> Table 3 - Acreage and Qa quantities are rounded up to one decimal place to represent a measureable quantity.

## Hydrologic/Hydrogeologic Evaluation

The following are excerpts from a technical memorandum titled “*Hydrogeologic Technical Analysis for Water Right Change Application Nos. CS4-069703CL@1, CS4-069703CL@2, CS4-069703CL@3, CS4-069703CL@4, and CS4-069703CL@5, Chelan County, Washington*” written by Kurt Walker and reviewed by Thomas Mackie. The full technical memorandum is available at Ecology’s Central Regional Office in Yakima:

### *Site Geology near the Subject Wells*

The site specific geology description is based on geologic mapping (Tabor et al., 2007), well logs, topographic maps, air photos, and site observations. The metamorphic Chelan Mountain terrane and the granitic Entiat pluton form the bedrock floor in the Entiat River Valley from roughly river mile 7 to the confluence with the Columbia River. The subject area (river miles 2-5) is located along the right bank (looking downstream) of the Entiat River. With the exception of the Betty Tyler well, the subject wells are drilled to bedrock then completed into the unconsolidated fluvial valley fill sediments. The project well logs record that boulders, cobbles, gravel, and sand were encountered with the sands and gravels comprising the majority of the material. The thickness of the unconsolidated valley sediments varies with the topography of the underlying bedrock, but is generally less than 80 feet. The Betty Tyler well was drilled to 47 feet below ground surface (bgs) without encountering bedrock, however the other project wells contacted bedrock between 38 and 79 feet bgs.

### **Well Location and Summary:**

Didricksen (2008), well logs, and other application documents were used to summarize the well and pump characteristics (see Table 2.). The project wells were drilled and tested between May and August of 2008. Each of the wells were drilled to bedrock (except the Betty Tyler well), constructed with an 8-inch casing, and completed into the valley fill aquifer. Ten-foot long 80-slot stainless steel screens were placed near the bottom of the wells after which they were developed and tested using a step draw-down method. Well performance information, provided by the applicant, was used to better understand the aquifer characteristics and select the most appropriate pump for each location. While the Keystone 1 well does not currently have a pump installed and the Betty Tyler well has a 1 horsepower (hp) submersible pump, the remaining wells are outfitted with 7.5 hp submersible pumps capable of delivering approximately 100 gpm at 200 feet of head.

### *Keystone Wells*

Five wells were originally planned for the Keystone Ranch. Only two wells were drilled because bedrock was encountered at a shallower depth than expected and the percentage of fine grained sediment limited the pumping capacity. It was decided to keep the two drilled wells, but continue to use surface water for most of Keystone’s irrigation. The Keystone 2 well has 7.5 hp pump installed and is designed to produce up to 115 gpm while the Keystone 1 well does not currently have a pump in place. While Keystone Ranch will continue to use surface water, the combined total rates of diversion and withdrawal shall not exceed 700 gpm. Likewise the combined total annual quantities shall not exceed the authorized amount of 401.5 acre-feet per year.

### **Potential for Impairment of Ground Water Users:**

An evaluation of well logs, aerial photographs, and personal communications were used to identify wells near the project wells which may experience composite drawdown as a result of this change. The Keystone 1 and 2, Small Brothers 1 and 2, and Betty Tyler well are located much closer to the Entiat River than any identified non-project wells. Proximity of these project wells to the River, aquifer characteristics, and hydraulic communication between the valley fill aquifer and the Entiat River will likely limit potential interference with other wells in the area. Because the project wells are located so close to the Entiat River, their pumping drawdown cone is expected to encounter a recharge boundary and stabilize before it extends out to any identified non-project wells. This is not the case for the remaining project wells.

Three domestic wells are located within 300 feet of the William Small well, and the Michael Grubbs well is located approximately 280 feet from a different domestic well. Property owners Joseph Peter, Peter Dauer, and Tanya Banks have domestic wells near the William Small project well. While only the Dauer well has an associated well log which confirms that it is completed in the subject aquifer, the Peter and Banks wells are assumed to be completed into the subject aquifer and not into bedrock for evaluation purposes. Using GPS coordinates, air photos, and personal communication, the domestic wells are approximately 315 feet (Peter), 190 feet (Dauer), and 130 feet (Banks) away from the William Small well. Property owner Daniel Benefield uses a well that is located within the Small Bros. Orchard property and is approximately 280 feet away from the Michael Grubbs well. Since there is no log for the Benefield well, it will likewise be assumed to be completed into the subject aquifer for evaluation purposes.

An evaluation using the Theis non-equilibrium equation coupled with image well theory and estimated aquifer parameters discussed above was performed to assess possible pumping interference at the nearby

domestic wells as a result of the change. The evaluation was based on scenario in which the project well was pumped at the maximum Qi for 60 days. After 60 days of pumping, the drawdown cone is expected to have reached the River and stabilized. Results indicate (see Table 3) that pumping at the maximum authorized Qi is unlikely to draw down the water table more than 3 feet at the Benefield well site, and is expected to induce less drawdown at the other well locations. Because pumping at the maximum Qi would exhaust the Qa in approximately 110 days, pumping at the maximum Qi is expected to be used only periodically to meet peak crop demand. As a result, composite drawdown/well interference, which may be observed, is not expected to be significant. Therefore, withdrawals from the proposed wells are not anticipated to result in the impairment of any ground water users (see Appendix A.)

**Table 3<sup>9</sup>**  
**Potential for Impact to Domestic Wells**

Domestic Well Name	Nearest Project Well	Distance to Project Well (ft)	Estimated Drawdown (ft)
Peter	William Small <sup>1</sup>	315	1.5
Dauer		190	1.6
Banks		130	2.2
Benefield	Michael Grubbs <sup>2</sup>	280	2.9

<sup>1</sup> Evaluation based on pumping 61 gpm for 60 days.

<sup>2</sup> Evaluation based on pumping 133 gpm for 60 days.

**Same Source Consideration:**

To change from a point of diversion to a point of withdrawal, the well must be in direct hydraulic continuity with the original surface water source. This requirement ensures that the POW can be managed in the same manner as the POD. An analytical model was used to evaluate the hydraulic relationship between the original source of water and the proposed well.

The Well Pumping Depletion Model (WPDM) (Western Water Consulting, 2001) was used to estimate the amount and timing of pumping-induced stream flow depletion from the proposed wells. The rate and timing of stream depletion are dependent on the properties of the subject aquifer and the distance between the pumping well and the stream. In general, the greater the distance between the pumping well and the stream, the greater the time period is between pumping and stream flow impact. The aquifer characteristics and well properties described above were used to define the WPDM parameters.

The maximum pumping rate and a transmissivity of 10,000 gpd/ft was used to assess the rate and timing of stream depletion of the Entiat River for each of the change applications. The model results are listed below in Table 4. After pumping ceases, stream depletion is expected to decrease by more than 50% within one day near many of the project wells. Stream depletion is predicted to dissipate more slowly in the vicinity of the Grubbs and William Small wells because they are located further away from the Entiat River. While post-pumping effects will continue to impact the River, residual stream depletion is expected to dissipate well before the next irrigation season. As a result, the proposed wells are considered to be in direct hydraulic continuity with the Entiat River, and the proposed wells can be effectively managed in the same manner as the historic POD.

**Table 4**  
**Stream Depletion Model Results**

Name	Distance to the Entiat R. (ft)	Pumping Rate (gpm)	Days to 50% *Reduction in Stream Depletion
Small Brothers 1	35	216	<1
Small Brothers 2	20	216	<1
Betty Tyler	145	6	3
Michael Grubbs	420	133	10
Keystone 1	35	30	<1
Keystone 2	50	115	<1
William Small	500	61	12

\*Reduction in Stream Depletion = pumping rate - amount of continued stream depletion. Results based on Schroeder (1987) with a transmissivity of 10,000 gpd/ft.

As shown in Table 4, the groundwater to be withdrawn from the Keystone Ranch wells is closely associated with the Entiat river.

**Impairment Considerations**

RCW 90.03.380 provides that a perfected water right may be changed in several ways, provided that the change will not impair the right of another water right holder. When investigating a change in POD to a POW location,

<sup>9</sup> Table 1 and 2 are included in the full text of the technical memorandum.

the potential for impairment of surface water and groundwater users in the nearby area must be considered including the potential of impairment of instream flow rights.

Impairment may result from an action that:

- adversely impacts the physical availability of water for a beneficial use that is entitled to protection, including earlier filed applications, or
- prevents the beneficial use of the water to which a water right holder is entitled, or
- adversely affects the flow of a surface water course at a time when the flows are at or below instream flows levels established by rule, or
- degrades the quality of a groundwater source such that an existing user of that source is prevented from the beneficial use of water.<sup>10</sup>

#### *Instream Flow*

The term “instream flow” is used to identify a specific stream flow (typically measured in cubic feet per second, or cfs) at a specific location for a defined time, and typically following seasonal variations. Instream flows are usually defined as the stream flows needed to protect and preserve instream resources and values, such as fish, wildlife and recreation. Instream flows are most often described and established in a formal legal document, typically an adopted state rule.

Once established, a minimum flow constitutes an appropriation with a priority date as of the effective date of the rule establishing the minimum flow (RCW 90.03.345). Thus, a minimum flow set by rule is an existing right which may not be impaired (RCW 90.03.345; RCW 90.44.030).

Adopted on September 3, 2005, chapter 173-546 WAC established a minimum instream flow for the three stream management units in the Entiat River Basin WRIA 46. Both the historic H-D Ditch POD and proposed POWs are located within the Lower Entiat stream management unit that extends from the confluence of the Entiat and Columbia Rivers to Entiat river mile 16.2. The October 19, 1903 claimed date of first water use of Claim No. 069703 predates the September 3, 2005 priority date of the minimum instream flow; therefore, the diversion asserted under the claim is not subject to curtailment when minimum instream flow levels are not met.

#### *Existing Water Rights*

There is no history of curtailment of water rights due to unavailability of water in the Entiat Basin. As stated in the hydrogeologic technical memorandum, it is anticipated that no impairment to any groundwater users will result from the operation of the Keystone Ranch wells.

Any diversion asserted under Claim No. 069703 is subject to curtailment based on the priority system, whereby senior rights must be satisfied before a junior right may divert water. In order to preserve the integrity of the priority system if the change in POD to a POW is approved, water use at the POW must be managed in the same manner as the originally claimed POD. If a situation occurs in which the priority system mandates that the diversions under Claim No. 069703 must be curtailed, the asserted withdrawal under the portion of Claim No. 069703 at the newly authorized POW must be curtailed until all senior water rights are fulfilled.

#### **Public Interest Considerations**

The addition of a point of withdrawal or a point of diversion to a water right must not have a detrimental effect upon the public interest. A public interest investigation includes analyzing harm to fish and wildlife, effects on endangered or threatened species, impacts to wetlands, recreation, water quality, and any other concerns expressed by commenting and protesting parties.

In general, removing PODs and instream structures from a river has a positive impact on aquatic habitat. Diversions and instream pumps require frequent servicing that involves entering the river to repair structures, remove silt and debris from screens, and maintain pushup dams. Replacing a POD with a POW alleviates the need for repeated construction in the river and the associated disturbances from increased silt loading and streambank modifications.

#### *Fisheries and Habitat Impacts*

In a letter to Ecology dated March 4, 2008, Washington Department of Fish and Wildlife (WDFW) Instream Flow Biologist Paul La Riviere describes the impacts and benefits of the proposed change in POD and addition of POWs:

“The project will consolidate two major irrigation systems in the lower Entiat River. Despite an upstream POD move (0.8 miles) the loss of flow in the mainstem will be offset by an increase in flow in the 1,200-ft side channel, non-consumptive (NCU) water savings in the primary reach (estimate is between two and six cfs for 3.26 miles), and additional instream habitat structures (rock weirs, LWD placed along the mainstem and in the side channel) that will improve some habitat and the hydro-geologic conditions of the stream” (Page 2).

<sup>10</sup> See Water Resource Program Policy 1200 (POL-1200) and Chapter 173-150 WAC

“The WDFW Water Team supports the funding of the POD consolidation project provided that the [maintenance of] the side channel habitat features is a long-term priority for the cooperating landowner and project managers. We feel this is essential. [...] Flow restoration and maintenance, especially during the winter period, may be the most productive outcome for fish life of the project. The restoration of floodplain functions by operating and maintaining the H-D side channel as a natural habitat helps to address major deficiencies that were consequences of the 1948 and 1970 stream re-alignment activities” (Page 4).

WDFW identified an additional benefit of the project as the elimination of annual instream POD maintenance and the associated habitat disturbance, resulting in a likely reduction in juvenile fish mortality, redd disturbance, and sediment impacts. WDFW did not identify any adverse impacts to fish rearing or recreational activities associated with the proposed change in POD.

## CONCLUSIONS

Based on careful consideration of the information presented in this report, the author makes the following conclusions regarding the proposed changes in Change Application No. CS4-069703CL@4:

- The portion of Claim No. 069703 that has been put to beneficial use by the applicant and is available for change is 700 gallons per minute (1.56 cubic feet per second), 401.5 acre-feet per year, for the irrigation of approximately 84 acres from April 1 through October 31.
- The subject claim will not be enlarged by approving a change in point of diversion. The quantity of water diverted at the authorized POWs and POD is limited to the quantity of water historically put to beneficial use, as listed on the cover page of this report.
- The two proposed POWs withdraw water from the same source of water as the originally claimed POD.
- The proposed POD diverts water from the same source of water as the originally claimed POD.
- The proposed changes will not impair existing water rights.

## RECOMMENDATIONS

Based on the above investigation and conclusions, I recommend that the request for change to point of diversion and point of withdrawal be approved in the amounts and within the limitations listed below and subject to the provisions beginning on Page 2, et seq.

### Purpose of Use and Authorized Quantities

I recommend that 700 gallons per minute (1.56 cubic feet per second), 401.5 acre-feet per year, for the irrigation of approximately 84 acres April 1 through October 31 are available for change to two points of withdrawal and a point of diversion. 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.

### Point of Diversion

Entiat River Point of Diversion – 2,175 feet West and 2,160 feet North of the SE corner of Section 18, within the NW $\frac{1}{4}$ , SE $\frac{1}{4}$ , Section 18, T. 25 N., R. 21 E.W.M.

### Points of Withdrawal

Keystone Well No. 1 – 1,890 feet East and 2,565 feet South of the NW corner of Section 18, T. 25 N., R. 21 E.W.M., Ecology well tag No. AEG-320.

Keystone Well No. 2 – 590 feet East and 1,990 feet South of the NW corner of Section 18, T. 25 N., R. 21 E.W.M., Ecology well tag No. AEG-321.

### Place of Use

84 acres lying within the SW $\frac{1}{4}$ NE $\frac{1}{4}$ , SE $\frac{1}{4}$ NE $\frac{1}{4}$ , E $\frac{1}{2}$ NW $\frac{1}{4}$ SE $\frac{1}{4}$ , NE $\frac{1}{4}$ SE $\frac{1}{4}$  of Section 13, T. 25 N., R. 20 E.W.M., all lying South of the Entiat River; and S $\frac{1}{2}$ SW $\frac{1}{4}$ NW $\frac{1}{4}$ , NW $\frac{1}{4}$ SW $\frac{1}{4}$ , S $\frac{1}{2}$ SE $\frac{1}{4}$ NW $\frac{1}{4}$ , NE $\frac{1}{4}$ SW $\frac{1}{4}$  of Section 18, T. 25 N., R. 21 E.W.M., all lying South of the Entiat River.

Chelan County Assessor Parcel No. 252118230050.

Report by: \_\_\_\_\_

Dave Holland  
Water Resources Program

\_\_\_\_\_

Date

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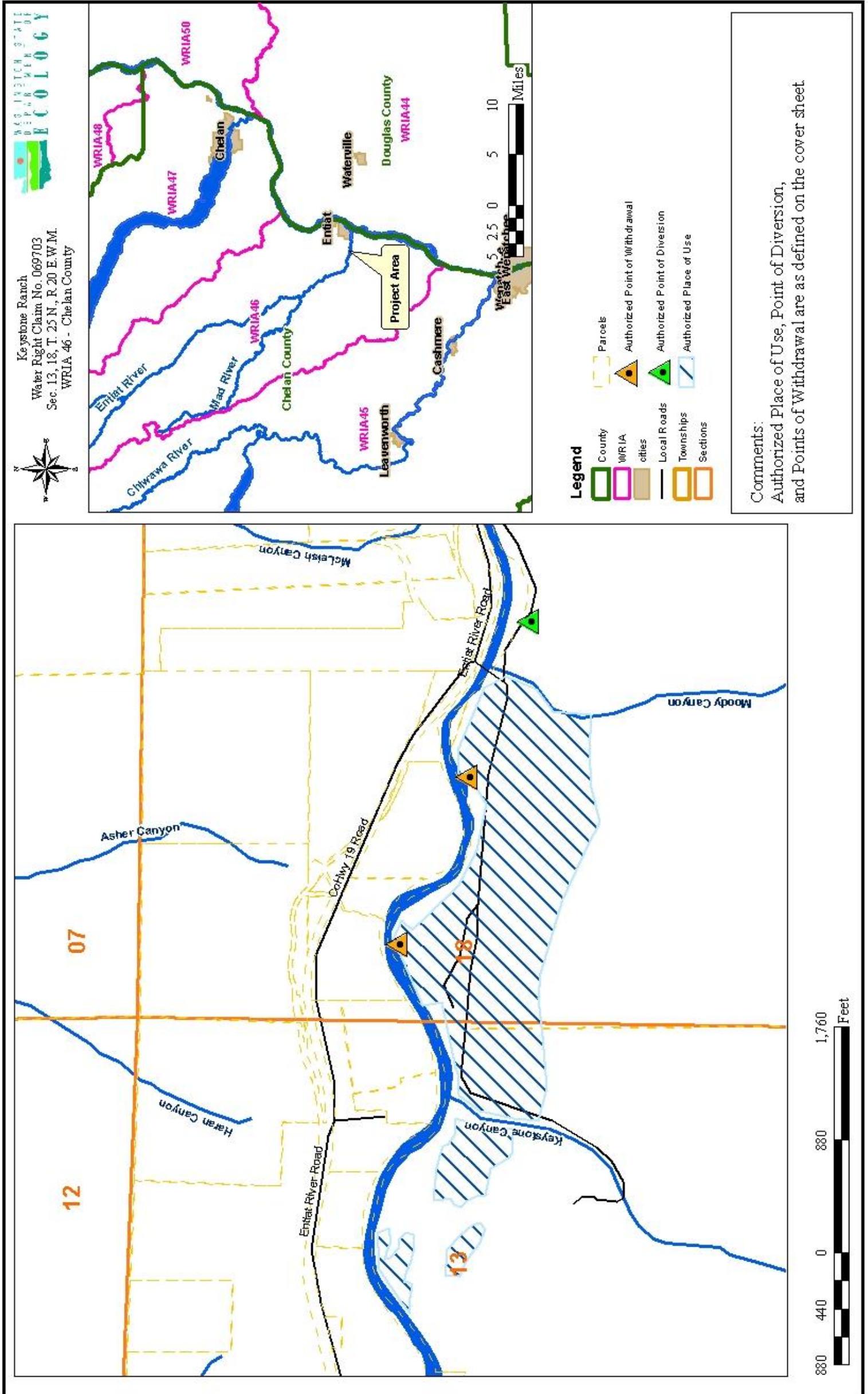
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Comments:  
 Authorized Place of Use, Point of Diversion,  
 and Points of Withdrawal are as defined on the cover sheet.