



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

### Add Point of Withdrawal

<b>PRIORITY DATE</b> 1910	<b>CLAIM NUMBER</b> S4-120405CL	<b>CHANGE APPLICATION NUMBER</b> CS4-120405CL
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<b>MAILING ADDRESS</b> Robert Harper P.O. Box 24 Entiat, WA 98801-0024	<b>SITE ADDRESS (IF DIFFERENT)</b> 6565 Entiat River Road Entiat, WA 98822
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Total Quantity Authorized for Withdrawal or Diversion		
WITHDRAWAL OR DIVERSION RATE	UNITS	ANNUAL QUANTITY (AF/YR)
10	gpm	2

Purpose						
PURPOSE	WITHDRAWAL OR DIVERSION RATE			ANNUAL QUANTITY (AF/YR)		PERIOD OF USE (mm/dd)
	ADDITIVE	NON-ADDITIVE	UNITS	ADDITIVE	NON-ADDITIVE	
Irrigation	10		gpm	2		Apr 1 – Oct 15

### REMARKS

The application is to add a point of withdrawal to the current surface water source of the Entiat River (Gaines Ditch). The current point of diversion is located approximately 3,400 feet upstream of the proposed point of withdrawal. The added source well (Irrigation Well BCA877) has been drilled within the place of use.

IRRIGATED ACRES		PUBLIC WATER SYSTEM INFORMATION	
ADDITIVE	NON-ADDITIVE	WATER SYSTEM ID	CONNECTIONS
0.5			

Source Location			
COUNTY	WATERBODY	TRIBUTARY TO	WATER RESOURCE INVENTORY AREA
Chelan	Entiat River	Columbia River	Entiat WRIA 46

SOURCE FACILITY/DEVICE	PARCEL	WELL TAG	TWN	RNG	SEC	QQ Q	LATITUDE	LONGITUDE
Irrigation Well	252003420400	BCA877	25	20E	03	NE SW	47.68970°	120.31588°
Diversion Ditch	252003230150	--	25	20E	03	NW NW	47.69843°	120.32058°

Datum: WGS84

**Place of Use (See Attached Map)**

**PARCELS**

252003420400

**LEGAL DESCRIPTION OF AUTHORIZED PLACE OF USE**

All that certain lot, piece of parcel of land situated, lying and being in the county of Chelan, State of Washington, described as follows: Part of the south half of Section 3, Township 25 North, Range 20 E.W.M., Chelan County, Washington, according to the Dependent Resurvey thereof accepted June 3, 1940, described as follows: Commence at the southeast corner of the southwest quarter of the southeast quarter of said Section 3 and run thence north on the east line of said subdivision for 726 feet; thence turn 90 degrees left and run west to the centerline of the county road as the same was located and is in use as of December 11, 1920; thence northerly along the centerline of said road for 320 feet; thence run due west to an intersection with the north and south centerline of said section and the true point of beginning; thence continue on the same course to the middle of the Entiat River; thence northerly along the center of the Entiat River as the same was located in 1920 to a point of intersection with a line drawn 53½ rods south of and parallel with the east and west centerline of said Section 3; thence east along the said line to its intersection with the centerline of the county road as the same was located and used in 1920; thence southerly along the center of said road to the intersection with a line drawn parallel with and 22.5 feet south of the north line of the southwest quarter of the southeast quarter of said Section 3; thence west on said line to its intersection with the north and south center line of said Section 3; thence south along said line to the true point of beginning, subject to the right of way for said county road, and excepting also the additional right of way granted Chelan County for road and fully described in deed recorded in Book 525 at page 365 (Document No. 489321), Chelan County Records.

**Proposed Works**

The added Irrigation Well (Unique Well ID BCA877) was drilled in April 2012 with 6-inch-diameter casing to 38 feet and completed with an open bottom. The existing irrigation system for the property consists of 2-inch-diameter underground pipes connected to above-ground spigots. Irrigation of the turf/pasture and garden areas is done manually. A flow meter is installed at the well.

**Development Schedule**

BEGIN PROJECT	COMPLETE PROJECT	PUT WATER TO FULL USE
Begun	Completed	October 15, 2015

**Measurement of Water Use**

How often must water use be measured?	Monthly
How often must water use data be reported to Ecology?	Annually
What volume should be reported?	Total Annual Volume
What rate should be reported?	Annual Peak Rate of Withdrawal (gpm or cfs)

**Provisions**

**Measurements, Monitoring, Metering and Reporting**

An approved measuring device must be installed and maintained for both the well and surface water sources identified by this water right in accordance with the rule "Requirements for Measuring and Reporting Water Use", WAC 173-173, which 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.

Recorded water use data shall be submitted via the Internet. To set up an Internet reporting account, contact the Central Regional Office. If you do not have Internet access, you can still submit hard copies by contacting the Central Regional Office for forms to submit your water use data.

### **Water Use Efficiency**

Use of water under this authorization will 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.

### **Non-Additive to Confirmed Claims**

The tentative determination made by Ecology for this requested change is not an adjudication of the claim. Water use under this authorization will be considered non-additive to any water rights confirmed for this claim as a result of a general adjudication through Superior Court, should adjudication be undertaken.

### **Proof of Appropriation**

The water right holder must file the notice of Proof of Appropriation of water (under which the certificate of water right is issued) 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 will reflect the extent of the project perfected within the limitations of the superseding permit. Elements of a proof inspection may include, as appropriate, the source(s), system instantaneous capacity, beneficial use(s), annual quantity, place of use, and satisfaction of provisions.

### **Schedule and Inspections**

Department of Ecology personnel, upon presentation of proper credentials, will 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.

### **Real Estate Excise Tax**

This decision may indicate a Real Estate Excise Tax liability for the seller of water rights. The Department of Revenue has requested notification of potentially taxable water right related actions, and therefore will be given notice of this decision, including document copies. Please contact the state Department of Revenue to obtain specific requirements for your project.

Department of Revenue  
Real Estate Excise Tax  
PO Box 47477  
Olympia WA 98504-7477

Phone: (360) 570-3265  
Internet: <http://dor.wa.gov/>  
E-mail: [REETSP@DOR.WA.GOV](mailto:REETSP@DOR.WA.GOV)

### **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(s) of use are beneficial; and that there will be no detriment to the public interest.

Therefore, I ORDER approval of Application No. CS4-120405CL 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.

Address and Location Information	
Street Addresses	Mailing Addresses
<b>Department of Ecology</b> Attn: Appeals Processing Desk 300 Desmond Drive SE Lacey, WA 98503	<b>Department of Ecology</b> Attn: Appeals Processing Desk PO Box 47608 Olympia, WA 98504-7608
<b>Pollution Control Hearings Board</b> 111 Israel Road SW STE 301 Tumwater, WA 98501	<b>Pollution Control Hearings Board</b> PO Box 40903 Olympia, WA 98504-0903

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://www.leg.wa.gov/CodeReviser>

Signed at Yakima, Washington, this \_\_\_\_\_ day of \_\_\_\_\_, 2014.

\_\_\_\_\_  
Mark Kemner, LHG, Section Manager  
Water Resources Program/CRO

*If you need this document in an alternate format, please call the Water Resources Program at 509-575-2490. Persons with hearing loss can call 711 for Washington Relay Service. Persons with a speech disability can call 877-833-6341.*

## INVESTIGATOR'S REPORT

### BACKGROUND

On March 6, 2012, Robert Harper submitted an Application for Change/Transfer of Water Right to the Washington State Department of Ecology (Ecology). The application was assigned Change Application No. CS4-120405CL. Harper proposes to add a point of withdrawal (POW) from a new well located within the place of use (POU) and approximated 3,400-feet downstream of the existing point of diversion (POD). Attributes of the existing Claim and the Application for Change are presented below in Table 1.

**Table 1: Attributes of the Existing Water Right Claim and Proposed Change**

Attributes	Existing	Proposed
<b>Name</b>	Leslie C. Julian	Robert Harper
<b>Priority Date</b>	1961 <sup>1</sup>	1910 <sup>1</sup>
<b>Change Application Date</b>	N/A	March 23, 2012
<b>Instantaneous Quantity</b>	10 gpm	10 gpm
<b>Annual Quantity</b>	2 acre feet	2 acre feet
<b>Purpose of Use</b>	Irrigation	Irrigation
<b>Period of Use</b>	April 1 to October 15	April 1 to October 15
<b>Place of Use</b>	NE¼SW¼ and NW¼SE¼ of Section 03, T. 25 N., R. 20 E.W.M. Parcel 252003420400	same
<b>Point of Diversion</b>	Entiat River (Gaines Ditch) NW¼ NW¼ of Section 03, T. 25 N., R. 20 E.W.M.	Entiat River (Gaines Ditch), and Irrigation Well BCA877 NE¼SW¼ of Section 03, T. 25 N., R. 20 E.W.M.
<b>Irrigated Acres</b>	0.5	0.5

Stated in a letter from Trout Unlimited accompanying the Change Application, the POD change is part of a larger effort being conducted by the Cascadia Conservation District to decrease direct diversions from the Entiat River. The biological benefits to this are numerous and important to the long-term management goals for the Entiat River as laid out in the Entiat (WRIA 46) Watershed Plan. The intent is to fully use the groundwater source and only use the surface water source in case of emergency such as well failure.

### Legal Requirements for Proposed Change

The following is a list of requirements that must be met prior to authorizing the proposed Change Application No. CS4-120405CL.

<sup>1</sup> Cascadia Conservation District requested that Ecology consider amending the claim as part of the change process. They assert that the property has historically been irrigated with water diverted into the Gaines Ditch. Therefore, the claim asserts the incorrect priority date, or date of first use.

### *Public Notice*

A public notice of the Change Application must be published in a local newspaper once a week for two consecutive weeks (RCW 90.03.280). The public notice of Change Application CS4-120405CL was published in the Wenatchee World during the weeks of December 27, 2012 and January 3, 2013.

### *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 (cfs), unless that project is for agricultural irrigation, in which case the threshold is increased to 50 cfs, 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 (gpm);
- It is an application that, in combination with other water right applications for the same project, exceeds 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 WAC 197-11-305.

Because this Change Application does not meet any of these conditions, it is categorically exempt from SEPA and a threshold determination is not required.

### *Water Resources Statutes and Case Law*

Based on the provisions of RCW 43.21A.690 and RCW 90.03.265, this Change Application has been processed by Licensed Hydrogeologists with GeoEngineers, Inc. under Ecology Cost-Reimbursement Agreement No. GEO005 (master contract No. C1000187).

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 water right claim can only be determined by a Superior Court in 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.

### *Administrative Status of Surface Water Bodies*

Surface water bodies in the region are subject to administrative regulations governing the right to withdraw water for beneficial use. Minimum instream flow regulations for the Entiat watershed (Water Resource Inventory Area [WRIA] 46) have been adopted in WAC Chapter 173-546. Maximum future water right allocations in the Entiat River basin have been established for May 1 through July 15.

## INVESTIGATION

The examination of the Application for Change of Surface Water Right Claim S4-120405CL submitted by Robert Harper was led by consultants from GeoEngineers, Inc. contracted as part of Ecology's cost reimbursement program to facilitate the processing of the application. Kelsey Collins of the Water Resources Program, Ecology (Central Region), oversaw the examination and provided review.

The investigation included the review of:

- The State Water Code, specifically Title 173 Washington Administrative Code (WAC) and Title 90 Revised Code of Washington (RCW).
- United States Geological Survey (USGS) topographic maps.
- Washington State Department of Ecology, 2012, Washington State Well Log Viewer website, <<http://apps.ecy.wa.gov/welllog/index.asp>> (Accessed November 2012).
- Washington State Department of Ecology, 2012, Water Rights Tracking System (WRTS) website <<http://www.ecy.wa.gov/programs/wr/rights/tracking-apps.html>> (Accessed November 2012).
- Kirk, T., P. Kerr, and H. Riddle, 1995, Draft: Initial Watershed Assessment, Water Resources Inventory Area 46, Entiat River Watershed. Washington Department of Ecology Open File Report 95-02.
- Long, W. A., 1951, Glacial Geology of the Wenatchee-Entiat Area, Washington. Northwest Science 25, 3–16.
- Tabor, R. W., V. A. Frizzell, Jr., J. T. Whetten, R. B. Waitt, D. A. Swanson, G. R. Byerly, D. B. Booth, M. J. Hetherington, and R. E. Zartman, 1987, Geologic Map of the Chelan 30-Minute by 60-Minute Quadrangle, Washington. Map 1-1661. U.S. Geological Survey. Miscellaneous Investigations Series.
- Chelan County Conservation District (CCCD), October 2004, Entiat Water Resources Inventory Area (WRIA) 46 Management Plan.
- Walker, K., 2009, Technical Memorandum: 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. Report by Kurt Walker and reviewed by Thomas Mackie.
- Schroeder, D. R., 1987, Analytical Stream Depletion Model: Ground Water Software Publication No. 1, Office of the State Engineer, Colorado Division of Water Resources.
- Google Earth aerial photographs from 1998, 2005, 2006, 2009 and 2011.
- Photocopies of aerial photographs from 1965, 1988 and 1994 were obtained from the Chelan County Assessor's office in Wenatchee.
- Photocopies of 1945 aerial photographs were provided by Ecology.
- Information submitted by and conversations and/or meetings with the applicant Robert Harper, Kurt Hosman of Cascadia Conservation District and Jason Hatch of Trout Unlimited.
- A site visit on December 6, 2012.

### **History of the Water Use**

The original POD that supplied the Harper orchard was described as being located approximately 2.5 miles upstream of the current POD (Gaines Ditch). As a result of flooding in 1948, the original POD was changed to the current POD located on the Entiat River, based on the petition for change submitted on October 5, 1950 by Frank A. Gollaher, A.J. Mars, Tessie Cruver and S.S. Gaines (see Attachment 1).

The Harper property is located in the Entiat River valley, Water Resource Inventory Area (WRIA) 46. The single parcel (Parcel No. 252003420400) is 2.05 acres (ac), comprised of a homestead and 0.5 ac of turf located at about river-mile (RM) 6.1 (see Attachment 2). The Harper property lies in the valley bottom bounded to the west by the Entiat River and to the east by Entiat River Road.

The Harper property historically was irrigated using surface water from the Gaines Ditch diversion located approximately 2,400 feet upstream of the property. On June 25, 1974, Leslie C. Julian submitted to Ecology a Claim (No. S4-120405) that asserts a surface water right to 10 gpm, 2 acre-feet per year (af/yr), for the irrigation of 0.5 ac from April 1 through October 15. The claimed date of first putting water to use is June 1961. However, based on discussions with Kurt Hosman of Cascadia Conservation District, the usage on the Harper property occurred when the ditch was put into use in 1910. Harper purchased the property from Julian in 2002.

### **Proposed Point of Withdrawal**

The request is to add a new POW to the existing POD. A well log for the Harper Irrigation Well was obtained from Ecology's database. The proposed new POW is a 6-inch-diameter irrigation well drilled in April 2012 to 38 feet and completed with an open bottom. The well was assigned Ecology unique well identification number BCA877, located approximately 1,625 south and 100 feet west of the center of Section 3, T. 26 N., R. 20 E.W.M., approximately 250 feet east of the Entiat River. The existing irrigation system for the property consists of 2-inch-diameter underground pipes connected to above-ground spigots. Irrigation of the turf/pasture and garden areas are done manually. A flow meter is installed at the well. The intent is to use the new POW as the main source and the existing POD is to be used only in the case of emergency, such as well pump failure.

### **Site Visit**

A site visit was conducted by Joel Purdy, Senior Hydrogeologist with GeoEngineers, on December 6, 2012. Kurt Hosman provided a tour of the POU, POW and irrigation system. The locations of the POW and POU were recorded using a GPS mapping system. Photographs were also taken of facilities.

The surface water is obtained from a line off the Gaines Ditch (the POD). The groundwater is pumped from the well through 2-inch-diameter pipe to the existing irrigation water system of buried pipes to above-ground spigots.

Manually placed sprinklers and hoses are used for irrigating the turf/pasture, lawn and garden. A 2-inch totalizing flow meter was observed at the wellhead and it read 0094120 gallons. The irrigation well was not pumping at the time of the visit.

### **Extent and Validity**

Aerial photographs from 1945 to 2011 were obtained from public sources. These aerial photographs were reviewed to assess the irrigated areas after 1967 per RCW 90.14.160. The irrigated area consists of

0.5 ac of turf/pasture areas based on the site visit and measurements using aerial photographs. These areas are irrigated using manually placed sprinklers and hoses.

It appears that the turf/pasture areas have been irrigated continuously after the parcel was developed. It appears on the 1965 photograph that the cleared area may have been smaller; however, the quality and photograph scale is not adequate to discern the irrigated acreage accurately. There was no definitive evidence found to indicate that the irrigation was discontinued for any 5-year period.

The irrigated areas estimated above appear to have been irrigated continuously for the last 5 years and consistently irrigated prior to that based on the review of the available aerial photographs. The irrigated acres on the site were estimated to be 0.5 ac. For the Entiat watershed, the average monthly and seasonal irrigation water usage was estimated for pasture/turf irrigation in WAC 173-546-070 (Table 4-15). The estimates were for an average condition and for 65-percent application efficiency. Use for the irrigation of pasture/turf is 2.64 to 4.06 acre-feet per season per acre, respectively. Accounting for the manual irrigation method, 65-percent is a reasonable estimate of the irrigation system application efficiency. Thus, for the average water use at the Harper property is:

$$0.5 \text{ ac of turf/pasture} \times 4.06 \text{ af/ac} = 2.03 \text{ af}$$

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

Information on water rights in the Entiat River valley was obtained from Ecology's Water Resources Explorer online database. There appears to be no other applications, water rights or claims for the subject POU. There are four surface water rights and five groundwater rights downstream within the Entiat River Valley. There are also 65-groundwater claims and 34-surface water claims downstream of the Harper property.

#### **Hydrologic/Hydrogeologic Evaluation**

The following is a discussion of the hydrogeologic and hydrologic characteristics in the vicinity of the Change Application.

##### *Well Location and Description*

The irrigation well (BCA877) is located about 250 feet from the left bank of the Entiat River and approximately 150 feet east of an existing domestic. The irrigation well was drilled in April 2012 with 6-inch-diameter casing to 38 feet and completed with an open bottom. A static water level of 7 feet below the top of casing is reported on the well log.

##### *Hydrologic Setting*

The Entiat River originates from the eastside of the Cascade Mountains, flows southeast through the valley between the Chelan and Entiat Mountains, and joins the Columbia River about 9.5 river-miles downstream near Entiat, WA. A large portion of the annual precipitation in the basin falls as snow and forms the winter snowpack. Spring temperatures and rain release water accumulated in the snowpack. The snowpack runoff is the dominant source of streamflow and groundwater recharge in the basin. For the USGS stream gage (#12453000) at Entiat (R.M. 0.5) from 1911 through 1925 and 1951 through 1958, the mean annual flow ranged from 275 to 800 cfs, peak annual flow ranged from 1,100 to 10,800 cfs and the 7-day mean low-flow ranged from 45 to 120 cfs (CCCD, 2004). The Entiat River gage was moved to near Keystone (#12452990 at R.M. 1.4) in 1996. Runoff is highly variable within the watershed. Data from the USGS gage near Ardenvoir (#12452800) show that in the water year 1972 the annual streamflow was 451,140 af. The next year the flow was 178,970 af (Kirk et al., 1995).

### *Geologic Setting*

The deeply incised Entiat River Valley is underlain by metamorphic and plutonic bedrock that is overlain by volcanic ash, regolith, and unconsolidated glacial and alluvial sediments. The bedrock was formed before the Tertiary period and consists mainly of gneiss, amphibolite, tonalite, gabbro, schist, marble and quartzite. The hillslopes at both sides of the river are mainly composed of tonalite and tonalite gneiss of the late Cretaceous Entiat Pluton (Tabor et al., 1987).

The unconsolidated sediments within the Entiat River Valley include glacial tills and outwash originating from the Peshastin and Leavenworth Stage glaciers during the last Ice Age (Long, 1951) and younger surficial alluvium. The sediments mainly contain moderately sorted cobbles, sand and gravel (Long, 1951; Tabor et al., 1987). Below Ardenvoir, where the subject area is located, the valley is generally unglaciated and the unconsolidated deposits are generally reworked glacial material and alluvium consisting of moderately sorted cobbles, sand and gravel that overlie the bedrock. The thickness of the unconsolidated deposits is typically between 50 and 100 feet within the unglaciated portion of the Entiat River Valley (Kirk et al., 1995).

### *Hydrogeologic Analysis*

The Entiat River Valley forms a laterally bounded system with groundwater in the alluvial flood plain in direct hydraulic continuity with the Entiat River. The aquifer tapped by the Harper Irrigation Well is comprised of approximately 30-foot thick deposits of unconsolidated alluvium. Water that is pumped from the Harper Irrigation Well is derived in part from the river, and causes drawdown in the aquifer that intercepts a portion of (or reduces) groundwater discharge from the aquifer as baseflow to the river. Consequently, the net effect on river flow of changing to a groundwater source is generally less than if all the water came directly from the river, as is the case with the existing surface water diversion.

Estimates for transmissivity of the unconsolidated deposits in the upper Entiat River valley range from 12,000 to 60,000 gallons per day per foot (gpd/ft) based on analysis of pumping test data (Kirk et al., 1995). A 62-foot-deep well located approximately 1,200 feet upstream of Harper Irrigation Well was pumped at 125 gpm, with 35 feet of drawdown after 4 hours. These pumping test data suggest a high transmissivity at the Harper location as seen in the upper valley.

### *Impairment*

The only pumping test data available for the Harper Irrigation Well is what is provided on the Ecology well log. The test data reported on the well log indicates that the well was air-lifted at 30 gpm for 1 hour. However, aquifer transmissivities are assumed to be high based on pumping tests conducted elsewhere in the valley. An analysis was conducted assuming an aquifer transmissivity of between 12,000 and 60,000 gpd/ft. The interference drawdown at a distance of 150 feet is expected to be less than 1 foot based on image well theory taking into account the positive boundary of the river and the negative boundary of the valley walls. Thus, the use of the Harper Irrigation Well at a rate of 10 gpm will not impair other groundwater or surface water users in the vicinity based on available information.

### *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. Direct hydraulic continuity exists when, as a result of pumping the proposed well, additional water from the original surface water source will flow into and recharge the aquifer where it can eventually be captured as ground water. Additionally, the proposed well must be located and constructed such that within a short time after pumping starts, the majority of the pumped water should be derived from, or replaced by, the surface water source; and within a short

time after pumping stops, the ground water that has been removed from aquifer storage should be replaced by infiltration from the surface water source. This requirement ensures that the POW can be managed in the same manner as the POD. An analytical groundwater flow model that included representation of the river was used to evaluate the hydraulic relationship between the original source of water and the proposed well.

The Integrated Decision Support Alluvial Water Accounting System (IDS AWAS) was used to compute amount and timing of pumping-induced stream flow depletion from operation of the proposed well based on the Analytical Stream Depletion Model (ASDM) (Schroeder, 1987). 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 ASDM parameters. An average pumping rate of 10 gpm and a transmissivity of 30,000 gpd/ft were used to predict the rate and timing of stream depletion of the Entiat River. The model predicts that after one day of continuous pumping, stream depletion accounts for approximately 50 percent of the water drawn from the proposed wells. Similarly, when the pumping ceases, stream depletion is expected to decrease by more than 50 percent within one day. For continuous pumping, the predicted stream depletion reaches 90 percent after 27 days. The relatively long time of stream depletion is because the well is 250 feet away from the Entiat River, and the pumping rate is only 10 gpm. As a result, the proposed well is considered to be in direct hydraulic continuity with the Entiat River, and the well can be effectively managed in the same manner as the historic POD.

#### *Availability*

Precipitation and snowmelt within the drainage basin provide water to maintain streamflow and groundwater levels. The Harper Irrigation Well (BCA877) was successfully air-tested after construction at 30 gpm for 1 hour. Based on its location and shallow depth, the inferred source aquifer is likely in hydraulic continuity with the adjacent Entiat River. Water is therefore physically available to meet the claimed withdrawal of 10 gpm and 2 af/yr at the point of withdrawal to provide a supply for irrigation use by the applicant.

There are no closures on surface water bodies in WRIA 46. Therefore, surface water is legally available for appropriation.

#### *Impairment*

The requested Change Application is for use from a well that is located approximately 150 feet from the nearest neighboring well and will not impair this or other existing users. The intended change from a direct surface water diversion to a groundwater withdrawal will buffer the impacts of water usage to the Entiat River and, thus, will provide a net benefit to maintain instream flows.

#### *Public Interest*

RCW 90.03.290 requires that a proposed appropriation not be detrimental to the public interest. The seasonal withdrawal of up to 10 gpm under this water right Claim for irrigation at the Harper property is consistent with state policy without adversely impacting instream flows or other public needs and values. No detriment to public interest could be identified during the examination of the subject application.

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 maintaining 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.

**Consideration of Protests and Comments**

No protests or comments have been filed.

**CONCLUSIONS**

Approving Change Application No. CS4-120405CL would not impair existing water users.

**RECOMMENDATIONS**

Based on the information presented above, the author recommends that:

Change Application No. CS4-120405CL be approved in the amounts, and subject to the provisions described in the Order for Report of Examination No. CS4-120405CL pages 2-3.

Report by: \_\_\_\_\_  
Joel W. Purdy, LG, LHG Date \_\_\_\_\_

Reviewed by: \_\_\_\_\_  
Kelsey Collins Date \_\_\_\_\_



**Attachment 2: Place of Use, Proposed Point of Withdrawal and Irrigated Areas for the Harper Change Application No. CS4-120405CL.**

