



STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

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

APPLICATION DATE	APPLICATION NO.
June 5, 2009	G4-35248

NAME		
Iron Snowshoe LLC (Forest Ridge)		
ADDRESS/STREET	CITY/STATE	ZIP CODE
206 West First Street	Cle Elum, WA	98922

PUBLIC WATERS TO BE APPROPRIATED

SOURCE		
Up to three wells		
TRIBUTARY OF (IF SURFACE WATERS)		
MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE-FEET PER YEAR
	250	63.9

QUANTITY, TYPE OF USE, PERIOD OF USE
250 gallons per minute, 31.95 acre-feet per year for year-round multiple domestic supply of up to 190 units, 31.95 acre-feet per year for the irrigation of 12.87 acres from May 1 – September 30.

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION—WITHDRAWAL
500 feet east and 1,000 feet north from the southwest of Section 24, T. 20 N., R. 15 E.W.M. – Well ID BAF623
800 feet west and 500 feet south from the northeast of Section 24, T. 20 N., R. 15 E.W.M. – Well ID APB228
1,000 feet west and 2,000 feet south from the northeast of Section 24, T. 20 N., R. 15 E.W.M. – Well ID ALN806
or
Up to three wells in the SW1/4 of Section 30, Township 20 North, Range 16 E.W.M.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP	RANGE	WRIA	COUNTY
NE ¹ / ₄ NE ¹ / ₄ , SE ¹ / ₄ NE ¹ / ₄ and SW ¹ / ₄ SW ¹ / ₄ ;	24	20 N.	15 E.W.M.	39	Kittitas
or SW ¹ / ₄	30	20 N.	16 E.W.M.		
PARCEL NUMBER	LATITUDE	LONGITUDE	DATUM		

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.]

N³/₄ of Section 24, Township 20 North, Range 15 E.W.M.

DESCRIPTION OF PROPOSED WORKS

Two existing water supply wells are located on-property (Well IDs ALN806 and APB228) and one existing well is located adjacent to the property (BAF623). These wells are completed in bedrock to depths of 120 and 243 feet, respectively. A second water supply source is also under consideration and would consist of up to three wells to be completed in the unconsolidated Yakima River alluvium at a property know as the Flatwater development. Water from either wells ALN806, APB228, and BAF623 or new wells completed in the alluvium will be used for domestic supply for a planned 190 unit residential development. The proposed domestic use will be regulated as a Group A, community public water system by the Washington State Department of Health. Domestic wastewater will be discharged to an onsite, engineered community drain field.

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE	COMPLETE PROJECT BY THIS DATE	WATER PUT TO FULL USE BY THIS DATE
December 31, 2011	December 31, 2021	December 31, 2025

PROVISIONS

Wells

1. The water supply wells shall consist of either existing wells ALN806, APB228, and BAF623 completed in bedrock and hydraulically related to the Yakima River or up to three wells to be drilled and completed in the unconsolidated alluvial deposits in hydraulic continuity with the Yakima River. Use of a combination of wells completed in both alluvium and bedrock is not authorized.
2. Proposed wells at the Flatwater site shall not be completed within 500 feet of any existing wells to avoid potential well interference.
3. Use of well BAF623 is contingent on completing a pumping test and providing the results to Ecology to confirm that impairment of other groundwater wells will not occur.
4. In accordance with WAC 173-160, 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.
5. All wells constructed in the state shall meet the construction requirements of WAC 173-160 titled "Minimum Standards for the Construction and Maintenance of Wells" and RCW 18.104 titled "Water Well Construction". Any well which is unusable, abandoned, or whose use has been permanently discontinued, or which is in such disrepair that its continued use is impractical or is an environmental, safety or public health hazard shall be decommissioned.
6. Flowing wells shall be constructed and equipped with valves to ensure that the flow of water can be completely stopped when not in use. Likewise, the well shall be continuously maintained to prevent the waste of water through leaky casings, pipes, fittings, valves, or pumps -- either above or below land surface.
7. 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.
8. Required installation and maintenance of an access port as described in WAC 173-160- 291(3).
9. In order to maintain a sustainable supply of water, pumping must be managed so that static water levels do not progressively decline from year to year. Static water level is defined as the water level in a well when no pumping is occurring and the water level has fully recovered from previous pumping. Static water levels shall be measured and recorded monthly, using a consistent methodology. Data for the previous year shall be submitted by January 31 to the Department of Ecology.
10. Static water level data shall be submitted in digital format and shall include the following elements:
 - a. Unique Well ID Number
 - b. Measurement date and time
 - c. Measurement method (air line, electric tape, pressure transducer, etc.)
 - d. Measurement accuracy (to nearest foot, tenth of foot, etc.)
 - e. Description of the measuring point (top of casing, sounding tube, etc.)
 - f. Measuring point elevation above or below land surface to the nearest 0.1 foot
 - g. Land surface elevation at the well head to the nearest foot.
 - h. Static water level below measuring point to the nearest 0.1 foot.

Aquifer Source Selection and Well Testing

Ecology cannot issue a permit with multiple sources. Therefore, the applicant must choose a source aquifer to supply the requested project. Due to the hydrogeologic uncertainties and lack of site specific data available at the Forest Ridge site, the applicant has not yet selected a source aquifer. Therefore, Ecology is requiring the following provisions.

11. Northland must select a source aquifer to supply the Forest Ridge development by July 2, 2012.
12. Northland shall retain the services of a licensed hydrogeologist to develop a well test plan for the Forest Ridge site.
13. The hydrogeologist shall submit a well test plan to Ecology for review and approval prior to well testing.
14. The hydrogeologist shall submit a hydrogeologic report to Ecology which includes: general hydrogeologic description, site specific hydrogeologic description, analysis on well testing with raw data and results. The report shall be stamped, dated and signed in accordance with Chapter 18.220 RCW and WAC 308-15-075. The report shall be submitted to Ecology no later than February 2, 2012.

Metering and Reporting

15. 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", WAC 173-173. <http://www.ecy.wa.gov/programs/wr/measuring/measuringhome.html>

16. Water use data shall be recorded weekly and maintained by the property owner for a minimum of five years. The maximum monthly rate of diversion/withdrawal and the monthly total volume shall be submitted to the Department of Ecology by January 31st of each calendar year.
17. 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.

General

18. 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.
19. The water right holder shall file the notice of Proof of Appropriation of water (under which the permit 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. A certificate will reflect the extent of the project perfected within the limitations of the water right. 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.
20. The water source and/or water transmission facilities are not wholly located upon land owned by the applicant. Issuance of a water right change authorization by this department does not convey a right of access to, or other right to use, land which the applicant does not legally possess. Obtaining such a right is a private matter between applicant and owner of that land.
21. 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.
22. Use of water under this authorization shall be contingent upon the Department of Ecology's acceptance and Northland Resources Inc.'s compliance with a storage and release plan, which addresses historic out-of-irrigation season (October 1 to March 31) impacts associated with the withdrawals under this permit.
23. Per WAC 173-539A, consumptive use authorized under this permit shall be water budget neutral. Consumptive use quantities (total withdrawal minus return flow) shall be fully offset by debit of an equal consumptive use quantity of seasonal irrigation water rights placed into permanent trust in the Washington State Trust Water Right Program by Northland Resources LLC.
24. Water use under this authorization is contingent upon the conveyance of an equal (38.3 acre-feet per year) or greater amount of consumptive use from a suitable instream flow right (see trust water right agreement) to the Washington State Trust Water Right Program.
25. The connection limit (190 units) is contingent upon the approval of a Group A Water System by the Washington State Department of Health.

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 water is physically and legally available, the water use will be beneficial, and the appropriation of water as recommended will not be detrimental to existing rights or to the public interest.

Therefore, I ORDER approval of Application No. G4-35248 and a Permit be issued 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 Hearing 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
<p>Department of Ecology Attn: Appeals Processing Desk 300 Desmond Drive SE Lacey WA 98503</p> <p>Pollution Control Hearings Board 4224 – 6th Avenue SE Rowe Six, Building 2 Lacey WA 98503</p>	<p>Department of Ecology Attn: Appeals Processing Desk PO Box 47608 Olympia WA 98504-7608</p> <p>Pollution Control Hearings Board PO Box 40903 Olympia WA 98504-0903</p>

Signed at Yakima, Washington, this _____ day of _____ 2010.

Mark C. Schuppe, Section Manager
Water Resources Program
Central Region Office

DRAFT

BACKGROUND

Project Description

On June 5, 2009, Iron Snowshoe LLC, of Cle Elum, Washington (the applicant) filed an application with the Washington State Department of Ecology (Ecology) for a water right permit to appropriate public groundwater. The application was assigned application number G4-35248. The applicant requested authorization for an instantaneous withdrawal (Qi) of 250 gallons per minute (gpm) and an annual withdrawal volume (Qa) of 58.5 acre-feet per year (ac-ft/yr) for multiple domestic supply for a planned 170 unit residential development, referred to as Forest Ridge.

In a memorandum to Ecology dated October 19, 2009 the applicant requested that the Qa be increased to 75 ac-ft/yr to supply 190 residential units.

Requested locations for water supply wells include the entire development property, specifically the N³/₄ of Section 24, T. 20 N., R. 15 E.W.M.; an off-property location (the Wald well, Ecology Well ID BAF623) adjacent to the development property located in the SW ¹/₄SW ¹/₄ of Section 24, T. 20 N., R. 15 E.W.M.; and an off-property location approximately 1 mile southeast of the development property referred to as Flatwater, located in the SW¹/₄ of Section 30, T. 20 N., R. 16 E.W.M.

The applicant intends to mitigate for consumptive use under the requested appropriation through creation of a water banking program, referred to as the Northland Water Exchange. The Northland Water Exchange will be established by transferring into the Washington State Trust Water Right Program (TWRP) water rights that divert water from the Yakima River or its tributaries and have a pre-1905 priority date (Trust Water Rights). The Trust Water Rights will be maintained in trust to mitigate for out-of-priority use of new water right permits, including the subject application. Specific terms of the Northland Water Exchange are described in Attachment 2 – Trust Water Right Agreement between Northland Resources, LLC and the State of Washington, Department of Ecology.

Table 1
Summary of Application No. G4-35248

<i>Attributes</i>	<i>Proposed (as published in the Public Notice)</i>
Applicant	Iron Snowshoe LLC
Date of Application	June 5, 2009
Instantaneous Quantity	250 gallons per minute (gpm)
Annual Quantity	75 ac-ft/yr
Source	A well or wells
Point of Withdrawal	N ¹ / ₂ , N ¹ / ₂ S ¹ / ₂ , and SW ¹ / ₄ SW ¹ / ₄ of Section 24, T. 20 N., R. 15 E.W.M., and SW ¹ / ₄ of Section 30, T. 20 N., R. 16 E.W.M.
Purpose of Use	Multiple domestic
Period of Use	Year-round
Place of Use	As described on page 1 of this Report of Examination

Legal Requirements for Application Processing

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

- **Public Notice**
Notice of the application was published in the *Daily Record* of Ellensburg, Washington, on October 24 and 31, 2009. No comments or protests were received by Ecology during the 30-day comment period.
- **State Environmental Policy Act (SEPA)**
SEPA is pending.
- **Water Resources Statutes and Case Law**
Chapters 90.03 and 90.44 RCW authorize the appropriation of public water for beneficial use and describe the process for obtaining water rights. Laws specifically governing the water right permitting process are primarily RCW 90.03.250 through 90.03.340 and RCW 90.44.060. RCW 90.42.100 authorizes Ecology to use the Trust Water Right Program for water banking purposes within the Yakima River Basin.

INVESTIGATION

Site Visit

Site visit from Ecology has not occurred.

Domestic Water Use

The proposed Forest Ridge development does not currently have a Group A water system plan. However, the applicant has presented water demand estimates by month (see Table 3). Average daily demand (ADD) for indoor water use purposes is estimated at 150 gallons per day (gpd) per equivalent residential unit (ERU). Outdoor water use is expected to primarily consist of lawn and garden irrigation, and is estimated using methods and assumptions found in Ecology's GUID 1210, *Determining Irrigation Efficiency and Consumptive Use*¹, and Chapter 173-539A WAC.

The 2009, *Water System Design Manual*² (WSDM) by the Washington State Department of Health (DOH) contains guidance for establishing water demands. The suggested methods (in order of preference) include:

1. Metered water-production and use records.
2. Comparable metered water-production and use data from analogous water systems. See WAC 246-290-2321(3)(a) and Section 5.2.3
3. The criteria presented in this chapter.

Analogous water systems are defined in Section 5.2.3 of the WSDM as systems with similar characteristics such as: demographics, housing size, income levels, lot sizes, climate, water pricing structure, conservation practices, use restrictions, soils and landscaping, and maintenance practices.

There is no water use for the proposed development to review, and records for qualifying analogous systems are not available. Currently, the proposed water demand estimates are not consistent with the WSDM. As a result, Ecology's connection approval (190 units) is only tentative and is contingent upon DOH's approval of a Group A water system which remains within the other limitations of this permit (i.e. Qi, Qa, irrigated acres, etc.) DOH has full discretion and authority to limit the number of connections to less than the proposed 190 units.

Table 3
Domestic Water Use

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Indoor (gpd per ERU)	150	150	150	150	150	150	150	150	150	150	150	150
Outdoor (gpd per ERU)	0	0	0	0	70	380	540	480	320	0	0	0
Total (gpd per ERU)	150	150	150	150	220	530	690	630	470	150	150	150

¹ Ecology's GUID 1210, *Determining Irrigation Efficiency and Consumptive Use*
<http://www.ecy.wa.gov/programs/wr/rules/images/pdf/guid1210.pdf>

² Department of Health's *Water System Design Manual* <http://www.doh.wa.gov/ehp/dw/Publications/331-123.pdf>

Monthly and annual total and consumptive use at full build-out of the project were calculated based on the planned 190 ERUs, the indoor and outdoor water use per ERU in Table 3, and the consumptive use factors specified in the *Upper Kittitas Emergency Groundwater Rule* (WAC 173-539A). Under WAC 173-539A, 30 percent of domestic in-house use on a septic system is assumed to be consumptively used and 90 percent of outdoor use is assumed to be consumptively used. Calculated total and consumptive use are summarized in Table 4.

Table 4
Estimated Total and Consumptive Use at Full Build-Out

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Total (acre-feet)	2.7	2.4	2.7	2.6	4.0	9.3	12.5	11.4	8.2	2.7	2.6	2.7	63.9
Consumptive (acre-feet)	0.8	0.7	0.8	0.8	2.0	6.8	9.6	8.6	5.8	0.8	0.8	0.8	38.3

Ecology's Guidance Document 1210, *Determining Irrigation Efficiency and Consumptive Use*, and the assumptions found in WAC 173-539A were used to calculate the area that could be irrigated using 0.17 ac-ft/yr per ERU. A crop irrigation requirement (CIR) for grass in the Cle Elum area of 24 inches was estimated using the ASCE-Penman Monteith method. Assuming the outdoor use is 90 percent consumptive, consistent with the assumptions in WAC 173-539A, and applying the ASCE-Penman Monteith CIR, the assumed outdoor use is sufficient to irrigate approximately 2,950 square feet of grass per ERU or 12.87 acres for the entire development.

Hydrologic/Hydrogeologic Evaluation

The project site is located on the south flank of Cle Elum Ridge, about 1 mile north of the City of Cle Elum city limits and about 2 miles north of the Yakima River. A drainage mapped as Steiners Canyon runs north to south through the site. Surficial geology at the site and the potential adjacent off-property well location is mapped as bedrock of the upper Roslyn Formation (Tabor, et al., 1982), which consists of sandstone, siltstone, and coal. The northeast portion of the property is also mapped as landslide deposits, described as poorly sorted mud to boulder-size materials. The surficial geology of the potential off-property well location at the Flatwater property is mapped as Yakima River alluvium, and is described as consisting of boulder to pebble gravel deposits.

There are seven existing wells at the Forest Ridge property, all completed in bedrock. Air lift tests at four of the wells indicated yields of less than about 2 gpm. The reported yield from well APB228, located in the NE1/4NE1/4 of Section 24, was about 6.5 gpm. The reported yield from well ALN806, located in the SE1/4NE1/4 of Section 24, was about 15 gpm. Well APB228 was completed in February 2007 to a depth of 300 feet. The driller's log describes 12 feet of clay and gravel overlying sandstone with two thin coal seams. The static water level at the time of drilling was 63 feet below ground surface (bgs). The ground surface elevation at this well, read from the USGS Cle Elum 7.5 minute quadrangle map, is about 2,700 feet. Subtracting the depth to water measurement from the ground surface elevation results in a static water level of about 2,640 feet.

Well ALN806 was completed in August 2007 to a depth of 120 feet. The driller's log describes 22 feet of soil, clay, and boulders overlying sandstone and broken conglomerate. The static water level at the time of drilling was 35 feet bgs. The ground surface elevation at this well is about 2,600 feet. Subtracting the depth to water measurement from the ground surface elevation results in a static water level of about 2,565 feet.

The Wald well (BAF623) is located in the SW1/4WW1/4 of Section 24, just south of the Forest Ridge property. This well was completed in October 2008 to a depth of 243 feet bgs. The driller's log describes shale and clay overlying water bearing sandstone and gravel at a depth of 228 to 243 feet bgs. The driller's log indicates this well is artesian, with a shut-in pressure of about 10 pounds per square inch, or about 23 feet of water. An air lift test was performed after well completion, with an estimated yield of approximately 150 gpm. The ground surface elevation at this well is about 2,400 feet. Adding the artesian head to the ground surface elevation results in a static water level of about 2,430 feet.

Wells have not been drilled at the potential Flatwater property well site. Five well logs were identified in Ecology's well log database that appear to be located in the same quarter section as the Flatwater property, SW1/4, Section 30, T.20N., R16E.; one completed in the unconsolidated deposits and four completed in sandstone of the Roslyn Formation. An additional 20 wells were mapped in adjacent quarter-quarter sections. The thickness of the unconsolidated deposits reported in the logs range up to greater than 220 feet. Except for a few shallow wells, the saturated thickness for wells completed in the unconsolidated deposits generally ranges from 100 to 200 feet. Reported yields for wells completed in unconsolidated deposits range from 5 to 150 gpm.

The applicant has requested to appropriate groundwater from either the sandstone bedrock aquifer at and near the Forest Ridge property or from the alluvial aquifer at the Flatwater property. Based on the coarse-grained nature of the alluvium and the proximity to the Yakima River, a well completed in alluvium at the Flatwater site is expected to be in hydraulic continuity with the Yakima River. Based on the approximate groundwater elevations at wells APB228, ALN806, and BAF623, the hydraulic gradient in the bedrock is generally southward, and groundwater is expected to discharge to the alluvial aquifer system and ultimately the Yakima River. Groundwater tapped by bedrock wells APB228, ALN806, and BAF623 is hydraulically related to the Yakima River.

Planned Mitigation

The Northland Water Exchange has been created by the transfer of pre-1905 water rights to instream flow and water banking purposes through the TWRP. As a result of these transfers, the Exchange represents mitigation credits based on the consumptive use of these water rights on a month-by-month basis. The mitigation credits will be debited to mitigate for consumptive use under the subject application. The Exchange currently has mitigation credits represented by the following approved applications:

- **CS4-02223CTCLsb2@1 (Pasco).** This application, approved by Ecology on April 19, 2010, permanently changes the use from year-round domestic supply and seasonal irrigation and stock watering to instream flow for water banking purposes. The historic authorized point of diversion is an unnamed spring, tributary to Spex Arth Creek and the Yakima River. Consumptive use recognized under this Trust Water Right is 55 ac-ft/yr.
- **CS4-01676(B)CTCL@1 (Newton).** This application, approved by Ecology on May 14, 2010, permanently changes the use from seasonal irrigation and stock watering to instream flow for water banking purposes. The historic point of diversion is on the Teanaway River. The currently authorized point of diversion is the Younger Ditch diversion from the Yakima River. Consumptive use recognized under this Trust Water Right is 73.7 ac-ft/yr.
- **CS4-00365CTCLsb5 (Henshaw).** This application, approved by Ecology on May 24, 2010, permanently changes the use of a portion of Acquavella Adjudicated Court Claim No. 00365 from seasonal irrigation to instream flow for water banking purposes. The historic authorized point of diversion is the Younger Ditch diversion from the Yakima River. Consumptive use recognized under this Trust Water Right is 89 ac-ft/yr.

The current mitigation credits represented by the transfer and change of the three above water rights are as follows by estimated total monthly consumptive use:

Table 4
Available Consumptive Use Mitigation Credits

Water Right	Apr	May	Jun	Jul	Aug	Sep	Annual
Pasco	0.09	4.18	11.5	15.9	14.0	9.22	55
Newton	0	15.7	26.6	31.4	0	0	73.7
Henshaw	0	1.4	17.3	28.6	25.2	16.5	89
Total	0.09	21.28	55.4	75.9	39.2	25.72	217.7

Notes: Pasco water right includes approximately 0.01 acre-feet per month consumptive use mitigation credits from October through March. Consumptive use mitigation credits under the Newton water right will be used prior to July 29 each year.

The total year round consumptive use associated with this proposed use is 38.3 ac-ft/yr. Table 3 presents the estimated monthly consumptive use. The consumptive use impacts to surface water flows in the Yakima River associated with this application will be mitigated on a month to month basis by a combination of assigning consumptive use mitigation from the Northland Water Exchange and providing scheduled releases from storage to address new out-of-season impacts. Specific terms of the Northland Water Exchange, including requirements to provide sufficient storage for release of mitigation water outside the historical irrigation season, are described in Attachment 2.

Impairment Considerations

Groundwater – Bedrock Wells at the Forest Ridge Property

Ecology's well log database was searched to identify wells in the vicinity of the Forest Ridge property that could be affected if the three bedrock wells are used as the source of supply. The closest well to the applicant's wells APB228 and ALN806 appears to be at least ½ mile to the northwest, in Section 13, T.20N., R15E. The closest wells to the Wald well (BAF623) appear to be four wells located about 1,000 feet to the east.

Due to the higher expected yield from the Wald well and the shorter distance to nearby wells, potential impacts from pumping the Wald well are assumed to provide a worst case evaluation of potential impairment. The four nearby wells (APG160, APG214, BAN889, and BAN890) are completed in sandstone and shale or clay, with total depths ranging from 275 to 423 feet bgs. Available drawdown (total depth minus static water level) at these wells ranges from about 240 to 390 feet, with reported yields of ½ to 1 gpm.

The potential effect of pumping the Wald well on water levels at the nearby wells was evaluated using the Theis nonequilibrium equation and the following parameters. Peak water use for the project will occur from June through September, representing the period over which impairment would be most likely to occur. At full build-out, a total of 44.1 acre-feet could be withdrawn over this 122 day period, equating to an average withdrawal rate of 82 gpm. A transmissivity of 160 feet squared per day was estimated based on the yield and available drawdown of the Wald well. A storativity of 10^{-5} was assumed, based on typical specific yield for sandstone bedrock under confined conditions. Applying the above values, the estimated drawdown at 1,000 feet from the pumping well after 122 days is 66 feet, or about one-quarter the minimum available drawdown in the nearby wells.

The impairment analysis assumes the transmissivity is constant between the Wald well and the nearby wells. Based on the limited yield reported for the nearby wells, they appear to be tapping zones of the bedrock aquifer with significantly lower transmissivity than that tapped by the Wald well. By using the higher transmissivity of the Wald well, the potential impact at nearby wells is likely overestimated.

Groundwater – Alluvial Wells at the Flatwater Property

If wells are completed at the Flatwater property, the target aquifer for water supply would be the unconsolidated Yakima River alluvium. The potential effect of pumping a well completed in the alluvium on water levels at other nearby wells was evaluated using the Theis nonequilibrium equation and the following parameters. A transmissivity of 1,000 feet squared per day was estimated based on an assumed 100 foot minimum saturated thickness of the sand and gravel deposits and an assumed hydraulic conductivity of 10 feet per day for these materials. A storativity of 0.2 was assumed, based on typical specific yield for sands. A worst case scenario was evaluated assuming pumping of the well at an instantaneous pumping rate of 250 gpm for 40 days, until the annual quantity of 63.9 acre-feet is exhausted. The exact location of the proposed water supply well on the Flatwater property has not been established. Based on a review of Ecology's well log database, there do not appear to be any wells within about 500 feet of the north, east, or south property boundaries of the Flatwater property. One well (Well Tag ID APG149) is apparently located across White Road, immediately west of the Flatwater property; however, this well is completed to a depth of 285 feet in sandstone bedrock and is unlikely to be affected by pumping from the shallower alluvium. Given this information, the distance from a well at the property to the nearest off-property well completed in the alluvium is expected to be at least 500 feet. Applying the above values, the estimated drawdown at 500 feet from the pumping well after 40 days is 4.5 feet.

Surface Water

Consumptive use impacts to the mainstem Yakima River associated with the project will be mitigated through use of mitigation credits available from transfer of pre-1905 water rights to the TWRP. No other surface water bodies will be affected by the proposed appropriation, regardless of whether water is withdrawn from the Forest Ridge property wells (APB228 and ALN806) and the Wald well (BAF623), or new wells at the Flatwater property.

Water Availability

Water availability includes legal availability (e.g., closure of basins to further appropriation) and physical availability (e.g., productivity of the aquifer). Under WAC 173-539A all groundwater in upper Kittitas County, including the project site, is withdrawn from further appropriation, except where the new appropriation is water budget neutral. The rule defines water budget neutral as "...an appropriation or project where withdrawals of ground water of the state are proposed in exchange for discharge of water from other water rights that are placed into the trust water right program where such discharge is at least equivalent to the amount of consumptive use." The appropriation proposed under the subject application will be water budget neutral by dedicating 38.3 ac-ft/yr of consumptive use available from the Northland Water Exchange to mitigation purposes.

Reported yields for wells completed in the sand and gravel Yakima River alluvium that would be tapped by a well at the Flatwater property range up to 150 gpm. These yields are based on air lift tests and do not necessarily represent the maximum yield of a properly constructed well completed in this aquifer. Given the coarse-grained nature of these materials, the unconfined conditions, and available drawdown on the order of 100 feet or more, a fully penetrating well should be able to produce a Qi of 100 to 150 gpm and sustain a yield of 63.9 ac-ft/yr. Assuming yields of 100 gpm, it may require up to three wells at the Flatwater property to provide the requested Qi of 250 gpm.

Reported yields for the three proposed wells completed in bedrock at or adjacent to the Forest Ridge property range from about 6 to 150 gpm, with a combined yield of approximately 170 gpm. These values are based on air lift tests, providing only an approximate indication of potential instantaneous yields. More rigorous pumping tests have not been performed to confirm that the yields from these wells is sustainable; however, the available data imply that a total yield on the order of 170 gpm may be achievable from the existing wells. See Provisions Section for required pump testing.

Public Interest Considerations

When investigating a water right application, Ecology is required to consider whether the change is detrimental to the public interests. Ecology must consider how the change will affect an array of factors such as wildlife habitat, recreation, water quality, and human health. The environmental amenities and values associated with the area were taken into account during the consideration of this application.

Consideration of Protests and Comments

No protests or comments were received during the 30-day comment period following publication of the public notice.

CONCLUSIONS

- Water is physically available at the quantities requested. When combined with the proposed mitigation measures, water is legally available under the provisions of WAC 173-539A.
- According to RCW 90.54.020 multiple domestic use is considered a beneficial use.
- Approval of the proposed appropriation, when combined with the proposed mitigation measures, will not result in impairment of senior water right holders.
- Approval of the proposed appropriation, when combined with the proposed mitigation measures, is not detrimental to the public interest.

RECOMMENDATIONS

Based on the above investigation and conclusions, I recommend Application No. G4-35248 be approved and that a permit issued in the amounts and within the limitations listed below and subject to the provisions beginning on Page 2.

Purpose of Use and Authorized Quantities

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

- 250 gallons per minute
- 63.9 acre-feet per year (31.95 for domestic and 31.95 for irrigation)
- Irrigation of 12.87 acres from May 1 to September 30
- Year-round multiple domestic supply of up to 190 units

Points of Withdrawal

Bedrock Wells

500 feet east and 1,000 feet north from the southwest of Section 24, T. 20 N., R. 15 E.W.M.

800 feet west and 500 feet south from the northeast of Section 24, T. 20 N., R. 15 E.W.M.

1,000 feet west and 2,000 feet south from the northeast of Section 24, T. 20 N., R. 15 E.W.M.

Or

Alluvial Wells

Up to three wells in the SW1/4 of Section 30, Township 20 North, Range 16 E.W.M.

Place of Use

As described on Page 1 of this Report of Examination.

Report by: _____
Kurt Walker, Water Resources Program Date _____

DRAFT

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Attachment 1

