



WR File NR G2-30647  
WR Doc ID 6281453

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

**PRIORITY DATE**  
September 18, 2014

**WATER RIGHT NUMBER**  
G2-30647

**MAILING ADDRESS**  
Firgrove Mutual Water Company  
10408 144th Street East  
Puyallup, WA. 98374

**SITE ADDRESS (IF DIFFERENT)**  
14220 80th Ave. Ct. E.  
Puyallup, WA 98375

**Total Quantity Authorized for Withdrawal or Diversion**

WITHDRAWAL RATE	UNITS	ANNUAL QUANTITY (AC-FT/YR)
300	GPM	110

**Purpose**

PURPOSE	WITHDRAWAL OR DIVERSION RATE			ANNUAL QUANTITY (AF/YR)		PERIOD OF USE (mm/dd)
	ADDITIVE	NON-ADDITIVE	UNITS	ADDITIVE	NON-ADDITIVE	
Municipal		300	GPM		110	01/01 to 12/31

ADDITIVE	IRRIGATED ACRES		PUBLIC WATER SYSTEM INFORMATION	
	ADDITIVE	NON-ADDITIVE	WATER SYSTEM ID	CONNECTIONS
			25200 M	8921

**Source Location**

COUNTY	WATERBODY	TRIBUTARY TO	WATER RESOURCE INVENTORY AREA					
Pierce	Groundwater	N/A	10 – Puyallup 12 – Clover-Chambers					
SOURCE	PARCEL	WELL TAG	TOWNSHIP	RANGE	SECTION	QQ Q	LATITUDE	LONGITUDE
Well 22	0419174016	AEC-903	19N	04E	17	SW SE	47.12714	-122.32247

Datum: NAD83/WGS84

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

**LEGAL DESCRIPTION OF AUTHORIZED PLACE OF USE**

The place of use (POU) of this water right is the service area described in the most recent Water System Plan/Small Water System Management Program approved by the Washington State Department of Health, so long as the water system is and remains in compliance with the criteria in RCW 90.03.386(2). RCW 90.03.386 may have the effect of revising the place of use of this water right.

**Proposed Works**

Well 22: 12 inches in diameter and 345 feet deep, screened from 295 feet to 340.6 feet below ground surface in Aquifer C

**Development Schedule**

BEGIN PROJECT

COMPLETE PROJECT

PUT WATER TO FULL USE

Started

January 1, 2021

January 1, 2026

**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 (ac-ft)
What rate should be reported?	Annual Peak Rate of Withdrawal (gpm)

**Provisions**

***Wells, Well Logs and Well Construction Standards***

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

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

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

***Measurements, Monitoring, Metering and Reporting***

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

WAC 173-173 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 Southwest Regional Office.

***Department of Health Requirements***

Prior to any new construction or alterations of a public water supply system, the State Board of Health rules require public water supply owners to obtain written approval from the Office of Drinking Water of the Washington State Department of Health. Please contact the Office of Drinking Water at Southwest

Drinking Water Operations: 243 Israel Road S.E., PO Box 47823, Tumwater, WA 98504-7823, (360) 236-3030.

***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.

***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.

***Findings of Facts***

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

Therefore, I ORDER approval of Application No. G2-30647, subject to existing rights and the provisions specified above.

**Your Right To Appeal**

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

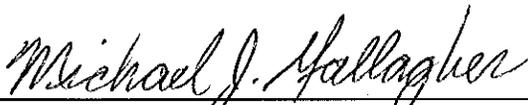
To appeal you must do the following within 30 days of the date of receipt of the Order:

- File your appeal and a copy of this Order with the PCHB (see addresses below). Filing means actual receipt by the PCHB during regular business hours.
- Serve a copy of your appeal and this Order on Ecology in paper form - by mail or in person. (See addresses below.) E-mail is not accepted.

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

Street Addresses	Mailing Addresses
<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> 1111 Israel RD SW, Ste 301 Tumwater, WA 98501	<b>Pollution Control Hearings Board</b> PO Box 40903 Olympia, WA 98504-0903

Signed at Lacey, Washington, this 22<sup>nd</sup> day of October, 2015.



Michael J. Gallagher, LHG, Section Manager  
Water Resources Program/  
Department of Ecology

For additional information visit the Environmental Hearings Office Website: <http://www.eho.wa.gov>. To find laws and agency rules visit the Washington State Legislature Website: <http://www1.leg.wa.gov/CodeReviser>.

## INVESTIGATOR'S REPORT

Application for Water Right – Firgrove Mutual Water Company

Water Right Control Number G2-30647

**BACKGROUND**

This report serves as the written findings of fact concerning Water Right Application Number G2-30647.

Firgrove Mutual Water Company (Mutual) has sufficient well capacity to pump its annual quantity (Qa) on an annual basis, but is not capable of producing its fully authorized instantaneous quantity (Qi) when required to meet existing and future system (seasonal) peaking requirements for all pressure zones (and fire-flow requirements). Firgrove seeks to enhance the operational reliability of the pressure zone served by Firgrove Well 22 by increasing the Well 22 Qi by 300 gpm and the Qa by 110 afy, both on a non-additive basis. The non-additive Qi and Qa would be derived from existing Firgrove additive water rights at Well 7 (G2-25772; 5,100 feet south of Well 22) and Well 16 (G2-27872C; 3,205 feet west of Well 22).

Table 1 Summary of Requested Water Right

<b>Applicant Name:</b>	<b>Firgrove Mutual Water Company</b>
<b>Date of Application:</b>	September 18, 2014
<b>Place of Use</b>	The place of use (POU) of this water right is the service area described in the most recent Water System Plan/Small Water System Management Program approved by the Washington State Department of Health, so long as the water system is and remains in compliance with the criteria in RCW 90.03.386(2). RCW 90.03.386 may have the effect of revising the place of use of this water right.

County	Waterbody	Tributary To	WRIA
Pierce	Groundwater	N/A	10 – Puyallup 12 – Clover-Chambers

Purpose	Rate	Unit	Ac-ft/yr	Begin Season	End Season
Municipal Supply	300	gpm	110	01/01	12/31

Source Name	Parcel	Well Tag	Twp	Rng	Sec	QQ Q	Latitude	Longitude
Well 22	0419174016	AEC-903	19N	04E	17	SW SE	47.12714	-122.32247

Datum: NAD83/WGS84

GPM = Gallons per Minute; Ac-ft/yr = Acre-feet per year; Sec. = Section; QQ Q = Quarter-quarter of a section; WRIA = Water Resource Inventory Area; E.W.M. = East of the Willamette Meridian

**Cost Reimbursement**

This application is being processed under a cost reimbursement agreement between the applicant and the Department of Ecology. This report has been prepared by Robinson Noble, Inc.

**Legal Requirements for Approval of Appropriation of Water****Public Notice**

RCW 90.03.280 requires that notice of a water right application be published once a week, for two consecutive weeks, in a newspaper of general circulation in the county or counties where the water is to be stored, diverted and used. Public notice of the proposed non-additive application was published in

"The News Tribune," a daily newspaper in Pierce County, on November 8th and 15th, 2014. Ecology received no protests from this public notice.

***Consultation with the Department of Fish and Wildlife***

The Department must give notice to the Department of Fish and Wildlife of applications to divert, withdraw, or store water. As this application is non-additive, relying on existing wells and water rights, and thus represents no new use of water, the Department of Fish and Wildlife was not consulted.

***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, 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 WAC 197-11-305.

This application does not meet any of these conditions and is categorically exempt from SEPA. Therefore, a threshold determination is not required.

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## **INVESTIGATION**

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### **Site Visit**

Robinson Noble hydrogeologist, Burt G. Clothier, LHG, conducted a site visit on August 20, 2013 accompanied by Leonard Horton, Superintendent for the Mutual. This site visit was for a preceding proposed water rights transfer project that has since been withdrawn but involved the same well sites as the current application. The walkthrough and photographic documentation of wellheads was accomplished at Wells 12 and 22, Well 16, and Wells 7 and 17 (Figure 1). A second site visit was conducted by Mr. Clothier on October 16, 2014.

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### **Hydrologic/Hydrogeologic Evaluation**

The study area for this investigation is roughly aligned along Meridian Avenue, between Puyallup in the north and Graham to the south, and extending from the Puyallup River valley in the east to just past Fredrickson in the west. The study area and the Mutual's service area straddle the boundary between Ecology's Water Resource Inventory Areas (WRIA) 10 and 12.

The following summary of the hydrogeologic setting is primarily based on the recent U.S. Geological Survey (USGS) study on the Clover-Chambers Creek basin (Savoca and others, 2010), a parallel study of the Puyallup River watershed (Welch and others, in press), and previous investigations by Robinson Noble completed for the Mutual including well construction reports, annual monitoring, and regional-

period, and the materials are often distinctively colored, suggesting source material originating from Mount Rainier and vicinity; ash layers are sometimes noted. Where present, the ash layers form important marker beds in the vertical geologic sequence. The non-glacial deposits of this unit occasionally have areas of higher permeability that can yield useable sources of water, but as with confining unit B, they are typically infrequent and discontinuous. The unit is up to 200 feet thick in the local area, but further to the west, the thickness can increase to over 300 feet.

*Aquifer E* – The third major source aquifer used by purveyors in the region, aquifer E is dominated by glacial drift deposits that appear to correlate with the Stuck Glaciation as defined by Walters and Kimmel (1968). It mainly consists of deposits of silt, sand, and gravel. The aquifer is typically highly confined and regionally extensive. The unit ranges in thickness from a few tens of feet to over 200 feet. However, few wells in the Firgrove area tap this aquifer, mainly due to the required depth of drilling. Only the Mutual's Wells 10 and 14 produce water from this aquifer and neither is highly productive.

*Confining Unit F* – The final confining unit identified by the USGS study, unit F, is primarily silt and clay deposits with discontinuous lenses of sand or sand and gravel. The unit is not well defined as few wells fully penetrate the deposits, but the USGS states it as usually 50 to 200 feet thick.

*Aquifer G* – The deepest unit defined in the USGS effort is the aquifer underlying confining unit F (aquifer G) and all of the remaining sediments below that aquifer previously identified by the 1985 study by Brown and Caldwell (confining unit H and aquifer I). These units were undifferentiated by the USGS study due to the lack of deep boreholes to define the various layers across the region. In the Lakewood area, there is sufficient information to identify aquifer G as separate from the units below, but this differentiation becomes more difficult in the east half of the basin. Walters and Kimmel (1968) defined the sediments currently associated with aquifer G as part of the Orting Drift, the oldest glaciation defined in the Puget Sound region. Of the Mutual's wells, only Well 12 has drilled to sufficient depth to identify aquifer G, but the well was not completed in the aquifer. While the regional presence of the aquifer is implied by wells in Puyallup, Fife, and Federal Way (Robinson & Noble, 2006), the extent of this unit under the Firgrove area is not well defined.

All five of the regional aquifer units described by USGS are present in the vicinity of the Mutual, and it has wells completed in the middle three aquifer systems (A3, C and E). The majority of the Mutual's water production comes from wells in aquifers A3 and C. Aquifer E wells are slightly less productive, on average, than those in the systems above. Except for Well 16, which is completed in aquifer A3, the subject wells for this water rights application are completed in aquifer C.

### Proposed Use and Basis of Water Demand

The Mutual's water is supplied from 16 operating wells located throughout their service area. Tacoma Water provides the Mutual with an additional source of water through three interties. The Mutual also maintains three emergency interties, two with Rainier View Water Company and one with Fruitland Mutual Water Company. At the end of 2014 the Mutual had 8,921 connections serving a population of approximately 24,500. Table 2 below shows recent production and use data.

Table 2: Firgrove Mutual water production for fiscal year 2014 (April 2014 to March 2015)

2014 Total production	2,808 acre-feet*
2014 wholesale purchase from Tacoma Water	153.4 acre-feet
Maximum production month (June 2014)	448.0 acre-feet
Minimum production month (March 2015)	159.6 acre-feet

\* The Mutual acknowledges that this total is in excess of its annual allocation and has taken steps to improve tracking and prevent future exceedances.

level investigations. Previous work describing the geology of the area includes: Walters and Kimmel (1968), Robinson & Noble (1992), Jones (1999), and Borden and Troost (2001), and Robinson Noble & Saltbush (2006).

The USGS conceptual model describes the hydrogeologic units of the area as being comprised of 11 layers of alternating water-bearing (aquifer) and non-water-bearing (confining layers) sediments. Unlike previous investigations, the USGS layer definition is focused solely on these hydrogeologic properties without regard to geologic origin or age. This means that previous layer designations from earlier studies are not necessarily directly comparable to the current ones (Savoca and others, 2010), but even where the names are unchanged, the location and extent of each layer (both vertically and horizontally) are now different.

Descriptions for the each of hydrostratigraphic units defined by the USGS are listed below (geologic map unit abbreviations are provided in parenthesis, where applicable):

*Aquifer A1* – Often present at land surface, this aquifer primarily consists of stratified silt, sand, and gravel deposits of Vashon recessional outwash (Qvr) of the Fraser glaciation. Locally, this unit includes very coarse outwash gravels of the Steilacoom Gravel (Qvs) in broad plains to the west and in the bottoms of outwash channels (the channels were originally described by Walters and Kimmel, 1968). The unit is typically a few feet up to about 50 feet thick. Where saturated, the unit represents a water-table aquifer and is often in direct continuity with surface water bodies.

*Confining Unit A2* – This unit is dominated by glacial till deposits of the Vashon glaciation (Qvt), which are often found at land surface when aquifer A1 is not present. Ice-contact and fine-grained glaciolacustrine deposits are also included in this unit. The material is typically low-permeability mixtures of clay, silt, sand and gravel, often compacted and dense. In the local area, the unit averages about 70 feet in thickness, but this can increase to over 100 feet in a few places.

*Aquifer A3* – The aquifer below confining unit A2 is mainly composed of deposits from the Vashon advance outwash (Qva). In some areas, older, pre-Fraser coarse-grained non-glacial (Qpfc) deposits are also included in this unit. The material is usually well-sorted sand or sand and gravel, sometimes with lenses of silt or clay. Locally, the aquifer appears to be confined by the overlying till. The Mutual has several wells that produce water from this system, previously named the Firgrove Aquifer in the local area (Robinson & Noble, 1992; 2006). The Mutual's Wells 1, 4, 5, 8, 16 and 19A all produce from aquifer A3.

*Confining Unit B* – This unit is dominated by deposits of the Olympia Beds (Qob), low-permeability silts and clays from the Olympia-age interglacial period, and glaciolacustrine clays from the early Vashon called the Lawton Clay (Qvlc). Isolated areas of the unit can contain coarser-grained sands that can support limited water production, but these areas are uncommon and discontinuous. The unit is typically more than 50 feet thick in the area and results in strong confinement of the underlying aquifer.

*Aquifer C* – Sometimes also called the sea-level aquifer due its coincident elevation, this system was named the Fredrickson Aquifer in the 1992 and 2006 Robinson Noble studies. The unit is usually sand and gravel deposits of pre-Olympia age glacial drift, but lower-permeability deposits of silt, clay, or till are sometimes encountered. The aquifer is 70 to 150 feet thick in most places in the area. Productive zones in this unit seem to be more discontinuous across the region than is the case with aquifers A or E. However, in the Firgrove area, the aquifer is often highly productive with 14 wells producing water from this system (Wells 2, 3, 6, 7, 9, 12, 13, 15, 17, 18, 19B, 20, 21, and 22).

*Confining Unit D* – Regionally extensive, this confining unit is made up of non-glacial deposits of alluvial and lacustrine sand, silt, and clay. Most of the unit was laid down during the Puyallup interglacial

The Mutual is requesting that this application provide non-additive Qi and Qa in order to improve its operational conditions. No new water allocations are requested, and the annual production authorizations held by the Mutual will remain unchanged. The purpose of use is municipal supply.

The primary goal is to provide an additional 300 gpm and 110 afy (non-additive) to Well 22 from other existing sources in a manner that poses no net harmful impact or impairment to the ground and surface waters or other water rights holders in the area through examination of the natural relationship between ground and surface waters Well 22, currently authorized to pump 500 gpm, can produce 1,000 gpm (Robinson & Noble, 1998).

For various mechanical and operational reasons, Wells 7 and 16 cannot produce their authorized instantaneous quantities. The Mutual wants to expand the Well 22 production by using the currently unused portions of the instantaneous quantities associated with these wells. Based on the expected operational patterns of Well 22, the additional 300 gpm produced at this well would result in an annual withdrawal of about 110 acre-feet.

### Other Rights Appurtenant to the Place of Use

The Mutual maintains 20 groundwater permits and certificates (Table 3) which serve the Place of Use.

Table 3: Firgrove Mutual Existing Water Rights

Certificate	Priority date	Source	Additive or non-additive	Qi (gpm)	Qa (acre-feet)
4701-A	9/12/1962	Well 2	Additive	76	121.6
G2-20044C	3/17/1972	Well 7	Additive	300	45
G2-20776C	2/16/1973	Well 3	Additive	70	56
G2-20775C	2/16/1973	Well 4	Additive	180	144
G2-21086C	5/23/1973	Well 6	Additive	60	48
G2-24021C	11/28/1975	Wells 5 & 10	Additive	525	565.4
G2-24012C	11/28/1975	Wells 5 & 10	non-additive		34.6
G2-25669C	8/15/1980	Well 12	Additive	250	200
G2-25772	12/12/1980	Well 7 *	Additive	400	339
G2-25772	12/12/1980	Well 7 *	non-additive		45
G2-26506C	3/27/1984	Well 13	Additive	460	380
G2-27256C	12/24/1987	Well 14	Additive	255	204
G2-27497C	3/16/1989	Well 15	Additive	265	258
G2-27871C	9/13/1990	Well 17	Additive	130	100
G2-27872C	9/13/1990	Well 16	Additive	200	160
G2-27935C	12/4/1990	Well 18	non-additive	900	300
G2-28161	5/24/1991	Well 9	Additive	500	56
G2-28161	5/24/1991	Well 9	non-additive		374
G2-28312	10/21/1991	Well 19B	non-additive		54
G2-29345	1/22/1996	Well 21	non-additive	800	100
G2-29346	1/22/1996	Well 22	non-additive	500	60
G2-27079	12/6/2007	Well 20	Additive	100	23.4
				Primary Qa total	2,700.4
				non-additive Qa total	967.6**

\* A Well 11 was originally authorized as one of two points of withdrawal (including original Well 7/G2-20044) for appropriation under G2-25772. Due to Well 11's proximity to contamination, this well was taken off-line by Firgrove after permitting, leaving original Well 7 to produce the authorized quantities of G2-25772 and G2-20044C.

\*\* Current production of non-additive quantities is higher than reported here as allowed under a Temporary Use Authorization from Ecology dated February 6, 2010. This authorization will cease in 2015 and production will revert to permitted limits.

## **ANALYSIS**

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Under Washington State law, the following four criteria must be met for an application to be approved:

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

## **Impairment Considerations**

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Impairment is an adverse impact on the physical availability of water for a beneficial use that is entitled to protection. A water right application may not be approved if it would:

- Interrupt or interfere with the availability of water to an adequately constructed groundwater withdrawal facility of an existing right. An adequately constructed groundwater withdrawal facility is one that (a) is constructed in compliance with well construction requirements and (b) fully penetrates the saturated zone of an aquifer or withdraws water from a reasonable and feasible pumping lift.
- Interrupt or interfere with the availability of water at the authorized point of diversion of a surface water right. A surface water right conditioned with instream flows may be impaired if a proposed use or change would cause the flow of the stream to fall to or below the instream flow more frequently or for a longer duration than was previously the case.
- Interrupt or interfere with the flow of water allocated by rule, water rights, or court decree to instream flows.
- Degrade the water quality of the source to the point that the water is unsuitable for beneficial use by existing users (e.g., via sea water intrusion).

### *Impacts to Existing Water Users*

Within approximately one mile surrounding Well 22, 17 claims, one permit, and seven certificates were identified from Ecology on-line database. The permit and all but one of the certificates are held by the Mutual.

The remaining certificate, G2-24413, is recorded as held by John McNeil for 50 gpm and 8 acre feet per year serving domestic supply to 12 mobile homes. The priority date is February 4, 1977. The authorized withdrawal under this certificate is a well located 900 feet east and 250 feet south of the northwest corner of section 21 (approximately 8852 144th Street East). The water system was absorbed by the Mutual sometime in the 1990s (Leonard Horton, Supervisor, email communication, 2015). The status of the well is unknown, but is presumed to be out of service.

None of the 17 claims is within ½ mile of Well 22. Some of these appear to be for sites within the Mutual's service area and are thus assumed to be unused. Most claims are registered for smaller sources, such as domestic or irrigation needs, and are often related to surface water sources or shallow wells. It is also probable that the majority of these claims, if used, are producing water from the A1 or A3 aquifers and if so, they would be only indirectly affected by the Mutual's production from its aquifer

C wells such as Well 22. Regardless, the Mutual's Wells 7 and 16 are closer to the various claims found outside of the Mutual's service area, so exercising an additional 300 gpm and 110 afy (non-additive) at Well 22 will have less of an effect than using the rights at Wells 7 or 16. Consequently, the proposed application should pose no harmful impact or impairment to existing water right users.

#### *Impacts to Surface Water*

As noted above, Wells 7 and 22 are completed in aquifer C and Well 16 is completed in the shallower aquifer A3. All three wells are monitored continuously for water level responses and production rate. The Mutual reports that none of these three wells exhibit interference drawdown effects resulting from the operation of one or both of the other wells (Leonard Horton, Firgrove Superintendent, pers. comm.). Annual analyses of the Mutual's monitoring program data (2002 to present) also support this finding (Robinson Noble, 2011, 2012, and 2013).

The proposed addition of 200 gpm of production at Well 22 instead of at Well 7 represents a slight shift in production location as compared to the same production at Well 7, but will be a no-net-change as regards aquifer C as a whole. Likewise, the beneficial use of 100 gpm of production at Well 22 instead of at Well 16 is a minor change in location but also represents a lessening of production from aquifer A3 (which might slightly improve discharges to surface water systems from this aquifer) and the commensurate increase in production from aquifer C. Producing the water from the deeper of the two aquifers will make any surface water impacts less direct and more attenuated over time.

The headwaters of Clover Creek are approximately 1.8 miles to the southwest of the Well 22 site (Figure 1). Clover Creek is closed to further appropriation as per WAC 173-512-030. The creek is fed from surface runoff and discharges from aquifer A1. Aquifer A3 may also have indirect discharges to seeps where the unit is exposed at land surface, but these are expected to be intermittent as the average water levels in the aquifer are below land surface in most places. In some locations, the upper portions of aquifer A3 in the Firgrove area are often dry, which has the effect of making aquifer A1 perched.

In the Firgrove area, effects to Clover Creek from increased withdrawals in aquifer C will occur as indirect leakage through the overlying layers (where aquifer A1 is not present or is perched). However, such leakage is spread out both in location and over time making the response regional in scope rather than localized to a nearby stream reach. At this regional level, the Mutual's annual production will not be increased, the leakage effects as related to the discharges to surface water are not expected to change.

To investigate the natural interrelationship between ground and surface waters, and potential harmful impacts or impairment to other users and surface water bodies at the more local level, Robinson Noble completed an analysis using the USGS numerical flow model (Johnson and others, 2011). The analysis compared modeled discharges to Maplewood Springs (Puyallup River Basin – WRIA 10) and Clover Creek (Chambers-Clover Creek Basin – WRIA 12) before and after moving the  $Q_i$ . The modeling was performed first as a baseline case where each of the well was producing its allocated  $Q_i$  total and a second predictive run where the  $Q_i$  values were adjusted from the baseline by the amounts proposed under the application.

All wells for all stress periods were run at their USGS-assigned production rates except for the three Firgrove wells in question (Wells 7, 16, and 22), and their rates were only changed for the two time periods investigated. The two time periods investigated for the shift in  $Q_i$  were a 31-day period (July)

and a 3-month period (July through September), run separately as different simulations. These time periods were selected to represent the period of highest production and also the driest time of year where impacts on surface water might be the greatest. Thus, the simulations represent a conservative approach to looking for impacts. An additional run was made to describe full use of the requested annual quantity of 110 afy at Well 22 as compared to use at Well 16. Production was spread over the year, with the majority of use occurring during the summer, peak season of July through September. The simulations found changes in surface water flow, both positive and negative, of less than 0.02%.

While the USGS does not specifically address the model accuracy limit in their report (Johnson and others, 2011) an accuracy limit can be estimated based on other, similar modeling studies. The City of Yelm, for its recent water right mitigation plan, considered model-predicted depletions of one percent or less of the total groundwater flow rate at a surface water body to be beyond the accuracy limit of the numerical model used. The model used by Yelm was the McAllister Groundwater Model (originally developed for the City of Olympia in 2002 by CDM, updated in 2006 by Golder, and again in 2011 by Shannon and Wilson), which is of an approximately similar size and scope as the Chambers-Clover Creek Watershed model used here. Thus, if model-predicted depletions result in changes that are less than 1% of the model-defined groundwater contribution to the flow for each particular stream reach for every stress period, the change is within the model's error bound and is not considered a sufficient scientific basis to conclude harmful impact or impairment to surface waters.

Based on the results of simulations using the USGS model, it appears that the non-additive shift of up to 300 gpm Qi and 110 afy to Well 22 from Well 16 and Well 7 will not have impacts greater than modeling error on either Clover Creek or Maplewood Springs and Clarks Creek. These results indicate that in the field, the non-additive shift of production will essentially have no effect on surface water, and consequently will pose no harmful impact or impairment. These results make sense considering the small distance between wells compared to the large distance to the streams, and the production shift – in one case, not changing aquifers or, in the second case, coming from a deeper aquifer.

## Water Availability

For water to be available for appropriation, it must be both physically and legally available.

### ***Physical Availability***

For water to be physically available for appropriation there must be ground or surface water present in quantities and quality and on a sufficiently frequent basis to provide a reasonably reliable source for the requested beneficial use or uses. In addition, the following factors are considered:

- Volume of water represented by senior water rights, including federal or tribal reserved rights or claims;
  - Water right claims registered under Chapter 90.14 RCW;
  - Ground water uses established in accordance with Chapter 90.44 RCW, including those that are exempt from the requirement to obtain a permit; and
  - Potential riparian water rights, including non-diversionary stock water.
- Lack of data indicating water usage can also be a consideration in determining water availability, if the department cannot ascertain the extent to which existing rights are consistently utilized and cannot affirmatively find that water is available for further appropriation.

The source aquifers at Wells 7, 16, and 22 have been tested at rates higher than currently produced from each of the wells. The testing demonstrates the capability of the aquifers to support the intended pumping rates.

### ***Legal Availability***

To determine whether water is legally available for appropriation, the following factors are considered:

- Regional water management plans – which may specifically close certain water bodies to further appropriation.
- Existing rights – which may already appropriate physically available water.
- Fisheries and other instream uses (e.g., recreation and navigation). Instream needs, including instream and base flows set by regulation. Water is not available for out of stream uses where further reducing the flow level of surface water would be detrimental to existing fishery resources.
- The Department may deny an application for a new appropriation in a drainage where adjudicated rights exceed the average low flow supply, even if the prior rights are not presently being exercised. Water would not become available for appropriation until existing rights are relinquished for non-use by state proceedings.

The Mutual's permitted and certificated water rights qualify as municipal purpose water rights. There is no expansion of the existing additive instantaneous and annual quantities of these authorized rights under the Mutual's application. The addition of this permit to provide (non-additive) instantaneous and annual production flexibility represents a no-net-change condition to existing groundwater flow conditions and will pose no harmful impact or impairment to surface waters. Therefore, the water is legally available.

### **Beneficial Use**

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The proposed use of water is defined in statute as a beneficial use (RCW 90.54.020(1)).

### **Public Interest Considerations**

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RCW 90.03.290 requires that a proposed appropriation not be detrimental to the public interest. Firgrove Mutual is a designated water purveyor for this area. The Mutual's Water System Plan, dated January 2013, was approved by the Washington Department of Health on January 13, 2013 and addresses future service to customers in the Mutual's service.

RCW 90.54 (Water Resources Act of 1971) provides the most comprehensive list of legislative policies that guide the consolidation of public interest in the allocation of water. These policies generally require a balancing of the state's natural resources and values with the state's economic wellbeing. Specifically, the policies require allocation of water in a manner that preserves instream resources, protects the quality of water, provides adequate and safe supplies of water to serve public need, and makes water available to support the economic wellbeing of the state and its citizens. Therefore, this proposed appropriation is not detrimental to the public interest.

No protests were received by Ecology.

## Conclusions

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In accordance with Chapter 90.03 RCW, I conclude that:

- The water is physically and legally available for appropriation,
- The water will serve a beneficial use,
- The withdrawal will not cause impairment of existing rights, and
- The proposed use is not detrimental to the public interest.

## RECOMMENDATIONS

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

### Purpose of Use and Authorized Quantities

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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:

300 gpm

110 acre-feet, non-additive

Municipal Supply Purposes

#### ***Point of Withdrawal***

SW¼, SE¼ of Section 17, Township 19N, Range 04 East, Willamette Meridian

#### ***Place of Use***

As described on Page 1.

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

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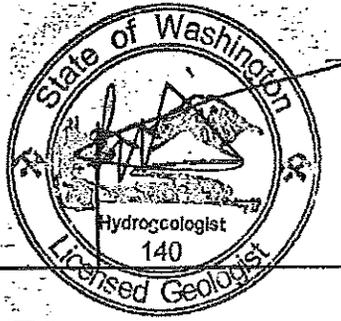
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Reported by:

Report Writer

Date

10/15/2015

BURT G. CLOTHIER

Reported by:

Hydrogeologist

Date

Reviewed by:

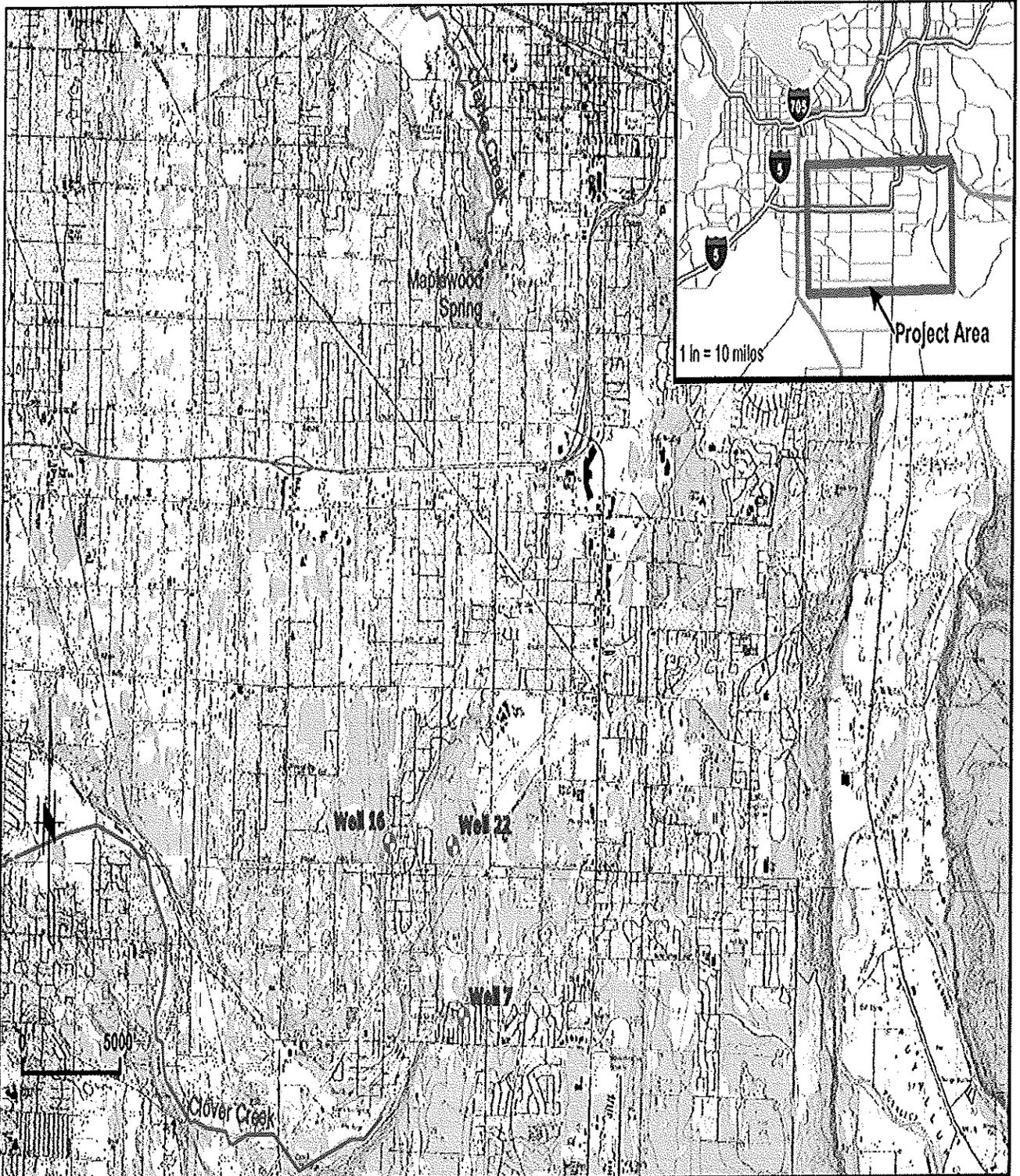
Tammy Hall, Water Resources Program

Date

10/15/2015

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 <b>ROBINSON NOBLE</b>	Note: Basemap from USGS Puyallup and Frederickson Quadrangles	PM: BGC August 2015 1299-0168	Pierce County T 19 NR 04 E Scale 1" = 5000'	<b>Figure 1</b> <b>Well Location Map</b> Firgrove Mutual Water Company: Water Right Support, Well 22
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