File No. G2-30614
WAC Doc ID: 5604506

DEPARTMENT OF ECOLOGY
State of Washington

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

| PRIORITY DATE | APPLICATION NUMBER |
|---|---|
| February 7, 2013 | G2-30614 |

| MAILING ADDRESS | SITE ADDRESS (IF DIFFERENT) |
|---|---|
| PanAmerican Berry Growers (Ty Powell)<br>212 Klickitat Creek Road<br>Mossyrock, WA 98564 | |

## Quantity Authorized for Withdrawal or Diversion

| DIVERSION RATE | UNITS | ANNUAL QUANTITY (AF/YR) |
|---|---|---|
| 450 additive and 700 non-additive | gpm | 267.5 additive and 270 non-additive |

## Purpose

| PURPOSE | WITHDRAWAL OR DIVERSION RATE | | | ANNUAL QUANTITY (AF/YR) | | PERIOD OF USE (mm/dd) |
|---|---|---|---|---|---|---|
| | ADDITIVE | NON-ADDITIVE | UNITS | ADDITIVE | NON-ADDITIVE | |
| Irrigation (76.5 acres) | 450 | 700 | gpm | **157.5** | 270 | April 1 to Oct. 1 |
| Frost control, crop cooling, chemigation, and farm operations | same | 0 | | **110** | 0 | Year-round, as needed |

## Source Location

| WATERBODY | TRIBUTARY TO | COUNTY | WATER RESOURCE INVENTORY AREA |
|---|---|---|---|
| Klickitat Prairie Aquifer | Cowlitz River | Lewis | 26 |

| SOURCE FACILITY/DEVICE | PARCEL | TWN | RNG | SEC | QQ Q | LATITUDE | LONGITUDE |
|---|---|---|---|---|---|---|---|
| Proposed Well #6 | 02845013002 | 12N | 2E | 10 | N 2/3 SE ¼ | TBD | TBD |
| | 02845013002 | 12N | 2E | 11 | N 2/3 W 1/2 W1/2 SW1/4 | TBD | TBD |

Datum: WGS84

## Place of Use (See Map, Attachment 1)

PARCELS

028505002000, 028485013002, 028482002000, and 028489001002

LEGAL DESCRIPTION OF AUTHORIZED PLACE OF USE

135 acres of the 144.5 acres of parcel 028505002000, in Section 11, Township 12 North, Range 2 East W.M., the north 2080 feet of the east 880 feet of the E.L. Busey D.L.C. No. 37; less roads and 52 acres of the 52.54 acre parcel 028485013002, in Section 10, Township 12 North, Range 2 E. PT Busey DLC SE and Section 11 W ½ SW ¼ Lot 2 Short plat 98121 3293143, and 9.68 acres of Parcel 028482002000, in Section 10, Township 12 North, Range 2 E, West 453.75' East 1787.50' South 997.92 Busey DLC Sections 10 and 11 Except the South 156' West 140' and Co RD, and 14.82 acres of the 15.84 acres of Parcel 028489001002, in Section 11, Township 12 North, Range 2 E, SW ¼, NE ¼ East state property except the North 100'

## Proposed Works

A proposed well supplying expanded irrigation system. New well to be designated as Well 6. The new well will be constructed with variable speed pumps and capable of changing the flow. Wells 1 and 2 are authorized for use consistent with the **Mitigation and Monitoring Plan** and the discussion in this ROE. Additional wells may be constructed subject to the provisions of this recommended approval, and within the Potential Point-of-Withdrawal Area for New Well as identified in Attachment 1.

## Development Schedule

| BEGIN PROJECT | COMPLETE PROJECT | PUT WATER TO FULL USE |
|---|---|---|
| Started | Sept. 1, 2020 | Sept. 1, 2022 |

## Measurement of Water Use

| | |
|---|---|
| How often must water use be measured? | Monthly |
| How often must water use data be reported to Ecology? | Annually (Jan 31) |
| What volume should be reported? | Total Annual Volume |
| What rate should be reported? | Annual Peak Rate of Withdrawal (gpm) |

## Provisions

**Subject to Regulation**

The issuance of this permit is subject to regulation in favor of senior water rights held by the Washington Department of Fish and Wildlife (WDFW) at their Mossyrock Hatchery facility.

**Subject to Mitigation and Monitoring Plan**

The issuance of this permit is subject to compliance with a Department of Ecology approved Mitigation and Monitoring Plan. This plan envisions that mitigation for impacts to existing rights held by the Washington Department of Fish and Wildlife (WDFW) at their Mossyrock Hatchery facility will be provided by shifting PanAmerican pumping exercised under existing rights away from the hatchery water supply sources (springs). The plan provides that once the proposed new PanAmerican well has been constructed and tested that the model developed by a licensed hydrogeologist for the processing of the application will be revised and used to define the ratio of the compensating shift in production

and that the compensation must be defined so as to result in zero net impact at the Hatchery Spring. Once the new well has been constructed and tested PanAmerican will provide Ecology with that analysis, accompanied by a report that details the construction and testing of the new well.

A report of pumping from all wells with a narrative description of mitigation offsets will be submitted to Ecology every two years in January during the permit phase with the first report due on January 15, 2016. A similar report will be provided to Ecology every 5 years once the right is certificated, to be revisited by mutual consent of Ecology and PanAmerican. WDFW has been consulted and concurs with this approach. WDFW retains their senior water right at the Mossyrock Hatchery and this does not relieve Pan American Berry Growers from potential impairment challenges that may need to be addressed in the future.

**Operating Authorization**
Under the terms of PanAmerican's Mitigation and Monitoring Plan withdrawals from Wells 1 and 2 will be shifted to Well 6 such that withdrawals under this permit do not reduce the discharge of water at the Mossyrock Hatchery facility.

When pumping from all 3 wells, the total shall not exceed 1150 GPM and the existing wells (Well 1 and 2) shall not exceed 250 GPM and 450 GPM, respectively. Total withdrawals from Well 6 will not exceed 1,150 gpm and 537.5 acre-feet per year less any water produced at Wells 1 and 2. In conjunction with the Mitigation and Monitoring Plan water may be distributed anywhere on the property.

**Construction of Additional Wells**
Additional wells may be constructed to the extent they are in compliance with RCW 90.44.100 AND located within the area designated on Figure 1. New sources must be tested and mitigation requirements calibrated as addressed in the Mitigation and Monitoring Plan.

**Measurements, Monitoring, Metering and Reporting**
An approved measuring device shall 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, 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 Southwest Regional Office. If you do not have Internet access, you can still submit hard copies by contacting the Southwest Regional Office for forms to submit your water use data.

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

**Proof of Appropriation**
The water right holder shall 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 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, shall have access at reasonable times, to the project location, and to inspect at reasonable times, records of water use, Wells, diversions, measuring devices and associated distribution systems for compliance with water law.

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

Therefore, I ORDER approval of Application No. G2-30614, 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.

| Street Addresses | Mailing Addresses |
|---|---|
| **Department of Ecology**<br>Attn: Appeals Processing Desk<br>300 Desmond Drive SE<br>Lacey, WA 98503<br><br>**Pollution Control Hearings Board**<br>111 Israel RD SW STE 301<br>Tumwater, WA 98501 | **Department of Ecology**<br>Attn: Appeals Processing Desk<br>PO Box 47608<br>Olympia, WA 98504-7608<br><br>**Pollution Control Hearings Board**<br>PO Box 40903<br>Olympia, WA 98504-0903 |

Signed at Olympia, Washington, this 27th day of February 2014.

Michael J. Gallagher

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

Report of Examination
Prepared by Jill Van Hulle, Pacific Groundwater Group

**BACKGROUND**

On February 7, 2013 Ty Powell of PanAmerican Berry Growers filed an Application for Water Right Permit with the State Department of Ecology. The project site is PanAmerican's farming operation located near Mossyrock, Washington, in the Cowlitz River Watershed Inventory Area (WRIA 26). PanAmerican requested a water-right permit for:

- an additional 450 gallons per minute (gpm) that, when combined with other water rights, will allow for the withdrawal of 1,150 gpm, and
- an additional annual allocation of 270 afy or adequate water to supply their expanded farming demands.

This application has been processed under Ecology's Cost Reimbursement Program. Pacific Groundwater Group (PGG) prepared this report under contract to Ecology. PGG reviewed all available documents pertaining to this and other related Applications for Water Right, including site conditions, hydrogeological considerations, historical water use, and standing of water rights and applications.

Under the provisions of RCW 90.03.290 and 90.44, a water right may be issued upon findings that water is available for appropriation for a beneficial use, and that the appropriation will not impair existing rights or be detrimental to the public welfare. In accordance with these provisions, subject to the recommendations of this report, I recommend issuance of Permit G2-30614.

**Project Description**

**Table 1**
Summary of Application No. G2-30614

| *Attributes* | *Proposed* |
|---|---|
| Applicant | PanAmerican Berry Growers |
| Application Received | February 7, 2013 |
| Instantaneous Quantity | 450 gpm additive and 700 gpm non additive |
| Source | 2 existing and one proposed well screened in the Mossyrock Aquifer |
| Purpose of Use | Irrigation, frost control, crop cooling, chemigation, and farm operations |
| Period of Use | Year-round, as needed |
| Place of Use | See Page 1 |

**Legal Requirements for Application Processing**

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

- Public Notice

A public notice of the proposed appropriation was published in The Chronicle (Centralia) on March 21 and 26, 2013. No protests were received as a result of this notice.

- 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 feet 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 gpm.
- 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.

None of these situations applied to this application.

- Water Resources Statutes and Case Law

Under the provisions of RCW 90.03.290 and 90.44.050, a water right shall be issued upon findings that water is available for appropriation for a beneficial use and that the appropriation, as proposed in the application, will not impair existing rights or be detrimental to the public welfare.

This application has been processed under Ecology's Cost Reimbursement Program. Based on the provisions of RCW 43.21A.690 and RCW 90.03.265, Pacific Groundwater Group (PGG) prepared this report under contract to Ecology.

**INVESTIGATION**

Evaluation of this application included, but was not limited to, research and/or review of the following:

- Department of Ecology records of surface and ground water rights and claims, and Well construction reports within the vicinity of the subject production Wells.

- Documents and reports applicable to the area, including:

- Letter Report on Inspection and Testing of Anderson Farm Wells, Robinson & Noble, March 23, 2005.
- PanAmerican Berry Growers Mossyrock Farm Aquifer Testing, Mossyrock, Washington, Robinson & Noble, July 2013.
- PanAmerican Berry Growers Mossyrock Farm Application for New Water Right G2-30614, Phase 1 Water Right Assessment, Robinson & Noble, February, 2013.
- Technical Memorandum, PanAmerican Berry Growers Mossyrock Farm Groundwater Modeling Discussion, Robinson & Noble, Dember, 5, 2013.
- Geology of dam sites in southwestern Washington; Part II- Miscellaneous dam sites on the Cowlitz River above Castle Rock, and the Tilton River, Washington U.S. Geological Survey Open-File Report 51-27, 314 p., 18, 1951.
- Grays-Elochoman and Cowlitz Watershed Management Plan, WRIAs 25 and 26, LCFRB, July, 2006.

- A field visit conducted on July 3, 2013, by Jill Van Hulle and Linton Wildrick of Pacific Groundwater Group.

**Project Description**

The project site is PanAmerican's Mossyrock Farm in Lewis County, WA, near the community of Mossyrock and on the south side of Mayfield Lake. The 160-acre farm is the largest blueberry farm in southwest Washington and produces over 1 million pounds of berries each summer. The farm is located in Section 11, Township 12 North, Range 2 East, just north of US Highway 12. PanAmerican currently farms 135 acres and is pursuing the addition of another 78 acres.

Current water uses for PanAmerican's operations are authorized by the following water rights:

- G2-09219 authorizes the withdrawal of 250 gpm and 70 acre-feet per year (afy) from Wells 1 and 2 for irrigation and frost control of 35 acres. The period of use is April 15 to October 15$^{th}$.

- G2-21724 authorizes the withdrawal of 450 gpm and 200 afy, also from Wells 1 and 2, for irrigation and frost control of 100 acres. The period of use is April 15 to October 15$^{th}$.

Additionally, PanAmerican owns property to the south and irrigates it under the authority of GWC 1293 that was issued to E. Blaisdell for the irrigation of 30 acres.

Application G2-30614 was filed by PanAmerican for 1,150 gpm and 533 afy. The original intent of the filing was to secure authorization for withdrawals from all three wells for a single place of use. Although the two existing wells are authorized by both of the existing water rights, the requested application was for a permit that would have provided additional flexibility to shift withdrawals between sources. Some of this flexibility to shift pumping between sources as been authorized and is addressed in the section entitled Quantities for Permit.

During the subject investigation, PGG found that increasing withdrawals from the existing wells might result in diminished discharges to the springs that supply WDFW's Mossyrock Trout Hatchery. The

springs are located less than one-half mile northeast of PanAmerican's current irrigation wells, on the bluff above Mayfield Lake.

In response to this finding, the application was modified to reflect withdrawals from a proposed new well, and a more specific well site was selected so as to minimize the risk of impacts to hatchery operations. The new well has been designated by PanAmerican as Well 6. PanAmerican has proposed a mitigation approach to address impacts to the spring that supplies WDFW's Mossyrock Hatchery. PanAmerican has proposed to construct Well 6 approximately 2,000 feet northwest from Well 1, with the intent of minimizing direct impacts to the WDFW springs. Additional wells may be constructed as needed to the extent they comply with the Showing of Compliance provisions of RCW 90.03.100.

**Site Description**

The Mayfield Lake 7.5 Minute topographic quadrangle map indicates that PanAmerican's Mossyrock Farm occupies a relatively flat upland terrace at an elevation approximately 580 to 600 feet above sea level and 150 to 170 feet above the level of Mayfield Lake.

Water supply for the operation is currently supplied by Wells 1 and 2. The wells are 110 and 125 feet deep and produce water from a zone at depths between 100 and 120 feet below land surface, respectively. Static water levels are about 80 feet below land surface. Specific capacities of 12 gpm/ft and 34 gpm/ft, respectively, were measured by Robinson and Noble in 2005 during testing of the wells. The transmissivity of the aquifer is estimated to be 5,300 $ft^2/d$ (40,000 gpd/ft) or greater.

**Aquifer Characterization and Site Hydrogeological Conditions**

The project site is situated along the south bank of Lake Mayfield on a terrace referred to as Klickitat Prairie. In addition, the project site is located at the western and downgradient end of the Mossyrock Aquifer, an approximately six-mile by one-mile water bearing unit situated beneath the Klickitat Prairie.

The geology and hydrogeology of the site are described in Water Supply Bulletin 17, *Geology and Ground-water Resources of West Central Lewis County, Washington* (Foxworthy, 1962) and *Geology of Dam Sites in Southwestern Washington, Part II - Miscellaneous Dam Sites on the Cowlitz River above Castle Rock and the Tilton River, Washington*. U. S. Geological Survey Open-File Report 51-27 (Erdmann and Bateman, Jr., 1951).

Summaries of the geology are also presented in the documents entitled "Inspection and Testing of Anderson Farm Wells", Letter from Robinson Noble to Rod Cook, PanAmerican Berry Growers (Robinson Noble & Saltbush, March 23, 2005) and "PanAmerican Berry Growers, Mossyrock Farm, Application for New Water Right G2-30614, Phase 1 Water Right Assessment (Robinson Noble, 2012).

The geology in the vicinity of the PanAmerican wells consists of unconsolidated deposits associated with the Cowlitz River, including terrace deposits, and perhaps, morainal glacial and lahar (mudflow) deposits. These sediments are described in well logs as a complex mixture of clay-rich gravel, sand, and sand and gravel. This is typical of the terrace deposits and morainal deposits described in Foxworthy (1962).

Regional groundwater flow is expected to be northward through the terrace deposits toward discharge along the bluff above Mayfield Lake, with a possible down-valley bias to the west. The groundwater flow system was impacted by the creation of the lake when Mayfield Dam was built in the early 1960's. Because the outflow from the lake is regulated under the FERC license for the operation of the power plant and spills from the dam, the system is no longer a strictly natural flow system – this makes the setting unique in a regulatory sense.

**Cost-Reimbursement and Priority Processing**

RCW 90.03.265(2) provides that, in pursuing a cost-reimbursement project, the Department of Ecology must determine the source of water from which the water is proposed to be diverted or withdrawn, and determine if other water right applications are pending from the same source. A water source may include surface water, groundwater, or surface and groundwater together. Ecology bases these interpretations, in part, on a review of technical information submitted by the applicant.

RCW 90.03.265(1)(b) provides that the requirement for an applicant to pay for the processing of senior applications does not apply in situations where it can be determined that the water allocated to one party will not diminish the water available to a senior applicant from the same source of supply.

The nearest pending water-right application G2-29073, was submitted by DeGoede Bulb Farm on July 7, 1994, for a permit to pump up to 300 gpm, for the irrigation of 135 acres from 3 existing wells. DeGoede's wells are approximately 130 feet deep and are currently in use under previously issued water rights; approximately 250 acres are irrigated intermittently, with approximately 150 acres being irrigated at any one time. Accordingly, DeGoede Bulbs appears to be operating within the constraints of their existing water rights and has not needed to aggressively pursue additional water rights.

DeGoede and PanAmerican share the same aquifer (source of supply) and have done so for a number of years without apparent impairment of one another. If impairment occurs, PanAmerican's permit would be subject to regulation in favor of DeGoede's filing, because DeGoede's application is senior to PanAmerican's application. For the purposes of this Cost Reimbursement Agreement, Ecology has interpreted that, because PanAmerican's application will not directly limit the amount of water available for DeGoede, the application can be processed prior to other pending applications. Additionally, DeGoede Farms filed a letter with Ecology indicating that they do not object to their application being skipped in processing order.

**Four Statutory Tests**

This Report of Examination (ROE) evaluates the application based on the information presented above. To approve the application, Ecology must issue written findings of fact and determine that each of the following four requirements of RCW 90.03.290 has been satisfied:

1. The proposed appropriation would be put to a beneficial use;
2. Water is available for appropriation;
3. The proposed appropriation would not impair existing water rights; and
4. The proposed appropriation would not be detrimental to the public welfare.

## Beneficial Use

According to RCW 90.14.031, irrigation is considered a beneficial use of water.

## Availability

Water is available for appropriation. The targeted aquifer is capable of supporting the additional withdrawals requested. The quantity appropriated reflects the amount needed to meet the needs of the applicant's intended use. Water is therefore judged to be available for appropriation under existing Ecology regulations.

### Potential for Impairment

The approval of this application must not impair existing rights. A review of Ecology records indicates that seventeen water-right certificates are located within approximately a one-mile radius of PanAmerican's proposed Well 6, including two owned by PanAmerican (registered under Anderson Berry Farms). Based on an evaluation of information collected during pumping tests, groundwater modeling, and our conceptual understanding of the groundwater flow system in the vicinity, we believe that the proposed ground-water withdrawal will reduce the flow to springs that supply the Mossyrock Hatchery. In response to this finding, PanAmerican Farms has submitted a Mitigation Plan that is designed to minimize impacts at the hatchery.

1. **Potential for Impairment to Senior Water Rights**

Ecology's Water Right Tracking System indicates that several groundwater rights have been issued in the vicinity of PanAmerican's proposed Well 6. Table 2 lists water rights that have been issued within an approximate 1-mile radius of the subject application. The nearest large water user is DeGoede Bulb Farms, located approximately ¼ mile southwest of PanAmerican Berry Growers' property. DeGoede Bulbs holds Ground Water Certificates G2-21825 and G2-25742 that allow the irrigation of 140 acres. Furthermore, DeGoede filed application G2-29073 in 1996 for additional water rights, which is pending.

During the initial assessment , PGG identified a nearby senior surface-water right that is held by the Washington Department of Fish and Wildlife (WDFW) and likely would be impaired by PanAmerican's requested new allocation. The springs that serve WDFW's Mossyrock Hatchery are located above Mayfield Lake, along the bluff forming the northern edge of PanAmerican's fields and approximately 1,000 feet north of the Mossyrock Farm's current irrigation wells. WDFW requested an assessment of the potential springflow capture by the new water right.

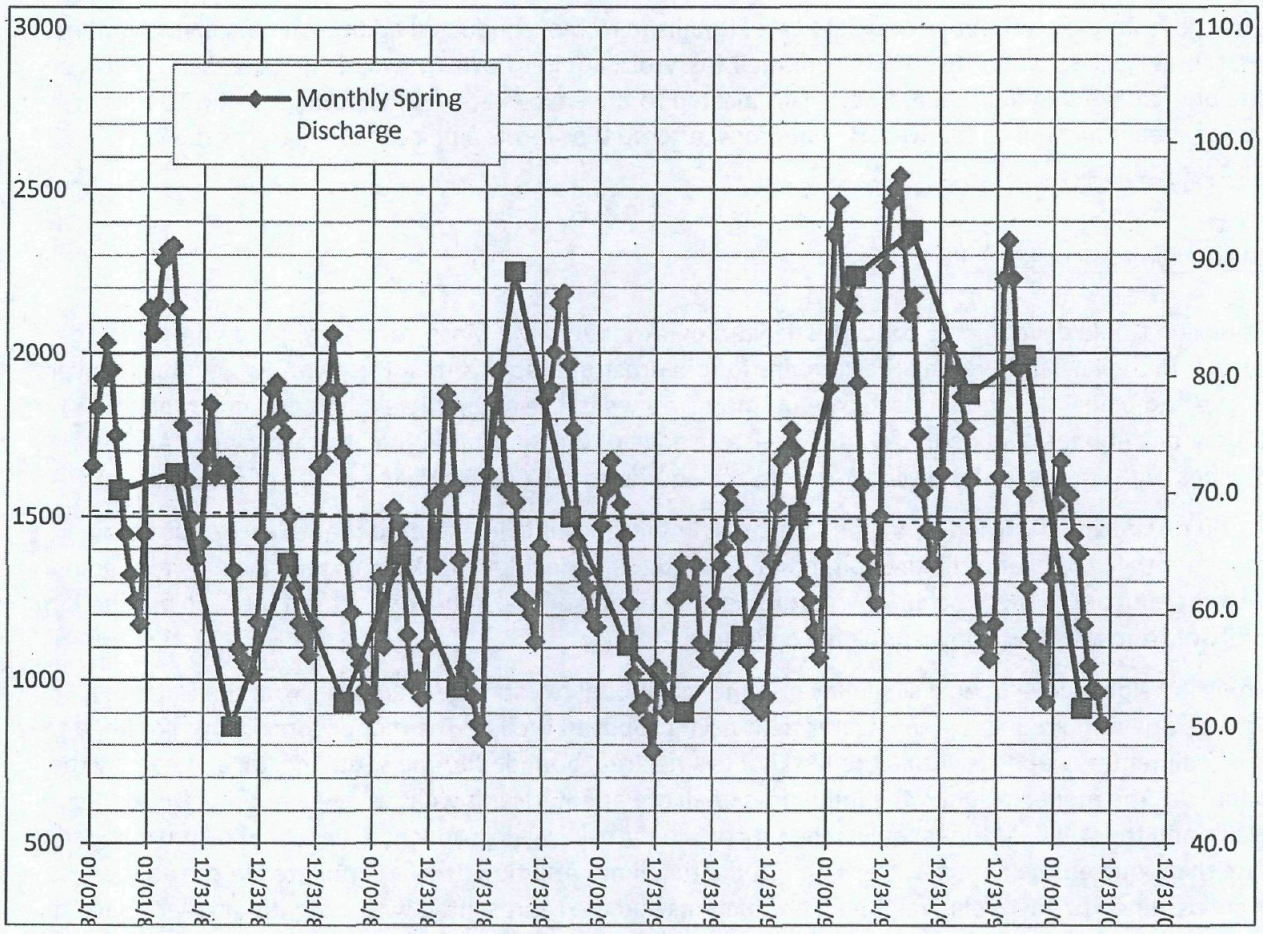
Although there have been no reports of interference between groundwater users on the Klickitat Prairie, it appears that the operations of irrigation wells correlates with decreased springflow at the Department of Fish and Wildlife's Mossyrock Trout Hatchery. Water use at the hatchery is authorized by two surface-water rights, SWC 2136 and SWC 2137, as modified by *Certificates of Change S2-CV2P674* and *S2-CV2P675,* respectively. The certificates authorize a total diversion of 3.8 cfs from springs that emerge from the hillside directly down gradient from PanAmerican's wells.

Table 2 – Water Rights Within 1-mile Radius of PanAmerican Berry Growers.

| WR # | Name | Date | Use | GPM | CFS | Qa (afy) | # Acres | TRS | QQ/Q | Sources |
|---|---|---|---|---|---|---|---|---|---|---|
| S2-22158 | Gordon Stark | 04/09/1974 | ST,IR | | 0.05 | 3.5 | 1 | 12N 2E 2 | | Unnamed Spring |
| G2-01106 | WA Parks & Rec. | 09/30/1969 | DM | 150 | | 17 | | 12N 2E 2 | SW/NW | Well |
| 3866 | WDFW | 02/04/1960 | FR,DS | 25 | | 40 | | 12N 2E 2 | | Well |
| G2-21724 | Anderson Berries | 12/10/1973 | IR | 450 | | 200 | 100 | 12N 2E 11 | | Well |
| 6268 | Anderson Berries | 02/14/1968 | IR,FP | 250 | | 70 | 35 | 12N 2E 11 | | Well |
| S2-CV2P674 (2136) | City of Tacoma | 06/05/1940 | FS | | 0.3 | | | 12N 2E 11 | SW/NE | Unnamed Spring |
| S2-CV2P675 (2137) | City of Tacoma | 06/06/1940 | FS | | 3.5 | | | 12N 2E 11 | | Unnamed Spring |
| S2-00359 | Vincent Flanning | 09/16/1971 | ST,IR | | 0.44 | 49.5 | 20 | 12N 2E 12 | NW/SE | Unnamed Spring |
| G2-25742G | DeGoede Bulb Farm | 11/06/1980 | IR | 200 | | 200 | 100 | 12N 2E 13 | NW/NW | Well |
| G2-25513G | Ned Rankin | 03/07/1980 | IR,DS | 10 | | 3 | 1 | 12N 2E 13 | SE/SE | Well |
| 2356 | N.A. Aldrich | 02/02/1953 | IR | 200 | | 120 | 59 | 12N 2E 13 | NE/NW | Well |
| G2-28651 | City of Mossyrock | 10/29/1992 | MU | 200 | | 143.6 | | 12N 2E 13 | | Well |
| G2-21825 | DeGoede Bulb Farm | 1106/1980 | IR | 150 | | 80 | 40 | 12N 2E 13 | NW/NW | Well |
| G2-CV3P1171 (6340) | City of Mossyrock | 01/24/1968 | MU | 200 | | 145.6 | | 12N 2E 13 | SE/NE | Well |
| G2-21545 | Glen Schwartz | 10/12/1973 | IR,DS | 72 | | 46 | 30 | 12N 2E 14 | NW/NE | Well |
| 4477 | W. Osborne | 11/16/1961 | ST,IR | 600 | | 200 | 100 | 12N 2E 14 | | Well |
| 1293 | E. Blaisdell | 08/31/1951 | | 225 | IR | 60 | 30 | 12N 2E 14 | NW/NE | Well |
| *G2-30614* | *PanAmerican Berry Growers* | *02/07/2013* | | *450* | *IR,FP* | *263* | *211.5* | *12N 2E 11* | *SW/SE* | *Well 2* |
| *G2-29073* | *DeGoede Bulb Farm* | *07/07/1994* | | *300* | *IR* | | *135* | *12N 2E 14* | | Well |

Linton Wildrick and Jill Van Hulle visited with Tim Summers, manager for the Mossyrock Trout Hatchery, on July 3, 2013 and discussed water supply. Three large spring sources are tapped by the hatchery. The springs are collected in a series of vaults and gravity fed via a single pipeline to the hatchery. Water is used for incubation and in the rearing raceways, with all discharge routed to Lake Mayfield. The facility produces resident trout, as well as steelhead from fish stock native to the Kalama River. The facility is configured with an alarm system to indicate when flow from the spring-fed distribution system becomes too low. The water supply is most critical in March and April, and, for the most part, the facility has been able to adapt their operations to take advantage of whatever water is available from the springs. Water is however, needed year-round and all spring discharge is used for either incubation or rearing in the series of outdoor raceways.

PGG obtained water-use records for the total flow through the Mossyrock Hatchery from its manager, Tim Summers. The flow data is obtained by reading a staff gage attached to a sharp-crested weir. The gage likely underestimates the flow rate slightly because the staff gage is not mounted the recommended distance upstream of the weir's lip. The gage is read weekly. The following graph covers the period 1983 through 1999; more recent data have been collected but were not available.




Note on the graph that the monthly discharge and annual precipitation show an approximate correlation; however, the trendline for the monthly spring discharge shows a very slight long-term decline, whereas the annual precipitation shows a 20 to 25% increase for the same period.

The lack of similar trends may indicate that increasing groundwater withdrawals are reducing springflow. On the other hand, water-level measurements in one of PanAmerican's wells indicates that there has been no long-term decline in head suggesting long-term stability of the groundwater flow system that feeds the springs. There are several other possible explanations for the lack of correlation between precipitation and spring discharge:

- Deterioration of the Hatchery's piping system may be causing a progressive increase in leakage.
- Increased groundwater recharge resulting from increasing annual precipitation may be compensating for seasonal groundwater depletion due to pumping.
- Groundwater recharge through the surficial fine-grained weathered soil and glacial till may be relatively steady, while surface runoff carries off any excess precipitation.

In order to better assess the movement of groundwater on the Klickitat Prairie, and specifically to evaluate how additional groundwater withdrawals may affect the discharge of several large springs that

emerge from the bluff above Mayfield Lake, Robinson Noble, conducted additional field investigations that found groundwater discharge from the Mossyrock aquifer flows to two distinct areas of springs on the bluff above Mayfield Lake. One area is located to the east where WDFW springs occur. The other spring area is located to the west of a bedrock outcrop that forms a point that separates the two discharge areas.

Groundwater Flow Model

Robinson Noble developed a conceptual hydrologic model of the Mossyrock area. The hydrogeologic system in the Klickitat Prairie area contains four hydrostratigraphic units. These are two confining layers above and below the aquifer used by PanAmerican's wells, the aquifer itself, herein named the Mossyrock Aquifer, and bedrock. At the eastern edge of the Klickitat Prairie, the Mossyrock Aquifer pinches out. Groundwater discharges from the aquifer to the Cowlitz Valley and Mayfield Lake.

Based on precipitation and spring flow records, Robinson Noble interpreted that there is a three- to four-month lag between the precipitation peak and the spring flow peaks. This time lag may also help decrease impact to the hatchery's water use as the period of maximum effect from the well production is offset from the typical low spring flow period.

Robinson Noble developed a single-layer numerical model to estimate "capture" from the Hatchery Springs due to pumping the new water right from proposed Well 6. The model domain was confined to the sedimentary deposits within the Klickitat Prairie area, bounded to the south, north, and east by the bedrock. The model included the influences of all of PanAmerican's wells, the neighboring DeGoede wells, and the wellfield that supplies the City of Mossyrock. Well production was set at a constant daily rate that equaled the annual water right production limit. Additional wells completed in the aquifer were assumed to have relatively small productions and are represented with a slightly smaller recharge.

Predictive modeling was completed with a transient version of the steady-state model that was run for a period of one year with one stress period per month.

Mitigation and Monitoring Plan

The model estimated capture indicates that the new water right can be mitigated by locating the new well(s) on the northwestern corner of the farm and by the shifting 50% of the current production from the farm's Wells 1 and 2 to the new well(s), where capture will be focused on the western springs. This discharge configuration and the underlying geologic conditions make it advantageous to produce water from well(s) situated in the northwest portion of the farm expansion property as close to the north bluff as is practical.

The new water right should be conditioned such that any potential capture due to the new allocation must be compensated for by shifting a suitable amount of the existing production from Wells 1 and 2 to the new well(s). Because farm demands are not constant through the year, this will be accomplished by using the model to estimate the ratio of the amount of old-right production that must be shifted to compensate for a given new-right production. Upon completion of the new well or wells, the model will be revised to reflect the new information generated from drilling and testing and run to reflect the new

well location. This will assure that there is no net impact at the WDFW Hatchery Springs as a result of the issuance of the new right.

PanAmerican Berry Growers agreed to use the model to define the appropriate level of shift in production of its existing water rights to its new well(s) and to make the necessary production shifts to compensate for the effects of new-water-right production at the Hatchery Springs. New-right production and the compensating old-right production shift will be monitored by PanAmerican and reported to Ecology every two years while in permit and, once the certificate is issued, will be provided every 5 years, or until modified with Ecology's concurrence. WDFW has been consulted and concurs with this approach. WDFW retains their senior water right at the Mossyrock Hatchery and this does not relieve Pan American Berry Growers from potential impairment challenges that may need to be addressed in the future.

**2. Potential for Surface-Water Impairment**

The most significant surface-water body in the vicinity is the Lake Mayfield impoundment of the Cowlitz River. Based on evaluation of the groundwater flow system, it appears that PanAmerican's wells draw water from a confined aquifer whose base lies at an elevation above Lake Mayfield. Therefore, pumping from proposed Well 6 will capture groundwater that will discharge into Lake Mayfield but cannot capture water directly from the lake.

Three major hydroelectric projects have been constructed on the mainstem Cowlitz River. The lowest is Mayfield Dam (RM 52.0), followed by Mossyrock Dam (RM 65.5), and furthest upstream is Cowlitz Falls Dam (RM 88.5). Mayfield and Mossyrock dams are owned by Tacoma Power. In addition, Tacoma Power placed a low Barrier Dam below Mayfield to intercept fish, as part of the operation of its salmon hatchery.

Riffe Lake acts as a huge storage facility (1,686,000 acre-feet of storage) to control flood flows and store water for future power generation. Riffe Lake is drawn down in the fall to provide flood storage for winter flows. Flows out of Mayfield Dam are controlled by managing the storage in Riffe Lake. Mayfield Lake is generally not drawn down and does not provide significant flood storage, (133,764 acre-feet of storage). Cowlitz Falls Dam, the third hydroelectric dam on the river, is owned and operated by Public Utility District No. 1 of Lewis County. The dam is operated primarily as a run-of-the-river facility, with little direct impact on downstream flows.

Flows in the Cowlitz River are greatly affected by the operation of the dams. In November 1997, an agreement was reached between the City of Tacoma and the Washington Department of Fish and Wildlife to maintain flows below Mayfield Dam at a level that protects salmon and steelhead and their habitat in the lower Cowlitz mainstem.

Klickitat Creek is a small perennial stream that flows across Klickitat Prairie westerly about a mile south of the PanAmerican Berry Farm and then northerly about 1/2 mile west of the Farm. Where it crosses the Prairie, the creek appears to be perched above, and hydraulically isolated from, the deeper groundwater system, except perhaps where the creek becomes incised into the hillside near its mouth at Mayfield Reservoir.

**Public Welfare**

No detriment to the public interest was identified during the investigation of the subject application. Aspects considered included the role and recommendation of the Watershed Planning Process and rule development.

**Consistency with Watershed Planning**

It is the Department of Ecology's goal that decisions on new water-right applications in WRIA 26 be consistent with the watershed planning process. The final Grays-Elochoman/Cowlitz Watershed Plan was approved by the Planning Unit on December 9, 2004, and includes water supply, water quality, instream flows, and habitat components.

The Watershed Management Plan addresses a range of issues related to water resources in the Cowlitz drainages, including water supply, streamflow management, water quality, and fish habitat. The adopted Watershed Management Plan recommended the closure of all sub-watersheds in WRIA 26 to new water appropriations except for specified reservations. As currently applied, the Plan affects the ability of Ecology to issue new water rights in much of the WRIA.

During the process of trying to adopt minimum instream flows in the Cowlitz River, stakeholder groups have elected to revisit some of the initial recommendations regarding flows in the river and certain tributaries. Ecology has suspended rule making while the Watershed Planning Group establishes new guidance for the basin.

Specifically relevant to the PanAmerican application is an agreement between Ecology and WDFW to open certain portions of the Cowlitz River above Mayfield Dam to further appropriations. Since flows in the lower Cowlitz River and the reservoirs above the dam are, to a great extent, controlled by Tacoma Power, which holds senior water rights to maintain reservoir levels in Riffe and Mayfield Lakes, Ecology and WDFW have taken the position that water can be appropriated in certain parts of the basin without impairment of instream resources. Further, while formal instream flows will eventually be established, it is anticipated that direct closures will apply only to the tributaries and will not conflict with the issuance of this permit.

On November 14, 2013 a vote was taken by the Watershed Planning group to amend the Watershed Plan, effectively reopening certain stretches of the Cowlitz to new appropriations. While the process to formally amend the plan may take several months to finalize both Ecology and WDFW has taken the position that decisions may be made during the interim that are consistent with the vote taken by the Planning Group[1].

[1] While the WDFW originally commented to Ecology that this application should be denied, that response was predicated on the fact that the Cowlitz Watershed Plan *as written at that time* closed allocation from the main stem of the Cowlitz River.

**Quantities for Permit**

PanAmerican operates both drip lines and overhead sprinklers to maximize berry production regardless of weather conditions; accordingly, the water duty in any given year can fluctuate considerably.

When drip irrigation was used exclusively between 2009 and 2010, the water duty was as low as 10.1 inches (0.84 ft) and as high as 13.3 in (1.11 ft), with a 4-year average of 11.9 in (0.995 ft). In 2011 and 2012, when PanAmerican used strictly overhead irrigation at the main farm, the water duty was nearly 24 in (2 ac-ft). Currently, both methods of irrigation are used, depending on the type of berries and climatic conditions.

The applicant proposes to expand the irrigated acreage by 76.5 acres. In addition, PanAmerican has identified a need for 50 afy for frost protection and 50 afy for chemigation and crop cooling; these uses are independent of the irrigation demand. Water usage for general farm operations, such as washing equipment, is expected to require an additional 10 afy.

The irrigation demand for 76.5 acres is based on the higher end crop of water duty for raspberries and climatic conditions at the Centralia weather station. While irrigation requirements vary considerably, depending on the type of crop, berries usually have higher water demands than most other crops. For the purposes of estimating water demand, we assumed a professionally managed system that will be 80% efficient.

For 76.5 acres of irrigation, we assume as follows:

| | |
|---|---|
| Crop Irrigation Requirement per acre | 21 inches |
| Crop Irrigation Requirement for project | 134 afy |
| **Total Irrigation Requirement for project** | **157.5 afy** |

The recommended allocation of 157.5 afy is consistent with the 24-inch (2 feet) "high-end" demand noted by PanAmerican.

PanAmerican has also requested the allocation of 50 afy for frost protection, 50 afy for "chemigation" and crop cooling[2] and an additional 10 afy for general farm related water needs. This additional water would be used across the entire farm.

**Operation Well Constraints**

Total additive demand for the new water right permit is 267.5 afy and 450 gpm for proposed Well 6. Wells 1 and 2 are already authorized for use by other water rights amounting to 700 gpm and 270 acre-feet per year. Since the mitigation plan proposed for this project necessitates PanAmerican's ability to shift production from Wells 1 and 2 to Well 6, Wells 1 and 2 have been authorized as points of withdrawal on this permit. Under this operating arrangement and the terms of this mitigated permit up

[2] This amount has been calculated by PanAmerican based on the number of applications and the amount of water needed to make each application.

to 700 gpm and 270 acre-feet can be shifted from Wells 1 and 2 to Well 6, however withdrawals authorized under G2-30614 for Well 6 may not be shifted to Wells 1 and 2 without special arrangements with the Department of Ecology, preferable in the format of a Temporary Permit.

Issuance of this permit is intended to allow for irrigation of the entire site by Wells 1 and 2, and by Well 6 so long as total withdrawals authorized by this permit are not exceeded.

## CONCLUSIONS

The conclusions based on the above investigation are as follow:

1. The proposed appropriation of 450 gpm (additive), and 267.5 afy (additive) is a beneficial use of water;
2. 267.5 afy is available for appropriation subject to the approved Mitigation Plan;
3. The new appropriation will not impair senior water rights; and
4. The new appropriation will not be detrimental to the public interest.

## RECOMMENDATION

Based on the information presented above, the author recommends that the request to consumptively appropriate 450 gpm, and 267.5 afy, be approved in the amounts described, limited, and provisioned on page 1 through 3 of this report.

Report by: _____

Jill Van Hulle, Pacific Groundwater Group — Date

Reviewed by: Michael J. Gallagher — 2/27/2014

Michael J. Gallagher, Water Resources Program — Date

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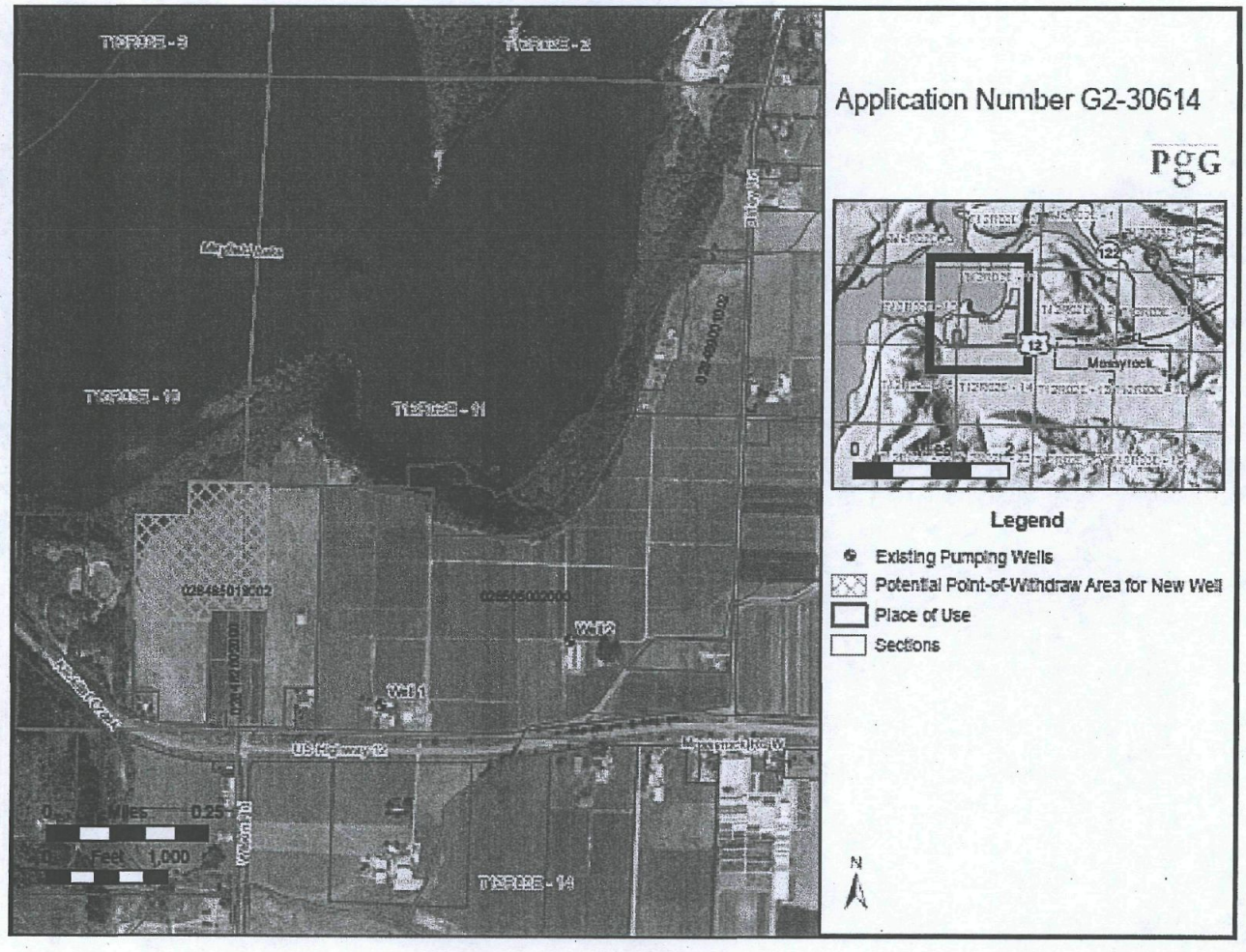


Attachment 1