WR File CG1-*03563C@1
WR Doc ID 6623690

DEPARTMENT OF ECOLOGY
State of Washington

State of Washington
REPORT OF EXAMINATION
FOR WATER RIGHT CHANGE

Add Irrigation Acres | Change Place of Use | Add or Change Point of Withdrawal

PRIORITY DATE	WATER RIGHT NUMBER
March 31, 1954	GWC 2677 (CG1-*03563C@1)

MAILING ADDRESS	SITE ADDRESS (IF DIFFERENT)
US Golden Eagle Farms, LP 2nd Floor, 510 West Hastings Street Vancouver, B.C., Canada, V6B-1L8	

Total Quantity Authorized for Withdrawal

WITHDRAWAL RATE	UNITS	ANNUAL QUANTITY (AF/YR)
650	GPM	81

Purpose

PURPOSE	WITHDRAWAL RATE ADDITIVE	WITHDRAWAL RATE NON-ADDITIVE	UNITS	ANNUAL QUANTITY (AF/YR) ADDITIVE	ANNUAL QUANTITY (AF/YR) NON-ADDITIVE	PERIOD OF USE (mm/dd)
Irrigation	650			81		4/1 – 9/15

REMARKS

A balance of 37 acre-feet (ac-ft) including 10 acre-feet consumptive and 27 non-consumptive may be available for donation into the State's Trust Water Program

IRRIGATED ACRES		PUBLIC WATER SYSTEM INFORMATION	
ADDITIVE	NON-ADDITIVE	WATER SYSTEM ID	CONNECTIONS
310.70			

Source Location

COUNTY	WATERBODY	TRIBUTARY TO	WATER RESOURCE INVENTORY AREA
Skagit	Groundwater		3 (Lower Skagit-Samish)

SOURCE FACILITY/DEVICE	PARCEL	WELL TAG	TWN	RNG	SEC	QQ Q	LATITUDE	LONGITUDE
Well 1	P41829	BHZ526	35	6E	22	SE ¼ NW ¼	48.509999	-122.01968
Well 4	P41852	AHG046	35	6E	22	SE ¼ NE ¼	48.512270	-122.02127
Well 6	P41270	BIS393	35	6E	16	SE ¼ SW ¼	48.517676	-122.04053
Well 10	P41309	BHZ524	35	6E	16	NW ¼ SE ¼	48.519515	-122.03508
Well 13	P41308	APS882	35	6E	16	NE ¼ NE ¼	48.526649	-122.03134
Well 14	P41238	BHE534	35	6E	15	SE ¼ NW ¼	48.525916	-122.01701

Datum: NAD83/WGS84

Place of Use (See Attached Map)

PARCELS (NOT LISTED FOR SERVICE AREAS)

P-41253, P-41269, P-41268, P-41267, P-41250, P-41270, P-41254, P-41262, P-41255, P-41746, P-41745, P-41744, P-41743, P-41750, P-41782, P-41800, P-65627, P-65626, P-65625, P-65622, P-65623, P-41277, P-41310, P-41309, P-41313, P-41314, P-41312, P-41245, P-41307, P-41306, P-41308, P-41230, P-41238, P-41239, P-41851, P-41852, P-41853, P-41799, P-41801, P-41830, P-41829, P-41850, P-41828, P-41825, and P-65657

LEGAL DESCRIPTION OF AUTHORIZED PLACE OF USE

All those portions of Section 15, Township 35 North, Range 6 East, W.M., described as follows:
The South ½ of the Northwest ¼ of said Section 15 AND the West ½ of the Southwest ¼ of the Southwest ¼ of said Section 15, LESS ROADS.

All those portions of Section 16, Township 35 N, Range 6 E, W.M., described as follows:
The South ½ of said Section 16, AND the South 183 ft of the Southeast ¼ of the Northwest ¼ of said Section 16 lying South of Jims Slough (AKA Etach or Minkler Creek), AND the South 485 feet of the Southwest ¼ of the Northeast ¼ lying South and West of said Jims Slough, AND the Southeast ¼ of the Northeast ¼ of said Section 16 lying South of County road and West of the following described line: Beginning at the East ¼ corner of said Section 16, thence West along the East and West Centerline of said Section 16 389 ft, thence N 1°47'2" E 120 ft, thence N 8°54'36" W 1184 ft to the South line of County road, LESS the East 363 ft of the Northwest ¼ of the Southeast ¼ of said Section 16, AND LESS the South 310 ft of the East 516 ft of the Southwest ¼ of the Southeast ¼ of said Section 16 lying northeasterly of county road, AND LESS ROADS.

All those portions of Section 21, Township 35 N, Range 6 E, W.M., described as follows:
The North ½ of said Section 21, lying North of the Skagit River, LESS those portions of lot 3 and lots 7-15 of the Plat of Heart O' Skagit River Tracts lying in said Section 21, AND LESS ROADS.

All those portions of Section 22, Township 35 N, Range 6 E, W.M., described as follows:
The West ½ of the Northeast ¼ of said Section 22, lying North and West of the Skagit River, AND the West ½ of said Section 22, lying North and West of the Skagit River, LESS those portions of lots 15-36 of the Plat of Heart O' Skagit River Tracts lying in said Section 22, AND LESS ROADS.

Proposed Works

USGE uses 6 wells, and a small pond to irrigate its Cockreham Island project. Each well serves an individual pressure zone with the surface water pond being used for a nursery area. Micro-drip tape with individual emitters, and a computerized irrigation system.

Development Schedule

BEGIN PROJECT	COMPLETE PROJECT	PUT WATER TO FULL USE
Started	**Completed**	**January 1, 2021**

Measurement of Water Use	
How often must water use be measured?	Monthly
How often must water use data be reported to Ecology?	Annually, by January 31st, and upon Ecology Staff Request
What volume should be reported?	Total Monthly Volume
What rate should be reported?	Monthly Peak Rate of Withdrawal (gpm)

Provisions

Relationship to Other Cockreham Island Project Water Rights
Water Rights SWC 11032, GWC 2677, G1-096365CL and GWC 1848 are all appurtenant to the project and are authorized for a combined total of 1,250 gpm, and 170 acre-feet per year for the irrigation of 743 acres within the same place of use.

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, 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 Northwest Regional Office. If you do not have Internet access, you can still submit hard copies by contacting the Northwest Regional Office for forms to submit your water use data.

Proof of Appropriation
The water right holder must file the notice of Proof of Appropriation of water (under which this change authorization 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 Superseding Certificate will reflect the extent of the project perfected within the limitations of this authorization. Elements of a proof inspection may include, as appropriate, the source(s), system instantaneous capacity, beneficial

use, 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 on the tentative determination of the extent and validity of the water right certificate; that the additional wells tap the same body of public groundwater as the original point of withdrawal; that there will be no impairment to existing rights; that the annual consumptive quantity will not be exceeded; and that there will be no detriment to the public welfare.

Therefore, I ORDER approval of Application for Change No. CG1-*03563C@1 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
Department of Ecology Attn: Appeals Processing Desk 300 Desmond Drive SE Lacey, WA 98503	**Department of Ecology** Attn: Appeals Processing Desk PO Box 47608 Olympia, WA 98504-7608
Pollution Control Hearings Board 111 Israel RD SW STE 301 Tumwater, WA 98501	**Pollution Control Hearings Board** PO Box 40903 Olympia, WA 98504-0903

Signed at Bellevue, Washington, this 22nd day of June 2016.

Tom Buroker, Section Manager
Water Resources Program -- Department of Ecology, Northwest Region Office

INVESTIGATOR'S REPORT

Applicant for Water Right Change: U.S. Golden Eagle Farms, L.P.
Water Right Control Number CG1-*03563C@1
Investigator: Jill Van Hulle

BACKGROUND

This report serves as the written findings of fact concerning Water Right Application Number CG1-*03563C@1 (Water Right Certificate 2677).

Aquilini Renewable Energy Ltd., doing business as US Golden Eagle (USGE), filed applications to change three water right certificates and one water right claim associated with its Skagit County farming operations. These applications have been processed under Ecology's Cost Reimbursement Program. Pacific Groundwater Group (PGG) prepared this report under contract to Ecology.

The stated intent of Change Application CG1-*03563C@1 is to change the place of use to enable irrigation of additional acres, change the place of use to be common to all water rights appurtenant to property owned by USGE, and add the currently used production wells to each water right document.

Table 1. EXISTING Water Right Attributes

Water Right Owner:	Hauenstein, M.G
Priority Date:	March 31, 1954
Place of Use	SE ¼ of the NE ¼ of Section 21, T 35 N., 6 E.W.M., less roads, and less a tract in NW 1/4 , thereof described as follows: Commencing at the northwest corner of SE ¼ NE ¼ thence east 20 feet, thence south 30 feet, thence west 20 feet, thence north 30 feet to the point of beginning; ALSO Government Lots 4 and 5, Section 22, T 35 N., 6 E.W.M, less roads, ALSO, E ¼ , NE ¼ NW ¼ Section Section 22, T 35 N., 6 E.W.M, less roads

County	Waterbody	Tributary To	WRIA
Skagit	Groundwater		3

Purpose	Rate	Unit	Ac-ft/yr	Begin Season	End Season
Irrigation of 110 acres	650	GPM	220	Not Specified	

Source Name	Parcel	Well Tag	Twp	Rng	Sec	QQ Q	Latitude	Longitude
Well 4	P41852	AHG046	35	6E	22	SE NE	48.512270	-122.02127

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 Datum:

Table 2. REQUESTED Water Right Attributes

Applicant Name:	US Golden Eagle
Date of Application:	May 29, 2015
Place of Use	All those portions of Section 15, Township 35 North, Range 6 East, W.M., described as follows: The South ½ of the Northwest ¼ of said Section 15 AND the West ½ of the Southwest ¼ of the Southwest ¼ of said Section 15, LESS ROADS. All those portions of Section 16, Township 35 N, Range 6 E, W.M., described as follows: The South ½ of said Section 16, AND the South 183 ft of the Southeast ¼ of the Northwest ¼ of said Section 16 lying South of Jims Slough (AKA Etach or Minkler Creek), AND the South 485 feet of the Southwest ¼ of the Northeast ¼ lying South and West of said Jims Slough, AND the Southeast ¼ of the Northeast ¼ of said Section 16 lying South of County road and West of the following described line: Beginning at the East ¼ corner of said Section 16, thence West along the East and West Centerline of said Section 16 389 ft, thence N 1°47'2" E 120 ft, thence N 8°54'36" W 1184 ft to the South line of County road, LESS the East 363 ft of the Northwest ¼ of the Southeast ¼ of said Section 16, AND LESS the South 310 ft of the East 516 ft of the Southwest ¼ of the Southeast ¼ of said Section 16 lying northeasterly of county road, AND LESS ROADS. All those portions of Section 21, Township 35 N, Range 6 E, W.M., described as follows: The North ½ of said Section 21, lying North of the Skagit River, LESS those portions of lot 3 and lots 7-15 of the Plat of Heart O' Skagit River Tracts lying in said Section 21, AND LESS ROADS. All those portions of Section 22, Township 35 N, Range 6 E, W.M., described as follows: The West ½ of the Northeast ¼ of said Section 22, lying North and West of the Skagit River, AND the West ½ of said Section 22, lying North and West of the Skagit River, LESS those portions of lots 15-36 of the Plat of Heart O' Skagit River Tracts lying in said Section 22, AND LESS ROADS.SW ¼ and the NW ¼ of Section 15, the S ½ and the SE ¼ NE ¼ and the SE ¼ NW ¼ of Section 16, the N ½ of Section 21, the N ½ of Section 22 all in T. 35 N., R. 6 E.W.M., in Skagit County.

County	Waterbody	Tributary To	WRIA
Skagit	Groundwater		3

Purpose	Rate	Unit	Ac-ft/yr	Begin Season	End Season
Irrigation	650	GPM	81	April 1	September 15

Source Name	Parcel	Well Tag	Twp	Rng	Sec	QQ Q	Latitude	Longitude
Well 1	P41829	BHZ526	35	6E	22	SE NW	48.509999	-122.01968
Well 4	P41852	AHG046	35	6E	22	SE NE	48.51227	-122.02127
Well 6	P41270	BIS393	35	6E	16	SE SW	48.517676	-122.04053
Well 10	P41309	BHZ524	35	6E	16	NW SE	48.519515	-122.03508
Well 13	P41308	APS882	35	6E	16	NE NE	48.526649	-122.03134
Well 14	P41238	BHE534	35	6E	15	SE NW	48.525916	-122.01701

Datum: NAD83/WGS84

Legal Requirements for Proposed Change

The following is a list of requirements that must be met prior to authorizing the proposed change to CG1-*03563C@1.

Public Notice

A public notice detailing this proposed change was published on July 11 and 18, 2015. No protests were received as a result of the statutory notice.

Consultation with the Department of Fish and Wildlife

The Department of Ecology must give notice to the Department of Fish and Wildlife (WDFW) of applications to divert, withdraw, or store water. Biologist Steven Boessow (WDFW), was notified of the proposed project and on January 15, 2016, Mr. Boessow responded that WDFW does not oppose this water right change so long as there is no increase in the amount of water withdrawn.

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 conditions apply to this application. While this request involves the change of four individual rights, the combined instantaneous quantity does not exceed the threshold that triggers a SEPA determination for either surface water or groundwater.

Water Resources Statutes and Case Law

RCW 90.03.380(1) states that a water right that has been put to beneficial use may be changed including the place of use and purpose of use if it would not result in harm or injury to other water rights. Additionally, RCW 90.44.100(2)(d) requires that when making a change in the place of use of a water right, other existing water rights shall not be impaired.

RCW 90.03.380(1) provides that "[a] change in the place of use...to enable irrigation of additional acreage...may be permitted if such change results in no increase in the annual consumptive quantity (ACQ) of water. Annual consumptive quantity means the estimated or actual annual amount of water diverted pursuant to the water right, reduced by the estimated annual amount of return flows, averaged over the two years of greatest use within the most recent five-year period of continuous beneficial use of the water right.

Changes can be made to existing water rights to the extent that the water right has been perfected and the change will not impair other water users. While changes to purpose of use can be allowed, adding additional purposes of use can only be allowed if the change will not increase the annual consumptive quantity of the water right. Water not beneficially used cannot be changed and is subject to relinquishment.

The Washington Supreme Court has held that Ecology, when processing an *Application for Change* to a water right, is required to make a tentative determination of extent and validity of the claim or water right. This is necessary to establish whether the right is eligible for change (*R.D. Merrill v. PCHB and Okanogan Wilderness League v. Town of Twisp).*

When changing or adding points of withdrawal to groundwater rights (RCW 90.44.100) the wells must draw from the *same body of public groundwater*. Indicators that wells tap the *same body of public groundwater* include:

(a) Hydraulic connectivity
(b) Common recharge area
(c) Common flow regime
(d) Geological materials that allow for storage and flow, with recognizable boundaries or effective barriers to flow.

Cost Reimbursement Processing

RCW 90.03.265(2) provides that, in pursuing a cost-reimbursement project, the Department must determine the source of water from which the water is proposed to be diverted or withdrawn, including the boundaries of the area that delimit the source. The Department must determine if any other water-right applications are pending from the same source. A water source may include surface water only, groundwater only, or surface and groundwater together, if the Department finds they are hydraulically connected. The Department shall consider technical information submitted by the applicant in making its determinations under this subsection.

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. This request is an *Application for Change* and no water will be used beyond that which has been historically appropriated. This request will be neutral to other potential users and will not diminish the amount of water available to them, accordingly it can be processed prior to other pending applications.

INVESTIGATION

Jill Van Hulle with Pacific Groundwater Group (PGG) visited the project site on September 30, 2015. Staff from USGE and applicant John Negrin showed Ms. Van Hulle the wells and various fields.

Site Visit/Site Description

The project site is USGE's farming operations on Cockreham Island. USGE farms approximately 800 acres of primarily low lying floodplain along the Skagit River. The property is located between the towns of Lyman and Hamilton in Skagit County.

The project is currently in operation with extensive plantings of blueberries already in place. Berries are planted in elevated rows, each with dedicated irrigation drip line. The rows are configured with enough space between them to facilitate the use of a small tractor which eliminates weed growth between the rows.

USGE has rebuilt all of the wells, installing sand control devices and updated fixtures. USGE's operation is intended to be highly efficient, so the individual berry bushes are irrigated with micro-drip tape. Berries are planted approximately 2 feet apart in rows that are spaced 10 feet apart (approximately 1,750 plants per acre). The Hortau irrigation system that is used allows for the targeted use and application of water and fertilizer and is coupled with a network of sensors that monitor ambient temperature, soil-moisture tension, and humidity.

Figure 1, shows the locations of the wells and a pond used by USGE for irrigation. The fields are color-coded according to which wells are used to irrigate them.

History of Water Use

Information on the history of water use under this water right was pieced together from a variety of sources including information provided from the applicant, irrigation guides, the site visit by PGG, aerial photos, Landsat imagery and data reported by the Washington State Department of Agriculture (WSDA).

The Cockreham Island area has a long history of agricultural activities and was homesteaded and farmed long before the enactment of the State's modern Water Code in 1917. In support of these applications, USGE provided PGG with a detailed list of agricultural activity on the island with dates as far back as 1882. This information is based primarily on the recollections of local historian Ed Lipsey. Mr. Lipsey has actively farmed portions of Cockerham Island himself, and has firsthand knowledge of the types of crop generally produced by his neighbors. Mr. Lipsey is also the primary author of the book *Hamilton 100 Year*, which was prepared by the Hamilton Pioneer Museum in 1993, and includes references to farming activities in the area.

Over the past decades the island has been the site of a large dairy operation, with numerous crops grown. USGE purchased the properties between 2009 and 2012, gradually converting the land from vegetable crops such as potatoes and pasture lands to blueberries.

Hauenstein Groundwater Certificate 2677

Certificate 2677 (Hauenstein) corresponds to irrigation that occurred on USGE's Field 1 (20 acres), a 61.5 acre portion of Field 4, and a 10.5 acre portion of Field 5, for a total 92 acres.

The right is associated with the original Cockerham homestead, and allows for the irrigation of the fields that surround the old home, which is now being used as USGE's office complex.

This portion of USGE's property was the core of the original Cockreham operation with farming dating back to 1882. The Hauensteins owned the property between 1956 and 1960 before selling to the Kaaland family that owned and operated a large dairy on the island. Mr. Lipsey indicated that this property was used for numerous crops including "row" type crops of beets, potatoes, peas, cabbage, turnips, as well as corn and grass, however it appears that much of it was maintained as pasture.

The Hauenstein Well (Well 4) was constructed in June of 1953. The well was constructed with an 8-inch casing to a depth of 39 feet and is perforated from 15 to 36 feet. Preliminary pump testing of the well at the time of drilling indicated that the well was capable of producing over 100 gallons per minute per foot of drawdown. The well was equipped with a centrifugal pump, and originally operated from the PTO of a tractor.

This water right original allowed for the irrigation of 110 acres, but includes areas south of Cockreham Lane that were established as recreational lots and have clearly never been irrigated, and lack physical access to the production well.

Other Rights Appurtenant to the Hauenstein Place of Use

Ecology's records indicate that a water right claim is appurtenant to the same place of use as described by this filing. Claim S1-079479CL was filed under the name of Chris Palzer for mining and domestic purposes. The place of use designated by the claim includes Sections 14, 15, 22, 23, 25, 26, 27, 28, 33, 34, 35, and 36 of Township 35 North, Range 6 East.W.M. thus the entire USGE project site is included in the Palzer place of use. The Palzer claim indicates a proposed diversion rate of 26 cfs, and 900 ac-ft/year from multiple locations on the Skagit River, Loretta Creek, Cumberland Creek and Day Creek. While the date of first use is listed as 1882, the 1974 claim does not indicate that any water is actually in use.

Water Rights Associated with the Proposed Cockreham Project

There are three other water rights appurtenant to property when combined with this filing allow for the potential irrigation of 250 acres. These rights are:

1. Surface Water Certificate 11032 (Mailliard) is for 0.60 cubic feet per second (cfs), 90 ac-ft/yr for irrigation of 60 acres from June 1 to September 15 each year, with a priority date of June 22, 1967.

2. Ground Water Certificate 1848 (Philips) is for 180 gallons per minute (gpm), 100 ac-ft/yr for irrigation of 50 acres, with a priority date of May 6, 1953.

3. Ground Water Right Claim G1-096365CL (Lipsey) for 150 gpm, 60 ac-ft/yr for summer irrigation of 30 acres.

Applications for Change have been filed for each of these water rights. It is USGE's intent to reconfigure these four water rights to meet their current water supply needs. At the time these water rights were first issued the properties identified as the place of use were independently owned and each source(s) was specific to that right. Today, USGE manages this as a single farm and has configured their request to identify all of the existing production wells as potential points of diversion on each of their water rights.

While the USGE water rights allow for the potential irrigation of 250 acres, based on a review of the individual places of use it appears that 220 acres could have been irrigated based on the limitations of the legal descriptions. Our analysis is based on USGE's field sizes, as compared to aerial photos. The remaining acreage is associated with areas that have never been irrigated, such as roadways, riparian areas, and buildings, or have not been irrigated for periods exceeding 5 years. Since ACQ calculations must be tied to actual water use within the original place of use, de facto changes in place of use (the irrigation of areas that were not authorized by the water right) or "pre-spreading" have not been considered in this analysis.

Crop Types and Irrigation Assumptions

From the distribution of crop types reported by Mr. Lipsey, as corroborated by the data provided by the Washington State Department of Agriculture, it appears that a mixture of crop types were cultivated across the project site with potatoes and grass hay being the two most commonly reported crop types. This is true for the Hauenstein property which was used for pasture and other crops such as corn and potatoes.

Based the guidelines provided by the Washington Irrigation Guide (WIG) the amount of supplemental irrigation needed to successfully grow potatoes and pasture grass in the Sedro Woolly area are 7.25 inches and 11.12 inches respectively for an average demand of 9.185 inches per acre. Most all irrigation is reported as being conducted using "Big Gun" style sprinklers.

Table 3 presents various assumed and calculated components of the irrigation for the Hauenstein water right. Based on these estimates, the 92 acres of alternating, or mixed, crops of potatoes and pasture would have required the application of 108.34 ac-ft/yr, of which 81.25 ac-ft/yr was consumed and 27.08 ac-ft/yr would have returned to the aquifer.

Table 3 – Annual Water Use for Irrigation of 92 Acres for Hauenstein right

# Acres	Crop Type	CIR in inches (WIG)	CIR Total	TIR	App. Efficiency (%)	% Total Evaporated	Total Consumed (af)	Return Flow (af)
92	Mixed Potatoes and Pasture	9.185	70.42	108.34	65	10	81.25	27.08

CIR – Crop Irrigation Requirement: 9.18 in equivalent to 0.76 ft
TIR – Total Irrigation Requirement = 1.18 ac-ft/irrigated-ac (equivalent to 14.13 acre-inches/irrigated acre)
ACQ – Total Consumed = 0.88 ac-ft/irrigated-ac

Table 4 presents various assumed and calculated components for the full 220 acres found to have been irrigated within the original places of use designated by the 4 water rights associated with this request.

Table 4 details the irrigation use for the Hauenstein property.

Table 4 – Annual Water Use for Irrigation of 220 Acres

# Acres	Crop Type	CIR in inches (WIG)	CIR Total	TIR	App. Efficiency (%)	% Total Evaporated	Total Consumed (af)	Return Flow (af)
220	Mixed potatoes and pasture	9.185	168	259	65	10	194	65

CIR – Crop Irrigation Requirement; 9.185 inches is equivalent to 0.77 feet of water
TIR – Total Irrigation Requirement = 1.18 ac-ft/irrigated-ac
ACQ – Total Consumed = 0.883 ac-ft/irrigated-ac

Based on these calculation, the irrigation of 220 acres of alternating/or mixed crops of potatoes and pasture would have required about 259 acre-feet per year of which 194 acre-feet were consumed and 65 ac-ft returned to the shallow aquifer.

Annual Consumptive Quantity Analysis

RCW 90.03.380(1) states that acreage irrigated under a water right may be enlarged if the annual consumptive quantity (ACQ) is not increased. The annual consumptive quantity means the estimated or actual annual amount of water diverted pursuant to the water right, reduced by the estimated annual amount of return flows, averaged over the two years of greatest use within the most recent five-year period of continuous beneficial use of the water right.

USGE began purchasing property on Cockreham Island in 2009 and started actively converting to blueberries in 2013, when 420 acres were planted in the fall after the traditional irrigation season. An additional 183 acres were planted the following fall, thus the composition of what was grown in the original place of use is slightly different depending on the location.

Ecology's ACQ analysis does not allow applicants to benefit from spreading that occurred prior to the approval of the *Applications for Change*, thus the premature conversion to the irrigation of blueberries results in years where the quantity of water that was consumptively used is significantly less than it would have been when other crop types were irrigated.

Prior to 2015, the sources were not metered therefore water use has been approximated by assessing crop type and irrigation method. For the mixture of potatoes, and pasture that made up most of the original crops we have assumed a water duty of 1.18 acre-feet per irrigated acre which equates to a consumptive quantity of 0.883 acre-feet per irrigated acre. For blueberries, grown using USGE's system of irrigation drip line coupled with the Hortau weather station the water duty is 0.23 acre-feet per acre.

Table 5 tracks the conversion of traditional mixed crops to blueberries based on aerial photographs, with the distinctive "texture" of the rowed berry crops making it easy to distinguish the cropping patterns.

Table 5 – ACQ Estimates by Year (Ac-ft)

	2008	2009	2010	2011	2012	2013	2014
Acres of Blueberries	0	0	0	0	0	154	220
Acres of Row Crops/ Pasture	220	220	220	220	220	66	0
ACQ	194.30	194.30	194.30	194.30	194.30	92.48	50.6
Total Acreage	220	220	220	220	220	220	220

For these 4 water rights that have been proposed for change the average of the two highest of the last 5 years of continuous use is the same 194 acres feet per year. This is because regardless of whether the lower water duty berries were established in 2013 or 2014 since we can capture the higher water duty years of either 2009/2010 or 2010/2011.

Proposed Water Demand

USGE has determined they need 2.60 inches a year per acre to successfully grow blueberries. The water demand analysis also assumes that the irrigation system for the blueberries is working at or above a 95% efficiency rate, and a 5% evaporation rate.

In the four applications for change filed by USGE, the applicant proposed irrigation of 743 acres within the enlarged place of use.

Table 6 assesses the demand associated with 743 acres of highly efficient blueberry irrigation and it shows that a consumptive quantity of approximately 169 ac-ft/yr is needed, which is less than the 194 ac-ft/yr that was calculated based on previous cropping patterns.

Table 6 – Water Use for Irrigation of 743 Acres of Blueberries

# Acres	Crop Type	CIR in inches[1]	CIR Total (Ac-ft)	TIR (Ac-ft)	App. Efficiency (%)	% Total Evaporated	Total Consumed (ac-ft)	Return Flow (ac-ft)
743	Blueberries	2.60	161	169	95	5	169	0.00

CIR -Crop Irrigation Requirement: 2.6 in = 0.22 ft
TIR = 0.23 acre-feet per acre
ACQ = 0.23 acre-feet per acre

Based on the individual extent of these 4 rights, they can be spread as follows using an ACQ factor of 0.227 (169 ac-ft/743 ac-ft):

[1] Based on USGE's projected demand

Table 7 – New Acre Authorizations by Water Right

Water Right/Name	Original Acres Verified	Original ACQ (ac-ft/yr)	*Potential* Spreading (ac-ft)
SWC 11032/Mailliard	60	53	233
GWC 2677/Hauenstein	92	81	357
GWC 1848/Philips	38	33.5	148
G1-096365CL/Lipsey	30	26.5	117
Total	**220**	**194**	**855**

Because USGE only needs an ACQ of 169 ac-ft/yr of the original ACQ of 194 ac-ft/yr to irrigate 743 acres, there will be a balance of 25 (194-169) ac-ft/yr. This quantity can be held by USGE, subject to relinquishment if not beneficially used for 5 or more years without sufficient cause. Or, another option may be to place this quantity in Ecology's Trust Water Program as a permanent or temporary donation.

An ACQ "block" of 25 ac-ft/yr could result in the irrigation of an additional 112 acres (855-743). However, prior to expanding the number of acres under cultivation, Ecology would review metering data from the operation at that time to ensure that the estimated crop demand of 2.6 inches is adequate. Should USGE use more than the projected TIR of 169 acre-feet, they must notify Ecology immediately.

Table 8 – Recommended Allocation[2]

Water Right/Name	GPM	# Acres	ACQ Needed Ac-ft/year	ACQ Remaining Ac-ft/year
SWC 11032/Mailliard	270	202.64	46	6.8
GWC 2677/Hauenstein	650	310.70	71	10.5
GWC 1848/Philips	180	128.34	29	4.3
WRC 096365/Lipsey	150	101.32	23	3.4
Total	1,250	743	169	25

Hydrologic/Hydrogeologic Evaluation

This discussion of the hydrogeological conditions of the project site are supported by the Techical Memo prepared by Pacific Groundwater entitled *Hydrogeologic and Impairment Evaluation of the US Golden Eagle Farms Water Right Change Applications,* dated March 11, 2016.

The Skagit River floodplain is a broad, relatively flat alluvial valley that is approximately 3,000 feet wide near Cockreham Island. The valley is underlain by fluvial sand and gravel, with occasional layers of clay, silt, and peat. Collectively these sediments are referred to as the Alluvial aquifer where saturated with groundwater. The alluvial floodplain is bounded to the north and south by alluvial terraces and mountains. The valley alluvium and valley walls are underlain by Jurassic age metamorphic bedrock that is mantled with glacial, landslide, and lahar sediments.

Mapping by the U.S. Geological Survey (USGS) indicates that the alluvial aquifer can be as much as 300 feet thick in the area around Sedro Woolley (Savoca et al, 2009). The depth to groundwater in the alluvial aquifer at the project site is about 10 to 15 feet, and the aquifer extends to a depth of at least

[2] Rounded 0.1 to allow for accounting purposes

100 feet (based on available well logs). The subject wells withdraw from this aquifer. The horizontal groundwater flow direction in the alluvial aquifer at the project site is assumed to be generally toward the Skagit River, with a small component of flow down the axis of the valley.

USGE's request will result in changes to where water is applied and where that water originates. Under the original water rights, USGE withdrawals groundwater from three wells and one surface-water diversion. Under the proposed Applications for Change, USGE would cease most of its surface water diversion (8.01 acre-feet/year would be retained at the Mill Pond site) and withdrawal water from a total six existing wells with a total consumptive use of 169 acre-feet/year.

In order to assess potential changes in surface water/groundwater fluxes along the nearby Skagit River caused by the proposed additional groundwater withdrawal, PGG developed a groundwater-flow model (using the USGS's modeling program, MODFLOW) to evaluate streamflow capture under the existing and proposed water-use regimes (PGG, 2015).

The groundwater modeling indicates that the cumulative capture of surface water from the Skagit River will not increase along any reach of the river under the future water-use configuration, nor will other groundwater users be impaired.

Evaluation of Water Availability

USGE operates 6 production wells that are completed in the alluvial aquifer at depths ranging between 30 to 60 feet below ground surface. The wells are designated by the fields they supply and include Field Well 1, Field Well 4, Field Well 6, Field Well 10, Field Well 13 and Field Well 14.

Well logs were located for Field Well 1, Field Well 4, Field Well 13 and Field Well 14. Information related to water availability from these logs are provided below.

- Field Well 1 (Well Tag: BHZ526) was drilled for Knutzen Brothers Farms in 2003. The well was constructed with an 8-inch casing to a depth of 54 feet and completed with a 10-ft screen at depths of 39 to 49 feet in a zone characterized as sand and gravel. The static depth to water at time of drilling was 9.5-ft. An air-lift test was conducted at the time of drilling that demonstrated a potential well capacity of 500 gpm.

- Field Well 4 (Well Tag: AHG046) was drilled for M.G Hauenstein in June of 1953. The well was constructed with an 8-inch casing to a depth of 39 feet and is perforated from 15 to 36 feet in a zone characterized as coarse sand and gravel. Preliminary pump testing of the well at the time of drilling indicated that the well was capable of producing over 100 gallons per minute per foot of drawdown (i.e. specific capacity). The water right associated with this well allowed for withdrawals of 650 gpm. The well should be capable of sustaining this rate for at least short periods of time. At 650 gpm, the drawdown in the well would be about 6.5 feet (assuming no significant reductions in well efficiency or aquifer transmissivity with increased pumping rates). Given a static depth to water of 11.5 feet (at time of drilling), the total depth to water when operating at 650 gpm would be 18 feet, which would leave about 85% of the well's perforations submerged.

- Field Well 10 (Well Tag: BHZ524) was constructed for Don Kaaland in 2007. The well is 45 feet deep and screened between depths of 25 to 40 feet in a zone characterized as coarse sand and

gravel. An air-lift test that was conducted at the time of drilling demonstrated a potential well capacity of 300 gpm.

- Field Well 13 (Well Tag: APS882) was constructed for C.G. Philips in September of 1953. The well was constructed with an 8-inch casing to a depth of 30 feet and is perforated between depths of 16 to 30 feet in a zone characterized as coarse river gravel. The water right associated with this well allowed for withdrawals of 180 gpm. Given the well's completion in "coarse river gravel", the well could have easily produced this rate.
- Field Well 14 (Well Tag: BHE534) was constructed for USGE as a replacement for the original "Lipsey" well. It is 56 feet deep, and screened between 28.5 and 38.5 feet in a zone characterized as sand and gravel. The static water level depth at time of drilling was 14 feet. An air-lift test that was conducted at the time of drilling demonstrated a potential well capacity of 600 gpm.

All of USGE wells in the Cockereham Island area are completed in highly productive sand and gravel zones within the upper portion of the alluvial aquifer, they are expected to produce several hundred gallons per minute (depending on the size of individual pumps), they are hydraulically connected and share a common recharge area and flow regime. They are therefore considered to be in the same-body of public groundwater.

Impairment Considerations

The proposed changes involve both surface-water and groundwater rights. Therefore, impairment of both minimum instream flow water rights and other groundwater rights must be considered.

Impairment of Minimum Instream Flow Water Rights

The term "instream flow" is used to identify a specific stream flow (typically measured in cubic feet per second, or cfs) at a specific location for a defined time, and typically following seasonal variations. Instream flows are usually defined as the stream flows needed to protect and preserve instream resources and values, such as fish, wildlife and recreation.

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

The Skagit River Basin Instream Resources Protection Program Rule (WAC 173-503) established instream flows in the basin. Since these changes will not result in the withdrawal of additional water from the basin, the approval of this request will not adversely impact instream flows.

Impairment, Qualifying Ground Water Withdrawal Facilities, and Well Interference

There are three concepts that are important when considering whether a withdrawal of water from a well would impair another existing water right. The concepts are defined as follows:

1. Impairment is an adverse impact on the physical availability of water for a beneficial use that is entitled to protection (i.e., water rights that are both senior and junior in priority to the right the applicant seeks to change).

2. Qualifying ground water withdrawal facilities are defined as those wells which in the opinion of the Department are adequately constructed. An adequately constructed well is one that (a) is constructed in compliance with well construction requirements; (b) fully penetrates the saturated thickness of an aquifer or withdraws water from a reasonable and feasible pumping lift (WAC 173-150); (c) the withdrawal facilities must be able to accommodate a reasonable variation in seasonal pumping water levels; and (d) the withdrawal facilities including pumping facilities must be properly sized to the ability of the aquifer to produce water.

3. Well interference may occur when several wells penetrate and withdraw ground water from the same aquifer. Each pumping well creates a drawdown cone. When several wells pump from the same aquifer, well density, aquifer characteristics, and pumping demand may result in individual drawdown cones that intersect and form a composite drawdown cone. At any point in an aquifer, the composite drawdown caused by pumping wells will be greatly influenced by the transmissivity (T) of the aquifer. In aquifers with high Ts, composite drawdown will generally be much less than in aquifers with similar properties but with low Ts. Transmissivity is related to hydraulic conductivity (K) and the saturated thickness (b) of an aquifer by the relationship T=Kb.

   An aquifer's hydraulic conductivity (K) is derived from the physical properties of both the fluid and geologic materials that form an aquifer. Once formed, an aquifer's saturated thickness (b) becomes important in evaluating its transmissivity. For regions of similar K in an aquifer, a large saturated thickness will result in a much higher T than a small saturated thickness. As a result, regions of similar K in an aquifer with a large saturated thickness will experience less composite drawdown or well interference than with a small saturated thickness.

Some conditions, however, will increase or steepen composite drawdown in an aquifer. For instance, where characteristics (such as very fine, clay-rich, or poorly sorted sediments) of an unconfined aquifer cause significant drawdown relative to the saturated thickness, the composite drawdown will increase as saturated thickness is reduced and T becomes smaller. Additionally, in regions where negative or no-flow boundaries occur, such as near the edges of a valley fill aquifer where it is bounded by bedrock, composite drawdown will be steeper than in the central part (generally the greatest thickness region) of the aquifer. Consequently, it is commonly understood that the greatest composite drawdown or well interference is more likely to occur in regions of low transmissivities, thin saturated thicknesses and near negative or no-flow boundaries than in regions of high transmissivities, large saturated thicknesses, and away from negative or no-flow boundaries.

USGE's requested to change to this right will result in both a larger place of use, and the ability to irrigate more acres than previously. This can only be allowed if it can be accomplished without impairment to other water users or instream flows.

Based on our assessment of the ramifications of shifting points of withdrawal, other water users will not be affected because the amount of water used by USGE is not increasing and the shift in withdrawal points will not result in any significant interference impact to existing groundwater users.

A review of water right records on file with the Department of Ecology for the four sections that include Cockreham Island indicates that there are no other conflicting water uses that would be impacted by the proposed changes to USGE's operations. Of the 51 documents on file, we note that 42 are claims and likely represent small, single domestic uses. The others are certificates for small scale irrigation.

Public Interest Considerations

Developing new sources of supply in the Skagit River watershed is challenging, and Ecology generally promotes to the extent possible, the use of existing water rights to support new development. The USGE property has historically been irrigated, and with the advent of conservation based application methods, more acreage can be irrigated without adverse impacts.

This right as originally issued, and as modified under this request is not detrimental to the public interest.

Consideration of Protests and Comments

No protests were received as a result of the public notice.

CONCLUSIONS

The subject water right is eligible for change, the additional wells will tap the same body of public groundwater as the original well; there will be no impairment of existing rights; the combined total withdrawal from the original and the additional wells will not enlarge the right; and there will be no detriment to the public interest.

RECOMMENDATIONS

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

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:

650 gpm
81 ac-ft/yr (10 acre-feet would be available for Trust)
Irrigation of 310.70 acres

Points of Withdrawal

Well	TWN	RNG	SEC	QQ Q
Well 1	35	6E	22	SE ¼ NW ¼
Well 4	35	6E	22	SE ¼ NE ¼
Well 6	35	6E	16	SE ¼ SW ¼
Well 10	35	6E	16	NW ¼ SE ¼
Well 13	35	6E	16	NE ¼ NE ¼
Well 14	35	6E	15	SE ¼ NW ¼

Place of Use

As described on Page 2 of this Report of Examination, Attachment 1 shows the place of use for USGE's Cockreham Island operation

Jill E Van Hulle

6/22/16

Report by Jill Van Hulle *Date*

Dawn Chapel

Dawn Chapel

6/22/16

Hydrogeologic Report by Dawn Chapel, LG, LHG, License #2651 *Date*

J. R. "BUCK" SMITH

Buck Smith

6/22/16

Reviewed by Buck Smith, LG, LHG, License #1479 *Date*

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Selected References

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

- Department of Ecology records of surface and groundwater rights and claims, and of well construction reports within the vicinity of the subject production wells.
- Ecology's Water Resources Program's policies, procedures, and guidance.
- *Water Well Reports* from the Department of Ecology well log database (various dates).
- Records of water rights (and related information) in the vicinity of the subject property.
- Information provided by the applicant in support of this application
- Aerial photos from Skagit County's collection from 1937, 1941, 1956, 1969, 1998, 2001, 2004 – 2007, 2009, 2011 and 2013
- Aerial images of the property viewed in GoogleEarth from 7/24/1998, 7/21/2003, 7/31/2005, 8/17/2006, 9/10/2009, 11/3/2011 and 7/14/2013,
- LandSat imagery (http://landsatlook.usgs.gov/viewer.html) dating back to 1973
- The Washington State Department of Agriculture (WSDA) agricultural land use Geo-database
- Geologic and hydrogeologic data provided in USGS SIR 2009-5270, USGS SIR 2009–5208, USGS SIR 2010-5184, and WDNR OFR 2000-1
- Hydrogeologic and Impairment Evaluation of the US Golden Eagle Farms Water Right Change Applications, Pacific Groundwater Group ,March 11, 2016

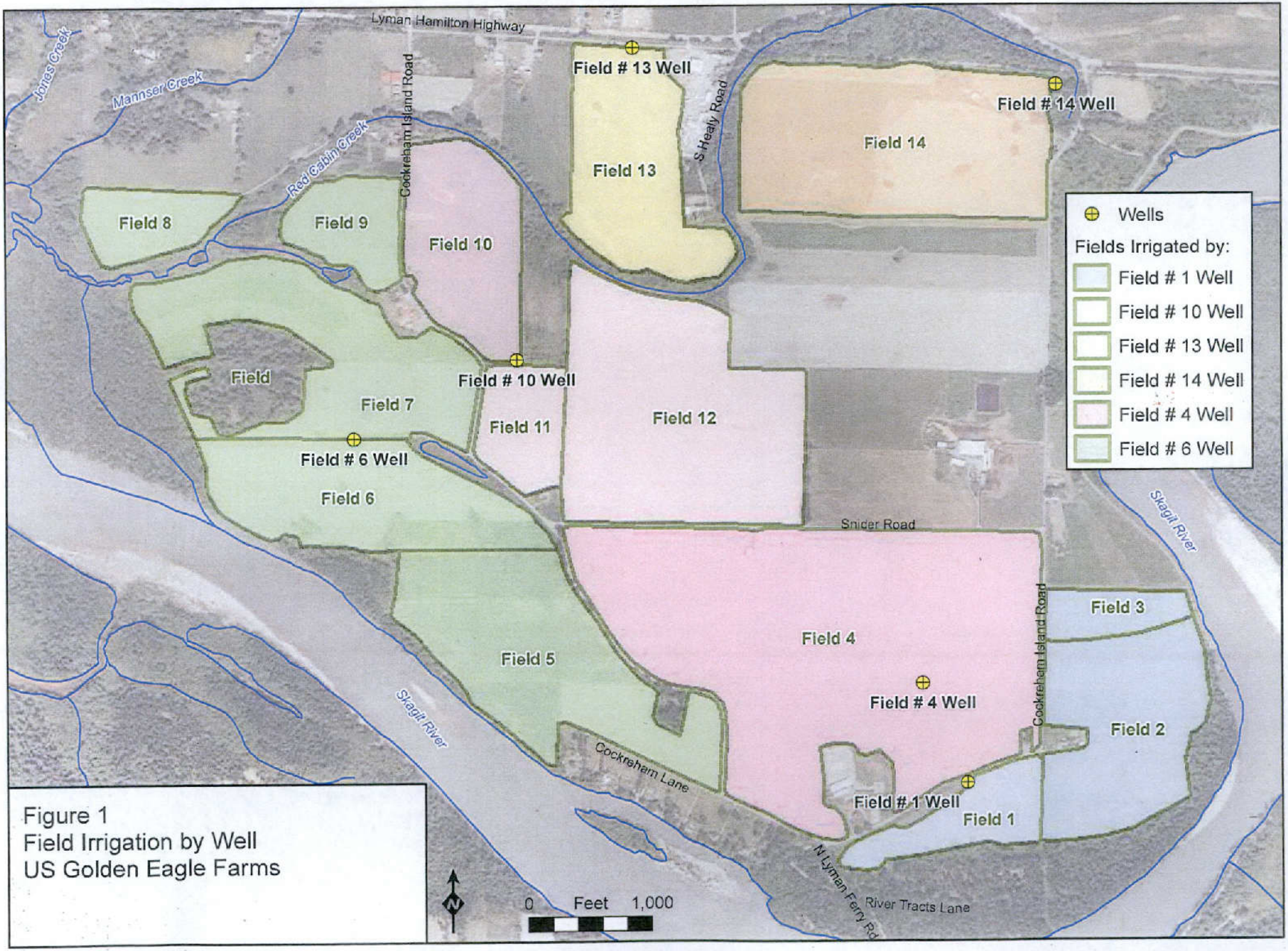
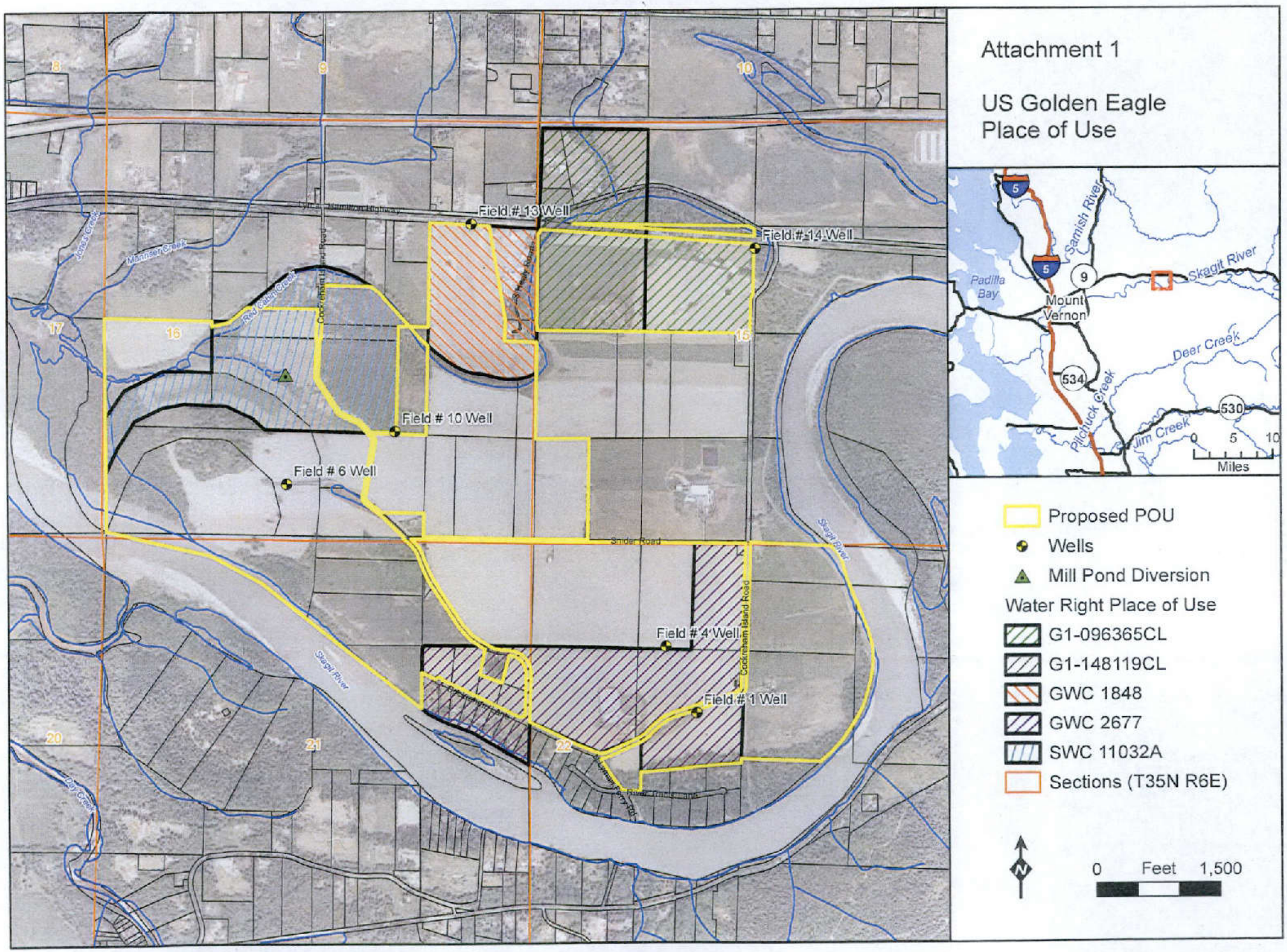


Figure 1
Field Irrigation by Well
US Golden Eagle Farms


Attachment 1
US Golden Eagle
Place of Use
Field # 13 Well
Field # 14 Well
Field # 10 Well
Field # 6 Well
Field # 4 Well
Field # 1 Well
Cockreham Island Road
Snider Road
Skagit River
Red Cabin Creek
Jones Creek
Mannsen Creek
Day Creek
Samish River
Padilla Bay
Mount Vernon
Deer Creek
Pilchuck Creek
Jim Creek
534
530
0 5 10
Miles
Proposed POU
Wells
Mill Pond Diversion
Water Right Place of Use
G1-096365CL
G1-148119CL
GWC 1848
GWC 2677
SWC 11032A
Sections (T35N R6E)
N
0 Feet 1,500