STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

PROTESTED REPORT OF EXAMINATION
Change of: Groundwater Permit 261
WRTS File # CG1-*00266C

PRIORITY DATE	CLAIM NO.	PERMIT NO.	CERTIFICATE NO.
June 6, 1946		261	

NAME
Deer Creek Water Association

ADDRESS/STREET	CITY/STATE	ZIP CODE
PO Box 1010	Lynden, WA	98264

PUBLIC WATERS TO BE APPROPRIATED

SOURCE
Well field

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND (cfs)	MAXIMUM GALLONS PER MINUTE (gpm)	MAXIMUM ACRE FEET PER YEAR (ac-ft/yr)
	200	4.0

QUANTITY, TYPE OF USE, PERIOD OF USE
community domestic supply - continuously

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION--WITHDRAWAL
534 feet South and 2134 feet East from the NW corner of Section 31, T. 39 N., R. 3E, W.M.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP	RANGE	WRIA	COUNTY
NE 1/4 NW 1/4	31	39N	3E	1	Whatcom

PARCEL NUMBER	LATITUDE	LONGITUDE	DATUM
390331 224483			

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED
[Attachment 1 shows location of the authorized place of use and point(s) of diversion or withdrawal]

The Area Served by Deer Creek Water Association as shown in the 2006 Water System Plan, Plate 2-2

DESCRIPTION OF PROPOSED WORKS

The association currently has 452 active residential connections (2006). The distribution system consists of nearly 20 miles of waterlines, predominantly 4, 6, 8, and 10 inch diameter AC, PVC and HDPE. Two existing side-by-side concrete storage tanks with a total capacity of 270,000 gallons are located approximately ¾ mile northeasterly from the wellfield.

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE	COMPLETE PROJECT BY THIS DATE	WATER PUT TO FULL USE BY THIS DATE
Project Begun	Project Completed	May 25, 2012

PROVISIONS

Well Head Protection

In accordance with WAC 173-160, wells shall not be located within certain minimum distances of potential sources of contamination. These minimum distances shall comply with local health regulations, as appropriate. In general, wells shall be located at least 100 feet from sources of contamination. Wells shall not be located within 1,000 feet of the boundary of a solid waste landfill.

Well Construction Standard

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

Well Tag

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

Access Port

Required installation and maintenance of an access port as described in WAC 173-160- 291(3).

Meter Installation

An approved measuring device shall be installed and maintained for each of the sources authorized by this water right in accordance with the rule "Requirements for Measuring and Reporting Water Use", WAC 173-173. http://www.ecy.wa.gov/programs/wr/measuring/measuringhome.html

Record Weekly, Report Annual Totals

Water use data shall be recorded weekly. The maximum rate of diversion/withdrawal and the annual total volume shall be submitted to the Department of Ecology by January 31st of each calendar year.

Electronic Reporting

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.

Metering Rule Description And Petition Info

WAC 173-173 describes the requirements for data accuracy, device installation and operation, and information reporting. It also allows a water user to petition the Department of Ecology for modifications to some of the requirements. Installation, operation and maintenance requirements are enclosed as a document titled "Water Measurement Device Installation and Operation Requirements".
http://www.ecy.wa.gov/programs/wr/measuring/measuringhome.html

Authority To Access Project

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.

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 superseding permit. Elements of a proof inspection may include, as appropriate, the source(s), system instantaneous capacity, beneficial use(s), annual quantity, place of use, and satisfaction of provisions.

Health Approval Required

Prior to any new construction or alterations of a public water supply system, the State Board of Health rules require public water supply owners to obtain written approval from the Office of Drinking Water of the Washington State Department of Health. Please contact the Office of Drinking Water at Northwest Drinking Water Operations, 20435 72nd Avenue S, Suite 200, K17-12, Kent, WA 98032-2358, (253) 396-6750, prior to beginning (or modifying) your project.

FINDINGS OF FACT AND ORDER

Upon reviewing the investigator's report, I find all facts relevant and material to the subject application have been thoroughly investigated. Furthermore, I find the change of water right as recommended will not be detrimental to existing rights.

Therefore, I ORDER approval of the recommended change of point of withdrawal and place of use under Ground Water Permit 261, subject to existing rights and the provisions listed above.

You have a right to appeal this ORDER. To appeal this you must:

- File your appeal with the Pollution Control Hearings Board within 30 days of the "date of receipt" of this document. Filing means actual receipt by the Board during regular office hours

- Serve your appeal on the Department of Ecology within 30 days of the "date of receipt" of this document. Service may be accomplished by any of the procedures identified in WAC 371-08-305(10). "Date of receipt" is defined at RCW 43.21B.001(2).

Be sure to do the following:

- Include a copy of this document that you are appealing with your Notice of Appeal.
- Serve and file your appeal in paper form; electronic copies are not accepted.

1. To file your appeal with the Pollution Control Hearings Board

Mail appeal to:

The Pollution Control Hearings Board
PO Box 40903
Olympia, WA 98504-0903

OR

Deliver your appeal in person to:

The Pollution Control Hearings Board
4224 – 6th Ave SE Rowe Six, Bldg 2
Lacey, WA 98503

2. To serve your appeal on the Department of Ecology

Mail appeal to:

The Department of Ecology
Appeals Coordinator
P.O. Box 47608
Olympia, WA 98504-7608

OR

Deliver your appeal in person to:

The Department of Ecology
Appeals Coordinator
300 Desmond Dr SE
Lacey, WA 98503

3. And send a copy of your appeal to:

Andrew B. Dunn
Department of Ecology
Northwest Regional Office
3190 160th Avenue SE
Bellevue, WA 98008

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

Signed at Bellevue, Washington, this 27th day of AUGUST 2009.

A. B. Dunn

Andrew B. Dunn, LG, LHG, Section Manager
Water Resources Program
Northwest Regional Office

BACKGROUND

Introduction

The applicant, Deer Creek Water Association, is a non-profit corporation classified as a Group A Community Water System by the Washington State Dept of Health. It is located in Whatcom County, Washington. Belden Acres Water Association, the former holder of this permit (originally issued to C. V. Wilder), no longer exists. Former customers of Belden Acres are to be served by Deer Creek Water Association, the City of Bellingham, or some other water source.

NOTE: References are made in this report to several tables and figures from the "Report on Hydrogeologic Conditions, Deer Creek Water Association, Change Application CG1-*00266C" prepared by Golder Associates for this investigation. Of them, only tables 2-1, 3-1, and 4-2 are reproduced in this Report of Examination. Tables 3-1 and 4-2 had extraneous information removed upon transfer to this ROE, for brevity. None of the figures from the hydrogeologic report are included here. Attachment 1 from this Report of Examination serves as a substitute for Figure 1-1.

Description and Purpose of Proposed Change

The applicant has applied to change the point of withdrawal of this permit from its current location to a well field. The applicant has another water right (G1-21084) legally authorized for this well field, and this change will give both the water right and this permit the same point of withdrawal. This change is being carried out as a result of a settlement agreement reached between the Deer Creek Water Association and the Department of Ecology concerning the status of this permit.

Attributes of the Permit and Proposed Change

Table 1. Summary of Proposed Changes to Permit No. 261

Attributes	*Existing*	*Proposed*
Name	Deer Creek Water Association (originally issued to C. V. Wilder)	Deer Creek Water Association
Priority Date | Date of Application for Change	June 6, 1946	September 5, 2007
Instantaneous Quantity	200 gpm	200 gpm
Annual Quantity	4.0 afy	4.0 afy
Source	Well	Well field
Point of Diversion/Withdrawal	E ½ Sec. 36, T39N, R2E	NE ¼ NW ¼ Sec. 31, T39N, R 3E
Purpose of Use	Community Domestic and Irrigation of 50 acres	Community Domestic
Period of Use	Continuously for Domestic/Seasonal for Irrigation	Continuously
Place of Use	For domestic supply for community in vicinity of Smith Road and Guide Meridian in Whatcom County, Washington. For irrigation in Section 36, Twp. 39 N., Rge. 2 E.W.M., less the SE ¼ of SE ¼ thereof.	The Area Served by Deer Creek Water Association as shown in the approved 2006 Water System Plan, Plate 2-2

Legal Requirements for Proposed Change

The following is a list of requirements that must be met prior to authorizing the proposed change in point of withdrawal and place of use.

- **Public Notice**

  Legal notice for this change was published on October 24th and October 31st, 2007. One protest was received from the Lummi Nation.

- **State Environmental Policy Act (SEPA)**

  This change is categorically exempt from the requirements of SEPA under WAC 197-11-800(4).

- **Water Resources Statutes and Case Law**

  Chapters 90.03 and 90.44 RCW authorize the appropriation of public water for beneficial use and describe the process for obtaining water rights, including the process to amend or change existing rights. Laws specifically governing the water right permitting process are RCW 90.03.250 through 90.03.340 and RCW 90.44.060. Changes or amendments to these rights are covered under RCW 90.03.380 and RCW 90.44.100.

INVESTIGATION

In considering this application for change, my investigation included, but was not necessarily limited to research and review of the following:

- The State Water Code
- Existing certificates, permits, and supporting documents held by Deer Creek Water Association and C.V. Wilder
- The Deer Creek Water Association Water System Plan Amendment and Project Report to Incorporate Belden Acres Water Association, 2005
- A Department of Ecology letter reviewing the 2005 Deer Creek Water Association Water System Plan Amendment for the Washington State Department of Health
- The Deer Creek Water Association Water System Plan, 2006
- A Department of Ecology letter reviewing the 2006 Deer Creek Water Association Water System Plan for the Washington State Department of Health
- DOH Water Facilities Inventory Forms, dated 1/14/2000 and 1/28/2005
- Information on the Department of Health's SENTRY Water System Search page: http://www4.doh.wa.gov/SentryInternet/Intro.aspx Belden Acres Water Association water system ID - 05250
- Results of Hydrogeologic Investigations for the Deer Creek Water Association, Pacific Groundwater Group (September, 1995)
- Report on Hydrogeologic Conditions, Deer Creek Water Association Change Application CG1-*00266C (June, 2008)
- Final Settlement Agreement and Stipulation of the Parties of PCHB case 07-002, Deer Creek Water Association v. State of Washington, Department of Ecology, May 25, 2007
- Maps, including those existing at the Department of Ecology and those provided by Deer Creek Water Association
- A letter of protest from the Lummi Indian Business Council, dated October 31, 2007

History of Water Use

1. On June 6, 1946, the Department of Ecology received a ground water application from C.V. Wilder, to appropriate ground water for "domestic supply for community and irrigation" in the amount of 2700 gallons per minute (gpm) and 730 acre-feet per year (afy). The intent was to irrigate 450 acres and serve an ultimate population of 10,000 people by 1951. The application was assigned ground water application number 266.

2. The Department of Ecology issued a Report of Findings on October 2, 1946, for reduced quantities of 450 gpm and 375 afy for "irrigation and domestic supply for community". The reduction in the amount of water granted occurred as a result of many protests received from concerned parties relying on withdrawals of water from surface streams and springs in the area.

   On October 29, 1946, Ground Water Permit 261 was issued to C.V. Wilder. The permit allocated 450 gpm and 375 acre-feet per year for "domestic supply for community and irrigation".

4. An affidavit attesting to the appropriation of water underground water permit 261 was signed by C.V. Wilder on February 13, 1952. It states the following:

   > "Such well was constructed and finished July 17, 1947, and tested on September 1, 1947, and ever since said last date has been in operation, and water granted by said permit, duly appropriated to the uses provided by said permit, continuously and is now so being used and appropriated."

5. On February 21, 1952, the Department of Conservation and Development, Division of Hydraulics issued C.V. Wilder Certificate of Ground Water Right 988-A. This certificate authorized 450 gpm and 375 acre-feet per year for domestic supply for community and irrigation. The place of use was the same as indicated on the original permit.

6. The development within the place of use of this water right was not complete at issuance of the ground water certificate.

7. The Washington State Supreme Court's decision in *Department of Ecology v. Theodoratus*, 135 Wn.2d 582 P.2d 1241 (1998) contains holdings that relate to such water rights. In that decision, the Supreme Court held that "statutory and common law does not allow for a final certificate of water rights to be issued based upon system capacity."

8. Based on the above information, The Department of Ecology issued an Order of Rescission of Ground Water Certificate 988-A and Reinstatement of Ground Water Permit 261 to Deer Creek Water Association (the owner of Certificate 988-A) on December 12, 2006 (Order No. DE 06WRNR-3934).

9. Rescission Order No. DE 06WRNR-3934 was appealed by Deer Creek Water Association on 01/10/2007.

10. The Department of Ecology and Deer Creek Water Association agreed to a settlement of PCHB case No. 07-002 on May 25, 2007. The settlement established that the rescission of Certificate 988-A to Ground Water Permit 261 would stand, and would be issued for four (4) acre-feet per year and two hundred (200) gallons per minute, with a three-year development schedule from the time of reissuance.

11. Deer Creek agreed to submit a change application for Permit 261 to change the point of withdrawal to the Deer Creek Water Association well field and the place of use to the approved service area for Deer Creek (these changes are the subject of this Report of Examination). The change application was accepted as complete by the Department of Ecology on September 5, 2007.

8. Deer Creek Water Association has attached the well for this right to their water system but it is currently in standby mode. There were 11 connections relying exclusively on Ground Water Certificate 988-A before they were attached to the Deer Creek Water Association's water system in 2005.

10. Through the exchange of information with Deer Creek during settlement talks, the Department of Ecology recognized that there had been diligence in the development of Certificate 988-A (now Groundwater Permit 261). The permit had been *exercised* both at the point of withdrawal specified in Groundwater Permit 261 and Certificate 988-A, and through an unauthorized point of withdrawal located within the NW ¼ of Section 31, Township 39N, Range 3E belonging to the Deer Creek Water Association (the Deer Creek well field to which the point of withdrawal for Permit 261 is being moved in this Report of Examination, and the point of withdrawal for Deer Creek's main water right G1-21084). The permit has been *beneficially used* at the place of use specified in Groundwater Permit 261 and Certificate 988-A to service customers belonging to the Belden Acres Water Association.

Proposed Use

The Purpose of Use of the water will be for community domestic supply of the Deer Creek Water Association and the former members of the Belden Acres Water Association. The irrigation purpose of use will be dropped.

Site Visit

A site visit was conducted by Buck Smith, hydrogeologist, and the report writer on January 22, 2008. We inspected the wells and pump houses for Deer Creek Water Association, and the well and pump house for the former Belden Acres well, the water right of which is the subject of this report. The well pump in the Belden Acres well had been pulled as of the site visit, so no pump test could be performed. The Deer Creek wells were in good working order.

Other Rights Appurtenant to the Place of Use

See Table 4-2 below for a list of water rights, permits and claims considered during the impairment assessment of this change.

Table 4-2: List of Water Right Certificates, Permits, and Claims

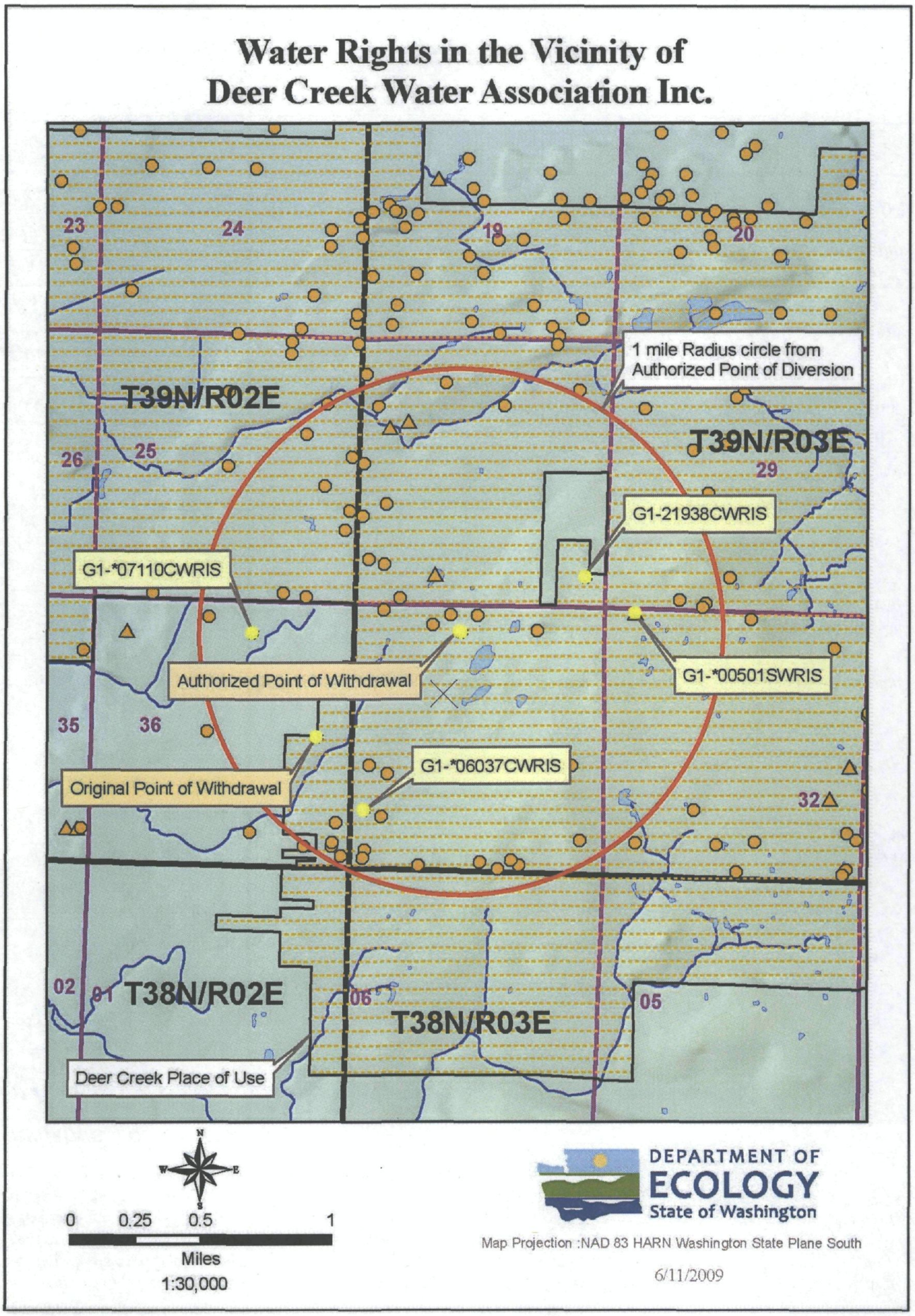
DOCUMENT NUMBER	DOCUMENT TYPE	PURPOSE LIST	NAME	PRIORITY DATE	GPM	ACRE FEET	TRS
G1-014021CL	Claim Long Form	DG	GERRIT R. VAN DIEST				T39N/R02E-25
G1-014677CL	Claim Long Form	DG	HARRY HANSON				T39N/R02E-25
G1-017554CL	Claim Long Form	DG	DARWIN THOMPSON				T39N/R02E-25
G1-018635CL	Claim Long Form	DG	LOUISE S. JOHNSON				T39N/R02E-25
G1-021918CL	Claim Long Form	DG ST	GERRIT R. VAN DIEST				T39N/R02E-25
G1-022112CL	Claim Long Form	DG ST	HARVIE R. OWEN				T39N/R02E-25
G1-027322CL	Claim Long Form	DG ST	GEORGE H. STURGIS				T39N/R02E-25

G1-030625CL	Claim Long Form	DG ST	LAVERNE L. WILDER				T39N/R02E-25
G1-054223CL	Claim Long Form	DG	LONNIE H. BARRETT				T39N/R02E-25
G1-061666CL	Claim Long Form	DG	CARMI H. KING				T39N/R02E-25
G1-141703CL	Claim Long Form	DG ST	LLOYD D MATHESON				T39N/R02E-25
G1-156406CL	Claim Long Form	DG IR ST	DOUG PULLAR				T39N/R02E-25
G1-103426CL	Claim Short Form	DG IR ST	RICHARD L HAGER				T39N/R02E-25
G1-131733CL	Claim Short Form	DG IR	SEBULON WERRE				T39N/R02E-25
G1-131895CL	Claim Short Form	DG IR	WARREN J STANDAL				T39N/R02E-25
G1-*00266C	Certificate	DM IR	WILDER C V	6-Jun-46	450	375	T39N/R02E-36
CG1-*00266C	Change Application	DM IR	Deer Creek Water Association	5-Sep-07	200	4	T39N/R02E-36
G1-*06763C	Certificate	IR	WILDER C V	17-Jun-63	600	480	T39N/R02E-36
G1-*07110C	Certificate	IR	WILDER C V	13-Apr-64	550	520	T39N/R02E-36
G1-012897CL	Claim Long Form	DG IR	VERN S. WOODS				T39N/R02E-36
G1-093334CL	Claim Long Form	DG	MINNIE E MARTINSEN				T39N/R02E-36
S1-025981CL	Claim Long Form	DG	VERNER E. LINDSTROM				T39N/R02E-36
G1-047301CL	Claim Short Form	DG	WILLIAM W. WHITE				T39N/R02E-36
G1-066801CL	Claim Short Form	DG	BENNIE M. LARSEN				T39N/R02E-36
G1-070965CL	Claim Short Form	DG IR ST	JACK D FOSTER				T39N/R02E-36
G1-162996CL	Claim Short Form	DG ST	C V WILDER				T39N/R02E-36
G1-162997CL	Claim Short Form	DG	C V WILDER				T39N/R02E-36
G1-21938C	Certificate	DM FR	BISHOP LEO W ET AL	28-Jun-74	20	2.6	T39N/R03E-30
G1-009905CL	Claim Long Form	DG	JOE A. WIKBERG				T39N/R03E-30
G1-016134CL	Claim Long Form	DG	DEAN HAWKS				T39N/R03E-30
G1-017158CL	Claim Long Form	DG	WILBUR E. BOWEN				T39N/R03E-30
G1-030247CL	Claim Long Form	DG	HENRY F. MEYER				T39N/R03E-30
G1-056309CL	Claim Long Form	DG	JESSE J. HUBER				T39N/R03E-30
G1-077376CL	Claim Long Form	DG	JOE WILKERSON				T39N/R03E-30
G1-137643CL	Claim Long Form	DG ST	LAWRENCE T JOHNSON				T39N/R03E-30
G1-153661CL	Claim Long Form	DG ST	DAN CHITWOOD				T39N/R03E-30

G1-153919CL	Claim Long Form	DG ST	WILLIAM A MARTINSON				T39N/R03E-30
S1-011881CL	Claim Long Form	DG ST	ALBERTUS BOGMAN				T39N/R03E-30
S1-141702CL	Claim Long Form	DG ST	LLOYD D MATHESON				T39N/R03E-30
G1-050015CL	Claim Short Form	DG	REYNARD W. BALDWIN				T39N/R03E-30
G1-130763CL	Claim Short Form	DG IR ST	LAWRENCE PULLAR				T39N/R03E-30
G1-132950CL	Claim Short Form	DG	CARL S PETERSON				T39N/R03E-30
S1-048215CL	Claim Short Form	DG	OTTO ZYLSTRA				T39N/R03E-30
G1-21792	Permit	IR ST	JOHN BISHOP	14-Jun-74	240	68.3	T39N/R03E-30
G1-*06037C	Certificate	IR	KAEMINGK J ET AL	29-Aug-61	40	16	T39N/R03E-31
G1-21084C	Certificate	DM	Deer Creek Water Association Inc	30-Nov-73	300	336	T39N/R03E-31
G1-010387CL	Claim Long Form	DG ST	GORDON L. ERICKSON				T39N/R03E-31
G1-011614CL	Claim Long Form	DG ST	MARION F. BROOKS				T39N/R03E-31
G1-015358CL	Claim Long Form	DG	PAULAS VANDERWIELEN				T39N/R03E-31
G1-018495CL	Claim Long Form	DG	WILLIAM R. PEACH				T39N/R03E-31
G1-033027CL	Claim Long Form	DG ST	LEONARD S. RITCHIE				T39N/R03E-31
G1-042625CL	Claim Long Form	DG ST	RAYMOND V. SHANAHAR				T39N/R03E-31
G1-071681CL	Claim Long Form	DG	HAROLD A. JONES				T39N/R03E-31
G1-138133CL	Claim Long Form	DG IR ST	PAUL C MILLARD				T39N/R03E-31
G1-138134CL	Claim Long Form	IR ST	PAUL C MILLARD				T39N/R03E-31
G1-138135CL	Claim Long Form	DG IR ST	PAUL C MILLARD				T39N/R03E-31
G1-159876CL	Claim Long Form	DG ST	HULDA J MATHESON				T39N/R03E-31
G1-045079CL	Claim Short Form	DG	WARREN E. CLARK				T39N/R03E-31
G1-059708CL	Claim Short Form	DG ST	RIEKUS V. DUIM				T39N/R03E-31
G1-077377CL	Claim Short Form	DG ST	CARRIE KOLB				T39N/R03E-31
G1-081712CL	Claim Short Form	DG	ALFRED HIRSIG				T39N/R03E-31
G1-112532CL	Claim Short Form	DG	ALFRED LEISHMAN				T39N/R03E-31
G1-157951CL	Claim Short Form	DG IR ST	RICHARD R BLAKE				T39N/R03E-31

Source:
Washington State Department of Ecology Water Rights Application Tracking System Database, October 2006
Washington State Department of Ecology Water Rights Application Tracking System (http://www.ecy.wa.gov/programs/wr/info/wrats/Wria_whatcom.pdf), Jun 2008
Purpose of use codes: DM -Domestic Multiple, DG - Domestic General, CI - Commercial-Industrial, IR - Irrigation, ST - Stock Watering, DY - Dairying, FR - Fire Protection

Figure 1-A: Map Showing Water Rights in Vicinity of Deer Creek Water Association Well Field SO3



Hydrologic/Hydrogeologic Evaluation (the following information in italics was taken directly from the Golder report)

INTRODUCTION

*Golder Associates, Inc. has prepared this report at the request of the Washington State Department of Ecology (Ecology) to summarize hydrogeologic conditions in the vicinity of the Deer Creek Water Association (Association) wells. The Association's wellfield is located about three miles north of Bellingham in Whatcom County, Washington. Ecology has requested this report to support processing of the Association's application for water right change/transfer CG1-*00266C, filed on September 15, 2007. This application seeks to transfer an instantaneous quantity of 200 gallons per minute (gpm) and an annual quantity of 4 acre-feet from the Belden Acres Well (Source S04) to the Association's wellfield (S03), which consists of two wells (Wells 1 and 2; S01 and S02, respectively).*

HYDROGEOLOGIC CONDITIONS

The description of the hydrogeology in the area of the Deer Creek Water Association Wells is summarized from Cox and Kahle (1999), Easterbrook (1976) and Pacific Groundwater Group (1995).

1.1 Geologic Units

The geologic units in the area include unconsolidated alluvial and glacial sediments and sedimentary bedrock:

***Alluvial Deposits** consist of sand, gravel, and silt deposited by the Nooksack River and small streams.*

***Recessional Glacial Outwash** consists of sand and gravel deposited in glacial streams. The outwash is generally less than 50 feet thick, but may be up to 100 feet thick.*

***Glaciomarine Drift** includes the Bellingham and Kulshan Glaciomarine Drift. These units consist of silt and clay with dropstones and shell fragments. The drift units were deposited as debris melting out of floating glacial ice. The Bellingham Drift is exposed at the ground surface and is about 10 to over 100 feet thick; the Kulshan Drift is not exposed at the ground surface and is only intersected in wells. It is about 100 to 150 feet thick.*

***Deming Sand** consists of sand and gravel. The Deming Sand is limited in extend and is not exposed at the ground surface, and occurs below the Bellingham Drift. The thickness of the Deming Sand ranges from about 30 to over 100 feet.*

***Vashon Drift** includes glacial till and advance outwash sands. The Vashon Drift is not exposed at the ground surface and may be 30 to about 100 feet thick.*

***Bedrock** consists of the Chuckanut and Huntington Formations, a thick (greater than 1,000 feet) series of sandstones, mudstones, and conglomerates. The bedrock generally underlies the glacial units, but is exposed at the ground surface east and southeast of the Deer Creek Water Association wells.*

A generalized stratigraphic column is shown in Table 2-1.

Table 2-1. Stratigraphic Column of Geologic Units in the Area of the Belden Acres and Deer Creek Wells

Summarized from Easterbrook (1976), PGG (1995) and Cox and Kahle (1999)

GEOLOGIC UNIT	AGE	DESCRIPTION	THICKNESS (feet)	HYDROGEOLOGIC UNIT	
Alluvial Deposits	Holocene-Pleistocene	Sand, Gravel, Silt	0-35	Unconfined Aquifer (Sumas Aquifer)	
Recessional Glacial Outwash	Pleistocene	Sand and Gravel	20 to >50		
Bellingham Drift	Pleistocene	Silt and Clay	10->100	Aquitard	Everson-Vashon Semi-Confining Unit (Deer Creek Aquifer within Deming Sand)
Deming Sand	Pleistocene	Sand and Gravel	30->100	Aquifer	
Kulshan Drift	Pleistocene	Silt and Clay	100-150	Aquitard	
Vashon Drift (till and advance outwash)	Pleistocene	Sand, Gravel, Silt, Clay	30-100(?)	Aquifers and Aquitards	Vashon Semi-Confining Unit
Bedrock (Chuckanut/Huntington Formation)	Paleocene-Miocene	Sandstone, Mudstone, Conglomerate	>1,000	Bedrock (aquifers and aquitards)	

1.2 Hydrogeologic Units

The hydrogeologic units in the area are summarized in the following sections. The two principal aquifers in the area are the Sumas Unconfined Aquifer and the Everson-Vashon Semi-Confining Unit, which includes the Deer Creek Aquifer.

1.2.1 Sumas Unconfined Aquifer

The recessional glacial outwash and alluvial deposits form an extensive, highly productive, unconfined aquifer that occurs in the Nooksack River valley, north and west of the Deer Creek wells. The Sumas Aquifer is in continuity with surface water, and is underlain by the Bellingham Glaciomarine Drift. Depth to water in the aquifer typically ranges from about 10 to 20 feet below ground.

1.2.2 Everson-Vashon Semi-Confining Unit

The glaciomarine drift units and the Deming Sand form the Everson-Vashon Semi-Confining Unit. The glaciomarine drift units are fine-grained (silt and clay) and thus low permeability, and form aquitards. The Deming Sand, which underlies the Bellingham Drift, forms an aquifer (the Deer Creek Aquifer, PGG 1995) in the area of the Associations' wells. The Deer Creek Aquifer is unconfined but is not in direct continuity with the Sumas Unconfined Aquifer or surface water because it underlies the low-permeability Bellingham Drift.

Depth to water in the Deer Creek Aquifer ranges from about 10 to 200 feet below ground, depending on land surface elevation. The groundwater elevation ranges between about 100 and 150 feet.

1.2.3 Vashon Semi-Confining Unit and Bedrock

The Vashon Semi-Confining Unit and bedrock underlie the Everson-Vashon Semi-Confining Unit. The Vashon Semi-Confining Unit includes advance outwash which forms an aquifer, however, few wells are completed in this unit. Bedrock underlying the glacial deposits locally forms an aquifer where the bedrock is fractured.

1.3 Aquifer Hydraulic Properties

The Sumas Unconfined Aquifer is moderately to highly permeable. Cox and Kahle (1999) used well log data to estimate the hydraulic conductivity. They estimated hydraulic conductivity of the Sumas Unconfined Aquifer to be about 7 to 7,800 ft/d, with a median hydraulic conductivity of 270 ft/day. There are no estimates of the aquifer specific yield, but it likely ranges from about 0.05 to 0.2.

In the Deer Creek Aquifer, Cox and Kahle (1999) estimated hydraulic conductivity to range from 3 to 570 ft/d, with a median of 81 ft/day. PGG (1995) estimated the aquifer transmissivity to be about 6,000 ft^2/d, and the hydraulic conductivity to be about 120 ft/d, based on specific capacity data. There are no pumping test data to determine the specific yield. The specific yield is estimated to range from about 0.05 to 0.2.

1.4 Groundwater Recharge

Groundwater recharge is from the infiltration of precipitation. Cox and Kahle (1999) report recharge to the Sumas Aquifer is in the range of 16 to 30 inches per year. Recharge to the Everson-Vashon Semi-Confining Unit is estimated to be about 11 to 15 inches per year by Cox and Kahle (1999), while PGG (1995) estimates recharge to be in the range of 8 to 13 inches.

1.5 Groundwater Flow Directions

Figure 2-1 shows the general groundwater flow directions near the Deer Creek Water Association Wells based on mapping presented in PGG (1995). Groundwater flows in the Sumas Aquifer are generally to the northwest towards the Nooksack River. In the Deer Creek Aquifer, an east-southeast trending groundwater divide is inferred about one mile northeast of the Association's wells. The divide parallels Deer Creek. Groundwater on the north side of the divide flows north and northeast, and groundwater on the south side of the divide flows southeast, towards a discharge area consisting of springs in the headwaters of small tributaries to Silver Creek.

1.6 Surface Water

The two principal surface water bodies in the area of the Association's wells are Deer Creek and Silver Creek. Deer Creek is located about one mile north of Wells 1 and 2. Tributary headwaters of Silver Creek are located about one mile southwest of Wells 1 and 2. Wells 1 and 2 are located in the Silver Creek basin, near the divide between Silver Creek and Deer Creek. The Belden Acres well is located in the Silver Creek basin.

Both Silver Creek and Deer Creek have instream flow requirements under WAC 173-501-030 (2). Also, Deer Creek is closed to further consumptive appropriation all year, and Silver Creek is closed from May 1 to November 15.

DEER CREEK WATER ASSOCIATION INFORMATION

1.7 Well Information

The Deer Creek Water Association owns and operates three wells. This section describes known well information. Information on well construction is summarized on Table 3-1, and well locations are shown in the Figure 1-1.

Table 3-1: Information on Belden Acres and Deer Creek Wells

Well Number	Date Completed	Depth Drilled (feet bgs)	Screened Interval (feet bgs)	Water Right Number	Priority Date	Instantaneous Quantity (gpm)	Annual Quantity (AF)
Well 1 (SO 1)	10/20/1973	185	129-135, 145-155	G1-21084C	11/30/1973	300	336
Well 2 (SO 2)	5/31/1983	157	136-157				
Belden Acres (SO 4)	7/17/1947	105	94-104	G1-*00266	6/6/1946	475*	375**

*Subsequently reduced to 200 gpm by Ecology relinquishment action

**Subsequently reduced to 4 acre-feet per year by Ecology relinquishment action

1.7.1 Well 1 (S 01)

Well 1 was drilled in 1973 to a depth of 185 feet. The well is completed between a depth of about 129 and 155 feet (estimated elevation range of 101 to 75 feet) using two intervals of screen. The depth to water was about 106 feet below ground when drilled, and about 104 feet below ground in January 2008. The well is equipped with a 30 hp pump capable of pumping about 285 gallons per minute (gpm).

1.7.2 Well 2 (S 02)

Well 2 was drilled in 1983 to a depth of 157 feet. The well is completed between a depth of about 136 and 157 feet (estimated elevation range of 94 to73 feet). The depth to water was about 115 feet below ground when drilled, and about 116 feet below ground in January 2008. The well is equipped with a 30 hp pump capable of pumping about 277 gpm.

Wells 1 and 2 are located about 100 feet from each other and operated as a wellfield designated as S 03. The combined instantaneous pumping rate from the two wells is limited to 300 gpm by current water rights.

1.7.3 Belden Acres Well (S 04)

The Belden Acres Well was drilled in 1947 to a depth of 105 feet. The well is completed between a depth of about 94 and 104 feet (estimated elevation range of 90 to 80 feet). The depth to water was about 70 feet below ground when drilled, and about 72 feet below ground in January 2008. The well pump had been pulled at the time of the field exam, but was equipped with a pump capable of pumping about 50 to 60 gpm, however, the well was tested at 200 gpm, and was capable of pumping about 450 gpm.

***1.8** Groundwater Level Information*

Groundwater level information includes data on the well logs and depth to water measurements provided by Ecology for the Association's wells. Groundwater levels were measured periodically between August 1993 and January 2008 in Well 1. Limited groundwater level measurements are available from Well 2 in 1993, 2004, and 2008, and from the Belden Acres Well in 2008.

Groundwater elevations for the wells are plotted on Figure 3-1 (in hydrogeologic report). Groundwater elevations in the wells are similar ranging from about 113 to 127 feet msl. The groundwater elevation in Well 1 has varied between about 125 and 127 feet msl, and the groundwater elevation in Well 2 has remained constant about 114 feet. Over the period of record, the groundwater elevations have remained stable.

***1.9** Pumping Information*

Information on pumping from Wells 1 and 2 from 2001 through 2005 is included in the draft water system plan (Reichhardt and Ebe Engineering 2006). Available pumping information is summarized below:

Year	Water Produced (Mgal)	Water Produced (AF)	Average Pumping Rate (gpm)
2001	49.43	152	94
2002	51.59	158	98
2003	53.99	166	103
2004	56.08	172	106
2005	53.37	164	102

NOTE: The above table was prepared by Golder Associates, Inc. and reflects their summary of pumping information as part of their hydrogeologic and impairment analysis. It does not reflect, nor is intended to reflect, the maximum instantaneous quantities (Qi) pumped during any given period.

There is no pumping information from the Belden Acres Well.

HYDROGEOLOGIC EVALUATION

This section describes the evaluations of the hydrogeologic conditions, including whether the wells are completed in the same body of groundwater and an evaluation of potential impairment to other groundwater users and to surface water.

1.10 *Same Body of Groundwater*

Wells 1 and 2 are located about 100 feet from each other and are both completed in the Deer Creek aquifer, with screens placed at approximately the same elevation range of approximately 75 to 100 feet. Both wells have similar groundwater levels of about 115 to 125 feet (based on estimated ground elevations). Given this information, both wells are considered to withdraw from the same body of public groundwater

The Belden Acres Well is completed at an elevation of about 80 to 90 feet, and the groundwater elevation is about 115 feet. The completion interval and groundwater elevation are similar to Wells 1 and 2. Hydrogeologic cross sections prepared by PGG (1995) are included in Appendix A. The Belden Acres Well is not shown on the sections, but it would be located about ½ mile east of the Deer Creek wells on Section A-A' (Figure A-2; well numbers 164 and 165),and about ½ mile south of the section line. On Section B-B' (Figure A-3), the Belden Acres well would be about ½ mile west of the section line, and projects onto the section at well numbers 167 and 188.

The completion elevations, groundwater elevations, and hydrogeologic cross sections demonstrate that the Belden Acres Well is completed in the same body of groundwater as the two Deer Creek Water Association wells (Wells 1 and 2), with all of the wells completed in the Deer Creek Aquifer (Deming Sand).

1.11 *Impairment Evaluation*

The Washington State Department of Ecology Well Log Database (http://apps.ecy.wa.gov/welllog/index.asp) was queried to obtain information on nearby wells, as summarized in Table 4-1. The Washington State Department of Ecology Water Rights Application Tracking System database was queried to obtain information in water rights and claims near Wells 1 and 2, as summarized in Table 4-2. There are six certificates and one permit for groundwater, 51 groundwater claims, two applications for groundwater rights, and four claims for surface water.

1.11.1 Groundwater

The potential impairment to other groundwater uses was evaluated by calculation of the interference drawdown resulting from pumping Wells 1 and 2 at the proposed instantaneous rate of 500 gpm (combined from both wells). Selection of 500 gpm as the pumping rate provides a conservative evaluation, since the net increase in instantaneous pumping proposed by the change application is 200 gpm. The interference drawdown was calculated using Jacob's equation (Kruseman and deRidder 1994). The estimate of interference drawdown assumes the following:

- *The aquifer transmissivity is 6,000 ft^2/d and the specific yield is 0.1.*
- *Wells 1 and 2 are represented by a single well pumping at 500 gpm continuously for 30 to 120 days.*

The results of the distance-drawdown analysis is shown on Figure 4-1. The analysis predicts about 2 to 4 feet of drawdown at a distance of 1,000 feet from the wells for 90 to 120 days of continuous pumping.

Table 4-1 summarizes the predicted interference drawdown in other wells near the Association's wells based on the above analysis, and also shows the estimated remaining potential drawdown in area wells. As a conservative look at potential impairment, this summary assumes that all of the wells are within the Deer Creek Aquifer and are hydraulically connected to the Association's wells, although it is expected that several of the wells are in other hydrogeologic units. The effects of the interference drawdown on the available drawdown (distance between the pump setting depth and depth to water) in the wells was estimated assuming the pumps were set about three feet above the base of the casing (open bottom completion) or three feet above the top of the well screen for screened wells. The analysis suggests that the maximum predicted interference drawdown in any of the wells is 2.6 feet, but significant remaining drawdown potential exists in all of these cases.

1.11.2 Surface Water

The closest surface water bodies to the Association's wells are Deer Creek and tributaries to Silver Creek (Figure 1-1, Attachment 1), both of which are tributaries to the Nooksack River. Well logs and hydrogeologic cross-sections prepared by Pacific Groundwater Group (1995) show that the Deer Creek Aquifer is separated from surface water by unsaturated, low-permeability glaciomarine drift and unsaturated sands and gravels. This suggests that both the streams are perched in the area of the Association's wellfield and that the Deer Creek Aquifer is not in direct continuity with surface water in this area. Based on this interpretation, neither Deer Creek or Silver Creek is expected to be impaired by approval of the requested water right change.

Pacific Groundwater Group (1995) previously evaluated the effects of increased instantaneous pumping in the wellfield area on surface water. PGG predicted that if the peak instantaneous pumping rate was increased, there could be a short-term decrease in discharge from the Deer Creek Aquifer to the Nooksack River, but because the aquifer is not directly connected to the river, the effects would be delayed and spread out over a longer time than the pumping duration. No significant net decrease in groundwater discharge to the Nooksack River is expected if the requested water right change application is approved, given the relatively short distance between the wells involved with the change (approximately ½ mile) compared to

the distance from the wells to the Nooksack River (approximately 5 miles), combined with the lack of an increase in the total annual withdrawal quantity associated with the water right.

Impairment Considerations

The bulk of analysis for the impairment assessment was explained in the Hydrogeologic Evaluation section above. As described there, no impairment of surrounding groundwater rights are expected as a result of this change.

Deer Creek and Silver Creek are subject to closures and/or instream flows as per WAC 173-501-030, as is the Nooksack River, to which both creeks are tributaries. Because there will be no net increase in withdrawals, there will be no new impact (impairment) on the creeks or the river.

Enlargement considerations

This change will not result in an enlargement of Groundwater Permit 261. Quantities have been reduced to those already perfected (200 gpm, 4 acre-feet per year). Even though the transfer of this permit to Deer Creek's well field will allow service to all 452 active connections in the Association's service area, the permit contains no inchoate quantities to grow into.

Public Interest Considerations

No negative public interest impacts are evident as a result of this change. The Washington Department of Fish and Wildlife concurs that there will be minimal impact on fish in Deer Creek and Silver Creek.

According to RCW 90.54.020(8),

> "Development of water supply systems, whether publicly or privately owned, which provide water to the public generally in regional areas within the state shall be encouraged. Development of water supply systems for multiple domestic use which will not serve the public generally shall be discouraged where water supplies are available from water systems serving the public."

Nothing in this change is inconsistent with the goals and priorities described in the WRIA 1 Watershed Plan adopted in June, 2005.

Consideration of Protests and Comments

A protest letter was received on November 2, 2007, from the Lummi Indian Business Council, written by Leroy Deardorff, Environmental Program Director. The brief letter makes reference to ongoing issues relating to negotiations and litigation over "Reservation ground water". The letter further states that, "...the Department of Ecology has notified the Lummi Nation that further withdrawals in this area will not be approved."

This water right change is being done subsequent to a partial rescission of a considerable portion of Groundwater Permit 261. The water right has been found to be valid for 200 gpm and 4 acre-feet per year for community domestic use. No further appropriations can be approved as part of a water right change, so the concern expressed by the Lummi Nation about "further withdrawals" is unwarranted.

Historically the Lummi Nation has been very concerned about preserving and protecting water and habitat for fish and other wildlife in the Nooksack River and its tributaries. As explained in the Hydrogeologic Assessment portion of this report, impairment of the nearby tributaries of Deer Creek and Silver Creek is not expected to occur as a result of this change. Therefore, this change shouldn't result in a negative impact on water and habitat in the Nooksack system.

It should be noted that the annual quantity of water being changed here (4 acre-feet) is less than the 5.6 acre-feet per year an individual is entitled to when using a well under the exemption for single or group domestic purposes as per RCW 90.44.050.

CONCLUSIONS

In accordance with chapters 90.03 and 90.44 RCW, I find that Groundwater Permit 261 is in good standing and eligible for change. The new point of withdrawal is in the same source as the original point of withdrawal. Moving the point of withdrawal will not impair existing rights, or be detrimental to the public welfare. Moving the point of withdrawal and changing the place of use will not result in an enlargement of the right.

RECOMMENDATIONS

Based on the above investigation and conclusions, I recommend that the request for change to Groundwater Permit 261 be approved in the amounts and within the limitations listed below and subject to the provisions beginning on Page 2, et seq.

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:

- 200 gpm
- 4.0 acre-feet per year

- Community domestic supply

Point of [Diversion Withdrawal]

NE¼ NW¼, Section 31, Township 39 North, Range 3 East,W.M.

Place of Use

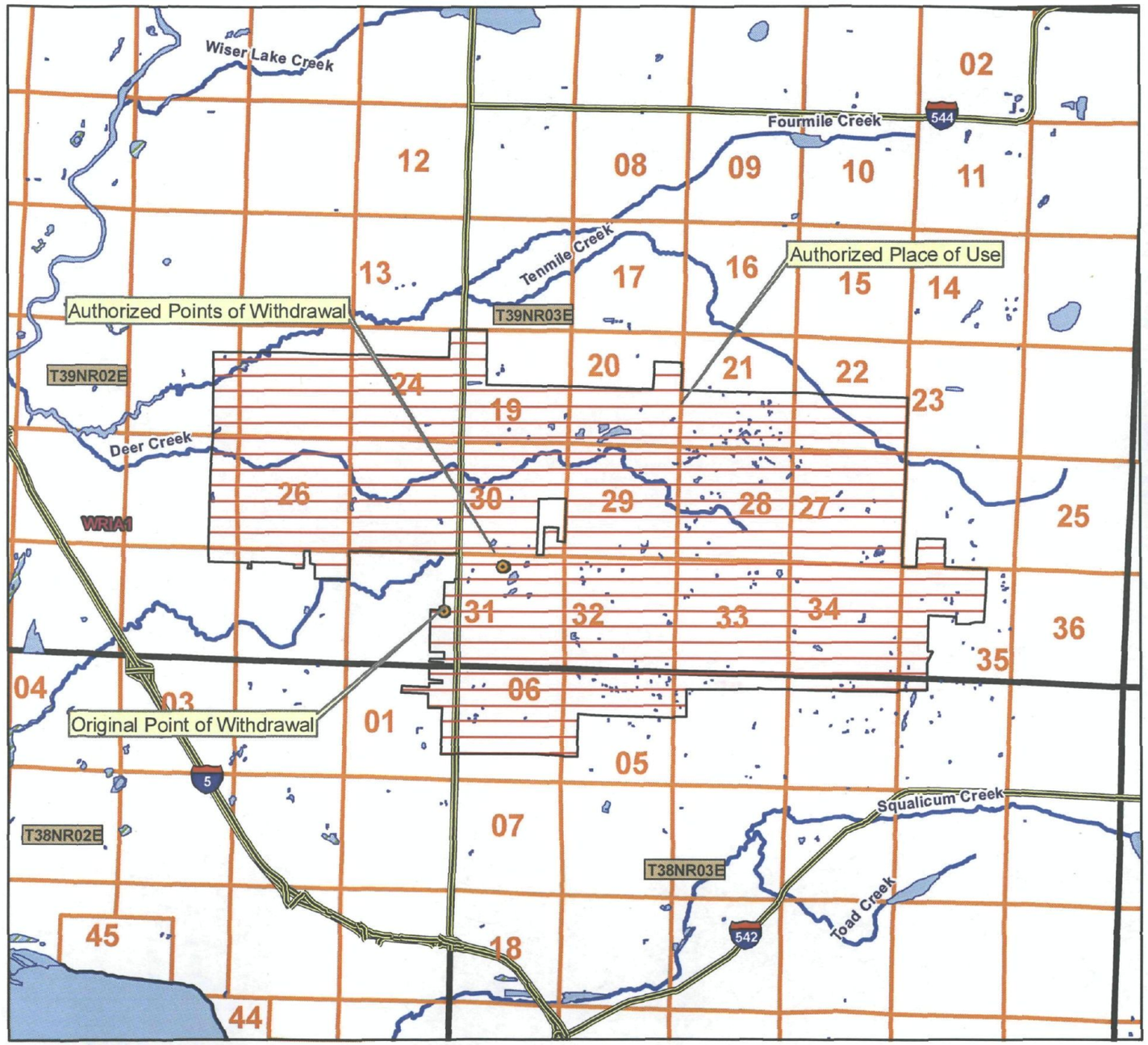
As described on Page 1 of this Report of Examination.

Report by: _____ August 27, 2009
FOR Paul Fabiniak — Date
Water Resources Program

If you need this publication in an alternate format, please call Water Resources Program at 425-649-7000. Persons with hearing loss can call 711 for Washington Relay Service. Persons with a speech disability can call 877-833-6341.

Deer Creek Water Association Inc
Water Right Number G1-*00266CWRIS
Sect. 31 T 39N R 03E W.M.
WRIA 1 - Whatcom County

DEPARTMENT OF ECOLOGY
State of Washington



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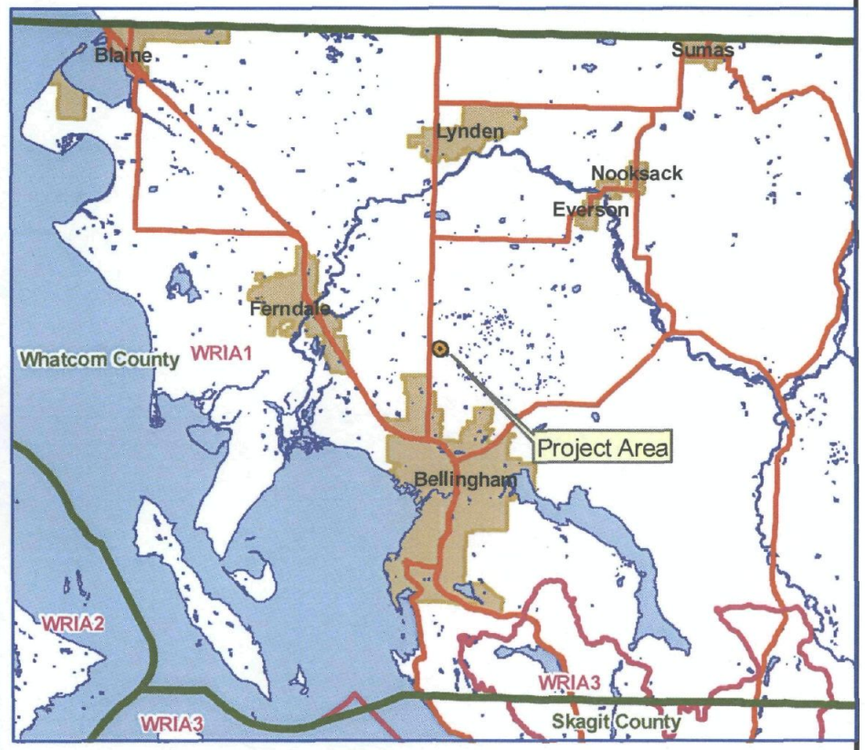

5 2.5 0 5 10 Miles

Legend

- County
- WRIA
- Highways
- Townships
- cities
- Sections
- Authorized Point of Withdrawal
- Authorized Place of Use Deer Creek Water Association

Place of use and point(s) of diversion/withdrawal are as defined on the cover sheet under the headings, 'LOCATION OF DIVERSION/WITHDRAWAL' and 'LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED.'

Attachment 1