DEPARTMENT OF ECOLOGY
State of Washington

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
REPORT OF EXAMINATION
To Appropriate Public Waters of the State of Washington

APPLICATION DATE	APPLICATION NO.
May 1, 1996	G2-29383

NAME
Lake Cushman Maintenance Company

ADDRESS/STREET	CITY/STATE	ZIP CODE
3740 North Lake Cushman Road	Hoodsport, Washington	98548

PUBLIC WATERS TO BE APPROPRIATED

SOURCE

Eight existing wells: Wells 1, 3, 4, 5, 7, 8, 9 and 11, and one or more additional new wells

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE-FEET PER YEAR
	2,250[1]	793.5[2]

QUANTITY, TYPE OF USE, PERIOD OF USE

2,250 gallons per minute, 793.5 acre-feet per year continuously for Municipal supply

Fish Propagation – 100 gpm and 52 acre-feet per year (additive)

[1]850 gallons per minute is additive for Municipal supply
[2]690.82 acre-feet per year is additive for Municipal supply

LOCATION OF WITHDRAWAL

APPROXIMATE LOCATION OF WITHDRAWAL
Well 1 (AHB681) 520 feet South and 825 feet East from the North 1/4 of Section 29, T. 23 N., R. 04 W. W.M.
Well 3 (AHB677), 780 feet North and 50 feet East from the South 1/4 of Section 04, T. 22 N., R. 04 W. W.M.
Well 4 1,570 feet South and 2,670 feet West from the Northeast Corner of Section 16, T. 22 N., R. 04 W. W.M.
Well 5 (AHB678) 950 feet North and 375 feet East from the Center of Section 05, T. 22 N., R. 04 W. W.M.
Well 7 (AHB675) 580 feet North and 165 feet West from the South 1/4 of Section 04, T. 22 N., R. 04 W. W.M.
Well 8 (AHB679) 890 feet North and 440 feet East feet from the Center of Section 05, T. 22 N., R. 04 W. W.M.
Well 9 (AHB680) 630 feet South and 980 feet East from the North 1/4 of Section 29, T. 23 N., R. 04 W. W.M.
Well 11 (AHB676) 140 feet South and 250 feet West from the North 1/4 of Section 09, T. 22 N., R. 04 W. W.M.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP	RANGE	WRIA	COUNTY
NW ¼ of the NE ¼ Well 1 (AHB681)	29	23 N.	04 W. W.M.	16	Mason
SE ¼ of the SW ¼ Well 3 (AHB677)	04	22 N.	04 W. W.M.	16	Mason
NE ¼ of the NW ¼ Well 4	16	22 N.	04 W. W.M.	16	Mason
SW ¼ of the NW ¼ Well 5 (AHB678)	05	22 N.	04 W. W.M.	16	Mason
SE ¼ of the SW ¼ Well 7 (AHB675)	04	22 N.	04 W. W.M.	16	Mason
SW ¼ of the NW ¼ Well 8 (AHB679)	05	22 N.	04 W. W.M.	16	Mason
NW ¼ of the NE ¼ Well 9 (AHB680)	29	23 N.	04 W. W.M.	16	Mason
NE ¼ of the NW ¼ Well 11 (AHB676)	09	22 N.	04 W. W.M.	16	Mason

PARCEL NUMBER	LATITUDE	LONGITUDE	DATUM
423290060000 (Well 1)	47° 27' 33.80"	123° 12' 58.61"	WGS84
422045000137 (Well 3)	47° 25' 10.66"	123° 11' 53.57"	WGS84
42216500125(Well 4)	47° 23' 53.90"	123° 11' 51.22"	WGS84
422055200063 (Well 5)	47° 25' 37.83"	123° 13' 06.27"	WGS84
422095000174 (Well 7)	47° 25' 08.69"	123° 11' 53.81"	WGS84
422055200063 (Well 8)	47° 25' 37.00"	123° 13' 05.34"	WGS84
423290060000 (Well 9)	47° 27' 32.62"	123° 12' 56.35"	WGS84
422095000174 (Well 11)	47° 25' 01.67"	123° 11' 58.16"	WGS84

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 place of use of this water right is the service area described in the most recent Lake Cushman Maintenance Company Water System Plan for Lake Cushman System 5 approved by the Washington State Department of Health, so long as the Lake Cushman Maintenance Company is and remains in compliance with the criteria in RCW 90.03.386(2). RCW 90.03.386 may have the effect of revising the place of use of this water right.

If the criteria in RCW 90.03.386(2) are not met, the place of use of this water right reverts to the last place of use described by Ecology in a water right authorization.

DESCRIPTION OF PROPOSED WORKS

For the domestic use, the Lake Cushman System 5 water system is a combination of three intertied systems previously referred to as Systems 1, 5 and 10. The combined system consists of 55,042 linear feet of pipe smaller than 4-inch-diameter, 47,138 linear feet of 4-inch-diameter pipe; 4,747 linear feet of 6- and 8-inch-diameter pipe; 427,700 gallons of storage and eight wells (Wells 1, 3, 4, 5, 7, 8, 9 and 11). Water is pumped and pressure-fed to residences. There are 2,247 connections expected by the year 2050 and 1,274 are currently served.

For the fish propagation use, the plan is to raise winter steelhead and spring Chinook and coho salmon, and hold adult fish for incubation at the proposed North Fork Skokomish Hatchery. The groundwater will be used for clean, pathogen-free water that is vital in early incubation.

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE	COMPLETE PROJECT BY THIS DATE	WATER PUT TO FULL USE BY THIS DATE
Begun	2020	2030

PROVISIONS

The total amount authorized for withdrawal from eight existing wells and one or more additional new wells under Ground Water Right Permit Number G2-29383P shall be limited to 2,250 gallons per minute; 793.5 acre-feet per year for Municipal supply. The amount includes 100 gallons per minute and 52 acre-feet per year for fish propagation.

This authorization is subject to the following conditions:

The total withdrawal under this Permit G2-29383P and water right certificates G2-00895C, G2-00896C, G2-00897C, G2-23350C, G2-27388C, G2-27389C, G2-27596C and G2-27598C shall not exceed 2,250 gallons per minute, 793.5 acre-feet per year.

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

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

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

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.

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

The water source and/or water transmission facilities are not wholly located upon land owned by the applicant. Issuance of a water right permit by this department does not convey a right of access to, or other right to use, land which the applicant does not legally possess. Obtaining such a right is a private matter between applicant and owner of that land.

FINDINGS OF FACT AND ORDER

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

Therefore, I ORDER the approval of Application No. G2-29383 subject to existing rights and the provisions specified above.

Signed at Olympia, Washington, this 19th day of December 2011.

Michael J Gallagher

Michael J. Gallagher, Section Manager
Water Resources Program
Southwest Regional Office

YOUR RIGHT TO APPEAL

You have a right to appeal this decision to the Pollution Control Hearing Board (PCHB) within 30 days of the date of receipt of this decision. 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 all of the following within 30 days of the date of receipt of this decision:

- File your appeal and a copy of this decision 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 decision 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 **Pollution Control Hearings Board** 1111 Israel RD SW STE 301 Tumwater, WA 98501	**Department of Ecology** Attn: Appeals Processing Desk PO Box 47608 Olympia, WA 98504-7608 **Pollution Control Hearings Board** PO Box 40903 Olympia, WA 98504-0903

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://www.leg.wa.gov/CodeReviser .

BACKGROUND

The Lake Cushman Maintenance Company's (LCMC) Lake Cushman System 5 (Washington Department of Health Water System ID# 03528F) water system is a residential development along the east shorelines of Lake Cushman and Lake Kokanee approximately 3 miles northwest of Hoodsport, Washington. Lake Cushman System 5 is the merger of three systems in to one. The inactive Systems 1 and 10 were intertied with System 5 to become the current System 5. System 5 will serve up to 2,247 lots. Currently there are approximately 1,274 active connections.

LCMC submitted a Ground Water Application prepared with the assistance of JW Morrissette & Associates Inc. and was assigned application number G2-29383 and priority date of May 1, 1996. Four other applications originally submitted individually were combined into Application G2-29383 to reflect the merging of multiple systems into Lake Cushman System 5 and to simplify the processing of the applications. Their eight existing Certified Ground Water Rights: G2-00895C, G2-00896C, G2-00897C, G2-23350C, G2-27389C, G2-27388C, G2-27596C, and G2-27598C have a system total Instantaneous Quantity (Qi) of 1,400 gpm and a total primary Annual Quantity (Qa) of 102.68 acre-feet. The subject application requests a total system Qi of 2,250 gpm, resulting in an additional 850 gpm and 690.82 acre-feet per year.

Attachment 1 shows the location of the eight existing LCMC wells and the approximate location of nearby domestic supply wells. If additional wells are drilled, they will be located in the same ¼ ¼ sections advertised in the public notification for System 5 points of withdrawal.

Project Description

For the subject Application, LCMC proposes to withdraw groundwater from eight existing wells to provide a water supply for Lake Cushman System 5. A summary of the Ground Water Right Application G2-29383 is presented in Table 1.

Table 1. Summary of Application No. G2-29383

Attributes	*Proposed*
Applicant	Lake Cushman Maintenance Company
Date of Application	May 1, 1996
Instantaneous Quantity	2,250 gallons per minute
Annual Quantity	793.5 acre-feet
Sources	Eight existing wells (plus one or more new wells)
Points of Withdrawal	NW ¼ NE ¼ Section 29, T. 23 N., R. 04 W. W.M. Well 1 (AHB681) SW ¼ SE ¼ Section 04, T. 22 N., R. 04 W. W.M. Well 3 (AHB677), NE ¼ NW ¼ Section 16, T. 22 N., R. 04 W. W.M. Well 4 SW ¼ NW ¼ Section 05, T. 22 N., R. 04 W. W.M. Well 5 (AHB678) SE ¼ SW ¼ Section 04, T. 22 N., R. 04 W. W.M. Well 7 (AHB675) SW ¼ NW ¼ Section 05, T. 22 N., R. 04 W. W.M. Well 8 (AHB679) NW ¼ NE ¼ Section 29, T. 23 N., R. 04 W. W.M. Well 9 (AHB680) NE ¼ NW ¼ Section 09, T. 22 N., R. 04 W. W.M. Well 11 (AHB676)
Purpose of Use	Multiple Domestic (Municipal supply) and Fish Propagation
Period of Use	Continuous
Place of Use	Lake Cushman System 5 (03529)

This application is one of two water right applications filed by LCMC in Mason County, Washington. LCMC also submitted Ground Water Right Application G2-29382 for 560 gpm for their Lake Cushman System 3 (Washington State Department of Health Water System ID 03528F) located north of Lake Cushman System 5. A summary of the two LCMC applications is shown in Table 2.

Table 2. Summary of Lake Cushman Maintenance Company Applications.

Project	Control Number	Purpose of Use	Priority Date	Quantity	Points of Withdrawal Locations	Sources
Lake Cushman System #3	G2-29382	Domestic Multiple	5/1/1996	560 gpm	22N/4W-18	Wells 2 and 10
Lake Cushman System #5	G2-29383	Domestic Multiple	5/1/1996	2,250 gpm	22N/4W-4, 5, 9, 16 23N/4W-29	Wells 1, 3, 4, 5, 7, 8, 9, and 11

Legal Requirements for Application Processing

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

- **Public Notice (RCW 90.03.280)**
  A public notice of the application must be published in a local newspaper once a week for two consecutive weeks (RCW 90.03.280). The public notice of application G2-29383 was published in the Shelton-Mason County Journal during the weeks of September 8 and 15, 2011.
- **State Environmental Policy Act (SEPA)**
  The subject water right is not subject to SEPA [WAC 197-11-305 and WAC 197-11-800(4)] because the instantaneous quantity does not exceed the threshold of 2,250 gallons per minute.
- **Water Resources Statutes and Case Law**
  Chapters 90.03 and 90.44 RCW authorize the appropriation of public water for beneficial use and describe the process for obtaining water rights. Laws governing the water right permitting process are contained in RCW 90.02.250 through 90.03.050. In accordance with RCW 90.02.290, determinations must be made on the following four criteria in order for an application for water rights to be approved:
  - Water must be available;
  - There must be no impairment of existing rights;
  - The water use must be beneficial; and
  - The water use must not be detrimental to the public interest.
- **Administrative Status of Surface Water Bodies**
  Surface water bodies in the region are subject to administrative regulations governing the right to withdraw water for beneficial use. Minimum instream flow regulations for the Skokomish-Dosewallips watershed (Water Resource Inventory Area [WRIA] 16) have not been adopted. Administrative rules have been proposed in WAC Chapter 173-516 in 1985. Closure of the North Fork of Skokomish to further water right allocations was proposed.

  Currently, no instream flows and basin closures have been set for WRIA 16 by Ecology. However, instream flow studies have been conducted related to watershed planning in WRIA 16 (Aspect Consulting, 2005). In addition, Watershed Planning Phases 1 through 3 have been completed, including a Draft Level 1 Assessment and a Watershed Management Plan.

INVESTIGATION

The examination of Ground Water Right Application G2-29383 was led by consultants from GeoEngineers, Inc. contracted as part of the Washington State Department of Ecology's (Ecology's) cost reimbursement program to facilitate the phased processing of the application. Phil Crane of the Water Resources Program, Southwest Region, Ecology oversaw the examination and also provided review. The review was triggered by processing of a group of water right applications submitted by Tacoma Power relating to the Cushman Hydroelectric Project, some of which are junior to the subject right. GeoEngineers performed the review and examination of these rights also under Ecology's cost reimbursement program.

The investigation included, but was not limited to, the review of:

- The State Water Code, specifically WAC 173 and RCW 90.
- Ecology water right files.
- Ecology, 2010, Washington State Well Log Viewer website, <http://apps.ecy.wa.gov/welllog/index.asp> (Accessed May 2010).
- Ecology, 2010, Water Rights Tracking System (WRTS). website.<http://www.ecy.wa.gov/programs/wr/rights/tracking-apps.html> (Accessed June 2010);
- Washington State Department of Health, 2010, Office of Drinking Water Find Water Systems website. <https://fortress.wa.gov/doh/eh/portal/odw/si/Intro.aspx> (Accessed June 2010)
- United States Geological Survey (USGS) topographic maps.
- Aspect Consulting, 2005, WRIA 16 Instream Flow Studies, Jefferson and Mason Counties, Washington. Prepared for WRIA 16 Planning Unit. <http://www.ecy.wa.gov/programs/eap/wrias/Planning/docs/wria16_isf_122305.pdf>
- Aspect Consulting, 2009, River and Stream Impairment Analysis, WRIA 16 and 14b, Skokomish-Dosewallips Planning Area. Prepared for WRIA 16 Planning Unit. <http://www.ecy.wa.gov/programs/eap/wrias/Planning/docs/wria16_ir_63009.pdf>
- Golder Associates, Inc. and Economic & Engineering Services, Inc., 2002, Draft Skokomish-Dosewallips Watershed (WRIA 16) Phase II – Level 1 Assessment, Data Compilation and Preliminary Assessment. Prepared for WRIA 16 Planning Unit Steering Committed, Shelton, Washington. <http://www.ecy.wa.gov/biblio/0306014.html>

- Tabor, R.W. and Cady, W.M., 1978, Geologic map of the Olympic Peninsula, U.S. Geological Survey Miscellaneous Investigations Map 994, scale 1:125,000;
- Molenaar, D. and Noble, J.B., 1970, Geology and related ground-water occurrence, southeastern Mason County, Washington: Washington Department of Water Resources Water-Supply Bulletin 29, 145 p., 2 plates;
- Washington State Department of Natural Resources (DNR), 2010, Washington Interactive Geologic Map. <http://wigm.dnr.wa.gov/> (Accessed June 2010)
- WRIA 16 Planning Unit, 2006, Watershed Management Plan Skokomish-Dosewallips Water Resource Inventory Area (WRIA 16) including the WRIA 14 South Shore Sub-Basin. <http://www.ecy.wa.gov/programs/eap/wrias/Planning/docs/WRIA%2016%20Draft%205_lo_res.pdf>;
- Information submitted by and conversations and/or meetings with Randy Bruff of LCMC and Trent Lougheed of JW Morrissette & Associates Inc.
- A site visit on May 17, 2010.

Site Visit

Joel Purdy, a Senior Hydrogeologist with GeoEngineers, conducted a site visit on May 17, 2010. Randy Bruff of LCMC gave a tour of the facilities and property. The tour included the inspection of the Wells 1, 3, 5, 7, 8, 9 and 11, their pump houses and wellheads. All the wells are 8-inch-diameter and located within wooden well houses that were found to be clean and well maintained. GeoEngineers took photographs of the wells, recorded Ecology well tag ID numbers, recorded meter readings, and established locations (latitude and longitude). Wells 4 and 6 were not inspected because they are reportedly inactive. At the time of the visit, Wells 3, 5 and 9 were pumping at approximately 140, 170 and 250 gpm, respectively. A summary of well construction details are provided below in Table 3.

Table 3. Well construction details for Points of Withdrawal for G2-29383.

Source	Ecology Well ID	Date Drilled	Total Depth Drilled (feet)	Screened interval (feet)	Pumping Test Rate (gpm)	Current Pumping Rate Capacity[1] (gpm)	Static Water Level[2] (feet)
Well 1	AHB681	Unknown	Unknown	108- unknown	Unknown	125	--
Well 3	AHB677	1968	51	35 - 49	300	140	10
Well 4		11/14/1969	82	18 - 45	172	80	4.8
Well 5	AHB678	Unknown	159	55 - unknown	307	170	9.8
Well 7	AHB675	5/7/1988	63	40 - 55	115	60	11
Well 8	AHB679	5/7/1988	140	93.5 - 115	500	140	32
Well 9	AHB680	10/5/1989	208	192 - 206	289	250	80
Well 11	AHB676	10/30/1989	160	102 - 122	100	80	0

[1] Pumping rates are based on the current Washington Department of Health Water Facilities Inventory Form (updated 12/7/2009), except for rates fir Wells 3, 5 and 9, which are based on observations during site visit on May 17, 2010.

[2] Groundwater levels fluctuate with corresponding lake levels fluctuations. Between 1988 and 1990, Lake Cushman levels were as low as Elevation 640 feet (nearly 100 feet lower than present lake levels) during construction of spillways (Steve Fisher, Tacoma Power, personal communication of 6/3/2010).

Existing LCMC Water Rights

LCMC has been allocated eight ground water rights associated with the Lake Cushman System 5 and one surface water right related to the irrigation of the golf course. The certified surface water right S2-00883C is for diversion of 0.67 cubic feet per second (cfs) and 53 acre-feet per year from an unnamed stream for irrigation of the golf course. The groundwater rights are summarized in Table 4.

Table 4. Summary of Existing LCMC System 5 Water Rights.

Control Number	Certificate	Priority Date	Qi (gpm)	Additive Qa (ac-ft/yr)	Non-Additive Qa (ac-ft/yr)	Source
G2-00895CWRIS	895	5/28/1970	180	14.4	--	Well 1 (AHB681)
G2-00896CWRIS	896	5/28/1970	400	55.78	--	Well 3 (AHB677)
G2-00897CWRIS	897	5/28/1970	160	18.2	--	Well 4
G2-23350CWRIS	G2-23350C	11/6/1974	300	14.3	--	Well 5 (AHB678)
G2-27389CWRIS	G2-27389C	7/14/1988	55	--	88.28	Well 7 (AHB675)
G2-27388CWRIS	G2-27388C	7/14/1988	145	--	88.28	Well 8 (AHB679)
G2-27596CWRIS	G2-27596C	8/16/1989	100	--	14.4	Well 9 (AHB680)
G2-27598CWRIS	G2-27598C	8/16/1989	60	--	76.9	Well 11 (AHB676)
		Totals	**1,400**	**102.68**		

LCMC has a total Qi allocation of 1,400 gpm and 102.68 acre-feet per year from the eight sources listed in Table 4 based on water right documents. Upon review of the water right documents, it appears that LCMC has a Qa of 14.4 acre-feet under G2-00895C and G2-27596C (Wells 1 and 9), 18.2 acre-feet under G2-00897C (Well 4), and 70.08 acre-feet of additive rights under G2-00896, G2-23350C, G2-27389C, G2-27388C and G2-27598C (Wells 3, 5, 7, 8 and 11). Therefore, LCMC's total Qa is 102.68 acre-feet.

Hydrologic/Hydrogeologic Evaluation

The project site lies on the southeastern Olympic peninsula near the town of Hoodsport, Washington. The subject application is related to Lake Cushman System 5 project located near the east shorelines of Lake Cushman and Lake Kokanee within the Skokomish-Dosewallips WRIA 16.

Geology
The geology of the general project area is depicted by DNR on their website. The geology in the North Fork Skokomish River headwaters generally consists of Tertiary volcanic and sedimentary bedrock (DNR website, 2010). Characterization of the geology and hydrogeology of southeastern Mason County was conducted by Molenaar and Noble (1970). Although the study area did not include the area near the groundwater point of withdrawal at the Lake Cushman System 5, much of the general descriptions of characteristics of principal stratigraphic units in the area apply to the site.

Recent unconsolidated alluvium as well as deposits of alpine glaciations occurs along the North Fork Skokomish River valley floor and along the Lake Cushman shoreline. Near Lake Cushman, unconsolidated deposits formed as the result of erosional and depositional events during multiple glaciations. The last glaciation occurred during the Ice Age approximately 15,000 years ago, known locally as the Vashon Stade of the Fraser Glaciation. The geologic history of the Hoodsport area results in complex layering of unconsolidated deposits (stratigraphy) overlying the primarily volcanic bedrock. The typical sequence for Mason County, from youngest to oldest, is alluvium, Vashon recessional outwash, Vashon till and Vashon advance outwash, underlain by older glacial, non-glacial deposits and the Tertiary bedrock. These deposits are described in Molenaar and Noble (1970) as follows:

- **Alluvium**: Fine-grained silt and sand, with some clay and peat. This unit is found in river valleys (e.g. the North Fork Skokomish River valley), lowland floodplains and near the mouths of valleys of the larger streams that flow into Hood Canal.
- **Vashon recessional outwash**: Discontinuously bedded loose gravel with some sand, silt and clay. It overlies till in depressions on drift plains and deltaic bedding along north sides of some valleys. This unit is not mapped in the Lake Cushman vicinity.
- **Vashon till**: Coarse cobbles in silt-clay matrix. This unit extensively mantles drift plains and generally occurs at surface in the central portion of the east shoreline of Lake Cushman and near Lake Kokanee.
- **Vashon advance outwash**: Unconsolidated gravel, sand and silt. This unit is generally exposed in the Lake Cushman vicinity within the walls of the incised valley of Big Creek, which drains to Lake Cushman, and the valley streams located several miles to the east. This unit also occurs to the east of North Fork Skokomish River in the area between the two reservoirs (Cushman and Kokanee).
- **Older unconsolidated deposits**: Deposits beneath the Vashon units found in the Hoodsport vicinity include: the Kitsap formation, a non-glacial unit of horizontally bedded silt and fine sand, with some clay and peat occurring near sea level along Hood Canal; Salmon Springs Drift, a pre-Vashon glacial deposit of coarse sand, gravel and some till; and undifferentiated deposits found generally beneath sea level. These deposits are not mapped in the Lake Cushman vicinity.
- **Tertiary bedrock**: Basalt of the Crescent Formation likely occurs at depth beneath the unconsolidated deposits. Exposures of basalt occur at various locations along the shorelines of Lake Cushman and Lake Kokanee in the Lake Cushman System 5 vicinity.

Another unit, alpine glacial deposits, occurs on and near the west shorelines of Lake Cushman and Lake Kokanee.

Hydrogeology
In the vicinity of Lake Cushman, the source for groundwater supply is either shallow unconsolidated alluvium and glacial deposits or the bedrock. For the subject application, the following is a general description of aquifers that may be potential sources:

- **Unconsolidated Aquifer**: This aquifer is found predominantly within the permeable layers of alluvium and Vashon glacial deposits that occur at the surface. The aquifer is unconfined and assumed to be in hydraulic continuity with Lake Cushman and Lake Kokanee based on groundwater level fluctuations that correspond with lake level changes. Static water levels are generally at a similar elevation as lake levels. Infiltration of precipitation, as well as exchange with Lake Cushman and Lake Kokanee, is an additional source of recharge to the unconsolidated aquifer. All of the System 5 wells are completed in this aquifer.
- **Bedrock Aquifer**: Basalt of the Crescent Formation is encountered below the Unconsolidated Aquifer in the vicinity of the subject application. The Crescent Formation is thick sequence of submarine and columnar basalt that is exposed along the north and west shorelines of Lake Cushman. The basalt forms a regional aquifer that is used for relative minor amounts of water supply for domestic purposes. Infiltration of precipitation and exchange with Lake Cushman are the sources for recharge to the Bedrock Aquifer.

As part of the investigation of subsurface conditions, Ecology Water Well Reports (well logs) in the general vicinity of the LCMC application were downloaded from Ecology's Well Log Viewer website. The logs of nearby wells and other hydrogeologic information regarding the site vicinity, including the previously discussed sources, were reviewed. The following is a summary of the water sources and hydrogeology in the area:

- Subsurface unconsolidated deposits are typically composed of glacial and non-glacial deposits. The deposits consist of layers of sand and sand and gravel, separated by finer-grained layers of silt and clay.
- The unconsolidated aquifer is unconfined at System 5 wells based on water level information reported on the well logs and information provided by LCMC.
- Other identified water supply wells in the vicinity of the System 5 are shown on Attachment 1. Wells are drilled to depths between 100 and 600 feet. Most shallow wells are completed in the unconsolidated aquifer. Some wells, especially those located in the upland areas away from Lake Cushman and Lake

Kokanee, are completed in the basalt bedrock aquifer. Pump testing rates for the nearby wells were reportedly between 2 and 40 gpm.

- The movement of groundwater in the vicinity of the subject application is generally from upland areas toward Lake Cushman.

Hydrogeologic Characteristics

There are no available data such as aquifer tests to characterize the properties of the aquifers described above. In order to evaluate the potential impacts on water resources or impairment of existing water rights, typical hydraulic properties of the source aquifers are assumed based on general properties, such as the grain size of the geologic deposits. Specific capacities (pumping rate divided by drawdown) of the wells range from 1 to 37.5 gpm per foot of drawdown, which implies transmissivities ranging from 1,500 to 56,000 gpd/ft (200 to 7,500 ft^2/day).

Shallow groundwater in the vicinity of System 5 wells likely flows toward Lake Cushman and Lake Kokanee and the unconsolidated aquifer discharges to Lake Cushman. Groundwater levels fluctuate with lake levels as indicated by limited historical water levels reported on well logs for wells drilled at different years and times of the year.

Projected Demand

According to information provided by JW Morrissette & Associates Inc., System 5 is projected to serve 2,247 lots by the year 2050. Using 0.33 acre-feet per connection, the projected annual demand is 741.5 acre-feet per year. When the application was amended, Tacoma Power indicated an additional 52 acre-feet per year was needed for the proposed North Fork Skokomish Hatchery. Therefore, the total projected annual demand is 793.5 acre-feet per year.

Area of Influence

The area of influence for application G2-29383 is likely small based on the direct continuity with Lake Cushman and the high aquifer transmissivity. The boundaries of the area of influence were conservatively estimated based on the drawdown cone likely to develop within an unconfined aquifer and the aquifer boundary. We conservatively used a 0.5-mile radius as the area of influence extending in an arc east (inland) of the well locations near Lake Cushman and a 1-mile radius for Wells 3, 7 and 11. There are no known wells within the 0.5-mile radius of the wells near Lake Cushman or within 1 mile of Wells 3, 7 and 11. While the existing LCMC wells have been operating in recent years at a combined rate of approximately 840 gpm, the wells located more than a mile away have not been known to be impacted.

Impairment Considerations

It is expected that the withdrawals by the applicant related to all the wells in the Lake Cushman System 5 will be from the unconsolidated aquifer that is in hydraulic continuity with Lake Cushman. The areal extent of the aquifer is controlled by the occurrence of bedrock. Because of the distance from the known nearby wells and the proximity to the recharge sources of Lake Cushman and Lake Kokanee, the potential for drawdown interference at other wells caused by pumping of the LCMC wells is minimal. Thus, there will be no impairment of existing rights.

The North Fork Skokomish River water budget for the Cushman Hydroelectric Project area is established in the settlement agreement as 160,000 acre-feet per year. The settlement agreement includes several elements and plans to reduce and mitigate potential impacts as a result of the project. No impairment of the ability to meet the established water budget for required releases to the North Fork Skokomish River is expected from the pumping of the System 5 wells.

Potential for Impairment of Existing Rights

A list of nearby existing water rights was developed using water right information provided by Ecology. A summary of the existing documents are shown below in Table 5.

Table 5. Summary of Existing Water Rights in the Vicinity of Lake Cushman System 5.

Owner	Control Number	Priority Date	Qi (cfs)	Qi (gpm)	Qa (ac-ft/yr)	Purpose of Use	Location
Robert and Betty Bangs	G2-25605	5/29/1980	--	51.5	8	Domestic Multiple	T22/R4W-10P
City of Tacoma	R2-*00354CWRIS	12/11/1919	--	--	190,000	Power Generation	T22/R4W-5
City of Tacoma	R2-*03766CWRIS	12/13/1932	--	--	7,300	Power Generation	T22/R4W-16
City of Tacoma	S2-*00353BSCWRIS	12/11/1919	1,000	--	--	Power Generation	T22/R4W-5L
City of Tacoma	S2-*02525CWRIS	12/11/1919	1,000	--	--	Power Generation	T22/R4W-16F
City of Tacoma	S2-*04176CWRIS	11/22/1935	2	--	--	Domestic Multiple, Irrigation, Heat Exchange	T22/R4W-4C
City of Tacoma	S2-*04787CWRIS	4/17/1939	0.5	--	--	Municipal, Heat Exchange	T22/R4W-4
City of Tacoma	S2-*11405CWRIS	5/29/1952	5	--	--	Power Generation	T22/R4W-7C
City of Tacoma	S2-*21349CWRIS	10/31/1968	0.1	--	5	Domestic Multiple	T23/R4W-20F
Daryl McClelland	S2-00687CWRIS	6/21/1971	0.02	--	0.5	Domestic Single	T23/R4W-32A
Kermit Franks	S2-24965CWRIS	7/24/1978	0.02	--	1	Domestic Single	T22/R4W-4D

None of the water rights listed in Table 5 will be impaired by the pumping of System 5 wells because they are either surface water rights related to the impoundment of Lake Cushman and Lake Kokanee, or they occur at a great enough distance from System 5 Wells as to not be impaired. Pumping of groundwater that is in hydraulic continuity with surface water in Lake Cushman or Lake Kokanee will result in either some reduction of groundwater seepage to the lakes or an increase in induced infiltration of surface water from the lakes. However, the volumes involved are negligible when considered in the context of the reservoir and surface water rights listed in Table 5, and are insufficient to cause impairment of these rights.

There are two ground water claims located in T22N/R4W Section 9. The claims process allowed users of water developed before 1917 for surface water and 1945 for ground water to register withdrawals. The state required users to register withdrawals during a "claims period" between 1969 and 1974, 1985 and again in 1998. A claim is not authorization to use the water, but a statement of claim. The validity of existing claims has not been determined in most cases and can only be determined by the Superior Court through adjudication.

There are three surface water right applications that are senior to the LCMC application priority date of May 1, 1996. Two are Tacoma Power surface water applications related to power generation at Cushman Dams 1 and 2. The other is a surface water right application S2-29274 submitted by Richard Haynie on August 23, 1995 for 0.02 cfs from an unnamed spring. Haynie agreed to be skipped during this cost reimbursement processing as stated in a document signed July 20, 2009. The pumping of System 5 wells will not impair the potential source of the Haynie application because the spring source is not in hydraulic continuity with the aquifer source of the System 5 wells.

Water Availability

The System 5 wells are located near Lake Cushman and Lake Kokanee. The wells are completed in the unconfined aquifer that is in direct hydraulic continuity with Lake Cushman based on groundwater and lake level correlation. The ground water supply is readily available due to the hydraulic continuity with Lake Cushman and Lake Kokanee and the fact that the drainage basin for the North Fork Skokomish River receives abundant rainfall. Therefore, the water is physically available.

There are no closures on surface water bodies in WRIA 16. No impact to surface (fresh) water is expected to occur from the operation of the wells. Therefore, groundwater is legally available for appropriation.

Public Interest Considerations

RCW 90.03.290 requires that a proposed appropriation not be detrimental to the public interest.

The 1971 Water Resources Act provides the most comprehensive list of legislative policies that guide the consideration of public interest in the allocation of water. These policies generally require a balancing of the state's natural resources and values with the state's economic well-being. Specifically, the policies require allocation of water in a manner that preserves instream resources, protects the quality of the water, provides adequate and safe supplies of water to serve public need, and makes water available to support the economic well-being of the state and its citizens.

The year-round withdrawal of 2,250 gpm of water for municipal supply and fish propagation use is consistent with state policy without adversely impacting instream flows or other public needs and values. No detriment to public interest could be identified during the examination of the subject application.

Consideration of Protests and Comments

No protests were received during the public notice period. A settlement agreement between Tacoma Power and other entities that hold stakes in the water, habitat and environment resources of the North Fork Skokomish River has led to several plans and strategies to preserve and monitor the water resources, including controls on lake levels for Lake Cushman and ramping discharges for the North Fork Skokomish River. The utilization of groundwater via the subject wells does not conflict with the provisions of the settlement agreement.

CONCLUSIONS

Water must be available
Lake Cushman System 5 is located in an area that receives abundant rainfall and groundwater recharge. Results of the hydrogeologic analysis indicate no significant water level drawdown from pumping of wells is expected at distance. It is concluded that sufficient water is available to provide 2,250 gpm and 793.5 afy.

No legal constraints to the use of the water by this right were identified, and the water is considered legally available.

There must be no impairment of existing rights.
The requested withdrawal is not expected to interrupt or interfere with the availability of water to an existing right.

The water use must be beneficial.
Municipal supply and fish propagation uses are considered beneficial uses in accordance with RCW 90.54.020.

The water use must not be detrimental to the public interest.
As describe above, this water use is not detrimental to the public interest.

RECOMMENDATIONS
Based on the above investigation and conclusions, I recommend that the Application No. G2-29383 be authorized in the amounts and within the limitations listed below and subject to the provisions beginning on Page 2.

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

- 2,250 gpm
- 793.5 acre-feet per year
- Municipal Supply and Fish Propagation
- The total withdrawal under water rights G2-00895C, G2-00896C, G2-00897C, G2-23350C, G2-27388C, G2-27389, G2-27596C and G2-27598 and permit G2-29383 shall not exceed 2,250 gallons per minute, 793.5 acre-feet per year.

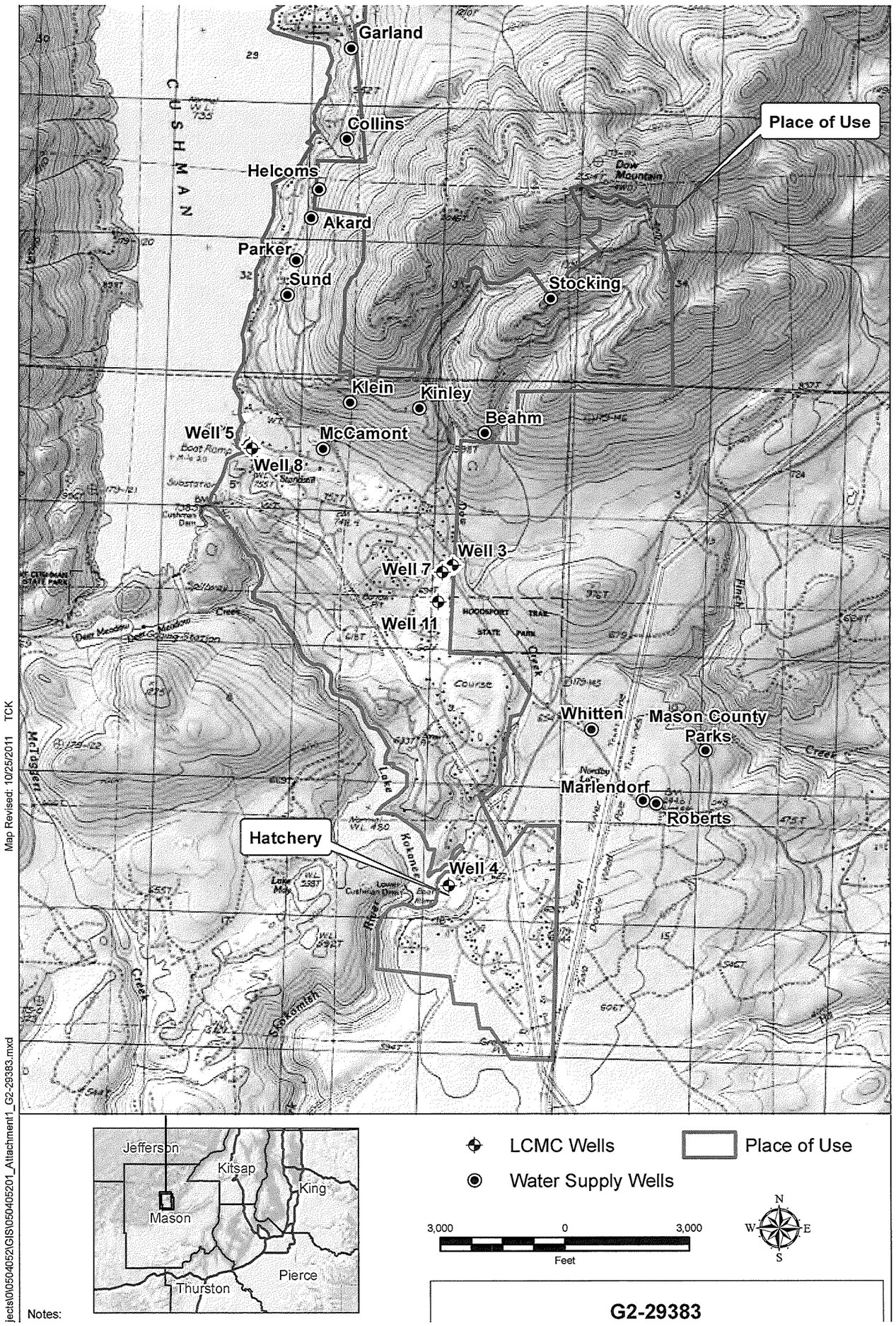
Points of Withdrawal
NW ¼ NE ¼ Section 29, T. 23 N., R. 04 W. W.M. Well 1 (AHB681)
SW ¼ SE ¼ Section 04, T. 22 N., R. 04 W. W.M. Well 3 (AHB677),
NE ¼ NW ¼ Section 16, T. 22 N., R. 04 W. W.M. Well 4
SW ¼ NW ¼ Section 05, T. 22 N., R. 04 W. W.M. Well 5 (AHB678)
SE ¼ SW ¼ Section 04, T. 22 N., R. 04 W. W.M. Well 7 (AHB675)
SW ¼ NW ¼ Section 05, T. 22 N., R. 04 W. W.M. Well 8 (AHB679)
NW ¼ NE ¼ Section 29, T. 23 N., R. 04 W. W.M. Well 9 (AHB680)
NE ¼ NW ¼ Section 09, T. 22 N., R. 04 W. W.M. Well 11 (AHB676)
And one or more additional new wells drilled within the ¼ ¼ sections listed above.

Place of Use
As described on Page 1 of this Report of Examination.

Reviewed by: Phil Crane — Phil Crane

12/19/2011 — Date

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



Notes:

Map Revised: 10/25/2011 TCK

jeats\0\0504052\GIS\0504052O1_Attachment1_G2-29383.mxd